TRADE SECRETS IN NEW ZEALAND

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TRADE SECRETS IN NEW ZEALAND

The major problems associated with trade secret law in New Zealand are that it is confused in definition and in jurisdiction. This confusion contributes to the failure of trade secret law in some instances, particularly to protect information created in the emerging biotechnology and computer software industries. This has contributed to alternative forms of protection, notably through copyright for computer programs.

From a review of the current law, categories of trade secrets are identified, including sub-patentable and patentable trade secrets. The jurisdictional dispute may be resolved if it is recognised that trade secrets represent a form of property right. To this end, the legal and economic approaches to property rights are synthesised. This synthesis is then extended to create a legal-economic model of the justifications for, and the problems with, the protection of these rights: the intellectual property rights continuum. From this model, it is concluded that some legal protection of trade secrets is justified, provided that equally harmful effects are not created. In particular, sub-patentable trade secrets may warrant greater protection, and patentable trade secrets may be over-protected.

One proposal is to punish industrial espionage, although some harmful effects may result. Utility models and laws that protect trade secrets in general are considered and rejected as solutions. Instead, patents of improvement (PI) are proposed which would protect trade secrets that represent an advance on an existing patent. PI would represent a lower standard of inventiveness that is adopted from American biotechnology patent disputes, and so protect sub-patentable trade secrets. The other, higher threshold from the existing English patent law would remain as the patent standard. If a PI were granted to a patent owner, then s/he could practise price discrimination, but if granted to a rival, then competition could result. Either outcome could protect trade secrets, yet mitigate the harmful effects of legal protection. If these proposals were adopted, more information could be produced as well as utilised. Moreover, the growth of the biotechnology and computer software industries in New Zealand could be furthered.

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PREFACE

"Trade Secrets in New Zealand" begins with a broad conspectus of the current law. Academic opinion and case law from New Zealand are utilised, and material from jurisdictions which are persuasive in this country, particularly those of England and Australia. Following the identification of the chief problems in this area of the law, and the construction of a legal-economic model through which to express these problems, the topic is effectively narrowed to examining the protection of particular categories of trade secrets: sub-patentable, and to a lesser extent, patentable trade secrets. The approach which is taken toward these secrets is 'reformist conservative', in that the changes to the law which are proposed may be accommodated within the existing intellectual property rights system.

The proposals are influenced, in part, by statutes and case law in jurisdictions that are less persuasive in New Zealand than England or Australia, notably Japan and the United States. These references are made chiefly to illustrate the potential for developments to be made in New Zealand law, but not as exhaustive expositions of the intellectual property law in those jurisdictions. Where consideration is given to the legal culture and legislation of such jurisdictions, as in the discussion of Japanese legal culture and utility model rights in Chapter Four, it is only to assist with the comprehension of that law as the basis for discussing its relevance for New Zealand. The proposals may also be influenced by other areas of New Zealand law. For example, in Chapter Three, the proposal for an industrial espionage law makes mention of unconscionability and negligence, but only so far as is useful for determining the approach to be made and its wording. In the same way, the industries in which another proposal, patents of improvement, may be applied, are discussed only with regard to that proposal. Hence, Chapters Six and Seven concern the application of patents of improvement to specific problems in the law relating to the biotechnology and computer software industries, but are not expositions of the law in those areas as a whole. Further, Chapter Six contains a review of the English patent criteria which are useful insofar as they may be persuasive in New Zealand, and may be adapted to accommodate patents of improvement. In Chapter Seven there is also limited mention of copyright law as an alternative to trade secret and patent law in the computer industry. However, these

discussions are not meant to be expositions of patent or copyright law as such. The result is that this research is based on a diverse range of materials. Therefore, to assist with comprehension of the thesis as a whole, the following descriptions are given of each chapter. These descriptions are reprinted as an abstract at the beginning of the relevant chapter.

Chapter One: Trade Secrets and the Action for Breach of Confidence

The identification of changes to the protection of trade secrets in New Zealand is difficult because the term 'trade secrets' is vague and the basis of the action for breach of confidence is confused. In this Chapter, the action for breach of confidence is considered more closely by dividing 'trade secrets' and the obligation of confidence into their constituent parts. The conclusion is that patentable and sub-patentable trade secrets need further analysis to determine if additional protection for these secrets is warranted. This task may be facilitated by the clearer view of the obligation of confidence which emerges from this Chapter.

Chapter Two: Trade Secrets and the Intellectual Property Rights Continuum

The discussion in Chapter One concerned the composition, but not the justification for, trade secrecy and the obligation of confidence. Like other intellectual property rights, trade secrecy is justified on the basis of natural law and economic theory. These arguments underlie one boundary of the intellectual property rights continuum. At the other extreme, the imposition of intellectual property rights may result in detrimental effects for society. The intellectual property rights continuum lies between these boundaries, with the position of each right determined according to its relative economic effects. The protection of sub-patentable trade secrets is found to be the least satisfactory and may require additional protection, whereas patentable trade secrets may be over-protected and warrant a reduction in protection. Once it is established that some form of legal barrier is necessary, the question then is how to scale the barrier so that a balance between the extremes of the continuum is achieved. The solution proposed is to find the least inefficient position on the continuum. Several approaches for altering the protection of trade secrets which may lead to this outcome are introduced.

Chapter Three: Industrial Espionage Law in New Zealand

Intellectual property rights are necessary to protect an innovator's natural rights and to avert market failure. Industrial espionage is not prohibited under the obligation of confidence so that its effectiveness as a legal barrier is reduced, particularly in the case of sub-patentable trade secrets. Different methods of widening this barrier through the equitable duty of confidence, improper means, unfair competition, and negligence are considered. These methods are drawn upon to create a new civil statutory duty *in rem.* It is proposed that espionage be punished as a form of improper means, the application of which is defined through a standard of gross negligence.

Chapter Four: Utility Model and Trade Secret Rights in Japan

In theory, multiple intellectual property rights to the same invention can be sold or licensed in different combinations according to the needs and means of the consumer. This form of price discrimination may be used to reduce the market imperfections which accrues from these rights. In this context, the use of utility models and trade secret rights in Japan are investigated and seen as a means of providing additional protection for trade secrets, including sub-patentable secrets. In fact, the Japanese may practise competition in preference to price discrimination, and more evidence is required before Japanese models are adopted elsewhere.

Chapter Five: Patents of Improvement

Sub-patentable trade secrets may have insufficient natural lead time before they are acquired by others, particularly if commercially valuable. Hence, inventors are unable to gain a sufficient return on their investment, harming their natural rights and leading to market failure. Widening the patent law may not be a solution, as patents can have equally harmful effects. In this Chapter, a proposal is made to introduce a patent of improvement (PI) in addition to the existing patent law. The PI would protect (presently) sub-patentable trade secrets, so that the size of the return to the inventor is increased. However, its use could also lead to product differentiation and price discrimination, so that the potentially negative effects of a patent right may be avoided. In the long term, the cost and risk of research could decrease so that the pattern of research and development could evolve into a series of improvements. This may benefit small and

large, emerging and established enterprises alike.

Chapter Six: Patents of Improvement II. Biotechnology

Advances in biotechnology may generate highly valuable trade secrets which tend, apart from the applications of pioneer discoveries, to be sub-patentable. Two main approaches to biotechnology patentability disputes have emerged in the common law jurisdictions, but may pitch the inventiveness threshold too high or too low; both are problematic. However, the lower threshold could be adapted to a patent of improvement (PI) in addition to the standard patent, as proposed in Chapter Five. The result could be that more biotechnological trade secrets could be protected and disseminated as PI without causing equally harmful effects. A dual patent-PI system may also overcome several difficulties of applying patents in this field, including the patenting of farmers' breeding stock, medical treatment methods, and difficulties associated with lengthy testing procedures. Therefore, if PI were adopted, the creation of specialist laws to protect biotechnological inventions may be unnecessary.

Chapter Seven: Patents of Improvement III. Computer Software

The inclusion of computer software under copyright law may protect valuable sub-patentable trade secrets. However, it may also create further inefficiency and harm the exercise of the natural rights of others. Recent alternative proposals to protect software have focused on enhancing the incentive to invent by targeting misappropriation, when it occurs, or on increasing the returns to the inventor. Neither are satisfactory because of imperfect information, so that neither the size of the problem, nor any optimal level of return, can be adequately assessed. Computer program trade secrets, where otherwise patentable, may also be challenged for not being suitable subject matter for a patent. A solution may be the patent of improvement (PI) proposed in Chapter Five, through which sub-patentable trade secrets may be protected without causing an equally harmful outcome. PI may also represent a legitimate outcome for reverse engineering and so would impose an acceptable scope for this activity. Therefore, if PI were adopted in addition to standard patents, then specialist legislation for software protection may be unnecessary.

A NOTE ON THE FORMAT

The chapters of this thesis are written as a series of related papers, rather than in the more traditional format of 'introduction, methods, results and conclusions'. In part, this approach is predicated by the breadth of the law which is discussed. However, Chapter One may be viewed as representing an introduction, in that trade secrecy and the law of trade secrets in New Zealand, as well as material from persuasive foreign jurisdictions, are reviewed and problems are posited from that review. Chapter Two may be viewed as a form of methods section insofar as the legal and economic model which is developed therein is used to express these problems, and is applied to subsequent chapters. The remaining chapters contain the bulk of the investigation in the form of potential solutions to the problems posed in Chapters One and Two. This includes a discussion of a law to punish industrial espionage and a proposal for patents of improvement and applications of the latter to some of the problems inherent in the biotechnology and computer software industries. Each chapter contains its own conclusion and hence the main conclusion is a review of the most pertinent points to emerge from this thesis, as well as proposals for further research.

A note of explanation may be required for those who are unfamiliar with the style of pagination which is employed. Given that the chapters represent a series of related papers, as noted above, the numbering is reset at the beginning of each chapter. For example, "5.26" means Chapter Five, page 26; "see 7.32, n184" is a cross reference that relates to Chapter Seven, page 32, footnote 184.

In addition, some may be unfamiliar with references to a series of letters such as "http://biotechlaw.ari.net/2sm.html". This marks an address on the internet. One problem that is associated with these references is that the files which were accessed did not have page numbers. Hence, these references may at first appear to be incomplete.

CHAPTER ONE:
Trade Secrets and the Action for Breach of Confidence

TRADE SECRETS AND THE ACTION FOR BREACH OF CONFIDENCE

The identification of changes to the protection of trade secrets in New Zealand is difficult because the term 'trade secrets' is vague and the basis of the action for breach of confidence is confused. In this Chapter, the action for breach of confidence is considered more closely by dividing 'trade secrets' and the obligation of confidence into their constituent parts. The conclusion is that patentable and sub-patentable trade secrets need further analysis to determine if additional protection for these secrets is warranted. This task is facilitated by the clearer view of the obligation of confidence which emerges from this Chapter.

The treatment of trade secrets and other confidential information in New Zealand has been strongly influenced by decisions in other common law jurisdictions, particularly England and Australia. Any discussion of trade secrets and their protection under the action for breach of confidence ought to include reference to these decisions as well as those from New Zealand. An initial observation is that confidentiality and trade secrets are both terms which defy precise definition.[1] The courts may simply recognise that a communication is confidential without additional definition[2], or, as with trade secrets, resort to definition by example.[3] This confusion may contribute to the failure of the law to protect some trade secrets, particularly in the biotechnology and computer software industries.[4] Moreover, it may lead to the search for alternative forms of legal protection including, for example, copyright, rather than to the adaption of the obligation of confidence.

Despite the confusion, one starting point for further discussion is the definition of trade secrets and other confidential information in *Faccenda Chicken Ltd v Fowler*

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[1] Eg *Thomas Marshall (Exports) Ltd v Guinle* [1978] Ch 193, at 208; *CE Elley Ltd v Wairoa-Harrison and Anor* [1987] 1 NZELC 95,620, at 95,627; see also the comments of Sir Nicholas Browne-Wilkinson VC in *Attorney-General v Guardian Newspapers Ltd* [1987] 1 WLR 1248, at 1263.

[2] *Amber Size and Chemical Company Limited v Menzel* [1913] 2 Ch 239, at 245; *Duchess of Argyll v Duke of Argyll* [1967] 1 Ch 302, at 330.

[3] See Dean R (1990) *The Law of Trade Secrets*, The Law Book Company: Sydney, at 20.

[4] Discussed in Chapters Six and Seven.

and Ors.[5] In that case, Goulding J at first instance distinguished between: (1) Information which is too trivial to be considered confidential or which is publicly available[6]; (2) Information which forms part of an employee's skill and knowledge and which is to be considered confidential (because it is obvious or as a result of express instruction), but only during employment, and; (3) Trade secrets which are specific information that can only be used for the benefit of the employer, whether during or after the termination of the employment. Skill and knowledge, or knowhow, is protected only during employment because of the difficulty of restraining its use and because it is generally available in the trade anyway.[7] Trade secrets are items of confidential commercial information that are distinct from skill or knowhow, and hence are not commonly available.[8]

According to Megarry J in *Coco v AN Clark (Engineers) Ltd*[9], there are three elements that must be satisfied for a breach of confidence to be established: (1) The information must have the "necessary quality of confidence"[10]; (2) The information must have been imparted under an obligation of confidence; and (3) There must be unauthorised use of that information to the detriment of the party communicating it.

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[5] [1985] 1 All ER 724, at 731-2; approved on appeal in *Faccenda Chicken Ltd v Fowler and Ors* [1986] 1 All ER 617. This judgment has been widely accepted: see for example, *SSC & B: Lintas New Zealand Ltd v Murphy* [1986] 2 NZLR 436, at 457; *PCA of New Zealand Ltd v Evans and Anor* [1987] 1 NZELC 95,412, at 95,428; *CE Elley v Wairoa-Harrison*, above n1, at 95,632; *Wright v Gasweld Pty Ltd* (1991) 20 IPR 481, at 504.

[6] See for example, *Coco v AN Clark (Engineers) Ltd* [1969] RPC 41, at 48.

[7] See for example, *United Indigo Chemical Co Ltd v Robinson* [1931] 49 RPC 178, at 187.

[8] See for example, *Westminster Chemical NZ Ltd v McKinley* [1973] 1 NZLR 659, at 665; *New Zealand Needle Manufacturers Ltd v Taylor and Anor* [1975] 2 NZLR 33, at 44; *Lock International plc v Beswick and Others* [1989] 3 All ER 373, at 378; cf the lack of specificity required of general knowledge or knowhow in *Printers and Finishers Ltd v Holloway* [1964] 3 All ER 731, at 736.

Trade secrets can include discrete applications of knowhow: see for example, *Saltman Engineering Co Ltd v Campbell Engineering Co Ltd* (1948) 65 RPC 203, a case which concerned the misuse of drawings of a leather punch that could have been acquired legally by purchasing a punch and hiring a draftsperson to make drawings of it; that is, the knowhow involved was commonly available, but the application of knowhow was specific enough that it could not be obtained without independent production.

[9] Above n6, at 47.

[10] This phrase is drawn from Lord Greene MR in *Saltman Engineering*, above n8, 215.

Gurry[11] has observed that these elements are a cumulative precondition to liability. This classification has been adopted as the standard test for breach of confidence in both New Zealand[12], and Australia.[13]

The practical application of Megarry J's necessary quality of confidence is imprecise, despite the initial definition of trade secrecy and knowhow given by Goulding J in *Faccenda.* This is because there is a wide variety of information that may be included in the categories of knowhow and trade secrets. Knowhow differs between trades, and much information may be classed as trade secrets, even where that information is short-lived[14], or simple.[15] Trade secrets are comprised of four broad categories of mostly dissimilar information: patentable secrets and sub-patentable secrets, strategic business secrets, and experimental data. Patentable trade secrets are those which meet the threshold patent criteria of commercial usefulness, novelty and inventiveness, yet the owner has chosen secrecy. An example may be the pig-rearing apparatus which was at issue in *Nichrotherm Electrical Co Ltd and Ors v Percy and Anor.*[16] If trade secrecy is maintained, then presumably this is because the information is worth more to its owner as a secret than if disseminated through patent specifications. Sub-patentable trade secrets may partially meet the thresholds of the patent criteria. Possible patentable or sub-patentable trade secrets are the undisclosed process in *Amber Size and Chemical Co Ltd v Menzel*[17], and the confectionary manufacturing process in *AB Consolidated*

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[11] (1984) *Breach of Confidence*, Clarendon Press: Oxford, at 5.

[12] Eg *AB Consolidated Ltd v Europe Strength Food Co Pty Ltd* [1978] 2 NZLR 514, at 520; *Whimp v Kawakawa Engineering Ltd and Davidson* [1979] 1 NZIPR 144, at 161-3; *Woods & Mitchell Advertising Ltd v Tiley, Youmans and Thorne* [1983] 1 NZIPR 439, at 450; *Aquaculture Corporation v New Zealand Green Mussel Co Ltd and Ors* [1985] 5 IPR 353, at 377; *Pacifica Shipping Co Ltd v Anderson* [1986] 2 NZLR 328, at 342; *Attorney-General for the United Kingdom v Wellington Newspapers Ltd* [1988] 1 NZLR 129, at 141.

[13] Eg *Interfirm Comparison (Australia) Pty Ltd v Law Society of NSW Inc* [1975] 5 ALR 527, at 541; *Wright v Gasweld*, above n5, at 504.

[14] *Faccenda*, above n5, at 627.

[15] *Cranleigh Precision Engineering Ltd v Bryant and Anor* [1964] 3 All ER 289, at 295; *Allco Agencies Auckland Ltd v Naidoo and Anor* [1988] 2 NZELC 95,922, at 95,929.

[16] [1956] 13 RPC 272.

[17] Above n2. The apparatus in *Nichrotherm*, if not patentable would likely have been sub-patentable.

Ltd v Europe Strength Food Pty Ltd Co.[18] Into this category of trade secrets also comes much of the information in the 'borderline areas' of patent law, such as biotechnology and computer software inventions. Strategic business secrets pertain to the operation of the enterprise. These include customer lists, knowledge of customers, and pricing data that could be used by competitors, as in *Faccenda.*[19] Experimental data represents results that do not yet constitute a saleable item, but could be used by a competitor to save them the cost of a similar investment in research. The broad nature of the trade secret categories has led judges to compile a list of factors which may be used when determining confidentiality. In Part I, the factors that are commonly used to determine the necessary quality of confidence are evaluated. It is suggested that trade secrets and knowhow vary in the degree to which these factors are present in the information. This is the first step toward distinguishing between different groups of trade secrets as well as from knowhow.

The application of Megarry J's second element for breach of confidence, that an obligation of confidence exists, is complicated by the multiple doctrinal bases under which the issue may be decided. Express and implied contract, the equitable duty of confidence, and fiduciary obligation have all been used. The concept of property was mentioned in early cases but has not taken root[20], possibly as the usefulness of property is viewed as being limited to commercial information.[21] However, in this Chapter the consideration of confidential information is limited to just such commercial information. Finn[22] at least acknowledges that confidential information shares some of the 'attributes' of property, although these are ill-defined. In Part II, a terminology is developed to classify confidential information as a property right and to reduce such a right to the constituent legal and economic behavioural relationships: the claim-right and

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[18] Above n12.

[19] See also *Herbert Morris Ltd v Saxelby* [1916] 1 AC 688, [1916-17] All ER 305, which concerned prices that were not generally known.

[20] Finn P (1977) *Fiduciary Obligations*, The Law Book Company: Sydney, at 31; Gurry, 1984, at 46-56.

[21] See also Jones G (1970) Restitution of Benefits Obtained in Breach of Another's Confidence, 86 *LQR* 463, at 465; Cross JT (1991) Trade Secrets, Confidential Information, and the Criminal Law, 36 *McGill LJ* 525, at 534.

[22] Above n20, at 132; see also Jones, above n21, at 464; Gurry, above n11, at 46-7.

duty of exclusivity, the power and liability of transferability, and the claim-right and duty of enforceability. Each of these three relations must be found to exist between the same two parties if an obligation of confidence is to be established. The duty of confidence is simply the portion of these relations which affect the confidant: the duty of exclusivity, restrictions on the power of transferability, and the duty of enforceability. Of course, if a duty of confidence is held to exist then the obligation of confidence may be inferred. Hence, judges tend to discuss the duty and obligation of confidence as synonyms.

These constituent relations provide a framework under which the circumstantial evidence for the creation of a duty of confidence can be considered. This evidence may be used to assess the similarities and differences between the implied contract, the equitable duty of confidence and fiduciary duty so that the correct doctrinal basis of the obligation of confidence can be resolved. The conclusion is that the obligation of confidence is also a fiduciary obligation that can be established under different circumstances.

In Part III Megarry J's third element for breach of confidence, that there be detriment following unauthorised use of confidential information, is discussed. It is suggested that the nature of the detriment that is suffered from a breach of confidence may differ, in theory, according to the circumstances in which the obligation arises. The advantage of the treatment of the obligation of confidence given in Parts II and III is that attention may then properly be focused on the protection of patentable and sub-patentable trade secrets. It is concluded that the economic issues which are recognised to be associated with trade secrets in Part I and the action for breach of confidence in Part II deserve further consideration.

I *The Necessary Quality of Confidence*

The courts tend to take a subjective overview of the information under consideration to determine if it manifests the necessary quality of confidence. There are numerous factors that are considered, but most can be grouped under the title of secrecy. The secrecy element of confidentiality appears to be the parallel of the dissemination

requirement for patents. Three further factors are commercial value, novelty, and skill. These factors also seem to be closely related to the patent criteria of commercial usefulness, inventiveness and novelty, respectively. This parallelism is consistent with the view of Friedman, Landes, and Posner[23], who believe that trade secrets evolved as a supplement to patents where patent protection is believed to be "too costly relative to the value of the invention, or that it will give them a reward that is substantially less than the benefit of their invention (as reflected, in part, in the length of time before anyone else will invent it), either because the invention is not patentable or because the length (or other conditions) of patent protection is insufficient".

I(a) *Secrecy*

Secrecy is a precondition for establishing confidentiality, the common basis for which is that the information cannot be generally known or available to the public.[24] In deciding what is secret, the court may view the information in the context of the confidence at issue. This is because secrecy is a relative term or a "question of degree depending on the particular case".[25] In some instances, information may still be considered confidential where parts of it have entered the public domain[26], or is wholly public but not commonly known to be available, such as where publication has been limited.[27] Hence, knowledge of a secret within a foreign country does not necessarily

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[23] (1991) Some Economics of Trade Secret Law, 5(1) *J Econ Persp* 61, at 64.

[24] *Saltman Engineering*, above n8, at 415; see also *AB Consolidated v Europe*, above n12, at 521; *Mense and Ampere Electrical Manufacturing Co Pty Ltd v Milenkovic* [1972] VR 784, at 801; *Secton Pty Ltd and Anor v Delawood Pty Ltd and Ors* [1991] 21 IPR 136, at 150. See also Jones, above n21, at 463.

[25] *Franchi v Franchi* [1967] RPC 149, at 153, per Cross J.

[26] Eg *Pacifica Shipping v Andersen*, above n12, at 342; see also *Thomas Marshall v Guinle*, above n1, at 209-10.

[27] See for example, *Westpac Banking Corporation v John Fairfax Group Pty Ltd and Ors* [1991] 19 IPR 513, at 525; *European Pacific Banking Corporation v Fourth Estate Publication Ltd* [1993] 1 NZLR 559, at 152.

destroy its confidentiality elsewhere.[28] Further, all the parts of the information can be individually available, but if the whole is not, and is not capable of immediate use, then the information may still be considered sufficiently confidential to be a trade secret.[29] The court may be aided in its overview of the information if it is considered in the context of related information. In *Faccenda*, Neill LJ said:[30]

> For our part we would not regard the separability of the information as being conclusive, but the fact that the alleged confidential information is part of a package is likely to throw light on whether the information in question is really a trade secret.

Similarly, in *Printers and Finishers Ltd v Holloway and Ors*[31], Cross J found that the use in new employment of information which is not readily separable from a person's general knowledge is unlikely to be considered improper. In contrast, once the information is accepted as confidential it does not matter whether it is mixed with other information. According to Lord Denning MR:[32]

> When the information is part public and part private, then the recipient must take special care to use only the material which is in the public domain. He should go to the public source and get it: or at any rate, not be in a better position than if he had gone to the public source.

The suggestion that information may eventually be discovered independently and so become public knowledge has been rejected as a defence which lessens

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[28] See *Franchi v Franchi*, above n25, although in that case a Belgian specification did destroy the confidentiality of a secret in Britain, given that British patent agents were believed to monitor foreign applications.

[29] *Saltman Engineering*, above n8, at 415; *Coco v Clark*, above n6, at 47; *Ansell Rubber Co Pty Ltd v Allied Rubber Industries Pty Ltd*, [1967] VR, at 49; *H&R Block Ltd v Sanott and Anor* [1976] 1 NZLR 213, at 217; *AB Consolidated v Europe*, above n12, at 518; *Whimp v Kawakawa Engineering*, above n12, at 161; *Pacifica Shipping v Andersen*, above n12, at 342; *Secton v Delawood*, above n24, at 150.

[30] Above n5, at 627; see also *Korbond Industries Ltd v Jenkins* [1992] 1 ERNZ 1141, at 1156.

[31] Above n8, at 736.

[32] *Seagar v Copydex Ltd* [1967] 2 All ER 415, at 417; accepted, for example, in *Woods & Mitchell Advertising*, above n12, at 450.

confidentiality, as it would make trade secrecy pointless.[33] Neither can secrecy be lost through the mere communication of an idea in negotiations[34], as the confidence does not amount to public knowledge. Rather, secrecy is destroyed through publication[35], by a third party[36], in patent specifications[37], or through the sale of commonly known technology.[38] However, where the confidant is also responsible for publication, liability for breach of confidence is not destroyed, even if secrecy is lost.[39]

I(b) *Commercial Value*

Commercial usefulness relates to the expected demand for and so value of a secret. In *Coco v Clark*[40], Megarry J held that where "information of commercial or industrial value is given on a business-like basis" the confidant ought to have realised that they were under an obligation of confidence, as discussed below. The point here is that if the confidant ought to have realised that the information was given "in confidence"[41] from its commercial value, then they ought also to have recognised the confidentiality of that information. Indeed, if the information was not confidential and

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[33] See *AB Consolidated v Europe*, above n12, at 525.

[34] *Fraser and Ors v Thames Television Ltd and Ors* [1984] 1 QB 44, at 67.

[35] See generally, *Lysnar v Gisborne Harbour Board* [1924] NZLR 13; *European Pacific v Fourth Estate Publications*, above n27, at 560.

[36] *Attorney-General v Guardian Newspapers Ltd (No 2)* [1988] 2 WLR 805, at 814-5; *Attorney-General v Wellington Newspapers*, above n12, at 175.

[37] *O Mustad & Son v S Allcock & Co Ltd* [1963] 3 All ER 416, at 418; see also *Cranleigh Precision Engineering v Bryant*, above n15, at 302; *Dillon and Anor v JP Products Pty Ltd and Ors* [1984] 4 IPR 372, at 385; *Secton v Delawood*, above n24, 196.

[38] *Peter Pan Manufacturing Corp v Corsets Silhouette Ltd* [1963] 3 All ER 402, at 408; *Lock International v Beswick*, above, n8, at 378; *Secton v Delawood*, above n24, at 170.

[39] *Attorney-General v Guardian Newspapers (No 2)*, above n36, at 810-11.

[40] Above n6, at 48.

[41] Ibid.

secret there would be no demand in the marketplace. In other words, commercial usefulness could be an indicator of confidentiality that has been understated in the case law, and possibly inferred through the phrase 'commercial confidences'.[42]

In one example, at least, commercial value has been used as a pre-condition of trade secrecy. In *Secton Pty Ltd and Anor v Delawood Pty Ltd and Others*[43] a proposed trade secret was rejected for lack of commercial value. Indeed, earlier in that case King J suggested that the law of trade secrets was derived as a commercial application of the action for breach of confidence.[44] In contrast, knowhow may have a commercial value and there may be demand for it in the labour market, but the assessment of it is independent of that value. Indeed, a person's skill and experience may be worthless in monetary terms in the labour market, yet still be regarded as knowhow. Hence, commercial value may be a negative test of trade secrecy, though not necessarily of knowhow.

Commercial value may not be used to distinguish between different types of confidential information because the monetary value can vary between cases. Knowhow may in fact be more valuable than a patentable trade secret. However, as a generalisation there may be more instances where patentable and sub-patentable trade secrets represent highly valuable inventions compared with strategic business secrets or experimental data, so that this factor may be useful for distinguishing between different categories of trade secrets.

I(c) *Novelty*

Novelty in information may be the application of an inventor's skill. Indeed, in

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[42] This phrase is used by Gowans J in *Ansell Rubber v Allied Rubber*, above n29, at 46, as an apt description of trade secrets.

[43] Above n24, at 219.

[44] Ibid, at 149.

Coco v Clark, Megarry J said:[45]

Something that has been constructed solely from materials in the public domain may possess the necessary quality of confidentiality for something new and confidential may have been brought into being by the application of the skill and ingenuity of the human brain. Novelty depends on the thing itself and not upon the quality of its constituent parts.

Originally, novelty may have been a key factor in the determination of confidentiality, given that trade secrets were traditionally limited to novel and secret formulae and methods[46], such as the malt extracting process in *Wilson Malt Extract Co Ltd v Wilson and Ors*.[47] More recently there has been a trend toward broadening the class of information which can be considered to be trade secrets, including the names of customers and details of the goods which they buy.[48] In *Lansing Linde Ltd v Kerr*[49], Butler-Sloss LJ cited this development as a consequence of the changing business environment and said:[50]

'Trade secrets' has, in my view, to be interpreted in the wider context of highly confidential information of a non-technical or non-scientific nature which may come within the ambit of information the employer is entitled to have protected, albeit for a limited period.

A corollary of this catholic trend is a decline in the importance of novelty. It is now a circumstantial factor that can be used to help determine the existence and the

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[45] Above n6, at 47; accepted in *Thomas Marshall v Guinle*, above n1, at 209; *Fraser v Thames Television*, above n34, at 66.

[46] See *NZ Needle Manufacturers v Taylor*, above n8, at 42; *Allco Agencies v Naidoo*, above n15, at 95,928.

[47] [1919] NZLR 659; see also *Amber Size v Menzel*, above n2.

[48] See for example *Thomas Marshall v Guinle*, above n1, at 209; *Lintas v Murphy*, above n5, at 456-7; *Peninsular Real Estate Ltd v Harris* [1992] 2 NZLR 216, at 220-1; *CE Elley v Wairoa-Harrison*, above n1, at 95,628; *Korbond Industries v Jenkins*, above n30, at 1154. An early precedent which concerned prices was *WC Leng & Co Ltd v Andrews* [1909] 1 Ch 763, at 774, quoted in *Morris v Saxelby*, above n19, at 311.

[49] [1991] 1 All ER 418.

[50] Ibid, at 435.

level of confidentiality. Indeed, in *NZ Needle Manufacturers*, McMullin J said:[51]

> [T]he less novel a machine is, the less likely it will be that a plaintiff will be able to show that it was so secret that a duty of confidentiality should be held to exist.

Depending on the information, the level of novelty can vary from trivial changes to the level of the criterion of patentability. Knowhow has limited novelty as it is available from others in the labour market. Trade secrets may be so specific that they are novel. Thus, novelty, like skill, can be used to distinguish between knowhow and trade secrets. In addition, novelty may vary between the different broad categories of trade secrets. Patentable and sub-patentable trade secrets ought to be assessed as more novel than experimental data and customer lists, if only because of the different level of skill that may be employed, as discussed below. The more skill that is employed, the greater the scarcity of the information, and so the greater the relative novelty of that information.

I(d) *Skill*

Evidence of the skill expended to create information is a factor in determining confidentiality. In *Saltman Engineering Co Ltd v Campbell Engineering Co Ltd*, Lord Greene MR said:[52]

> ...what makes it confidential is the fact that the maker of the document had used his brain and thus produced a result which can only be produced by someone who goes through the same process.

Skill can be considered as a relatively elementary form of talent on a scale that extends to the level of the inventiveness criterion of patentability. Hence, a serendipitous creation cannot be presumed to lack an input of skill as it may represent talent, if only

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[51] Above n8, at 43; see also *Wheatley and Ors v Bell and Ors* [1982] 2 NSWLR 544, at 546.

[52] Above n8, at 415; see also *Coco v Clark*, above n6, at 47; *Conveyor Co of Australia Pty Ltd v Cameron Bros Engineering Co Ltd* [1973] 2 NZLR 38, at 42.

for realising the inventive potential which the application of a discovery would have. Inventiveness itself, however, it not a prerequisite for confidentiality or trade secrecy[53], nor is the existence of a right to a patent.[54] Rather, confidentiality is related to the general scarcity that is implicit in skill, and breach of confidence to a lack of skill or desire not to expend it. Consequently, the claim by Palmer[55] that intellectual property rights do not arise from scarcity and so have no legitimate moral grounding is debatable.

The more skill that is evident in the information, the more likely it will be perceived as different or secret from information in the public domain. Knowhow cannot be readily separated from the employee who is free to use it in the employ of another[56], but it is also not protected because it may be commonly available on the labour market and so in the public domain. An employer may substitute the knowhow of one employee with that of a similarly qualified person, but a trade secret may be difficult to replace were it to be lost. Indeed, a trade secret also embodies skill but of a level such that it is not commonly available outside of a specific employment. For example, in *New Zealand Needle Manufacturers Ltd v Taylor and Anor*[57], the "flair and inventive ability" of the employer in the creation of a flexible arm was observed in the finding that it represented a trade secret. Further, if the public availability of a trade secret and so skill that is embodied in it are to be assessed, then it must be a specific concept.[58] For example, in *Secton v Delawood*[59] bare goals were rejected as trade secrets, and indeed, King J rejected one proposed trade secret as it was "so vague and

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[53] *Ansell Rubber v Allied Rubber*, above n29, at 49, 50; *AB Consolidated v Europe*, above n12, at 521; *Allco Agencies v Naidoo*, above n15, at 95,928; *Secton v Delawood*, above n24, at 156.

[54] Jones, above n21, p 479; *NZ Needle Manufacturers v Taylor*, above n8, p 44; *AB Consolidated v Europe*, above n12, at 521.

[55] (1990) Are Patents and Copyrights Morally Justified? The Philosophy of Property Rights and Ideal Objects, 13(3) *Harv J L & Pub Pol* 817, at 861.

[56] See *United Indigo, Printers and Finishers*, above.

[57] Above n8, at 46; see also *AB Consolidated v Europe*, above n12, at 522; *Whimp v Kawakawa Engineering*, above n12, at 161; *Allco Agencies v Naidoo*, above n15, at 95,929; *Wright v Gasweld*, above n5, at 499.

[58] *Lock International v Beswick*, above n8, at 378.

[59] Above n24.

gratuitous...that there is no basis for it to be taken seriously".[60]

Skill may be used for more than as a part of an overview of confidentiality. Considerations of skill may be used to distinguish between different trade secrets as well as between trade secrets and knowhow. It seems reasonable to suggest that patentable and sub-patentable trade secrets will embody more skill than that which is needed to compile a list of customers and prices, and possibly more than that which is required at the elementary stage of invention from which experimental data is derived.

In summary, secrecy and commercial usefulness are both preconditions for confidentiality. Secrecy is used to distinguish between confidential and non-confidential information. If secret, commercial usefulness may be used as a negative test to establish the trade secrecy. Novelty and skill are further matters of evidence that vary in their weight according to the confidential information in question and may be useful for distinguishing between trade secrets and knowhow. This two-part division represents a different threshold of evidence or 'necessary quality of confidence'. Another possible difference is between trade secrets for which novelty and skill have reached or are near the thresholds of patentability, and secrets where the level is more trivial, such as strategic business secrets and experimental data, as well as knowhow. This distinction may be reflected in the commercial usefulness or expected value of the information. If this proposed distinction between patentable/sub-patentable secrets and other trade secrets and knowhow is recognised, there would then be a three-part division. These evidentiary divisions in confidential information may be the first step toward greater precision in the law relating to trade secrets and breach of confidence. Indeed, the different categories may be used to identify specific problems with the degree of protection which is available under the obligation of confidence.

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[60] Ibid, at 179.

II *The Existence of an Obligation of Confidence*

II(a) *Traditional Divisions*

A cause of imprecision in the conception of confidential information is the issue of whether the basis of the obligation lies in contract or in equity. Express and particularly implied contract cover knowhow and trade secrets during employment, and equitable and fiduciary obligations cover trade secrets during and outside of employment. The basis in early cases of the action for breach of confidence as found in property in early cases has not been followed and appears to be uncertain.[61] At most, the term 'property right' is used in a metaphorical sense.[62] Different doctrines and combinations of doctrines have been favoured in different cases but without a definitive approach emerging, so that the precise basis of the action for breach of confidence remains unresolved. It is not clear whether contractual disputes need include equity or whether the two overlap, so that the employment of each is uncertain. These uncertainties may add to the length and so the cost of enforcement of the obligation of confidence.

(i) Express Contract

The obligation of confidence between the parties to an employment contract will be determined first under the relevant express terms.[63] The terms may take the form of a confidentiality or non-disclosure agreement within the employment contract which the employee will breach through use or disclosure of confidential information.[64] The

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[61] Finn, above n20, at 131; Gurry, above n11, at 46-56.

[62] See Gurry, ibid, at 46-8. Some also seem to treat information as a property right without reference or detailed consideration of the theory which underlies this classification: see for example, Milgrem RM (1990) *Milgrem on Trade Secrets*, Vol 1, Matthew Bender: New York; Soltysinski SJ (1986) Are Trade Secrets Property? 3 *IIC* 331; Feldman MJ (1994) Toward a Clearer Standard of Protectable Information: Trade Secrets and the Employment Relationship, 9(1) *High Tech LJ* 151.

[63] See *Vokes Ltd v Heather* [1945] 62 RPC 135, at 141; *Faccenda*, above n5, at 625.

[64] Eg *Reid and Sigrist Ltd v Moss and Mechanism Ltd* [1932] 49 RPC 461, at 480; *Fiscal Technology Ltd v Johnson and Ors* (unreported, 3 July 1991) Auckland HC, M2109/90, at 11.

use of confidential information after the employment has terminated can be limited by means of a restrictive employment covenant, although these are prima facie invalid[65] and so may be difficult to enforce.[66] In the absence of express terms to the contrary, or in addition to those terms, confidential information can be protected by implied terms[67], and/or by the equitable duty[68], depending on the case. Indeed, express terms are rarely at issue in breach of confidence actions, and accordingly the focus in the remainder of this chapter will be on implied contract, equitable duty and fiduciary duty.

(ii) Implied Contract

An obligation of confidence can be inferred from an employment contract. In *Merryweather v Moore*[69], Kekewich J commented that "where the Court is satisfied of the confidential relation, then it at once infers or implies the contract arising from that confidential relation". Later, Kekewich J further clarified the issue:[70]

> But the question is, is not this an abuse of the confidence necessarily existing between him and his employers - a confidence arising out of the mere fact of employment, the confidence being shortly this, that the servant shall not use, except for the purpose of service, the opportunities which that service gives him of gaining

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[65] See for example, *Morris v Saxelby*, above n19, at 315; *Brown v Brown* [1980] 1 NZLR 484, at 498; *Broadcasting Corporation of New Zealand v Nielsen* [1988] 2 NZELC 95,040, at 96,047; *Laser Alignment (NZ) 1984) Ltd v Scholz* [1993] 2 ERNZ 250, at 259; see also Cornish WR (1989) *Intellectual Property: Patents, Copyrights, Trademarks and Allied Rights*, 2nd ed, Sweet & Maxwell: London, at 229-231; Brown A, Grant A (1989) *The Law of Intellectual Property in New Zealand*, Butterworths: Wellington, at 666-670.

[66] The public interests that are at issue include 'sanctity of contract', competition, and employee mobility, which are further discussed below in Part II(b)(iv). In *Faccenda*, above n5, at 626, Neill J in the Court of Appeal rejected the lower Court's finding that knowhow could be included under a restrictive covenant.

[67] See for example, *Faccenda*, above n5, at 625. This includes employee inventions that have been expressly assigned to an employer. Hence, if the express terms are invalidated, the invention may be assigned to the employer by virtue of an implied contractual duty of confidence: see *Triplex Safety Glass Co v Scorah* [1938] Ch 211; see also the review by Morgan O (1994) Product Innovation - Employees and Intellectual Property, *NZLJ* 152. Such an assignment is likely despite the apportionment of value between employer and employee that is anticipated under s65 of the Patents Act 1953: see Morgan, ibid, at 155.

[68] Eg *Probert Industries Ltd and Anor v Rogers and Anor* (unreported, 28 May 1984) Auckland HC, A394/84, at 15.

[69] [1892] 2 Ch 518, at 522.

[70] Ibid, at 524.

information?

The justification for an implied duty arises when, according to Bowen LJ, the court "assumes that there is a promise to do that which is part of the bargain, or which can be fairly implied as part of good faith which is necessary to make the bargain effectual".[71] Lord Evershed MR also said that "the Court can imply a stipulation...because it is a thing which must necessarily have been in the view of both parties when they entered into the contract".[72] Megarry J suggested that such an implied term which upheld the intentions of the parties or the efficacy of the contract would apply with particular force to information of "commercial or industrial value"[73]; that is, trade secrets.[74] Thus, through implied terms the court endorses the 'sanctity of contract' on which the operation of the information and labour markets depend.[75]

The implied contractual duty of confidence usually arises out of the broader duty of fidelity and good faith owed to an employer during employment[76], by which name it is often referred. Gurry[77] has summarised the requirement of fidelity during a person's employment:

1. The employee is bound not to disclose, nor to use for purposes which are inimical to his employer's interests, confidential information received by him in his capacity as employee.

2. The employee must not compete with his employer during the subsistence of the employment relationship.

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[71] *Lamb v Evans* [1893] 1 Ch 218, at 229.

[72] *Robb v Green* [1895] 2 QB 315, at 317.

[73] *Coco v Clark*, above n6, at 48.

[74] See for example, *Wilson Malt v Wilson*, above n47, at 243; see also *NZ Needle Manufacturers v Taylor*, above n8; *CE Elley v Wairoa-Harrison*, above n1; *Allco Agencies v Naidoo*, above n15.

[75] The policy that underlies 'sanctity of contract' is discussed further below in Part II(b)(iv).

[76] *Robb v Green*, above n72, at 316-7; *Wessex Dairies Ltd v Smith* [1935] 2 KB 80, at 84-5. Recently, Hammond J also found that a contract for services could give rise to an implied contractual duty of confidence: see *Laser Alignment*, above n65, at 259.

[77] Above n11, at 179.

3. The employee is bound to disclose to his employer valuable information which he receives *qua* employee and which is unknown to his employer.

In the absence of an express contractual term, knowhow may be protected by an implied duty of confidence only during the period of employment.[78] Thereafter, knowhow may not be protected because it is a part of that person's skill and knowledge which could be acquired in the trade generally and so is impossible to protect.[79] Consequently, it has been found that an implied contractual obligation of confidence may still exist, but is more limited in scope than that which imposes a general duty of fidelity and good faith.[80] The problem is that there is an equitable duty of confidence that exists during and after employment so that some overlap may occur.

(iii) Equity

Lord Denning MR, in an oft-quoted dictum, states that the law for breach of confidence does not:[81]

...depend on any implied contract. It depends on the broad principle of equity that he who has received information in confidence shall not take unfair advantage of it.

Similarly, in *AB Consolidated v Europe*[82], Woodhouse J thought it unnecessary to consider some "quasi-contractual" relationship between the parties so that a duty of fidelity and good faith could be implied and accepted that the obligation arises from equity and independently of contract and of tort. Hence the equitable obligation of

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[78] *Faccenda*, above n5, at 731; *Lock International v Beswick*, above n8, at 378.

[79] See *United Indigo*, above n7; *Printers and Finishers*, above n8; *Westminster Chemical v McKinley*, above n8, at 665; *NZ Needle Manufacturers v Taylor*, above n8, at 44.

[80] *Faccenda*, above n5, at 625; accepted in *Allco Agencies v Naidoo*, above n15, at 95,927. Cf the discussion of this point in Part II(b)(iv), below.

[81] *Seagar v Copydex*, above n32, at 417; referring to *Saltman*, above n8. Cf the earlier view of Lord Greene in *Vokes v Heather*, above n63, at 142; see also Jones, above n21, at 465-6.

[82] Above n12, at 520; see also *Peter Pan v Corsets Silhouette*, above n38, at 406-8; *Conveyer Co v Cameron Bros*, above n52, at 41.

confidence may extend to non-contractual as well as contractual situations. For example, in *Saltman*[83], the defendants manufactured leather punches for the plaintiffs, but kept the relevant drawings and subsequently made and sold the punches themselves. There was no contractual relationship between the parties, yet the court found the defendants had breached an equitable duty of confidence. In *AB Consolidated*, the defendants were found to have breached their equitable duty by using trade secrets for the manufacture of a confectionary bar which were acquired during licensing negotiations. Hence, an equitable duty is useful for the protection of trade secrets communicated during commercial negotiations as the information cannot be purchased without its nature first being disclosed in confidence.[84]

Under an equitable duty, unlike a contractual duty, knowhow may not be protected at all. Applications of knowhow have been protected if specific, novel and embodying enough skill and effort[85], although here such applications are treated as trade secrets. However, the confidence can be held to extend to third parties. In *Saltman*[86], Lord Greene MR commented that the plaintiff's rights could be infringed by use of confidential information obtained indirectly as well as directly from the plaintiff. Hence, a third party need not obtain the information directly from the original communicant, yet still be "tainted with the breach of confidence by the direct recipient"[87], and so under the same obligation of non-disclosure. For example, in *PCA*

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[83] Above n8.

[84] This problem has been called Arrow's paradox of information: see Merges RP (1994b) Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents, 62(1) *Tennessee L Rev* 75, at 81, referring to Arrow KJ (1962) Economic Welfare and the Allocation of Resources for Innovation, in: National Bureau of Economic Research Conference Series, *The Rate and Direction of Inventive Activity: Economic and Social Factors*, Princeton University: Princeton, 609, at 615. The paradox, according to Merges, ibid, is that "[t]o sell, one must disclose the information, but once the information is disclosed, the recipient has the [information] and need not buy it. On the other hand, if one does not disclose anything the buyer has no idea what is for sale".

[85] See for example, the application of knowhow at issue in the *AB Consolidated* case, above n12.

[86] Above n8, at 414.

[87] Wei G (1992) Surreptitious Takings of Confidential Information, 12 *Leg Stud* 302, at 308; see also *Cranleigh Precision Engineering v Bryant*, above n15, at 295; *Printer and Finishers v Holloway*, above n8, at 737, referring to *Prince Albert v Strange* (1849) 1 Mas & G 25; see also *Allco Agencies v Naidoo*, above n15, at 95,921.

of New Zealand Ltd v Evans[88], the defendant misused confidential information belonging to the plaintiff when establishing a near-identical photographic business in direct competition with the plaintiff. Chilwell J found this new business liable as a third party "in breach of the duty imposed by equity not to use the confidential information" received from the defendant. The first defendant was liable under his implied contractual as well as an equitable duty of confidence[89] but his company was only liable under that equitable duty. Thus, the equitable duty can extend to more parties than the implied contractual duty of confidence, although it is of a narrower scope, being limited to trade secrets only, so that the two are not exact duplicates.

(iv) Fiduciary Obligation

The existence of an obligation of confidence is complicated by the addition of fiduciary obligation, although the term is not well understood. Perhaps the best attempt to clarify the term so far has been that of Finn, who in *Fiduciary Obligations* gives two descriptive uses of the term 'fiduciary':[90]

> In one usage, the term is employed to describe powers which are given to one person to be exercised for the benefit of another ... In a second usage the term describes in a very general way, persons who are acting for, or on behalf of, or in the interests of, or with the confidence of, another.

From the second description, it is apparent that the fiduciary is not subjected to the direct and immediate control of others[91], so that there is an element of trust involved.[92] Finn[93] goes on to suggest that the second usage of the term 'fiduciary'

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[88] Above n5, at 95,428.

[89] Ibid.

[90] Above n20, at 2, referring to Sealy, 1962.

[91] Ibid, at 3, 13.

[92] The distinction is made by Colgan J in *Korbond Industries v Jenkins*, above n30, at 1150, discussed further below.

[93] Above n20.

implies that certain standards of loyalty and fidelity will be expected of a person who is a 'fiduciary'. To this end, Southin J in *Girardet v Crease and Co*[94] states that a breach of fiduciary duty must be accompanied by the "stench of dishonesty" if the claim is not to be overused. There may also be an element of vulnerability on the part of the beneficiary of the relationship as a result.[95]

According to Meagher, Gummow and Lehane[96], "the equitable duty of confidence has now sufficiently developed (as has the law of trusts to a much greater degree) to be regarded as occupying a specific field of its own". In contrast, Finn[97] treats the obligation of confidence as a fiduciary obligation. Following Finn, Gurry[98] observes that "the obligation of confidence can itself be regarded as a fiduciary obligation which defines for its own purposes its own class of fiduciaries". Finn regards both the express and implied contractual as well as the equitable duty of confidence as fiduciary relationships on the basis of his definition of "fiduciary", quoted above.[99] Fiduciary obligations are traditionally thought to be based on the application of particular principles of equity[100], so it may at first seem strange that Finn should

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[94] [1987] 11 BCLR (2d) 361, at 362: quoted in *LAC Minerals Ltd v International Corona Resources Ltd* (1989) 61 DLR (4th) 14, at 62.

[95] This element has gained importance, particularly in recent Canadian decisions, such as *LAC Minerals*, ibid, and *Hodgkinson v Simms* (1994) 117 DLR (4th) 161: see Ogilvie MH (1995) Fiduciary Obligations in Canada: From Concept to Principle, *J Bus Law* 638, for review; see also *Watson v Dolmark Industries Ltd* [1992] 3 NZLR 311, at 315, per Cooke J.

[96] (1992) *Equity: Doctrines & Remedies*, 3rd ed, Butterworths: Sydney, at 870. Hammond also rejects the need to link the equitable duty of confidence with the "spectrum of fiduciary duties", suggesting that it would "stunt the growth of the doctrine of breach of confidence"; that is, the obligation of confidence is not viewed as having a co-extensive fiduciary duty: (1979) Is Breach of Confidence Properly Analysed in Fiduciary Terms? 25 *McGill LJ* 244, at 250-1; see also Brown and Grant, above n65, at 642.

[97] Above n20; accepted by Stuckey J (1981b) The Liability of Innocent Third Parties Implicated in Another's Breach of Confidence, 4 *UNSWLJ* 73, at 80.

[98] Above n11, at 159.

[99] Cf Klinck D (1990) "Things of Confidence": Loyalty, Secrecy and Fiduciary Obligation, 54 *Saskatchewan L Rev* 73, at 86, who regards the obligation of confidence as an essentially equitable concept.

[100] Finn, above n20, at 2.

include contractual duties as a form of fiduciary relationship.[101] However, Finn traces the historical development of implied contractual duties from the merger of law and equity which began in the late nineteenth century. In particular, he notes the influence of Bowen LJ in *Lamb v Evans*[102] and Kay LJ in *Robb v Green.*[103] Finn concludes[104] that "[i]t is immaterial whether the undertaking is or is not in the form of a contract". Rather, contracts may be treated as evidence of the agreement under which a fiduciary obligation is created. In addition, Finn makes no distinction concerning the nature of a fiduciary relationship between a minor and senior employee, because "their common bond is the undertaking each has given to act for or on behalf of another in some matter".[105] Under this approach, all employees who are liable to an implied contractual duty of confidence are also liable to a fiduciary duty. Furthermore, there is suggestion that, like the equitable duty of confidence, a fiduciary duty could be extended to third parties. According to Klinck[106], a third party stranger to a fiduciary relationship can be fixed with a "constructive trusteeship" much in the same way as a third party recipient of confidential information.

If in theory the obligation of confidence can be described as a fiduciary obligation, the exact nature and interrelationship of the contractual, particulary implied, and the equitable fiduciary duties is not so clear. Finn[107] has phrased the problems:

> Are the considerations which call into existence the equitable duty of confidence the same type of considerations as those which give rise to the implied duty of confidence? Are the two duties mutually

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[101] Dean, above n3, at 182, is also prepared to recognise that what he calls an "implied term of faithful service" will impose obligations that are identical to an "equitable duty of fidelity", which elsewhere, at 98, he appears to combine into a "fiduciary duty of confidence and fidelity"; see further the discussion of the implied contractual duty of confidence, in Part II (b)(i) below.

[102] Above n71.

[103] Above n72.

[104] Above n20, at 201.

[105] Ibid, at 201. Cf Hammond RG (1986) Breach of Confidence: Assignability of Rights, 12 *IPJ* 247, at 248, who appears to regard the fiduciary law as being limited to "key" employees.

[106] Above n99, at 82.

[107] Above n20, at 133-4.

exclusive or do they overlap?

In most judgments, fiduciary obligations, if mentioned at all, appear to be limited to senior employees and are sometimes distinguished from an implied contractual duty of confidence. The judgments that include reference to fiduciary obligations conflict in the treatment of fiduciary obligations relating to confidential information. In support of his contention that the implied contractual duty of confidence is another form of fiduciary duty, Finn[108] cites Fletcher Moulton LJ in *In Re Coomber, Coomber v Coomber*[109], who said:

> Fiduciary relations are of many different types; they extend from the relation of myself to an errand boy who is bound to bring me back my change up to the most intimate and confidential relations which can possibly exist between one party and another where the one is wholly in the hands of the other because of his infinite trust in him.

More recently, in *Reagan v Grant*[110], Eichelbaum J acknowledged the existence of a fiduciary duty for senior employees and cautiously endorsed the like for minor employees insofar as they were not entitled to take and misuse a customer list to solicit customers of their former employer, as occurred in that case. Indeed, Eichelbaum J appeared to describe the implied duty in terms of a fiduciary duty:[111]

> The legal basis of the cause of action was that such information was acquired by the first defendant in circumstances where it was his duty to keep it confidential and not use it to the detriment of the plaintiff nor to his own nor anyone else's benefit.

Further, Goulding J in *Faccenda*[112], although not referring to fiduciary duty, did acknowledge that "there seems to be no established distinction between the use of

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[108] Ibid, at 201.

[109] [1911] 1 Ch 723, at 728.

[110] [1982] 1 NZIPR 416.

[111] Ibid, at 423.

[112] Above n5, at 731.

such information where its possessor trades as a principal, and where he enters the employment of a new master".[113] In other words, although in many judgments a fiduciary duty seems to be limited to senior employees, recognition of this duty may not be dependent on the degree of seniority of the confidant.[114]

In addition, the equitable duty of confidence may be treated as a fiduciary obligation. In *Schering Chemicals Ltd v Falkman Ltd and Others*[115], Shaw LJ did not find a duty of confidence in the absence of a contract between the parties, yet nonetheless found what amounted to an equitable duty of confidence, which he called a fiduciary obligation:[116]

> As I see the position, the communication in a commercial context of information which at the time is regarded by the giver and recognised by the recipient as confidential, and the nature of which has a material connection with the commercial interests of the party confiding that information, imposes on the recipient a fiduciary obligation to maintain that confidence thereafter unless the giver consents to relax it.

A further approach is that taken in the cases in which fiduciary obligations are treated as separate from the implied contract and/or equitable duty of confidence. For example, in *SSC & B: Lintas New Zealand Ltd v Murphy*[117] Pritchard J found the defendant to be in breach of his implied duties of fidelity to the plaintiff both as an employee and again as its managing director, without classing either as a fiduciary duty. However, in *Korbond Industries Ltd v Jenkins*[118], Judge Colgan considered the judgment in *Lintas* to be an "acknowledgement of the existence of potentially separate duties of fidelity and to act as a fiduciary although of course in that case they may have

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[113] Ibid, at 731; see also *Lamb v Evans*, above n71, at 229; *Baker v Gibbons and Ors* [1972] 2 All ER 759, at 767.

[114] Rather, it may be that seniority is important circumstantial evidence that a duty exists: see further, Part II(b)(i), below.

[115] [1982] 1 QB 1 at 27; Chilwell J also noted some similarity between the two concepts in *Whimp v Kawakawa Engineering*, above n12, at 154.

[116] His Lordship also seems to have limited the term 'duty of confidence' to the implied duty.

[117] Above n5, at 456; see also *NZ Needle Manufacturers v Taylor*, above n8, at 42.

[118] Above n30.

been found to have existed by virtue of the defendant's status as both an employee and managing director".[119] Judge Colgan went on to find in *Korbond* that although an implied contractual obligation of confidence existed, a fiduciary relationship did not because the defendant had had no direct role in significant decision-making for the company.[120] The distinction appears to hinge on whether the implied duty of confidence expected of the defendant in *Korbond* entailed sufficient independence or seniority of the kind that is expected of a fiduciary. Finn would probably have found that there was, whereas Judge Colgan did not. Thus, his Honour's approach to fiduciary duty appears to be narrower than that of Finn. In addition, in *Pacifica Shipping Co Ltd v Andersen*[121] the former agent of the plaintiff was found to have breached his fiduciary duty and his equitable duty of confidence.

Lastly, there are cases where fiduciary obligations may exist but are not considered. In *AB Consolidated v Europe*, Woodhouse J rejected the argument that a recognised fiduciary relationship, or even a contractual nexus, is required before a remedy can be given for misuse of confidential information, and found that it was sufficient to consider the case on the basis of equity.[122] Thus, many of the judgments in this area do not treat the duty of confidence as a fiduciary duty, whether based in contract or equity. At most, these judgments are consistent with the view of La Forest J in *LAC Minerals Ltd v International Corona Resources Ltd*[123] who said that "the law of confidence and the law of fiduciary obligations, while distinct, are intertwined".

(v) The Merger of Law and Equity

The imprecision in the relationship between the jurisdictions in contract, and in equity and their relationship to fiduciary obligations is part of a wider debate about the

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[119] Ibid, at 1150; see also *Baker v Gibbons*, above n113, at 767.

[120] Above n30, at 1150, 1151.

[121] Above n12, at 346-8.

[122] Above n12, at 520-1, citing the *Saltman* and *Seagar* cases, as above; see also *Canadian Aero Service Ltd v O'Malley* [1974] SCR 592, at 616.

[123] Above n94, at 35.

inter-relationship of law and equity. Lord Greene MR in *Vokes Ltd v Heather*[124] repudiated the need for introducing equitable principles where a contract exists and a duty could be implied if necessary. Further, Dean[125] maintains that there is a distinction between the equitable protection of trade secrets and equity's auxiliary jurisdiction to grant remedies in aid of common law contractual rights. Dean also regards decisions which appear to award common law damages as though it were equitable compensation in cases of breach of confidence as symptomatic of a "fusion fallacy" or misunderstanding of the basis of the jurisdiction.[126]

The alternative view was expressed by Lord Diplock, who commented that to perpetuate the notion of a dichotomy between law and equity would lead to erroneous conclusions about the development of English law, as these have now mingled.[127] This approach was reaffirmed recently by Cooke P in *Aquaculture Corp v Green Mussel Co Ltd*:[128]

> Whether the obligation of confidence in a case of the present kind should be classified as purely an equitable one is debatable, but we do not think that the question matters for any purpose material to this appeal. For all purposes now material, equity and common law are mingled or merged. The practicality of the matter is that in the circumstances of the delays between the parties the law imposes a duty of confidence. For its breach a full range of remedies should be available as appropriate, no matter whether they originate in common law, equity or statute.

With respect to breach of confidence, it is submitted that the view of Lord Diplock and Cooke P is correct. In breach of confidence actions, equity and law have in practice mingled, and it is accepted that in practice the courts may award injunctions and monetary compensation together without giving preference to the jurisdictional base

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[124] Above n63, at 141-2; see also *British Celanese Ltd v Moncrieff* [1948] 1 Ch 564, at 578.

[125] Above n3, at 45.

[126] Ibid, at 319.

[127] *United Scientific Holdings Ltd v Burnley Borough Council* [1978] AC 904, at 924-5; accepted in *Day v Mead* [1987] 2 NZLR 443, at 451; *Attorney-General v Wellington Newspapers Ltd*, above n12, at 172.

[128] [1990] 3 NZLR 299, at 301; see further Rickett C, Gardner T (1994) Compensating for Loss in Equity: The Evolution of a Remedy, 24 *VUWLR* 19.

or the role of equity, as in *Robb v Green.*[129] As a consequence, the action for breach of confidence may be best treated as *sui generis*, using the most applicable features from the common law and equity.[130] It may also mean that case reviews which emphasise the importance of the remedies that have been imposed, particularly the early breach of confidence cases, may not be relevant.[131]

If the action for breach of confidence is treated as *sui generis*, it may lead to a view that the implied contractual duty of confidence and the equitable duty are really the same, and that there is some overlap with fiduciary relationships. Indeed, Gurry[132] reduces the obligation of confidence to an ethical issue of 'trust' and suggests that the "jurisdiction is secondary to the confidence". If so, then it seems strange that this historical distinction survives. In Part II(b) the obligation of confidence is deconstructed into its different constituent behavioral relations as a framework for the further discussion of the duty of confidence. It is found that there is one duty of confidence which may be recognised from different evidential circumstances and that it amounts to a single fiduciary duty.

II(b) *Legal-Economic Relations*

One means of clarifying the nature of the obligation of confidence is to examine

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[129] Above n72; at 317-8; see also *Ansell Rubber v Allied Rubber*, above n29, at 51-52; *NZ Needle Manufacturers v Taylor*, above n8, at 45.

[130] See Vaver D (1981) Civil Liability for Taking or Using Trade Secrets in Canada, 5(3) *Can Bus LJ* 253, at 262; Gurry, above n11, at 58; Brown and Grant, above n65, at 644. Hammond, above n96, at 251, views the action for breach of confidence as traditionally a "head of equity jurisdiction *sui generis*", although he comes to emphasise the importance of broader arguments than those which concern jurisdiction, at 253; see also the judgment of Hammond J in *Laser Alignment*, above n65, at 257.

[131] Cf case reviews, for example, North PM (1972-3) Breach of Confidence: Is There a New Tort? 12 *JSPTL* 149; Ricketson S (1977) Confidential Information - A New Proprietary Interest? Part I 11 *MULR* 223; Stuckey JE (1981a) The Equitable Action for Breach of Confidence: Is Information Ever Property? 9(2) *Syd L Rev* 402. See also Roberts RJ (1987) Is Information Property? 3 *IPJ* 209, at 212; Dean, above n3, at 56, 68-9.

[132] Above n11, at 43, 59. Stuckey, above n131, at 402-3, also emphasises a relationship of trust and confidence, but argues that the duty of confidence which arises from it is purely equitable, whereas Gurry concedes that the action may be *sui generis*, as above.

its constituent behavioural relations. These behavioural relations can be described in Hohfeldian legal terms. Hohfeld devised his terminology in order to remove the overlap and inconsistency in the use of words pertaining to fundamental legal concepts.[133] The result is that a more logical and clear conveyance of an argument and its analysis is possible[134], so that an individual can "discern common principles of justice and policy underlying the various judicial problems".[135] The term 'right' had a loose common usage, as now, so Hohfeld sought its clarification by dividing the term into four behavioural relations[136] between a right-holder (the discloser) and right-regarder (the confidant) of the confidential communication: claim-right[137] and duty; privilege and no-right; power and liability; and immunity and disability.

A further means of understanding the behavioural relations which constitute an intellectual property right is to use a description of property. The modern legal approach to property rights contrasts with the physicalist view of Blackstone that predominated until the beginning of the 19th Century.[138] At that time, property was also conceived of as an absolute, in which there was sole and despotic domain.[139] The physical and absolute formulation of property also allowed the courts to fix remedies with certainty once a right was recognized.[140] The physicalist view was weakened by the inclusion of the "incorporeal hereditament" or intangible property that was considered as a 'thing'

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[133] See Corbin, AL (1978) Foreword, in: WN Hohfeld, *Fundamental Legal Conceptions as Applied to Jural Reasoning*, Greenwood Press, at viii; Hohfeld, ibid, 29, 31; Vandevelde KJ (1980) The New Property of the Nineteenth Century: The Development of the Modern Concept of Property, 29 *Buffalo L Rev* 325, 330.

[134] Corbin, above n133, viii, xiii.

[135] See Hohfeld, above n133, 64.

[136] Hohfeld also distinguished opposites to these relations: ibid, at 36.

[137] To avoid confusion of a Hohfeldian "right" with the more general use of the word, the former will hereafter be called a "claim-right": after Finnis J (1971-2) Some Professorial Fallacies About Rights, *Adelaide Law Review* 377, at 377.

[138] Vandevelde, above n133, at 325, 328-9. For a review of the evolution of intellectual property law, see Hammond G (1991) The Legal Protection of Ideas, 29 *Osgoode Hall LJ* 93.

[139] Ibid.

[140] Ibid, 328-30.

if only "in contemplation".[141] In the 19th and early 20th Centuries, the absolute nature of property was also weakened as rights were found to protect behavioural relations and not things, with the result that political influences were introduced where controversy arose, particularly through the concept of public policy.[142] This is consistent with the general approach of Hohfeld to rights as behavioural relations, as discussed above.

The modern legal approach to property rights is compatible to that found in the economics literature. An economist may view property rights as "a set of behavioral rules that society chooses to observe and to accommodate".[143] Benson[144] goes further and states that "enforceable rules of obligations can create or destroy property rights". On the composition of property rights, Alchian and Demsetz[145] state:

> The domain of demarcated uses of a resource can be partitioned among several people ... It is not *the* resource itself that is owned, it is a bundle, or portion, of rights to *use* a resource that is owned.

Consequently, contractual arrangements "exist not so much to accomplish the exchange of goods and services but to permit the exchange of "bundles" of property rights".[146] In turn, each of these property rights has been deconstructed by economists into a bundle of behavioural relations or attributes, relating to exclusivity, transferability,

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[141] Ibid, 333.

[142] Ibid, 330.

[143] Johnson RWM (1992) Resource Management, Sustainability and Property Rights in New Zealand, 36(2) *Aust J Ag Econ* 167, at 168; see also Furubotn EG, Pejovitch S (1972) Property Rights and Economic Theory: A Survey of Recent Literature, 10 *J Econ Lit* 1137, at 1139.

[144] (1994) Emerging from the Hobbesian Jungle: Might Takes and Makes Rights, 5(2) *Constit Pol Econ* 129, at 131.

[145] (1973) The Property Rights Paradigm, 33(1) *J Econ Hist* 16, at 17, italics in original; see also Coase RH (1960) The Problem of Social Cost, 3 *J L & Econ* 1, at 44; (1992) The Institutional Structure of Production, 82(4) *Am Econ Rev* 713, at 717; Demsetz H (1967) Toward a Theory of Property Rights, 57 *Am Econ Rev* 337, at 347; Ciriacy-Wantrup SV, Bishop RC (1975) "Common Property" as a Concept in Natural Resources Policy, 15 *Nat Res J* 713, at 714; cf Honore AM (1961) Ownership, in: Guest AG (ed) *Oxford Essays in Jurisprudence*, Clarendon Press: Oxford, 134.

[146] Furubotn and Pejovitch, above n143, 1139.

and enforceability, as discussed below.[147]

The legal and economic approach to property rights as behavioural relations or attributes can be described through a synthesis of the Hohfeldian-legal with economic terms: the claim-right and duty of exclusivity, the power and liability of transferability, and the claim-right and duty of enforceability.[148] The duty of confidence is a sub-set of this obligation, and consists of duty of exclusivity, restrictions on the power of transferability, and a duty of enforceability. The obligation of confidence exists when all three of these behavioural relations are recognised in law. Each of the relations exists between two legal entities and relates to what Finnis calls the "act-description" to form what he calls a "three-term relation".[149] The act-description concerns the act/s which are performed by virtue of the relation in question. For example, the act of exclusion is the act-description of the claim-right and duty of exclusivity.[150] Common to each act-description of a single intellectual property right will be the information which is protected and the scope of that protection. Under an obligation of confidence, the information that is protected is determined by an assessment of the 'necessary quality of confidence', as discussed in Part I, above. The scope includes the period of protection, which under the obligation of confidence is potentially indefinite. Thus, what is excluded, transferred or enforced will be governed by how the behavioural relations which constitute an intellectual property right are recognised in law, which in this case is judge-made law.

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[147] It is interesting that amongst lawyers, Finn acknowledges that there are some ill-defined "attributes" of property which are displayed by "certain types of confidential information and particularly trade secrets": above n20, at 132; see also Jones, above n21, at 464; Gurry, above n11, at 48.

[148] For these relationships and other variations, see Becker LC (1977) *Property Rights: Philosophic Foundations*, Routledge & Kegan Paul: London, 112-128; Scott A (1983) Property Rights and Property Wrongs, 16(4) *Can J Phil* 723; Soltysinski, above n62; Johnson, above n143; Gordon WJ (1993) A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property, 102 *Yale LJ* 1533, at 1546; Maughan CW (1995) The Economics of Property Rights, 1(2) *NZBLQ* 78. Honore, above n145, 112-128, lists 11 'incidents' of ownership, but these may be viewed as applications of or limitations upon these four relationships.

[149] (1980) *Natural Law and Natural Rights*, Clarendon Press: Oxford, 199. Hence, each relation is separate from any other, and can persist when associated relations are extinguished or cannot be enforced: see further Finnis, ibid, at 202-3; above n137, at 379; Wilson JG (1980) Hohfeld: A Reappraisal, *University of Queensland Law Journal* 190, at 191, 201.

[150] In this case, the other act-descriptions involve the transfer of information and the enforcement of the obligation of confidence.

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This legal-economic approach should not be taken as support for considering the obligation of confidence within the property jurisdiction as it is commonly understood. The property jurisdiction is not the basis of an obligation, the obligation is the basis of the property right. Thus, an intellectual property right stems from an obligation of confidence, or rather the behavioural relations that underlie it, and which were formed historically from the law of 'contract' and 'equity'. A consequence of this approach is that repetition of the conflicting case law on the nature of property rights in information is no more helpful than a discussion of the remedies which were traditionally employed, as noted above.[151] Instead, consideration of each of the three fundamental behavioural relations that comprise each right may assist the understanding of the nature of the obligation and the evidence for its existence. It will be assumed for the purpose of this discussion that there is clear title to all economic goods, so that the intellectual property rights function without a "distorted perception of the costs and benefits of utilizing resources" and that would lead to an inefficient allocation of resources.[152]

(i) Exclusivity

Exclusivity is not the act of exclusion itself. Rather, exclusivity is a *claim-right* to exclude others from the use of certain information, with a corresponding *duty* in another to respect that claim-right.[153] In general terms, Scott[154] describes exclusivity as a measure of the strength of the property right; how much the right is accepted by the community and so how far exercise of the right is free from disturbance.[155]

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[151] Cf Dean, above n3, at 34-40.

[152] Maughan, above n148, at 152.

[153] See also Gordon, above n148, 1552-3; cf Finn, above n20, 498-9, who discusses the private right of "exploitation" and a duty of confidence as separate questions to be addressed in trade secrecy cases, when in fact they are co-existing correlatives which ought to be discussed together.

[154] 1989: cited in Johnson, above n143, 168.

[155] Honore, above n145, 113-120, lists the right to possess, to manage, of income, and of capital as separate incidents of ownership, but these are more properly assigned as examples of the claim-right of exclusivity. Honore's "prohibition of harmful use", ibid, at 123, is a limitation placed upon that claim-right of exclusivity; see also the "non-owned interests" suggested by Gordon, above n148, 1546-7. Allen views a right to the enjoyment of property as distinct from a right to exclude: (1993) Commonwealth Constitutions and the

Exclusivity is important for the establishment of property rights in information, as without it unsustainable exploitation of a scarce resource may result without individuals paying for the costs of their utilization.

Despite the evolution to property rights to represent behavioural relations, as discussed above, critics often make the error of emphasising the physical exclusion of some tangible 'thing' or commodity as a reason to deny property rights in information. This over-emphasis on physical exclusion may reflect what Finnis[156] has called a "lawyer's ascription of rights" involving "two term relations between persons and one subject matter (in a broad sense) thing". For example, Breyer[157] views property simply as land and chattels and so distinct from information. The focus of these criticisms is on the act-description which defines a particular form of property right, rather than the behavioural relations which are common to all property rights.

Much time is spent in identifying the existence of a duty of exclusivity from which a duty of confidence and so the obligation of confidence may be inferred. The court may take an overview of several circumstantial factors that indicate if a duty exists; that is, if the information was imparted 'in confidence'. Where the communication of the information is contested, coincidental discovery will be a matter

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Right not to be Deprived of Property, 42 *Int Comp LQ* 523, at 551-35. While the arguments of Allen may be true, the right to exclude could theoretically be extended to enjoyment, so that a right of enjoyment exists where a claim-right of exclusivity of another is absent.

[156] Above n149, at 199.

[157] (1970) The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs, 84(2) *Harvard Law Review* 281, at 288; see also Brown and Grant, above n65, at 642. Moon also treats information as one of the "things which the law recognises as being the subject of property rights", although only by virtue of legislation: (1990) Review of Legal Protection for Computer and Semiconductor Technologies, in: Ministry of Commerce (ed) *Review of Industrial Property Rights, Patent, Trade Marks and Designs: Possible Options for Reform*, Vol 2, Ministry of Commerce: Wellington, 1, at 20. Hence, Moon views the right to protect trade secrets, which he calls "secret proprietary information", as existing "irrespective of whether that information is protected or capable of protection as intellectual property", because it is founded on notions of fairness and equity: ibid, at 23.

Roberts, above n131, 210, appears indirectly to view property as relating to a 'thing' which can be possessed in that he distinguishes it from information on the basis that information is capable of universal possession; see also Hammond, above n96, at 247; Cross JT, above n21, at 534, 535.

Dean, above n3, at 54-5, acknowledges the theory that property rights represent relationships, but goes on to assert that "whatever philosophy lies behind its creation the existence and extent of a proprietary right depends on the willingness of the courts to protect the "owner" of the subject matter against interference by others". Dean suggests that historically ownership of this subject matter involves possession of a tangible thing as well as the capacity to exclude others: ibid, at 54.

of evidence.[158] Often, the coincidence of circumstances tends to suggest that the information was communicated.[159] The court will assess whether the confidant knew or ought to have known of the confidentiality of the information. An example is *Seagar v Copydex Ltd*[160], where Salmon LJ dryly remarked that the "plaintiff, as he amply demonstrated before us, is a very difficult man to stop talking" and concluded that the plaintiff had disclosed his idea.[161] More commonly, the confidant's knowledge of the duty of confidence may be constructed from its deliberate acquisition and/or the circumstances of his/her employment.

If the information is acquired deliberately by the 'confidant', then the court may infer recognition of the confidential value of the information and so the existence of a duty of confidence on their part. Documentary evidence is a prime indication where the confidential information was deliberately obtained.[162] Indeed, it is "easy to make and enforce an injunction referring to a written list".[163] Hence, the courts:[164]

> ...will view with considerable circumspection, even scepticism, a contention by a defendant who has chosen to use a list, that he already carried some of the information in his own head and that looking at the list for any particular name or names was quite superfluous and unnecessary.

Documentary evidence is frequently absent, as where the information was memorised. A common view is that genuine unaided memory is allowable, particularly with regard to knowhow, but that memorisation of trade secrets is not. For example, in

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[158] See *Silvercrest Sales Ltd v Gainsborough Printing Co Ltd* [1985] 5 IPR 123, at 131.

[159] *Printers and Finishers v Holloway*, above n8, at 737; *Seagar v Copydex*, above n32, at 417.

[160] Above n32.

[161] Ibid, at 418.

[162] See for example, *Merryweather v Moore*, above n69, at 524; *Robb v Green*, above n72, at 318; *PCA v Evans*, above n5, at 95,429; *Warman International and Others v Envirotech Australia Pty Ltd and Others* (1986) ATPR 47,808; *European Pacific v Fourth Estate Group*, above n27, at 565.

[163] *Baker v Gibbons*, above n113, at 767, per Pennycuick VC.

[164] *Universal Thermosensors Ltd v Hibben and Ors* [1992] 3 All ER 257, at 267, per Sir Donald Nicholls VC.

Printers and Finishers[165], Cross J commented:

The employee might well not realise that the feature or expedient in question was in fact peculiar to his late employer's process and factory ... and I do not think that any man of average intelligence and honesty would think that there was anything improper in putting his memory ... at the disposal of his new employer.

Indeed, a significant element of gaining experience is that it is acquired without the employee deliberately taking information. The person may have been employed in the development of the information and so unavoidably have learnt it.[166] It then becomes part of their general skill and experience or knowhow. In early cases, memorised trade secrets were also exempted from protection.[167] More recently, in *Faccenda*[168], Goulding J stated that specific trade secrets are "so confidential that, even though they may have necessarily been learnt by heart and even though the servant may have left the service, they cannot lawfully be used for anyone's benefit but the master's".[169] Similarly, Pritchard J in *Lintas*[170] held that "[t]here is no valid reason why a servant, endowed with a good memory, should be accorded more extensive rights of canvassing his master's customers than one who is not so blessed". In short, according to Tipping J in *Peninsular Real Estate Ltd v Harris*[171]:

An ex-employee who, without a list of deliberate memorisation, happens to recall that somebody is a customer or client of his former employer is ordinarily allowed to approach that person to do business in competition with his former employer. What the ex-employee may not do is deliberately to copy, take away, or memorise

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[165] Above n8, at 736; see also *Commercial Plastics Ltd v Vincent* [1965] 1 QB 623, at 642; *Westminster Chemical v McKinley*, above n8, at 665; *NZ Needle Manufacturers v Taylor*, above n8, at 44.

[166] *E Worsley and Co v Cooper* [1939] Ch 290, at 307; *Allco Agencies v Naidoo*, above n15, at 95,926; Dean, above n3, at 233-254.

[167] Eg *Merryweather v Moore*, above n69, at 524; *Robb v Green*, above n72, at 13; *Morris v Saxelby*, above n19, at 318.

[168] Above n5, at 732.

[169] Ibid, at 732.

[170] Above n5, at 456.

[171] Above n48, at 220-1.

lists of customers or the like to facilitate his competition with his former employer.

Disputes can develop over whether the memorised information was confidential[172] or that it was memorised deliberately.[173] Provided that the confidence is intact, the court may use the circumstances of employment to infer that the confidant ought to have known of the confidentiality of the information so that, whether or not it was memorised deliberately, an obligation of confidence existed. The court may revert to the fiction of the 'reasonable man' to assess whether the confidant "would have realised that upon reasonable grounds the information was being given to him in confidence".[174] This inference may be assisted where the confidant ought to have been aware of the discloser's attitude toward and so the confidentiality of the information. For example, in *Wilson Extract v Wilson*[175] the employee was told that the malt extracting process was secret and this appeared to assist the acceptance of the secrecy of the information. In *NZ Needle Manufacturers v Taylor*[176] the employer attempted to reduce public access to and so keep the details of a flexible arm machine secret from the public, which also was of assistance to the court.[177] Similarly, the extent to which the information is circulated within an organisation, particularly if restricted to a limited number of individuals, may also "throw light on the status of the information and its degree of confidentiality".[178] In *Allco Agencies Auckland Ltd v Naidoo and Another*,

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[172] *Littlewoods Organisation v Harris* [1978] 1 All ER 1026, at 1033.

[173] *Peninsular Real Estate v Harris*, above n48, at 21.

[174] *Coco v Clark*, above n6, at 48, per Megarry J; see also *Wheatley v Bell*, above n51, at 548; *Deta Nominees Pty v Viscount Plastic Products Pty Ltd* [1979] VR 167, at 191.

[175] Above n47, at 661; See also *Ansell Rubber v Allied Rubber*, above n29, at 39; *Allco Agencies v Naidoo*, above n15, at 95,930.

[176] Above n8, at 45.

[177] See also *E Worsley v Cooper*, above n166, at 307; *Faccenda*, above n5, at 627; *Wright v Gasweld*, above n5, at 499; *Lansing Linde v Kerr*, above n49, at 425; *Secton v Delawood*, above n24, at 150; *Korbond Industries v Jenkins*, above n30, at 1155.

[178] *Faccenda*, above n5, p 627, per Neill J.

Wallace J said:[179]

In my view ... it is true that an employee who regularly handles sensitive information is likely to be more aware of the situation than an employee who only obtains the information occasionally.

The frequency of access to confidential information may be increased by virtue of a person's seniority in an organisation. In *Wright v Gasweld Pty Ltd*[180], Kirby P stated that a relevant factor for determining confidentiality was:

...the fact that the employee in question has been permitted to share the information only by the reason of his or her seniority or high responsibility within the employer's organisation.

The employer's attitude toward the information can also be inferred from the practices in the relevant industry, particularly where these are known to the employee.[181] However, warning an employee or guarding information which an employer would not want to be communicated to rivals is not itself a prerequisite for confidentiality.[182] Rather it is part of the overview of the existence of an obligation of confidence and, like consideration of seniority, is better viewed as circumstantial evidence that the obligation existed.

It may be tempting for a judge to use the circumstances of the contract to find an implied contractual duty of exclusivity rather than an equitable duty. Indeed, the basis of the distinction is not clear, apart from historical differences between the common law and equity. One suggestion is that the two duties are just conventions that represent the same duty of confidence. This seems to be the essence of Gurry's suggestion that the different duties can be reduced to trust, as mentioned above. This conclusion may have

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[179] Above n15, at 95,928.

[180] Above n5, at 499.

[181] See *Thomas Marshall v Guinle*, above n1, at 210, where Megarry VC proposed this element for consideration of confidentiality of the information, although it is better considered as an indicator that the employee should have known of the existence of their duty of confidence.

[182] *E Worsley v Cooper*, above n166, at 308; *Faccenda*, above n5, at 627.

arisen because in *Coco v Clark*, Megarry J[183] devised his three elements that are required if a breach of confidence action is to succeed[184] in the context of an equitable duty of confidence "apart from contract". Under the second element for the action of breach of confidence proposed in *Coco v Clark*[185], the circumstances which impart an obligation of confidence, Megarry J went on to find that a "reasonable man" would have realised that the information was disclosed under an equitable duty of confidence. The phrase "circumstances of communication" can be argued to be misleading when applied to the assessment of an implied contractual duty of confidence, as the focus is on a communication, although it may be suited to the assessment of an equitable duty as in *Coco v Clark.*

The reason for this distinction is evidentiary; that is, it relates to the circumstances in which the 'implied contractual' or 'equitable' duty of confidence arises. The difference was observed in *Ansell Rubber Co Pty Ltd v Allied Rubber Industries Pty Ltd* [186], where Gowan J said:[187]

> That obligation (i.e. of confidence) may come into existence by reason of the terms of an agreement, or what is implicit in them, by reason of the nature of the relationship between the persons, or by reason of the subject matter and the circumstances in which the subject matter has come into the hands of the person charged with the breach.

The implied contractual duty of confidence is created by virtue of a "relationship between the persons", as above. This duty may be one of many which are created when a formal relationship is created, such as through an employment contract. Some of these duties that are owed to an employer, such as trust and co-operation, may be loosely combined with the implied contractual duty of confidence under the so-called duty of

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[183] Above n6, at 47.

[184] Discussed above, at 1.01.

[185] Above n6, at 48.

[186] Above n29.

[187] Ibid, at 40; quoted by Finn, above n20, at 136-7.

fidelity and good faith.[188] It also means that implied contractual duty of exclusivity is created prior to the confidential communication of the information, not by means of it. Rather, a pre-existing contractual relationship can be implied to extend to cover whatever confidential information is communicated under it.[189] As a result, trade secrets which are gradually 'pieced together' over a long period of employment, and knowhow which is gained by experience, can be protected under an implied contractual duty by virtue of that contractual relationship.[190] Of course, trade secrets that are specifically communicated can also be protected under this duty, but by virtue of the relationship, not the subsequent circumstances of communication.

In contrast, the nature of the equitable duty of confidence is clearer as it has been established outside of contract. The equitable duty arises by virtue of the "subject matter and the circumstances in which the subject matter has come into the hands of the person charged with the breach", as described by Gowan J in *Ansell*, quoted above. Indeed, cases in which the equitable duty exists seem to involve discrete secrets which were specifically or deliberately communicated in confidence. For example, in *AB Consolidated v Europe*[191], an equitable duty of confidence was found to have been created where information concerning confectionery manufacturing was communicated during licensing negotiations. In other words, a constructive duty of confidence is recognised by virtue of the confidential communication itself, not on the basis of any pre-existing formal relationship. Indeed, the emphasis on the specificity of communication may be necessary in the absence of a contract which would have provided important circumstantial evidence of a duty of exclusivity and so a duty of confidence. For this reason, knowhow, which represents an individual's skill and knowledge, nor trade secrets which are gradually learnt, will be protected under an

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[188] See further Anderson G, Banks B, Harrison R, Hughes J, Johnston K (1993) *Butterworths Employment Law Guide*, Butterworths: Wellington, at 513-5. This broad duty might be better described as the *duties* of fidelity and good faith.

[189] See for example, *Regan v Grant*, above n110, at 423, where it was the circumstance in which the defendant acquired the information that was significant: an employment relationship.

[190] After employment is terminated, knowhow may not be protected given the cost of enforcement and for reasons of public interest: see the discussion below.

[191] Above n12.

equitable duty of confidence. Furthermore, evidence of the specificity of communication may be used as a basis on which to 'extend' the equitable duty to third parties. In that case, however, the confidant would not have been authorised to disclose the trade secret, so that a duty of confidence is recognised as existing between the third party and the original discloser.

An equitable duty can, of course, co-exist with an implied contractual relationship. However, the circumstantial evidence of a contract may facilitate the finding by the judge of an implied contractual duty of exclusivity in preference to an equitable duty, particularly if the occurrence of a confidential communication is disputed. Therefore, in answer to Finn's question relating to the contractual and equitable duties of confidence, quoted above, the circumstances under which the equitable duty of confidence is created are different from those which give rise to the implied contractual duty. The difference is best summarised as follows: under an implied contractual term the duty of confidence is created through a relationship; under an equitable duty of confidence the relationship is created through a confidence (ie. a specific confidential communication). This evidential difference may be why this historical distinction survives although the outcome, the duty of confidence, is the same, as discussed further below.

In addition, if the circumstantial evidence from a contractual relationship or specific communication can be used to infer a duty of exclusivity, it may also be used to indicate that there is the sort of fiduciary-beneficiary relationship under a fiduciary duty as well. For example, in *Reagan v Grant*[192], an employment relationship was found to give rise to a fiduciary duty with regard to confidential information. In a dissenting judgment in *LAC Minerals*[193], Wilson J also suggested that a fiduciary duty could be created by virtue of a confidential communication, much like an equitable duty of confidence. In contrast, Dean[194] views the protection afforded by a fiduciary relationship as wider than that of the equitable duty of confidence. This may stem from a view of a fiduciary relationship as being related to the broad duty of fidelity and good

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[192] Above n110.

[193] Above n94, at 16.

[194] Above n3, at 179.

faith that is owed to an employer.[195] However, the duty of fidelity and good faith is composed of multiple collateral duties that are formed as part of an employment contract, as noted above, one of which is the implied contractual duty of confidence. In the same way, it is submitted that a broad fiduciary relationship formed between two parties, such as through an employment contract, includes a fiduciary duty not to misuse trade secrets conferred under it. The detail of such a fiduciary duty is discussed in the section on transferability, below.

(ii) Transferability

Gurry[196] observes that the law provides a means to license technology. This 'means' relates to the power of transferability through which licensing may occur. Transferability is not the act of transfer of property itself, but represents the behavioural relation through which the transfer can occur.[197] Transferability is the *power* to transfer bundles of attributes of property and the corresponding *liability* in the recipient to be subject to the ensuing change in legal relations.[198] Prior to the confidential communication, the confidants-to-be are liable to the transfer, but on receipt of the information attain a power of transferability over it for themselves.

Wilson[199] has noted that to be meaningful a power must be accompanied either by a privilege or duty to exercise it or not. Indeed, one jural relation may support

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[195] Dean, above n3, at 179, also suggests that the extent of the protection under a fiduciary relationship "depends on the classification of the relationship which in turn determines the extent of the duty of fidelity". By this he means that the "level" of the duty increases according to whether the level of responsibility and trust imposed on the confidant in each case; ibid, at 184, 188. However, as noted above, the level of responsibility or seniority may be more important as circumstantial evidence from which the duty of exclusivity and so the implied contractual duty of confidence can be inferred.

[196] Above n11, at 8.

[197] Moreover, given that a property right concerns behavioural relations, the act of transfer is not of physical entities per se, but of the "rights to perform certain actions": see Coase, above n145, at 717; see also above n145, at 44.

[198] Hohfeld, above n133, gave the example of the transfer of legal title in land, at 51, although the example is just as applicable to information; see also Gordon, above n148, 1546, 1551, with regard to copyright; Posner RA (1992) *Economic Analysis of Law*, 4th ed, Little Brown: Boston, at 33.

[199] Above n149, at 192.

another.[200] The discloser may, for example, enter under a duty to part with the information, as under a contract of sale. Aside from contract, there is a privilege concerning the discretion of the discloser, and thereafter the confidant, to invoke the power.[201] Where no sale of a secret is agreed, yet the information has already been communicated, then the power of transferability of the discloser remains intact, although a claim-right and duty of exclusivity is created between the discloser and the confidant, respectively, as above.

The imposition of a duty of exclusivity does not alter the power of transferability in the confidant directly. The confidant can still transfer the information if s/he wishes. Rather, the privilege to exercise the power is changed to a *no-right*.[202] The confidants who receive trade secrets may utilise their power of transferability only according to the purpose for which it was disclosed or if authorised by the original discloser. In contrast, the confidants of strategic business secrets and experimental data are unlikely to be authorised to share such information. Hence, the power of transferability for data and lists is more likely to be invoked than for patentable and sub-patentable trade secrets.

A no-right is the absence of a privilege and so it is the same whether established by an implied contractual or equitable duty of exclusivity. Hence, whatever the circumstances in which it arises, the duty of confidence and so the obligation of confidence may produce the same outcome.[203] In effect, there is one duty of confidence and one obligation of confidence, even though the evidential distinction between implied contract and equity survives, as discussed above. Consequently, once a duty of confidence is recognised, it is pointless to pursue additional evidence. Indeed,

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[200] Finnis, above n137, 378-9, using the example of a claim-right and a privilege; see also Wilson, above n149, 191.

[201] Note that Finn, above n20, calls a privilege a 'discretion' and so power that is accompanied by a privilege is a 'discretionary power'.

[202] In Hohfeld's terminology, a no-right is the opposite of a privilege: see Hohfeld, above n133, at 36.

[203] Two variations are that the 'implied contractual' duty is applicable to knowhow during employment and that the 'equitable' duty can be extended to third parties, as noted above. Both these variations may be viewed as the product of the costs of identifying confidences and/or enforcing the claim-right of exclusivity: see the discussion in Part II(b)(iii), below.

in *Conveyer Co of Australia Pty Ltd v Cameron Bros Engineering Co Ltd*[204], Moller J found it unnecessary to find an implied term when the matter could be resolved under an equitable duty of confidence.

In addition, fiduciary obligations frequently involve fetters on the power of a person in the position of a fiduciary[205], although they retain some independence of action from the beneficiary. Finn[206] observes that fiduciaries are debarred from exercising their powers other than for the benefit of their beneficiaries. This description appears to correspond with the limitation of the power of transferability of a confidant. Hence, the fiduciary may have a *no-right* to exercise their power of transferability. This conclusion may help to clarify the suggestion by Cornish[207] that a "fiduciary responsibility may be the source of the duty to preserve confidence". Rather, the restriction on the power of transferability of the confidant, which appears to amount to the fiduciary responsibility in this case, is also part of the duty of confidence.

(iii) Enforceability and Problems of Enforcement

Enforceability is not the act of enforcement, but is the *claim-right* to enforce another claim-right, or power against others, who will then have a *duty* to respond. Enforceability is the security of entitlement that is provided by the legal system and its popular acceptance.[208] Without enforceability, the other behavioural relations which constitute a property right would not be respected, and the property rights system would be undermined. This claim-right is also accompanied by a privilege whether or not to invoke it. Plaintiffs can exercise their privilege to invoke the claim-right of enforceability where another duty is not being respected or a purported use of a power

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[204] Above n52, at 41.

[205] As suggested by Finn, above n20.

[206] Ibid, at 45.

[207] Above n65, at 228.

[208] Scott, 1989, cited in Johnson, above n143, similarly refers to 'quality of title'.

which has been ineffective.[209] For example, a trade secret holder may seek the enforcement of a duty of confidence.

The courts are the adjudicatory bodies which determine whether the information fulfils the act-description, if the duty or power exists, and if it has been correctly performed. The courts have a privilege to utilize a further power to confirm a relationship where one exists, such as by injunction or an order for specific performance, or to substitute another claim-right-duty relationship, as to pay damages.[210] The plaintiff and defendant both have a corresponding liability to accept the judgment of the court.[211]

The discloser of confidential information would appear to have the same claim-right of enforceability whether the confidant's duty of exclusivity or the restrictions on his/her power of transferability are not respected. However, a difficulty can arise where the information has entered the public domain so that while the claim-right of enforceability exists, the duty of confidence cannot be enforced. This occurs when an employee leaves an employer and offers his/her services on the labour market. Knowhow which can be acquired in the trade may be impossible to restrain following the termination of employment because "once [it is] learned [it] necessarily remains in the servant's head and becomes part of his own skill and knowledge applied in the course of his master's business".[212] In *Faccenda*[213], the acknowledgement of the inseparability of employee and knowhow was taken to mean that the implied term which imposes an obligation of confidence is more restricted in scope than that which imposes a general duty of good faith; that is, the implied duty of confidence is limited to trade secrets after employment has ceased unlike the wider duty of good faith that subsists during employment. A literal acceptance of this approach is implicit in the earlier case

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[209] See Wilson, above n149, at 201.

[210] Ibid, at 201-2.

[211] A similar liability is called the 'liability to execution': Honore, above n145, at 123-4.

[212] *Faccenda*, above n5, at 731; see also *Morris v Saxelby*, above n19, at 311; *Wessex Dairies v Smith*, above n76, at 89; *E Worsley v Cooper*, above n166, at 307; *Ansell Rubber v Allied Rubber*, above n29, at 40; see also the discussion of public interest defences, below.

[213] Above n5, at 625.

of *Schilling v Kidd Garrett Ltd*[214], where an employee was held liable for breach of his wider implied duty to serve his employer even though the incident at issue occurred during the last days of that employment when he was on leave. Had the employee waited those few days, his actions would have been legal. Theoretically, the same approach could be taken with regard to knowhow given the *Faccenda* decision, above. However, a pertinent observation is also given in *United Indigo Chemical Co Ltd v Robinson*[215], where it was found that to try to restrain a former employee "by injunction from using knowledge which in that way has become his own, is to try to do something which the Court really has no power to do, or rather it has no power to enforce the injunction if one could be granted". Thus, if knowhow cannot be protected outside of employment it is not because of the cessation of the implied duty, but because it is physically difficult to prevent the use of that knowhow.[216] Under this approach, had the *Schilling* case concerned a breach of confidence relating to knowhow, it would have been decided on the basis of the physical difficulty of preventing the employee from using his knowhow, for which purpose a strict emphasis upon dates seems to be pointless.

The obligation of confidence can be destroyed where the discloser publishes the information, as discussed above in Part I(a). However, loss of secrecy does not result in an immunity for the confidant from the duty of enforceability. In *Schering Chemicals v Falkman*[217], Shaw LJ said that "[i]t is not the law that where confidentiality exists it is terminated or eroded by adventitious publicity". If the information is partly published by other than the confidant, the duty of confidence will remain until the information is completely accessible. This is Gurry's[218] interpretation of Roxburgh J's

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[214] [1977] 1 NZLR 243.

[215] Above n7, at 187, per Bennet J; quoted in *Faccenda*, above n5, at 731; see also *Triplex Safety Glass v Scorah*, above n67, at 215.

[216] A third reason involves a public interest in employee mobility, discussed further below.

[217] Above n115, at 339.

[218] Above n11, at 245-252.

judgment in *Terrapin Ltd v Builder's Supply Co (Hayes) Ltd*[219], that "a person who has obtained information in confidence is not allowed to use it as a springboard for activities detrimental to the person who made the confidential communication". Gurry's analysis[220] of that case shows that the information in question was still confidential, so that the springboard doctrine cannot be taken to mean an indefinite prohibition on the confidant using the information once it has become completely public. Indeed, in *Roger Bullivant and Others v Ellis and Others*[221], an appeal to limit the period of such an injunction was successful. One of the best summaries of the springboard doctrine is given in *Aquaculture*[222] by Pritchard J:

> One can only conclude that there is a principle, founded on a concept of fairness that when once a person has received information in confidence he is not free, if and when the information becomes freely available public knowledge, to exploit any advantage he may have gained over other members of the public by reason of having had advance knowledge of the former "secret"; but that so long as he takes no advantage, derived solely from having had information in advance of the general public, the confidant is free to use the information in the same way as any other member of the public - even to the detriment of the person who confided in him. Any unfair advantage of this sort is regarded as being of a temporal nature. Resorting once more to the language of metaphor - it gives the confidant a head start.

In other words, it seems unfair to enjoin the confidant from using information that everyone else can. However, it must be noted that the court could still enforce the duty of confidence against the defendant, but that it would be infeasible to do so against all the public if the information becomes widespread. Consequently, the court may have the legal, but not what Hohfeld[223] described as the physical, power to enforce the

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[219] [1960] RPC 128, 130.

[220] Ibid.

[221] [1987] FSR 172: reviewed by Goulding P (1995) Springboard Injunctions in Employment Law, 24 *Indust LJ* 152.

[222] Above n12, at 383; referring to *Terrapin*, above; *Cranleigh Precision Engineering v Bryant*, above n15; *Seagar v Copydex*, above n32; *Whimp v Kawakawa Engineering*, above n12.

[223] Above n133, at 58.

claim-right. Hence, when Friedman et al[224] claim that the holder of a trade secret lacks any exclusive 'right' because loss of secrecy precludes a remedy, they confuse the legal and physical powers of the court. Rather, the duty of confidence persists between the original parties, but is extended to other parties when the secret is disclosed to the extent that it becomes physically impossible for the court to enforce.

Another label for 'physical' power is the economic cost of enforcement.[225] This cost arises because the marginal cost of communicating information to an additional person is so low that information spreads easily. Hence, it is harder to trace the descent of an idea than of other forms of property.[226] Thus, although the duty of enforceability may be shared by many, in practice it can become too costly for the information owner or the court to locate and pursue each party. This may be one reason why knowhow, which is acquired generally in the trade, cannot be protected outside of an employment relationship; the cost of enforcement is too high when so many share the same knowhow. In the same way, once trade secrecy is lost it is too costly to enforce a duty against all who have acquired information through the publication in question. Both the trade secret owner and the court may then exercise their respective privileges not to pursue the matter further. An exception is where a third party acquires information by the breach of another's confidence. In that case, the cost of identifying each party and enforcing the duty of confidence may be financially feasible where there is evidence of a confidential communication. Thus, even though there may be no formal or informal relationship between the parties a constructive duty between the parties may be recognised.

If so, then the fact that information is capable of universal possession[227] and that the confidential information may be difficult to distinguish from non-confidential

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[224] Above n23, at 62. Gurry, above n11, at 74, makes a similar error.

[225] On the subject of enforcement costs, see further, North DC (1995) *Institutions, Institutional Change and Economic Performance*, Cambridge University Press: Cambridge, at 27.

[226] Discussed above in Part I (c); see also Landes WM, Posner RA (1987) Trademark Law: An Economic Perspective, 30 *J L & Econ* 265, 267.

[227] See Hammond, above n96; Roberts, above n131; Cross, above n21.

items[228] can make the duty of confidence costly to enforce, but it does not abolish the property right, as is suggested or implied by some critics. These critics may confuse the enforcement of the property right with the property right itself. The claim-right to seek enforcement will still exist, but the imposition of high economic cost and so the loss of 'physical' power by the court may mean in practice the defendant has an economic immunity, if not a legal one. Further, if it is accepted that the economic cost of enforcement is important then further examination of wider economic effects of protecting the different categories would be worthwhile.

The discussion of enforcement costs is relevant for another argument concerning property rights in information. The duty of confidence is only imposed and so is enforced on an *in personam* basis[229], not *in rem*. Dean[230] uses this distinction as a reason to deny property rights in trade secrets. He asserts that "the most important characteristic of a property right is that it can be enforced *in rem*".[231] However, elsewhere Dean[232] suggests that a right *in rem* is a right "against the whole world". In contrast, following the Hohfeldian approach to rights which is adopted here, a right *in rem* is composed of multiple rights *in personam* and is against "organised society", not the whole world.[233] As a consequence, the difference between the duty of confidence *in personam* and Dean's conception of property *in rem* is a matter of scale not jurisdiction. If so, then the fact that the duty of confidence is a duty *in personam* may be traceable to factors other than its jurisdictional basis. The duty of confidence may exist *in personam* in practice partly because the cost of enforcement *in rem* is prohibitive.

A different problem is where information is acquired surreptitiously. This has

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[228] Arrow, above n84, 615.

[229] *Deta Nominees v Viscount Plastic Products*, above n174, at 191; Wei, above n87, at 303.

[230] Above n3, at 55.

[231] Ibid.

[232] Ibid, at 29. Dean distinguishes the action of breach of confidence from a right of privacy on the basis that the former is a right *in personam*, and the latter is a right *in rem* which is a right against the whole world.

[233] See Corbin AL (1919) Legal Analysis and Terminology, 29 *Yale LJ* 163, at 170-1.

been suggested to arise because there is no relationship between the parties so that no duty of confidence *in personam* exists.[234] Hence, the courts cannot punish industrial espionage because no duty of confidence exists, not because it is too costly to enforce.[235]

Recognition that the duty of enforceability may persist even if it cannot be utilised may also be used to clarify the nature of the duty of confidence as a fiduciary duty. Cornish[236] suggests that a fiduciary duty is not a duty of confidence because the former is wider in scope. He argues that a fiduciary duty may be expected to continue as one even after the information has become public. However, loss of secrecy may not destroy a duty of enforceability and so a duty of confidence, although it may be too costly to enforce. In addition, Cornish[237] suggests that a fiduciary may be "obliged to hold the profits of his breach on trust for his beneficiary", unlike a confidant. However, this distinction may not hold indefinitely, as is illustrated by the *LAC Minerals* case[238], in which a majority found a breach of confidence, yet imposed a constructive trust.

(iv) Immunity

A successful defence against an action where a duty of confidence exists is that the breach of confidence is in the public interest. It involves the imposition of an *immunity* against the claim-right of enforceability that relates to the claim-right of exclusivity. The original discloser of the confidential information would then have a *disability* to invoke those claim-rights. Hence, a confidant would have his/her privilege to use their power of transferability restored. It follows that the immunities considered here do not represent a fourth fundamental behavioural relation, but exceptions to

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[234] See Wei, above n87, at 303.

[235] Proposals to extend the duty of confidence to cover espionage are considered further in Chapter Three.

[236] Above n65, at 228.

[237] Ibid.

[238] Above n94.

enforceability.[239]

An immunity in the public interest can be imposed because the courts will not abet "fraudulent or illegal transactions".[240] Indeed, initially, publication of confidential information was permitted only if it were concerned with a breach of law or iniquity of similar gravity.[241] In New Zealand, there is a related discretionary immunity in the public interest by virtue of s35 of the Evidence Amendment Act (No 2) 1980, which protects media sources. This statutory immunity may be recognised in breach of confidence cases, although it may exist independently if iniquity is disclosed.[242] More recently, the public interest has been held to extend to cover all types of information.[243] Finn[244] has grouped these developments into an immunity which is imposed where continued secrecy would be to the harm of the public. In that context, breach of confidence is held to be in response to a "higher duty" to society.[245]

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[239] This may be a solution to the question posed by Finn PD (1984) Confidentiality and the "Public Interest", 58 *Aust LJ* 497, at 506, as to whether the duty of confidence is "overridden" or "destroyed" through inequitable conduct by the discloser. ie. under the legal-economic terminology adopted here, the duty of enforceability is overriden, which amounts to an immunity.

[240] *Wilson Malt Extract v Wilson*, above n47, at 661, per Sim J; *Initial Services Ltd v Putterill* [1967] 3 All ER 145, at 148. Both judgments refer to *Gartside v Outram* (1856) 26 LJ Ch 113.

[241] See for example, *Beloff v Pressdam Ltd and Anor* [1973] 1 All ER 241, at 267; *Attorney-General v Guardian Newspapers Ltd (No 2)*, above n36, at 807.

[242] See *European Pacific Banking Corporation v Television New Zealand Ltd* [1994] 3 NZLR 43, at 48, per Cooke P.

[243] Eg *Fraser v Evans* [1969] 1 All ER 8, at 11; *Schering*, above n115, at 30; *Lion Laboratories Ltd v Evans* [1984] 2 All ER 417, at 423; *Attorney-General v Guardian Newspapers Ltd (No 2)*, above n36, at 807; *Attorney-General v Wellington Newspapers*, above n12, at 177; *Marcel and Ors v Commissioner of Police of the Metropolis and Ors* [1990] 20 IPR 532, at 541; *Westpac v John Fairfax Group*, above n27, at 525; *In re Barlow Clowes Gilt Managers Ltd* [1992] 2 WLR 36, at 44.

[244] Above n20, at 506.

[245] Ibid. The issue of an immunity for public servants who disclose government secrets in the public interest in New Zealand remains unclear. In England, neither the iniquity nor public harm defences would appear to succeed where the information in question is protected by statute: see Cripps Y (1985) Protection from Adverse Treatment by Employers: A Review of the Position of Employees who Disclose Information in the Belief that Disclosure is in the Public Interest, 101 *LQR* 506, for a review of unsuccessful cases under the Official Secrets Act 1911 (UK). This Act was in force in New Zealand until the Official Secrets Act 1951 (NZ) was passed, which in turn was repealed by the Official Information Act 1982 (NZ). Under s9(2)(b) of the Official Information Act, information may be withheld by officials where it concerns a trade secret. Disclosure of such information does not appear to directly constitute an offence under this Act, as compared to s6 of the Official Secrets Act 1951, or s2 Official Secrets Act 1911. However, 9(2) of the Official Information Act is subject to s6(c) which provides for the withholding of information where disclosure would

Furthermore, Lord Denning has added:[246] "In these cases of confidential information it is a question of balancing the public interest in maintaining the confidential against the public interest in knowing the truth." Finn[247] has argued that Lord Denning's formulation is less constrained in scope than the inquiries as to iniquity or public harm, although in practice this distinction may amount to little in practice, as both inquiries are broad in nature, particularly public harm.

In general, the weighing of public interests is that of the different economic consequences of each interest. The public interest that underpins the action for breach of confidence is commercial in nature.[248] This was recognised by Lord Shaw in *Herbert Morris Ltd v Saxelby*:[249]

> Nothing could be a more sure deterrent to commercial energy and activity than a principle that its accumulated results could not be transferred save under conditions which would make its buyer insecure.

Further, the owner of the confidential information could be equally deterred from

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"prejudice the maintenance of the law". This includes s20A(1)(b) of the Summary Offences Act 1981, which prohibits the knowing communication of any official information as defined in section 78A(2) of the Crimes Act 1961. The 'official information' is also defined *mutatis mutandis* in the same terms as in s2 of the Official Information Act 1982): see further Eagles I, Taggart M, Liddell G (1992) *Freedom of Information in New Zealand*, Oxford University Press: Auckland, at 293-306, 598-610. Thus, it is possible that disclosure by public servants of trade secrets which are deemed to be official information could be punished and hence no immunity against enforceability could exist, as in England.

Despite this possibility, if a disclosure is published outside of New Zealand, the extent of it may convince a court that an injunction against publication is pointless, and may defeat the whole action for breach of confidence: see *Attorney-General v Wellington Newspapers*, above n12, at 163, 176. Hence, a disclosure of government secrets in the public interest, even in breach of a statute, might plausibly succeed as a defence, provided that it was made outside of New Zealand and widely published.

[246] *Woodward v Hutchins* [1977] 1 WLR 760, at 764; see also *Morris v Saxelby*, above n19, at 313; *Schering Chemicals v Falkman*, above n115, at 22; *Lion Laboratories*, above n243, at 422-3, 430; *Attorney-General v Wellington Newspapers*, above n12, at 176; *W v Egdell and Ors* [1989] 2 WLR 689, at 711, per Scott J; *Westpac v John Fairfax*, above n27, at 525; *European Pacific v Fourth Estate Publications*, above n27, at 564.

[247] Above n11, at 507.

[248] Finn, above n239, at 449-5 also lists the inventor's right of enjoyment as a public interest, although this is perhaps better described as a natural right which, together with the commercial public interest mentioned here, forms the basis of the justification for intellectual property rights in Chapter Two.

[249] Above n19, at 313.

creation by the insecurity of the negotiation process. Gurry[250] acknowledges that one purpose of the obligation of confidence is to achieve greater efficiency of organisation as resources might otherwise be wasted in additional security measures. However, criminal activities may undermine such efficiency gains by forcing inventors to invest more in security. It follows that it is in the public interest to waive the obligation of confidence where there has been iniquity.

Wider public interests may also be involved. These include the 'sanctity of contract', competition and employee mobility.[251] The operation of the labour and information markets may be undermined unless there is 'sanctity of contract', so that the parties keep to their agreement.[252] Without it, the importance of negotiations would be devalued, leading to information costs for each party in monitoring the fulfilment of the agreement. This interest is most openly recognised for the imposition of an implied contractual duty "to make the bargain effectual".[253] Moreover, where information is disclosed outside contract, as in pre-contractual negotiations, the protection of confidences is also integral to the success of those negotiations.

Against the public interest in favour of 'sanctity of contract' are interests in favour of competition and employee mobility. An example that concerned competition was *Reagan v Grant*[254], where confidential information relating to pizza recipes, marketing, and other business secrets were misused by a former employee. One issue of concern for Eichelbaum J was that if an injunction were to be effective and the defendants were to avoid all risks of infringement, they would be forced to cease trading in the area in which the plaintiffs were operating. This, Eichelbaum J explained[255]

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[250] Above n11, at 8.

[251] These interests may also be considered when determining if a restrictive employment covenant is reasonable, as noted above.

[252] An early case in which 'sanctity of contract' was discussed was *Printing and Numerical Registering Co v Sampson* (1875) LR 19 Eq 462, wherein Jessel MR emphasised respect for the liberty of the contracting parties.

[253] *Lamb v Evans*, above n71, per Bowen LJ.

[254] Above n110, at 425; see also, for example, *Laser Alignment*, above n65, at 259.

[255] Above n110, at 425.

would protect the plaintiffs not simply against unfair competition, but all competition, and he declined to impose an injunction on these grounds. A related interest is employee mobility or the liberty of the individual to exercise his/her skills and earn a living, and its competitive effects.[256] This interest is most likely to be considered when the employee in question has skills that can be used in the service of a competitor of his/her former employer, but is restrained through an employment covenant from using them. Usually the public interest is held to favour the use of such skills or knowhow to the benefit of society. For example, in *Schilling v Kidd Garrett Ltd*[257], Woodhouse J stated that:[258]

> [I]t would seem to be in the public interest that people who have left one job should be encouraged or at least left free to take up another as soon as possible.

An extension of the argument in favour of employee mobility may be made with regard to innocent third party acquisitions of a trade secret by virtue of a breach of confidence by another. At present, there is a limited defence where the confidant was not warned of the confidentiality.[259] However, once the third party has realised or been informed of the confidentiality of the information in question, then the duty of confidence is inferred to exist.[260] In *Fraser v Evans*[261], Lord Denning MR said:

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[256] *Thornsten Nordenfelt v Maxim Nordenfelt Guns and Ammunition Co Ltd* [1894] AC 535, at 565; accepted in *Morris v Saxelby*, above n19, at 308, 315; *Mason v Provident Clothing and Supply Co Ltd* [1911-13] All ER 400, at 404-5; see also *Westminster Chemical v McKinley*, above n8, at 667; *Wright v Gasweld*, above n5; *Laser Alignment*, above n65, at 259.

[257] Above n214.

[258] Ibid, at 256.

[259] *E Worsley v Cooper*, above n166, at 307.

[260] Ie the duty of exclusivity and so the duty of confidence are inferred from the circumstances of the case, much as the duty of the employee can be inferred from the circumstances of his/her employment: see the discussion above. Subsequent use of the information is therefore in breach of the third party's duty of exclusivity when s/he has a no-right associated with his/her power of transferability, so that there is a breach of confidence, as discussed above.

[261] Above n243, at 11; accepted in *Wheatley v Bell*, above n51, at 550; *Citicorp New Zealand Ltd and Anor v Blomkamp and Anor* (unreported, 4 September 1992) Auckland HC, CP 1017/92, at 7; see also *Talbot v General Television Corporation Pty Ltd* [1980] VR 224, at 239-40.

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Even if he comes by information innocently, nevertheless once he gets to know that it was originally given in confidence, he can be restrained from breaking that confidence.

Thus, were the confidant subconsciously[262] or through error[263] to reproduce an idea, or similarly incorporate it into a "hybrid" design[264], s/he may not escape liability once they are informed of the breach. Similarly, innocent or *bona fide* purchasers of confidential information, who were unaware that they were abetting a breach of confidence, become liable when informed of this fact.[265] At this point, the public interest in maintaining the confidence seems to dominate. However, Jones[266] suggests that a third party ought to have a defence where they have changed their position to their detriment, particularly where the innocent purchaser cannot be restored easily to that original position. Indeed, it may mean that the third party is effectively prevented from exercising his/her skills by virtue of a breach of confidence by another. This defence could most likely be successful when the damage to the third party outweighs that to the discloser, so that the balance of the public interest is toward allowing the innocent third party to escape liability.

In contrast, Gurry[267] suggests that the existence of the obligation of confidence represents a sacrosanct relationship of trust and is maintained as such. Of course, Gurry is referring to a wider array of confidential information, including personal confidences for which 'trust' may be a general linkage. However, knowhow and trade secrets are the product of commercial relationships which underlie any 'trust' that is present. If it is accepted that these public interests have an economic basis, then it would be appropriate

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[262] *Seagar v Copydex*, above n32, at 418.

[263] *Interfirm Comparison v Law Society*, above n13, at 544.

[264] *Conveyor Co v Cameron Bros*, above n52, at 44; see also *Peter Pan v Corsets Silhouette*, above n38, at 407.

[265] Jones, above n21, at 478; see also *Wheatley v Bell*, above n51, at 549-550; *Citicorp v Blomkamp*, above n261, at 9. Stuckey, above n97, at 77, also suggests that exempting a *bona fide* purchaser from the breach of a duty of confidence by another could harm disproportionately the discloser.

[266] Above n21, at 479; accepted by Finn, above n20, at 162; Stuckey, above n97, at 79; Gurry, above n11, at 281-2; see also Dean, above n3, at 269-70.

[267] Above n11, at 59; see also 164.

to consider further the protection of trade secrets in legal and economic terms.[268]

In summary, law and equity may have mingled, but the historical contractual and equitable distinctions remain depending on the circumstances in which the duty of confidence, and with it the cost of enforcement. The implied contractual duty is based on the relationship between the parties, whereas the equitable duty is based on the specific communication. Both duties of exclusivity can arise, as in an employment relationship, but only one is necessary to find a duty of confidence and an obligation of confidence where the restrictions on the power of transferability and the duty of enforceability in the confidant are the same. The pursuance of these duties of exclusivity under a corresponding duty of enforceability can be limited by cost and/or by economic immunity from the action in the public interest. From discussion of the composition of the duty of confidence, it may be viewed as coextensive with a fiduciary duty.

III *Unauthorised Detrimental Use of Information*

Once the obligation of confidence has been established, the plaintiff must show that unauthorised use has occurred. According to Wei[269], "[l]iability flows from the breach of confidence through the unauthorised use of that information". Cornish[270] has further categorised unauthorised use into considerations of wrongful acts, the defendant's state of mind, and detriment to the plaintiff. The first two of these considerations are in practice either non-essential or difficult to prove.[271] This leaves a question of detriment, the use of which also appears to be debatable.

Detriment to the plaintiff may seem to follow logically from an unauthorised use of information in breach of an obligation of confidence. For example, in *Lintas*[272], the

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[268] See generally, Chapter Two.

[269] Above n87, at 303-4.

[270] Above n65, at 234-5.

[271] Ibid.

[272] Above n5, at 465; see also *Seagar v Copydex*, above n32, at 417; *Whimp v Kawakawa Engineering*, above n12, at 163.

plaintiffs were entitled to damages because:

> ... the defendants unfairly exploited confidential information about the plaintiff's transactions with its clients, the defendants succeeded in seriously impairing the plaintiff's opportunity to retain and to regain a considerable number of profitable clients.

It is, however, often difficult to prove the extent of detriment to the plaintiff.[273] Dean[274] has stated that "[n]o case has failed for lack of detriment to the plaintiff".[275] Indeed, there is precedent where detriment is not considered as a prerequisite for breach of confidence.[276] Gurry has also suggested that consideration of detriment is more relevant to the determination of a remedy than the existence of a breach of confidence.[277]

However, the forgoing arguments appear to assume too readily that there can have been no detriment in cases where the courts failed to find it. In *Nichrotherm*[278], the defendant manufactured and sold a pig-rearing apparatus in breach of confidence to the plaintiff who had also intended to market it. In that case, Harman J[279] was not convinced that the plaintiff suffered any damage, though they suffered a "legal wrong". Despite this finding, it seems reasonable to suggest that the action may be justified on the grounds of damage to an existing reputation or the prevention of expected damage.[280] It does not matter if the apparatus in this case would have been a commercial failure as the damage may have been to the public perception of the

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[273] Eg *Medic Corporation v Barret and Ors* [1992] 3 ERNZ 523, at 23.

[274] Above n3.

[275] Ibid, at 176; see also Gurry, above n11, at 407.

[276] Eg *Nichrotherm*, above n16; *X v Y* [1988] 2 All ER 648, at 657-8.

[277] Above n11, at 407.

[278] Above n16: cited by Gurry, above n11, at 408; Dean, above n3, at 177.

[279] Above n16, at 281.

[280] Brown and Grant, above n65, at 664, suggest that unauthorised use can sometimes be inferred by showing that there is an overwhelming likelihood that the defendant cannot avoid using the confidential information in question. If so, then detriment may also be inferred.

invention so that the market for it or an improved design is adversely affected. Indeed, in *Aquaculture*[281], the supply of a mussel extract as a cure for arthritis was "branded a quack remedy" and banned by the American authorities and was held to have injured the plaintiff's business prospects relating to another mussel extract. Thus, detriment is difficult to disprove as a pre-condition of the action for breach of confidence.

Furthermore, given that the action for breach of confidence is treated here as being coextensive with a fiduciary duty, the comments by La Forrest J in *LAC Minerals*[282] are relevant. The judge found that harm need not be shown to have resulted under a breach of fiduciary obligation as distinct from the detriment requirement of the action for breach of confidence. However, if the potential for detriment is difficult to disprove, as discussed above, then it may not be a crucial factor for distinguishing the action for breach of confidence from a fiduciary obligation.

If detriment is difficult to disprove in general, it does not prevent a known level of detriment being used to assess the magnitude of damages. It is noted that in *Aquaculture*[283], Pritchard J found the defendants guilty of a "ruthless disregard for the plaintiff's interests" by exploiting specific trade secrets regarding a mussel extract that they had learnt through discussions with the plaintiff in the absence of a contract. Pritchard J had found that compensatory damages were inapplicable and awarded exemplary damages instead. This decision was overturned in the Court of Appeal[284] and compensatory damages instituted, although it was recognised that exemplary damages are possible. It seems reasonable to infer that the outrageous conduct found by Pritchard J related to the level of the detriment in question which in turn may have been facilitated by evidence of a specific communication under an equitable duty. If so, then following the Court of Appeal decision there would have to be an even greater degree of detriment for exemplary damages to be awarded.

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[281] [1986] 1 NZIPR 678, at 678.

[282] Above n94, at 36.

[283] Above n12, at 690-691.

[284] Above n128.

Conclusion

If the obligation of confidence is considered in legal-economic terms, the interrelationship of its constituent behavioural relations, the evidence for the confidentiality and the existence of the obligation may be more clearly perceived. A source of confusion at present is the overlap between the contractual, equitable and fiduciary duties. This can be resolved by dividing the obligation of confidence into its constituent behavioural relations.

The key difference lies in the circumstances in which the duty of exclusivity and so the duty of confidence will arise, and the costs of enforcing the duty, given those circumstances. The implied contractual duty is created when an agreement is formed, such as by means of an employment contract. This contact may serve as circumstantial evidence for a duty of confidence, and so reduce the cost of enforcement. In contrast, the equitable duty of confidence is created by a communication of a trade secret. This communication may also be used as circumstantial evidence of a duty, particularly where there is no formal or pre-existing relationship between the parties, including third parties. The duty of exclusivity, however, will have the same effect on transferability and enforceability so that the outcome, the duty of confidence and so the obligation of confidence is the same. In addition, this duty of confidence may be regarded as a form of fiduciary duty. As a result, it may not be necessary to consider whether a fiduciary duty is involved as part of the action for breach of confidence once a duty of confidence is found to exist.

In addition, the two-part division of confidential information into knowhow and trade secrets could be revised to produce different categories of trade secrets. There seems to be an initial argument in favour of distinguishing between patentable, sub-patentable, and other trade secrets and so create a tri-partite division. This is important given the potential commercial value of patentable and sub-patentable trade secrets. However, by itself, this categorisation may be inadequate for a discussion of the differences between such trade secrets. In this context, the discussion of the claim-right and duty of enforceability and the immunities from it are of interest. It was found that the enforcement of the duty of confidence may be limited by its cost. It was also found that the public interests involved in immunities from that duty may represent expressions

of economic policy. If economic policy has a role in the recognition and limitation of the obligation of confidence, it may also be a means to analyse further the importance of different trade secret categories and their degree of legal protection. It follows that for the purpose of economic analysis, the further development of a legal-economic framework for intellectual property rights would seem to be desirable. The outcome of this assessment could be useful for determining the use and viability of tailored protection for patentable and sub-patentable trade secrets.

CHAPTER TWO:
Trade Secrets and the Intellectual Property Rights Continuum

TRADE SECRETS AND THE INTELLECTUAL PROPERTY RIGHTS CONTINUUM

The discussion in Chapter One concerned the composition, but not the justification for, trade secrecy and the obligation of confidence. Like other intellectual property rights, trade secrecy is justified on the basis of natural law and economic theory. These arguments underlie one boundary of the intellectual property rights continuum. At the other extreme, the imposition of intellectual property rights may result in detrimental effects for society. The intellectual property rights continuum lies between these boundaries, with the position of each right determined according to its relative economic effects. The protection of sub-patentable trade secrets is found to be the least satisfactory and may require additional protection, whereas patentable trade secrets may be over-protected and warrant a reduction in protection. Once it is established that some form of legal barrier is necessary, the question then is how to scale the barrier so that a balance between the extremes of the continuum is achieved. The solution proposed is to find the least inefficient position on the continuum. Several approaches for altering the protection of trade secrets which may lead to this outcome are introduced.

In Chapter One it was found that a trade secret is confidential information that is specific to the secret's owner, such as an employer, whereas knowhow is the skill and knowledge that is generally acquired in the trade. This distinction is reflected in the skill employed to create and so in the novelty and commercial value of a trade secret as compared with knowhow. Trade secrets can be further divided into four broad categories: patentable and sub-patentable secrets, business secrets[1], and experimental data.[2] As a generalisation, these secrets are also distinguishable by the level of skill that is employed and the levels of novelty and possibly of commercial value that are achieved. Patentable and sub-patentable trade secrets may embody more skill, be more novel, and so be more valuable than other secrets. This may also be reflected in the

[1] Business secrets includes customer lists, customer, pricing, and marketing data.

[2] Experimental data includes the results of experiments which have yet to yield patentable or sub-patentable information, but are valuable in so far as such knowledge would reduce the need for duplicative research by competitors.

level of circumstantial evidence for the existence of each.[3] It was suggested in Chapter One that patentable and sub-patentable trade secrets may be better suited to a tailored form of protection than other trade secrets, but this categorisation by itself may not be of further assistance. Indeed, before such a suggestion can be evaluated, the consequences of the present level of protection must be analysed.

In Chapter One it was noted that the protection of confidential information and any immunity to litigation which is imposed by the court represent a clash of 'public interests'. For example, there is a balance between keeping a confidence and permitting the breach of that confidence in order to expose iniquity. It was concluded that these interests represent inarticulate economic issues that require further examination, and may provide the framework within which the different categories of trade secrets and knowhow can be assessed.

For this purpose, an extension of the legal-economic approach from Chapter One is made in order to assess the need for and consequences of additional protection for trade secrets, particularly patentable and sub-patentable secrets. In Part I, the main legal and economic justifications for intellectual property rights and the problems that are associated with the conferral of such rights will be reviewed. The result is the construction of an intellectual property rights continuum that stretches between boundaries which have both legal and economic aspects. The first boundary is 'anarchistic', beyond which natural rights are not recognised and which can lead to market failure and the under-production of knowledge. Therefore, a basic conclusion is that some form of property rights system is desirable to avoid market failure through the under-production of information. Once intellectual property rights are recognised, the degree of exclusivity strengthens along the continuum until monopoly is possible, in which event the utilisation of information is limited. It follows from this market imperfection that the natural right to create further information in another is constrained. Hence, at the other extreme of the continuum, there is a 'monopolistic' boundary. Different rights are positioned along the continuum and comparable to each other according to their relative economic effects. The position is determined in part by virtue of the property right itself and the information in question. The essential conclusion is

[3] See 1.36-1.39.

that patentable trade secrets may create market imperfections and so may not warrant further protection, or may even require a reduction in protection, whereas sub-patentable trade secrets may be at risk of market failure and so be in need of additional protection.

In Part II, the economic aspects of the intellectual property right continuum are examined more closely. Both the anarchistic and monopolistic boundaries represent extremes of inefficiency, so that it is tempting to utilise efficiency criteria in order to evaluate the position of a right. However, it is found that efficiency criteria cannot be used as a universal principle or normative goal for the differentiation between property rights systems, even though a particular property rights system may lead to an efficient outcome. At best, efficiency considerations can be used as one guide to indicate whether the property right leads to an outcome which may or may not be normatively desirable. Despite this limitation, the inefficient boundaries of the continuum ought to be avoided and so the least inefficient position between these extremes sought. This, following Demsetz[4], involves determining the scale of barriers to market entry which are inherent in the intellectual property right, and which will alter the position of that right on the continuum. In this context, several approaches to the barriers inherent in trade secret rights are introduced in Part III.

I *The Intellectual Property Rights Continuum*

I(a) *The Anarchistic Boundary*

(i) John Locke and the Natural Rights of Property

The arguments of John Locke have become a standard defence for the natural right of the individual to acquire an unlimited amount of property[5], at least in common

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[4] (1982) Barriers to Entry, 72(1) *Am Econ Rev* 47.

[5] This was despite the fact that his thought was indicative of his era, being "on the whole not original, either in the main structure or in details, and similarities can be found between his arguments and those of numerous predecessors": Gough JW (1948) Introduction, in: Locke J, *The Second Treatise of Civil Government and a Letter Concerning Toleration*, Basil Blackwell: Oxford, at x; see also Vaughn K (1980) *John Locke: Economist and Social Scientist*, Athlone: London, at 82. Furthermore, Locke's intended audience was modest, being a radical minority of 17th Century Englishmen: see Ashcraft R (1986) *Revolutionary Politics and Locke's*

law countries.[6] Locke and his fellow thinkers sought to redefine the relationship between the monarch and subjects as a 'social contract' rather than divine or absolute right.[7] His arguments were based upon a 'natural law' that "prevailed irrespective of the existence of government and must exist if the world was to be compatible with the will of God".[8] Locke's work on property rights appeared during the on-going political struggle with the absolutists. In this context, Locke's views may be seen as an attempt to reassure the male property-enfranchised electorate that to break the link between the regent and God would not undermine the sanctity of property.[9]

According to Locke, the individual began with a natural right of property in their own person, which through labour could be extended to or mixed with common property so that it becomes 'a part' of the individual and so separate from the common:[10]

> The labour of his body and the work of his hands we may say are properly his. Whatsoever, then, he removes out of the state that nature hath provided and left it in, he hath mixed his labour with, and joined to it something that is his own, and thereby makes it his property.

Tully[11] suggests that Locke conceived of property in the individual and his/her actions, concluding that Locke made wide use of the term 'property' to mean any sort

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Two Treatises of Government, Princeton University Press: Princeton, at 327, 578-9.

[6] Another justification derives from the philosophy of Hegel which has had particular influence in Continental European law: see further, Hughes J (1988) The Philosophy of Intellectual Property, 77 *Georgetown LJ* 287; Palmer TG (1990) Are Patents and Copyrights Morally Justified? The Philosophy of Property Rights and Ideal Objects, 13(3) *Harv J L & Pub Pol* 817.

[7] Nyland C (1993) John Locke and the Position of Women, 25(1) *Hist Pol Econ* 39, at 39. However, Locke did not view the natural rights of property as 'trumps' with which to override government. For example, he accepted taxes which invade the right of property of the individual if imposed by representative government: 1948, at 71.

[8] Nyland, above n7, 40; see also Ashcraft, above n5, 258, 261-2; Snyder DC (1986) Locke on Natural Law and Property Rights, 16(4) *Can J Phil* 723, reprinted in: Chappel V (ed, 1992) *John Locke - Political Philosophy*, Essays on Early Modern Philosophers, Vol 9, Garland Publishing Inc: New York, 218-223.

[9] Nyland, above n7, 41; see also Ashcraft, above n5, 260-4. However, it is noted that at that time the amount of property owned by the electors varied between electorates: see Ashcraft, ibid, 145-52.

[10] Above n5, at 13, 15.

[11] Tully J (1980) *A Discourse on Property: John Locke and his Adversaries*, Cambridge University Press: New York, at 105.

of right. In support of this view, Tully quotes the following passage from Locke:[12]

Man, by being Master of himself and proprietor of his own person, and the actions of labour of it, had still in himself the great foundations of property. . .

Rather than a loose usage of 'property', the two meanings can be viewed as closely associated in Locke's mind. In fact, Locke equated liberty and private property: "By property I must be understood here, as in other places, to mean that property which men have in their persons as well as goods".[13] Similarly, Nyland[14] concludes that individual liberty, like the capacity for labour, is a form of private property. Hence, a better interpretation of the passage quoted by Tully is that individual liberty is the foundation of property and that its acquisition is through labour or effort as the expression of self-will[15] and so of that liberty.[16] Without a system of property rights to protect individual liberty, as is expressed through inventive effort, there is a return to the state of nature or anarchy. Hence, there is an 'anarchistic' boundary to the intellectual property rights continuum.

The Lockean concept of 'natural' rights of property is still relevant for the legal arguments in support of intellectual property rights. For example, Locke's emphasis on the liberty of the individual seems to have found expression in *Herbert Morris Ltd v Saxelby*[17] where Lord Shaw stated that with regard to knowhow:

a man's aptitudes, his skill, his dexterity, his manual or mental ability - all those things which in sound philosophical language are not objective - they may, and they ought, not to be relinquished by a servant; they

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[12] Ibid, at 105; see Locke, above n5, at 23.

[13] Ibid, at 87.

[14] Above n7, at 48.

[15] Note that "[a]imless effort is not labour" under natural law: see Gordon WJ (1993) A Property Right in Self-Expression; Equality and Individualism in the Natural Law of Intellectual Property, 102 *Yale LJ* 1533, at 1547.

[16] See also Becker LC (1977) *Property Rights: Philosophic Foundations*, Routlege & Kegan Paul: London, at 33. See further the libertarian argument discussed below in Part II(b).

[17] [1916-17] All ER 305, at 313.

are not his master's property: they are his own property; they are himself.

In *Morris*, such knowhow was distinguished from trade secrets which were the property of the master. The Lockean principle for this distinction is also summarised by Libling[18], who applies it to information:

Any expenditure of mental or physical effort, as a result of which there is created an entity, whether tangible or intangible, vests in the person who brought the entity into being, a proprietary right to the commercial exploitation of that entity which right is separate and independent from the ownership of that entity.

Thus, Libling recognises that the act of production or causation is the conceptual foundation of a natural property right in information and links it to a power and liability of transferability as well as a claim-right and duty of exclusivity.[19] In addition, the same opportunity exists for others to create further information of similar quality, which according to Hughes[20] is consistent with Locke's notion of a 'common' from which private property can be taken. These Lockean arguments have economic consequences that are discussed in the next section.

(ii) Market Failure

The application of natural rights of property does have economic effects and it is not surprising that many modern economists have been influenced by the literature stemming from the philosophy of Locke.[21] The Lockean attitude to knowhow and trade secrets appears to have economic counterparts. For example, if an individual's natural right of property in his/her own inventions is recognised, then they will be able to capture the benefits from those creations and so have an incentive to produce further

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[18] (1978) The Concept of Property: Property in Intangibles, 94 *LQR* 103, at 104; see also Gordon, above n15, at 478. A less common emphasis is on the social value that is produced by the labour not the labour itself: for a review see Hughes, above n6, at 305-310.

[19] In addition, there is a claim-right and duty of enforceability: see 1.29.

[20] Above n6, at 315.

[21] See Scott A (1983) Property Rights and Property Wrongs, 16(4) *Can J Econ* 555, at 557.

information. Hughes[22] calls this economic theory the instrumentalist argument for the justification of intellectual property rights. Under it, individuals must be rewarded for the unpleasantness of labour with property because people must be motivated to perform labour. Hughes[23] also notes that this economic argument may be treated as 'proof' of the Lockean normative proposition that labour *should* be rewarded.

Despite this confusion, Hughes[24] concedes that the economic justification of intellectual property rights may exist independently of natural law arguments. Indeed, it may be conceded that some knowledge is produced for other than pecuniary reasons[25], but if the knowledge producer cannot appropriate the benefits of their production, too small an incentive is thought to be generated and knowledge underproduction may be predicted.[26] Indeed, knowledge production is risky as the output cannot be perfectly predicted and so an inherent disincentive against such production may exist[27], and hence it will cease if there is not a sufficient reward; that is, market failure.

If market failure occurs it is due to the difficulty of protecting trade secrets and other confidences. This is because information is a public good capable of consumption in a non-rival manner without depletion. Consequently, the cost of adding another

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[22] Above n6, at 303.

[23] Ibid, at 303; see also Gordon WJ (1992) Of Harms and Benefits: Torts, Restitution, and Intellectual Property, 21 *J Leg Stud* 449, at 449-50, who also divides the justification for intellectual property rights into a normative "fairness" argument and an economic argument.

[24] Above n6.

[25] See Vaver D (1991) Some Agnostic Observations on Intellectual Property, 6 *IPJ* 125, at 127.

[26] See Machlup F (1962) The Supply of Inventors and Inventions, in: National Bureau of Economic Research (ed) *The Rate and Direction of Inventive Activity: Economic and Social Factors*, Princeton University Press: Princeton, at 145; Arrow KJ (1962) Economic Welfare and the Allocation of Resources for Innovation, ibid, at 619; Demsetz H (1967) Toward a Theory of Property Rights, 57 *Am Econ Rev* 347, at 359; Lehman M (1985) The Theory of Property Rights and the Protection of Intellectual and Industrial Property, 16(5) *IIC* 526, 538-9; Paepke CO (1987) An Economic Interpretation of the Misappropriation Doctrine: Common Law Protection for Investment in Innovation, 2 *High Tech LJ* 55, at 55-56, 58-62; Scherer FM, Ross D (1990) *Industrial Market Structure and Economic Performance*, Houghton Mifflin/The Free Press: New York, at 627; Duncan A (1990) Economics of Intellectual Property, in: Ministry of Commerce (ed) *Review of Industrial Property Rights, Patents, Trade Marks and Designs: Possible Options for Reform*, Vol 2, Ministry of Commerce: Wellington, 1, at 3.

[27] Arrow, above n26, 616.

'consumer' is close to zero. This means that once information is in the public domain, open and unrestricted access can lead to universal possession of the information so that its value is difficult to appropriate.[28] According to Demsetz[29], the 'public good' nature of information is only important where contracting costs are large because those 'free-loaders' or 'free-riders' who would otherwise be willing to pay for further research would be excluded. However, in the absence of an exclusive property right, that is, anarchy, the risk and cost of contracting will always tend to be high, as above. What then accrues to the information developer is a return which, given that the market has failed, will not include a return on the cost of development.[30] Hence, without protection the costs and risks of research may be too great, so that the output of invention declines or halts. Put formally, where the social value exceeds the private value of new information, it leads to under-investment in inventive activity[31] and so under-production of knowledge or market failure.

In the long term, knowledge under-production will result in the poorer diffusion of knowledge and so, it is presumed, slower technological development to the disadvantage of society, compounding the market failure.[32] The level of profit for the inventor from the sale or licensing of the invention will therefore depend on the natural lead time in which it remains secret[33], unless the information is protected as an intellectual property right. Market failure may also lead to costly expenditure on security in order to maintain secrecy, which represents an opportunity cost to further investment

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[28] See Arrow, ibid, at 619; Note that public property is not the same as common property, which may imply some collective controls on access or use: see Ciriacy-Wantrup SV, Bishop RC (1975) "Common Property" as a Concept in Natural resources Policy, 15 *Nat Res J* 713, at 714-15; Taylor M (1993) The Economics and Politics of Property Rights and Common Pool Resources, 32 *Nat Res J* 633, at 634.

[29] (1969) Information and Efficiency: Another Viewpoint, 12 *J L & Econ* 1, at 12. Contracting costs include the formation and enforcement of the bargain: ibid, at 13.

[30] See Kitch EW (1980) The Law and Economics of Rights in Valuable Information, 9 *J Leg Stud* 683, at 699.

[31] Hirshleifer J (1971) The Private and Social Value of Information and the Reward of Inventive Activity, 61 *Am Econ Rev* 561, at 561.

[32] See Scotchmer S (1991) Standing on the Shoulders of Giants: Cumulative Research and the Patent Law, 5(1) *J Econ Persp* 29, at 31.

[33] See Reichman JH (1994) Legal Hybrids Between the Patent and Copyright Paradigms, 94 *Colum L Rev* 2432, at 2442; see also Scherer and Ross, above n26, at 626-8.

in invention.[34]

The alternative to market failure is to recognise the need for a property rights system. Demsetz[35] argues that "the main function of property rights is the internalisation of the beneficial and harmful effects" or externalities of transactions, so that these rights evolve with the emergence of new or different externalities. The positive externality which is associated with intellectual property rights is the "difference between the private and social returns to innovation due to the "spillover" of benefits to users and imitators which are not captured by the inventor".[36] The action for breach of confidence reduces the risk and so cost of negotiating technology transfer, and in effect extends the lead time before the information will reach the public domain. It thus encourages invention, but at the cost of immediate dissemination. The publication of patent specifications would also ideally reduce the search cost of locating the information owner, particularly where the efficiency of a personal search is extremely low.[37] A legal property right also reduces the cost of enforcing exclusive contracts and so of acquiring the information in question[38], thereby raising the cost of free-riding.

The establishment of intellectual property rights is mitigated against, however, by the same free-riding problem noted above. Suppose that a party does not consent to receive and so does not pay for information, yet may benefit from it. This party may come to feel entitled to use the information and not wish to pay for what they obtain already at little or no cost.[39] Hence, there may be public resistance to the introduction

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[34] Gurry F (1984) *Breach of Confidence*, Clarendon Press: Oxford, at 8; Trebilcock also suggests that a restrictive employee covenant in this instance may be less costly than security measures, or other protective alternatives such as a fragmented work regime to reduce the dissemination of information amongst employees: Trebilcock MJ (1986) *The Common Law of Restraint of Trade: A Legal and Economic Analysis*, The Law Book Co: Sydney, at 120-1.

[35] Above n26, at 350; see also Becker, above n16, at 68; Lehman, above n26, at 530; Friedman D, Landes WM, and Posner RA (1991) Some Economics of Trade Secret Law, 5(1) *J Econ Persp* 61, at 64-5.

[36] Revesz J (1994) *The Economics of Patents*, Bureau of Industry Economics, Occasional Paper 18, Australian Government Publishing Service: Canberra, at 5, referring to patents.

[37] In practice, the volume of patent records may make searching for technical information difficult as suggested in surveys reviewed by Revesz, ibid, at 52.

[38] Ibid, at 13; see also Posner RA (1975) The Social Costs of Monopoly and Regulation, 83(4) *J Pol Econ* 807, at 825.

[39] Maughan CW (1995) The Economics of Property Rights, 1(2) *NZBLQ* 78-9, at 83.

of new property rights in confidential information.

I(b) *The Monopolistic Boundary*

(i) Market Imperfection

Under-utilisation of knowledge can be the side-effect of rewarding innovation and is the major problem associated with an intellectual property right. This is because the information market may operate imperfectly where economic agents are able to interfere with competition by means of their intellectual property right/s. If knowledge is protected to the extent that competition is reduced, output can be lowered, and price increased as in any monopoly.[40]

There are several inefficiencies which follow from monopolistic interference and that result in knowledge under-utilisation. These disadvantage both consumers and producers. The result for society is loss of consumer and producer welfare; that is, a deadweight loss in economic activity.[41] An inflated price may exclude some consumers who would have acquired the information if it were less expensive, particularly the poorer members of society and developing countries, leading to under-utilisation of that knowledge.[42] Indeed, where secrecy can easily be protected the bargaining power of the holder may be increased and so the price of the secret may be higher than if it were patented, so that price-exclusion and under-utilisation are exacerbated. It follows that there is also a loss in producer welfare as competitors are excluded from using the information which also results in under-utilisation[43], and so in the end, under-production. However, knowledge under-production that occurs because knowledge

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[40] See Demsetz, above n29, at 17.

[41] For a summary of deadweight loss that results from patents: see Gordon, above n15, at 1548-9; Revesz, above n36, at 14-15.

[42] For example see Arrow, above n26, at 617; Hammond RG (1981) Quantum Physics, Econometric Models and Property Rights to Information, 27 *McGill LJ* 47, at 55; Landes WM (1992) Copyright Protection of Letters, Diaries, and Other Unpublished Works: An Economic Approach, 21 *J Leg Stud* 79, at 83; see also Becker, above n16, at 96-8.

[43] For example see Hammond, above n42, at 69; Landes, above n42, at 83.

utilisation is *low* must be distinguished causatively from the under-production which occurs because that information is a public good and utilisation of information is ***high***, as discussed above. The deadweight losses which arise from monopolistic behaviour form the economic aspect of the 'monopolistic' boundary of the intellectual property rights continuum and complement the economic aspect of the 'anarchistic' boundary, discussed above.

When the monopolistic rewards of a property right are high, competition for their capture may consume most of the rents from that right, transforming the benefit into a social harm.[44] In a sense, the patent system represents an attempt to harness rent-seeking in the form of inventive activity[45], but this may be outweighed by more rent-seeking behaviour. Races for knowledge discovery could lead to over-investment in duplicative research at the cost of forgoing alternative research[46], so that the total output of research is lowered. The inventor may wastefully invest scarce resources to maintain or extend his/her existing property rights rather than invest in further research. Examples of such rent-seeking are the development of security systems, the lobbying of politicians, and excessive litigation.[47] Cheaper alternatives to security expenditure may be less efficient, such as nepotistic employment practices.[48] Further, in a non-contestable market, a monopolist has little to gain from engaging in a risky venture like research and development.[49] Indeed, Hughes[50] suggests that the possession of property tends to make the owner more risk-averse, which may affect investment strategies. In

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[44] See Landes WM, Posner RA (1987) Trademark Law: An Economic Perspective, 30 *J L & Econ* 265, at 267.

[45] Kaplow L (1984) The Patent-Antitrust Intersection: A Reappraisal, 97 *Harv L Rev* 1815, at 1873.

[46] See further, Posner, above n38, at 807; Kaplow, above n45, at 1873; Friedman et al, above n35, at 65-6; Scotchmer, above n32, at 31, referring to Loury. To some extent the published patent may reduce the duplication of research: see Kitch EW (1977) The Nature and Function of the Patent System, 20 *J L & Econ* 265.

[47] See Kitch, above n30, 697-699; Dam KW (1994) The Economic Underpinnings of Patent Law, 23 *J Leg Stud* 247, at 262-3.

[48] See Friedman et al, above n35, 67.

[49] Revesz, above n36, at 7.

[50] Above n6, at 290-1.

the long-term there will be slower dissemination and development of information in society[51], which compounds the deadweight losses described above. For example, an over-reliance on trade secret protection may hinder technological growth by 'locking up' valuable information.[52]

Intervention to rectify the welfare losses that follow under-utilisation of information in an imperfect market can be ineffective. For example, forcibly lowering the price of a monopolised resource by regulation will increase welfare, as more will be able to afford to use the information, but at the expense of knowledge production in particular industries. It may, in effect, transform the problem of deadweight losses that are associated with monopoly to another form of inefficiency, market failure. Further, this intervention may favour one industry or firm at the expense of others.[53] Conversely, the continuance of monopolistic pricing will allow the producer to increase their profit, but at the expense of under-production of knowledge, so that the deadweight losses remain.

In reply to arguments concerning the negative consequences of imperfect markets, it may be argued that there are no special adverse effects of monopoly on the incentives to invent. Chief among these sceptics of the severity of monopolisation is Kitch[54] who views the defensive nature of a patent monopoly to be an advantage as the duplication of research can be reduced and the co-ordination of further research achieved, like a mineral prospect. The difficulty is that empirical evidence for this claim is hard to establish. Indeed, not everyone is so carefree about the potential for monopoly erosion and so in this Chapter it remains as a boundary on the intellectual property rights continuum, as above. Kitch's prospect theory has been criticised because post-patent duplicative research is a relatively minor problem, whereas patents may block rather

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[51] Scotchmer, above n32, refers to the importance of cumulative research. According to Arrow, above n26, at 618, the value of information to the further development of information is conjectural and so may be under-estimated.

[52] Office of Technology Assessment (1986) *Intellectual Property Rights in an Age of Electronics and Information*, OTA-CIT-302, US Government Printing Office: Washington DC, at 87, referring to the computer industry.

[53] Dam, above n47, at 253.

[54] Above n46, at 276; see also the review by Duncan, above n26, at 14-16.

than co-ordinate research, particularly where the lag-time between patenting and commercialisation is short.[55] Indeed, Merges and Nelson[56] were unable to find a single case where the holder of a broad patent used it effectively through tailored licensing to co-ordinate the research and development of others. Kitch also equates commercial success with patentability and thereby implicitly values the reward of inventors at the expense of the policy that favours disclosure and society.[57] Hence, if the potential market failure that is associated with sub-patentable information is averted by the introduction of another intellectual property right, there is a danger that even more harmful market imperfections could arise.

Furthermore, monopoly sceptics may suggest that "usually" a monopoly is eroded by substitutable competition.[58] For example, Dam[59] claims that the existing limitations of patent scope and length ameliorate the worst effects of any patent monopoly and that the remaining duplicative research which is stimulated by monopoly profits is a form of beneficial competition that yields further invention. In contrast, Demsetz[60] acknowledges the advantages of a decrease in monopolisation, but rejects the possibility of under-utilisation as an argument against monopoly if the alternative is to discourage research; that is, market failure.

Other economists are less sanguine about the benefits of the intellectual property right breadth and length restrictions. Narrow patents, for example, may not infringe other patents and so increase the dissemination of information within society, but this

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[55] See Hart MJ (1994) Getting Back to Basics: Reinventing Patent Law for Economic Efficiency, 8 *IPJ* 217, at 239-40; Merges RP (1988a) Commercial Success and Patent Standards: Economic Perspectives on Innovation, 76 *Calif L Rev* 803, at 840; Eisenberg RS (1989) Patents and the Progress of Science: Exclusive Rights and Experimental Use, 56 *Uni Chicago L Rev* 1017, at 1069; Merges RP, Nelson RR (1990) On the Complex Economics of Patent Scope, 90(4) *Colum L Rev* 839, at 872-5.

[56] Ibid, at 875.

[57] Merges, above n55, at 841.

[58] Paekpe, above n26, at 70; see also McCarthy JT (1985) Intellectual Property and Trade Practices Policy: Coexistence or Conflict? The American Experience, *Aust Bus Rev* 198, at 202-3; Duncan, above n26, at 18, 19; Dam, above n47, at 250.

[59] Ibid, at 257-61.

[60] (1964) The Exchange and Enforcement of Property Rights, 7 *J L & Econ* 11, at 11, 19-20.

approach is rejected by Scotchmer[61], as there would be an insufficient financial incentive for the initial research. Narrow patents can also result in competition between close substitutes, to the erosion of revenue.[62] According to Scotchmer[63] "the only way to ensure that firms undertake every research project that is efficient is to let the firms collect as revenue all the social welfare they create", including a licence royalty from second generation products, but she recognises that this gain is offset by the costs of monopolistic pricing that will encourage over-investment. Broad patents may also make it easier to block the research into improvements upon patented information by competitors.[64] An optimal patent length is difficult to determine because a long or unlimited patent may hinder subsequent research[65], yet if the length is short it may generate an insufficient financial incentive for future research. This latter reason is why Hart's[66] proposal for patent bidding may not succeed. Hart suggests that competitors submit bids and that the shortest patent length be the criterion for the grant. This would encourage short patents, but imperfect information may result in an underestimation of the returns and marketing lag time to be expected. Hence, firms may overbid to secure a monopoly profit, but may not recoup their investment to the detriment of their means and incentive for further research. Therefore, there are identification costs involved in determining the appropriate level of protection.[67]

From these arguments it could be thought that no intellectual property right

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[61] Above n32, at 33.

[62] Scotchmer S, Green J (1990) Novelty and Disclosure in Patent Law, 21(1) *RAND J Econ* 131, at 135.

[63] Above n32, at 31; see also Green JR, Scotchmer S (1995) On the Division of Profit in Sequential Innovation, 26(1) *RAND J Econ* 20, at 20.

[64] Merges and Nelson, above n55, at 869-70.

[65] See Gilbert R, Shapiro C (1990) Optimal Patent Length and Breadth, 21(1) *RAND J Econ* 106, at 112.

[66] Above n55.

[67] On the theory of transaction costs of exchange, see for example, North DC (1995) *Institutions, Institutional Change and Economic Performance*, Cambridge University Press: Cambridge, at 27-35. Identification costs relate to the costs of measuring the valuable attributes of what is being exchanged: ibid, at 27.

breadth or length can be optimally efficient, particularly that of patents. Scotchmer[68] concludes that the prospects for fine-tuning the patent system through patent policy are limited. This despondency and the arguments of the monopoly-sceptics has contributed to an attitude of 'fait accompli' typified by the comments of Judge Posner:[69]

> Our law is not rich in alternative concepts of monopolistic abuse; and it is rather late in the day to try to develop one without in the process subjecting the rights of patent holders to debilitating uncertainty.

If the monopoly sceptics err by condoning the monopoly which may still be practised, the potential reformers of patent lengths and breadth have erred by taking an 'across the board' approach as a solution to monopoly. In fact, each industry may have its own practice so that the monopolistic abuse and the position of the intellectual property rights are subject to individual variation.[70] Thus, the most which can be said is that monopolistic practices, and so market imperfections are possible, depending on the information and industry in question.

(ii) A 'Natural' Limitation to Property Rights

There is an argument for the natural limitation of property rights which flows from the economic argument against the price-exclusion of individuals or groups under monopolistic pricing. It concerns the individual's access to information.[71] The individual liberty of those other than the inventor can be threatened through the restriction of information to a select few. The privilege to purchase information is not abolished, but its exercise limited in practice by the price of the information. An economic restriction on access could also reduce the dissemination of useful information

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[68] Above n32, at 40.

[69] *USM Corp v SPS Technologies, Inc*, 694 F2d 505, at 512 (1982): cited in Samuals WJ, Mecurio N (1984) Posnerian Law and Economics on the Bench, 4 *Int Rev L & Econ* 107, at 119; see also Revesz, above n36, at 15.

[70] See Merges and Nelson, above n55.

[71] See further Hammond, above n42, at 55, 69; Lehman, above n26, at 534-5; Cross JT (1991) Trade Secrets, Confidential Information, and the Criminal Law, 36 *McGill LJ* 525, at 534.

to the harm of society.[72] In turn, this may interfere with the exercise of individual liberty to create further information and so additional natural rights.

These arguments form the legal aspect of the 'monopolistic' boundary of the intellectual property rights continuum. Whereas the economic argument in favour of incentives for knowledge production may appear to some as 'proof' of the Lockean-derived model of 'natural' property rights, here the economic arguments against under-utilisation of knowledge actually interfere with the natural rights of others. Locke did not contemplate these exact circumstances, but he did recognise that legislative power is limited to what he called the public good of society[73], as expressed through the legislature, so that even the law of property could be overlaid through popular consent.[74] It is also noted that the courts may recognise that there are issues of public interest which necessitate the imposition of an immunity for a confidant from the action for breach of confidence, so that the public may have access to that information.[75] In short, the extension of existing intellectual property rights is likely to engage legal as well as economic arguments.

I(c) *The Intellectual Property Rights Continuum*

Arguments for and against natural rights and related economic issues constitute the different aspects of the 'anarchistic' and 'monopolistic' boundaries of an intellectual property rights continuum. The creation of an intellectual property right may be in recognition of a natural right and be used to avert market failure, but it could result in monopolistic abuse of market power and the restriction of the natural rights of others. The difference between the legal and economic aspects is that the natural rights are

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[72] Both concerns were in the Nineteenth Century as reasons for opposing copyright and patent rights: see Palmer, above n6, at 828.

[73] Above n5, 67-8: "It is a power that hath no other end but preservation, and therefore can never have a right to destroy, enslave, or designedly to impoverish the subjects."

[74] Ibid, 71-2.

[75] See 1.47-1.52.

either recognised in law or not, whereas the economic effect of market failure or imperfection, even if it is so recognised, can vary in magnitude. Therefore, once the inventor's natural right is recognised, the different intellectual property rights may be positioned along the continuum relative to their different economic effects. From an initial understanding of the legal and economic reasoning for the creation of intellectual property rights, closer attention may be paid to the position of each right on the intellectual property rights continuum.

Each intellectual property right can be characterised as a series of legal-economic behavioural relations, as discussed in Chapter One. Each of those behavioural relations exists between two legal entities and involves an act-description. The behavioural relations are the claim-right and duty of exclusivity, the power and liability of transferability, and the claim-right and duty of enforceability. The related act-descriptions are the acts of exclusion, transfer, and enforcement. These relations exist by virtue of a natural right and/or in order to avert market failure, as discussed above. Each act-description under a single intellectual property right concerns the scope of that right and the same information. For example, the information which is protected as a trade secret is defined according to the 'necessary quality of confidence' as assessed by a judge[76]; a patent protects information which is defined by the patent threshold criteria under statute[77]; a copyright protects information which is defined as an original expression, also under statute. Hence, the act-description exists by virtue of the law, whereas the behavioural relations may or may not be recognised in law.

The scope of the right is important for determining the position of the right on the intellectual property rights continuum. In theory, the existence of trade secrets as an intellectual property right ought to mean that they are closer on the continuum to the monopolistic boundary than to the anarchistic. Patents and copyright ought also to be closer still to the monopolistic boundary, given that both represent rights *in rem* compared to the obligation of confidence which is created *in personam*.[78] On the basis

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[76] See 1.05-1.13.

[77] These criteria are commercial utility, novelty and inventiveness: see further 6.10-6.15.

[78] It is also possible that other rights may be positioned on the continuum, such as trademarks and design rights.

of the period of protection the trade secret is potentially more monopolistic than either patent or copyright as it is infinite if secrecy persists. Copyright is the next monopolistic, given that these last for 50 years after the death of the author[79], whereas patents last 20 years from the date of filing.[80]

In practice, however, the position of each right on the continuum will vary according to the character of the information[81] and industry in question. For example, according to Merges and Nelson[82], in the chemical industry, product patents "tend to define a well delineated class of substances. Valium is valium and, although subject to some variation, sulphuric acid is sulphuric acid." Hence, a chemical may be easy to imitate, but this simplicity in turn makes it easier to specify accurately so that once it is patented it is difficult to create a competing product without infringement.[83] Indeed, Revesz[84] concludes that patents may play a major role in the pharmaceutical and speciality chemical industries. The length of copyright may also be mitigated by minor borrowing under the so-called 'fair dealing' exceptions[85], the frequency of which may vary according to the category of expression in question.

The length and market imperfections of a trade secret right depend in part on its natural lead time.[86] Patentable trade secrets probably are difficult to discover, so that

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[79] Under the Berne Convention: see Cornish WR (1989) *Intellectual Property: Patents, Copyright, Trademarks and Allied Rights*, 2nd ed, Sweet & Maxwell: London, at 250; see also World Trade Organisation (1994) Agreement on Trade-Related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods, 47(1162) *BNA's PTCJ* 230, art 9(1). Under s22(1) of the New Zealand Copyright Act 1994, the copyright in literary, dramatic, musical or artistic works "expires at the end of the period of 50 years from the end of the calendar year in which the author dies"; see also ss23-25.

[80] Art 33, TRIPs, above. Under s30(3) of the New Zealand Patents Act 1953 the term was 16 years, but this has now been amended to 20 years from the 1st of January 1995.

[81] This includes consideration of the market concentration: see Merges and Nelson, above n55, at 911-12, referring to the chemical industry and others.

[82] Ibid, at 897.

[83] From a review of empirical research, Revesz concludes that patents may slow the introduction of imitations so that the imitator has to "invent around" the patent specifications: above n36, at 28-9.

[84] Ibid, at 43.

[85] See generally, Cornish, above n79, at 300-305.

[86] Natural lead time is the period in which an inventor may exploit a trade secret before their competitors discover it: see Reichman, above n33, at 2506, referring to computer software.

its natural lead time may be sufficient to avert market failure, and this is indicated by the onwer's choice of secrecy. Indeed, if it is possible to keep patentable information secret so that it is only known to its owner, and provided that substitutes are not found, then the length of the right and the potential for monopolistic pricing is indefinite.[87] These are factors which may contribute to monopolisation and so market imperfections, as discussed above. Hence, patentable trade secrets may in practice be closer to the monopolistic boundary than either patents or copyrights. This monopoly is undesirable as it may 'lock up' trade secrets from wider use, to the disadvantage of society.[88] Therefore, patentable trade secrets may not warrant any additional protection than already exists under the breach of confidence action, and may require some limitation to reduce market imperfections where these occur.

In contrast, the owner of sub-patentable information does not have the option of patenting, at least without further invention. For example, information may be readily obtained because the procedures or products involved are well known, such as in the biotechnology industry[89], or it is readily acquired through examination of the product, as in the computer software industry.[90] Consequently, in these industries the sub-patentable secrets may have a natural lead time which is too short for the inventor to gain a sufficient return on his/her investment, and so the outcome is more likely to be market failure than in the case of patentable trade secrets. The volume of profits in and rapid development of the biotechnology and computer software industries may overshadow market failures in niches of the industries where failures persist.[91] In addition, if the law is unable to protect sub-patentable trade secrets, the inventor's 'natural' rights in their invention, above, may go unrecognised. Therefore, sub-patentable trade secrets could warrant separate protection that is tailored to that information, provided that market imperfections do not result.

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[87] Cf Reichman, ibid, at 2510.

[88] OTA, above n52, at 87, referring to the computer industry.

[89] See 6.05-6.07.

[90] See 7.05-7.07.

[91] See 6.06, 7.04.

II *Problems with the Rationale for Reform*

Natural rights theory is applicable to both boundaries of the intellectual property rights continuum. Without a property right, the inventor's natural right to exclude others or transfer the right, may go unrecognised. At the other extreme, a property right can be used to price exclude others so that their natural rights or privilege to purchase information is restricted, as above. However, between these two extremes, natural rights theory is of little help in finding a balanced position on the continuum. Rather, between the extremes of market failure and market imperfections, which lie parallel to the extremes of natural rights, finding a balanced position has widely been considered to be possible, or at least, normatively desirable.

The first step toward some balance between the economic extremes of the continuum is to recognise that intellectual property rights need to exist in order to avert market failure in information production. Once a right is established and distributed, questions remain as to the justification for changing the position of that right on the continuum. These arguments primarily are an extension of the justification for the continuum itself. Numerous attempts have been made to extend the instrumentalist argument whereby property rights should be recognised so as to reward and stimulate further invention. Greater efficiency of inventive output is intuitively appealing, insofar as people may be presumed to favour a greater rate of information output that is relative to their input of resources or that input which is made on their behalf. Some legal and economic philosophers have attempted to formalise this intuition by linking greater efficiency with an increase in the benefits which are perceived to accrue from property rights, including utility and liberty. If successful, efficiency criteria can then be applied widely as a normative goal, including the assessment of and possible change of the position of intellectual property rights on the continuum. There is, of course, an extensive literature on this subject, and it is impossible to discuss it all. However, there are at least four key arguments which are not exclusive, but are among the best known. None of these arguments appear to succeed, as discussed below. Consequently, efficiency criteria ought to be regarded more as a guide or as an evaluative criterion than as a universal principle which must be applied. This is important because if less emphasis is given to identifying a common philosophical basis for all situations, then

more general suggestions may be made for the analysis of proposals to change the position of rights on the intellectual property rights continuum.

II(a) *Utilitarianism*

Utilitarianism, as it is ordinarily understood, "holds that the moral worth of an action (or of a practice, institution, law, etc) is to be judged by its effect in promoting happiness".[92] This consequentialist judgment may be governed by the facts of the particular situation ('Act' utilitarianism).[93] Some view the goal of economics as being to maximise economic welfare or utility through these judgments.[94] Hence, the utilitarian focus on a more efficient production of knowledge is based on the benefits to society and consequent increase in utility which an expansion of knowledge could bring.[95] A problem with this approach is that it may be used to justify an intellectual property right when in fact another institutional arrangement could also satisfy these goals.[96] A more serious problem are the technical difficulties in choosing the people, the preferences to be considered and their distribution, and then how to compare the utilities;[97] the choice of criteria is too subjective to be valid. One solution is to make the judgment according to the application of a law to each individual case ('Rule' utilitarianism).[98] This may include reference to moral laws or principles that are equally subjective. Another alternative is to utilise efficiency criteria which do not require

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[92] Posner RA (1979) Utilitarianism, Economics, and Legal Theory, 8 *J Leg Stud* 103, at 104-5.

[93] See Urmson JO (1968) Utilitarianism, in: Sills DL (ed) *International Encyclopaedia of the Social Sciences*, Vol 16, Macmillan/The Free Press: New York, 224, at 225-6.

[94] Posner, above n92, at 105.

[95] This efficiency argument is noted by Breyer S (1970) The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs, 84(2) *Harv L Rev* 281, at 289, as a means to "satisfy more human wants".

[96] Ibid, at 289.

[97] Coleman JL (1988) *Markets, Morals and the Law*, Cambridge University Press: Cambridge, at 96.

[98] Urmson, above n93, at 226.

interpersonal comparisons.

Pareto efficiency criteria are based on individual preference orderings rather than interpersonal comparison under an existing distribution of property rights. An allocation of resources which is Pareto superior is one in which all individuals are at least as well off and one or more are better off. A Pareto optimal solution is where there is no other allocation of resources which would benefit one without harming others.[99] To determine whether an individual is better or worse off, and so whether the move is more efficient, his/her preferences must be ordered, which is a key task for that individual. However, according to Coleman[100], efficiency has an empirical significance that is independent of the welfare goals of utilitarianism, so that even if the idea of total utility were meaningless it would still be possible to discuss Pareto improvements. That is, it is possible to discuss an individual's preferences even if it is impossible to compare utilities accurately: the two are not linked. Consequently, efficiency is independent of aggregate utility and so should not be used as an approximation of utilitarian goals.

II(b) *Libertarianism*

If an invention is thought to result from an expression of individual will or liberty, then to reward it by an intellectual property right may be argued to maximise efficiently the liberty of the inventor. The key is that the preference ordering of the Pareto efficiency criteria are linked to the consent of the inventor, and so to his/her will and liberty. Thus, efficiency is valued as being based on the liberty of the individual, much like the natural law arguments of John Locke, above.

Consent appears to be the key to Coase's[101] argument that amongst a small number of individuals externalities may be reduced and efficiency gains made through voluntary exchange, provided that bargaining costs are sufficiently small. It must be

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[99] See Coleman, above n97, for review; see also Hirshleifer J (1988) *Price Theory and Applications*, Prentice Hall: Englewood Cliffs, at 462.

[100] Above n97, at 100-1.

[101] See (1960) The Problem of Social Cost, 3 *J L & Econ* 1.

noted that the 'Coase theorem' represents a challenge to the Pigouvian economic analysis which emphasised government intervention in an ideal world; according to Coase, in an ideal world intervention would be unnecessary.[102] Coase[103] has since commented:

> Of course, it does not imply, when transaction costs are positive, that government actions (such as government operation, regulation, or taxation, including subsidies) could not produce a better result than relying on negotiations between individuals in the market. Whether this would be so could be discovered not by studying imaginary governments but what real governments actually do. My conclusion: let us study the world of positive transaction costs.

It is in this world that Coase finds assignment of rights to those who can use them most productively to be "obviously desirable" and to necessitate a low cost of transference.[104] It follows that the number of exchanges can be maximised with less recourse to "authoritarian" methods of government, including the conscription and seizure of property[105], which of course restricts the exercise of an individual's self-will or liberty. Thus, in his argument it is implicit that, by consenting to the voluntary exchange, individual liberty is increased.

The problem with the libertarian argument is that people need not consent to actions they prefer where the path to achieving those preferences is morally unacceptable. They may desire an action, but never consent to take it. Consent, therefore, is path-dependent and cannot be deduced from preference orderings.[106] Furthermore, if that consent is based on faulty information it may lead to decisions which make the individual worse off even where there is free choice. Consequently,

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[102] This theorem continues to provoke criticism. For example, see Veljanovski CG (1982) The Coase Theorem and the Economic Theory of Markets and the Law, 35 *Kyklos* 53.

[103] (1992) The Institutional Structure of Production, 82(4) *Am Econ Rev* 713, at 717-8; see also Demsetz, above n29, at 1.

[104] Ibid, at 717-8.

[105] See Coase, above n101, at 17-8, who emphasises the costs of governmental regulation and suggests that economists and policy-makers have over-estimated the advantages of such policy.

[106] Coleman, above n97, at 137.

coercive intervention may be necessary to achieve a Pareto superior allocation so that market failure can be averted, but this approach is an anathema to most libertarians. Therefore, the libertarian view of rights as instruments of autonomy is independent of efficiency. Another consequence is that the pursuit of liberty may also be an inappropriate goal, or at least is too indeterminate to assess accurately.

II(c) *Constitutionalism*

Constitutionalists take a wider view of the value of consent than libertarians and ground their normative use of efficiency criteria in the consent of the people. According to Coleman[107], constitutionalists are realists when they claim that "in determining which policies, trades, or rules are efficient, we are restricted to the framework defined by existing transaction costs". Indeed, Buchanan and Tullock[108], following Wicksell, favour unanimity in decision-making, but recognise that this may be too costly to accomplish, whereafter the "rational individual will deliberately choose to collectivise certain activities to allow these to be organised under rules that require less-than-unanimous consent of all members to decisions". According to Maughan[109], the "solution will be the procedure which minimises jointly external costs and transaction costs. Since these costs move in different directions as more/less people agree, the optimal decision will always represent a compromise." Another consequence of this constitutionalist argument is that consent may be used to justify the allocation of resources by an elected government that involves coerced Pareto improvements. It follows that efficiency may not be secured through voluntary exchange in all circumstances and so the constitutionalist view avoids a theoretical limitation of the libertarian argument, above.[110] Of course, a constitutionalist would be likely to argue

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[107] Ibid, at 144.

[108] (1962) *The Calculus of Consent*, University of Michigan Press: Ann Arbour, at 93-4.

[109] Above n39, at 85.

[110] Coleman regards the libertarian argument as a species of the wider consent argument used here: see above n97, at 128.

that unanimity is still a useful approximation of voluntary exchange.

A problem with the constitutionalist argument flows from the use of efficiency when there is less-than-unanimous consent. Buchanan and Tullock[111] recognise that under these conditions the efficiency of proposed policy changes is difficult to test empirically, so they resort to a presumption of Pareto optimality for which the "attainment of consensus in support of the change would lend support to the hypothesis; failure would tend to refute the hypothesis". One outcome of this test may be to conclude that "agreement is both logically necessary and sufficient for efficiency".[112] From this "semantic" interpretation of consent[113] it is possible to argue that consent indicates that an individual's self-interest has been maximised through agreement. Thus, popular consent becomes 'proof' of efficiency. In contrast, under the libertarian argument, above, efficiency is emphasised as 'proof' of consent and so autonomy. In other words, the constitutionalist may reduce efficiency to a focus on consent, whereas the libertarian may reduce consent to a focus on efficiency.[114]

At a basic level, Buchanan and Tullock's approach can be criticised because it is possible to rationalise all collective actions as efficient because of the consent involved, provided that force or fraud are absent.[115] In addition, common agreement may be reached for reasons that differ between individuals, so that consent cannot be said to maximise anything, including efficiency.[116] Therefore, if consent is evidence of rational self-interest, this in itself cannot be said to amount to efficiency.[117] Efficiency cannot be reduced to consent, just as the libertarian economists cannot reduce consent to efficiency, as above.

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[111] Above n108, at 94.

[112] Coleman, above n97, at 139.

[113] Ibid, at 139-40.

[114] Ibid.

[115] Ibid, at 145.

[116] Ibid, at 141.

[117] Ibid, at 139-41.

II(d) *Wealth Maximisation*

An infamous alternative to utilitarianism is Posner's attempt to maximise wealth efficiently by means of a "cost-benefit analysis as the criterion of social choice, where the costs and benefits are measured by the prices that the economic market places on them, or would place on them if the market could be made to work".[118] The advantage of using prices is that these may be used as an indicator of individual preferences without the arguments about the subjective criteria that must otherwise be used to evaluate those criteria.[119] As prices are dependent upon markets and voluntary exchange, wealth maximisation is also dependent on consent for its justification.[120] Indeed, Posner[121] advances a libertarian argument for consent where rights are an instrument to achieve wealth maximisation and through it other welfare goals, including individual autonomy or liberty.[122] However, Dworkin[123] queries whether all consent is informed or uncoerced and so distinguishes it from autonomy. Again, consent and efficiency are not the same. Coleman[124] also finds that if, following Posner, consenting to a transaction justifies it, then barter is justified even though it is not wealth maximising.[125]

It seems as though Posner realises that the libertarian argument for consent

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[118] (1984) Wealth Maximisation and Judicial Decision-Making, 4 *Int Rev L & Econ* 131, at 132; for a recent review, see Gardner T (1995) Who's Right About Wealth? 16(3) *NZULR* 303.

[119] The disadvantage is that it involves an assumption that a dollar is worth the same to everyone. An additional dollar may be viewed differently by a rich and a poor person: see the review by Gardner, ibid, at 306.

[120] Coleman, above n97, at 110.

[121] (1980) The Ethical and Political Basis of the Efficiency Norm in Common Law Adjudication, 8 *Hofstra LR* 487, reprinted in: Kuperberg M, Beitz C (eds, 1983) *Law, Economics, and Philosophy*, Rowman and Allanheld: Totowa, 81, at 85-91.

[122] Cf utilitarianism under which rights may be abrogated in the pursuit of utility.

[123] (1980) Why Efficiency? A Response to Professors Calabresi and Posner, 8 *Hofstra LR* 1, reprinted in: Kuperberg M, Beitz C (eds, 1983) *Law, Economics and Philosophy*, Rowman and Allanheld: Totowa, 123, at 124.

[124] Above n97, at 115-6.

[125] Ie barter does not involve money and so not wealth, as under Posner's approach.

cannot succeed where intervention is required to correct market failure. He therefore turns to counterfactual consent as indirect evidence of the rational self-interest of individuals; that is, Posner[126] argues that rational individuals would consent *ex ante* to the risk of not being compensated, and so have a cheaper opportunity to maximise their wealth given that systems which award compensation *ex post* are deemed to be more costly to enforce. To do so, Posner relies upon a potential Pareto superior allocation of resources where the loser could be compensated by the winner, but which is not obligatory; that is, Kaldor-Hicks efficiency. Dworkin[127] and Coleman[128] reject the notion that either *ex post* or *ex ante* acceptance amount to consent. Were Posner right, the only way a victim of another's wrong-doing could refuse their consent would be to refuse *ex post* compensation. Agreement to *ex post* compensation cannot amount to consent, and so *ex ante* 'consent' cannot be authentic. In contrast, Posner[129] claims that the Paretian insistence upon absolute unanimity, that is where every person must benefit or at least not lose, would be "fanatical" and so finds Kaldor-Hicks efficiency acceptable. However, Dworkin[130] believes that a non-fanatical Pareto standard collapses into utilitarianism - the same philosophy that wealth maximisation was supposed to escape. When even a few people are permitted to be relatively worse off, consideration of the quantity of welfare is necessary and so the utilitarian problem of interpersonal comparison is resurrected.[131]

II(e) *Finding the Least Inefficient Position on the Continuum*

It seems that the four arguments discussed are attempts to further the normative

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[126] Above n121, at 86; see also Coleman, above n97, at 118.

[127] Above n123, at 126-7.

[128] Above n97, at 118-9.

[129] Above n121, at 495.

[130] Above n123, at 132-3.

[131] Ibid, at 132-3.

use of efficiency. The weak links in each approach appear to rest on the equation of the voluntary exchange, which is necessary to achieve the Pareto efficiency criteria, with consent. It is suggested that the essential problem in these arguments is one of trying to identify and isolate a single common link between all people for all conditions over time under conditions of imperfect information. These conditions could include the lead time of a trade secret in question, the pricing policy of the information owner, the level of market competition and concentration. Hence, the real value of the four legal-economic philosophies discussed is to show that there is, as yet, no universal principle involved in the creation of property rights, despite the extensive literature on this topic. Any attempt to identify a universal principle of efficiency that leads to the location of an efficient optimum is problematic, and cannot be used successfully as a normative goal; that is, as the basis for the re-evaluation and reform of existing legal rules. As a consequence, the problems associated with the nature of information as a public good remain, notably the under-production of information.

Efficiency criteria are better used as a descriptive or explanatory tool by which the "existing legal rules may be rationalised or comprehended".[132] Indeed, the arguments that are summarised above may be attractive in different situations. Intuitively, increased utility or liberty may operate as a motivating instinct or conscious influence in at least some people some of the time. An efficient increase in output of information and associated financial rewards or a reduction in administrative costs of processing intellectual property rights, for example, may be normatively desirable. Hence, although the efficiency criteria are difficult to apply, these are still relevant as a general intuitive guide. Of course, the outcome of the proposed changes to the legal rules can also be described in terms of efficiency and this may affect policy decisions. The point is that efficiency should not be used as a normative goal to *stimulate* change, but as a descriptive means for its evaluation. Additional normative applications of efficiency should be left to the individual and not imposed in legislation nor by the courts when the base of other normative goals, such as 'justice' or 'fairness', are equally indeterminate and are no less valid.

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[132] See Coleman's definition of descriptive law and economics: above n97, at 67. Cf positive law and economics, which is the use of "market models to provide a conceptual apparatus within which traditional legal problems may be conceived": Coleman, ibid, at 68.

Another alternative to efficiency is to favour the least inefficient balance between the two extremes of the intellectual property rights continuum.[133] It should be noted that these extremes are not all-or-nothing states. Once property rights are recognised, the inefficiencies associated with under-production of knowledge are reduced, and continue to decline until extinction as the exclusivity of those rights is strengthened. However, at the same time as individuals are excluded, other inefficiencies will develop, leading to the under-utilisation of information at the monopolistic boundary. Therefore, a balance between these extremes is not simply a goal of efficiency expressed in another way because there is no emphasis on one Pareto optimal goal. Rather, the least inefficient position will involve some degree of exclusion.

In short, the approach taken here is a another form of the constitutionalist argument. It is realist, insofar as the position of least degree of inefficiency is recognised to depend on the degree of exclusion in the information market. However, consent is not semantically equated with efficiency, but is treated as weak evidence of it. Coleman[134] calls this an epistemic interpretation so that consent may be used as a "weak rule of thumb about human behaviour". This assumption underlies the following attempts to find the least inefficient position of trade secret rights on the intellectual property rights continuum. The options for the protection of trade secrets all involve setting legal barriers to property rights, and are discussed in Part III.

III *Setting Legal Barriers*

Once the need for property rights is established, the question is one of devising what Demsetz[135] has called "properly scaled barriers to entry". Demsetz[136] explains that a custom developed amongst post-World War Two economists to "seek monopoly

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[133] See Maughan, above n39, at 83.

[134] Above n97, at 139-40.

[135] Above n4, at 49.

[136] Ibid, at 47.

explanations for data not obviously or directly implied by the perfect competition model. The perceived persistence of higher rates of return in some industries than in others was suggestive of barriers to entry." However, all property rights have some barriers, even in the theoretical perfectly competitive market. Hence, these barriers are imposed with the introduction of property rights at the anarchistic boundary of the continuum, and which are enlarged as the right shifts closer to the monopolistic boundary.

Secrecy and statutory protection impose high barriers, so that intellectual property rights tend to be situated toward the monopolistic boundary on the continuum, as discussed in Part I(c), above. Patentable trade secrets may be positioned even closer to the monopolistic boundary than patents or copyrights when secrecy is an effective barrier to acquisition by competitors. In contrast, these other rights must be disclosed to gain statutory protection, at which point research may be begun on improvements. If a patentable trade secret is likely to be discovered by duplicative research, such as reverse engineering, or industrial espionage, then a patent may be obtained. However, sub-patentable trade secrets, although potentially valuable, may not be patented and so are vulnerable to these methods of acquisition. Therefore, it was concluded that sub-patentable trade secrets may require additional protection to avert market failure. It was also concluded that patentable trade secrets do not require, and may even stand a reduction in, protection to avoid market imperfections.

Several options exist to address these problems. First, two means of increasing the legal barriers for the protection of trade secrets are the punishment of industrial espionage and the creation of a new intellectual property right to protect sub-patentable trade secrets which are the most in danger of market failure, as discussed above. Thereafter, two proposals for using price discrimination are made as a means to reduce market imperfections, irrespective of the height of the barrier in question.

III(a) *Trade Secret Barriers*

(i) Industrial Espionage

In Chapter One, the action for breach of confidence was examined as the means or barrier by which others could be excluded from the trade secrets and other

confidential information of an information owner. It was noted that the obligation of confidence can only be imposed *in personam* through a confidential relationship or communication. Industrial spies, however, may have no relationship with the information owner at all and acquire the trade secret surreptitiously. In that case, the action for breach of confidence is inapplicable.[137] It is impossible to maintain the least inefficient position of these rights on the continuum if there is market failure through threat of espionage. An inventor is unlikely to be able to capture all the rewards of his/her invention if competitors are able surreptitiously to acquire it, or obtain the full rewards when there is threat of espionage. Consequently, it would be advantageous if there were some form of punishment of industrial espionage in addition to the action for breach of confidence.

In Chapter Three, the economic justifications for the action for breach of confidence and limitations upon it are re-examined, particularly the need for a confidential relationship. These arguments in turn may be used to facilitate recognition of a tacit confidential relationship between the parties, permitting the extension of trade secret rights in order to punish espionage. Widening the scope of trade secrecy will help to avert the under-production of all trade secrets, and particularly the sub-patentable secrets which may be in the most danger of market failure, as suggested above. In this context, some solutions for protecting against industrial espionage are considered in Chapter Three: "Industrial Espionage Law in New Zealand." This includes reference to the Japanese trade secret law, which is discussed further in Chapter Four. A proposal to prohibit industrial espionage is not, however, the sole solution to the problem of inefficiency. Indeed, from the extension of this barrier, market imperfections and the under-utilisation of information will result. Therefore, further solutions may be needed to combat market imperfections.

(ii) Utility Models

In this Chapter, sub-patentable trade secrets are identified as being most at risk of market failure and so of anarchy, in which the natural rights of the inventor are not

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[137] See 1.46-1.47.

recognised. It may therefore be advantageous to develop a specific intellectual property right to protect sub-patentable trade secrets. A utility model is a small form of patent that protects minor inventions that do not reach the threshold of patentability required for a patent. Hence, the threshold for a utility model ought to be lower than the patent law threshold and so adaptable for the protection of sub-patentable trade secrets. However, it must be noted that the creation of intellectual property rights can cause market imperfections and impinge upon the natural rights of others, as above. Consequently, utility models may not be the sole solution for protecting sub-patentable trade secrets. Thus, in Chapter Four, utility models are considered in the context of price discrimination, discussed below.

III(b) *Price Discrimination*

(i) Perfect Price Discrimination

The problem of monopolistic pricing and the associated restriction of the natural rights of others may be reduced in theory where there is pure price discrimination.[138] Price discrimination consists of the ability of a monopolistic supplier to sell the same product in separate markets with differing demand at different rates of return.[139] Price discrimination is dependent upon barriers to voluntary exchange which prevents the importation and resale of the resource by consumers in the higher priced markets at a cheaper rate from the lower priced markets. Thus, the supplier is able to match the ability of different markets to pay different prices more closely and receives a comparable increase in reward. In theory, if a perfectly price discriminating monopolist were to charge a price that is close to the maximum of what each consumer or group of consumers are prepared to pay then the more the consumer surplus is reduced.[140]

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[138] There is some scholarship as to how far and in what circumstance joint-ventures may also mitigate against the imperfections caused by monopoly: for references, see Ordover JA (1991) A Patent System for both Diffusion and Exclusion, 5(1) *J Econ Persp* 43, at 54.

[139] Different prices are not necessarily a criterion as discrimination can occur with equal pricing between customers when the costs of serving them differ: Bork RM (1978) *The Antitrust Paradox: A Policy at War with Itself*, Basic Books: New York, at 383, 395-7; see also Scherer and Ross, above n26, at 489.

[140] See Revesz, above n36, at 15.

However, the consumer surplus is transferred to the producer so that there is no additional loss in welfare to the community as a whole, and, if output increases to service customers formerly excluded by the monopoly in one market, deadweight losses will be reduced and welfare increased.[141] It should be noted, however, that price discrimination is not obligatory. According to Scherer and Ross:[142]

> In the absence of legal quirks, no firm with monopoly power has to discriminate. It will only do so if a system of discriminatory prices yields higher expected profits than uniform pricing, ceteris paribus.

Perfect or first degree price discrimination occurs where every consumer is charged a different price so that the producer appropriates all the consumer surplus. Second and third degree price discrimination involve discrimination between different groups and markets respectively. Hence, information could be sold to different groups within society and between nations at different prices with both welfare gains and an enhancement of the natural rights of the community[143], if price discrimination coupled with output increases could be used.

A major limitation on the use of price discrimination is resale between markets. Hence, perfect price discrimination is most likely where a technology includes a barrier to resale, or if it is highly novel and the number of buyers is small, so that the resale between markets may be closely monitored and prevented or prohibited by law. Once the technology and its market are established it becomes physically difficult to locate buyers individually under imperfect information and so second and third degree price discrimination is likely to become the norm, with a smaller reduction in the deadweight loss.

Price discrimination is illegal in the United States[144] and under Australian

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[141] See further the discussions in Bork, above n139, at 395-6; Kaplow, above n45, at 1873-8; Posner RA (1992) *Economic Analysis of Law*, 4th ed, Little Brown: Boston, at 282.

[142] Above n26, at 489-90.

[143] Recall that a monopolistic restriction on output will result in price exclusion for part of the community, which in practice restricts their natural rights to purchase that information: see Part I(b)(ii), above.

[144] For a discussion of the Robinson-Patman Act, see Bork, above n139, at 382-94.

legislation[145], but this prohibition is not found in Commerce Act 1986 (NZ). According to Dellow and Feil[146], the Australian prohibition against price discrimination is so rarely invoked that its absence in the New Zealand law is of little practical consequence. The New Zealand approach to price discrimination is also thought to encourage pro-competitive negotiations by large buyers to secure a more favourable price for their purchases.[147] Furthermore, an exception is granted in s45 of the Commerce Act for the anti-competitive effects of contracts, agreements or understandings which concern a statutory intellectual property right, unless it involves the misuse of a dominant position[148] or resale price maintenance.[149] Given that price discrimination is not expressly illegal, courts might be expected to apply these sections according to the beneficial or harmful effect of the activity.[150] If so, price discrimination may be investigated as a legitimate means to reduce the effects of market imperfections.

(ii) Reification and the Potential of Price Discrimination

The recognition of price discrimination may be hindered by the 'reification' of the legal barriers which are applied to the invention. Parker[151] describes reification as "the mental process by which an unjustified concreteness, impersonality, objectivity or

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[145] See s49 Trade Practices Act 1974.

[146] Dellow T, Feil J (1991) Competition Law and Trans-Tasman Trade, In: Ahdar RJ (ed) *Competition Law and Policy in New Zealand*, The Law Book Co Ltd: Sydney, at 31-2.

[147] van Roy, Y (1991) *Guidebook to New Zealand Competition Laws*, CCH New Zealand Ltd: Auckland, at 141.

[148] Ss36, 36A. Under s36(2) there is also an exception to the dominant use provisions for the purpose of enforcement of a statutory intellectual property right.

[149] Ss37, 38.

[150] See also van Melle A (1995) Competition Law and Refusals to License Intellectual Property, *NZLJ* 318, at 319.

[151] (1987) Law and Language in Japan and the United States, 34 *Osaka Uni L Rev* 47, at 48-50, referring to a Japanese perception of reifications in American law and theory, amongst other topics. Parker is careful to distinguish this use of the term from other philosophical connotations.

independence is attributed to something".[152] An invention may be reified so that the composite information is considered to form completely separate or substantive rights when protected, for example as under trade secret and patent law. In contrast, Coase[153] has pointed out that the exchange of property rights does not transfer physical entities, but the "rights to perform certain actions". Hence, a better view is that there is considerable overlap between patented information and trade secrets within a single invention so that the distinction in practice is not always clear and one right may not be useful without the other/s. Thus, a secret which is closely related to patented information may embody a different manifestation of the same skill, and have an associated commercial value. Recognition that an invention may be composed of numerous intellectual property rights can lead to two innovative proposals for increasing the practice of price discrimination in technology transfer.

(iii) Price Discrimination with Existing Intellectual Property Rights

If an invention is composed of numerous intellectual property rights, and is not an all-or-nothing entity, it follows that not all rights need be purchased for the invention to be transferred. The product which is being sold may still be considered the 'same' for the purpose of licensing even though a minority of the intellectual property rights are not purchased. A licensee could already have rights to complementary information, or the licensor may not wish to share all of their knowhow and trade secrets with every licensee. These differences could affect the price that the licensee is willing to pay. Hence, there is potential for greater price discrimination by selling varying combinations of intellectual property rights to the same invention at different prices in different markets or at least to different consumers, according to market needs. This form of price discrimination will be discussed in Chapter Four: "Utility Model and Trade Secret Rights in Japan."

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[152] It may be that the use of efficiency criteria as a normative goal, discussed above, is an example of reification.

[153] Above n103, at 717; see also n101, at 44.

(iv) Competition and Price Discrimination with Improvements

A related proposal to that introduced in Part III(b)(iii) concerns a new intellectual property right. It would be used to protect improvements on patented information, yet these rights would still be considered to amount to the same invention. If the right to that improvement is held by the same inventor who owns the patent, then the potential for price discrimination within different markets arises. However, if the improvement is made by a competitor of the patent owner, then competition, not price discrimination, may ensue. These alternatives outcomes are discussed in Chapter Five: "Patents of Improvement."

Conclusion

From this discussion, it appears that the intellectual property rights continuum can be viewed as being composed of legal and economic 'anarchistic' and 'monopolistic' boundaries. Property in information is a safeguard to individual liberty or privilege of inventive effort as much as monopolistic pricing is a threat to liberty or privilege of others to purchase information. In complementary economic terms, the choice is between the positive externalities which lead to under-production of information if no barriers are imposed, and the deadweight losses involving under-utilisation if barriers are imposed. Both of these inefficiencies result in wider negative externalities which affect society through the slower development of information, including technological progress. The boundaries of the intellectual property rights continuum are not symmetrical opposites, given that the institutional causes are different. Hirshleifer[154] sums up the distinction as follows:

> A competitive industry would tend to undersupply a public good because of inability to discriminate; a monopolist would tend to undersupply in order to exploit its monopoly power.

This study has shown that once an individual inventor's natural right to the

[154] Above n99, 481.

product of his/her mental labour is recognised and market failure averted, then economic factors are important for determining the position of that right on the continuum. Of the trade secrets, patentable trade secrets are probably positioned the closest to the monopolistic boundary and may be over-protected. In contrast, sub-patentable secrets may be most in danger of falling into market failure and may require additional protection.

There is as yet no commonly agreed universal principle or optimum that can be used as a goal in determining the level of protection for a right. This has not prevented some scholars from attempting to use efficiency criteria as a normative goal. The difficulty is to identify an 'optimum' so that the private value of the resource may be appropriated without interfering with the conditions of perfect competition: an impossible task. The answer is to find the least inefficient solution between the economic extremes, and which would also place intellectual property rights within the limits of individual liberty. For this purpose, a property rights system must first be established. This may result in rights which are positioned near the monopolistic boundary, but the inefficiency of which may be lessened through price discrimination. Alternatively, these rights may be shifted away from the monopolistic boundary through competition.

CHAPTER THREE:
Industrial Espionage Law in New Zealand

INDUSTRIAL ESPIONAGE LAW IN NEW ZEALAND

Intellectual property rights are necessary to protect an inventor's natural rights and to avert market failure. Industrial espionage is not prohibited under the obligation of confidence so that its effectiveness as a legal barrier is reduced, particularly in the case of sub-patentable trade secrets. Different methods of widening this barrier through the equitable duty of confidence, improper means, unfair competition, and negligence are considered. These methods are drawn upon to create a new civil statutory duty in rem. It is proposed that espionage be punished as a form of improper means, the application of which is defined through a standard of gross negligence.

Intellectual property rights are traditionally awarded in recognition of the natural rights of the inventor and, more recently, to encourage the further production of information. This is because information is a public good which is capable of consumption in a non-rival manner without depletion. In the absence of legal barriers, inventors would not be able to capture the full benefit of their invention, resulting in market failure and so the under-production of further information. Thus, some form of legal barrier ought to be applied.[1]

Trade secrets are protected under an obligation of confidence which exists between the discloser of information and the confidant. The obligation can also be discussed in terms of the claim-right of confidence of the discloser or, more commonly, the duty of confidence of the confidant. The latter is composed of a duty of exclusivity, restrictions on the power of transferability, and a duty of enforceability.[2] The difference between the so-called implied contractual and equitable 'duties' of confidence is actually a difference in the evidence for a duty of exclusivity; the outcome and so the duty are the same.[3] Moreover, following Finn[4], the duty of confidence may be viewed as a

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[1] See 2.03-2.10.

[2] See 1.29.

[3] See 1.40.

[4] (1977) *Fiduciary Obligations*, The Law Book Co: Sydney, at 2: see also 1.38-1.39, 1.41, 1.47.

fiduciary duty.

A major flaw in the efficacy of the duty of confidence as a legal barrier is that it exists *in personam* only, yet no relationship or confidential communication may exist between the information owner and a spy.[5] Industrial espionage is the deliberate and surreptitious acquisition of confidential information so that the owner is intended to remain unaware of the acquisition. It would seem to be advantageous to extend the legal protection of trade secrets *in rem*[6], although the outcome of not fully protecting an invention is difficult to gauge directly as cases of espionage are rare. Indeed, there does not appear to have been a case reported in New Zealand that involved espionage. Examples that have reached the courts in other jurisdictions include a dispute over the conversion of material that embodied a trade secret[7], telephone-tapping[8], and photographing a production plant.[9] In theory, the consequences are an increased risk of market failure in the production of information.[10] In addition, any attempt to limit the market imperfections which accrue from the use of intellectual property rights[11] will be undermined when, in fact, market failure for selected trade secrets is occurring because of espionage. If the breach of confidence action or an equivalent action were to protect fully against industrial espionage the number of cases might increase and so reveal the true extent of pre-existing market failure.

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[5] See also the initial review of this problem at 1.46.

[6] According to the interpretation of Corbin (1919) Legal Analysis and Terminology, 29 *Yale LJ* 163, at 170-1:

> Right *in Rem*: A right possessed by A against B when it happens to be one of innumerable similar rights possessed by A against all (or nearly all) other members of organized society, each one of whom is under a correlative duty to A (these innumerable duties being likewise similar)... Observe also that a "right *in rem*" is not a right against the world or against all other persons.

[7] Eg *Franklin v Giddens* [1978] Qd R 72.

[8] *Francome and Anor v Mirror Group Newspapers Ltd and Ors* [1984] 2 All ER 408.

[9] *EI duPont deNemours and Co v Christopher*, 431 F2d 1012, 166 USPQ (BNA) 421, 167 USPQ (BNA) 1 (1970), 400 US 1024 (1971).

[10] See above n1.

[11] See Chapters Four to Seven.

In this Chapter, the existing solutions for protecting against industrial espionage are considered. In Part I, the limitations of the existing duty of confidence and proposals to extend it are discussed and are argued to be problematic. Given the small number of cases in this area, other options, such as the common law of negligence, have not as yet been investigated by the courts. However, without some form of established protection against espionage, victims may not be willing to take legal actions, particularly as this may require the disclosure of the trade secret in court.[12] A statutory solution may therefore be desirable in order to extend the protection of trade secrets against espionage. In Part II, statutory solutions which are based on improper means, unfair competition, and negligence are considered. Protection against some or all of these forms of conduct has been codified under American and Japanese law, but not widely adopted elsewhere. Overall these solutions are found to represent either too high or too low a standard of proof so that these would be ineffective. However, in Part III, a duty *in rem* is argued to be feasible, on the basis of an extension of the economic arguments that underlie the duty of confidence/fiduciary duty. In Part IV, a proposal is made to establish a statutory duty *in rem* which codifies a fiduciary duty against industrial espionage, and which could be adopted in New Zealand.

I *Proposals Based on Existing Legal Doctrines*

I(a) *The Extension of the Duty of Confidence*

The duty of confidence exists *in personam* only, yet it has been proposed that it could be extended to sanction industrial espionage. The Torts and General Law Reform Committee 1973 in New Zealand[13] considered that the existing law was

[12] See for example, 4.20-4.21.

[13] Quoted in Brown A, Grant A (1989) *The Law of Intellectual Property in New Zealand*, Butterworths: Wellington, at 671.

sufficiently flexible[14] that a statutory tort to replace the action for breach of confidence was not needed, when presumably such a tort might have included a prohibition against espionage. In the context of the existing action for breach of confidence, Jones[15] finds it inequitable that someone who acquires information by "reprehensible means", that is, deliberately and surreptitiously, may as a result be in a better position than one who innocently purchases information in good faith.[16] The spy would not be known to the information owner and so no duty of confidence is created, whereas the innocent purchaser creates a duty by virtue of the purchase. Jones' solution is that the action for breach of confidence should be extended to include the reprehensible means under an equitable duty of confidence. This argument is based on Lord Denning MR's dictum that the law of breach of confidence does not:[17]

> ... depend on any implied contract. It depends on the broad principle of equity that he who has received information in confidence shall not take unfair advantage of it.

Gurry accepts Jones' solution and refers[18] for support to *ITC Film Distributors v Video Exchange Ltd*[19] where the potential for the application of the action for breach of confidence to surreptitious behaviour was recognised. More recently, Lord Goff in *Attorney-General v Guardian Newspapers Ltd (No 2)*[20] was prepared to extend the equitable doctrine to innocent recipients of confidential information, from which

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[14] An example of this flexibility which impressed the Committee was how account could be taken of the public interest in receiving information: ibid.

[15] (1970) Restitution of Benefits Obtained in Breach of Confidence, 86 *LQR* 463, at 482-3; see also Gurry F (1984) *Breach of Confidence*, Clarendon Press: Oxford, at 164.

[16] An innocent purchaser is liable under an obligation of confidence once informed of the confidentiality of the information: see 1.51-1.52; see also Gurry, ibid, at 164.

[17] *Seagar v Copydex Ltd* [1967] 2 All ER 415, at 417; cited by Jones, above n15, at 465-6.

[18] Above n15, at 166.

[19] [1982] 2 All ER 241.

[20] [1988] 3 WLR 776, at 805-6.

Laster[21] concludes that, *a fortiori*, a duty of confidence could be extended to the spy who intentionally procures information. In addition, the advantage of extending the equitable duty is that there is no need to specify the means involved, such as theft or other illegal means; 'reprehensible' means, which includes legal yet dishonest means is enough. Thus, it is possible that industrial espionage could be prohibited through an extension of the equitable duty of confidence. Indeed, the Torts and General Law Reform Committee of New Zealand found that the willingness of the courts "to develop the equitable principles relating to breach of confidence in order to cover new types of situation" was such that they saw "little advantage in a statutory restatement of the existing rules".[22]

The essential problem with Jones' approach is that the evidence for an equitable duty of exclusivity and the resulting duty of confidence is based on a specific confidential communication.[23] In effect, the duty is created by a relationship between the parties which arises when the information is communicated. In contrast, an implied contractual duty is established by virtue of a relationship which pre-exists the communication.[24] Such a specific communication between the parties is absent when trade secret acquisition is surreptitious, even though information is transferred. Thus, Jones' simple extension of the duty of confidence on the basis of equity strains the existing doctrine. Gurry advances a more complex argument in which he suggests that surreptitious acquisition amounts to a confidential communication. To do so, Gurry has to rationalise the surreptitious acquisition as creating a confidential relationship:[25]

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[21] (1989) Breaches of Confidence and of Privacy by Misuse of Personal Information, 7(1) *Otago LR* 31, at 52.

[22] (1973) *Protection of Trade Secrets*: quoted by Brown and Grant, above 13, at 642. An Australian Report into privacy also found that "the present law is still subject to some uncertainty, although it appears to be developing in a reasonably consistent, yet flexible, fashion": Australian Law Reform Commission, Report No 22 (1983) *Privacy*, Vol 1, Australian Government Publishing Service: Canberra, at 699.

[23] See 1.37-1.38.

[24] See 1.36-1.37.

[25] See above n15, at 164; see also Wei G (1992) Surreptitious Takings of Confidential Information, 12 *Leg Stud* 302, at 304-5.

3.06

The spy has, however, used means to force an unwanted communication, or at least, transmission, of the information on the confider. Because of those means he has placed himself in the position of one who receives confidential information, and the means also indicate that he is aware that the confider wishes to keep the information confidential - otherwise he would not have needed to employ the means but could have asked the confider for the information.

Further, Gurry relies on an ethical norm of "trust" which he believes underlies all confidences, including those in personal relationships.[26] Thus, the discloser would create a trust relationship by a disclosure to the confidant, who may or may not be aware of the acquisition and so of that trust.[27] Gurry elsewhere[28] suggests that "trust" can be honoured by contract or equity, but in this case he is concerned with an extension of equity, following Jones, as noted above. The problems with Gurry's proposal are that first, like Jones' proposal, no relationship between the parties is established by a confidential communication. Second, no matter how 'aware' the spy is of the trade secret owner's wishes, this awareness does not amount to a relationship which pre-exists the transfer. Gurry is, in fact, attempting to extend the basis of an implied contractual term, a pre-existing relationship between the parties, under the banner of equity.[29] It also seems strange that spies should be the ones to impose the trust when they are the most disadvantaged by it, given that their spying activities are punished. If there is any 'trust' involved which would justify a duty of confidence *in rem*, it may be based on the recognition of a broader economic relationship between the parties prior to the espionage[30], rather than on evidence of an individual communication, but then it would not be called either an implied contractual nor an equitable duty of confidence.

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[26] See Gurry, above n15, at 164, also 59.

[27] Ie the innocent purchaser is included.

[28] Above n15, at 59. This relates to Gurry's view that the action for breach of confidence is *sui generis*: ibid, at 58.

[29] In Chapter One it was noted that implied contractual terms were derived from equity, following Finn: see 1.20-1.21. However, the distinction between the implied contract and equity for the purpose of the duty of confidence is evidential.

[30] Discussed further below.

I(b) *Unconscionable Conduct*

An attempt has been made to prohibit espionage on the basis of equitable principles[31], but not by an extension of an equitable duty as envisaged by Jones or Gurry. In *Franklin v Giddens*[32], an orchardist was convicted of stealing nectarine budwood from which he grew trees, the fruit from which he planned to sell in competition with the plaintiff. The trade secret in question was the genetic information (the genotype), which may have constituted a patentable or sub-patentable secret.[33] This information, likened by Dunn J to a formula, is the product of generations of cross-breeding which is impossible to replicate.[34] At no time was this information specifically communicated to the defendant so that no equitable duty of confidence was involved.

The key information which enabled the theft to occur was the location of the fruit trees, as this was not public knowledge. Indeed, the trees were "situated some distance from a road which ran past the orchard"[35], so it may not have been apparent to the casual observer. The defendant also knew that the plaintiffs "wished to keep the trees to themselves". It was during voluntary labour for the plaintiffs that the defendant made his observation of where the trees were situated. That labour served to establish an informal relationship between the parties, as a result of which the knowledge of the location of the trees was acquired. If a contract had been involved, it would have been arguable that an implied contractual term between the parties had been breached. Indeed, it is interesting to note that Dunn J found that the conduct was no less unconscionable than if committed under an employment contract by a "traitorous servant". In the end,

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[31] Stuckey JE (1981a) The Equitable Action for Breach of Confidence: Is Information Ever Property? 9(2) *Syd L Rev* 402, at 429, views the decision discussed below as being based in equity. Note, however, that Dean is less sure of its basis: (1990) *The Law of Trade Secrets*, The Law Book Co: Sydney, at 67.

[32] Above n7.

[33] See the discussion of the categories of trade secrets at 1.03-1.04.

[34] Above n7, at 73-4.

[35] Ibid.

3.08

Dunn J decided the case on the broad principle of unconscionability:[36]

> I find myself quite unable to accept that a thief who steals a trade secret, knowing it to be a trade secret, with the intention of using it in commercial competition with its owner, to the detriment of the latter, and uses it, is no less unconscionable than a traitorous servant. The thief is unconscionable because he plans to use and does his own wrong conduct to better his position in competition with the owner, and also to place himself in a better position than that of a person who deals consensually with the owner.

Gurry[37] has criticised the application of unconscionability in *Franklin v Giddens*, finding it to be too broad and open-ended a principle, and because it cannot be used to distinguish between illegitimate espionage and "legitimate competitor intelligence or surveillance". Perhaps Dunn J would not have referred to unconscionability had there been a means of directly targeting the misuse of information which was acquired through an informal relationship, irrespective of contract. Therefore, in the absence of a precedent in which the duty of confidence is extended *in rem*, or is otherwise commonly accepted, it may be worthwhile to consider other alternatives of potential application in New Zealand, including trade secret statutes.

II *Potential Legislative Solutions*

II(a) *Improper Means*

One of the simplest legal solutions to protect against industrial espionage is legislation that prohibits the misuse of trade secrets. This is a particular advantage in cases of industrial espionage where there is no relationship between the parties that would give rise to an obligation of confidence. Hence, there is a statutory right against industrial espionage that exists *in rem* and not *in personam*. This approach is justified

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[36] Ibid, at 80. Dunn J did not refer to Jones' proposal.

[37] Above n15, at 165.

by an assumption that the statute will act as a deterrent. For example, Dratler[38] finds a link between a lack of statutory trade secret protection and a greater incidence of industrial espionage.

Statutory protection against industrial espionage is established under the American Uniform Trade Secrets Act (UTSA) 1979.[39] Many of the actions under this law tend to relate to issues that would be decided in New Zealand under the implied contractual duty of confidence[40], or the equitable duty of confidence[41], so that true cases of industrial espionage are still rare. However, the law is of potential application against espionage as it covers the acquisition of information by "improper means" and which include "theft, bribery, misrepresentation, breach or inducement of a breach of a duty to maintain secrecy, or espionage through electronic or other means".[42] The UTSA is not a criminal law, although state legislatures may have statutes which specifically cover theft of trade secrets, or such protection is given as part of other statutes, including those governing crimes against property.[43] An example is when a defendant paid a mechanic to examine the inside of a robot in order to duplicate it, and which was treated by a New York district court as theft of a trade secret.[44]

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[38] (1989) Trade Secrets in the United States and Japan: A Comparison and Prognosis, 14 *Yale J Int Law* 68, at 77.

[39] This is a state and not a federal law. By 1992 this law had been adopted by 36 states, while four more have adopted variants on this law: see Svetz HE (1992) Japan's New Trade Secret Law: We Asked for it - Now What Have We Got? 26(2) *Geo Wash J L & Econ* 413, at 418. It should be noted that there is some variation between American courts in the information which is protected and the nature of its protection. Some may treat trade secrets narrowly as a species of property, excluding strategic business secrets, such as customer lists, which are protected as an issue of unfair competition: see further Eagles I, Taggart M, Liddell G (1992) *Freedom of Information in New Zealand*, Oxford University Press: Auckland, at 294-7.

[40] Eg *American Credit Indemnity Co v Sacks* 213 Cal App 3d 622, 262 Cal Rptr 92 (1989): in Merges RP (1992) *Patent Law and Policy*, Mitchie: Charlottesville, at 954-962. Nearly all American trade secret cases involve alleged misappropriation by a former employee or contractor: Wiesner D, Cava A (1988) Stealing Trade Secrets Ethically 47 *Maryland L Rev* 1076, at 1080.

[41] Eg *Sheets v Yamaha Motors Corp*, USA 849 F2d 179, 7 USPQ 2d (BNA) 1461 (1988): in Merges, above n40, at 969-975.

[42] UTSA s1(1): see Svetz, above n39, at 426.

[43] Svetz, ibid, at 440-1.

[44] See *Elnickey Enterprises v Spotlight Presents, Inc* 213 USPQ (BNA) 855 (1981): discussed by Wiesner and Cava, above n40, at 1123-4; cf *Colony Corp of America v Crown Glass Corp* 102 Ill App 3d 647, 430 NE2d 225 (1981), where the defendant firm convinced the court that it could have copied the plaintiff's secret

3.10

The American legislation has a Japanese progeny, the 1990 amendment to the Unfair Competition Prevention Act (UCPA). This Japanese civil law prohibits "unfair acts" which include "theft, duress or other unfair means".[45] In Japan, few cases have arisen and those which have tended to be of minor commercial significance.[46] Indeed, the Japanese adoption of trade secret legislation seems less aimed to secure a deterrent to espionage or breach of confidence than to satisfy American political pressure.[47] The cause of action is termed widely so that as many means that may be deemed improper or unfair may be punished as necessary. Hence, acts which might be otherwise legal may be sanctioned if considered improper or unfair. This is consistent with the breach of confidence action, above, when an unauthorised disclosure of information would be legal if it did not involve a trade secret. Similar statutory torts have been proposed in both England[48] and Canada.[49]

A problem may arise when the acquisition in question is otherwise legal as it may be difficult to treat it as improper or unfair. This problem is hinted at in the English case of *Malone v Metropolitan Police Commissioner*.[50] This case was decided on the basis of the action for breach of confidence, but it effectively also concerned the scope of improper means. In *Malone*, the telephone-tapping at issue was authorised and so

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design from the product itself, a glass candle jar. Hence, according to Wiesner and Cava, ibid, at 1124, one defence is that "a secret is not a secret if we all know or can easily discover it".

[45] UCPA s1(3)(i): see Doi T (1992) *Intellectual Property Protection and Management Law and Practice in Japan*, The Institute of Comparative Law, Comparative Law Study Series No 19, Waseda University: Tokyo, at 78; discussed further in Chapter Four.

[46] See 4.20.

[47] Ibid. This pressure appears to be part of an international trend toward increased protectionism in intellectual property law: see also 7.09.

[48] Law Commission, No 110 (1981) *Breach of Confidence*, HM Stationary Office: London, at 103. The English report argued against use of the criminal law to deter the misappropriation of trade secrets.

[49] Institute of Law Research and Reform, Alberta, No 46 (1986) *Trade Secrets*, University of Alberta: Edmonton. Note that criminal punishment was also recommended in this report, but as part of a separate amendment to the Canadian Criminal Code: see Hayworth WL (1986-7) Trade Secrets: Report of a Federal-Provincial Working Party, 12 *Can Bus LJ* 494, at 501.

[50] [1979] 1 Ch 345. In New Zealand, such authorised 'espionage' by the police could be argued to represent an "unreasonable search" under s21 of the New Zealand Bill of Rights Act 1990. However, if the authorisation were made under statute, considerations of the Bill of Rights Act would be invalidated under s4 of that Act.

Megarry VC did not oppose it, but he did consider that the complainant was unjustified in protesting about his loss of confidentiality:[51]

> It seems to me that a person who utters confidential information must accept the risk of any unknown overhearing that is inherent in the circumstances of the communication ... I do not see why someone who has overheard some secret in such a way should be exposed to legal proceedings if he used or divulges what he has heard ... When this is applied to telephone conversations, it appears to me that the speaker is taking such risks of being overheard as are inherent in the system ... In addition, so much publicity in recent years has been given to instances (real or fictional) of the deliberate tapping of telephones that it is difficult to envisage telephone users who are genuinely unaware of this possibility. No doubt a person who uses a telephone to give confidential information to another may do so in such a way as to impose an obligation of confidence on that other: but I do not see how it could be said that any such obligation is imposed on those who overhear the conversation, whether by means of tapping or otherwise.

Hence, Megarry VC was reluctant to penalise an action which was otherwise legal for the purpose of finding a breach of confidence. If adopted in an espionage case, this approach could mean that a successful litigation may be limited to incidents where illegal means were employed. If legal and improper means of acquisition are permissible, then it would lay the identification cost[52] of finding an alternative, and probably more time-consuming or expensive means of communication, on the discloser. The court could be tempted to accept espionage on the basis of a failure by the information owner to secure the information adequately. The balance in the English courts may have turned again in favour of the information owner, given the decision in *Francome and Another v Mirror Group Newspapers Ltd and Others*.[53] In *Francome*, Donaldson MR distinguished[54] the *Malone* decision on the basis that Megarry VC had expressly stated that he was deciding nothing on the position when tapping was effected for purposes other than the prevention, detection and discovery of crime and criminals or by persons other than the police. His Honour proceeded to find the telephone-tapping

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[51] Ibid, at 345-6.

[52] On the subject of transaction costs, see further North DC (1995) *Institutions, Institutional Change and Economic Performance*, Cambridge University Press: Cambridge, at 27.

[53] Above n8.

[54] Ibid, at 411.

in question arguably unlawful. In the same case, Fox LJ also said:[55]

> Illegal tapping by private persons is quite another matter, since it must be questionable whether the user of a telephone can be regarded as accepting the risk of that in the same way as, for example, he accepts the risk that his conversation may be overheard in consequence of the accidents and imperfections of the telephone system itself.

In contrast to *Malone*, it was to avoid creating greater costs elsewhere that the American Fifth Circuit Court in *EI duPont deNemours and Co v Christopher*[56] found that taking aerial photographs of a production plant was an instance of improper means of discovering a trade secret under Texas law, even though the activity did not itself violate any law. The Court also stated that "[r]easonable precautions against predatory eyes we may require, but an impenetrable fortress is an unreasonable requirement".[57] Hence, the Court recognised that without protection against legal but improper means the plaintiffs would have had to wastefully increase expenditure on security.[58] Thus, either the information owner must bear the cost of security, as in *Malone*, or both parties must bear the costs that they might lose in litigation, as in *Christopher* and *Francome*.

Another approach to the *Malone*, *Christopher* and *Francome* decisions is to consider their effect on the standard of behaviour required to prove improper means. Wei[59] criticises the *Christopher* decision, and so the use of improper means, for creating uncertainty, because commercial morality is too vague a basis for legal action. Indeed, marginally different conduct, as if the photographs in *Christopher* were taken

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[55] Ibid, at 415.

[56] Above n9; see also Merges, above n40, at 966. Note that this case preceded the enactment of the UTSA.

[57] Above n9, at 1017: quoted in Merges, above n40, at 966.

[58] Despite the decision in *Christopher*, there may be some variation in the treatment of legal, yet improper means. For example, in *Chicago Lock Co v Fanberg* 676 F2d 400 (1982), a Court of the 9th Circuit found that an entrepreneur to advertised to discover the key codes or configurations to a lock system, then published the results amounted to an extension of reverse engineering which, as there was no "confidential relationship" between the parties, was legally proper: discussed in Wiesner and Cava, above n40, at 1123.

[59] Above n25, at 310.

from a mountain top, could conceivably have produced a different outcome.[60] Wei[61] also questions punishing legal activities like aerial photography, when reverse engineering from a product that is available in the marketplace is permitted. Thus, if improper means are otherwise legal and the standard of liability is uncertain, then the victims of espionage cannot count on successful litigation.

Difficulties in determining the standard of impropriety may lead lawmakers to specify what means are improper. This approach was taken by the English Law Commission[62], which listed circumstances in which an obligation of confidence might be owed in respect of information that was improperly acquired. The list has not been adopted, although Wei commends it[63] and notes[64] that some specialised prohibition of improper means has been enacted through the Computer Misuse Act 1990 (UK). In contrast, the Scottish Law Commission in 1984[65] right criticised this list because it was bound to be incomplete and require updating. In other words, it may be costly to regularly identify new means of improperly acquiring information in advance of litigation and update the list or specialist laws. An array of specialist laws may also be cumbersome to administrate.

A related proposal, which Wei[66] proceeds to suggest, is that the common denominator behind the relevant English and Australian decisions on the surreptitious taking of confidential information is "illegal means", which he believes would almost certainly involve the commissioning of torts. However, illegal means alone may not be a solution because information is intangible so that it may be impossible to prove how the defendant acquired it without physical evidence. Indeed, the finding of

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[60] Ibid.

[61] Ibid.

[62] Wei, ibid, at 322, summarises this list.

[63] Ibid, at 331.

[64] Ibid, at 232.

[65] Scottish Law Commission, No 90 (1984) *Breach of Confidence*, HM Stationary Office: Edinburgh; see Wei, 1992, at 327.

[66] Above n25, at 315, 317.

unconscionable conduct in *Franklin v Giddens* must have been facilitated by the confession of theft, but even without it the stolen plant material which embodied the trade secret would have been important evidence. In other cases though, the information may have no such physical embodiment, or misappropriation of the secret does not involve acquisition of its physical embodiment. In *Stewart v R*[67], the Supreme Court of Canada also rejected the application of the general property offences of theft and fraud in a case of espionage, given that the defendant had merely copied the information without taking a physical embodiment of it.[68] Trespass is also "founded on an interference with property in the form of chattels", and so the subject matter of the trespass must still be capable of physical interference.[69] Further, there must be evidence of deliberate intention to bring about such interference.[70] Hence, in the absence of physical evidence proving the use of illegal means, espionage litigation may be unsuccessful. Wei's approach may make the proof of espionage too difficult in the absence of physical evidence of illegal means. In other words, improper means that are illegal may present too high a standard of proof, whereas improper but legal means may achieve a lower standard, but may be too imprecise to be relied upon. Therefore, in the absence of commonly accepted precedent, emphasis on improper means may deter litigation and so be ineffective as a legal barrier to espionage. These conclusions are compounded if the standard required is raised to the level of criminal liability as part of a statutory tort of improper means. This point is illustrated by an examination of clause 185 of the New Zealand Crimes Bill 1989.

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[67] (1988) 41 CCC (3d) 481, 50 DLR (4th) 1: discussed by Cross JT (1991) Trade Secrets, Confidential Information, and the Criminal Law, 36 *McGill LJ* 525, at 548-550. Stewart had attempted to acquire the names, addresses and telephone numbers of all the employees of a hotel of behalf of union official. He did so by offering to pay a security worker at the hotel two dollars for each name.

[68] Another example is *Oxford v Moss* (1979) 68 Crim App Rep 183; discussed by Cross, ibid, at 542. This case did not concern a trade secret, but is useful as an analogy. A university student surreptitiously obtained a copy of an up-coming examination, read it, and returned it to its file. The majority in the Divisional Court (UK) found that no theft had been involved, and the university was not deprived of possession of the test questions, although these were useless thereafter.

[69] Dean, above n31, at 338.

[70] Ibid, at 339, 343.

II(b) *The Crimes Bill 1989*

The Torts and General Law Reform Committee in 1973, recommended to the New Zealand government that the Crimes Act 1961 be amended to cover theft of information.[71] Sixteen years later this recommendation found form in clause 185 of the Crimes Bill 1989. In 1991, the Crimes Consultative Committee[72] reported back to the New Zealand Minister of Justice on that bill which had been introduced by the previous government. As yet, no action has been taken to pass the Bill into law. Even one year after the introduction of the Bill, Moon doubted that it would be passed into law.[73] One conclusion of the Committee is that trade secrets represent economic interests worth protecting[74], yet the owner of a trade secret only has to believe that the information has commercial value.

The Bill contained a clause aimed at deterring the misuse of trade secrets:

185. Taking, obtaining or copying trade secrets - Every person is liable to imprisonment for 5 years who, with intent to obtain for himself or herself or for any other person any pecuniary advantage, -

(a) Dishonestly takes, obtains, or copies (whether by a photographic process or otherwise) any document or any model or other depiction of any thing or process; or

(b) Dishonestly takes or obtains any copy (whether produced by a photographic process or otherwise) of any document or of any model or other depiction of any thing or process,-

believing that the document, thing, or process is of commercial value.

In other words, the dishonest acquisition of trade secrets, including from a copy, is prohibited as a form of improper means. Dishonesty is defined in clause 178 of the

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[71] Brown and Grant, above n13, at 661-2.

[72] (1991) *Crimes Bill 1989*, Department of Justice: Wellington.

[73] (1990) Review of the Legal Protection for Computer and Semiconductor Technologies, in: Ministry of Commerce (ed) *Review of Industrial Property Rights, Patents, Trade Marks and Designs: Possible Options for Reform*, Vol 2, Ministry of Commerce: Wellington, 1, at 35.

[74] Above n72, at 67; see also 1.08-1.09.

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Crimes Bill:

... A person dishonestly does any act or dishonestly omits to do any act in each of the following circumstances:

(a) In respect of any act or omission requiring the authority of any other person and for which that authority has not in fact been given, where he or she-

(i) knows that no such authority has been given; or

(ii) does not believe that any such authority has been given,-

and has no reasonable grounds for believing that the other person would have given that authority had he or she been asked;

According to Doone[75], this definition of dishonesty poses:

... a strict liability test which is without precedent in the United Kingdom or Australia ... A purely objective definition can be opposed of two grounds. First, it violates one of the basic principles of the criminal law requiring proof of intent in respect of serious criminal charges. Second, there is increased potential for injustice by requiring a defendant to displace prima *facie proof* of an absence of reasonable grounds for belief.

Doone did not, however, refer directly to the trade secrets clause in which intent to gain pecuniary advantage is required, as quoted above. Indeed, the insertion of this requirement into c185 may be designed to prevent the deterrence of legitimate information acquisition, discussed below. However, intent to gain pecuniary advantage may seem to be easily inferred from the dishonest taking when the spy could plausibly gain from the action. However, when the misappropriation itself is difficult to prove, such a requirement may constitute an additional burden for the plaintiff. Hence, the absence of a requirement for proof of intent may be preferable. Further, Doone's second point, that the defendant must displace *prima facie* proof, may in fact be useful for helping to prove that trade secret acquisition amounts to misappropriation or espionage. *Prima facie* proof that authority would not been given, if asked, is that the trade secret in question was valuable and unlikely to be disclosed. This proof may be easily

[75] (1990) Commercial Fraud in New Zealand: Contemporary Legal and Investigative Issues, 20 *VUWLR Monograph 3*, 159, at 171.

displaced by a defendant who can show that they were involved in legitimate acquisition, such as through evidence of a request for the information. It does, however, require the defendant to do more than simply state a belief that the acquisition was innocent.

The definition of dishonesty does not involve any requirement of illegality. Thus, the court could find legal photography, as in the *Christopher* case, illegal for the purpose of this clause if it concludes that dishonesty is involved. The problem is that clause 185 is a criminal, not a civil clause. This means that when there is legal acquisition of information, or where illegal means cannot be proved, the dishonesty must be beyond reasonable doubt. In effect, there has to be much more than a suspicious coincidence, as when the spy is incapable of creating the information for itself or the plaintiff was the only source of a trade secret. It seems reasonable to suggest that few, if any, incidents of industrial espionage would be so clearcut for such a high standard of proof to be met without physical evidence, as in *Christopher* or *Franklin v Giddens*, discussed above. It may be that concern over such an outcome led to the provision of only the civil remedies of injunctions and damages under the Japanese trade secret law[76], mentioned above. In practice, proof of espionage under clause 185 would have been dependent on illegal means and the physical embodiment of the information, not the information itself, as discussed above. Therefore, clause 185 of the Crimes Bill 1989 may be too dependent on proof of illegal means, and so may pose too high a standard.

II(c) *Unfair Competition*

New Zealand and other common law jurisdictions have unfair competition laws which could be adapted for the protection of trade secrets.[77] Dean[78], for example, noted the potential for a tort of unfair competition to be developed where information

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[76] See 4.19-4.20.

[77] The United States and Japan also protect against unfair competition which involves trade secrets: see further Doi, above n45, at 78; Eagles et al, above n39, at 294-6.

[78] Above n31, at 27.

is acquired in the absence of a relationship between the parties. The New Zealand law which is most comparable to the Japanese prohibition against unfair competition is the Fair Trading Act 1986. Under s9, misleading and deceptive conduct is prohibited:[79]

No person shall, in trade, engage in conduct that is misleading or deceptive or is likely to mislead or deceive.

This is closely based on s52 of the Australian Trade Practices Act 1974, under which a "corporation shall not, in trade or commerce, engage in conduct that is misleading or deceptive or is likely to mislead or deceive". The immediate problem is that espionage is surreptitious and so is neither directly misleading nor deceptive. At most, spies mislead or deceive the public if they sell trade secrets of others as their own. Indeed, unfair competition law would be aimed at the outcome rather than the act of espionage. Another difficulty is that the plaintiff must establish that the secret information had a reputation that was or will be damaged through the misleading or deceptive conduct.[80] Further, the fair trading legislation may be ineffective if the trade secret is changed or improved to the point that it is no longer recognisable as the same as the plaintiff's information. As a consequence, the public may not be misled into believing that the information is the same as that of the original trade secret owner. Thus, the legislation may be inapplicable, yet the trade secret owner will go uncompensated for the use of his/her information.

If the unfair competition arises by virtue of a breach of confidence, the court may find it unnecessary to consider both actions. In a rare example, *Warman International and Others v Envirotech Australia Pty Ltd and Others*[81], breach of s52 of the Trade Practices Act and breach of confidence were considered and treated as separate heads of action. It was found that there was a serious question to be tried under s52 on the basis that the defendant falsely represented itself to others as the owner of

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[79] Although primarily a piece of consumer legislation, s9 of the Fair Trading Act is usually used by rivals: see *Taylors Textiles Services Auckland Ltd v Taylors Bros Ltd* (1988) 2 NZBLC 103,032, at 103,039. However, if the trade secret owner was not a rival of a spy who incorporated a secret of the former into a non-competing product, these circumstances need not bar an action under this section.

[80] See Dean, above n31, at 27, referring to s52 of the Trade Practices Act 1974; see also Brown and Grant, above n13, at 575.

[81] (1986) ATPR 47,808.

information which had originated from the plaintiffs.[82] The defendants were also found separately to have breached their duty of confidence to their former employer, the plaintiffs. However, if a breach of the fair trading legislation is considered to be distinct from and so not relevant to the action for breach of confidence, the court may hesitate to extend the Act to penalise espionage. Therefore, the fair trading legislation may not adequately punish industrial espionage and so additional protection should be sought against the means, rather than the outcome of unfair competition.

In common law countries, unfair competition has also given rise to equitable and tortious actions. An equitable claim against unfair competition is effectively based on the extension of the duty of confidence and/or unconscionable conduct, discussed above. An alternative is an action either through the tort of interference by unlawful means with the business of another, or through the emerging tort of breach of privacy. The development of both these torts may be limited by a requirement of proof of intent to injure.

In *Van Camp Chocolates Ltd v Aulsebrooks Ltd*[83], the plaintiffs alleged damage under the tort of interference by unlawful means with their business arising from a breach by the defendants of a duty of confidence which was owed to a third party. Cooke J accepted that this tort exists and emphasised that there is a requirement of intent to injure as a cause of the defendant's illegal conduct, although it was lacking in that case:[84]

> If the defendant would have used the unlawful means in question without that intent and if that intent alone would not have led him to act as he did, the mere existence of the purely collateral and extraneous malicious motive should not make all the difference. The essence of the tort is deliberate interference with the plaintiff's interests by unlawful means. If the reasons which actuate the defendant to use unlawful means are wholly independent of a wish to interfere with the plaintiff's business, such interference being no more than an incidental consequence foreseen by and gratifying to the defendant, we think that to impose liability would be to stretch the tort too far.

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[82] Ibid, at 47,820.

[83] [1984] 1 NZLR 354; discussed also in Todd SMD (ed, 1991) *The Law of Torts in New Zealand*, The Law Book Co: Sydney, at 563-574.

[84] Above n83, at 360. Damage must also result to the plaintiff: see Todd, above n83, at 564-5.

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Similarly, in *Lonrho plc v Fayed and Others*[85], Dillon LJ also found that intent was required under the tort of wrongful interference with trade or business:

> [T]he speech of Lord Diplock in *Lonrho Ltd v Shell Petroleum Co Ltd* [1981] 2 All ER 456 at 463, [1982] AC 173 at 187 establishes that the mere fact that a person has suffered injury in his business by an act of the defendant which is illegal in the sense of being in breach of a statutory prohibition does not automatically entitle the injured person to bring an action within this tort to recover damages for the injury.

Dillon LJ[86] went on to reject a requirement that the intent to injure be the predominant purpose of the unlawful conduct, but found that it must be proved by the plaintiff that "the unlawful act was in some sense directed at the plaintiff or intended to harm the plaintiff". These precedents may serve as an indication of how the statutory action for unfair competition involving information might be treated if it were extended in New Zealand. The emphasis on intent to injure, even if it did not amount to the 'predominant purpose' of the defendant, the damage and a degree of causation would have to be proved. Wei[87] suggests than an intent to injure may be satisfied by deliberate surreptitious acquisition of information, although he acknowledges that the issue on intent is not settled. If so, then the deliberate acquisition of information must be established first. This is not a problem where the misappropriation is not contested, as in *Franklin v Giddens*. Given the existing difficulties of proof that occur because of the intangible nature of information[88], a requirement of intentional damage may still be too difficult to establish without physical evidence of espionage. Therefore, even though the theoretical application of this tort was accepted in *Van Camp*, its application

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[85] [1989] 2 All ER 65, at 69. Lord Diplock in *Lonrho Ltd v Shell Petroleum Co Ltd* [1982] AC 173, at 189, was also concerned with the civil tort of conspiracy, which appears to involve a high standard of proof. In the absence of illegal means, a predominant purpose to injure by the conspirators may be required: see Wei, above n25, at 324. This standard of proof is higher than that of the tort of interference by unlawful means with the business of another, and so may not be relevant. Where unlawful means are employed, a predominant purpose to injure is not required, similar to the tort of interference by unlawful means: see Wei, ibid, at 324-5. It may be that the tort of interference by unlawful means, which is sometimes referred to as a "genus" tort (as noted by Wei, ibid, at 325), covers conspiracy using unlawful means, so that further consideration of conspiracy is unnecessary.

[86] Above n85.

[87] Ibid, at 326.

[88] Mentioned above.

in practice may be limited.

A further variation on unfair competition could be 'commercial privacy', if only because both terms are poorly defined. Indeed, the term 'privacy' has no commonly accepted definition.[89] In the context of procuring confidential information, Laster[90] suggests that privacy can be invaded by what he calls "unconscionable or unjust conduct", and so it is possible that breach of privacy could be accomplished by unfair competition. Wacks[91] rejects the application of the action for breach of confidence to complaints of breach of privacy because in many instances of the latter there will not be a relationship between the parties; that is, an obligation of confidence *in personam.* However, Wacks does not comment on the application of some form of privacy law to the action for breach of confidence, so that an obligation *in rem* is created. In New Zealand, at least, the tort of privacy has been found to exist for individuals and requires injury to "one's feelings and peace of mind" as a "natural progression of the tort of intentional infliction of emotional distress".[92] This conclusion arose in a case concerning personal information about an individual, but Laster[93] suggests that a right of privacy could be extended to the unauthorised taking or use of information. If so, then a right of commercial privacy, whether developed under the common law or statute could be expected to require proof of intention to cause a loss of privacy to the victim of the espionage. It follows that industrial espionage would be considered as a form of unfair competition that results in invasion of privacy. However, the same problems of establishing intent through an invasion of privacy could emerge, as discussed under the

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[89] Laster, above n21, at 61, proposes "individual autonomy in the form of an individual's dignity". In an earlier formulation, EJ Bloustein also discussed privacy as protecting "human dignity": see Wacks R (1980) The Poverty of Privacy, 96 *LQR* 73, at 75-6. Dean, above n31, at 28, concludes that no definition has proved satisfactory.

[90] Above n21, at 53.

[91] Above n89, at 81-2.

[92] *Tucker v News Media Ownership Ltd* [1986] 2 NZLR 716, at 731-2, per McGechan J, quoting Jeffries J; see also Laster, above n21; (1990) Commonalities Between Breach of Confidence and Privacy, 14 *NZULR* 144. For a review of recent cases involving personal privacy, see Longworth E, McBride T (1994) *The Privacy Act: A Guide*, GP Publications: Wellington, at 266-269; see also Wei, above n25, at 328-330, discussing English cases.

[93] Above n21, at 53-4.

tort of interference by unlawful means. In addition, there may be some resistance to the further protection of secret information that has entered the public domain. It is well established that trade secrecy is lost once the information is published[94], which if restricted could be viewed as one instance of how a tort of privacy may be seen to "trespass upon the freedom to receive and make use of information".[95] It seems improbable that the judiciary will substitute a new tort of invasion of privacy, or even the tort of interference by unlawful means, for the accepted action for breach of confidence. Indeed, if intentional damage is required it may present too high a standard of proof, deter litigation, and so amount to an ineffective legal barrier to espionage.

II(d) *Negligence*

Under the Japanese Unfair Competition Prevention Act, the misuse of trade secrets must have been intentional or result from gross negligence for the defendant to be held liable for an injunction or damages.[96] Proof of intent may be difficult without physical evidence, as noted above. 'Gross negligence' is a useful phrase with which to modify the requirement of intentional damage, as it permits a greater degree of judicial flexibility than under a requirement of negligence. The term ought to mean that the defendants should not be held strictly accountable for their actions unless grossly negligent. Under the Japanese legislation, however, the standard of negligence is linked to illegal means so that the latter may have to be demonstrated first, which again may be difficult without physical evidence, as discussed above.

If considered in isolation from illegal means or unfair competition, a standard of gross negligence may be more useful than ordinary negligence. Under ordinary negligence, a party may be required to exercise a duty of care which is expected of a

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[94] See 1.06-1.08.

[95] See Cornish WR (1989) *Intellectual Property: Patents, Copyright, Trademarks and Allied Rights*, 2nd ed, Sweet & Maxwell: London, at 241, citing the conclusion of the British Younger Committee in 1972 that a general right of privacy should not be introduced into the law.

[96] See art 1(3), art 1 *bis*(3): Doi, above n45, at 78-9.

reasonable person. In *Donoghue v Stevenson*[97], Lord Atkin gave a general account of the relations which create a duty of care:[98]

> The rule that you are to love your neighbour becomes in law, you must not injure your neighbour; and the lawyer's question, who is my neighbour? receives a restricted reply. You must take reasonable care to avoid acts or omissions which you can reasonably foresee would be likely to injure your neighbour. Who, then, in law is my neighbour? The answer seems to be - persons who are so closely and directly affected by my act that I ought reasonably to have them in contemplation as being so affected when I am directing my mind to the acts or omissions which are called in question.

A potential problem with the application of ordinary negligence in cases of alleged espionage is that it may in turn be used to inhibit legitimate information transfer. A negligence suit could be used as means to threaten business rivals in order to block or limit their acquisition of information, including new technology. Indeed, the threat of litigation could act as a deterrent to the informal trading of information, particularly knowhow and those trade secrets which represent applications of knowhow, including experimental data. For example, in a study of the American steel milling industry, von Hippel[99] found that there was considerable trading of information which was of too small a value to justify a formal agreement, and that this practice occurred even between direct rivals. Further, von Hippel[100] suggests that "a firm will only offer to trade valuable know-how with those who can reciprocate in kind". This form of reciprocal trading is beneficial because it reduces the level of duplicative research for society, leading to a less inefficient[101] allocation of resources, so that more information is produced. It may be this reciprocity which has led to its evolution without leading to a similar growth in negligence suits. However, if industrial espionage became a matter of ordinary negligence, it might become another strategic tool with which to undermine the

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[97] [1932] AC 562.

[98] Ibid, at 580.

[99] (1987) Cooperation Between Rivals: Informal Know-how Trading, 16 *Res Pol* 291.

[100] Ibid, at 294.

[101] Note that "less inefficient" is not the same as the general usage of the phrase 'more efficient' in that it is treated as a guide, not a goal: see 2.29.

activities of rivals. Causation of loss may be readily inferred once information acquisition and use is proved. The result could be a decrease in the dissemination of information, leading to an increase in duplicative research and an under-production of information overall. Therefore, the standard of proof for ordinary negligence may be argued to be too low, as it could encourage strategic lawsuits.

Gross negligence may require a stricter standard of proof than ordinary negligence so that it could be used to encompass espionage without affecting legitimate information transfer. Moreover, gross negligence may prove to be a useful euphemism when dishonest behaviour is suspected. It must be noted that its basis in the common law of negligence is debatable and that it may be argued to be co-extensive with a fiduciary duty, as will be discussed further below. Gross negligence was developed in England through a decision by Romer J in *Re City Equitable Fire Insurance Company Limited*.[102] In the context of directors' duties his Honour stated:[103]

In discharging the duties of his position thus ascertained a director must, of course, act honestly; but he must also exercise some degree of both skill and diligence. To the question of what is the particular degree of skill and diligence required of him, the authorities do not, I think, give any very clear answer. It has been laid down that so long as a director acts honestly he cannot be made responsible in damages unless guilty of *gross or culpable negligence in a business sense* ... If, therefore, a director is only liable for gross or culpable negligence, this means that he does not owe a duty to his company, to take all possible care. It is some degree of care less than that. The care that he is bound to take has been described by Neville J, in the case referred to above [In *re Brazilian Rubber Plantations and Estates Ltd* [1911] 1 Ch 425] as "reasonable care" to be measured by the care an ordinary man might be expected to take in the circumstances on his own behalf.

This approach was expressly adopted in *Kuwait Asia Bank EC v National Mutual Life*[104] and by Gallen J in *Grayburn v Laing*[105] who found:

The reference to gross and culpable negligence suggests that the standard of care required differs from that

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[102] [1925] 1 Ch 407.

[103] Ibid, at 427-8.

[104] [1990] 3 NZLR 513, at 533.

[105] [1991] 1 NZLR 482, at 490.

which may be considered appropriate in the case of what might be described as ordinary or standard negligence. The expansion by the Judge as a concept with reference to particular illustrations makes it clear that the extent of the obligations must be considered in relation to the particular case and the nature of the directorship subject to the over-riding consideration that in the case of honest action liability will not be imposed unless there is some feature of the situation which suggests the need for a greater degree of care than would usually be the case. Perhaps the matter is best expressed in terms of onus.

In other words, despite the use by Romer J of the phrase "reasonable care", quoted above, gross negligence is different from ordinary negligence and requires a higher threshold of proof. Indeed, Fleming[106] notes that in theory the common law of torts adheres to a single standard of care, but which is adjusted according to the individual circumstances of each case. Thus, although there may not be different degrees of negligence, different degrees of care are acknowledged. According to Fleming:[107]

True, there is only one single standard of care, but it may demand greater or less precaution depending on the nature of the particular risk. A reasonable man need not show the same anxious care when handling a pound of butter as he would a pound of dynamite. In this sense, it is true to say that "the nature of the thing may very well call for different degrees of care" (*Donoghue v Stevenson* [1932] AC 562, at 569, per Lord Atkin).

Furthermore, Gower[108] notes that the test in *Re City Equitable* is "partly objective (the reasonable man), and partly subjective (the reasonable man is deemed to have the knowledge and experience of the particular individual)". It is from such a subjective assessment of the knowledge and experience of a director that s/he is not (traditionally) held to be liable for mere errors of judgment, as in *Re City Equitable.*

It is plausible that the gross negligence standard which is applied to directors' duties is not simply a form of negligence, but is co-extensive with a fiduciary duty.[109] It must be noted that Romer J in *Re City Equitable* held a limited view of what

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[106] (1987) *The Law of Torts*, 7th ed, The Law Book Co: Sydney, at 112.

[107] Ibid, at 113.

[108] (1992) *Gower's Principles of Modern Company Law*, 5th ed, Sweet & Maxwell: London, at 587.

[109] Cf the views of Ipp J in *Permanent Building Society (in liq) v Wheeler and Ors* [1994] 12 ACLC 674, discussed further below.

constitutes a fiduciary duty:[110]

It has sometimes been said that directors are trustees. If this means no more than the directors in the performance of their duties stand in a fiduciary relationship to the company, the statement is true enough. But if the statement is meant to be an indication by way of analogy of what those duties are, it appears to me to be wholly misleading. I can see but little resemblance between the duties of a director and the duties of a trustee of a will or of a marriage settlement.

Gower[111] gives a similar account which depends on a distinction between the function of a director and a trustee:

In truth, directors are agents of the company rather than trustees of it or its property. But as agents they stand in a fiduciary relationship to their principal, the company. The duties of good faith which this fiduciary relationship imposes are virtually identical with those imposed on trustees and to this extent the description "trustee" still has validity. It is when we turn to the duties of care and skill that the trustee analogy breaks down. The duty of the trustees of a will or settlement is to be cautious and to avoid risks to the trust fund. The manager of a business concern must, perforce, take risks in an attempt to earn profits for the company and its members.

Ipp J in *Permanent Building Society (in liq) v Wheeler & Ors*[112] has also argued:[113]

It is essential to bear in mind that the existence of a fiduciary relationship does not mean that every duty owed by a fiduciary to the beneficiary is a fiduciary duty. In particular, a trustee's duty to exercise reasonable care, though equitable, is not specifically a fiduciary duty: *Equity Doctrines & Remedies*, Third Edition, Meagher, Gummow and Lehane at 131.

These arguments appear to limit the categorisation of fiduciary obligations to a

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[110] Above n102, at 426.

[111] Above n108, at 550-1.

[112] Above n109, at 679-80.

[113] See also *LAC Minerals Ltd v International Corona Resources Ltd* (1989) 61 DLR (4th) 14, at 28, per La Forest J and at 61, per Sopinka J; *Hodgkinson v Simms* (1994) 117 DLR (4th) 161, per Sopinka, MacLachlin JJ: discussed in Ogilvie MH (1995) Fiduciary Obligations in Canada: From Concept to Principle, *J Bus Law* 638, at 642.

high degree of care. However, as Finn[114] has pointed out, a "fiduciary for one obligation is *not* ipso facto a fiduciary for all, or indeed any of the other obligations". Hence, there may be different classes of fiduciaries with different functions who are also required to exercise a degree of care and skill according to their separate tasks.[115] Company directors belong to a class of fiduciaries which has been broadly defined as those "who have been entrusted with powers for the benefit of others, but who in the exercise of those powers are not subject to the direct and immediate control of those others".[116] Thus, the care required of directors was, until recently[117], considered to be lower than that of the trustee of a will used in Gower's example.

Furthermore, Finn[118] suggests that "any beneficiary alleging a breach of duty has the onus of proving affirmatively that the fiduciary has not acted in his beneficiaries' interests". Finn goes on to find that the onus "requires the proof of much more than a simple error of judgment in the exercise of the power", citing *Re City Equitable*. If so, then it follows that Romer J rejected an extension of the fiduciary duty, but created a co-extensive standard by an extension of negligence. Indeed, in *Grayburn v Laing*, Gallen J found that the liability of directors under s321 of the Companies Act 1955[119] was coextensive with the liability that was contemplated by Romer J in the *Re City Equitable* case.[120] This section was broadly worded, referring to guilt of "negligence, default, or breach of duty or trust in relation to the company". At the least,

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[114] Above n4, at 2.

[115] In the same way, Mackay J in *Cottam and Ors v GUS Properties Limited and Ors* (1995) 7 NZCLC 260,821, at 260,827, observed that the nature and scope of a directors' fiduciary duties also vary according to the circumstances of the case, referring specifically to duties which are owned to shareholders.

A variation in the degree of care to be exercised by different fiduciaries may be close to Klinck's suggestion that instead of distinguishing between fiduciary and non-fiduciary relationships, consideration should be given to "relationships having a greater or lesser, or perhaps inevitable, fiduciary component": (1990) "Things of Confidence": Loyalty, Secrecy and Fiduciary Obligation, 54 *Saskatchewan L Rev* 73, at 99.

[116] Finn, above n4, at 3.

[117] See the discussion below.

[118] Above n4, at 41-2.

[119] Cf s30(1) Companies Act 1993 (NZ).

[120] Above n105, at 491.

gross negligence, as interpreted by Gallen J, and breach of fiduciary duty appear to have been treated equally.

More recently, the use of gross negligence with regard to directors' duties may have been supplanted by ordinary negligence. This development may be at the heart of the treatment of the director's duty of care in *Permanent Building Society (in liq) v Wheeler & Ors.*[121] In that case, Ipp J acknowledged[122] that "it has been said that the duties of directors are analogous to those of trustees, and, indeed, the duty of directors to exercise care and skill is essentially the same as that of trustees". However, his Honour went on to find[123] that a "directors' duty to exercise reasonable care, though equitable (as well as legal) is not a fiduciary obligation". This was, in part, because "a court of equity, applying principles of fairness, should not require an honest but careless trustee to compensate a beneficiary for losses without proof that but for the breach of duty those losses would not have occurred".[124] As a result, following Ipp J, a director may breach his/her duty of care and not be liable if 'causation of loss' cannot be proved, yet can be liable for breach of a fiduciary duty once it is established.[125] At first glance, this may seem to mean that the standard of proof for a breach of a duty of care is higher than for a breach of fiduciary duty. However, Finn regards the standard of proof for a breach of fiduciary duty to be higher than that for a "simple error of judgment in the exercise of the power", as quoted above. Indeed, if the liability for breach of a fiduciary duty is focused on the breach itself, without the benefit of supplementary evidence like 'causation of loss', then a higher standard of proof may be justified. Thus, by rejecting a fiduciary duty, and so gross negligence, Ipp J appears to have lowered the standard required to the level of ordinary negligence.

Despite the distinction made in *Permanent Building Society* between an equitable

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[121] Above n109.

[122] Ibid, at 677, referring to *In re City Equitable*, above n102, and *ASC v Gallagher* (1993) 11 ACLC 286.

[123] Ibid, at 679.

[124] Ibid, at 687.

[125] Cf Rickett C, Gardner T (1994) Compensating for Loss in Equity: The Evolution of a Remedy, 24 *VUWLR* 19, at 32-5.

and common law duty of care, Ipp J treated both the same nonetheless. His Honour found "as regards matters of policy, that the tortious duty not to be negligent, and the equitable obligation on the part of a trustee to exercise reasonable care and skill are, in content, the same".[126] It was held[127] that the plaintiff had failed to prove that the loss in question would not have occurred but for the breach of either of the equitable or the common law duty of care. Thus, the duty of a director, whether described as an equitable or common law duty of care, appears to have been treated as a matter of ordinary negligence in that case.

The decision in *Daniels and Ors v Anderson and Ors; Hooke v Daniels and Ors; Daniels and Ors v AWA Ltd*[128] goes a step further away from the traditional use of gross negligence than in *Permanent Building Society*. In *AWA*, the directors' duty is limited to a common law duty of care, without reference to an equitable duty. This may be because the discussion rests partly on s232(4) of the Australian Corporations Law[129], which was interpreted as amounting to ordinary negligence. Clarke and Sheller JJA were "not impressed by this perceived barrier against imposing on directors a duty of care at common law ... The law of negligence can accommodate different degrees of duty owed by people with different skills but this does not mean that a director can safely proceed on the basis that ignorance and a failure to inquire are a protection against liability".[130] Their Honours did not treat the absence of the word "skill" under

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[126] Above n109, at 687.

[127] Ibid, at 682-688.

[128] [1995] 13 ACLC 614.

[129] Section 232(4) reads:

> In the exercise of his or her powers and the discharge of his or her duties, an officer of a corporation must exercise the degree of care and diligence that a reasonable person in a like position in a corporation would exercise in the corporation's circumstances.

For a discussion of the trends leading to the introduction of this statutory duty, see Cassidy J (1994) An Evaluation of s232(4) and the Directors' Duty of Due Care, Skill and Diligence, in: Piotrowicz R (ed) *ALTA 1994: Proceedings of the 49th Australasian Law Teachers Association Conference*, University of Tasmania Law Press: Hobart, at 511. The introduction of this duty, and its statutory counterpart in New Zealand, may also have been influenced by public concern for greater accountability of directors in the wake of the 1987 sharemarket crash. The basis of this concern has been questioned: see for example, Chapman Tripp Sheffield Young (1993) Corporate Performance and Board Responsibilities, 8 July *Counsel* 1.

[130] Above n128, at 663.

s232(4) as a hindrance to finding a duty of care.[131]

The interpretation of a comparable duty under s137 of the New Zealand Companies Act 1994 may follow *AWA*, given that skill as well as care and diligence is required. Under s137:

> A director of a company, when exercising powers or performing duties as a director, must exercise the care, diligence, and skill that a reasonable director would exercise in the same circumstances taking into account, but without limitation, -
>
> (a) The nature of the company; and
> (b) The nature of the decision; and
> (c) The position of the director and the nature of the responsibilities undertaken by him or her.

Recently, in *Dairy Containers Ltd v NZI Bank Ltd; Dairy Containers Ltd v Auditor-General*[132], a similarly strict interpretation of what constitutes reasonable care was taken. In that case, Thomas J stated:[133]

> Although constantly referred to as "the management", the executives' powers are delegated powers, subject to the scrutiny and supervision of the directors. Responsibility to manage the company in this primary sense remains firmly with the directors ... If a director negligently disregards the obligation to oversee the conduct of the company's business, he or she has manifestly failed to perform that function with reasonable care.

His Honour did not refer directly to s137 of the Companies Act 1993, but found that the directors in question had "failed to exercise the care, diligence and skill which any reasonable director would have exercised in the same circumstances".[134] Thus, recently, there appears to have been a change in what the New Zealand and Australian Courts require of directors from what was required in *Grayburn v Laing*. This change

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[131] Ibid, at 665.

[132] [1995] 2 NZLR 30.

[133] Ibid, at 79, 80.

[134] Ibid, at 80.

is noted by Trotman[135] as being a development from the "modern day duty of care". If so, then under the latest judicial revision, the 'modern day' duty of care amounts to ordinary negligence and is a fiduciary duty no longer. Of course, this change does not preclude the use of gross negligence as part of a statutory solution to prohibit industrial espionage, but it must be limited in scope so as not to be interpreted to mean ordinary negligence at a later date.

III *A Duty in rem*

III(a) *A Duty of Confidence in rem?*

In *Aquaculture Corp v Green Mussel Co Ltd*[136], Cooke P stated:

> For all purposes now material, equity and common law are mingled or merged. The practicality of the matter is that in the circumstances of the parties the law imposes a duty of confidence. For a breach a full range of remedies should be available as appropriate, no matter whether they originate in common law, equity or statute.

This argument is consistent with the outcome in *LAC Minerals Ltd v International Corona Resources Ltd*[137], when the majority found the defendants guilty of a breach of an duty of confidence, yet a constructive trust was imposed; that is, a remedy *in rem* was imposed when a duty *in personam* had been breached. The next step is to determine whether a duty *in rem* can be recognised because a remedy *in rem* is possible. This approach was not taken nor needed in *LAC Minerals*, where a duty of confidence *in personam* could be inferred from a confidential communication. Indeed, in Chapter One, an equitable duty of confidence was found to be created by a specific

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[135] (In press) Commentary on "Directors' Liability on Corporate Restructuring", in: Rickett CEF (ed) *Essays on Corporate Restructuring and Insolvency*, Brookers Ltd: Wellington.

[136] [1990] 3 NZLR 299, 301; see also *Day v Mead* [1987] 2 NZLR 443, at 458, per Somers J. For a review of the development of equitable compensation, equitable damages, and common law damages in tort law in New Zealand, see Rickett and Gardner, above n125.

[137] Above n113.

communication.[138] However, the informal relationship between the parties may be relevant as well. In Chapter One it was also recognised that a duty of confidence may be created by virtue of a contractual relationship which exists between the parties; the implied contractual duty of confidence.[139] If a relationship between two parties is used to create a duty *in personam*, then it may be that an informal relationship between a larger number of parties can be used to create a duty *in rem*. Recall that a duty *in rem* is considered to be composed of innumerable duties *in personam* between "members of organised society".[140] In this case, 'organised society' are the participants in the information market. These individuals are entitled, as acknowledged by Dunn J in *Franklin v Giddens*[141], to "rely on the fact that other people would normally be expected to respect their rights of property". In other words, it is proposed that there may be a tacit agreement or relationship between the participants in the information market to negotiate directly and not to indulge in spying; it is the *quid pro quo* of market participation.[142] It is not an ethical relationship of 'trust', as suggested by Gurry, above, unless the trust which exists is taken as evidence of an underlying, mutually beneficial economic relationship. It is from this pre-existing tacit relationship, and the actual or potential breach of it through espionage, that a duty of confidence and remedies *in rem* may be inferred, despite the limitations of the existing formulation of the duty. Furthermore, as there will not be an infinite number of competitors, these individuals or companies may be known to the trade secret owner, even though no relationship may exist between them. Hence, it may be financially feasible to identify the spy and enforce the duty of confidence *in rem*. If it is too costly, as when the information has been disseminated widely, then the duty will not be enforced as it is

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[138] See 1.37.

[139] Thus, the difference between the equitable and implied contractual duty of confidence is essentially circumstantial; the duty is the same. Of course, a trade secret which is specifically communicated after a relationship between the parties is established may be protected under both an equitable and an implied contractual duty: see further 1.38.

[140] See Corbin, above n6.

[141] Above n7, at 80.

[142] Ie it is undertaken and expected when entering the market; cf *Ligett v Kensington* [1993] 1 NZLR 257, at 281, where Gault J presented these as alternative approaches.

now when secrecy is lost.[143]

It may be argued that a pre-existing informal relationship *in rem*, if acknowledged, could be held to exist in a range of circumstances outside of breach of confidence. If so, then the duty *in rem* could be criticised for being too broad and open-ended a principle, like unconscionable conduct which was utilised in *Franklin v Giddens*, above. Wider applications of a duty *in rem* would be limited, however, if it were only established through statute. Useful precedent for such a course is found in New Zealand companies legislation. Recently, a directors' implied contractual duty of confidence was codified under s131(1) of the Companies Act 1994. This sub-section may be of use for composing the wording of a duty *in rem* that like the implied contractual duty of confidence is based on a relationship. It reads:

> Subject to this section, a director of a company, when exercising powers or performing duties, must act in good faith and in what the director believes to be the best interests of the company.

Indeed, an employee is expected to act with good faith toward his/her employer under his/her implied contractual duties, on the basis of their contractual relationship.[144] Furthermore, if a spy cannot act in good faith toward an information owner, by virtue of the tacit relationship suggested above, then this term may also be useful for the composition of a statutory prohibition of espionage.

III(b) *A Fiduciary Duty in rem?*

The proposed economic relationship between the participants in the information market may be elucidated further if it is recognised that the duty of confidence is a fiduciary duty. In Chapter One it was concluded that the duty of confidence is composed of three constituent relations; exclusivity, transferability and enforceability. The circumstantial evidence for the duty of exclusivity, the restriction on the power of

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[143] See 1.43.

[144] See 1.36-1.37.

transferability and the existence of the duty of enforceability of the confidant may also count as an indication of a fiduciary duty.[145] It was also concluded that if the duty of confidence is a form of fiduciary duty, then it may not be necessary to consider the fiduciary duty as part of the action for breach of confidence. However, for the purpose of discussing a tacit relationship between the members of organised society, as above, and developing a statutory solution to espionage, it may be worthwhile to further consider this form of fiduciary duty and its basis.

A fiduciary duty is not necessarily limited to a contractual relationship, as is suggested in two dissenting judgments in *LAC Minerals*, above. In that case, La Forest J treated the emergence of fiduciary obligations, much like an implied contractual duty of confidence, as deriving from the general circumstances of a relationship, as above, stating that:[146]

> The imposition of fiduciary obligations is not limited to those relationships in which a presumption of such an obligation arises. Rather, a fiduciary obligation can arise as a matter of fact out of the specific circumstances of a relationship. As such, it can arise between parties in a relationship in which fiduciary obligations would not normally be expected.

Indeed, Finn[147] has defined the term 'fiduciary' to include a relationship where persons act "for, or on behalf of, or in the interests of, or with the confidence of, another". In this case, the potential spy may be treated as a form of fiduciary and the trade secret owner as the beneficiary. Moreover, a confidential relationship shares features with other fiduciary relationships, including the independence of the fiduciary, the vulnerability of the beneficiary, and the requirement of good conscience of the fiduciary. Recognition of these features may assist the acceptance of a tacit relationship between the market participants.

Integral to the fiduciary relationship is the independence of the fiduciary from

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[145] See 1.38-1.39, 1.41, 1.47.

[146] Above n113, at 29.

[147] Above n4, at 2. In the other part to this definition, the "term is employed to describe powers which are given to one person to be exercised for the benefit of another": ibid. In the context of confidential information, this part of the definition appears to arise by virtue of a specific communication, as does the equitable duty of confidence: see 1.37.

immediate control and his/her discretion to determine how the interests of the beneficiary are to be served, within the limits of his/her powers and duties.[148] The emphasis is not on the powers that the fiduciary wields at a given moment, but their potential powers.[149] It follows from this independence that the beneficiary is vulnerable to the action of the fiduciary, a factor that may be taken as circumstantial evidence of the existence of a fiduciary duty. Certainly, each market participant is independent of the immediate control of others and has the potential to degenerate into a spy.

In the past decade, the issue of vulnerability of the beneficiary of a fiduciary obligation has increased in importance, particularly in Canada.[150] In *LAC Minerals*, Sopinka J for the majority found that vulnerability was an indispensable feature of a fiduciary relationship.[151] The minority view, as expressed by La Forest J, found that vulnerability was one relevant criterion, but not a necessary ingredient in every fiduciary relationship.[152] Recently, the importance of vulnerability was re-affirmed in *Hodgkinson v Simms*.[153] Ogilvie[154] notes that in *Hodgkinson*, La Forest J appears to have placed greater emphasis on the importance of vulnerability than in the *LAC Minerals* decision, to the extent that there may be "some coalescence" with the view of Sopinka J in both cases. In *Hodgkinson*, La Forest J concedes that fiduciary obligation will rarely be characteristic of commercial relationships, which Ogilvie interprets[155] to mean that only exceptional incidents of "power-dependency" or vulnerability will be

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[148] Finn, ibid, at 13.

[149] See *Lord Corporation Pty Ltd v Green and Others* (1991) 9 ACLC 1,094, at 1,104.

[150] See the discussion by Ogilvie, above n113, at 638; Conaglen MDJ, Hollyman R (1996) Fiduciary Relationships in Commercial Settings: Some Thoughts on Recent New Zealand Cases (Part I), *NZLJ* 13.

[151] Above n113, at 63, Lamer J, McIntyre J concurring; see Wilson J, at 17; see also *Hospital Products Limited v United States Surgical Corporation & Others* (1984) 156 CLR 41, at 102; *Permanent Building Society*, above n109, at 680; *Frame v Smith* (1987) 42 DLR (4th) 81, Wilson J dissenting: discussed by Ogilvie, above n113, at 644-5. See also *Watson v Dolmark Industries Ltd* [1992] 3 NZLR 311, at 315, per Cooke J.

[152] Above n113, at 40.

[153] Above n113.

[154] Above n133, at 648.

[155] Ibid, at 648.

"sufficient to attract the judicial intervention implicit in fiduciary obligations". In other words, considerable if not complete vulnerability may be required if a fiduciary obligation is to be found. However, the matter may not yet be resolved, for as Ogilvie notes[156], "[c]omplete vulnerability might very well only be found amongst those lacking in legal capacity as understood by the law of contract, rendering the fiduciary notion obsolete as a doctrine for legal redress".

It is submitted that the degree of vulnerability which is required may vary depending on the circumstances and so the fiduciary obligation in each case. In *Hodgkinson*, a case which concerned business advice, the majority found vulnerability and that a fiduciary obligation had existed and was breached, but that commercial relationships at arms length would rarely amount to a fiduciary obligation, as noted above.[157] In a similar vein, Wilson J in *Frame v Smith* suggested that businessmen are expected to bargain prudently[158] and hence may not be so vulnerable. In *Permanent Building Society*[159], Ipp J also found that the "directors' duty to exercise care and skill has nothing to do with any position of disadvantage or vulnerability on the part of the company". However, this view may, in part, stem from the knowledge of the alternative remedies which are available to parties in a commercial transaction. In commenting on a custodial dispute at issue in *Frame v Smith*[160], Ogilvie suggests few remedial options could mean that the parent in question was "peculiarly vulnerable as a result". A similar argument of vulnerability could be made regarding the range of remedial options available to Canadian Indians when the Crown failed to explain fully the terms of its lease to their land and was found to have breached a fiduciary duty.[161] Given the risk of industrial espionage, the trade secret owner is in a far more vulnerable position than

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[156] Ibid, at 644.

[157] Ibid, at 645; see also *Auag Resources Ltd v Waihi Mines Ltd* [1994] 3 NZLR 571, at 580.

[158] Discussed by Ogilvie, ibid, at 645.

[159] Above n109, at 680.

[160] Above n151. The case concerned the denial of access by the custodial parent to the non-custodial parent in relation to their children: see the discussion in Ogilvie, above n113, at 644-5.

[161] *Guerin v The Queen* (1984) 13 DLR (4th) 321: discussed by Ogilvie, above n113, at 644.

if the parties were to meet in an open negotiation when the owner could refuse to disclose their information. Moreover, as there is not an established means of legal redress once espionage has occurred, it may be argued that the information owner is at present vulnerable in law.

If the existence of a fiduciary obligation between the spies and information owners is accepted, then it may be noted that the parties stand in a reciprocal vulnerable relationship to each other. Hence, spying may be in breach of a form of fiduciary duty, yet that spy is also vulnerable to the spying of others; anyone may act as spy in breach of their 'fiduciary duty' to other participants in the market. If so, then it is justifiable to expect that each party would refrain from industrial espionage out of mutual interest given an implied or tacit agreement. The result is a multitude of fiduciary duties *in personam* between participants in the information market, which may constitute a duty *in rem.*[162] Furthermore, this series of tacit agreements may relate to factors of "trust and confidence" and "industry practice" which La Forest J in *LAC Minerals*[163] suggested as factors which could also support the imposition of a fiduciary duty.

Another description which is useful for determining a breach of fiduciary duty is given by Southin J in *Girardet v Crease and Co*[164], who required that the breach be accompanied by a "stench of dishonesty". This seems to be broadly analogous to the sanctioning of improper or reprehensible means or unconscionable conduct.

Recently, a fiduciary duty for directors was codified under s145(1) of the Companies Act 1994. Section 145(1) reads:

A director of a company who has information in his or her capacity as a director or employee of the company, being information that would not otherwise be available to him or her, must not disclose that information to any person, or make use of or act on the information, except -

(a) For the purposes of the company; or

(b) As required by law; or

(c) In accordance with subsection(2) or subsection (3) of this section; or

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[162] See the Hohfeldian definition of the term '*in rem*', given above.

[163] Above n113, at 35.

[164] [1987] 11 BCLR (2d) 361, at 362; quoted in *LAC Minerals*, above n113, at 62.

(d) In complying with section 140 of this Act.

A similar section in the Australian Corporations Law[165] was recently interpreted to amount to a fiduciary duty in *Rosetex Co Pty Ltd v Licata*[166], and it seems feasible that the same interpretation would be made in respect of the New Zealand law. Indeed, Harris[167] suggests that when a company director "usurps a corporate opportunity" to his/her financial advantage, s145(1) might apply because company information has been misused. Moreover, as s145 provides no remedy for a breach of its provisions, Harris suggests the "common law remedies for breach of fiduciary obligations, including breaches taking the form of profit-making arising out of the use of company information, continue to be available to an aggrieved company".[168] Hence, s145(1) is likely to be viewed a codifying a fiduciary duty.

If it is accepted that an implied contractual duty of confidence is another form of fiduciary duty, then there may be some overlap between section 131(1), above, and s145(1). This overlap ought to ensure that the liability for the breach of confidence/breach of fiduciary duty will be recognised where it exists. In addition, the wording of this section may also be of use for the composition of a statutory solution to the problem of espionage. Indeed, s145(1) delineates what is honest conduct for a director with regard to the company's information.

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[165] Section 232(5) states:

> An officer or employee of a corporation, must not, in relevant circumstances make improper use of information by virtue of his or her position as such an officer or employee to gain, directly or indirectly, an advantage for himself or herself or for any other person or to cause detriment to the corporation.

[166] [1994] 12 ACLC 269, at 273.

[167] Harris B (1994) Fiduciary Duties of Directors under the Companies Act 1993, *NZLJ* 242, at 242-3.

[168] Ibid, at 242-3.

IV *A Statutory Duty in rem*

IV(a) *An Overview*

The statutory expression of a civil duty *in rem* to prohibit industrial espionage could codify an implied contractual duty of confidence/fiduciary duty, yet must find an appropriate standard of evidence, given that information is intangible.[169] With judicial and legislative flexibility, the same economic reasons that underlie the duty of confidence can be adapted to sanction industrial espionage, and so give rise not only to a remedy *in rem*, but a duty *in rem* as well. Some general guidelines can be suggested from the preceding discussion. First, improper means or dishonest activity that would harm the tacit agreement between market participants should be punished, but without causing worse harm to legitimate activities, such as informal information trading. A standard of proof must be employed which resolves the problem of imprecision associated with legal, yet improper, means. In doing so, the legislation must also avoid relying on illegal means, unfair competition or ordinary negligence, given that the standard of proof required for these actions is too high or too low. In addition, intent to gain advantage for the spy, and disadvantage resulting for the trade secret owner, may be inferred from the use of the improper means.

The solution may be to limit the statutory liability to the level of gross negligence that was developed by Romer J in *Re City Equitable* and adopted by Gallen J in *Grayburn v Laing*, above. Following the language of Romer J in *Re City Equitable*[170], the market participants should exercise honesty, skill and diligence in their information acquisition, but not need "take all possible care". Hence, if information has been acquired and there is no physical evidence of misappropriation and/or it has been subsequently improved, the court would be able to assess whether the possession of the information by the defendants is achieved by more than accident or coincidence; that is, gross negligence. It would be unlikely that mere errors of judgment would be

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[169] Conceivably, a judge might find a duty of confidence/ fiduciary duty *in rem* as argued above, but espionage cases are so rare, partly because the outcome is uncertain, that a statutory solution may be preferable.

[170] Above n102, at 427-8, quoted above.

found to amount to gross negligence. This standard overcomes both the problems of illegal means and intentional damage which may be too difficult to prove in the absence of physical evidence, without making all innocent acquisitions potentially negligent. Therefore, the duty of confidence/ fiduciary duty *in rem* to refrain from espionage may be expressed in terms of gross negligence or a co-extensive duty of care, as proposed below.

IV(b) ***A Proposal***

The following proposal for an industrial espionage law in New Zealand is accompanied by a commentary in which the wording of each sub-clause is discussed.

Conduct expected with regard to trade secrets - Every person must act, by virtue of their actual or potential position in the market, with regard to the trade secrets held by others in that market, -

(1) Honestly or in good faith, and must exercise the degree of care and diligence that a reasonable person would exercise.

(2) To avoid confusion, the degree of care and diligence in subclause (1) should be interpreted as an absence of gross negligence.

(3) For the purposes of this section "trade secret" means any information which

(a) Is, or has the potential to be, used industrially or commercially; and

(b) Is not generally available in industrial or commercial use; and

(c) Has economic value or potential economic value to the possessor of the information; and

(d) Is the subject of reasonable efforts to preserve its secrecy.

(4) "Honestly", in relation to an act or omission, means done or omitted with a belief that there was express or implied consent to, or authority for, the act or omission

from the person entitled to give such consent or authority.

The purpose of this proposal is to punish the breach of a duty of confidence/ fiduciary duty *in rem* through conduct at a standard of civil liability. Civil remedies may be drafted in another clause, and should include the option of an injunction and/or damages. These civil remedies may be all that is needed to punish espionage, given that a conviction could severely damage the business reputation and/or employment prospects of the guilty party, and so act as a deterrent.

The Crimes Consultative Committee report on the Crimes Bill 1989[171] considered that without a reference to trade secrets, clause 185 was too vague and so recommended an inclusion of the term with the addition of a definition. For this the Committee[172] adopted a definition of trade secret which is derived from the Alberta Institute of Law Research and Reform[173], and which is largely repeated in sub-clause (3), above. This definition appears broadly to codify the existing definition used by the judiciary according to what Megarry J in *Coco v AN Clark (Engineers) Ltd*[174] called the 'necessary quality of confidence'.[175] Hence, the need for this definition may not seem great. However, acknowledgement of the economic importance of trade secrets is also important for emphasising that the purpose of the legislation is to protect the value and so the further production of information, and not some ethical norm of 'trust'. Indeed, the market is referred to in order to emphasise that the purpose of the duty is to protect a relationship that has an economic basis. All market participants or potential entrants are then liable to behave in order to make the tacit agreement recognised in

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[171] Above n73, at 68.

[172] Ibid, at 68, 112.

[173] Above n49; see also a reprint of this proposal in Hayworth, above n49, at 506. This definition is derived ultimately from the American First Restatement of Torts, 1939: see the discussion by its author who is now a New Zealand High Court Judge, Hammond J, in *Laser Alignment (NZ) 1984 Ltd v Scholz* [1993] 2 ERNZ 250, at 260.

[174] [1969] RPC 41, at 47; see also 1.02.

[175] Note that if a trade secret is not "generally available in industrial or commercial use", as in sub-clause (3)(b), it cannot be knowhow, as this is skill and knowledge that an individual may acquire in the trade: see 1.02.

subsection one effectual. The definition of market that may be used could be the same as is given in the Commerce Act 1986.[176]

The requirement of honest behaviour/good faith and a duty of care and diligence arises out of a pre-existing tacit or informal relationship between the parties *in rem*. The use of the term "honesty" is important for the consideration of whether there is a 'stench of dishonesty' sufficient to warrant the finding of breach of duty as a matter of gross negligence.[177] It also means that the clause is not limited to illegality. Further, good faith is apparently synonymous with honesty for the purposes of s131(1) of the New Zealand Companies Act and s232(2) of the Australian Corporations Law and is useful to indicate the standard of behaviour that is required if the economic relationship between the market participants is to be maintained. This requirement can include third parties to espionage who must therefore believe that the trade secret transfer in question was correctly authorised, as under sub-clause (4).

The use of the phrase "care and diligence" in subclause (1) is modified by the words "degree" and "reasonable person." As the phrase 'reasonable person' is normally associated with a standard of ordinary as well as gross negligence[178], the subclause is further modified to specify "gross negligence". Hence, grossly negligent behaviour is treated as being tantamount to dishonest conduct.[179] The effect may be to limit breach of the duty of care to intentional or grossly negligent behaviour without needing to specify the means. Hence, the standard of proof could be lower than that required, in practice, under improper means or unfair competition, yet higher than that of ordinary negligence. As a result, this proposal, if enacted, could lead to more litigation than

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[176] See s3(1A):

> Every reference in this Act ... to the term "market" is a reference to a market in New Zealand for goods and services as well as other goods or services that, as a matter of fact and commercial common sense, as substitutable for them.

[177] The definition of "honestly" given in sub-clause (4) is derived from the Crimes Bill Committee report, above n72, at 110.

[178] Recall that Romer J in *Re City Equitable* referred to the care required of a director as being "'reasonable care' to be measured by the care an ordinary man might be expected to take in the circumstances on his own behalf", quoted above.

[179] Cf a standard of ordinary negligence which concerns honest, but careless conduct. In this case, however, grossly negligent behaviour is held to be co-extensive with a breach of fiduciary duty; that is, is equated with a 'stench of dishonesty'.

occurs under the existing law. It could also mean that greater attention is given by defence counsels to the protection of information by the trade secret owner, but if the courts follow the arguments in the *Francome* and *Christopher* cases, discussed above, a 'fortress' of protection ought not to be required.

V *Support for an Industrial Espionage Law*

The sources of popular support for the introduction of a statutory prohibition against industrial espionage are potentially wide as it could benefit most enterprises which create trade secrets. In particular, an espionage law could be favoured in those industries in which there is a high incidence of sub-patentable trade secrets, such as the biotechnology and computer software industries. These secrets may be commercially valuable, yet the owners may have no recourse to other statutory protection, so this information may be especially vulnerable to espionage. Furthermore, if the additional protection of such trade secrets were to avert market failure, it could lead to an increase in information output, which may be viewed a normatively desirable by New Zealanders.

If the proposal is adopted, it could be questioned whether it would be used to supplant the existing duty of confidence. The duty of care of a duty of confidence/fiduciary duty *in rem* could be argued to cover the duty of confidence/fiduciary duty *in personam.* In Chapter One it was suggested that there was one duty of confidence/fiduciary duty which was the same whether it was recognised from implied contractual terms or a specific communication. The tacit agreement *in rem* may be one more circumstance in which the same duty could arise. Further, under the definition of "*in rem*" used above, a duty *in rem* could also be considered as differing from a duty *in personam* as a matter of scale rather than substance. On that basis it may seem as though the duty *in rem* proposed here could cover the existing duty *in personam.* However, in Chapter One it was also suggested that if evidence exists for both the implied contractual and equitable duty of confidence, the judiciary may focus on the contract, given that there could be a greater number of circumstantial factors

under it which could point to the existence of a duty.[180] In the same way, evidence of contract or a confidential communication may be used to determine a duty of confidence, without need of an assessment of market participation and so a duty *in rem*. Furthermore, to replace the existing obligation of confidence under statute might create needless uncertainty. Thus, the proposed industrial espionage law need not supplant the existing obligation of confidence.

Conclusion

The proposal for a civil statutory duty which would prohibit industrial espionage could operate in addition to the existing obligation of confidence. It is based on an economic relationship which is analogous to that which underlies the implied duty of confidence/fiduciary duty. Indeed, the common law and equity have in practice mingled so that such an extension of this duty *in rem* is feasible. It does, however, avoid the conceptual confusion of attempting to ground an extension of the equitable duty of confidence on such a relationship, or to base the duty in an ethical norm.

The advantage of wording the clause as a prohibition against dishonest behaviour, with a standard of gross negligence, is that the liability may not be open-ended. Thus, the courts may punish information acquisition which appears to be more than mere coincidence, yet is flexible enough that innocent acquisition will remain legal. Thus, the proposal may avoid the problem of other judicial reasoning or statutory provisions that may have too high a standard of proof, which could deter litigation, or too low a standard of proof, which could stimulate excessive litigation. Therefore, if enacted, the statutory provision could be an effective legal barrier against espionage and so could lead to a higher incidence of espionage litigation than occurs at present.

If a duty *in rem* is created against industrial espionage, an inventor's natural rights to their invention may be fully recognised and the legal barrier enhanced so that the inventor is able to capture more of the benefits which accrue from that invention. Hence, market failure leading to the under-production of information ought to be

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[180] For example, access to the trade secret during employment: see 1.32.

averted, particularly with sub-patentable trade secrets that are the most at risk.[181] As a consequence, further information and so additional natural rights may be produced. Of course, this outcome does not resolve the detrimental effects that may accrue from the successful imposition of such barriers; that is, market imperfections, as in the form of monopolistic practices. These problems will be addressed in subsequent chapters so that the least inefficient balance between the extremes of market failure and market imperfections may be found.

[181] See 2.19.

CHAPTER FOUR:
Utility Model and Trade Secret Rights in Japan

UTILITY MODEL AND TRADE SECRET RIGHTS IN JAPAN

In theory, multiple intellectual property rights to the same invention can be sold or licensed in different combinations according to the needs and means of the consumer. This form of price discrimination may be used to reduce the market imperfections which accrues from these rights. In this context, the use of utility models and trade secret rights in Japan are investigated and seen as a means of providing additional protection for trade secrets, including sub-patentable secrets. In fact, the Japanese may practise competition in preference to price discrimination, and more evidence is required before Japanese models are adopted elsewhere.

A legal and economic model of intellectual property rights[1] in the common law jurisdictions was proposed in Chapter Two. The rights exist on a continuum between the extremes of an anarchistic absence of rights, and the monopolistic abuse of those rights. Of concern is the under-protection of sub-patentable trade secrets which may generate an insufficient natural lead time[2] because these are easily misappropriated, leading to market failure, and which also undermines the natural right of the inventor.[3] As a consequence, the inventor may have to expend costly resources on additional security to protect and so recover a return on their investment. Utility model and trade secret rights may be two means of protecting trade secrets and so averting market failure. Utility models are a small form of patent with a reduced standard of patenting.[4] Trade secret rights relate to protection against the acquisition of information through improper means and/or as a result of unfair competition.[5] However, if successful in averting

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[1] This term will be limited here to the discussion of patents, utility models and trade secrets unless otherwise stated, although the conclusions reached may be applicable to other rights such as trademarks or copyright.

[2] Natural lead time is the period in which an inventor can gain a return on their investment before competitors acquire or invent around the secret: see Reichman JH (1994) Legal Hybrids Between the Patent and Copyright Paradigms, 94 *Colum L Rev* 2432, at 2506.

[3] See 2.03-2.10.

[4] Discussed further below, at 4.07.

[5] Discussed below, at 4.18.

market failure, the information owner may be tempted, in the absence of competition from substitutable goods, to raise the price and lower the output of information as in any monopoly. Monopolistic profits can inflate the incentive to invest and so attract rent-seeking in the form of duplicative research. A proportion of the population can be price excluded, thereby reducing the dissemination of that information so that it is under-utilised. The level of price exclusion in turn interferes with the creation of the further information and so additional natural rights.[6] Therefore, altering the legal protection of information is not a simple task, as the change may only substitute one source of inefficiency for another.

In Chapter Two, it was proposed that legal protection of intellectual property rights could help to reduce inefficiency through market failure, and when coupled with price discrimination could be used to reduce the market imperfections that may arise from the use of those rights. Price discrimination is achieved when the same good is sold in separate markets at different rates of return.[7] Barriers between markets would be necessary to prevent resale of the good from one market to another and so cause the loss of the discriminatory effect through competition. If the producer is able to match the price to the needs and means of different individuals or groups of buyers, they may capture more, if not all, of the consumer surplus. Consequently, although the monopoly remains, less buyers will be price excluded and so the market imperfections are reduced.

A method by which price discrimination with information could be achieved is through the intellectual property rights to the same invention. The consumer may have different needs for those rights, depending on their existing licences or the availability of substitute information. Hence, the producer or right-holder may not license all of the intellectual property rights to an invention, yet in general it can be said that the invention was licensed. The difference in the quantity of intellectual property rights may not be significant enough to mean that the invention sold between different buyers is no longer the 'same'. It follows that if there is a price differential then price discrimination can be said to occur. Hence, the sub-division of an invention into different bundles of

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[6] See 2.10-2.16.

[7] Bork RM (1978) *The Antitrust Paradox: A Policy at War with Itself*, Basic Books: New York, at 383, 395-7.

intellectual property rights provides legal barriers that facilitate the insulation of consumers for the purpose of price discrimination.

Consideration of price discrimination in this manner is constrained by the tendency to 'reify' concepts, so that an invention is not viewed as it should be, as a bundle of intellectual property rights, each of which in turn yields a bundle of legal-economic attributes.[8] Parker[9] describes reification as the unjustified attribution of concreteness or independence to an abstract concept such as theory, language or law.[10] Reification appears to be consistent with a 'right-by-right' approach by which intellectual property rights are considered separately during litigation. The result may be too great a conceptual deconstruction when, in fact, these rights relate to the *same* invention.[11] Thus, an invention may consist of numerous patents, utility models, trade secrets, and knowhow which may or may not be sold together at different prices according to the demands of separate markets or submarkets.[12]

Japanese intellectual property laws and practices are worth examination as these have potential for price discrimination and the consequent reduction of market imperfection. In Japanese law, confidential information may be protected under the

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[8] See 1.27-1.29, 2.34-2.35.

[9] (1987) Law and Language in Japan and in the United States, 34 *Osaka Uni L Rev* 47, at 49-50. Parker is careful to distinguish his usage of the term from other philosophical connotations.

[10] Coase has also opposed the treatment of the voluntary exchange of property rights as an exchange of some physical entity or thing; rather it is the exchange of behavioural relations or the "rights to perform certain actions": see Coase RH (1960) The Problem of Social Cost, 3 *J L & Econ* 1, at 44; (1992) The Institutional Structure of Production, 82(4) *Am Econ Rev* 713, at 717.

[11] See 2.34-2.35.

[12] Certainly, trade secrets may also be licensed along with patents: see Gurry F (1984) *Breach of Confidence*, Clarendon Press: Oxford, at 129; Revesz J (1994) *The Economics of Patents*, Bureau of Industry Economics, Occasional Paper 18, Australian Government Service: Canberra, at 31; see also Teece D (1993) Trans-Pacific Competitive Challenges for Innovation and Renewal, in: Licensing Executives Society (ed) *Technology Rivalries and Synergies Between North America and Japan*, Symposium III, March 28-30, Arlington, Virginia, 7, at 18.

Knowhow trading may be particularly important in Japan. A recent survey suggests that there is a low proportion of domestic Japanese firms which trade solely intellectual property rights through international licenses compared to those which are related to knowhow (1: 3.7). It is also noted that trade secrets are transacted much less frequently than knowhow. The survey was conducted by Hatsumei Kyokai Kenkyujo and consisted of 43 domestic firms: 14 pharmaceutical, 10 machinery, 7 metals, 5 electric, and 7 others: see Hatsumei Kyokai Kenkyujo (ed, 1992) *Transaction and Royalties: A Guide to Evaluating Licensing Fees for Intellectual Property Rights*, Hatsumei Kyokai: Tokyo, at 15, 17.

utility model and trade secret laws, which is a rare combination.[13] It follows that more combinations of intellectual property rights are possible in Japan, which may result in a greater incidence of price discrimination. Indeed, Parker[14] suggests that the Japanese may not reify abstract concepts, but rather the social norms which determine what is an appropriate behaviour in common social situations. Hence, an invention may not be viewed as a 'thing' but as a bundle of intellectual property rights.[15] In addition, the utility model and trade secret laws may add to the protection of sub-patentable information. The discussion of price discrimination provides a useful framework for the general evaluation of the utility model and trade secret laws. The outcome ought to be a preliminary view of the value of adopting the utility model and trade secret laws in New Zealand and other common law jurisdictions.

In Part I, Japanese legal practice is introduced, as a background for the discussion in Part II of the problems associated with utility model and trade secret legislation. In Part III, the incidence of price discrimination is assessed. It is concluded that price discrimination may be practised only rarely. Another outcome is that these laws are found to have little independent merit and so additional evidence is required if these laws are to be adopted elsewhere.

I *Japanese Legal Culture*

In theory, the use of intellectual property rights in Japan ought to resemble that of the German utility model and patent laws and American trade secret law from which the Japanese laws derive. In practice, the Japanese practice of negotiation, or *nemawashi*,

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[13] Utility model and trade secret laws are not found in the UK nor in much of the Commonwealth. Although petty patents are found in Australia these differ from utility models as processes may be registered: see Mandeville TD, Lamberton DM, Bishop EJ (1982) *Economic Effects of the Australian Patent System*, Australian Government Publishing Service: Canberra, at 12; The USA has trade secret legislation but not a utility model law.

[14] Above n9, at 52.

[15] For example, Kitagawa Z (1994) Comment on a *Manifesto Concerning the Legal Protection of Computer Programs*, 94 *Colum L Rev* 2610, at 2611, observes that a computer hardware invention may embody a program that in turn embodies an engineering design, so that a "copyright-or patent alternative" is inapplicable.

more commonly results in out-of-court settlements than in litigation to enforce a right. *Nemawashi* is a nurseryperson's term that literally means "root-wrapping", a practice that allows a transplanted tree to adapt and survive in new conditions.[16] The result is a compromise, or *wakai*, where each party voluntarily makes a concession to settle the dispute. The informal and voluntary nature of the compromise distinguishes it from formal conciliation or *chootei* by a committee which can issue summonses to the parties. The non-binding nature of these settlements in turn distinguish them from arbitration where the parties agree to accept the verdict of a mediator.[17] Negotiation can be a prolonged process; Ames[18] refers to a personal experience of negotiation in Japan which took over a year. Negotiation is also a broader practice that extends beyond intellectual property, so that Japanese companies rarely sue each other.[19] Consequently, litigation in Japan may be less acrimonious than in other countries.[20]

Tanaka[21] has reflected upon the Japanese tendency to negotiate: "[m]ost of the people are subject to the strong influence of their country's traditional pattern of culture and thought ... and to the patterns of behaviour woven into their being through lifelong exposure to the culture, the language and the system of education in their country." This includes a desire to avoid the social costs of a dispute that leads to negotiation and compromise. According to Noda[22] the Japanese "do not want to leave the embers of a grudge smouldering. We would rather pay a small price, if such a price rounds off the

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[16] Ames WL (1986) Buying a Piece of Japan Inc.: Foreign Acquisitions in Japan, 27 *Harv Int LJ* 541, at 58-9.

[17] See Yamashita T (1994a) Compromise, in: Kitagawa Z (ed) *Doing Business in Japan*, Vol 7, Matthew Bender: New York; (1994b) Conciliation, in: Kitagawa Z (ed) *Doing Business in Japan*, Vol 7, Matthew Bender: New York; Hattori H (1994) Arbitration, in: Kitagawa Z (ed) *Doing Business in Japan*, Vol 7, Matthew-Bender: New York.

[18] Above n16, at 559-60.

[19] See Young M (1988) Introduction to Japanese Law, in: Matsushita M (ed) *Japan Business Guide*, Vol 1, CCH: Chicago, at 6,604; Helfgott S (1990) Cultural Differences Between the U.S. and Japanese Patent Systems, *JPTOS* 231, at 235; Welsh LT (1993) Impressions of Japanese Patent Litigation in Comparison with Other Countries, 18(2) *AIPPI J* 23, at 28-9.

[20] Welsh, ibid, at 38, referring to American patent litigation.

[21] (1976) *The Japanese Legal System*, University of Tokyo Press: Tokyo.

[22] 1971: cited in Tanaka, ibid, at 307.

edges and lets bygones be bygones". Young[23] suggests that a desire for social harmony is not unique to the Japanese, but that the Japanese may have a higher proportion of interpersonal relationships than someone in the West, an occurrence increased by the practice of lifetime employment.

Recently, there has been a backlash against cultural explanations of Japanese legal behaviour. For example, Wineberg[24] and Ordover[25] express concern about the obstacles present within the Japanese patent law which may be used to extend costly litigation and so encourage negotiation, an outcome which is to the advantage of infringers as the compromise is likely to involve the licensing of the information. These obstacles include the monopolistic restrictions of entry to the legal profession, few lawyers, and so higher legal costs.[26] Upham[27] treats the law in Japan as a means to maintain the version of Japanese culture which is most beneficial for the ruling bureaucratic elite. His thesis is that where the courts have taken the initiative in the formation of law, such as environmental disputes, the administrative bureaucracy has re-established control through statute development in which the importance of bureaucratic mediation is emphasised. It is therefore interesting that the landmark success of Genentech Inc in a patent litigation against Toyobo Co in the Osaka District Court in 1993, has coincided with the establishment by the Japanese Ministry of International Trade and Industry (MITI) of a panel to mediate patent disputes between Japanese and foreign firms.[28] Whatever the precise reason for a desire for harmony, the social cost of disputes is commonly perceived within Japan to facilitate negotiation, which for the

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[23] Above n19, at 6,751, 6,822.

[24] (1988) The Japanese Patent System: A Non-Tariff Barrier to Foreign Businesses? 22(1) *J World Trade* 11.

[25] (1991) A Patent System for Both Diffusion and Exclusion, 5(1) *J Econ Persp* 43.

[26] An individual may study law as an undergraduate in Japan, but must also be admitted to the Legal Training and Research Institute in Tokyo. The Institute consistently limits the number of entrants by maintaining a pass rate of less than two percent: see Ramseyer M (1986) Lawyers, Foreign Lawyers and Lawyer Substitutes: The Market for Regulation in Japan, 27 *Harv Int LJ* 449, at 507.

[27] (1987) *Law and Social Change in Postwar Japan*, Harvard University Press: Cambridge; see also Ramseyer, above n26.

[28] Tong, 1993: cited in Teece, above n12, at 18.

purpose of this discussion affects the use of the utility model and trade secret laws and the potential for price discrimination.

II *The Use of Japanese Utility Models and Trade Secrets*

II(a) *Utility Models*

(i) Purpose

A utility model is a limited form of patent that can protect small as well as highly advanced creations, although not processes.[29] The primary purpose of the utility model is to protect small inventions and so encourage industries to develop.[30] Japanese public policy is commonly believed to favour the dissemination of information in order to encourage industry to adopt new inventions.[31] These small inventions are considered to have been vital for the technological development of Japan.[32] There appears to be a trend toward the spread of utility model legislation. China, Finland, Denmark, Georgia, Russia, and Ireland have recently adopted utility model or similar laws[33], presumably

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[29] Chemical substances, food and medicines are now patentable in Japan along with bacteria, but inventions involving a modification of a substance by atomic or nuclear transformation or which convenes public order, morals, or public health may not be patented or registered as a utility model: see Oda H (1992) *Japanese Law*, Butterworths: London, at 247; 260; Amemiya S, Nishimoto K (1994) Patents and Utility Models, in: Kitagawa Z (ed) *Doing Business in Japan*, Vol 4, Matthew Bender: New York, at 12, 47.

[30] See Inaba Y (1984) Patents and Utility Models, 9(2) *AIPPI J* 51, at 51; Itoh A (1993) *Utility Model Law*, Japan International Cooperation Agency: Osaka International Training Centre, at 1, 3; Amemiya S, Guttman D (1994) Knowhow, in: Kitagawa Z (ed) *Doing Business in Japan*, Vol 4, Matthew: New York, at 17; see also Reichman, above n2, at 2456-7.

[31] See Inaba, above n30, at 51; Wineberg, above n24, at 12; Helfgott, above n19, at 234; Tarr J-A (1993) A Comparative Overview of "Know-How" Protection in Japan and Australia, *J Bus Law* 596, at 598.

[32] Chen R (1983) The Utility Model System and its Benefits for China - Some Deliberations Based on German and Japanese Legislation, 14(4) *IIC* 493, at 500.

[33] See respectively, Pinard JL, Lian C (1987) Patent Protection Under Chinese Law, 1 *J Chin Law* 69; National Reports [1991] 8 *EIPR* 150; [1992] 4 *EIPR* 65; [1992] 12 *EIPR* 262; Van Caenegem WA (1993) Inventions in Russia: From Public Good to Private property, 4 *Aust IPJ* 232; Parkes A (1994) Short-Term Patents in Ireland, 25(2) *IIC* 204.

as part of a similar policy of industrial development.

(ii) Utility Model Applications and Litigation

A utility model, like other intellectual property rights, involves a claim-right and duty of exclusivity, a power and liability of transferability, and a claim-right and duty of enforceability. In addition, there is the act-description which is specific to the right, which like a patent, include the criteria of commercial utility, novelty, and inventiveness, although the threshold of inventiveness is lower. The "invention" in patent law must be a *highly advanced creation*, whereas a "device" in the utility model law can simply be a *creation*, of technical ideas.[34] Similarly, an 'invention' which could *easily* have been made is not patentable, whereas a device which could *very easily* have been made cannot be registered as a utility model.[35] A patent and utility model right cannot be held together for the same information.[36] In practice, the examiners in the Japanese Patent Office have applied the same standard of inventive step for both patent and utility model applications so that all inventions except processes can be regarded as a device in the utility model law.[37]

Procedural delay has been suggested to have contributed to the recent decline in the number of Japanese utility model applications. It is reported by the Japanese Patent Office (JPO) that utility model applications have declined from 200,000 in 1987 to 115,000 in 1991[38] and 95,000 in 1992.[39] These applications have tended to show little difference in inventive step to that required for a patent[40], as the distinction between

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[34] Inaba, above n30, at 52.

[35] Ibid, at 52; Amemiya and Guttman, above n30, at 23-4.

[36] Itoh, above n30, at 4.

[37] Inaba, above n30, at 52.

[38] Cited by Itoh, above n30, at 3.

[39] Japan Patent Office (1993) *For Prompt and Appropriate Granting of Patents: Policy Enforcement for Fiscal 1993*, Japan International Cooperation Agency: Osaka International Training Centre, at 2.

[40] Itoh, above n30, at 2.

the definition of inventiveness for a patent and utility model is "very subtle and any criteria for their standard have not been well established".[41] The reasons for the decline appear related to the costs of the system, both for the applicant and wider society, as discussed below.

Utility model applicants face similar procedures to patentees[42] and so many of the problems of the patent system are relevant. Japanese patents have a reputation for procedural and delays in litigation. Regarding the novelty of the initial application, the 'first-to-file' rule may encourage incomplete applications and amendments that provide grounds for opposition.[43] The filed claims are "laid open" or published prior to examination for 18 months in order to provide up-dated technical information to the public[44], but which also permits the preparation of opposition claims in advance.[45] The potential for opposition to amendments also discourages adequate disclosure, hinders evaluation, and places a greater surveillance burden on third parties.[46] A *de facto* exclusive right for applicants exists in the period between publication and grant, but according to Takenaka[47], United States and European patent owners are "reluctant to enforce such rights before grant because they might be liable for damages caused by the enforcement if the JPO subsequently rejects the application or modifies it to exclude the accused infringer's product". However, recently, the Japanese government adopted a post-grant system of publishing applications for opposition which closely resembles

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[41] Inaba, above n30, at 52.

[42] Ibid, at 51. For an overview of the Japanese patent application procedure, see Ohtsuka Y, Matsumoto K (1991) Protecting Intellectual Property in Japan (I), 16(2) *AIPPI J* 47.

[43] Wineberg, above n24, at 14; Ordover, above n25, at 45.

[44] Inaba, above n30, at 51; Ordover, above n25, at 45-6.

[45] See the summary of American concerns described by the Japan Patent Office, above n39, at 24.

[46] Yamamoto S (1992) Japan: International Harmonisation of the Patent and Utility Model Laws, 18 November *IP Asia* 25, at 27.

[47] (1995) Japan, 2(1) *CASRIP Newsletter: casrip@www.law.washington.edu.*

that of the European Patent Office[48], so that some of the difficulties mentioned above may be alleviated.

If the grant is made, then the examination period, claim amendments, and/or rejection of appeals are followed by the opposition period, and depending on the outcome, by appeals, invalidation appeals, and lawsuits.[49] A cause for a US-Japanese dispute is the number of opposition claims. It is alleged that 20 or more oppositions may be made by different parties at once.[50] The patentee will then have only a few months to respond to carefully prepared arguments[51] and so may be disadvantaged. If the Patent Office rejects a patent application, this ruling can be overturned by the High Court, but the Office can still reject an application on alternative grounds. For example, in *Takitai K.K. v. Director of the Patent Office*[52], the Patent Office repeatedly rejected a utility model application for a *furisode*, a traditional type of woman's garment. The first rejection was on the basis of novelty, which the High Court overturned, then on the basis of obviousness, which the Court also overturned. The potential for repeated rejection by the Patent Office can prolong litigation, and so the additional enforcement costs are a further disincentive against litigation itself. Another institutional problem for patent examination has been the number of applications per examiner. Financial reforms have meant a decrease from 905 examiners in 1980 to 853 in 1988, thereby raising the number of applications per examiner and lengthening the period for examination although since then the number has increased to 993 examiners by 1992[53], so some of the delay may be reduced.

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[48] Takenaka, ibid, at 1-2. Any person can file an opposition within six months after a patent is issued, but the grounds are limited to a lack of novelty or inventive step and insufficient disclosure. The Japanese Patent Office will also dispose of multiple oppositions together: ibid.

[49] For a discussion of patentability and the examination process in Japan: see Inaba, above n30; Yamamoto, above n46; Okuyama S, Kaspar AJ (1994) Newly Published Examination Guidelines (V): Specifications and Claims, 19(3) *AIPPI J* 99.

[50] Wegner HC (1993) International Patent Law Developments, 18(3) *AIPPI J* 87, at 90.

[51] Wineberg, above n24, at 22; Ordover, above n25, at 46.

[52] (Unreported, 26 December 1986) Tokyo High Court: see the case note by Yamasaki Y (1990) Action to Cancel the Patent Office Decision to Reject a Utility Model Application, 15(4) *AIPPI J* 185.

[53] Japan Patent Office, above n39, at 3, 34.

There may be further litigation against competitors who infringed the patent after it was published. Indeed, infringement may be facilitated by the process of laying open claims prior to examination, above.[54] The infringers may claim that they have found a new use for the patent[55], or that their infringement is within the national interest.[56] Proof of infringement may be hindered by the lack of a discovery period for incriminating documents.[57] If a party is enjoined for infringement, but the patent is then not registered, the applicant becomes liable to indemnify that party.[58] As a result, the courts may not enforce the patent applicant's right until the patent is registered and invalidation proceedings are complete.[59] Lastly, there does not appear to be a trend for the award of monetary damages in patent court cases, although injunctions are granted, so that the costs of litigation may not be recovered from the guilty party, which again could discourage litigation.[60]

Patent application and litigation delays can significantly reduce the term and so the commercial life of the patent, and the costs of such delays may be ruinous. A patent lasts 20 years from the time of filing or 15 years from the publication of any opposition.[61] There have been American concerns that it can take 5-7 years or a decade to gain a patent.[62] In 1990, the JPO denied this figure and suggested that on average

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[54] See the allegations by Fusions Systems Ltd reported in 21 October *IP Asia*, at 13; Ordover, above n25, at 48.

[55] Improvements may gain a non-exclusive licence where the main patent has not been used continuously for three years: Wineberg, above n24, at 19.

[56] Claims of national interest could also be made where a firm makes significant technological progress: see Ordover, above n25, at 47.

[57] See Welsh, above n19, at 30-1. These are further grounds for the US-Japanese dispute: see Japan Patent Office, above n39, at 25.

[58] Art 52(3), (4), Wineberg, above n24, at 16.

[59] Ibid.

[60] See Welsh, above n19, at 29-30.

[61] Ohtsuka Y, Matsumoto K (1991) Protecting Intellectual Property in Japan (II), 16(3) *AIPPI J* 99, at 101.

[62] Wineberg, above n24, at 18; Ordover, above n25, at 46, 47, 48.

an examination took 37 months.[63] However, the examination period in the USA was only about 19 months[64] at that time. This disparity may, however, have been narrowed due to the greater number of examiners that are now employed, as discussed above. Once the patent or utility model is gained, court proceedings can increase the time, effort and money required to police patents. For example, in *HB Planning Co Ltd v Hokushin Kogyo KK*[65], the applicant filed a patent application in 1972 which was not finally invalidated until 1990. If facing a potentially lengthy and costly dispute, it is not surprising that competitors are usually granted a licence of patented information at a reasonable royalty.[66]

It seems, therefore, that Japanese patents may serve largely a defensive purpose to allow the inventor the right to work the invention.[67] The relative cost of litigation may be greater for a Japanese utility model which until recently would only last 10 years[68] and so could be a contributing factor to the reduction in utility model applications. Apart from costs shared with the patent system, utility models create additional costs for businesses which may be forced to make use of utility models in response to competition. Japanese firms may file hundreds of utility models, as well as patents from a single invention which may differ only slightly from each other.[69] This

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[63] Yoshida F (1990) Harmonisation of Patent Systems, 15(1) *AIPPI J* 59-67, at 63; see also Durney EG (1989) Japan: Patent Critics, 14 September *IP Asia* 2, at 3.

[64] Durney, ibid, at 3.

[65] (Unreported, 19 October 1992) Supreme Court (Case No 92(0)364): see case note by Fujino J (1994) Public Policy v Contractual Obligations, 19(3) *AIPPI J* 124, at 125-6.

[66] See Ordover, above n25, at 47. In a recent survey, it was noted that the transfer of intellectual property rights under application is noticeable; amongst those companies the proportion (cf. total transfers) was especially high for utility models and patents - almost 50%: Hatsumei Kyokai Kenkyujo, above n12, at 14. It is noted that an exception to this licensing activity are design rights which were not frequently licensed. This is seen as unusual in Japan despite the expected commercial importance of 'in house' industrial designs.

[67] Helfgott, above n19, at 235; Oda, above n29, at 249.

[68] The term was calculated from the date of publication of the application and can expire no later than 15 years after the date of application: see for example, Chen, above n32, at 499.

[69] Ono, personal communication. To some extent it also occurs outside of Japan: see Scherer FM, Ross D (1990) *Industrial Market Structure and Economic Performance*, Houghton Mifflin Company: Boston, at 624. Recent Japanese patent reforms do not appear to address judicial interpretation of patent specifications and so the narrowness of patent scope: Takenaka, above n47, at 1. Hence, this practice may continue.

may partly reflect the highly competitive nature of the domestic market in Japan. Another contributing factor is the practice of linking worker performance to the number of patent applications registered.[70] However, a plethora of rights can also increase the chance of infringement with the rights of a competitor which, in the context of litigation costs and a social climate that indirectly favours negotiation, can lead to out-of-court settlements involving the cross-licensing of information between firms. The time and money spent researching model applications and the monitoring of applications by rivals is increased as a result. In addition, there are costs to the Patent Office which must process numerous and possibly trivial applications. These costs could be at the base of support for the abolition of the utility model. It is also reported that the Japanese Patent Office may be hostile to the continued existence of the utility model.[71] The Office has apparently attempted to educate firms so as to reduce the number of trivial applications[72] and so the associated administrative costs.[73]

The administrative costs that are associated with small patent rights like the utility model are not limited to Japan. For example, the 'Franki Commission' Report[74] to the Australian government which recommended the adoption of petty patents, acknowledged that "strong opposition" to the proposal existed on the basis that "a petty patent system would add greatly to the burden of manufacturers of conducting searches to ensure that any proposed new product did not infringe any monopoly". These costs were not considered by Mandeville et al[75] in their economic review of the Australian patent system, although they concluded that it was too early to judge the success of the petty patent system, which was then three years old. More recently, Revesz[76] attributes

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[70] See Fujino J (1990) Understanding the Flood of Japanese Patent Applications, 15(6) *AIPPI J* 255.

[71] Noted by Fujino, ibid, at 256; Yamamoto, above n46, at 29.

[72] Chen, above n32, at 500; Kinmouth EH (1987) Japanese Patents: Olympic Gold or Public Relations Brass? *J Pacific Affairs* 173, at 184; Fujino, above n70, at 255.

[73] See Chen, ibid, at 500.

[74] Designs Law Review Committee (1973) *Report Relating to Utility Models*, Second Term of Reference, Parliamentary Paper No 121: Canberra, at 12.

[75] Above n13.

[76] Above n12, at 51-2.

a relatively low use of the Australian petty patent law to the short period of protection when the requirements are the same as patents, so that individuals still tend to opt for a standard patent. Revesz does not consider the processing costs of the petty patent for established businesses, nor to the Patent Office were the petty patents to become more popular. Further consideration of the costs that are associated with the construction and processing of utility models may need to be undertaken if this law is to be adopted.

(iii) Recent Reforms

Recent reforms in Japan[77] may speed the processing of patent and utility model applications by limiting the potential for claim amendments, so that the scope of the claim may not be increased nor new matter introduced, including amendments filed during an appeal.[78] An additional appeal under s122 of the Utility Model Law that was related to dismissed amendments has been abolished, although a general appeal remains under s121.[79] The recent patent guidelines require greater specificity where the claim is indefinite.[80] An additional 90 examiners and procedural reform could facilitate a reduction in the examination length.[81] The procedure is still essentially the same as for a patent, but it is now examined only for formalities: "[t]he subject matter must be directed to the form, structure or combination thereof of an article; the utility model must not contravene public order, morality or health; there should be unity of device; and necessary items should be described in the specification or drawings and the description should be definite." Further, a public appraisal report may be made only if requested.[82] The anticipated result is a decrease in the period in which a utility model

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[77] Effective from January 1, 1994.

[78] Yamamoto S, Leong M (1993) Amendments to the Patent and Utility Model Law - a Summary and Comment, 25 November *IP Asia* 25, at 25-6.

[79] Ibid, at 26.

[80] See Okuyama and Kaspar, above n49, at 103-4.

[81] Japan Patent Office, above n39, at 7.

[82] Yamamoto and Leong, above n78, at 27; see also Japan Patent Office (1994) *Examination Guidelines for Patent and Utility Model in Japan*, AIPPI: Tokyo, at 20-1.

can be registered from "several years" to an estimated six to nine months.[83] The utility model period has also been shortened from ten to six years, since by the time rights are assigned to such a small invention its "product life" or commercial utility may have terminated.[84] Responsibility for making an adequate search for evidence of prior art is given to the applicant, for if the utility model is invalidated during an infringement suit, the owner is presumed to have been negligent unless they can demonstrate that they made a vigilant search at the time of filing.[85]

The revision of utility model laws was supposed to increase the speed of processing by simplifying procedures and so to provide protection earlier. The reforms may succeed insofar as the limitations on the ability to amend a patent application may encourage applicants to file more accurate claims. This ought to make evaluation of the patent easier and relieve the surveillance burden to third parties.[86] It could be argued that by lowering the standard of examination and by the introduction of presumptive negligence where an infringement suit has been laid the Japanese Patent Office transfers more of the administrative costs of examination to the patentee if the model is subsequently invalidated. In addition, Yamamoto[87] suggests with regard to utility models that these measures will lead to an "unstable" right with a rise in the level of invalidation cases before the Patent Office and the courts. If so, the quality of utility model applications may decline and the number of publications' appraisals required to assess the model may increase, so that the claimed reduction of procedural delay may not eventuate. The reduction in the model period could then not be justified by any decrease in processing time so that returns to the inventor could decline. Indeed, Wegner[88] claims that the utility model registration will prove unpopular and that "Japan

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[83] Itoh, above n30, at 3, 4.

[84] Yamamoto, above n46, at 27-8; Wegner, above n50, at 93; Yamamoto and Leong, above n78, at 27; Japan Patent Office, above n82, at 22.

[85] Yamamoto and Leong, above n78, at 27.

[86] Yamamoto, above n46, at 28.

[87] Ibid, at 29.

[88] Above n50, at 93.

has used the latest revision in its law as a chance to *de facto* bury the utility model system". It therefore seems likely that the reforms will succeed only in hastening the decline in utility model applications. If so, this result would be consistent with the putative hostility of the Japanese patent Office to the model law, noted above.

In short, utility models could benefit the development of industry, particularly in developing countries, through the protection of small inventions and so avert market failure in the further production of information of use to that industry. However, given that the subject-matter of, and the criteria thresholds for, models are not too different from that of patents, this advantage may be outweighed by the administrative costs associated with the establishment and protection of those rights. More evidence is required before it can be said that the adoption of a utility model law in New Zealand would be worthwhile.

II(b) *Trade Secrets*

(i) Purpose

In Japan, trade secrets have gained specific protection under the Unfair Competition Prevention Act (UCPA) amendment of 1990.[89] Like the obligation of confidence in New Zealand, the Japanese trade secret law is comprised of a claim-right and duty of exclusivity, a power and liability of transferability, and a claim-right and duty of enforceability. However, the Japanese trade secret statute confers a broader claim-right of exclusivity than the common law of confidence as the claim-right is not dependent upon the actual transfer of information and so exists *in rem* rather than *in personam.*[90]

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[89] Law No 66 1990: Doi T (1992) *Intellectual Property Protection and Management: Law and Practice in Japan*, The Institute of Comparative Law, Comparative Law Study Series No 19, Waseda University: Tokyo, at 76; A more recent amendment in 1994 does not affect the trade secret protection apart from clarifying the purpose of the law: see Rahn G, Heath C (1994) What is Japanese About the Japanese Unfair Competition Act? 25(3) *IIC* 343, at 352.

[90] Cf the protection of trade secrets under the obligation of confidence, at 1.46.

Prior to the amendment involving trade secrets, cases were almost non-existent.[91] A commonly stated reason for the codification of the trade secret law is to assist the prosecution of infringement litigation and so have a deterrent effect for potential misuse. Dratler[92] states that "[i]n a multinational environment lacking robust and uniform protection of trade secrets, technology transfers may receive no compensation or may languish for fear of piracy" and that the "[l]ack of legal protection for these innumerable little steps of invention", may cause investment funds to flee, employees to be demoralised, and industrial espionage to increase". In practice, the amendment was promulgated in anticipation of the perceived international trend toward greater statutory protection of trade secrets[93], in which American pressure has been of particular importance.[94] It is not surprising that the definition of trade secrecy in the Japanese law substantially reflects that of the American Uniform Trade Secrets Act (UTSA) 1979.[95]

Both the American and Japanese laws define a trade secret as commercially valuable information which has been deliberately and successfully kept secret from the public. The American definition of commercial utility is a little more strict, requiring independent economic value of the secret.[96] The Japanese law also has a more strict definition of deliberate secrecy, as intention is not sufficient which implies that procedural safeguards ought to be implemented.[97] A prime purpose of the trade secret

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[91] For a discussion of these cases and the previous law, see Doi T (1980) *The Intellectual Property Law of Japan*, Sijthoff and Noordhoff: Alphen aan der Rijn; Dratler J (1989) Trade Secrets in the United States and Japan: A Comparison and Prognosis, 14 *Yale J Int Law* 68; Tarr, above n31.

[92] Ibid, at 71, 77.

[93] Doi, above n89, at 90-1; Svetz HE (1992) Japan's New Trade Secret Law: We Asked for It Now What Have We Got? 26(2) *Geo Wash J Int L & Econ* 413, at 421-4; see also the extension of copyright law, discussed at 7.09.

[94] Svetz, ibid, at 421-425.

[95] For a review, see Doi, above n89; Svetz, above n93. By 1992, the UTSA had been adopted by 36 American states, while four more had adopted variants: Svetz, ibid, at 418.

[96] See Doi, above n89, at 82; see also Svetz, above n93, at 426.

[97] See Doi, above n89, at 83-4.

amendment is to introduce an injunctive remedy in addition to damages[98], so that anticipated disclosure of information may be sanctioned.[99] This includes unfair acts[100] and unfair competition[101] as well as third party liability where there has been a prior misuse resulting from either of the above.[102] Hence, the situation which led to the *Deutsche Werft AG v Waukesha Chuetsu Yugen Kaisha*[103] case could not now arise. There, a Japanese third party was allowed continued access to technology in violation of a licensing agreement between the plaintiff and its American licensor.[104] In addition, the statutory authority to award damages for trade secret misappropriation is now also clearer.[105]

(ii) Trade Secret Litigation

Considerable opportunity now exists for litigation. Disputes may occur over whether the trade secret has become extinct (ie if it has not been used in the three years following the detection of the wrong), or where ten years have passed since the wrong was committed.[106] Judicial discretion is required, for example, to determine if competition using a trade secret has been unfair, if third parties were more than negligent in their receipt of the secret, or were *bona fide* purchasers, or if any of the

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[98] Ibid, at 77.

[99] An injunctive remedy may be a form of recognition that the life-time employment practices have declined and with it the employee loyalty which made such sanctions unnecessary: Doi, ibid, at 90; Svetz, above n93, at 425, discussing a report by MITI.

[100] Under art 1(3)(i), unfair acts include "theft, duress or other unfair means": Doi, above n89, at 78.

[101] Under art 1(3)(iv), an entrepreneur who holds a trade secret is entitled to enjoin "[a]n act of using the trade secret shown by the holder for the purpose of doing unfair competition or other act of making unfair profit or inflicting an injury upon the holder or an act of disclosing it for such purpose": quoted in Doi, ibid, at 78.

[102] See Svetz, above n93, at 420, 429.

[103] [1966] 646 Hanji 34.

[104] Doi, above n91, at 88-90; Svetz, above n93, at 429-30.

[105] Svetz, ibid, at 434.

[106] Art 3; Doi, above n89, at 81.

defendants in an infringement case exercised another valid intellectual property right.[107] In spite of these opportunities, disputes usually focus upon whether the information is actually secret.[108] In the period from 15 June 1991 to March 1993 there were 27 cases involving trade secrets.[109] Of the 27 cases filed, two had been decided, two settled, one withdrawn, and the remainder were still pending.[110] This represents a significant increase in the incidence of trade secret litigation, but these cases do not reflect the number of trade secrets which are traded or disputed.[111]

The lack of criminal sanctions for the misuse of trade secrets may be argued to deter some litigants.[112] Doi[113] for example, has called for the preparation of penal provisions. Dratler[114] also suggests that criminal sanctions for trade secret misappropriation may be ineffective unless the corporation is fined at a level greater than the value of the secret as the misappropriator may still "wrest control of the direction of technology from the innovator's hands" so that the trade secret owner may lose the "headstart" profits from being the first onto the market. However, when a dispute over intellectual property does go to court, defendants tend to plead guilty.[115] Furthermore, a pertinent observation is that the nature of trade secrecy is so vague,

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[107] See art 1(3), art 2(1), art 6: Doi, ibid, at 77, 78, 80.

[108] Ono, personal communication.

[109] Senate Commercial Committee Report (1993) 126th sitting of the Diet, minute number 5, at 4.

[110] Ibid.

[111] Stewart, personal communication.

[112] The criminal provision of the UCPA does not apply to trade secrets. Criminal sanctions are only possible under the criminal code: Doi, above n89, at 81; Amemiya and Guttman, above n30, at 14.

[113] Ibid, at 89.

[114] Above n91, at 98.

[115] Japanese Prosecutors' Office (1992) *Yearly Statistics of the Prosecutors Office*, Japanese Government: Tokyo. It should be noted that these figures were based on trademark, unfair competition, and copyright cases only, as the number of cases that concerned patents and utility models were negligible: ibid.

Since this outcome is at variance with the 50 percent hypothesis, it suggests that there are asymmetric stakes between the plaintiff and the defendant. This hypothesis is that, with equal stakes, the plaintiff and defendant should each have a 50 percent chance of success in court: see Priest GL, Klein B (1984) 13 *Journal of Legal Studies* 1-55.

encompassing widely different information such as patentable and sub-patentable trade secrets, business secrets such as customer lists, and experimental data, that proof of misappropriation is more difficult than that of patents or utility models and so the use of criminal sanctions where there is such a potential for miscarriage of justice could be viewed as unjustified. If a public prosecutor were to take a trade secret case[116], it could signal that the strength of evidence was enough to make a loss likely for the defendants, who may then seek to negotiate out of court.[117] Moreover, the damage of a civil conviction to the guilty party's business reputation may act as an adequate deterrent.

The lack of *in camera* proceedings has been suggested as a deterrence to litigation because plaintiffs do not want their secrets to be publicly disclosed in court.[118] Indeed, the Japanese constitution requires that all trials be open to the public unless the publicity would be dangerous to public order or morality.[119] The problem was recently confirmed in a decision of the Tokyo High Court.[120] Svetz[121] suggests that the risk of disclosure of a secret is lessened by the absence of pretrial discovery procedures in the Japanese system. However, even *in camera*, the secret would still be disclosed to a competitor and the forum can never be entirely secret, a problem which exists in other countries. It is likely that the 27 trade secret cases filed 1991-3 would have only been of minor commercial importance[122], so that *in camera* proceedings

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[116] Note that prosecutions are discretionary, not mandatory: see BJ George (1988) Discretionary Authority of Public Prosecutors in Japan, in: Haley JO (ed) *Law and Society in Contemporary Japan: American Perspectives*, Japanese American Society for Legal Studies, Kendall/Hunt Publishing Co: Dubuque, 263, at 265-6.

[117] Insufficient evidence to proceed was used as a reason not to prosecute in approximately 12-15% of non-prosecution cases 1976-1982: ibid, at 269. This feature, in addition to the social tendency in favour of negotiation may partly explain why patent and utility model criminal sanctions are used infrequently.

[118] Svetz, above n93, at 437.

[119] A written report of the proceedings must be filed and so published: see Civil Code 265; Amemiya and Guttman, above n30, at 13.

[120] 24 September 1991, 769 Hanrei Times 280: cited by Rahn and Heath, above n89, at 357; cf American measures under the UTSA: Svetz, above n93, at 435-6.

[121] Ibid, at 437.

[122] Ono, personal communication.

would make little difference to either the quantity of litigation or commercial value of the information litigated. If litigation proceeds it seems likely that secrecy will have been already destroyed, or will be unless litigation is not undertaken, so that the plaintiff has little to lose through disclosure in court. Arbitration could then be favoured as the dispute can be heard in private and the record kept secret[123], although the equally secret process of negotiated settlement may be employed.[124]

If the criminal sanctions were not imposed because of the difficulty of proof, and if litigation is costly because of the loss of secrecy, whether held *in camera* or not, then the low incidence of trade secret litigation may not be due to the clarity and predictability of the legal rules, as is posited above. It may be that unless the conduct in question is illegal and there is conclusive physical evidence for it, litigation may be potentially so lengthy and costly that it is not deemed to be worthwhile.[125] This outcome is also likely given the Japanese cultural norms under which negotiation is favoured. Hence, the Japanese trade secret law allows a greater power to take court action for trade secret misappropriation than before, but its use may remain as a rare course of action as a proportion of the total number of disputes. The adoption of the trade secret law in Japan probably owes more to American political pressure than to the overwhelming merits of the legislation. Therefore, the suggestion by Svetz[126] that the trade secret law in itself should encourage more licensing by Japanese companies of US technology, with consequent financial benefits may be over-optimistic. From this preliminary discussion, more evidence on the benefits of trade secret law is required before the action for breach of confidence is replaced with a statutory trade secret law in other jurisdictions, including New Zealand.

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[123] Amemiya and Guttman, above n30, at 13.

[124] For a discussion of these terms, see 4.05.

[125] As noted above.

[126] Above n93, at 443.

III *Price Discrimination*

When there is a dispute over intellectual property rights, Japanese firms typically enter into negotiations to avoid the social and economic costs of prolonged disagreement. A dispute is likely because of the narrowness of patents and utility models in Japan.[127] In part, this is a consequence of the narrow interpretation of claims by the Japanese Patent Office that favours public access to information. For example, in *HB Planning Co*, above, it was reported[128] that the inventors had narrowed their patent specifications to avoid a rejection by the examiner to the extent that it no longer covered information which they had previously licensed. The Japanese Supreme Court held that the defendants could not be bound to a verbal contract to respect specifications which were no longer proprietary, especially where third parties could freely use the information.[129] Their decision was based on the public policy to encourage equal access to information.[130] This policy, combined with the acceptance of patents which are narrow in scope, could encourage applications. Certainly, large companies may file hundreds of patent and/or utility model applications relating to a single invention and which may differ only slightly from each other, as noted above.[131] However, in practice this may lead to an overlap with the rights of a rival and so infringement. Following a dispute and negotiation, the typical result is that all the rights to that invention are licensed together in an out-of-court settlement[132], at least between Japanese parties; some foreign firms may object to the mass licensing of their

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[127] Helfgott, above n19, at 234.

[128] Fujino, above n65, 124-5.

[129] Ibid.

[130] Ibid, at 124-5; For another example of a strict interpretation of claims, see the decision of the Japanese Supreme Court in *Director-General of the Patent Office v Boehinger Mannheim GmbH* (1991) 62 Gyo-Ke 3.

[131] Fujino, above n70, at 256, also notes that reductions in the number of patent applications under Patent Office directions tended to be heeded by leading firms.

[132] Ono, personal communication.

inventions.[133] Indeed, this practice has led to accusations that the 'flood' of narrow Japanese patents is a strategy for the acquisition of significant new technology.[134]

In theory, mass licensing may have been adopted in Japan because it costs less than price discrimination with those rights. These costs arise from identifying and enforcing the barriers to resale, which may be prohibitive when there are hundreds of rights to the same invention. Enforcement costs include the financial and social costs of a prolonged dispute. It is a gain for businesses to escape these administrative costs, and for society if the Patent Office and judicial system are not so burdened. It is also consistent with the Japanese propensity for negotiated settlements.

The outcome of mass licensing is that Japanese firms are able rapidly to acquire and utilise the most recent inventions. This in turn fuels competition, particularly in the Japanese domestic market. In other words, the Japanese appear to have opted to shift the position of rights away from the monopolistic boundary of the intellectual property rights continuum through competition, not price discrimination. Inherent in this approach is a judgment that the benefits to the economy and society from this form of competition and the rapid dissemination and utilisation of information outweigh the costs. The benefits which accrue from this competition may include the so-called 'life-time employment' policy. A problem may be market failure in the creation of new information, although this may be masked by the importation of technology. Other costs include the monopolistic restrictions on access to entering the legal profession, delays, and so high enforcement costs, all noted above, in which the legal profession are accomplices. The outcome is a lower level of public participation in the legal system as compared, presumably, with the common law jurisdictions. Of course, it may be argued that high enforcement costs facilitate efficient economic organisation, since it has been suggested that cases in which there are small disagreements about the probabilities of the outcome are more likely to be settled out of court.[135]

In contrast, when the competitive approach is impossible, and particularly when

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[133] See for example, Spero DM (1990) Patent Protection or Piracy - A CEO Views Japan, September-October *Harv Bus Rev* 58.

[134] Ibid.

[135] See for example, Gould JP (1973) The Economics of Legal Contracts, 2(2) *J Leg Stud* 279, at 296.

foreign companies are involved, then price discrimination may be practised in Japan. An example, appears to be the so-called second indication patents.[136] According to Matsui[137], second indication "means novel medical efficacy discovered (invented) in a compound which was known not only as the compound itself but also as having another medical efficacy". Second indication patents for two novel products are possible in Japan where the second was "not obvious based on the known medical indications of the same compound", and may be filed even after the first patent application has been issued.[138] A second indication patent would appear to be a claim that has been 'recasted' to permit protection, given that neither the American claim to the treatment of a patient, nor the European "use-type" claim are allowed in Japan.[139] A second use of the same medical invention could be sold in tablets with different uses and dosage for different markets.[140] The first case concerning a second indication patent was recently decided in the Tokyo District Court: *Sandoz AG v Kowa Yakuhin Kogyo KK and Others.*[141] It is not clear if the compound in question, which had both a prophylactic and therapeutic use for the treatment of allergic asthma, was to be sold at different prices, but the potential existed for price discrimination between use-markets. The Court could not distinguish the second use of the compound from other uses, particularly as the defendants did not make such a distinction in their process of manufacture or sale.[142] The Court did not appear to formulate the issue as such, but the compounds and the markets were not sufficiently separate. The consumers could purchase either product so that the defendant's product infringed upon the plaintiff's

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[136] Further opportunities exist for price discrimination according to the terms of the information licences, depending of course on their legality under anti-trust law.

[137] (1993) Report of Infringement Litigation Case of a Patent Granted on a Pharmaceutical Preparation to Prevent Allergic Asthma, 18(2) *AIPPI J* 3, at 3.

[138] Ibid, at 3, 4.

[139] Ibid.

[140] Ibid, at 5.

[141] (Unreported, 23 October 1992) Civil 129th Department (Case No 12094/1990): reviewed by Matsui, ibid.

[142] Ibid.

patent. The result was competition between the parties in breach of patent law. It also destroyed the potential for the plaintiff company to gain the second indication patent itself and to practise price discrimination in those markets.[143] The defendants might have had more success in the Court had they been able to adjust the dosage and price of the second indication patent to match more closely the differences in the requirements of their second market.

It is interesting to consider the effect that an under-appreciation of the domestic competition within Japan and its acceptability may have on outside observers. The unwillingness of foreign companies to adopt Japanese licensing practices and concern over legal costs, noted above, may lead to suspicion of conspiracy. However, Japanese firms cannot be expected to be concerned that the 'Japanese way' is not everybody's way, or that they are profitable at the expense of their competitors. On the other hand, to simply blame the nature of the Japanese legal system on the traditional preference for negotiated settlements may be to underestimate the acceptability of the competitive advantages which accrue from it and which contribute to the survival of such behavioural norms.

From the reluctance of some foreign firms to adopt Japanese licensing practices, it seems reasonable to suggest that the acceptability of Japanese mass licensing may not be exported to New Zealand, nor other common law jurisdictions. The New Zealand public may not welcome a rise in litigation costs; it may be contrary to New Zealanders' expectations of a legal system and so their legal culture. Hence, the Japanese competitive approach through the mass licensing of intellectual property rights may never be adopted in New Zealand.

Conclusion

From this preliminary review, it may be argued that Japanese society has two options regarding the intellectual property rights under consideration: competition

[143] Of course, a Japanese company might have widely licensed a second indication patent so that competition resulted. However, where a foreign company is the plaintiff, as in this case, the potential for price discrimination cannot be ruled out.

through mass licensing and price discrimination through the bundling of rights. Despite the existence of trade secret, utility model and patent laws and so the potential for price discrimination, it appears to be more expensive an option than competition. Indeed, the Japanese practice of negotiation of mass licenses of the intellectual property rights to an invention may hinder price discrimination on a wide scale. Rare incidents of price discrimination are still possible, however, depending on the licensing law. The outcome is that competition between the licence recipients may shift the position of the intellectual property right on the intellectual property rights continuum away from the monopolistic boundary. Consequently, under Japanese legal practice, the monopolistic pricing of information under intellectual property rights is less likely than in common law countries.

In addition, the justification for the wider adoption of utility model and trade secret statutes is not clear. The acceptability in New Zealand of the costs of the competitive approach that is taken in Japan may be insufficient for this approach to be adopted. Neither the utility model nor trade secret laws *per se* appear to be valuable. The advantage of an incentive for small industry under the utility model law may be balanced by administrative costs to other firms and the Patent Office. The value of trade secret law may also be doubted, particularly as there is difficulty of proof and as the threat of loss of secrecy may deter litigation. Further evidence in favour of either law is required before their adoption in New Zealand or elsewhere can be recommended.

CHAPTER FIVE:
Patents of Improvement

PATENTS OF IMPROVEMENT

Sub-patentable trade secrets may have insufficient natural lead time before they are acquired by others, particularly if commercially valuable. Hence, inventors are unable to gain a sufficient return on their investment, harming their natural rights and leading to market failure. Widening the patent law may not be a solution, as patents can have equally harmful effects. In this Chapter, a proposal is made to introduce a patent of improvement (PI) in addition to the existing patent law. The PI would protect (presently) sub-patentable trade secrets, so that the size of the return to the inventor is increased. However, its use could also lead to product differentiation and price discrimination, so that the potentially negative effects of a patent right may be avoided. In the long term, the cost and risk of research could decrease so that the pattern of research and development could evolve into a series of improvements. This may benefit small and large, emerging and established enterprises alike.

In Chapter Two, it was argued that intellectual property rights are justified both on legal and economic grounds in New Zealand and in other common law jurisdictions. In the legal tradition of natural rights, inventions are protected because these represent the individual liberty of inventors as expressed through their creative effort. There is also an economic argument which stresses the need to reward invention so that the inventors can recoup a sufficient return on their investment and hence under-production of information and market failure are avoided. The problem is that these rights can create market imperfections because the right-holder is able inefficiently to lower output and raise price, as in any monopoly. Price exclusion of a segment of society results in the under-utilisation of that information and so ultimately under-production of further information. It can also lead to a conflict of rights by impinging on the natural right of others by restricting, in effect, their right of access or privilege to purchase information. Thus, there are two boundaries to the intellectual property rights continuum, the anarchistic boundary, beyond which there is an absence of rights, and the monopolistic boundary, beyond which the problems created by those rights are greater than the benefits. Between these boundaries the different intellectual property rights are positioned on an intellectual property rights continuum according to their economic

effects.[1]

As a consequence of the analysis in Chapter Two, sub-patentable trade secrets were identified as being the most at risk of market failure and thus as warranting additional protection. Sub-patentable trade secrets may not be novel nor inventive enough to gain patent protection, yet may be commercially valuable, and so easy to appropriate, that the inventor may not be able to gain a sufficient return on their investment. Hence, sub-patentable trade secrets may be said to have an insufficient natural lead time[2], so that their position may be closest to the anarchistic boundary of the continuum. However, if additional protection were to be successful, including the protection against industrial espionage proposed in Chapter Three, all that would be gained would be a shift of the trade secret right from the anarchistic boundary of the intellectual property rights continuum to the other monopolistic extreme. Indeed, market imperfections may be associated with patentable trade secrets[3], and so may be problematic. The aim then is to find a mechanism of protection which will avert market failure, yet not result in market imperfections; that is, to find the least inefficient balance between the two extremes of the continuum.

In this Chapter, an additional intellectual property right is proposed which, it is suggested, will provide further protection for sub-patentable trade secrets and yet simultaneously reduce the harmful effects of the patent monopoly, when these occur: the patent of improvement (PI).[4] This proposal has the advantage of modifying the effect of the existing patent system without unduly disturbing that law. PI could be awarded for an improvement to the information which is protected by a patent, but the application of which is limited to a portion or sub-market which is covered by that patent. Hence, a PI could be used to protect sub-patentable trade secret and avert market failure. The result would be that sub-patentable trade secrets are shifted away from the

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[1] See 2.16-2.17.

[2] See 2.19.

[3] See 2.18-2.19.

[4] Hereafter, the abbreviation PI will be used to denote a patent of improvement so that the term 'patent' will solely be used to refer to a standard patent. A 'patent-PI system' refers to the combination of patents of improvement in addition to the existing patents.

anarchistic boundary toward their least inefficient position on the continuum. It could also result in a form of product differentiation that would lead to competition within the sub-market in question, or possibly facilitate price discrimination. As a result, patentable trade secrets and patents would be either shifted away from the monopolistic boundary through competition toward their least inefficient position, or their harmful effects may be reduced through price discrimination.

In Part I, existing laws which serve as partial models for the PI are reviewed. In Part II, the PI proposal, and the effect of product differentiation and price discrimination, are considered. Finally, in Part III the potential sources of support for the adoption of PI are outlined.

I *Origins of Patents of Improvement*

The concept of patents of improvement, although innovative overall, is partly influenced by four existing features of the patents system: the patent itself, patents of addition, compulsory licences, and the United States doctrine of reverse equivalents. Patents constitute a well-established, but potentially flawed system, that can be adapted to permit improvements.[5] Indeed, patents of addition are a precedent for an additional type of patent that co-exists with standard patents, and concerns improvements. Compulsory licences are a means of overcoming the slowing of the information dissemination by right holders and so are a precedent for intervention to reduce the identification and enforcement costs of voluntary exchange.[6] The doctrine of reverse equivalents is a precedent for an immunity from patent infringement for improvements.

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[5] On the subject of the harmful effects of intellectual property rights, including patents: see further the discussion in 2.10-2.15.

Utility models are not a basis for PI as these represent small patents rather than improvements and may suffer from the same inefficiencies as the patent system. Moreover, there may be some difficulty in distinguishing a separate threshold of patentability for utility models: see further 4.08.

[6] On the subject of identification and enforcement costs: see North DC (1995) *Institutions, Institutional Change and Economic Performance*, Cambridge University Press: Cambridge, at 27.

5.04

I(a) *Patents of Addition*

A fact which may easily be overlooked is that there are two types of patents that are possible. Apart from the standard patent there is a second, the patent of addition (PA). The justification for the PA is that invention is not a static event which ceases with patenting and sale, but is a dynamic and evolutionary process of development that may continue after a patent is granted.[7] In view of the continuing nature of research, the French adopted a *certificat d'addition* in 1844 for variations on the information developed subsequently by the patentee. These *certificats* were later included under Article 4 in the Paris Convention (1883) and subsequent revisions, where these were also named patents of addition or improvement patents, depending on the wording of the law in each member country.[8]

Patents of addition have the same criteria as have patents, but the addition typically incorporates information that is already patented.[9] The patent of addition only applies to information which comprises the addition, not the original information. Hence, the patentee cannot artificially extend their patent monopoly by referring to later applications.[10] As a result, a PA with multiple priorities can last no longer than the patent, yet is considered separate from it. When the addition is made in the year following the first filing prior to the international filing under the Paris Convention, the addition/s may be combined with the main patent for that international filing.[11]

In Part II, an alternative to the PA is considered whereby improvements to the patent which are made by someone other than the patentee may be patented in a small patent: a patent of improvement (PI). Patents of addition would remain, but they would be limited to the revision of a patent by the original patentee within a year or so of first

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[7] See for example, Beier F-K, Moufang R (1990) Convention Priority for Improvement Inventions and Patents of Addition, 21(5) *IIC* 593, at 594; Wegner HC (1992) Filing Patents for Evolutionary Inventions Abroad: Pitfalls under the Paris Convention, 23(2) *IIC* 184, at 184.

[8] Beier and Moufang, above n7, at 594, 600. In New Zealand, the term is 'patents of addition': see s34 Patents Act 1953.

[9] Ibid, at 595.

[10] Ibid, at 605-6.

[11] Wegner, above n7, at 185.

filing, depending on the law in each country. A PA could also be used by the improvement-maker to revise their PI application within a similar period.

I(b) *Compulsory Licences*

Provision exists for compulsory licensing under Article 31 of the recent Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)[12], where members to the agreement may authorise non-exclusive and non-assignable use provided that the right holder is paid "adequate remuneration".[13] In some countries this could include a compulsory non-exclusive licence for a patent upon which the improvement has been made, provided that the patent has not been worked for a set period.[14] In theory, the greater the rents from an intellectual property right, the more applications for compulsory licence could be attracted. If granted, the ensuing competition could shift the position of the right away from the monopolistic boundary of the continuum. Hence, compulsory licensing could be advantageous as a means toward achieving the least inefficient position for a right.

However, compulsory licences are seldom employed.[15] Compulsory licences have proved costly, as the negotiation and litigation costs may be higher than the returns gained and the royalty may be too difficult to assess fairly. A patent owner may not want to license their information to competitors who have made a significant

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[12] World Trade Organisation (1994) Agreement on Trade Related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods, 47(1162) *BNA's PTCJ* 230, at 237.

[13] See also ss46-54 Patents Act 1953 (NZ). Under s46, the High Court may award a compulsory licence that secures "reasonable remuneration" for the inventor.

[14] For example, in Japan the period is three years without continuous use: Wineberg A (1988) The Japanese Patent System: A Non-Tariff Barrier to Foreign Businesses? 22(1) *J World Trade* 11, at 19.

[15] This was noted, for example, in submissions to the recent review of the New Zealand Patents Act 1953, although the provision remains; see also Cornish WR (1989) *Intellectual property: Patents, Copyrights, Trademarks and Allied Rights*, 2nd ed, Sweet & Maxwell: London, at 205, 208; Brown A, Grant A (1989) *The Law of Intellectual Property in New Zealand*, Butterworths: Wellington, at 538; Revesz J (1994) *The Economics of Patents*, Bureau of Industry Economics, Occasional Paper 18, Australian Government Publishing Service: Canberra, at 46; Merges RP (1994b) Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents, 62(1) *Tennessee L Rev* 75, at 105.

improvement which is more valuable than the patent. Indeed, the patent owner may attempt to "hold up" further development in order to consolidate their monopolistic profit. One way to hold up licensing, that is suggested by van Melle[16], is when the competitor does not specify a price, which would allow a "constructive" refusal to license by excessive pricing. However, even if a price is specified, the information owner can still hold up negotiations though asking an excessive price. This tactic could lead to an increase in enforcement costs for the prospective licensee who may have to resort to legal action to obtain a licence.[17] However, the courts may also have difficulty valuing the relative importance of the parties' input and the commercial value of the information.[18] Much of the commercial value that is assessed will depend on each firm's prediction of the future market for their information, which in turn depends on the firm's experience. Hence, the determination of a royalty is a highly subjective process and the outcome is uncertain.[19] Consequently, in theory, licensing may not be initiated because it may be difficult and expensive to negotiate for the first licensee relative to subsequent competitors who 'free ride' on that earlier expenditure. If these costs did not exist and the compulsory licensing scheme did become common, as advocated by Talley[20], potential licensees might 'hold out' from negotiation in order to obtain a more favourable compulsory licence. That outcome would be no more desirable than the existing practice where the patent owner 'holds out', as above. Alternatively, patents of improvement, discussed below, could operate in lieu of a system of compulsory licensing and without the same costs, but sharing that system's goal of disseminating information.

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[16] (1995) Competition Law and Refusals to License Intellectual Property, *NZLJ* 318, at 319.

[17] See Merges RP, Nelson RR (1990) On the Complex Economics of Patent Scope, 90(4) *Colum L Rev* 839, at 865-6, 874. It may also amount to an abuse of a dominant position under s36 of the Commerce Act 1986 (NZ): see van Melle, above n16, at 318-9.

[18] Merges, above n15, at 99, referring to Scherer.

[19] Ibid, at 99-100.

[20] (1994) *Property Rights, Liability Rules and Coasean Bargaining Under Incomplete Information*, John M Olin Program in Law and Economics, Working Paper No 114, Stanford University: Stanford.

I(c) *The Doctrine of Reverse Equivalents*

The essence of the United States equitable doctrine of reverse equivalents is that improvement-makers can gain an *immunity* from liability for patent infringement if the improvement represents a significant technical advance. Merges[21] calls such advances "radical improvements". In the United States, the doctrine was established in 1898 by the decision of the Supreme Court in *Westinghouse v Boyden Power Brake Co.*[22] Westinghouse patented a train brake which was significantly improved by Boyden to the extent that it would not have been a commercial success without the improvement. The Court found that although the improvement was literally covered by the patent, the defendant was absolved from infringement.[23] Recently, the doctrine was invoked in *Scripps Clinic and Research Foundation v Genentech Inc*[24] because Genentech's recombinant Factor VIII:C blood clotting protein used for the treatment of haemophilia was held to be more commercially significant than the plaintiff's patent for the purified natural protein. It was found that the purpose of this equitable doctrine is "to prevent unwarranted extension of the claims beyond a fair scope of the patentee's invention".[25] Judge Newman found that the issue required trial and stated:[26]

> Application of the doctrine requires that factors specific to the accused device are to be determined and weighed against the equitable scope of the claims, which in turn is determined in light of the specifications, the prosecution history and the prior art.

In the absence of this doctrine, the improvement-maker may be too hesitant to disclose their improvement to the patent owner, as with any trade secrets. Alternatively, the improvement-maker may gain a patent for the *improvement only* so that their

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[21] Above n15, at 79.

[22] 17 US 537, at 537-8.

[23] See the review by Merges, above n15, at 92.

[24] 927 F2d 1565 (1991).

[25] Ibid, at 1581, per Newman J.

[26] Ibid, at 1581.

bargaining position is also weak, because the patent owner may then withhold permission to use the patented information on which the improvement is based. Hence, the patent owner is in a position to block the improvement and so gain a larger share of the cumulative surplus that accrues from it. With a radical improvement the gains at stake may be so large that an impasse results.[27] However, Merges[28] suggests that the doctrine is a useful threat that may serve as a bargaining tool for the improvement-maker and so facilitate licensing. Merges considers this form of negotiation to be cheaper than judicial resolution and consistent with the "patent system's favouritism toward voluntary licensing".[29] More importantly, if radical improvements are exempted from patent liability under this doctrine competition between the patent and improvement owners would result. Hence, the patent right in question would shift further away from the monopolistic boundary towards its least inefficient position.

Merges favours a vigorous enunciation of the doctrine by the courts in "important cases involving pioneers and key improvers in all fields"[30], so that he treats those efficiency gains as a normative goal. Thus, following Merges, it is tempting to attribute the rare invocation or application of this doctrine to the success of the threat or uncertainty of court intervention. Another interpretation is that this invocation rate is related to the difficulty, which Merges may underestimate, of valuing the improvement. Most cases do not involve clearly valuable or radical improvements, so that the courts may have difficulty evaluating the relative importance of the input by the patent owner and improvement-maker and its expected commercial success. In that case, the courts may not have enough information on which to base the imposition of the doctrine of reverse equivalents. Therefore, it is possible that many radical improvements and borderline cases go unprotected under the doctrine. Further, according to Cooter and

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[27] Merges, above n15, at 87, gives examples from the iron and electronics industries to show that impasses can be long and costly for all parties and society.

[28] Ibid, at 94.

[29] Ibid, at 76.

[30] Ibid, at 76.

Marks[31], legal action arises from the persistence of uncertainty. If so, then the persistence of legal action without reference to the doctrine of reverse equivalents, could indicate that it is ineffective as a threat, other than where the value of the improvement is obvious. Indeed, unless the significance or expected value of the improvement is obvious, then the utility of the doctrine could be limited.

The alternative is to look for an institutional mechanism to divide the gains of incremental invention. For this form of approach, Cooter and Marks[32] propose 'Hobbes' Theorem':

> Private bargaining to redistribute external costs will not achieve efficiency unless there is an institutional mechanism to dictate the terms of the contract for dividing the stakes.

However, this mechanism cannot include the courts who are already found to have imperfect information on which to make a decision. It is therefore possible to take an even more pessimistic view than Cooter and Marks[33], such that any division of the gains from an improvement is problematic. However, the immunity to patent liability under the doctrine of reverse equivalents may serve as a useful precedent that could be used to encourage the creation of improvements, and is adopted in Part II.

II *Patents of Improvement*

The first consequence of adopting patents of improvement (PI) would be to provide a legal barrier for the protection of trade secrets that do not reach the standard of patentability under the existing patent law.[34] Thus, PI could be a means by which market failure in improvements could be averted and the natural rights of the inventors

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[31] (1982) Bargaining in the Shadow of the Law: A Testable Model of Strategic Behaviour, 11 *J Leg Stud* 225, at 226.

[32] Ibid, at 243.

[33] Their use of efficiency as a normative goal is also questionable: on this subject, see 2.27-2.28.

[34] This could complement the general protection of secrets, including sub-patentable trade secrets, under the industrial espionage law which was proposed at 3.40-3.41.

recognised. PI would differ from patents of addition by being open to applications by others as well as the patent holder by virtue of an immunity from infringement. Second, PI, like compulsory licences and the doctrine of reverse equivalents, could be used to reduce market imperfections. This, however, could be achieved without the improvement-maker paying a royalty for the use of the patent, so that the identification costs that are associated with the doctrine of reverse equivalents may be avoided.

II(a) *The Protection of Sub-Patentable Trade Secrets*

(i) PI Criteria

In Chapter One, the combination of legal-economic behavioural relations which constitute an intellectual property right were introduced. Each right exists between two parties and concerns an act-description, which relates to the information protected, and so in practice to the patent criteria.[35] There are three legal-economic relations common to each intellectual property right; the claim-right and duty of exclusivity, the power and liability of transferability, and the claim-right and duty of enforceability. In addition, there are threshold criteria which are specific to individual rights. The criteria of the PI would include commercial utility, novelty and inventiveness, as in any patent[36], but the standard of inventiveness may be lower, given that part of the information has already been patented. Consequently, an improvement need not meet existing patentability

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[35] See further, 1.29.

[36] Under art 27 of TRIPs, inventions must be "new, involve an inventive step and are capable of industrial application". These criteria are not included under the New Zealand Patents Act 1953, which instead refers to a definition of invention:

> "Invention" means any manner of new manufacture the subject of letters patent and grant of privilege within section 6 of the Statute of Monopolies and any new method or process of testing applicable to the improvement or control of manufacture, and includes an alleged invention:

However, under s21 of the Patents Act, a patent may be opposed on the grounds of what amounts to lack of novelty and inventive step. Furthermore, the Ministry of Commerce has proposed that this definition be repealed and patentability determined according to the three criteria of commercial utility, novelty and inventive step, with which the existing definition is thought to be broadly equivalent, and that are accepted internationally: see Ministry of Commerce (1992) *Reform of the Patents Act 1953*, Ministry of Commerce: Wellington, at 6-8. Therefore, these criteria are adopted in this discussion in anticipation of this reform.

thresholds and so could be used to protect what are currently sub-patentable trade secrets.

Commercial utility of an improvement may be difficult to disprove as for any invention.[37] The improvement-maker may be granted an immunity against anticipation by the patent claim, although not against anticipation because of earlier use or publication of that improvement. The PI standard of inventiveness would be lower than that of the patent to create a two tier system of patents. The origin of this dual standard lies in the differing treatment of biotechnological trade secrets in England and the United States. The problem is that the biotechnology industry generates many rapid small advances which utilise known methods and/or products and so are sub-patentable and have few technological barriers to being copied.[38] The English approach in key biotechnology cases has been to apply a strict interpretation of the existing patent law so that the information is considered at an earlier stage of invention and the threshold of inventiveness or non-obviousness is harder to attain than in American cases.[39] The English approach to inventiveness emphasises the "likelihood of success that is sufficient to warrant a trial", if an invention is to be found non-inventive or obvious.[40] This does not involve postulating prior certainty of success. In contrast, under the American approach, an experiment may be accepted as being inventive even if it was "obvious to try".[41] Rather, lack of inventiveness may be concluded if there was a "reasonable prospect of success", so that prior certainty of success is postulated by American

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[37] See further the discussion at 6.10-6.11.

[38] See 6.05-6.07. The computer software industry also generates numerous sub-patentable trade secrets, but the solution has focused on developing copyright law. Of the remaining patentable trade secrets, dispute has focused on the suitability of programs as patentable subject matter rather than on inventiveness. However, this may change if current trends toward weakening the suitability requirement continue, when the focus may shift to inventiveness. In that case, the standards of inventiveness derived from the biotechnology patent disputes may become relevant: see 7.39.

[39] See the discussion in Chapter Six of, for example, *Genentech Inc and Anor v The Wellcome Foundation Ltd* [1989] 15 IPR 423; *Genentech Inc's (Human Growth Hormone) Patent* [1989] RPC 613; *Amgen Inc v Chugai Pharmaceutical Co Ltd* 706 F Supp 94 (1989).

[40] See 6.29.

[41] Ibid.

courts.[42]

Both standards are problematic: the English may exclude too many sub-patentable trade secrets from protection, so that there are few patents and market failure results, and market imperfections accrue from those which are granted a monopoly; the Americans may patent so many secrets that widespread market imperfections ensue. The problem may be solved where the English biotechnology approach is retained for patents and the American approach is adopted for the patent of improvement to create a two-tier system of patentability. This two-tier system could be achieved in part by inserting a reference to "patents and patents of improvement" in the discussion of patent criteria in article 27(1) of TRIPs, and as part of an inclusion of patentability criteria in a forthcoming revision of the New Zealand Patents Act.[43] Additional footnotes could then be inserted to provide definitions of what constitutes an inventive step. For example, the inventive step could be defined as an approach whereby the "likelihood of success was insufficient to warrant a trial".[44] It follows that the inventive step of PI would be defined as being limited to cases when an approach had "no reasonable prospect of success".[45] Consequently, trade secrets which fail to reach the existing standard of patentability, particularly sub-patentable trade secrets, may gain protection as PI so that market failure in the creation of improvements is averted. In effect, the natural right of the improvement-makers to have their information protected is also recognised. Therefore, if protected as PI, the position of sub-patentable trade secrets would shift further from the anarchistic boundary on the intellectual property rights continuum.

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[42] Ibid.

[43] Note that the patentability criteria - industrial applicability, novelty, and inventive step -are likely to be adopted in New Zealand law: see *Reform of the Patents Act 1953*, above n36, at 6-8.

[44] In other words, to be obvious, the likelihood of success would be sufficient to warrant a trial, as above.

[45] Note that PI would be established by virtue of a separate section: see below.

(ii) PI Scope: Market Delineations

Scotchmer[46] suggests that the competition between the original and the improved information would erode the joint profit to zero. This could in turn lead to a failure to recover investment costs and hence to market failure and the under-production of further information, as discussed in Chapter Two. Scotchmer's argument seems to assume that the improvement would cover all of the sub-markets that are protected by the patent. For this reason, improvements cannot simply be protected under a small patent like a utility model.[47] One means of avoiding such an outcome already exists in the form of the patent specifications which must delineate the application in question from the prior art. The applicant must include in the patent specifications a "claim or claims defining the scope of the invention claimed".[48] This claim may describe the expected market for the information as evidence of the distinction between it and the markets of existing patents. For example, in *Dawson Chemical Co v Rohm and Haas Co*[49], a patentee claimed a process for using the chemical as a fungicide; a use that had not been previously known. This practice could be adapted to the protection of PI, so that the improvement covers a sub-market of the patent in question. Indeed, a sub-patentable trade secret which reaches the threshold of PI patentability may not amount to an improvement to the whole of an existing patent.

If PI were limited to a specific market or sub-market, then the practice of specifying markets could be encoded as a fourth criterion[50]: the sub-market delineation (MD). For example, s10 of the Patents Act 1953 could be amended to read:[51]

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[46] (1991) Standing on the Shoulders of Giants: Cumulative Research and the Patent Law, 5(1) *J Econ Persp* 29, at 33.

[47] See further the discussion of utility models at 4.07-4.16.

[48] See s10(3)(c) Patents Act.

[49] See 448 US 176, 206 USPQ (BNA) 385 (1980): discussed in Merges and Nelson, above n17, at 852.

[50] The other three being commercial utility, novelty and inventive step, as above.

[51] Emphasis added. The market in question could be defined according to s3 of the Commerce Act 1986(NZ).

5.14

(3) Every patent or *patent of improvement* specification -

> (c) Shall end with a claim or claims defining the scope of the invention claimed, *including the markets or sub-market/s to which the invention applies.*
>
> (d) *The patent of improvement claim defined in (c) shall be limited to one market or sub-market of the patent to which it applies, provided one of those markets or sub-markets remains without improvement.*

Numerous PI to the same patent could be made, provided that there was at least one sub-market free of improvements so that competition was not total and the practice of price discrimination encouraged, as discussed further below. In practice, limiting the number of improvements may not be difficult if it is also a strict requirement that the MDs for a PI should not overlap, so that a PI could not be created from a composite of earlier improvements. Indeed, PI applications could be subject to infringement actions were these to overlap with an earlier successful PI. To reduce the incidence of infringement, or deter potential infringers, the onus would be on the initial PI applicant/s to make their MDs as specific as possible. This could be achieved by further amendment to s10 of the Patents Act.

The existence of MD could limit the practice of 'patent flooding'[52], where many applications which differ only marginally from each other may be lodged. This practice can result in infringement which may be used to 'hem in' or block research by competitors or as a bargaining tool to facilitate the negotiation of settlements or cross-licensing of inventions between competitors. A patent flood may be facilitated by the subjective evaluation of the novelty and inventiveness criteria[53] so that numerous variations are arguable. However, a MD is an objective criterion that can be tested

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[52] On this subject, see Dunford R (1986) Is the Development of Technology Helped or Hindered by Patent Law - Can Antitrust Laws Provide the Solution? 9 *NSWLJ* 117; Fujino J (1990) Understanding the Flood of Japanese Patent Applications, 15(6) *AIPPI J* 225; Spero DM (1990) Patent Protection or Piracy - A CEO Views Japan, September-October *Harv Bus Rev* 58; Scherer FM, Ross D (1990) *Industrial Market Structure and Economic Performance*, 3rd ed, Houghton Mifflin Company: Boston, at 624.

[53] See 6.11-6.15.

against existing sub-markets or later falsified if new sub-markets do not develop as projected. In other words, if there are MDs that are objectively falsifiable, then it is more difficult to devise overlapping improvements so that flooding ought to be diminished. Therefore, in practice, the sub-markets of patented information are unlikely to be covered by PI so that the extent of competition which is feared by Scotchmer, above, may not eventuate.[54]

An alternative form of flooding could occur as a defence against PI by an inventor who applies for many narrower patents corresponding to different MDs within the invention. If there is only one market and so one MD that is possible, the improvement-maker will not be able to specify a sub-market upon which to base a PI. To avert this problem, it could be recognised in law that MDs to the same invention should be included within the same patent application, including the patents of addition (PA), discussed above, that may be made by the same inventor. Further, where the PI is made by someone other than the inventor, it could also be appended to the patent in question. Therefore, this filing practice could also reduce the cost of monitoring the patenting activities of competitors and, in effect, could serve notice on the patent holder of the improvement's existence.

II(b) *The Reduction in Market Imperfections*

PI may help to reduce the market imperfections that are associated with patents. PI could be granted without need of a licence or royalty, so that there is an *immunity*[55] from patent infringement which may facilitate the following outcomes. First, if an improvement on patented information is made by a competitor of the patent owner, competition may arise between the improved and the patented information within an existing or a new sub-market. Second, if an improvement is made by the patent owner, and the PI is used to create a legal barrier between markets or sub-markets, price discrimination may be practised. Both outcomes may reduce the harmful effects of the

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[54] Competition is not the only outcome were PI to be introduced: see below.

[55] Other immunities exist from the obligation of confidence, see 1.47-1.53.

patent.

(i) Product Differentiation

The grant of a PI to a competitor of the patent owner would create, in effect, a substitute for the patent, and so would encourage competition within the market or sub-market which is improved.[56] Indeed, the patent owners could also have an immunity to utilise the improvement, and so exercise their natural rights to their information which is embodied in the improvement. Competition and increased output can also arise when the improvement results in the opening of a new sub-market, which may be covered by the patent and in which that patent owner is free to compete. For example, in *Re Application of Eli Lilly and Co*[57], the same chemical was used in chicken feed as an antibiotic, but was later found to also be a growth promotant when added to the feed of cattle and was sold as a different product under another brand name (presumably the doses were different). This discovery was made by the same company, but under the PI proposal a different company could have made the improvement and filed for a PI in the different MD. In that case, the patent owner would have been free to start producing their chemicals for sale as a growth promotant too. As a result of competition, the patent right could be shifted away from the monopolistic boundary of the intellectual property rights continuum toward its least inefficient position on the intellectual property rights continuum. However, this competition will not necessarily lead to market failure because the improvement only applies to a market or sub-market of the patent, and which in turn may limit the practice of patent 'flooding', as discussed above. This depends in part on the information in question. Merges and Nelson[58] note that product patents may define a class of substances: "Valium is valium and, although subject to some variation, sulphuric acid is sulphuric acid." Therefore, product differentiation and competition need not occur.

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[56] Note that when an improvement relates to a new sub-market, the standard patent owner would still have the power to extend his/her patent to that sub-market.

[57] [1982] 1 NSWLR 526.

[58] Above n17, at 897.

Joint ventures[59] between patent owners and their competitors may not be an effective means of reducing or precluding competition with improvements. If the joint-venture leads to information production and market imperfections, it may attract improvements from other sources.

(ii) Price Discrimination

Price discrimination is the ability of a supplier to sell the same product in separate markets at different rates of return.[60] Price discrimination is dependent upon barriers[61] to voluntary exchange which prevent the import and resale of the resource to consumers in the higher priced markets at a cheaper rate from the lower priced markets.[62] The outcome of price discrimination is that each customer is charged at or near the maximum price that s/he is prepared to pay. As a result, fewer consumers are price excluded and the dissemination of information is not so restricted, so that, although the monopoly is not reduced, its harmful effects are lessened. It also means that the consumer surplus is transferred to the producer. In other words, there is a greater financial return for the monopolist, which acts as an incentive to price discrimination.

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[59] The difference between a joint venture (JV) arrangement and a licence is that the parties agree to share both the costs of research as well as the profits from any improvement made, so that it is a horizontal and not a vertical arrangement: see Scotchmer, above n46, at 36; Dratler J (1992) Intellectual Property and the Antitrust Laws in the United States and Japan -Part II, 9 *Northw Uni Comp L* 69, at 78. The literature on joint-ventures is voluminous, but regarding information production: see for example, Jorde TM, Teece DJ (1990) Innovation and Cooperation: Implications for Competition and Antitrust, 4(3) *J Econ Persp* 75; Shapiro C, Willig RD (1990) On the Antitrust Treatment of Production Joint Ventures, 14(3) *J Econ Persp* 113; Ordover JA (1991) A Patent System for Both Diffusion and Exclusion, 5(1) *J Econ Persp* 43.

[60] Price discrimination can also involve a single price where the costs of serving separate customers differ: see Bork RM (1978) *The Antitrust Paradox: A Policy at War with Itself*, Basic Books: New York, at 383, 395; see also Scherer and Ross, above n52, at 489.

[61] The barriers in this discussion are legal, but further barriers could include the technology in which the information is embodied. An example is hybrid seeds that product sterile plants so that the genetic information cannot be resold. Initially, the seeds may be sold at a high price, but in subsequent years the price may be lowered so that broader markets are no longer price excluded and thus there is price discrimination over time.

Price discrimination may also be achieved through tying arrangements in licences. From the voluminous literature on this subject, see for example, Bork, above n60, at 376-8; see also Posner RA (1992) *Economic Analysis of Law*, 4th ed, Little Brown: Boston, at 312. However, licences may be irrelevant when the PI is royalty free, noted above.

[62] See Bork, above n60, at 383, 395-7. For general examples, see Besen SM, Raskind LJ (1991) An Introduction to the Law and Economics of Intellectual Property, 5(1) *J Econ Persp* 3, at 5.

5.18

According to Robinson[63] if the price sensitivity or elasticity[64] of the favoured, or lower-priced, market is increasing at a faster rate than the inelasticity of the remaining market/s, then aggregate output will increase. Indeed, a lower price could lead to an increase in the quantity demanded and so an increase in output within the sub-market in question. If an increase in output did occur, it would also result in a reduction in the deadweight loss to society. Consequently, the practice of price discrimination could reduce the market imperfections that are associated with the patent monopoly, and if output increases, reduce the deadweight loss itself.

If the patent owner makes an improvement for which a PI is granted, price discrimination can still be practised. A key assumption to be noted is that the information could still be considered as the 'same' for the purpose of price discrimination.[65] An invention is not a single rigid entity that is derived from one creation. More often, an invention is a collection of rights[66], so that a PI could be added without creating a whole new invention. The PI may also be used as legal barrier to resale between sub-markets, as specified under the MD criterion. Hence, another reason why the MDs of improvements should not overlap is in order that price discrimination can be facilitated. For example, if the MD for improved drug A overlaps with that of improved drug B, such that one may have partial benefit in the other's market, the sub-markets would overlap so that price discrimination could be subverted through resale, despite the differing demand in each.

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[63] 1959: accepted by Baxter W (1966) Legal Restrictions on Exploitation of the Patent Monopoly: An Economic Analysis, 76 *Yale LJ* 267, at 370; see also Bork, above n60, at 397.

[64] According to Bork, above n60, at 396:

> [D]emands are said to be relatively elastic if price changes result in relatively large changes in the amount of the product demanded, and relatively inelastic if price changes produce smaller effects on amounts demanded.

[65] For further discussion of this point, see 2.34-2.36, 4.02.

[66] Each of these rights in turn are characterised by a series of legal-economic behavioural relations: see 1.29.

II(c) *The Long-Term Effects*

(i) The Pattern of Research

At present, the pattern of research and development is characterised by what can be called 'technology bursts': the application of a major discovery is patented, followed by a scramble from competitors to invent around or undermine that patent, then 'shakeouts' and/or patent disputes when patents are granted. For example, Genentech was reported to have abandoned research when it was thought that Amgen Inc had engineered erythropoietin.[67] Once the patent disputes are settled, there is a consolidation of the monopoly that leads to the under-utilisation of that information. Consequently, there is a 'burst' of development which is followed by a decline under monopoly until that monopoly is eroded by new inventions and further patents.

If PI were introduced, then after a period of transition the pattern of research could become characterised by a patent followed by an on-going series of improvements, so that a rate of development evolves which is steadier than a series of technology bursts.[68] It also may mean that competitors who might have terminated their research once a patent application was made continue if there is a prospect of making an improvement. The series of improvements may include information that could otherwise have been developed over a longer period until patentable. Thus, a greater proportion of what are currently patentable trade secrets may be protected as PI when at a sub-patentable stage of development. If so, then the invocation of the action for breach of confidence, as reviewed in Chapter One, may decline.

(ii) Patent and PI Length

The reason for a limitation on patents at all is to prevent monopolistic profits, price exclusion and its effects on the natural rights of the consumer. In a patent-PI system, market imperfections could be mitigated either through enhanced competition

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[67] See *Amgen Inc v Chugai Pharmaceuticals Co Ltd* 13 USPQ 1737 (1989).

[68] Provided, that is, the production of information is not undermined as a result of industrial espionage: see 3.02.

or through price discrimination. However, it seems reasonable to suggest that improvements by other than the patent owner are most likely to be stimulated when large monopoly profits are being made. Duncan[69] makes a similar point with regard to patents, as monopoly profits may attract other inventors who will attempt to invent around the patent. In this case, inventors may be attracted who will improve upon the patent or upon an existing improvement. As a result, competition would erode the monopoly and the incidence of market imperfections may become self-limiting. Hence, the scope and/or length of the patent or PI could depend on its degree of monopolisation rather than being of a fixed duration. If no improvements were possible[70], then arguably there would be a renewed emphasis on compulsory licences, as discussed above.

III *Support for PI*

The difficult and prolonged nature of the negotiations which lead to the TRIPs agreement has made some commentators doubt that it can be altered in the foreseeable future.[71] The former President of the New Zealand Court of Appeal[72] has also expressed caution over unilateral changes in this area. However, the modification of the patent law is possible under the TRIPS agreement where members may enact "limited exceptions to the exclusive right conferred by a patent, provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the

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[69] (1990) Economics of Intellectual Property, in: Ministry of Commerce (ed) *Review of Industrial Property Rights, Trade Marks and Designs: Possible Options for Reform*, Vol 2, Ministry of Commerce: Wellington, 1, at 18.

[70] For example, where the patent defined a class of compounds, as noted above.

[71] Eg Ginsburg JC (1994) Four Reasons and a Paradox: the Manifest Superiority of Copyright over *Sui Generis* Protection of Computer Software, 94 *Colum L Rev* 2559, at 2563, referring to the copyright of computer programs.

[72] *Wellcome Foundation v Commissioner of Patents* [1983] NZLR 385, at 392-3; *Smith-Kline v Attorney-General* [1991] 2 NZLR 560, at 563.

legitimate interests of third parties".[73] Hence, a general question is whether the PI represent an unreasonable exception.

At present, there may be considerable resistance from patent owners who fear that competition from a PI owner would not enable them to recover their investment costs. However, according to Merges[74] "in the presence of high transaction costs, industry participants have an incentive to invest in institutions that lower the cost of intellectual property right exchange". In addition, Demsetz[75] argues that "the main function of property rights is the internalisation of the beneficial and harmful effects" or externalities of transactions. Thus, the likelihood of the adoption of PI is related to whether society views the identification and enforcement costs of patent licensing to be so high that the resulting under-utilisation of trade secrets is too great an externality to be tolerated. Were this view to develop, then the opportunity could exist for new rights to emerge in order to reduce those costs and so internalise the externality. The potential motivation for change would then follow, despite the potential for market failure in the short-term.

At present, governments could be interested in the patent-PI proposal as it can be argued that it would reduce administration costs that are associated with the protection and the processing of improvements. The enforcement costs of a patent-PI system may also be lower than the present patent system with an immunity from infringement. With fewer grounds for objection on the basis of infringement, there would be fewer disputes and so administrative savings, as noted above, which society may find desirable. Each PI could be appended to the related patent/s in the patent record to reduce the cost of monitoring of competition by both the patent holder and other potential improvement-makers.

The perception that the patent-PI system is truly needed, however, is likely to depend on the industry in question. Merges and Nelson[76] show that various industries

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[73] Art 30.

[74] (1994a) Of Property Rules, Coase, and Intellectual property, 94 *Colum L Rev* 2655, at 2655.

[75] (1967) Toward a Theory of Property Rights, 57 *Am Econ Rev* 347, at 350.

[76] Above n17.

exhibit differences in market concentration and behaviour, and this affects the nature and costs of transactions. In the biotechnology industry[77], broad patents may be awarded for the applications of major discoveries, that could lead to a technology burst followed by monopolistic consolidation, particularly as this industry is characterised by sub-patentable advances.[78] A putative example is the broad patent obtained by Hybridtech for the diagnostic kits which utilise monoclonal antibodies.[79] On a wide scale, broad patents may lead to support from the biotechnology companies for greater access to patented pioneer information without the costs of compulsory licence applications. Similarly, those countries wishing to develop biotechnology industries, including New Zealand, may support such a change. Further, if infringement is sufficient that the patents become unenforceable, then the patent owners may accept PI as a means to reduce imitation. A similar scenario could arise in the computer software industry as it matures. If the rate of major advances declines, then competition may lead to a greater incidence of patent infringement such that improvements by competitors may become favoured by patent owners as an alternative to imitation. The recent trend in Australia and New Zealand that favours patenting the applications of computer programs as commercially useful effects may also contribute to this outcome.[80] In addition, if producers become trapped with an inefficient standard that is too costly to change, there may be an industry-wide acceptance of PI as a means to generate improvements.

Whatever the source of support for PI, it can generally be said that the motivation for change will only occur when there is a perception that an "increase in the value of production consequent upon the rearrangement is greater than the costs which

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[77] See for example the patent granted to the National Institute of Health in the United States which covers a technique for gene therapy which is said to have been used in almost all such therapy trials to date: see Coughlan A (1995) Sweeping Patent Shocks Gene Therapists, 1 April *New Sci* 4.

[78] As noted in Chapter Two. For example, one scientist has recently suggested that the techniques involved in biotechnology research are now "routine": see Davidson F (1996) Gene Patenting, 379 *Nature* 111, at 111. In that case, it may be that the rate of development of biotechnology is slowing and is nearing the peak of its technology burst.

[79] See Merges and Nelson, above n17, at 915.

[80] See 7.36-7.39.

would be involved in bringing it about".[81] A simpler version was given by John Locke 300 years ago when he argued[82] that "no rational creature can be supposed to change his condition with an intention to be worse".

Conclusion

In Chapter Two, it was suggested that as neither market failure under anarchy nor market imperfections through monopoly were efficient, the best solution would be to seek the least inefficient balance between these inefficient extremes. Under PI, sub-patentable trade secrets would be given additional protection as a natural right of the improvement-maker and to avert market failure in improvements. Consequently, advances which currently are only protected as sub-patentable trade secrets could be shifted away from the anarchistic boundary of the intellectual property rights continuum if protected by PI. In addition, the introduction of PI could lead to competition so that the patent right is shifted away from the monopolistic boundary or to a extension of monopolisation, the deadweight losses of which could be reduced through price discrimination. As a result, there would be a decline in market imperfections and an increase, in effect, in public access to information. Thus, patent and PI rights may be positioned toward their least inefficient positions on the intellectual property rights continuum. It would also provide a useful addition to the industrial espionage law which was proposed in Chapter Three, which could also be used to protect sub-patentable trade secrets, but made no provision to reduce market imperfections.

If, after a period of transition, the pattern of research and development were to evolve into a series of improvements, any trade secrets could be protected as smaller advances under PI. This outcome is of particular importance in the biotechnology and computer software industries which generate a high proportion of sub-patentable trade secrets, and which are discussed in the following chapters.

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[81] Coase RH (1960) The Problem of Social Cost, 3 *J L & Econ* 1, at 15-16.

[82] (1948) *The Second Treatise of Civil Government and a Letter Concerning Toleration*, Basil Blackwell: Oxford, at 64.

CHAPTER SIX:
Patents of Improvement II: Biotechnology

PATENTS OF IMPROVEMENT II: BIOTECHNOLOGY

Advances in biotechnology may generate highly valuable trade secrets which tend, apart from the applications of pioneer discoveries, to be sub-patentable. Two main approaches to biotechnology patentability disputes have emerged in the common law jurisdictions, but may pitch the inventiveness threshold too high or too low; both are problematic. However, the lower threshold could be adapted to a patent of improvement (PI) in addition to the standard patent, as proposed in Chapter Five. The result could be that more biotechnological trade secrets could be protected and disseminated as PI without causing equally harmful effects. A dual patent-PI system may also overcome several difficulties of applying patents in this field, including the patenting of farmers' breeding stock, medical treatment methods, and difficulties associated with lengthy testing procedures. Therefore, if PI were adopted, the creation of specialist laws to protect biotechnological inventions may be unnecessary.

Biotechnology is the use of molecular genetic techniques to produce biological products from nature.[1] DNA from one species can be cut, recombined, and inserted into different species to attain (hopefully) specific genetic and physical changes. This altered or purified DNA may be described as 'recombinant DNA', and the proteins which are expressed from it may be called 'recombinant proteins'. This could allow the mass expression of specific DNA sequences as proteins which may not have existed in nature in a usable form or quantity. The processes permit access to and the manufacture of products of nature which were previously obscure, difficult to obtain, or contaminated with other products. Hence, the motivation which underlies much biotechnology research is to achieve more cost-effective and rapid development of existing as well as new products. Biotechnology does not appear to have a major role in the New Zealand

[1] For a further explanation of the science involved, see Jaworski EG (1986) Biotechnology: Prospects and Perspectives, 34 *Kansas L Rev* 655; Merges RP (1988b) Intellectual Property in Higher Life Forms: The Patent System and Controversial Technologies, 47 *Maryland L Rev* 1051; Burk DL (1991) Biotechnology and Patent Law: Fitting Innovation to the Procrustacean Bed, 17 *Rutgers Computer & Tech LJ* 1; Montague PE (1993) Biotechnology Patents and the Problem of Obviousness, 4 *Aust IPJ* 3.

economy as present[2], but consideration ought to be given to its protection because of its potential as a significant source of revenue.[3]

It has long been established that biological processes may be patentable in New Zealand as inventions.[4] Then in 1980, the Assistant New Zealand Commissioner of Patents found that microorganisms could be patented provided that these were the "product of a controllable, reproducible synthetic process and the product of the process had to be predictable".[5] Brown and Grant[6] suggest that only microorganisms of which the genetic structure has been altered through recombinant DNA technology are patentable. This approach is now part of the Agreement on Trade-Related Aspects of intellectual Property Rights, Including Trade in Counterfeit Goods (TRIPs).[7] Under article 27(1) of TRIPs, patents are available for any invention which meets the patent criteria without discrimination as to the field of technology. Under article 27(3)(b) of TRIPs, patents are available for any invention which exclude from patentability "plants and animals other than microorganisms, and essentially biological processes for the production of plants and animals other than non-biological and microbiological

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[2] In 1993, over 40 companies, university and government departments, institutes and societies were listed as involved in the New Zealand biotechnology industry: see Coombs J, Alston YR (1993) *The International Biotechnology Directory 1994: Products, Companies, Research and Organisations*, Macmillan: Basingstoke. In an earlier report it was estimated that 9% of listed companies in New Zealand were "biotechnology-related", with an emphasis on "pharmaceutical-biological reagents": see Phillips CC, Playne MJ (eds, 1989) *Australian and New Zealand Biotechnology Directory 1989*, Australian Industrial Publishers Pty Ltd: Adelaide, at 14.

[3] Estimates of the future value of the worldwide biotechnology industry may vary considerably. Forecasts for the year 2000 range between 9 to over 100 billion US dollars: see OECD (1989) *Biotechnology: Economics and Wider Impacts*, OECD: Paris, 20-1.

[4] See *Swift and Co v Commissioner of Patents* [1960] 79 NZLR 775, in which a patent that involved an enzyme for the tenderisation of meat was held to be a valid manner of manufacture for the purpose of qualifying as an invention under the Patents Act 1953 (NZ).

[5] Calhoun D (1990) International Developments: Patents and Biotechnology, in: Law Commission, Report No 13, *Intellectual Property: The Context for Reform*, Law Commission: Wellington, 53, at 60-1. Difficulties in achieving repeatability by a skilled researcher led to the microorganism deposit system: Bannerman D (1990) The Protection of Biotechnological Inventions, in: Law Commission, Report No 13, *Intellectual Property: The Context for Reform*, Appendix A, Law Commission: Wellington, 68, at 69.

[6] (1989) *The Law of Intellectual Property in New Zealand*, Butterworths: Wellington, at 490-1.

[7] World Trade Organisation (1994) 47(1162) *BNA's PTCJ* 230.

processes".[8] Given that DNA recombinant technology tends so far to involve microorganisms and their processes and that no technology may be discriminated against, it seems reasonable to suggest that biotechnological inventions are still patentable in New Zealand following TRIPs.

The problem is that many biotechnological inventions relate to existing products of nature so that their novelty may be questioned. These inventions frequently represent a rapid series of small incremental advances which, although commercially useful, do not necessarily meet the standard inventiveness required for a patent. Further, these sub-patentable trade secrets may be readily copied from examination of the invention or patent specifications, where applicable. Hence, there may be an insufficient natural lead time[9] in which inventors can recoup their investment, thereby resulting in market failure. It also undermines the natural rights of the inventor.[10]

As a result, biotechnological trade secrets may require greater protection than under the industrial espionage law which was proposed in Chapter Three. Indeed, greater legal protection for these advances has been proposed in the United States, both by academics and politicians, as a solution.[11] Separate laws exist for the protection of plant varieties and semi-conductor chips.[12] Burk[13] favours separate protection, but concedes that legislation could be expected to make such an exception only rarely.

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[8] Under article 27(3)(a), diagnostic, therapeutic and surgical methods for the treatment of humans or animals may also be excluded, discussed further in Part II(b)(iii).

[9] Natural lead time is the period in which an inventor gains a return on his/her investment in research before competitors independently discover or invent around it: see Reichman JH (1994) Legal Hybrids Between the Patent and Copyright Paradigms, 94 *Colum L Rev* 2432, at 2506; Revesz J (1994) *The Economics of Patents*, Bureau of Industry Economics, Occasional Paper 18, Australian Government Publishing Service: Canberra, at 8.

[10] See 2.03-2.06.

[11] See Burk, above n1, at 82-5.

[12] Burk, ibid. Now, in France, there is an additional complementary protection certificate for pharmaceuticals which have lost effective patent length through testing time: see Dossman G (1990) A New Industrial Property Right for Pharmaceutical Products in France - The Complementary Protection Certificate, 21(5) *IIC* 615.

[13] Burk, above n1, at 82-5.

Recently, the Biotechnology Process Patent Act 1995 became law in the United States.[14] Under this law old processes that are performed with new biotechnological starting-materials are patentable. However, Montague[15] argues that biotechnology is not the only candidate for special protection, but that multiple specialist laws could interfere with international patent harmonisation. Further, if biotechnology is superseded or expands beyond the statutory rights and definitions, more laws and amendments would be required leading to a cumbersome array of statutes.[16] This would be costly for both applicants and the authorities to process and monitor. For example, further specialist biotechnology intellectual property legislation would probably have to incorporate an exemption for farmers that recognises their traditional rights to breed the plants or animals, whether or not these organisms are genetically modified.[17] Therefore, the long-term administrative costs of specific biotechnology protection may outweigh any short-term benefit of that protection.

In Chapter Two, it was acknowledged that although intellectual property rights may be necessary to avoid anarchy, rights might create market imperfections and an effective reduction in access to information, which could interfere with the production of further information and so with the creation of additional natural rights. An example is the scientific discoveries which led to a broad patent for diagnostic kits using monoclonal antibodies.[18] Between these two extremes of inefficiency lies the intellectual property rights continuum along which a right may be positioned according to its economic effects. One solution introduced in Chapter Two was to utilise product differentiation and competition in order to find the least inefficient position for each trade secret on the intellectual property rights continuum between the extremes of

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[14] Maebius SB (1995) The Biotechnological Process Patent Act: Legislative Relief for Process Claims: *http://biotechlaw.ari.net/2sm.html.* See further the discussion of this Act, below.

[15] Above n1, at 31.

[16] Sherman notes that statutory changes in patent law can be rendered quickly obsolete by technological development: (1990) Patent Law in a Time of Change: Non-Obviousness and Biotechnology, 10 *Ox J Leg Stud* 278, at 278.

[17] See Merges, above n1.

[18] See Merges RP, Nelson RR (1990) On the Complex Economics of Patent Scope, 90(4) *Colum L Rev* 839, at 905-6.

anarchy and monopoly. An alternative was to utilise price discrimination so that if the monopoly was not reduced, then its harmful effects might be mitigated. In Chapter Five this approach was developed as the patent of improvement (PI).

In this Chapter, the difficulty of patenting biotechnological inventions in common law jurisdictions is examined. In Part I, the failure of trade secret law to protect biotechnological trade secrets is discussed. Copyrights are found to be an inappropriate solution, so that protection is focused on patents. The English approach to patentability in general is reviewed because it is persuasive in New Zealand and as the basis for further discussion. Biotechnological inventions may be of debatable novelty and inventiveness but, other standards being met, this discussion may provide a useful means for considering the limits and so the nature of these aspects of patentability. In Part II, the potential for patent reform as a solution to protect sub-patentable trade secrets is discussed. Both the English and American threshold tests for inventiveness are discussed and although these are problematic, they may be usefully adapted to protect sub-patentable trade secrets. In Chapter Five, it was proposed that these tests could be used in a two-tier threshold of inventiveness related to patents of improvement (PI) as well as the existing patent system, other criteria being met. PI may be the solution to the difficulty of providing additional protection for sub-patentable trade secrets in the biotechnology industry without causing market imperfections and related restrictions on the natural rights of others. Lastly, PI may be a solution to the issue of special-interest exemptions, and other controversies which are specific to biotechnology patents.

I *The Failure of Trade Secret Law and the Extension of Patent Law*

I(a) *Insufficient Natural Lead Time*

Many of the advances in the field of biotechnology are known products of nature. Hence, the product may be new only in the sense that it has not been manufactured before or in such a purified state; the advance tends to lie in the method of

manufacturing that product. This may simplify the task of competitors who do not have to expend resources examining differences in the product, so that the natural lead time may be decreased overall. Further, one technique or process may have wide application, so that the same answer may be sought by many, but if discovered independently and published, the trade secrecy is lost. Hence, the inventors' natural rights in their trade secrets may, in effect, be undermined. As a consequence, inventors may not gain a sufficient return on their research investment, so that despite the overall growth of this industry, market failure results, leading to the future underproduction of information. Thus, trade secret law[19] may be said to fail.

The patentability of biotechnological inventions tends also to relate to the method or process that is employed. Hence, patent cases may be used to illustrate the importance of biotechnological methods generally. For example, in *Genentech Inc and Another v The Wellcome Foundation Ltd*[20], existing recombinant DNA technology was employed to make copies to the DNA of human tissue plasminogen activator, a protein involved in wound healing. The copies were inserted into short lengths of bacterial DNA called plasmids that were then inserted into a suitable host, such as a bacterium or virus, which was grown to produce the protein from the inserted DNA. A majority of two to one held these methods to be obvious so that the appeal was dismissed, discussed further below. A second example is *Genentech Inc's (Human Growth Hormone) Patent*[21], where the DNA sequence for human growth hormone (hGH) was published, yet it was not known how to express that gene for hormone production in bacteria. The successful path to express the hGH gene involved removing the unwanted part of the prohormone. The prohormone is the combination of the growth hormone plus an additional protein segment which facilitates the removal of the prohormone from the cell, at which point the additional segment is lost and so the hormone is released. When the prohormone DNA was inserted into a bacterium so that it would manufacture the hormone, it was found that the bacterium expressed the prohormone intact without the final removal of the additional protein segment. Genentech artificially cleaved the prohormone DNA, but

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[19] Ie the obligation of confidence: see Chapter One.

[20] (1989) 15 IPR 423.

[21] [1989] RPC 613.

this also removed part of the hormone so they added synthetic DNA. This meant that the DNA now coded for the hormone only, not the prohormone. Finally, Genentech made numerous copies of the hGH DNA, which were inserted into bacteria which successfully expressed the growth hormone. In this case, the techniques were known and the outcome was known, but the choice of path or method was held to be inventive, as discussed further below. Thus, much depends on the method or process which is used.

Recently, a reversal of the burden of proof regarding process patents was incorporated in the TRIPs agreement under article 34. It has also been incorporated into the New Zealand Patents Act 1953 as s68A.[22] This means that alleged infringers will be required to show that their product has not been derived from a patented process. Prior to this requirement, it was almost impossible to prove that a process patent had been infringed.[23] This development may favour and so increase applications for biotechnological process patents.

The biotechnology industry may differ from some other industries in that there may be no rights to control the original biological research materials. In contrast, the supply of other materials, such as metals, may be constrained by relationships between the owners of the mines and smelters, and different researchers. In these industries, the exclusion of competitors may contribute to the monopolisation of information, its under-utilisation, and so the long-term underproduction of information.[24] If it is difficult to exclude competitors from the use of commonly available biological material, then the number of researchers may increase, which may contribute to the loss of natural lead time for biotechnological trade secrets.

I(b) *Copyrights*

Copyright law has not proved to be readily adaptable for the protection of

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[22] By virtue of s16 of the Patents Amendment Act 1994.

[23] Steel M (1995) The GATT Legislation in Particular Relating to Patents, Trade Marks, Border Enforcement and Geographical Indications, in: Legal Research Foundation (ed) *Intellectual Property: Copyright Act 1994 and GATT Legislation 1994*, Legal Research Foundation: Auckland, 1, at 7.

[24] See 2.10.

biotechnology trade secrets.[25] Processes are difficult to protect as original expressions, so that copyright is not a feasible mode of protection for most biotechnology inventions. A putative exception may be the three dimensional molecular co-ordinates of a protein which is the product of a biotechnological process.[26] The molecular co-ordinates do not merely represent the x-ray diffraction data, but involve conclusions which require expressions of intellectual creativity and effort to transform the discovered facts into useful information.[27] Hogle[28] proposes that these co-ordinates be protected under copyright. However, as Hogle[29] acknowledges, the determination of the co-ordinates involves skill and discretion such that significantly different structures for the same proteins have been reported in the scientific literature. If so, then the reliability of comparison for the purpose of assessing breach of copyright seems limited, so that copyright may not be suitable at all. Protection of biotechnology inventions therefore seems to be largely limited to process patents.

I(c) *Patents: The English Patent Criteria*

As a consequence of the failure of trade secret law and the difficulty of applying copyright law to biotechnological advances, there is greater emphasis on the role of patents. A trade secret may be disclosed in the patent application specifications, yet lost if the application is rejected, which may deter the application or even the initial research. It therefore seems appropriate to review the patent criteria and how biotechnology patent applications are contributing to the development of this law. The

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[25] See for example, Crespi RS (1988) *Patents: A Basic Guide to Patenting in Biotechnology*, Cambridge University Press: Cambridge, at 171-2.

[26] Hogle DM (1990) Copyright for Innovative Biotechnological Research: An Attractive Alternative to Patent or Trade Secret Protection, 5(1) *High Tech LJ* 75.

[27] Ibid, at 97.

[28] Ibid.

[29] Ibid, at 97.

New Zealand standard of patentability largely follows English precedent[30] so it is appropriate that this general standard be discussed first, although some reference is also made to relevant American decisions.

Patentability in English law is mildly confused because of the imprecision in the nature of novelty and inventiveness and their inter-relationship. The confusion may arise because at times novelty has a subjective aspect that is akin to inventiveness. An imprecise and subjective determination of novelty may then be used by some judges in association with their evaluation of inventiveness, a relationship which Oliver LJ has attempted to clarify in *Windsurfing International Inc v Tabur Marine (Great Britain) Ltd*[31], discussed below. To understand this development and how it relates to subsequent decisions in the major English biotechnology cases, the three criteria of patentability are first considered.

The traditional justification for patentable inventions is like that of other intellectual property rights: the applicant must have invested mental labour or effort in the invention and because an economic reward is thought to be desirable in order to encourage others to produce inventions of social value.[32] If these legal and economic justifications are satisfied, then an intellectual property right may be justified, but further criteria are required to be satisfied if the right is to be recognised in law. The intellectual property criteria relate to the act-description of the behavioural relationships which comprise each right.[33] In this case, it is the criteria of patentability, namely that the information be commercially useful, novel and involve an inventive step.[34] At present, the New Zealand Patents Act 1953 is still limited to the protection of "inventions".[35]

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[30] See for example, *Smale v North Sails Ltd* [1991] 3 NZLR 19, following *Windsurfing International Inc v Tabur Marine (Great Britain) Ltd* [1985] RPC 59.

[31] Ibid.

[32] See 2.03-2.10.

[33] See also 1.29.

[34] Whether there is an invention may be a further subjective question, but it overlaps with the other criteria: see for example, the approach taken by Mustill LJ in *Genentech v Wellcome*, above n20, at 262.

[35] In s2 of the Act:

> ... "invention" means any manner of new manufacture the subject of letters patent and grant

However, under s21 of the Patents Act, a patent can be opposed on what amounts to a lack of novelty or from lack of an inventive step, so that the test is not too dissimilar from the tripartite test given above. This was recognised in the recent report by the New Zealand Ministry of Commerce[36] where it was recommended that the tripartite test be adopted. Indeed, it is now recognised under international agreement.[37] Therefore, this test may be adopted in a forthcoming Intellectual Property Law Reform Bill.[38]

Before discussion of the three patent criteria, it is worth noting the relevance of the discovery on which the patent is based. According to Whitford J in *Genentech Inc and Another v Wellcome Foundation Ltd*:[39]

> It is trite law that you cannot patent a discovery, but if on the basis of that discovery you can tell people how it can be usefully employed, then a patentable invention may result. This in my view would be the case even though once you have made the discovery the way in which it can be usefully employed is obvious enough.

This view was accepted by Dillon LJ in the Court of Appeal in the same case.[40] His Lordship concluded that the patentability of an application should not be considered independently of the discovery from which it was made. Indeed, Dillon LJ went on to find that the novelty of the discovery of DNA sequences in question made the invention 'new' for the purposes of the Patents Act 1977 (UK).[41]

Commercial utility is the weakest patent criterion and reflects the policy that patented information should be capable of industrial application and so useful to society.

> of privilege within section six of the Statute of Monopolies and any new method or process of testing applicable to the improvement or control of manufacture, and includes an alleged invention ...

[36] (1992) *Reform of the Patents Act 1953*, Ministry of Commerce: Wellington, at 8.

[37] See for example, art 27(1), TRIPs.

[38] According to Steel, above n23, at 1, further reforms were not implemented in the GATT (Uruquay Round) Bill because the New Zealand government wanted to ratify the GATT Uruquay Round Agreement by the 1st of January 1995.

[39] Quoted in the Court of Appeal by Dillon LJ, above n20, at 508.

[40] Ibid.

[41] Ibid.

If discoveries or intellectual activity could be patented, the patent could be so broad that major market imperfections could follow to the detriment of society.[42] In practice, the expected utility for the claimed invention is so difficult to assess in advance that applications tend not to be rejected on this ground. Instead, the other criteria may be better indicators of utility as information is less likely to be useful if it is neither novel nor inventive. An exception may be where some biotechnology or other pharmaceutical patents have been rejected by the United States Patent and Trademark Office (PTO) for lack of utility where there is no data to show that the invention is effective in humans. However, recent PTO guidelines address this issue by permitting a qualified expert's evidence as a substitute for human test data.[43]

The independence of novelty from inventiveness is difficult to establish and initially the distinction between these criteria was not recognised. According to Davies J in *Winner and Another v Ammar Holdings Pty Ltd*:[44]

> ...where ... the early approach mainly differed from the current law is not that the concept of invention was absent, but rather that the distribution between obviousness and novelty was not clearly drawn until the second half of the 19th century.

In an ideal sense, novelty is the question of whether the information is 'new', as it seems unlikely that it will have as much additional commercial utility if previously exploited, or is capable of exploitation, given a prior publication. Lack of novelty means that the 'inventor' is not entitled to claim a patent as s/he may otherwise prevent the legitimate inventor from capturing the full benefit of the invention to the detriment of his/her natural rights and which may lead to market failure.[45] Recently, Peter Gibson

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[42] On the opposite nature of industrial applications and discoveries, see the observations of Hobhouse LJ in *Biogen Inc v Medeva plc*, [1995] RPC 25, at 107.

[43] Linck NJ, Chambers SA (1995) Utility in Biotech Patent Applications, 13 *Bio/Technology* 962, at 962-4.

[44] (1993) 25 IPR 273, at 279.

[45] See 2.03-2.10.

J in *Glaverspel SA v British Coal Corporation and Another*[46] reaffirmed this test of novelty:

> All that is required is to see whether, if one is to carry out the teaching in the prior document, that action would inevitably constitute an infringement of the patent in suit (see *General Tire and Rubber Co. v Firestone Tyre and Rubber Co Ltd* [1972] RPC 457, at 485). It is not necessary that the prior art be equal in practical utility or disclose the same invention in all respects as the patent in suit.

An exception may be where the properties of the invention cannot be predicted in advance, such as a chemical compound. In *Beecham Group Ltd v Bristol Meyers Co*[47], Cooke J doubted whether a compound could be truly published unless it had been made first. Hence, infringement of a 'publication' where the properties of a compound were unknown might not be regarded as inevitable.[48] This view may be relevant where DNA is so altered that the properties of the proteins which are expressed from it are unpredictable. In that case, a publication that includes the properties of the recombinant protein may be needed before infringement by the subsequent invention could be predicted.

Despite these differences in the test of novelty, it is *quantitative* in the sense that what is asked is whether there is an *absence* of a difference between the invention and the prior art. If infringement would ensue, then the focus of the court may shift to further objective matters such as priority date of application or whether the prior art was sufficiently disclosed in a publication.[49] Thus, the assessment of this form of anticipation may be described as a test of objective novelty.

In a case when objective novelty as well as inventiveness is clear, this may be

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[46] [1995] RPC 255, at 283; *General Tire v Firestone Tyre Ltd* [1972] RPC 457 is also quoted in *BSH Industries Ltd's Patents* [1995] RPC 183, at 188; *Merrel Dow Pharmaceuticals Inc and Another v HN Norton and Co Ltd* [1995] RPC 233, at 241; see also the test in *Meyers Taylor Pty Ltd v Vicarr Industries Ltd* [1977] 137 CLR 228, at 235, quoted in *Sumitomo Chemical Co Ltd v Rhone-Poulenc Chimie* (1994) 30 IPR 591, at 600.

[47] [1981] 1 NZLR 600, at 606.

[48] Ibid.

[49] See review by Falconer J in *Genentech Inc's (Human Growth Hormone) Patent*, above n21, at 621-2, referring to *Hills v Evans* (1862) 31 LJ Ch 457; *C Van der Lely NV v Bamfords Ltd* [1963] RPC 61; *General Tire v Firestone Tyre*, above n46, at 457.

all that is required to determine patentability. However, a subjective aspect to the test of novelty is exposed where the circumstances are not ideal and greater doubt exists in the mind of the judge.[50] Indeed, the test of objective novelty by itself may be crude because not every change from the prior art would be deemed novel. Trivial or minor changes should be excluded.[51] Hence, once a quantitative difference is recognised between the infringing patent and the prior art, the judge may have to establish how substantial is that difference; that is, a quantitative question of subjective novelty.

Inventiveness refers to the 'spark of imagination', skill, or talent that has been utilised in the creation of the information in question.[52] Without inventiveness, commercially useful information could be made by anyone, and that is hardly a reason to grant a monopoly.[53] Indeed, the inventiveness criterion may have arisen in the Nineteenth Century in order to limit the number of patents being issued.[54] The inventiveness threshold reflects the cost of rent-seeking which would follow were trivial inventions or discoveries patentable[55], and that would again undermine the inventor's natural rights and lead to market failure. Like novelty, inventiveness also has objective and subjective aspects.[56] The objective aspect is the priority date for the invention so that subsequent judgments can be made without the benefit of hindsight, sometimes

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[50] See the discussion of 'selection patents', below, at 6.15.

[51] Subjective novelty is also relevant in American cases: in *Ex parte Gray* 10 USPQ 2d 1922, at 1926 (1989), minor changes in nucleotide sequence were rejected by the examiner-in-chief as not novel:

> It is our view that a minor inactive substituent on an otherwise unpatentable complex compound will not necessarily impart patentability to said compound.

[52] The term "inventive step" is deemed to be synonymous with "non-obvious" under article 27 of TRIPs.

[53] See Mustill LJ, in *Genentech v Wellcome*, above n20, at 530; *PLG Research Ltd and Another v Ardon Internal Ltd and Others* [1995] RPC 287, at 313; see also Posner J in *Roberts v Sears Roebuck and Co.* 723 F2d 1324, at 1345 (1983).

[54] For a historical review of the patent law, see Merges RP (1992) *Patent Law and Policy*, Michie: Charlottesville, at 1-10.

[55] See Landes WM, Posner RA (1987) An Economic Analysis of Copyright Law, 18 *J Leg Stud* 325, at 268.

[56] Cf Sherman, above n16, at 282, who treats inventiveness as a solely objective examination.

many years later when the invention in dispute has become widely used[57]; that is to ensure that inventiveness is not overestimated.

The key to inventiveness is the subjective aspect, which is the evaluation of whether the information is of a quality that indicates the use of talent. This subjective aspect is supported by the assertion that inventiveness is a "jury question".[58] Indeed, Mustill LJ in *Genentech v Wellcome*[59] said that the "judge must simply form his own mental picture of the art and of the skilled practitioner".

The difference between novelty and inventiveness is that ideally these criteria relate to different stages of the same process. If novelty is a *quantitative* evaluation of the outcome of invention, inventiveness is a *qualitative* evaluation of the skill or talent used to initiate that invention. However, a combination of information may be new, but if anyone could have made it, it cannot be inventive. Similarly, inventiveness cannot be taken to imply novelty as someone equally inventive may have made the same invention before. Therefore, the two criteria, though related, are not the same. In addition, the evidential basis of novelty is different from inventiveness. If novelty is an addition to the *public knowledge* that is detectible to someone of *ordinary skill*[60], inventiveness is evaluated from the *common general knowledge* that includes the public knowledge as well as the knowhow of a *skilled researcher* in the field. This standard of the skilled researcher in the field has also been the subject of variation, in that the hypothetical 'person' may in fact represent a team. For example, in *Genentech v Wellcome* Purchas LJ, regarding knowledge within the biotechnology research industry, stated:[61]

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[57] See for example, *Windsurfing*, above n30, at 72, per Oliver LJ; *Smale v North Sails*, above n30, at 43; *Technograph Printed Circuits Ltd v Mills & Rockley (Electronics) Ltd* [1972] RPC 346, at 355, per Lord Reid, accepted in *Molnlycke AB and Anor v Procter & Gamble Ltd and Ors (No 5)* [1994] RPC 49, at 78; *PLG Research*, above n53, at 312.

[58] See *Johns-Manville Corporation's Patent* [1967] 18 RPC 479, at 496.

[59] Above n20, at 548.

[60] Ie relative to the skilled researcher test. An exception is *Stahlwerk Becker's Patent* (1919) 36 RPC 13, where the House of Lords found that to market a steel was to publish its composition, as this could be determined by chemical analysis by a skilled researcher: discussed by Cornish WR (1989) *Intellectual Property Rights: Patents, Copyright, Trade Marks and Allied Rights*, 2nd ed, Sweet & Maxwell: London, at 117, n22.

[61] Above n20, at 473.

The answer to the question: "What is the public?" would appear in a case such as this to be that community of research workers skilled in the art in general; but not, I would think, merely be known to one or two individual research workers pursuing their own experiments in private.

Whatever the exact number of researchers, inventiveness ideally represents a higher standard of evidence than that of novelty, given that the intangible nature of talent may be more difficult for the layperson to sense than a novel change from the prior art which has an objective basis.

In many cases which never reach the court, the general distinction between novelty and inventiveness may be satisfactory. However, when inventiveness is not clear, consideration of subjective novelty may be used to determine or fortify the assessment of inventiveness. This use of subjective novelty to assess inventiveness may be derived, at least in part, from the 'selection' patent cases which have typically involved changes to known classes of chemicals. In *Re I G Farbenindustrie AG's Patents*[62], Maugham J established the term:

It may be observed that chemical patents in recent years have consisted of two sharply divided classes. The first class is that of patents based on what may be described as an originating invention, that is, the discovery of a new reaction or a new compound. Such patents may be called for brevity 'originating' patents. The second class comprises patents (the so-called selection patents) based on a selection of homologues and substitution derivatives of the original compounds which presumably have been described in general terms and claimed in the originating patent ... I have come to the conclusion there is no more difficulty in such a case in establishing subjective matter than there is, say, in a mechanical or a combination patent. It must be remembered, of course, that the selected compounds have not been made before, or the patent would fail for want of novelty.

It is possible that Maugham J considered a subjective quantitative difference together with a qualitative difference between the originating and the selection patents, as well as the objective quantitative difference which related to the priority date. The role of subjective novelty in 'selection' patent cases was developed by Jenkins J in *May*

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[62] [1930] 47 RPC 289, at 321; approved in, for example, *Du Pont's (Witsiepe) Application* [1982] FSR 303. Maugham J went on to speak of "distinctive" and "unexpected properties": ibid, at 321; quoted in *Beecham Group v Bristol Meyers*, above n47, at 609.

6.16

& Baker Ltd and Chiba Ltd's Patent[63]:

Even where an invention consists of the production of further members of a known series whose useful attributes have already been described or predicted, it may possess sufficient subject-matter to support a valid patent provided the somewhat stringent conditions prescribed by Maugham J. as he then was, in *I.G. Farbenindustrie A.G.'s Patents* (1930) 47 RPC 289 as essential to the validity of a selection patent are satisfied, i.e. the patent must be based on some substantial advantage to be gained from the use of the selected members of a known series or family of substances, the whole (or substantially the whole) of the selected members must possess this advantage which must be peculiar (or substantially peculiar) to the selected group.

Buckley LJ in *Beecham Groups Ltd's (Amoxycillin) Application*[64] accepted the approach taken in *May & Baker* and added that the:

substance must be truly new and the advantage to be gained from its selection must be the inventor's own discovery as opposed to mere verification by him of previous predictions or of what was previously predictable; in other words, it must be unexpected.

In these cases, what was required was that the information represented "sufficient subject-matter", as in *May & Baker*, or was "truly new" as in *Beecham*. In other words, consideration of subjective novelty may have been involved as well as a qualitative evaluation of inventiveness. However, in these cases an additional reference was made to the "advantage" which is to be gained from the patent. This word may be used to imply some qualitative aspect to the consideration. Thus, the consideration of subjective novelty and inventiveness would appear in some instances to be closely associated.

The overlap between subjective novelty and inventiveness was taken further in *Windsurfing International Inc v Tabur Marine (Great Britain) Ltd.*[65] In that case, subjective novelty was used to frame the question of inventiveness. Oliver LJ developed a test for inventiveness, in which four steps were given as guidance:[66]

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[63] [1948] 65 RPC 255, at 281.

[64] [1980] RPC 261, at 292; see also *Beecham Group v Bristol Meyers*, above n47, at 609. In that case the evidence for inventiveness appears to have been clear: ibid, at 609-10.

[65] Above n30.

[66] Ibid, at 73-4.

The first is to identify the inventive concept embodied in the patent in suit. Thereafter, the court has to assume the mantle of the normally skilled but unimaginative addressee in the art at the priority date and to impute to him what was, at that date, common general knowledge in the art in question. The third step is to identify what, if any, differences exist between the matter cited as being 'known or used' and the alleged invention. Finally, the court has to ask itself whether, viewed without any knowledge of the alleged invention, those differences constitute steps which would have been obvious to the skilled man or whether they require any degree of invention.

Here the 'unexpected result' or discovery is identified in the 'inventive concept' and is used to frame first the question of novelty and together frame the question of inventiveness.[67] The third stage of the *Windsurfing* test of inventiveness may seem to be a question of objective novelty, but this was limited elsewhere to the question of anticipation in the design of the rigging of a sail. Oliver LJ's answer in *Windsurfing* suggests that he meant to make a subjective assessment, as he found that the "only difference of any substance" related to a particular type of sail.[68] Hence, subjective novelty appears to be used to frame the question of inventiveness *after* the research is conducted.[69] The conflation was explained as necessary by Oliver LJ because the philosophy behind obviousness must take into account the same concept as anticipation; that is, prohibit an obvious extension or practice of what was known in the art before the priority date. It may be noted that it is also possible to phrase the question the other way: i.e. is the inventive information in question also different in substance from the prior art? This appears to have happened in *Yamazaki Mazak Corporation v Interact Machine Tools (NSW) Pty Ltd*[70], where Gummow J[71] found that:

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[67] Cf *Graham v John Deere Co* 86 SCt at 694; 383 US 1, 148 USPQ (BNA) 459 (1966), when the United States Supreme Court also found that the obviousness or non-obviousness of the subject-matter is determined against a background of questions in which "the scope and content are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved".

[68] Above n30, at 74.

[69] Cf in *Johns-Manville*, the assessment is made at a point prior to conducting research, as above.

[70] (1991) 22 IPR 79.

[71] Ibid, at 91, referring to *Nicaro Holdings Pty Ltd v Martin Engineering Co* (1990) 16 IPR 545.

6.18

The disclosure will fall short of an anticipation of the combination claimed, if what is required of the skilled addressee is the exercise of inventive ingenuity of the taking of any inventive step.

In short, a finding of subjective novelty can be used to frame or fortify the finding of inventiveness, as is demonstrated by the wide application of the *Windsurfing* test in recent cases.[72]

The assessment of subjective novelty may be more difficult in biotechnology patent cases where the invention relates to known products of nature which are substantially similar or the same as those in existence. In that case, the test which was developed in *Johns-Manville Corporation's Patent*[73]and which utilises objective novelty may be more suitable. In *Johns-Manville*[74], Diplock LJ held that for a finding of obviousness "it is enough that the person versed in the art would assess the likelihood of success as sufficient to warrant actual trial" without postulating prior certainty of success. The assessment of inventiveness in that case was therefore made on the objective basis of two publications which the person is presumed to have read *prior* to conducting the trial; that is, as a matter of objective novelty.

II *Patent Reform: Patents of Improvement*

II(a) *The Inventiveness Threshold of Biotechnology Patents*

(i) English Patents

In two major decisions in this area, the *Genentech v Wellcome* and *Genentech (Human Growth Hormone)* cases, the *Windsurfing* test for inventiveness was not mentioned, despite its application elsewhere. This omission may have been an oversight, but in biotechnology cases the question of subjective novelty may be difficult to apply,

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[72] Eg *Smale*, above n30; *Hallen Co and Anor v Brabantia (UK) Ltd* [1991] RPC 195; *Molnlycke*, above n57; *Glaverspel*, above n46; *BSH Industries*, above n46; *PLG Research*, above n53; *Biogen Inc v Medeva plc* above n42.

[73] Above n58.

[74] Ibid, at 494.

so that the *Windsurfing* test is not helpful, as suggested above. This tentative conclusion needs further support, particularly given that the three judges in the English Court of Appeal in *Genentech v Wellcome*[75] did not decide the case on the same grounds as the lower court nor was the reasoning of each identical.

In the trial of the *Genentech v Wellcome* case, Whitford J[76] found that Genentech's research constituted more than the exercise of proficiency; it involved laborious and costly effort that ought to be rewarded in order to encourage further research for the public good. The implication is that effort is indicative of the talent necessary for inventiveness. This reasoning ought to be rejected as an argument in favour of inventiveness. Where there is laborious effort or mental labour, the individual may have a natural right to the information as a form of property.[77] Inventive information is also economically desirable and so ought to be given the incentive of further protection by the legal recognition of a property right[78], yet these justifications for an intellectual property right should not be confused with patentability. It is with regard to the *type* of property right, that the inventor must pass the additional threshold tests in order to meet the criteria of the act-description of that right, in this case patents.[79] Hence, the "laborious and costly effort" favoured by Whitford J appears to meet the basic threshold for an intellectual property right, but unless the other criteria are met the right is not recognised in law. His Honour appears to have confused the grounds for a property right with the threshold level required for patentability. In addition, Whitford J held that the claims were too wide so that the patent must be revoked.

In the Court of Appeal, Dillon, Mustill, and Purchas LJJ gave differing reasons

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[75] Above n20.

[76] As noted by Dillon LJ on appeal, ibid, at 510.

[77] See 2.05.

[78] See 2.07.

[79] See 2.17.

for dismissing the appeal.[80] The most accurate statement of inventiveness under these circumstances, in my view, was given by Dillon LJ, who helpfully summarised the finding of Lord Diplock in *Re Johns-Manville Corp's Patent*. Dillon LJ concluded[81] that his Lordship had expressed the view that obviousness would have been made out "if before the priority date the man skilled in the art would have thought the idea well worth trying out in order to see whether it would have beneficial results. He took the view that it would be enough that the person skilled in the art would assess the likelihood of success as sufficient to warrant actual trial without postulating prior certainty of success". In other words, for a particular step to be found obvious "it is not necessary to establish that its success is clearly predictable."[82] Dillon LJ went on to find that the patent was obvious.

The decision of Mustill LJ in *Genentech v Wellcome*[83] is curious in regard to the *Johns-Manville* decision, which his Lordship did not follow, preferring to gauge whether there had been a "spark of imagination" or talent. Mustill LJ's argument[84] was that to investigate further and evaluate the expectation of success was apparently unnecessary, and instead he proposed that in determining inventiveness, the court should:[85]

(a) Imagine a hypothetical skilled man, up to date with the prior art, looking towards the goal, whether or not precisely identifiable in advance, which will become a claimed invention if and when realised.

(b) Ask itself by what routes the hypothetical man would have proceeded from the starting point to the goal.

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[80] Above n20, at 493-4; His Lordship also referred to Graham J in *Olin Mathieson Chemical Corp v Biorex Laboratories Ltd* [1970] RPC 157 and Whitford J in *Re Phillips (Bosgra's) Application* [1974] RPC 241.

[81] Ibid, at 510.

[82] *Beecham Group Limited's (Amoxycillin) Application*, above n64, at 270, per Buckley LJ; see also *General Electric Co's Applications* [1964] RPC 413, 456.

[83] Above n20, at 547-8.

[84] Ibid.

[85] It is summarised at 426, the original passage is found at 542-3.

(c) Determine what obstacles the skilled man would have faced on these routes and enquire how he could have overcome them, either in the way the inventor chose or some other way.

(d) Having identified these various expedients, the court must finally ask whether the problems could have been overcome by pertinacity, sound technique or trial and error, with no more, or whether their solution would have required a spark of imagination beyond the imagination properly attributable to the skilled in the art. Only if the question is answered in the latter sense are the requirements of [the legislation] fulfilled.

Apart from the dangerous temptation to rely too heavily on routes and obstacles as secondary evidence[86], the approach of Mustill LJ is curious because these factors may relate indirectly to the likelihood of success of a research path as determined at an early stage of experimentation. His Lordship seemed to say as much when he concluded[87] that a person skilled in the art of sequencing would with pertinacity have found the right sequence in due course. If the final success was a matter of time it was because a skilled person would have sorted through a number of alternatives by trial and error. This process must have included a conscious or sub-conscious estimation of the likelihood of success to warrant each trial, including the one which led to the invention. In other words, Mustill LJ's test does not seem to go as far as the test in *Johns-Manville*, but may amount to a less precise formulation of the same thing. Like Dillon LJ, Mustill LJ also found that the claims were obvious.

Purchas LJ, unlike Dillon and Mustill LJJ, did not find the claims to be obvious, although he dismissed the appeal on the basis that the specifications did not represent a patentable invention. Purchas LJ found "considerable attraction" in the proposition that "without any substantial effort on the part of a team of persons skilled in the art" an invention is obvious, and that if there was "considerable effort on the part of such a person" it is inventive.[88] Purchas LJ went on to apply this 'test' and concluded:[89]

I do not think that fairness will be achieved as between the patentee and the rest of those involved in the

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[86] Discussed further below.

[87] Above n20, at 553.

[88] Ibid, at 483.

[89] Ibid, at 490.

practice of the art concerned if, through the application of the principles of obviousness, it was to be held that there was no inventive step involved in the discovery of the ... data.

His Lordship did admit that "such a test may be too simplistic".[90] Indeed, it appears to be another formulation of the test for an intellectual property right made by Whitford J in the same case, above, and to be equally flawed.

Purchas LJ did not follow *Johns-Manville*, and did not assess the prospects of success. In particular, Purchas LJ seems to have been influenced by the reasoning of Graham J in *American Cyanamid Co v Ethicon Ltd*[91], who distinguished *Johns-Manville*. Graham J had observed that in *Johns-Manville* the invention was obvious to try, but the chemical in question had a known use even though it had only recently come onto the market, whereas in *American Cyanamid* "no such facts exist".[92] Similarly, Purchas J concluded in *Genentech v Wellcome*:[93]

The existence of the data was obvious but what it was was unknown. It was, therefore, something which was not obvious to anyone and which was the target of a considerable number of different research teams exercising, I have no doubt, very great skills if not inventiveness. The present position is clearly distinguishable from the state of affairs (*Johns-Manville* case) where persons skilled in the art, although ignorant of the necessary fact, can by ready reference to an available source, discover that fact.

However, in that case, although the genetic sequence which was the outcome was unknown, the genetic techniques employed were known to the market, in the sense that they were practised in a number of research institutions which conducted experiments on behalf of Genentech.[94] Indeed, the techniques were sufficiently well known that the other judges in the case found the relevant claims, which were derived by the application of those techniques, to be obvious. Therefore, the facts of *Genentech v*

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[90] Ibid, at 483.

[91] [1979] RPC 215, at 266; quoted by Purchas J in *Genentech v Wellcome*, above n20, at 488-9.

[92] Above n91, at 266. Graham J went on to find that the invention at issue in *American Cyanamid* was not obvious: ibid, at 267.

[93] Above n20, at 490.

[94] See the discussion of evidence in this area by Dillon LJ, ibid, at 512-3.

Wellcome would appear to relate more closely to the standard set out in *Johns-Manville* and adopted by Dillon LJ.

An important addition to this discussion is that the standard of inventiveness proposed in *Johns-Manville* has been practised, although not directly acknowledged, in another major English biotechnology case, *Genentech Inc's (Human Growth Hormone) Patent*.[95] Counsel for the petitioner submitted and Falconer J accepted[96] that an invention is:

> ...obvious if the suitable addressee would consider it worth trying from a number of possible alternatives, even if (i) it was not the first he would have looked at and (ii) it was not obvious it would work; it is only necessary that the addressee could say it is sufficiently promising to be worth trying..."because there is some reasonable expectation that one might get a good result."

Falconer J was not directed to *Johns-Manville*, although counsel relied, and his Lordship accepted, the view of Lord Reid in *Technograph Printed Circuits Ltd v Mills and Rockley (Electronics) Ltd*:[97]

> The question is not whether it is now obvious to the court (or to the jury) but whether at the relevant date it would have been obvious to the unimaginative skilled technician.

Falconer J went on to find two of the claims to be inventive. This finding is consistent with the earlier emphasis in *Johns-Manville* on considering the prior art at an early stage of the inventive process. The *Genentech (Human Growth Hormone)* decision therefore seems to complement the approach of Dillon LJ in *Genentech v Wellcome*, so that the *Johns-Manville* standard of inventiveness may be central when biotechnological inventions are concerned. As noted above, the question of novelty in *Johns-Manville* appears to be objective and is based simply on the prior art before a trial was initiated, whereas in *Windsurfing* a question of subjective novelty was used to frame the question of inventiveness after the research was completed. It could be argued that the greater the

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[95] Above n21.

[96] Ibid, at 671, quoting counsel.

[97] Above n57, at 355.

overlap between subjective novelty and inventiveness, the more difficult the *Windsurfing* test is to apply.

Recently, the Court of Appeal appeared to take a different approach in *Biogen Inc v Medeva plc*[98], a case which concerned the application of genetic engineering techniques to genetic material extracted from the hepatitis B virus (HBV). Aldous J in the Patents Court did not refer to the *Johns-Manville* standard of inventiveness, but to the four-step test of Oliver LJ given in the *Windsurfing* case, above. To the third *Windsurfing* question, which was suggested above to amount to a question of subjective novelty, Aldous J concluded[99] that "the difference between the prior art and the inventive concept is the idea or decision to express a polypeptide displaying HBV antigen specificity in a suitable host". It may seem strange that no quantitative difference was found that related to the content of the prior art and the claimed invention. Indeed, "once a decision has been made to try expression of the HBV genome, the technique set out in [the prior publication] would have been sufficient to enable it to be carried out".[100] Moreover, the outcome reproduced known genetic material, so there was no subjective quantitative difference on that ground either. In contrast, Oliver LJ in *Windsurfing* at least found that there was some additional difference in the windsurfer rigging at issue.[101] In other words, the application in *Biogen* of the 'subjective novelty' question from the *Windsurfing* test appears to have been inappropriate; it was not a matter of a quantitative difference between information. At most, it was a matter of objective novelty relating to the decision to undertake the research in question, given the prior research that had been undertaken by others.

The next question in the *Windsurfing* test concerns whether the differences "constitute steps which would have been obvious to the skilled man or whether they require any degree of invention", as quoted above. Aldous J in *Biogen* "found it difficult in this case to adopt the mantle of the skilled man in December 1978", when Biogen

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[98] Above n42.

[99] Ibid, at 58.

[100] Ibid, at 58.

[101] Above n30, at 74.

made their first application.[102] This was in part because the technology had developed so rapidly that by the time another application had been made in 1979 the advance would clearly have been obvious. In the end, Aldous J found that there was inventiveness, but only on the basis of the 1978 application. His Honour found[103] that by the time of the other application date in 1979 "the prior art clearly indicated that expression of [the technique in question] would be worth trying". In other words, if the 1978 application was denied priority and the case rested on the 1979 application then, based on the prior art, it would have been worth trying and so obvious. This conclusion seems to be consistent with the reasoning in *Johns-Manville* in which an invention was obvious if a "person skilled in the art would assess the likelihood of success as sufficient to warrant actual trial".[104] It seems plausible that Aldous J may have used what amounted to the *Johns-Manville* test, but under the framework of the *Windsurfing* test. Indeed, the curious finding of 'subjective novelty' noted above, may be better understood as a question of objective novelty, as under the *Johns-Manville* test. Thus, it is not surprising that Aldous J in *Biogen* found it difficult to follow the *Windsurfing* test. The most that may be possible with this evidence concerning the prior art in *Biogen* is to assess whether it could be used to warrant a trial under *Johns-Manville*; that is, provide enough guidance for the inventive approach that might indicate it to be obvious. On Aldous J's judgment, the approach was inventive.

On appeal in *Biogen*, Hobhouse LJ, delivering the judgment of the Court, held that Biogen were not entitled to the earlier priority date in 1978.[105] The plaintiff had accepted Aldous J's finding that the claimed invention had become obvious by the later priority date in 1979. Once the 1978 patent was rejected the defendant's appeal succeeded, so that the issue of inventiveness was only considered briefly thereafter. Regrettably, Hobhouse LJ did not refer to either the *Johns-Manville* or the *Windsurfing*

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[102] Above n42, at 64.

[103] Ibid, at 65.

[104] Summarised in *Genentech v Wellcome*, above n20, quoted above, per Dillon LJ.

[105] Above n42, at 112.

tests, but said:[106]

The question of inventiveness (obviousness) will, subject to [the English legislation dealing with priority dates of multiple applications], have to be considered as against the state of the art at the date of application. If, as is illustrated by the present case, [the legislation] is relied upon to obtain an earlier priority date, then the requirement of support in an earlier document carries with it the question whether the earlier document contained a sufficient and enabling description of the invention (*Asahi*). There is therefore a statutory consistency, on the construction we prefer, between the date of the application and the priority date. The question of sufficiency is determined as at the date of the application; the parallel question of support has to be determined as at the alleged earlier priority date. Whatever priority date is contended for substantially the same test of sufficiency has to be satisfied.

These points relate to the fact that Biogen were claiming two applications together. What is interesting is that the earlier application is considered in terms of a "sufficient and enabling description" rather than as a matter of a subjective difference between the two applications. This is suggestive of a consideration of objective novelty as a basis of inventiveness, as used in the *Johns-Manville* test. Hobhouse LJ also concluded:[107]

Put at its highest, all the plaintiff achieved in 1978 was to show that it was possible to achieve the expression [of the genetic material in question] by the use of standard methods.

By 1979, the prior art had expanded to the extent that it was accepted by Biogen that their information was obvious, as above. That is, based on the prior art the likelihood of success would have been such that the Biogen approach at that time was warranted and so obvious, as under the *Johns-Manville* test.

From these decisions, it may be that the *Johns-Manville* test for inventiveness is the most appropriate when considering biotechnology inventions, given that the products may not be substantially different to those found in nature. The problem with the *Johns-Manville* approach to patenting is that the standard of inventiveness which it represents may prove to be too strict for many patents to be granted. In theory, there

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[106] Ibid, at 101. The reference to "*Asahi*" is to *Asahi Kasei Kogyo KK's Application* [1991] RPC 485.

[107] Ibid, at 114.

may be market imperfections which arise from each right, but in practice there may be far more market failure because too few inventors are able to gain protection for their information. The result in the long term would be to lower the incentive for investment in biotechnological research, slow the dissemination of useful information, and so may lead to a lower rate of development to the detriment of society. These are essentially the economic arguments against monopolisation which were developed in Chapter Two.

A solution, as proposed in Chapter Five, may be to introduce a patent of improvement (PI). This could result either in a reduction in monopoly through competition, or an extension of the monopoly, yet a reduction in its market imperfections through price discrimination. The threshold of inventiveness of the PI is crucial if it is to be distinguished by the courts from a patent. The basis of the PI threshold of inventiveness may lie in the American approach to biotechnology patentability, as the United States Courts appear to be less cautious in their estimation of subjective novelty than their English counterparts.

(ii) American Patents

In contrast to the English, the American courts have taken a more tolerant approach to the threshold for biotechnology patents. This tolerance for biotechnology patents stems from the famous *Diamond v Chakrabarty* case[108] when the Supreme Court affirmed that "everything under the sun that is made by man" is patentable.[109] Thus, it does not matter whether a product was generated by means of traditional or recombinant DNA technology.[110] This tolerance appears to be related to the lower threshold of inventiveness in key American cases.

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[108] 447 US 303, at 309 (1980): reprinted in Merges, above n54, at 113-122. This case concerned a genetically engineered bacterium with the ability to break down several components of crude oil and so was of use in controlling oil spills.

[109] Merges, ibid, at 115.

[110] See for example, *Scripps Clinic & Research Foundation v Genentech Inc*, 666 F Supp 1379, at 1385 (1987); *Amgen Inc v Chugai Pharmaceutical Co Ltd*, 706 F Supp 94, at 104 (1989).

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In *In re O'Farrell*[111], a biotechnology patent was rejected as obvious because of a published article by two of the inventors and a third scientist. Non-inventiveness or obviousness was found because the article contained evidence which suggested that the invention would be successful and so had a reasonable expectation of success.[112] The Court summed up:[113]

> Obviousness does not require absolute predictability of success. Indeed, for many inventions that seem quite obvious, there is no absolute predictability of success until the invention is reduced to practice. There is always at least a possibility of unexpected results, that would then provide an objective basis for showing that the invention, although apparently obvious, was in law nonobvious.

The Court also stated that if an approach was "obvious to try" it did not amount to obviousness. The reason was that what would have been obvious to try was a variation of experimental parameters, when the prior art may give "either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful".[114] Similarly, what was obvious might have been to investigate a new technology or promising field of experimentation, for which the prior art "gave only general guidance as to the particular form of the claimed invention or how to achieve it".[115] Indeed, in *In re Dow Chemical Co*[116], it was concluded that "[b]oth the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure ... There must be a reason or suggestion in the art for selecting the procedure used, other than the knowledge learned from the applicant's

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[111] 853 F2d 894, at 902 (1988). In the patent a method to control the expression of cloned genes in a bacterium was claimed.

[112] The article also included details that constituted an enabling disclosure, and a suggestion on how to modify the prior art to practise the claimed invention: ibid, at 902-4.

[113] Ibid, at 903-4, referring to *In re Merck & Co*, 800 F2d 1091, at 1098, 231 USPQ (BNA) 375, at 380 (1986); *Lindemann Maschinefabrik GMBH v American Hoist & Derrick Co* 730 F2d 1452, 1461, 221 USPQ 481, 448 (1984); *In re Papesch*, 315 F2d 381, 386-87, 137 USPQ 43, 47-48 (1963); see also *Ex parte Gray*, above n51, at 1925.

[114] Above n111, at 903.

[115] Ibid, at 903.

[116] 837 F2d 469, at 473 (1988).

disclosure".

This treatment of inventiveness was followed in *Ex parte Hudson*[117], where the Examiner-in-chief found:

> Whether or not the specific biosynthesis involved would have been obvious ... depends on the specific facts of each case, but the critical inquiry is would there have been a reasonable expectation of success in achieving the desired goal, applying only the knowledge evidenced in the prior art. *In re O'Farrell*, 853 F.2d 894, 7 USPQ 1673 (Fed. Cir. 1988); *Ex Parte Erlich*, 3 USPQ 2d 1011 (BPAI 1986).

In *Amgen Inc v Chugai Pharmaceutical Co Ltd*[118] it was also held that although the approach had been "obvious to try", there was not a proven "reasonable prospect of success" and so the invention was inventive or non-obvious.

The test of inventiveness which is developed in these cases is different to that used in the English *Johns-Manville* case. It will be recalled that in *Johns-Manville*, postulating prior certainty of success was not required. Rather, consideration was given to the prior art as the basis for determining if a trial was warranted. This test appears to have been rejected in the American courts which found that if a trial or experiment was "obvious to try", as above, it did not amount to obviousness or a lack of inventiveness. Rather, the American approach requires some additional consideration of whether there is a "reasonable prospect of success". That expectation seems to be assessed after the research has been completed, insofar as it appears to involve the consideration of the subjective differences between the claimed invention and the prior art. For example, in *O'Farrell*, it was a comparison of the differences between the publications and the claims which led to the conclusion that there had been a reasonable expectation of success. In effect, it was argued that the differences between the prior art and the claims were trivial, so that the claims lacked inventiveness or were obvious. Hence, subjective novelty may have been employed in the determination of inventiveness. More importantly, American courts are known to rely on 'secondary

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[117] 18 USPQ 2d 1322, at 1324 (1990), per Goldstein, examiner-in-chief.

[118] 18 USPQ 1016, at 1022 (1991), quoting from the district court. This case concerned using recombinant DNA technology to produce the purified and isolated DNA sequence which codes for erythropoietin, a protein used in the production of red blood cells. Production of erythropoietin from this DNA sequence could be of value in the treatment of anaemia.

considerations' or circumstantial evidence which involves an evaluation of subjective novelty, as discussed further below. It is this reliance which may have encouraged the American courts to postulate prior certainty of success, which seems to go beyond what was involved in the assessment of subjective novelty in the English *Windsurfing* case.

The approach taken in the United States may indicate a lower degree of caution than the English in employing subjective novelty to assess the inventiveness of biotechnological inventions. As a result, it may be easier to gain a biotechnology patent in the United States than in England, but result in greater market imperfections. This may include price exclusion on a wide scale so that information is under-utilised, leading eventually to the under-production of information. Montague[119] predicts that in the long-term a less-generous policy toward inventiveness may eventuate to avoid the 'stifling' of invention leading to a period of greater uncertainty in American patent litigation. In addition, if patents are granted which cover broad areas of biotechnology and then are challenged successfully by competitors on this basis, it may deter investment in this field of research[120], and also may lead to criticism of this standard. This response would seem likely if the approach to inventiveness were widely perceived to be an economic and nationalistic threat to American international dominance in biotechnology.[121] If so, then the American use of subjective novelty in the determination of inventiveness would not be expected to persist. However, this approach may now have been fortified indirectly as a result of recent legislative changes in the United States.

Recently, President Clinton signed into law the Biotechnology Process Patent Act.[122] It will protect old processes that are performed with patentable biotechnological starting materials or recombinant DNA.[123] For the purpose of this Act, a process is

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[119] Above n1, at 29.

[120] See Coughlan A (1995) Sweeping Patent Shocks Gene Therapists, 1 April *New Sci* 4, at 4, referring to Crowther and Burke.

[121] On the subject of American government's concern for the protection of its international advantage in the development of a biotechnology industry, see Munson A (1993) Genetically Manipulated Organisms: International Policy-Making and Implications, 69(3) *Int Affairs* 497, at 503.

[122] On 1 November 1995: Maebius, above n14.

[123] Ibid; see also de Valoir T (1995) The Obviousness of Cloning, 9 *IPJ* 349, at 367-372.

biotechnological if it involves:[124]

genetically altering or otherwise inducing a single- or multi-celled organism to

(i) express an exogenous nucleotide sequence,

(ii) inhibit, eliminate, augment, or alter expression of an endogenous nucleotide sequence, or

(iii) express a specific physiological characteristic not naturally associated with said organism.

Maebius[125] also quotes this definition to include "cell fusion procedures yielding a cell line that expresses a specific protein, such as a monoclonal antibody". According to Maebius[126], some non-biotechnological processes which "induce" the inhibition of an endogenous nucleotide sequence[127] could be covered by this definition, whereas some biotechnological processes which involve genetic alternation of a host cell's DNA *in vitro* may not. If the process is covered by the definition of "biotechnological", the patent applicant will be entitled to a finding of automatic inventiveness as to the claimed process.[128]

This Act is aimed to override a series of decisions in United States courts following *In re Durden*[129], where it was held that use of new starting materials in an old process may mean that the process is then 'new', but not necessarily inventive. For example, in *Amgen Inc v Chugai Pharmaceutical Co*[130] the court rejected Amgen's process claim for the method of producing the erythropoietin protein from the erythropoietin DNA sequence which had been isolated and purified using recombinant DNA technology, citing *Durden.* The claims for the erythropoietin DNA sequence itself

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[124] Maebius, above n14. Note that a "nucleotide" in this context is a biochemical unit of DNA.

[125] Ibid.

[126] Ibid.

[127] Maebius gives as an example an organic molecule known as AZT (3'-azidothymidine) which is being used to treat persons infected with the human immunodeficiency (HIV) virus: ibid.

[128] Ibid.

[129] 763 F2d 1406 (1985): see also Merges, above n54, at 501.

[130] Above n110; see also *Genentech Inc v Wellcome Foundation* 14 USPQ 2d (BNA) 1363 (1990): discussed by de Valoir, above n123, at 365.

were upheld in both the Federal District Court and the Federal Court of Appeal, as discussed above. However, foreign competitors were free to manufacture erythropoietin offshore and import it into the United States, given that the law against parallel importation only applies to products which have been made by a process which is patented in the United States.[131]

One option is to enforce the product patents offshore in multiple jurisdictions, but this would be extremely costly. The solution has been to add to the protection available in the United States through the Biotechnology Process Patent Act 1995. However, it should be noted that if the claims to the associated product are later invalidated, then this presumption of inventiveness for the process will also be lost.[132] In that case, according to Maebius, the courts would be able to return to the case law which existed prior to the passing of the Biotechnology Process Patent Act, including *In re Durden.*[133]

It is ironic, but one month after the new Biotechnology Act was signed into law, the general approach of cases which had relied on *In re Durden*, and to which the Act was a response, was overturned. The circumstances of the case, *In re Ochiai*[134], were held to be nearly identical to those in *In re Durden.* The process for the production of an organic compound which was claimed[135] had been rejected for lack of inventiveness by the patent examiner and the Board of Patent Appeals and Interferences in the United States Patent and Trademark Office (PTO), based on the reasoning *In re Durden.*[136] The Board said:[137] "[w]e are not here concerned with the patentability of the starting materials, the final compounds or other processes of making the ... compounds. We are

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[131] 35 USC 271(g) 1988: see de Valoir, above n123, at 365.

[132] Maebius, above n14.

[133] Ibid.

[134] CAFC App No 92-1446: see http://biotechlaw.ari.net/ochai2.html

[135] This compound does not appear to have involved any biotechnological process or technology, so the Biotechnology Process Patent Act was not cited.

[136] See *Ex parte Ochiai* 24 USPQ 2d 1265 (1992).

[137] Quoted in the Court of Appeals: above n134.

concerned only with the claimed process and the patentability thereof." However, the Court of Appeals for the Federal Circuit rejected that the judgment *In re Durden* could be used to draw a general rule of non-inventiveness or obviousness to the effect that "a process claim is obvious if the prior art references disclose the same general process using "similar" starting materials".[138] The Court also said:[139] "This method of analysis is founded on legal error because it substitutes supposed per se rules for the particularised inquiry required [under United States patent law]." Having made such an inquiry, and considering the subject-matter of the claim as a whole, the Court reversed the earlier rejection, finding that Ochiai's process was not *prima facie* obvious. Thus, it is possible that a process which uses biotechnological starting-materials could now be patented irrespective of the Biotechnology Process Patent Act. The difference is that the protection given by the Act is automatic, whereas that under *In re Ochiai* is not. Hence, the law may provide additional security for, and so encourage, investment in this industry.

According to de Valoir[140], the Biotechnology Process Patent Act creates similar protection to that which exists for processes under the article 64(2) of the European Patent Convention. However, in must be noted that of the English cases discussed above, *Genentech Inc's Patent* and *Biogen* did not concern processes. In *Genentech v Wellcome*[141] the patentee's claim resulted from their being the first to discover the DNA sequence for tissue plasminogen activator (t-PA). It was rejected as non-inventive or obvious, as above, so that claims for the process of expressing that DNA to produce the t-PA protein failed accordingly.[142] As a result, it seems reasonable to suggest that by limiting the patenting of recombinant DNA, the "starting materials", the strict English approach to inventiveness may thereby limit the development of patents for the processes of expressing that DNA to create recombinant proteins. In contrast, the weak

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[138] Ibid n134, Per Curiam.

[139] Ibid. The Court later supported this view by reference from *In re Durden*.

[140] Above n123, at 369.

[141] Above n20, at 424.

[142] Ibid, at 515.

American standard of inventiveness may lead to success in patenting these processes under the new Act.[143] Thus, an even greater disparity between English and American approaches to biotechnology patents may develop as a result of this legislation, and with it disputes over which is the correct approach. This disparity is also reflected in different approaches to secondary considerations between the two jurisdictions.

(iii) The Problem of Secondary Considerations

Secondary considerations may be used by the courts, particularly in the United States, indirectly to indicate that an invention is subjectively novel and so inventive. There are two broad forms of secondary considerations: market behaviour and the circumstances of research. The combination of imprecision in determining subjective novelty and inventiveness may lead some in the judiciary to rely too heavily on secondary considerations as circumstantial evidence of patentability. In general, English judges have been cautious about the merits of secondary considerations. According to Merges[144], the reliance upon secondary considerations is already well-advanced in the American Federal Circuit Court. Therefore, if the American courts rely on secondary considerations to indicate subjective novelty, it may help to explain the persistence of a weaker standard of biotechnology patentability compared to the English.

Secondary considerations from market behaviour relate to the actions of others as indicative of the inventiveness of the information. This can include the commercial success of the information, licensing, and copying behaviour. However, in the English case of *Hallen Co v Brabantia (UK) Ltd*[145], it was held that technical or practical obviousness, not commercial obviousness, should be considered. Recently, Morritt J in *Molnlycke AB and Anor v Procter & Gamble Ltd and Ors*[146] also took a cautious

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[143] Indeed, Merges, above n54, at 503, suggests an extension of the 'reasonable expectation of success' test in this regard.

[144] (1988a) Commercial Success and Patent Standards: Economic Perspectives on Innovation, 76 *Calif L Rev* 803, at 806.

[145] Above n72, at 211.

[146] Above n57, at 113; see also *BSH Industries*, above n46, at 204.

approach to commercial success and stated that secondary considerations should be no more than an aid in the determination of primary evidence because:

> ... evidence of the commercial success of the invention can lead into an investigation of the reasons for this success; there may be commercial reasons for this success unrelated to whether the invention was or was not obvious in the past.

In contrast, in *Graham v John Deere Co*[147] the United States Supreme Court stated:

> [S]econdary considerations as commercial success, long felt but unresolved needs, failures of others, etc. might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or non-obviousness, these inquiries may have relevance.

From this decision, the American courts appear to have placed greater emphasis on secondary considerations. The court may, for example, use the commercial success of the invention to indicate a degree of subjective novelty over the prior art. Commercial success was favourably considered in *Hybridtech Inc v Monoclonal Antibodies*.[148] In that case, the Federal Circuit Court of Appeals found that the twenty references which were used by the District Court to find obviousness did not "as a whole suggest the claimed invention".[149] The District Court had utilised evidence of objective novelty as an indication of obviousness, whereas the higher Court emphasised that "the commercial success here was due to the merits of the claimed invention".[150] This in turn could derive from the difference between that invention and the prior art; that is, indicate subjective novelty and so inventiveness.

Merges has rightly criticised these American decisions. Licensing may not simply

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[147] Above n67, at 693-4.

[148] 802 F2d 1367, at 1383, 231 USPQ 81 (1986), 48 US 947 (1987); see Merges, above n54, at 423-432. Another example is *Genentech's Patent of Polypeptide Expression*, T292/ 85 [1989] 1 EOPR 1: cited in Montague, above n1, at 24-5, when the Patent Board noted that many efforts by competitors had failed until Genentech's patent was published.

[149] Ibid, at 1383.

[150] Ibid, at 1383.

reflect the recognition by others that the licensed information is inventive, but is also commonly employed to avoid infringement litigation.[151] An unresolved need may exist yet not be recognised by a firm as it lacks perfect information about the market and so the information in question may not be inventive and there may not have been any patent race.[152] Commercial success may be due to greater market information, business acumen, and better market strategies than the inherent inventiveness of the information.[153] The result may be that commercial success and other secondary considerations may be used to 'prove' an otherwise unpredictable result, when the behaviour in question may be independent of inventiveness. Consequently, although the evidence of commercial success may be objective, the conclusions that are drawn from it are not. Therefore, the cautious English approach to market behaviour as secondary evidence would seem to be the most appropriate.

Indirect indications of inventiveness are the circumstances of research, including the 'obstacles to success' and 'failure to invent by others.' For example, Mustill LJ in *Genentech v Wellcome*[154] considered whether there were alternative routes available and obstacles to be overcome.[155] Most of the routes which were claimed by Genentech were dismissed by Mustill LJ as the application of existing technologies.[156] His Lordship then continued on to discuss and dismiss the remaining claimed obstacles. In *Amgen*[157], the "pitfalls" to success were also noted by the court.[158] It is possible that the more paths which existed and the more obstacles that were overcome by the patentee, the more these considerations could be interpreted as evidence of talent. In other words, the greater the number of obstacles, the greater the differences between the

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[151] See Merges, above n144, at 867.

[152] Ibid, at 872.

[153] Ibid, at 836-7, 845-6.

[154] Above n20, at 548-553.

[155] See also Dillon LJ, ibid, at 511.

[156] Ibid, at 549.

[157] Above n118, at 1023.

[158] Greater emphasis was given to 'failure to invent', discussed below.

prior art and the claimed invention, and so the greater the subjective novelty as an indication of inventiveness or at least a weaker standard.

The difficulty is that many obstacles *per se* do not prove inventiveness if in practice these can be overcome by a person who is skilled in the art, so that decisions which emphasise such considerations may on this basis be questionable. Fortunately, Dillon LJ in *Genentech v Wellcome* included consideration of 'obstacles to success' as a form of supplementary evidence.[159] In the same case, Mustill LJ also acknowledged that consideration of the obstacles alone does not directly prove inventiveness. In *Amgen*, the consideration of the pitfalls to research appears to be added after the main discussion, so may not have been influential, but the potential exists for too great an emphasis, leading to a false conclusion of inventiveness.

A valid secondary consideration is the 'failure to invent' where there is objective evidence that competitors with the same goal have searched and failed to find the path with which the patentee succeeded.[160] An advantage of 'failure to invent' is that it can be determined objectively from research records[161], failed patent applications, or publications. For example, in *Genentech (Human Growth Hormone)*, the failure of Eli Lilly to take the same approach as Genentech seems to have been a factor in Falconer J's decision[162] that the patent was inventive.[163] Similarly, in *Amgen*[164], the court considered the prior attempts to identify the gene for a protein used to stimulate the production of red blood cells, erythropoietin. It was argued that the earlier research, utilising baboon DNA, had made the later approach which used human DNA obvious. However, as noted above, the court found that the approach was obvious to try, but without a reasonable expectation of success, given the failure of this earlier research.

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[159] Above n20, at 511.

[160] Merges, above n144, at 863.

[161] Ibid, at 864-6.

[162] Above n21, at 636; see also *Optical Coating Laboratory Inc and Another v Pilkington PE Ltd and Another* [1995] RPC 145, at 166.

[163] Falconer J did not find the contradictory evidence of the 'expert witnesses' helpful and relied on the evidence at hand.

[164] Above n118, at 1023.

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A potential problem of utilising 'failure to invent' is that, if records are the key in the future, then it is conceivable that highly competitive companies could become much more careful in their construction of records. In the absence of or low reliability of these records Genentech's action may have been considerably more difficult to prove. The processes in question might have more closely resembled a new combination of known processes, as in the *Genentech v Wellcome* case. It may be noted that in *Genentech v Wellcome* there were several competitors who apparently found the same invention around the same time, so that the failure to invent in that case would have been debatable. Consequently, were the court to rely too heavily on 'failure to invent', then highly competitive companies may be tempted not to be so accurate in the construction of their research records.

If the value of secondary considerations is debatable, then the English caution in this area may be justified. The apparent American use of subjective novelty may therefore persist as long as secondary considerations remain favoured. Both standards of inventiveness are, however, problematic, as noted above. The English may exclude too much information from patenting, leading to market failure in the biotechnology industry; the Americans too little, leading to market imperfections. Therefore, it is difficult to avoid the conclusion of Mustill LJ in *Genentech v Wellcome* that the "traditional patent law, and indeed the current legislation, is ill at ease with this type of complex and rapidly developing new technology".[165] A different approach to patent law may be needed: patents of improvement.

II(b) *Patents of Improvement*

(i) An Overview

Little additional protection for sub-patentable biotechnological trade secrets can be expected to come from the judiciary or in England or other common law jurisdictions. For example, Cooke P in the New Zealand Court of Appeal has twice voiced his concern that the patent law ought not to be developed unilaterally by one

[165] Above n20, at 545.

country, unless absolutely necessary, given that the area is of international significance.[166] In this context, specialist legislation for biotechnology patents could be investigated, but may contribute to a cluttering of the law books with legislation which would still be difficult to apply. The solution may be patents of improvement (PI), which were proposed in Chapter Five. These could apply to biotechnology improvements as well as to existing classes of information and could be used to complement the existing patent law.[167]

The problems of the English and American approaches to biotechnology patentability may be alleviated under a PI system where the stricter English approach, as developed in *Johns-Manville*, is limited to the patent and the weaker American approach, as expounded in the *O'Farrell* and *Amgen* cases, to the PI. In other words, the patent inventiveness could be based on considerations of objective novelty, and the PI inventiveness would be framed by a consideration of subjective novelty. Furthermore, the improvements would be limited to a sub-market of an existing patent, so that whilst the current American test may not be suitable for determining the inventiveness of biotechnology inventions, it may represent an appropriate threshold for PI.

This two-tier patentability proposal seems consistent with both natural right theory and economic theory. Sub-patentable trade secrets may gain protection as PI, so that the natural rights of the inventor are recognised and market failure in the production of such information is averted. Thus, these secrets would be shifted away from the anarchistic boundary on the intellectual property rights continuum. This would seem particularly to benefit the biotechnology industry in which many sub-patentable trade secrets may be produced, as above. PI may not generate the same level of monopoly as a patent so that market imperfections are not substituted for market failure. Hence, improvements, including what are currently regarded as sub-patentable trade secrets, may be moved toward their least inefficient positions on the intellectual property rights continuum.

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[166] *Welcome Foundation Ltd v Commissioner of Patents* [1983] NZLR 385, 392-3, where he distinguished this approach from that taken by the American Supreme Court in *Diamond v Chakrabarty*, above n108; also cited in *Smith Kline v Attorney-General* [1991] 2 NZLR 560, at 563; see also Dillon LJ in *Genentech v Wellcome*, above n20, at 526-7.

[167] Note that 'patent', as used here, refers to the existing patent law, not PI.

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PI would be granted an immunity from patent infringement so that competition could result between the PI and patent owners. As a result, the patent right could be shifted away from the monopolistic boundary of the continuum. Market failure need not result, given that the PI would be limited to a specific market or sub-market that is covered by the patent. An alternative is where the improvement is made by the patent owner, in which case s/he may practise price discrimination. Price discrimination is the sale of the same[168] good at different prices in different markets, provided that there are barriers to resale.[169] These barriers may be generated through the MD requirement of PI. Consequently, the level of price exclusion and so market imperfections that are associated with the patent and PI rights may be decreased. Moreover, if that price discrimination results in an increase in output[170], then the deadweight loss which is associated with a monopoly will also be decreased, although the monopoly remains.

As a result of the introduction of PI, research and development could become characterised by a series of improvements.[171] Hence, a steadier rate of development than of 'technology bursts' whereby a major discovery is patented and followed by disputes and finally monopolistic consolidation. Indeed, most biotechnological inventions could be published as PI; either as improvements on the initial broad patents or on other improvements that have generated a high enough profit. Thus, the protection of patents and PI could become self-limiting and not in need of restrictions on length. The increase in the dissemination of trade secrets through the PI specification could reduce the incidence of duplicative research and facilitate further invention.

(ii) PI and an Exemption for Farmers

Farmers have a potential problem where the claim-right of exclusivity of patents conflicts with their customary breeders' rights. Traditionally, farmers bought seed and

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[168] The 'same' good in this context means the same invention: see further 2.35-2.36.

[169] See 2.33.

[170] See 5.18.

[171] See 5.19.

animals, yet were able to reproduce these organisms for their own use even if they had been selectively bred; the merchants had no enforceable right. With the advent of biotechnology patents, an enforceable property right has emerged which could be used to restrict customary practices. There has been considerable political agitation from farmers and their representatives to recognise the customary practice of farmers.[172] Recently, a European Community Directive was issued which recognised farmers' rights in a limited fashion:[173]

> [T]he sale of propagating material to a farmer by the holder of the patent or with his consent implies authorization for the farmer to use the product of his harvest for further reproduction or propagation by him on his own farm, the scope of and procedure for this derogation being limited to those relating to the corresponding exception under Community law on plant variety rights.

In effect, the Directive gives an immunity to the farmer from the patent right, much like the immunity proposed for the PI, but it does not constitute another property right. Note that the farmer is not entitled to resell the organisms that they reproduce on their farm, as in the past; they are not awarded the power of transferability or the other relationships that characterise an intellectual property right.[174] Suppose, however, that the farmer were to make an improvement to the genetic line of an organism that is bought, such as by traditional selective breeding over many years. The patent right could be used to delay the introduction of improved genetic strains that could have major benefits for society; that is, create market imperfections. It would be advantageous if a system existed that would allow farmers to have a royalty free immunity to research and develop improvements and the power to transfer those improvements.

Instead of creating a 'farmers' use' exemption, a patent-PI system would include free experimental use. If a farmer made an improvement to genetically modified breeding stock, then s/he would be eligible for a PI. The result could be competition between the patented and the improved stock, leading to a reduction of price exclusion

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[172] See Burk, above n1, at 82-5.

[173] *Off J EC*, art 12, at 69. Presumably, this amounts to a reasonable exception for the purpose of article 30 of TRIPs.

[174] On the subject of these relations, see 1.29.

to the benefit of society. The limitation on resale from the exemption would still exist where no improvement was made to the patented genetically modified breeding stock.

(iii) PI and the Protection of Methods for Treating Human Illness

The implications of the PI proposal extend to the problem of the patentability of human medical treatment. These methods are often conceived of as surgical techniques, but many of the biotechnological patents may have medical uses. There is also potential that biotechnological methods could be applied as techniques in the treatment of human illness, particularly in the diagnosing of inherited afflictions through gene probes.[175] Under article 27 of the TRIPs agreement, member countries are left to legislate independently on this subject:

(3) Members may also exclude from patentability:

(a) diagnostic, therapeutic and surgical methods for the treatment of humans or animals.

In New Zealand, exclusions to patentability may be imposed where the use of the information in question is deemed to be contrary to morality.[176] This section could potentially be used to limit the patenting of methods of treatment which include biotechnological invention/s. The difficulty in patenting human medical treatment was aptly summarised in the New Zealand case of *Wellcome Foundation Ltd v Commissioner of Patents*, where McMullin J said:[177]

There is much to be said for developing law to allow the grant of patents for methods of treatment of human illness by the putting of known compounds to new therapeutic use. Human suffering may thereby be alleviated to the greater good of mankind. In the fields covered by this case research may be encouraged by the knowledge that what is discovered or invented will be protected from competition and assured of a reward. But there is another side to the picture. The grant of a patent is the grant of a monopoly. In recognition of this feature the patents legislation aims to balance the desirability of encouraging and protecting technological

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[175] For a description of this technique, see Montague, above n1, at 7.

[176] See s17(1) of the Patents Act 1953, inserted under s3 of the Patents Amendment Act 1993.

[177] Above n166, at 398.

advances against the restrictions, impediments and even abuse which may result from monopolies. A shift in emphasis which favours one interest will probably be achieved only at the expense of the other. Whether, and to what extent, any significant innovative movement is justifiable is, I think, not a matter for the Courts.

Recently, in *Anaesthetic Supplies Pty Ltd v Rescare Ltd*[178], Sheppard J, in a dissenting judgment, viewed patenting as a "denial which might mean the death or suffering of countless people." What both these judges are concerned about is the potential for price exclusion under a patent monopoly that leads to the underutilisation of that information. A variation of the underutilisation argument, as presented by Loughlan[179], is that "the patents regime may operate to delay the dissemination of knowledge to others in the field and also hinder other researchers, by fear of an infringement action, from using and building upon the discoveries made". Therefore, when Loughlan[180] scorns the lack of evidence underlying the economic argument that favours patents as an incentive for further research, it must be remembered that her main argument against patenting is also based on economic theory. Concerns of underutilisation relate to the market imperfections which accrue from the monopolisation of information.[181] Price exclusion and underutilisation in turn may interfere with the creation of further information and so additional natural rights, as noted above.

In contrast, some view the inclusion of methods of treating illness as a logical extension of the right to patent pharmaceuticals. In the recent *Anaesthetic Supplies* case[182], a patent for a method of treatment was approved by the majority given the absence of any prohibition in Australian law. Recently, a patent was granted to the National Institute of Health in the United States which concerned a method of gene therapy, but the initial concern appeared to be directed to the possible effect on

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[178] [1994] 50 FCR 1, at 41.

[179] (1995) Of Patents and Patients: New Monopolies in Medical Methods, 6 *Aust IPJ* 5, at 13, referring to Eisenberg, 1987.

[180] Ibid, at 13.

[181] See 2.10.

[182] Above n178.

investment in this area were the patent overturned, as noted above[183], rather than its effects on underutilisation of information. In addition, Burch[184] suggests that ethical concerns ought to be subordinated to the better health care which would result if there were a greater incentive for research and development in this area due to patent rights.

There appear to be two options that could be taken if the market imperfections which could accrue from the patenting of methods of treatment are to be avoided. First, society could decide that market failure in the production of medical treatments is more desirable than market imperfections in their utilisation; that is, make a political or constitutional decision. It may be that some are more comfortable with the notion of a slower rate of medical technological development than the production of more technology which few can use. This concern for fairness or equity may have led to the English prohibition of patenting medical treatments, noted above, and may be at the base of Loughlan's arguments.[185]

Second, the dilemma of finding a balance between the extremes of these economic arguments may be resolved under a patent-PI system, when PI could be used to protect, and so avert market failure in, the production of improvements. The existing market imperfections under the patent law could be reduced by competition or through price discrimination with improvements. That could lead to a reduction in price exclusion of the poor, and so result in the greater dissemination of medical treatment. Indeed, under a patent-PI system, royalty-free research would be allowed, so that further research would not be restricted. In this environment, medical practitioners would be less likely to sign an exclusionary licence to use a treatment, as another and better improvement could be developed. Hence, the suggestion that doctors might prescribe the treatment that they had licensed in preference to a better treatment would be irrelevant

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[183] The gene therapy in question "covers the principle of removing cells from a patient, altering their genetic make-up and returning them to the body": Coghlan, above n120, at 4. The aim was to introduce a gene into the body of a person who lacks such a gene. The problem is that this technique has been used in almost all gene therapy trials, so is likely to be challenged: ibid.

[184] (1987) Ethical Considerations in the Patenting of Medical Processes, 65 *Texas L Rev* 1139, at 1143.

[185] It may also have led the court in *National Research Development Corp's Application* [1961] RPC 134, at 145, to consider that the whole subject of surgery and other treatments as being non-economic.

under a patent-PI system.[186] PI also seems less complicated than Burch's proposal for a system of universal licensing at a judicially determined "fair price".[187] Therefore, instead of an inflated incentive to develop methods of treating human illness, it seems possible that a PI system would encourage development of additional and improved techniques at a widely affordable price. Moreover, improvements by competitors need not result in such a level of competition that the incentive for research is diminished. Merges and Nelson[188], note that "valium is valium"; it may be difficult to develop an improvement, depending on the nature of the compound in question, including biotechnological pharmaceuticals.

(iv) PI and the Testing of Biotechnological Products

There are concerns related to the use of highly novel and inventive pharmaceuticals, including where these have been altered through biotechnological processes, as their potential side-effects are not known on humans.[189] Hence, biotechnological pharmaceuticals must be tested like other drugs.[190] Thus, although the inventor's natural rights in his/her invention may eventually be recognised through the grant of a patent, the delay may deter investment. Indeed, the pharmaceutical market or health regulations may change in that time, for example, so that the returns are lower than expected. The effect of releasing genetically modified organisms into the

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[186] Cf Burch, above n184, at 1153; McCoy: cited in Loughlan, above n179, at 14.

[187] See Burch, above n184, at 1166.

[188] Above n18, at 897.

[189] There may also be moral concerns about the patentability of biological matter, such as whether we ought to own life and the perceived right of a species to keep its genetic integrity without DNA manipulation: see Merges, above n1, at 1058-62. Typically, lawyers and business people distinguish these concerns as being limited to the testing process and separate from the role of patents as a form of property: ibid; Moufang R (1989) Patentability of Genetic Inventions in Animals, 20(6) *IIC* 823; cf Barrad CMV (1993) Genetic Information and Property Theory, 87(3) *Northw Uni L Rev* 1037, who combines the two and concludes that humans have property interests in their genetic material.

[190] For example, in the USA it may take 5-7 years from the beginning of clinical research to pre-marketing: see Merges, above n1, at 1056-8; Traynor M, Cunningham BC (1989) Emerging Product Liability Issues in Biotechnology, 3 *High Tech LJ* 149, at 164.

environment is also not known[191], but safety procedures may also cause delays with similar results.

The point of this section is to suggest that where PI are permitted, the improvement is based by definition on an existing class of patented information which may be largely understood from previous tests. This would be particularly true over time if the range and extent of effects from using molecular genetics techniques become more predictable. This knowledge may reasonably be used to shorten the testing procedures. The American Federal Drug Administration review process, for example, normally involves a balancing of the risk which a drug may have, against the benefit and alternatives available.[192] Traynor and Cunningham[193] suggest that the testing procedure could be reduced if public concern to find an AIDS vaccine outweighed concern about the risks of side-effects. A patent and not a PI would be the likely protection for such a novel vaccine, but where an improvement could have major benefits based on technology that is well understood, it seems reasonable to speculate that a shorter testing procedure could be negotiated on a case-by-case basis. If so, the option of a short testing time would increase the immediacy of release and profits and of public investment, so that some inventors may be encouraged to choose the lower novelty/inventiveness option of PI where they perceive the probability of patenting to be risky. It must be noted that at present there is said to be some opposition from the manufacturers of generic pharmaceuticals over the long FDA approval time required even for improvements to compounds already approved under brand names.[194]

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[191] There are questions as to the potential effects of disaster if live organisms are released, such as the effect of the genetically modified organism upon the existing ecological balance: see Jaworski, above n1, at 661-2; Miller M, Aplet G (1993) Biological Control: A Little Knowledge is a Dangerous Thing, 45 *Rutgers LR* 285. For a review of the international guidelines for the safe application of biotechnology, see Persley GJ, Giddings LV, Juma C (1993) *Biosafety: The Safe Application of Biotechnology in Agriculture and the Environment*, Research Report No 5, International Service for National Agricultural Research: The Hague.

[192] Traynor and Cunningham, above n190, at 153.

[193] Ibid, at 151-4.

[194] See Besen SM, Raskind LJ (1991) An Introduction to the Law and Economics of Intellectual Property, 5(1) *J Econ Persp* 3, at 10. This observation contrasts with Parker's claim that pharmaceutical imitators are in an advanced position by virtue of the ease of copying: (1991) *Pharmaceutical Patents in New Zealand*, IMS (NZ) Ltd: Auckland, at 3. Significant barriers to the introduction of improved or even imitative drugs still remain.

However, the introduction of PI could be an opportunity for a revision of this overlap of testing.

Therefore, provided that the technology is well-established and the risk of harmful effects low relative to the gain, a reduced testing time may be possible on a case-by-case basis. The drive for this application of PI is likely to come from manufacturers, either of genetically modified organisms or of biotechnological pharmaceuticals, who want their products to reach the market sooner. This would also yield efficiency gains for the government by freeing public resources for other research. A remaining difficulty could be in developing countries which have the research capabilities to produce biotechnological products, but may not have adequate safeguards for testing and release.[195]

Conclusion

Biotechnological inventions tend to represent known products or processes of nature so that the subjective evaluation of the quantitative difference between the claimed invention and the prior art is problematic. As a consequence, subjective novelty may not be useful for framing the question of inventiveness. In this context, the English standard of inventiveness may exclude too much biotechnological information, yet the American standard may be too weak so that insufficient protection is given. Both, therefore, are unsatisfactory. These standards are, however, suitable for a two-tier system of patentability in a patent-PI system, provided that all other criteria are met. The smaller scope of the PI may suit the weaker American test of inventiveness. PI, in combination with the existing patent system, have the potential to mitigate the effects of monopoly, when it exists, as well as protecting sub-patentable trade secrets within the biotechnology industry. If adopted, PI may therefore increase the incentive for the production of biotechnological inventions in New Zealand and other common law jurisdictions, without causing more harmful effects. Moreover, such a solution would be preferable to a system of specialist laws, including for biotechnology inventions, or exemptions for lobby groups that may be costly to identify and to enforce.

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[195] For a discussion of biotechnology and biosafety in Brasil: see Munson, above n121.

CHAPTER SEVEN:
Patents of Improvement III: Computer Programs

PATENTS OF IMPROVEMENT III: COMPUTER PROGRAMS

The inclusion of computer programs under copyright law may protect valuable sub-patentable trade secrets. However, it may also create further inefficiency and harm the exercise of the natural rights of others. Recent alternative proposals to protect programs have focused on enhancing the incentive to invent by targeting misappropriation, when it occurs, or on increasing the returns to the inventor. Neither are satisfactory because of imperfect information, so that neither the size of the problem, nor any optimal level of return, can be adequately assessed. Computer program trade secrets, where otherwise patentable, may also be challenged for not being suitable subject matter for a patent. A solution may be the patent of improvement (PI) proposed in Chapter Five, through which sub-patentable trade secrets may be protected without causing an equally harmful outcome. PI may also represent a legitimate outcome for reverse engineering and so would impose an acceptable scope for this activity. Therefore, if PI were adopted in addition to patents, then specialist legislation for computer program protection may be unnecessary.

A computer program instructs a computer to perform a desired operation, often by going through a series of steps called the algorithm.[1] Thereafter, the algorithm is written into a computer language to produce the source code, which can be read by humans.[2] The computer then converts the source code into the object code, which is the machine-readable instructions that is stored in magnetic impulses on a disk.[3] The protection of each these elements of the computer program have been given attention because of the size and growth of the computer industry, including by the New Zealand

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[1] Cornish WR (1989) *Intellectual Property: Patents, Copyright, Trademarks, and Allied Rights*, 2nd ed, Sweet & Maxwell: London, at 351. In *Diamond v Diehr* 450 US 175, at footnote 9 (1981) the United States Supreme Court noted that there were a variety of definitions of "algorithm", and gave two used by the government:

(1) A fixed step-by-step procedure for accomplishing a given result; usually a simplified procedure for solving a complex problem, also a full statement of a finite number of steps.

(2) A defined process or set of rules that leads (sic) and assures development of a desired output from a given input. A sequence of formulas and/or algebraic/logical steps to calculate or determine a given task; processing rules.

[2] Ibid, at 351-2; Davey K (1993) Reverse Engineering of Computer Programs, 4 *Aust IPJ* 59, at 63-5.

[3] Davey, ibid, at 63-5.

courts.

The problem is that the computer program may contain valuable trade secrets that may be readily gleaned through examination of that program, so that secrecy alone provides inadequate protection. If so, the natural rights of the inventor may not be fully recognised and market failure may ensue; that is, the anarchy, which forms one extreme of the intellectual property rights continuum.[4] As a consequence, a law against industrial espionage, as proposed in Chapter Three, may be inadequate to protect computer program trade secrets. Indeed, there has been political support from owners for greater protection of this information by means other than through trade secret law.

Patent law protects ideas but may be inapplicable because the standard of patentability is too high for the trade secrets in computer programs to qualify. Indeed, computer programs may incorporate many sub-patentable trade secrets which are the product of numerous small advances in software development. Those computer program trade secrets which are patentable also may be challenged on the grounds that the program is not patentable subject matter. The major solution to these problems to date has been to protect computer programs under copyright law. Recently, New Zealand opted for the expansion of copyright through its participation in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs)[5], and under the Copyright Act 1994. Copyright is traditionally limited to the production of expressions, so that the ideas which are inherent in computer programs may gain indirect protection. These may be the real focus of a dispute so that the use of copyright as a solution may seem unsatisfactory.

Specialist legislation may be created to protect particular sub-patentable trade secrets. For example, the American Semi-Conductor Chip Protection Act 1984 protects integrated circuit designs that incorporate elements of expression and ideas.[6] However,

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[4] See 2.03-2.10.

[5] World Trade Organisation (1994) Agreement of Trade-Related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods, 47 (1162) *BNA's PTCJ* 230.

[6] See also the Layout Designs Act 1994, discussed below.

as Moon[7] notes, there are already new manufacturing techniques in use that can bypass this protection. Hence, specialist laws may become obsolete and lead to a cluttering of the lawbooks. In a recent symposium, legal, economic, and software experts also discussed two proposals for a third paradigm, in addition to copyright and patent law, that might better protect software.[8]

Protection through copyright or specialist laws may lead to the other, monopolistic extreme of the intellectual property rights continuum and so create market imperfections, including price exclusion. That in turn may effectively restrict the natural rights of others to have access to information, their opportunity to use it to produce further information and so interferes with the creation of natural rights.

In this Chapter, the difficulty of protecting the ideas which are inherent in computer programs is discussed. In Part I, the failure of trade secret law is reviewed in relation to the sub-patentable trade secrets inherent in computer programs. The solution to protect these secrets under copyright is then criticised. In Part II, the potential for patent reform is examined. The controversy over computer programs as patentable subject matter is reviewed. Recently, the applications of computer programs have been protected as commercially useful effects in Australia and New Zealand. This result in less indirect protection of computer program trade secrets under copyright, and a renewed emphasis on patent law. If so, then disputes may focus on the issue of inventiveness, as in biotechnology patent disputes, as reviewed in Chapter Six. In that case, the solution which was proposed in Chapter Five, patents of improvement (PI), may be of use. This concerns a narrow patent with a lower threshold of inventiveness, that is derived from recent biotechnology cases.[9] This threshold is important because it would increase, in effect, the protection of sub-patentable trade secrets in the computer software industry. The result may be to avert anarchy in the production of these secrets, yet avoid the monopolistic boundary of the intellectual property rights continuum

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[7] (1990) Review of Legal Protection for Computer and Semiconductor Technologies, in: Ministry of Commerce (ed) *Review of Industrial Property Rights, Patents, Trade Marks and Designs: Possible Options for Reform*, Vol 2, Ministry of Commerce: Wellington, 1, at 35.

[8] Samualson P, Davis R, Kapor MD, Reichman JH (1994) A Manifesto Concerning the Legal Protection of Computer Programs, 94 *Colum L Rev* 2308; Reichman JH (1994) Legal Hybrids Between the Patent and Copyright Paradigms, 94 *Colum L Rev* 2432.

[9] See 6.29.

through competition, or at least mitigate the harmful effects of it through price discrimination. PI may also be a solution to the debate over the role of reverse engineering, as engineering which results in improvements could be legal; imitations would still be subject to infringement actions.

I *The Failure of Trade Secret Law and the Extension of Copyright and Patent Law*

I(a) *Insufficient Natural Lead Time*

Recent scholarship has focused on the development of software protectionism from the failure of trade secret law. According to Reichman:[10]

> Properly understood, the inability of the nineteenth-century intellectual property system to accommodate the growing array of marginal cases ... represents a failure of classical trade secret laws under modern conditions and not a collapse of the patent and copyright paradigms applied to their traditional objects of protection.

Traditionally, trade secret law has hindered incremental invention so that the information could not be discovered without (1) independent research; (2) reverse engineering, or; (3) licensing agreements.[11] The result was a lead time in which the original inventor could gain a return on his/her investment which was sufficient to create an incentive for further research and to avert market failure.[12] Trade secret law fails when there is an insufficient natural lead time to allow the original inventor to make a sufficient return to at least cover their investment. Indeed, market failure may result despite the overall growth in this industry.

In the computer software industry there may be advances which involve "adept

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[10] Above n8, at 2444-5.

[11] Ibid, at 2521-2; see also Revesz J (1994) *The Economics of Patents*, Bureau of Industry Economics, Occasional Paper 18, Australian Government Publishing Service: Canberra, at 8.

[12] Above n8, at 2506.

combinations of many ideas" and "unique combinations of known algorithms and methods" rather than "substantial leaps" in development.[13] As a result, there may be many sub-patentable trade secrets generated. Further, these secrets are readily observed "on the surface" or "near the face" of the software product.[14] The most obvious example of this acquisition is the observation of semi-conductor circuits. The reverse engineer can view a computer chip under a microscope in order to make a diagram of the layout from which further developments can be made.[15] A more advanced form of inspection is 'black box' testing, where a detailed study is made of a program as its instructions are executed under varying conditions.[16] Where these ideas are more difficult to obtain, then a lengthy process of decompilation may be employed. This is particularly the case when the consumer is only able to purchase a disk with the machine-readable instructions or object code, not the human-readable source code. The reverse engineer may decompile or disassemble the object code to produce the source code.[17] Reverse engineering allows the extraction of ideas that underlie a computer program, but may infringe the copyright of that program.[18] Abe, Kitagawa and Saito[19] list the main purposes of reverse engineering as:

> ... the discovery of copyright infringement, the discovery of defects or bugs in programs, the maintenance of programs, the investigation of performance and function of programs, the development of compatible programs, the development of programs to be interconnected with other programs or hardware, the development of programs enabling the exchange of storage media, and the development of converters.

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[13] Oracle Corporation (undated) *Patent Policy*, The League for Programming Freedom: http://www.lpf.org/Patent/patents.html.

[14] Samualson et al, above n8, at 2335, 2337, 2342.

[15] In this case, the engineering is specifically permitted under the specialist laws for the protection of these designs or masks, because it is an accepted industry norm of competition: see Davey, above n2, at 85-6; Reichman, above n8, at 247-9.

[16] See Samualson et al, above n8, at 2380.

[17] Davey, above n2, at 65.

[18] Ibid, at 60.

[19] (1992) Legal Framework of Reverse Engineering - Proposal of Legal Models, in: Kyoto Comparative Law Center (ed) *Reverse Engineering of Computer Programs*, AIPPI: Tokyo 114, at 114.

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Methods of reverse engineering include:[20]

(1) examination of manuals, specifications or other documents, (2) examination of source codes, (3) examination of object codes, (4) dumping memories of a computer before, during or after the execution of a program, (5) dumping disks or tapes, (6) running a test program on the target program, (7) tracking CPU[21], I/O[22], or lines during the execution of the target program, (8) examination of hardware. They can be used independently or in combination with each other.

Many of these activities are innocuous such as the discovery of function by reading software manuals and by studying the program's input and output. More controversially, it may be used to create a clone or inter-operable program, in order that a competing program may be developed.

Cloning is a type of reverse engineering, designed to achieve functional equivalents of program behaviour. Cloning may be relatively easy to undertake because elements of the software design may be displayed by the program in operation, in on-line help, and in the accompanying manual.[23] For example, in *Lotus Development Corp v Paperback International Inc*[24], Paperback had only to run the Lotus 1-2-3 spreadsheet package to observe its behaviour in order to clone it.[25] Inter-operable programs permit the interaction of one program with another. Inter-operability may be promoted by

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[20] Ohashi M (1992) Reverse Engineering of Computer Programs: Legal Analysis under the Copyright Laws, in: Kyoto Comparative Law Center (ed) *Reverse Engineering of Computer Programs*, AIPPI: Tokyo, 88, at 89.

[21] The Central Process Unit (CPU) contains "the control and processing components. The control component is a preset operating system program which controls the processing component. The processing component is the electronic binary abacus which is the heart of the computer where the programmer's instructions are implemented. It is where "computing" is carried out": Dean R (1990) *The Law of Trade Secrets*, The Law Book Co: Sydney, at 419.

[22] Input and output (I/O) represent "keyboards, optical character readers and other devices [which] accept information produced by the operator and convert it into a form which the computer can use. Output consists of video display units (VDU), printers and other devices the function of which is to accept information produced by the computer and to transform it into a form that is understood by people": Dean, ibid, at 419.

[23] Samualson et al, above n8, at 2335.

[24] 740 F Supp 37 (1990).

[25] Samualson et al, above n8, at 2335.

companies as a strategy to encourage sales of their existing software or hardware[26], or discouraged as part of a strategy to reduce the desirability of a rival's products to consumers where that rival utilises a standard which may be inter-operable.[27] Inter-operability development may also be fed by market demand where consumers desire software packages or 'suites' containing different programs that can be utilised together.[28] The competition which arises from the creation of inter-operable programs may mean that the inventor is unable to capture the full benefit of his/her invention, which may lead to market failure. As a consequence, inter-operability is disputed internationally.

A further reason why it is so cheap to copy software information is that there are virtually no manufacturing costs associated with information artifacts, such as software, in electronic form.[29] Distribution costs may be low, particularly where the information is transmitted electronically. Proof that the software trade secret has been misappropriated tends also to be difficult to obtain.[30] If in the future the practice of reverse engineering becomes more cost-effective, then the natural lead time that presently exists may be further eroded.[31] In contrast, research costs for the original inventor may be particularly high for the interface designs for computers[32], so that there is a significant risk that these costs may not be recovered. Thus, there may be a significant deficit between investment costs and the return in the computer software industry, leading to market failure and the political motivation to provide additional legal protection for software. This process may be hastened as the industry/market matures and the level of market imperfections increases. Indeed, monopolistic profits could

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[26] Ibid, at 2402-3.

[27] Menell PS (1989) An Analysis of the Scope of Copyright Protection for Application Programs, 41 *Stan L Rev* 1045, at 1067-8; Davey, 1993, at 66.

[28] Samualson et al, above n8, at 2375-6.

[29] Ibid, at 2338, 2364.

[30] Menell PS (1987) Tailoring Legal Protection for Computer Software, 39 *Stan L Rev* 1329, at 1353.

[31] Samualson et al, above n8, at 2335-7.

[32] Ibid, at 2402.

contribute to the incentive for competitors to develop more cost-effective decompilation techniques of reverse engineering.

I(b) ***Copyrights***

Copyright has been preferred to patent law because it has a weaker threshold, requiring only that the program be original, and so is relatively inexpensive and quick to acquire.[33] The extension of copyright to computer programs has been achieved, in part, through protection as literary works under the TRIPs agreement.[34] Under article 9:

(2) Copyright protection shall extend to expressions and not to ideas, procedures, methods of operation or mathematical concepts as such.

Under article 10 of TRIPs:

(1) Computer programs, whether in source or object code, shall be protected as literary works under the Berne Convention (1971).

(2) Compilations of data or other material, whether in machine readable or other form, which by reason of the selection or arrangement of their contents constitute intellectual creations shall be protected as such. Such protection, which shall not extend to the data or material itself, shall be without prejudice to any copyright subsisting in the data or material itself.

Under article 11 of TRIPs, exclusive rights are awarded to this material:

In respect of at least computer programs and cinematographic works, a Member shall provide authors and their successors in title the right to authorise or to prohibit the commercial rental to the public of originals or copies of their copyright work ... In respect of computer programs, this obligation does not apply to rentals where the program itself is not the essential object of the rental.

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[33] Menell, above n30, at 1350.

[34] Art 9, 10(1) TRIPs.

The TRIPs agreement which protects computer programs under copyright appears to extend existing American law. In 1980, the Americans gave full copyright protection to computer programs under the Software Protection Act.[35] This Act confers an exclusive right on the copyright owner to reproduce the program and to prepare derivative programs.[36] The legislation appears to have stemmed from lobbying by the American software industry, which was subsequently directed to the worldwide protection of computer programs. Its enactment contributed to a "transnational protectionist tide" to extend copyright[37], which has culminated in TRIPs.

Recently, the trend toward the protection of computer programs under copyright was reflected in the New Zealand Copyright Act 1994, where a program is now protected under s14 as a "literary work" which under s2 "means any work, other than a dramatic or musical work, that is written, spoken, or sung; and includes - (a) A table or compilation; and (b) A computer program".[38] The term "written" is defined in s2 to include "any form of notation or code, whether by hand or otherwise and regardless of method by which, or medium in or on which, it is recorded". According to Brown[39], this definition will cover both object and source code as literary works. Therefore, the Act supersedes the judgment of Smellie J in the New Zealand High Court in *International Business Machines Corporation and Another v Computer Imports Ltd and*

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[35] See s10(b), 94 Stat 3015, 3028, codified as amended at 17 USC ss101, 117 (1988): cited in Reichman, above n8, at 2484.

[36] Davey, above n2, at 77.

[37] Gordon WJ (1994) Assertive Modesty: The Economics of Intangibles, 94 *Colum L Rev* 2574, at 2592; see also Correa CM (1990) *The Legal Protection of Software: Implications for Latecomer Strategies Newly Industrialising Economies (NIEs) and Middle-Income Economies (MIEs)*, Technical Papers No 26, OECD: Paris, at 9, 18; Samualson et al, above n8, at 2348; Reichman, above n8, at 2484-5.

[38] This approach is consistent with the Australian Copyright Amendment Act 1984. This Act resulted from the finding by the Australian High Court in *Computer Edge Pty Ltd v Apple Computer Inc* (1986) 6 IPR 1, that the object code was not a literary work: see the discussion by Brown A, Grant A (1989) *The Law of Intellectual Property in New Zealand*, Butterworths: Wellington, at 320. Despite this trans-Tasman consistency, it must be noted that use of the term "literary work" to describe a technique which involves the operation of a machine may be viewed as incongruous: see further Cornish, above n1, at 355-6; see also the review by Correa, above n37, at 21-2.

[39] (1995) The New Copyright Legislation - An Analysis, in: Legal Research Foundation (ed) *Intellectual Property: Copyright Act 1994 and GATT Legislation 1994*, Legal Research Foundation: Auckland, 13, at 15.

Others[40] that the machine readable object code is a literary work only by virtue of being a "translation" of the source code. The author of a literary work is held to be the person who creates the work or, if computer generated, the person "by whom the arrangements necessary for the creation of the work are undertaken".[41] Multimedia works, which may contain combinations of text, photographs[42], other graphics, and sound, may not neatly fall within one definition of a type of work, are protected as a literary work which is a compilation.[43]

The creation of inter-operable programs may now be prohibited given the restriction on the making of adaptations[44] under s34(1) of the New Zealand Copyright Act 1994. In contrast, a recent EC Directive contains an exception from copyright, allowing a second comer to decompile the programs of others if it is done to achieve inter-operability.[45] Kitagawa[46] describes it as a compromise between those who wanted a wider exemption for reverse engineering and the protectionist lobby. According

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[40] (1989) 14 IPR 225, at 249.

[41] See s5(1), (2)(a).

[42] Photographs, which may be recorded or stored in digital form, are defined in s2:

> A recording of light or other radiation on any medium on which an image is produced or from which an image may by any means be produced.

[43] In s2, "compilation" is defined as including:

> (a) a compilation consisting wholly of works or parts of works; and
> (b) a compilation consisting partly of works or parts of works; and
> (c) a compilation of data other than works or parts of works;
>
> According to Brown, above n39, at 17, this definition is inclusive of databases.

[44] Under s2, an adaptation is defined:

> In relation to a literary work that is a computer program includes a version of the program in which it is converted into or out of, a computer language or code or into a different computer language or code otherwise than incidentally in the course of running the program.

[45] Davey, above n2, at 81-2.

[46] (1994) Comment on a *Manifesto Concerning the Legal Protection of Computer Programs*, 94 *Colum L Rev* 2610, at 2616.

to Brown[47], the New Zealand prohibition under s34 "means that it will usually constitute infringement to adapt a program designed for one type of computer for use on another". Thus, New Zealand has opted for comprehensive protection of computer programs under copyright.

Supporters of the inclusion of software under copyright suggest that TRIPs has the advantage of an international guarantee of minimum protection.[48] Given the difficulty of the negotiations which led to this agreement, it is unlikely that it will now be lightly abandoned.[49] The protectionist lobby has a tendency to emphasise market failure in the absence of exclusive rights, which may occur given the failure of trade secret law, above. However, the emphasis seems to come at the expense of a concern for creating market imperfections through the over-protection of information. Exclusive rights can be used to block or 'hold up' research into computer program ideas, so that further advances and competition are delayed, as above.[50] The 'hold up' problem may be particularly significant when the secondary invention is an improvement which contributes more value than the original.[51] Similarly, monopolists can use their exclusionary rights in one product to control the sale of compulsory products through tying arrangements. This means that there may be no market for improved complementary or inter-operable products so that research is blocked. It may be especially problematic when the rights relate to a product standard.[52] Thus, there may be a 'technology burst' following the initial discoveries and application to market niches that declines through market imperfection. Society may gain by the initial incentive for

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[47] Above n39, at 20.

[48] Eg Lehman M (1994) TRIPs, the Berne Convention, and Legal Hybrids, 94 *Colum L Rev* 2621, at 2625-6.

[49] Lehman, ibid; Ginsburg JC (1994) Four Reasons and a Paradox: The Manifest Superiority of Copyright over *Sui Generis* Protection of Computer Software, 94 *Colum L Rev* 2559, at 2563.

[50] For examples, see Dunford R (1986) Is the Development of Technology Helped or Hindered by Patent Law - Can Antitrust Laws Provide the Solution? 9 *NSWLJ* 117; Merges RP, Nelson RR (1990) On the Complex Economics of Patent Scope, 90(4) *Colum L Rev* 839, at 865; Merges RP (1994a) Of Property Rules, Coase, and Intellectual Property, 94 *Colum L Rev* 2655, at 2664.

[51] Merges and Nelson, above n50, at 865-6.

[52] Menell, above n30, at 1344.

invention, but suffer later through the hindrance of dissemination of information and further research. Consequently, the extension of copyright law seems to have been made with less concern for competition than in the desire to create specialist incentives; it is a short-sighted and uncritical response.

For the effect of TRIPs, it is worthwhile to consider American precedents. It has been held in the US that copyright protects not only the literal code, but also non-literal elements of a program, including its structure, sequence and organisation which may be considered to be function rather than expression.[53] The inclusion of function under copyright has led to arguments over expression which in fact may be about the protection of behaviour, which is what the consumers may really desire to purchase.[54] Samualson et al[55] suggest that disagreements over whether icons and other elements of the user-interfaces are copyrightable are in fact about the lawfulness of developing a program that imitates the behaviour of another. Similarly, in disputes over reverse engineering the focus may be on an intermediate copy of a program which is made during decompilation, when it is really about protecting an important internal functional design, such as an algorithm.[56] Indeed, the consumer may not actually purchase the expression, that is the text or source code of the program in a computer language such as BASIC, but the machine-readable object code that is used by the computer to direct the performance of behaviour.[57] Thus, by protecting the object code as well as the source code under copyright, protection is given to inaccessible ideas and not simply for textual expression.[58]

A similar approach appears to have been taken in Australia in *Autodesk Inc v*

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[53] See for example, *Whelan Associates v Jaslow Dental Lab*, 797 F2d 1222 (1986); *Gates Rubber Co v Brand Chemical Industries*, 9 F3d 823 (1993); *Engineering Dynamics Inc v Structural Software Inc*, 26 F3d 1335 (1994): cited in Ginsburg, above n49, at 2560.

[54] Menell, above n30, at 1359.

[55] Above n8, at 2430; see also Bender D (1995) Lotus v Borland Appeal - On-screen Program Menus not Copyright-Protected, 11(3) *Computer L & Pract* 71, at 71.

[56] Samualson et al, above n8, at 2430.

[57] Davey, above n2, at 65; see also Menell, above n27, at 48-9; Samualson et al, above n8, at 2318.

[58] Davey, above n2, at 65.

Dyason[59], when the defendants reverse engineered an electronic lock. It was designed to prevent multiple copies and uses being made of a program for the drafting of plans; without the lock the program would not work and so copies could not work. The defendants designed a device which performed the same *function* as the lock so that copies could be made of the drafting program. The High Court of Australia found that the program was present partly within the lock as a copy of a copyrighted work. The defendants breached the copyright in that copy when they made a further copy, from which they subsequently developed the competing lock. Davey[60] concludes that this judgment conflicts with the traditional idea/expression dichotomy of copyright and will mean that "to reverse engineer a computer program is virtually certain to result in an infringement of the copyright of the program". This approach has now been confirmed in TRIPs and the New Zealand Copyright Act 1994.

The scope of copyright protection of computer programs in the United States, at least, may once again have narrowed. For example, in *Computer Assoc International Inc v Altai, Inc.*[61], the United States Court of Appeals for the Second Circuit found that non-literal copying which resulted in a functionally similar program was not copying from the plaintiff's program.[62] It was noted that "[t]he essentially utilitarian nature of a computer program ... complicates the task of distilling its idea from its expression". This inconsistency may lead to the development of tests to determine if the protection of expression will give undue protection to behaviour. For example, under the American merger doctrine, if "there were only one or very few ways to perform a function, the court would consider "idea" and "expression" to be "merged" and no copyright protection would be available for that merged expression".[63] Thus, in *Apple Computer*

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[59] (1992) 172 CLR 330; see also *Barson Computers Australasia Ltd v Southern Technology Pty Ltd* (1988) 10 IPR 597.

[60] Above n2, at 71.

[61] 982 F2d 693, 712 (1992): cited in Samualson et al, above n8, at 2349.

[62] See also *Apple Computer Inc v Microsoft Corp* 35 F3d 1435, 32 USPQ 2d 1086 (1994), 115 SCt 1176 (1995), it was held that a screen display comprising icons was not patentable. According to Bender, above n55, at 71, the approach taken was similar to that in *Altai*.

[63] Samualson et al, above n8, at 2358.

Inc v Franklin Computer Corp[64], the idea that underlay an operating system was held not to be protected by copyright as other methods of expressing the idea were foreclosed.[65] This 'merger' solution may be unsatisfactory because it is a highly subjective assessment which is based on a multiplicity of factors which vary from case to case. Indeed, the problem of protecting ideas under copyright may not resolved as a result of this test.

Most recently, in *Lotus Development Corp v Borland International Inc*[66], a menu command hierarchy was precluded from copyright protection. The reason was that, although the hierarchy might constitute expression, it was also a method of operation, which the Court of Appeals for the First Circuit suggested might be more appropriately protected by a patent.[67] Therefore, despite protection of computer program ideas under copyright as literary works, the issue does not appear to have been settled. In the context of this uncertainty, inventors may seek to protect their information through patents as well as copyright. Indeed, if the *Lotus v Borland* case is accepted[68], many more software patent applications may follow.[69]

I(c) *Patents*

Patents may be used to avoid market failure, and to disseminate valuable information to encourage the production of further information, yet like copyright, patents may hinder the utilisation of that information.[70] Menell[71] suggests that the

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[64] 714 F2d 1240 (1983).

[65] See Menell, above n27, at 1073.

[66] 49 F3d 807, 34 USPQ 2d 1014 (1995). See also *Sega Entertainments Ltd v Accolade, Inc* 977 F2d 1510 (1993), discussed by Samualson et al, above n8, at 2401; Reichman, above n8, at 2486.

[67] Bender, above n55, at 71.

[68] Bender notes that Lotus will seek a review of the decision: ibid, at 72.

[69] Ibid, at 73.

[70] See generally, 2.10.

fixed term patent may be too long for inventions given the rapid development rate in that industry. However, the development of software frequently entails the application of knowhow of a level below the patent threshold, particularly inventiveness.[72] This problem is further complicated because those trade secrets which are otherwise patentable may be challenged as not being suitable subject matter for a patent. This is because the mathematical input into the creation of the algorithm may mean that it is viewed as an intellectual discovery and unpatentable.[73] As a consequence, it may not be straightforward to gain or to keep a computer program patent in practice, which could contribute to fears of market failure in this industry.

Despite these problems, and the favoured treatment of software copyrights, the incidence of software patents seems likely to increase, as programs are not specifically excluded from patenting under TRIPs. Patents have been awarded in Europe and the United States for software, including, for example, a method for digitally processing images[74], and an algorithm which was part of a rubber curing process.[75] Recently, in New Zealand a patent was issued for a computer implemented process related to determining the position of aircraft.[76] These decisions will principally benefit the lawyers and patent attorneys who will deal with the growth of program patent applications, the overlap with copyright, specialist laws and the ensuing disputes. Further, it seems that this overlap between software copyright and patents may be encouraged not because of the merits of multiple protection, but as a defensive strategy

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[71] Above n27, at 1083; see also Higashima T, Ushiku K (1986) A New Means of International Protection of Computer Programs Through the Paris Convention - A New Concept of Utility Model, 12(1) *Computer LJ* 1, at 12.

[72] Higashima and Ushiku, ibid, at 12; Menell, above n27, at 1076; Reichman, above n8, at 2502; see also Samualson et al, above n8, at 2346.

[73] See the discussion below in Part II(a).

[74] *VICOM Systems Inc Patent Application*, decision T208/84, 5 July 1986, [1987] Official Journal EPO 14, discussed further in Part III, below.

[75] *Diamond v Diehr*, above n1, at 185-7, discussed further in Part III, below.

[76] *Hughes Aircraft Co's Applications* (unreported decision, 3 May 1995) Applications Nos 221147, 233797, and 233798: discussed by Terry J (1995) Software Patents: Good or Bad? 1(1) *NZIPJ* 10, at 12. This decision followed an Australian case, *International Business Machines Corporation v Commissioner of Patents* (1992) 22 IPR 417.

given that several means are available. Some form of protection of confidential information is needed[77], but this duplication could facilitate the monopolisation of information. Moreover, the defence of these rights may increase the diversion of resources from further research and thereby may indirectly lead to market failure. Thus, not only will protection of software be problematic under copyright or patent law, but these problems are compounded by the trend toward protection under both laws.

I(d) *Alternatives to Copyrights and Patents*

Two of the most interesting paradigms for the protection of computer programs are a response to the criticism of the protection of software under copyright and patent law. The first is to develop a misappropriation doctrine to counteract market failure, where it occurs. The second is to establish a regime that may serve to reduce the deficit between investment and returns through a system of royalties or contributions, and so pre-empt market failure. If successful, these paradigms could be used to protect computer software without reference to copyright or patent law.

(i) Misappropriation Doctrine

Karjala[78] favours the use of the term 'misappropriation' over that of market failure, because the focus is the methods and so specific instances of failure. This is consistent with a view that market failure does not occur 'across the board' in the software industry. General evidence for this view is the huge growth of the computer industry.[79] Further, it has been suggested that the lead time could be preserved through

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[77] See generally the arguments reviewed at 2.03-2.10.

[78] (1994) Misappropriation as a Third Intellectual Property Paradigm, 94 *Colum L Rev* 2594, at 2595.

[79] For example, in New Zealand, the revenue from computer software and services grew from 1062 million dollars in 1993 to 1212 million dollars in 1994 and is projected to reach 1883 million by 1998: Webber J (1995) The IT Landscape, in: Computerworld, *1995 New Zealand Computer Industry Directory*, IDG Communications, Auckland, 9, at 10. On the growth of the computer industry in the United States, see Menell, above n30, at 1329-30.

invention in specific market niches[80], or where subsequent inventors require an additional development time before release of their product onto the market.[81] Supporters of copyright also use the thriving nature of the American computer industry since the adoption of copyright as evidence for their doubt of the need for change.[82] Goldstein[83] suggests this development is a significant evidential barrier that proponents of change must first overcome. Instead, Karjala treats the thriving nature of the computer industry as evidence that extensive protection under copyright is not needed and that the development of a misappropriation doctrine would be more suitable.

Karjala[84] has made an initial proposal to exclude information-based products from protection unless that information is the subject of market failure. Hence, the emphasis is on the methods of misappropriation. The advantage of this approach is that the protection is limited only to actual misdeeds.[85] However, the definitions of market failure and different methods of misappropriation, as well as the nature, scope and length of protection against those misappropriation remain undetermined.[86] Karjala responds[87] that these decisions can be left to judicial development on a case-by-case basis that ought to become more predictable with time, or that the types of misappropriation may ultimately be encoded in a list under statute.

The problem with the misappropriation proposal is not simply that these decisions are unpredictable, but that the definitions may be so contentious that the identification costs of establishing this doctrine could be prohibitive. Even if a set of rules for different methods of misappropriation were established, these may be equally

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[80] Goldstein P (1994) Comments on a *Manifesto Concerning the Legal Protection of Computer Programs*, 94 *Colum L Rev* 2573, at 2575.

[81] Karjala, above n78, at 2602.

[82] See Ginsburg, above n49, at 2559; see also Samualson et al, above n8, at 2378.

[83] Above n80, at 2575.

[84] Above n78, at 2575.

[85] Ibid, at 2606.

[86] Ibid, at 2605-2607.

[87] Ibid, at 2606.

as costly to enforce as a series of specialist laws.[88] The outcome may still be the under or overprotection of information.

If the identification and enforcement costs of this doctrine are under-estimated, it may be because of an assumption that market failure can be kept at a manageable level by the application of a misappropriation action. This assumption may arise because the potential for market failure is not fully appreciated. The level of existing market failure could be hidden by the rapid expansion of the industry in recent decades; large sales do not mean that all branches of software information have a sufficient inventive incentive. Further, too little weight may have been given to the public investment into computer research[89], without which the inherent market failure might be more transparent. Therefore, greater market failure could exist than is appreciated, so that future market failure should not be under-estimated.

A related problem is that the scale of computer development may mask the beginnings of the maturing of the market, particularly in market niches that leads to market imperfections. However, it is difficult, except in retrospect, to identify when a market has matured and the technology burst reached a consolidation phase. An indication of maturation may be implicit in the observation that increased effort is being made to develop software niche markets, such as computer-aided design or graphic design tools.[90] Another problem of using misappropriation doctrine is that in the consolidation phase of a technology burst it could be wrongly used to restrain competition, much like an exclusive right. Holders of key information may consolidate their market share or dominance by excluding those who might utilise that information in incremental invention under threat of misappropriation law. Indeed, Karjala[91] acknowledges that a definitive term or period of protection of misappropriation is inevitable to avoid discouraging incremental invention. This in turn leads back to a

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[88] See above, at 7.02-7.03.

[89] See Menell, above n30, at 1339, 1357. Nelson RR (1994) Intellectual Property Protection for Cumulative Systems Technology, 94 *Colum L Rev* 2674, at 2677, also notes that the development of computer technology may have been assisted by licensing practices within the industry.

[90] See Samualson et al, above n8, at 2372.

[91] Karjala, above n78, at 2607.

problem observed in the discussion of patent law, above: whether a fixed term could result in over or under-protection of the information.

(ii) Royalties and Contributions

In two recent publications, a blocking period and some form of obligatory royalty or contribution were proposed so that market failure could be pre-empted. First, Samualson et al[92] have written a manifesto for the legal protection of computer programs, the focus of which is the imposition of an artificial lead time after the introduction of software, when the natural lead time has been diminished through cheap copying. This concept is not new as both patents and copyrights have artificial lead times to ensure a period of exclusive rights. Samualson et al[93] recommend three primary factors for consideration, to assess when market failure is likely to occur:

> (1) the nature and size of the software entity or component that has been imitated; (2) the means by which a second comer obtains access to such an entity and the degree of dependence (or independence) of a second comer's creation; and (3) the degree of similarity between the products and markets of the original and second comers.

According to Samualson et al, market failure ought to be addressed by pre-empting it through an artificial lead time. Samualson et al's solution is to vary the length of the artificial lead time to avert market failure in accordance with the degree of damage that copying might achieve. The degree of protection may include some consideration of the size of the firm involved as a smaller firm may take longer to market their product and so amount to a relatively larger lead time.[94] Third, the closer the similarity between old and new information, the greater is the imitation and so the greater the protection should be. The authors favour a standard of "substantial *identity*", not the "substantial *similarity*" standard that is found in the American Semi-conductor

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[92] Above n8.

[93] Ibid, at 2378-80.

[94] Ibid, at 2341.

Chip Protection Act.[95] The reason is that the overlap may amount to more than that of similar expression; the functional identity of one software product may infringe upon another. This is implicit recognition that the protection of the expression may include protection of an idea. Hence, the authors describe their approach as "market-orientated". However, Samualson et al[96] concede that to tailor individually an artificial lead time for each software invention, yet still maintain a satisfactory return, would be too unpredictable to work. Instead, Samualson et al[97] focus on the cloning of software.

The term 'clone' usually refers to a program that precisely imitates the behaviour of another, but Samualson et al use it to mean a program with a substantially identical internal design as another.[98] Cloning, according to these authors, is the next most trivial means of acquiring functional equivalence after duplication of code. The result is that the gist of the program may be misappropriated without literal copying. Hence, cloning has a potential for causing market failure by reducing the profits of the original inventor. For example, in *Whelan Associates v Jaslow Dental Labs Inc*[99], Jaslow cloned a sub-compilation of knowhow in Whelan's Dentalab program and by copying internal design elements such as how information flowed through the program, and external design elements such as how the information "behaved", in order to achieve functional equivalence. The cloned program was then written in a different program language.[100] Samualson et al[101] favour an automatic artificial lead time that dates from the first public marketing of the original program; that is, a "blocking" period. The clones so blocked would be identical or nearly identical to the original[102], so that significant incremental improvements ought to be permitted. This is consistent with a view of

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[95] Ibid, at 2399-400.

[96] Ibid, at 2413.

[97] Ibid, at 2414.

[98] Ibid, at 2381.

[99] Above n53.

[100] See Samualson et al, above n8, at 2398.

[101] Ibid, at 2413.

[102] Ibid, at 2413.

incremental improvements as being more socially valuable than mere imitation, because improvements contribute to the level of skills in the technological community.[103]

Ideally, Samualson et al believe that the blocking period protection should be long enough to permit the development of a market niche without creating *de facto* standards in the marketplace that might hinder incremental invention.[104] Some confusion might arise where subsequent inventors do not know when that blocking period finishes. The proposed solution is to encourage inventors to register their inventions in return for a longer blocking period.[105] A registration system could also be a means to overcome another source of market failure. The original invention may be a commercial failure even though it is utilised for subsequent invention which is a success. If the original inventor cannot obtain at least part of the incremental social value derived from their work, the inventive incentive would be reduced, particularly for 'path-breaking' research. Samualson et al[106] suggest that a royalty system could operate in addition to the blocking period for computer programs; a knowhow register could serve to notify subsequent inventors of their duty. However, the identification costs of determining the level of the royalty in each case may be so high that this option is impracticable and so the authors concede that a standardised blocking period may be instituted instead.[107] They do however suggest[108] that some variation in the scope and period of protection to a registered invention could be possible where the market segment is 'distant'. That is, if the market segment of a secondary invention is so different to that of the original, then its market-destructive effects may be minimal and so may be lightly blocked, if at all.[109] Thus, the authors show an awareness of the potential to create market imperfections when attempting to alleviate market failure, that

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[103] Ibid, at 2420.

[104] Ibid, at 2423.

[105] Ibid, at 2417.

[106] Ibid, at 2415-18.

[107] Ibid, at 2415.

[108] Ibid, at 2418-9.

[109] Ibid, at 2419.

is perhaps greater than that of Karjala, above.

Reichman has proposed a separate regime which also incorporates an artificial lead time[110] as well as a set of liability rules that are tailored to the information and industry in question. Reichman also would apply this regime in a wider context than cloning and proposes that computer program protection focus on those new applications of knowhow that create behaviour, which he calls "industrial compilations".[111]

Reichman[112] argues that market failure may be aggravated where free-riders are able to appropriate the value of an original invention without contributing to the research costs. He suggests[113] that the best way to cope with the trade secret market failure is to design a "substitute liability regime that rationalizes the functions that trade secret law performed under optimum conditions". Borrowers would have to pay obligatory "contributions" to the original inventor, much like the royalties proposed above. These would generate a sufficient inventive incentive to overcome market failure, but minimal enough that the incentive is not distorted;[114] that is, without creating significant market imperfections. Thus, a minimal barrier to market entry for subsequent inventors could be achieved.

The artificial lead time and the liability rules would ideally reflect the harms and benefits to society from the use of the original invention.[115] Reichman suggests that the artificial lead time for the original invention and the obligatory contribution to that research should be shorter where "substantial improvements or new applications of existing technology" are made, and longer where imitators compete within the same market segment.[116] If a secondary inventor entered the market with a product that is

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[110] Above n8, at 2457.

[111] Ibid, at 2545.

[112] Ibid, at 2525.

[113] Ibid, at 2539.

[114] Ibid, at 2539.

[115] Ibid, at 2539.

[116] Ibid, at 2539-40.

substantially different from the original, Reichman[117] suggests that they might not have a lead time nor perhaps need pay a contribution. This is consistent with the 'market-orientated' proposal of Samualson et al, above.

A feature of Reichman's approach[118] is that the duration of an artificial lead time and the level of the contributory fees would be left to members of the relevant technical community to determine. Reichman expects that because each member has the potential to become both an inventor and an imitator, that it would pay them overall to transact efficiently and not overcharge or underbid for information. To ensure that these liabilities are not anti-competitive, outer limits could be set under legislation.[119] Any remaining regulations would be left to the technical communities to determine as they are, in effect, a substitute for the legislators and administrators who would have traditionally undertaken the task.[120]

To facilitate the collection of contributions, inventors ought to register an "identifying description of the industrial compilation in question"[121], as suggested by Samualson et al, above. Only enough information would be provided to allow subsequent inventors to avoid unintended replication of the same behaviour.[122] The option of registration need not be taken where it is to the original inventors' financial advantage. For example, the difficulty of reverse engineering may be such that the natural lead time may generate more profit than would be returned from contributions.[123]

Karjala[124] has criticised both Samualson et al's and Reichman's proposals because they do not include specific proposals for the object, scope, and length of

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[117] Ibid, at 2543.

[118] Ibid, at 2548.

[119] Ibid, at 2548.

[120] Ibid, at 2555.

[121] Ibid, at 2551.

[122] Ibid, at 2551-2.

[123] Ibid.

[124] Above n78, at 2596.

protection or associated remedies. The problem, however, is deeper than the outcome of a series of decisions, and extends to the organisational structure and how those decisions are made. Samualson et al, above, partially address the problem of market imperfection when they acknowledge that a standard blockage term or the level of a royalty to be paid by the secondary to the original inventor might be too costly to determine. Their solution is to favour a standardised royalty under law, as above. This approach may be successful with numerous or perhaps the majority of computer program royalties, but there will at least be niches for which the period is too short or too long. The result is that there will be either market failure through too little lead time or market imperfection through too much. Further, a standardised period may also be slow to change if the technology changes and where niches gain commercial importance as a consequence. In short, their approach may contribute to the cycles of over- and under-protection that Samualson et al want to avoid.

Samualson et al do not appear to propose a body to determine each blocking time or royalty, but Reichman suggests that this be left to the relevant technical community, as above. Thus, these elements of protection could be tailored to the nature of the information and characteristics of the industry in question. The model of the technical community appears to have worked successfully in some instances, such as for the protection of plant varieties[125], but there is no guarantee of similar co-operation in all industries. Mackaay[126] suggests that if the ratio of inventors to borrowers were to favour the borrowers, then weak protection and a relatively low ratio of invention could result. This outcome may seem reasonable in the software industry as the difference in the costs of original invention and subsequent copying are acknowledged to be marked. In turn, a large number of firms, particularly those which are new onto the market, may devote their limited resources to the type of research which could yield the maximum profit: copying. If so, then in practice Reichman's technical community may disintegrate as a result of market failure, which may be why in general such communities have rarely developed.

If the technical community were to exist and continue to operate, arguments may

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[125] For a review see Reichman, above n8, at 2465-72.

[126] (1994) Legal Hybrids: Beyond Property and Monopoly? 94 *Colum L Rev* 2630, at 2641.

develop over which information is suitable for registration, even if the system were to employ a copyright-like registration process. These arguments could assist the secondary inventors to 'hold up' negotiations[127] in order to pay the lowest possible contribution, however obligatory. Indeed, in commenting on Reichman's proposal, Gordon[128] doubts whether "reciprocal conditions will exist among the industry players and that they will be willing to work out sensible arrangements without wasteful litigation." If the secondary inventor is successful in lowering the level of his/her contribution it may contribute to market failure.[129]

Another alternative would be to refer the whole process to a third party such as a tribunal or a court to gain a form of compulsory licensing. This practice may also be criticised for the potential 'hold-up' behaviour of potential licensees who expect to gain a compulsory licence on favourable terms, akin to that which may be used by right holders, above. Thus, it seems that Samualson et al's "royalties" and Reichman's "contributions" may fail to avoid the problems of compulsory licensing.[130] The true difficulty may lie in trying to anticipate the behaviour of the market. Such goals are problematic when the decision-maker/s hold/s only imperfect information about the market, as the level of protection which results may be too little or too great. An alternative is to reform the patent law.

II *Patent Reform: Patents of Improvement*

II(a) *The Problem of Computer Programs as Inventions*

Much of the foregoing discussion has concerned the protection of sub-patentable trade secrets in computer programs under copyright. This solution has been favoured

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[127] This tactic is discussed further at 5.05-5.06, with regard to compulsory licensing.

[128] Above n37, at 2584.

[129] See Merges, above n50, at 2666-7.

[130] See 5.05-5.06.

partly because of the controversy over the protection of otherwise patentable trade secrets as suitable subject matter for a patent. In computer law, two divergent approaches to the problem of computer program patentability have arisen in England and America. If a computer program simply protects a mathematical algorithm[131], it may not be seen to be an invention, but a discovery or mental activity. This view is supported in England by the exclusion of computer programs from patentability in 1977. Consequently, whether the software patent claims really protect a program may be the principal matter of dispute. In England, the treatment of the application of computer programs has evolved to become stricter than that in America. Australian and New Zealand decisions appear to follow the American view and an early line of English precedents, yet go further so that the application of a computer program may be patentable if it yields a commercially useful effect. These contrasting approaches may, in effect, represent differing thresholds for software patents. If the threshold is too high it may lead to market failure, but if too liberal an approach is taken many programs may be patented so that market imperfections result. This divergence between jurisdictions may be addressed through patent reform.

(i) English Patents

For a period, the English courts favoured the patenting of computer programs. In *Stahl and Larson's Application*[132], a method and apparatus for collating statistical data relating to passenger travel on a transport system was rejected as being "intellectual in character"; utility in a claim was limited to the interaction of physical means. Consequently, the claim was found not to amount to a method of manufacture under the Patents Act 1949 (UK). However, in the Australian case of *National Research Development Corp's Application*[133], a "claim could be considered to be a manner of manufacture because it defined a process that resulted in a vendible product". This is

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[131] See definition above n1.

[132] [1965] RPC 596, at 600.

[133] [1961] RPC 134, summarised in *Sumitomo Chemical Co Ltd v Rhone-Poulenc Chimie* (1994) 30 IPR 591, at 602, per V Thom, Delegate of the Commissioner of Patents. The *NRDC* case entered New Zealand law through *Swift and Co v Commissioner of Patents* [1960] 79 NZLR 775, at 779.

consistent with the approach to computer programs that was later taken in *Slee and Harris' Application*[134], when a program was found to be patentable if "it is an integer which physically co-operates with a computer to control the latter in a certain way". Likewise, in *Burroughs Corporation (Perkin's) Application*[135] it was held that "computer programmes which have the effect of controlling computers to operate in a particular way, where such programmes are embodied in physical form, are proper subject matter for letters patent". These precedents are still persuasive in Australia and New Zealand, given that the definition of 'invention' under the Patents Act 1953 (NZ) is based on that in the Patents Act 1949 (UK).[136]

The key emphasis in these cases is on the physical effect of the program on the computer, rather than on the program and so the algorithm itself. In *Burroughs*[137], Graham J described an acceptable outcome as when a method "results in a new machine or process or an old machine giving a new and improved result". A computer program could achieve a new and improved result in an old machine: the computer. Note that the expectation is slightly different than if the method had resulted in a new machine or process; an old machine must give an improved as well as a novel result. It appears as though the court may have fortified its decision on whether a program was suitable subject matter for a patent by inquiring as to the quality of the outcome; that is, inventiveness. In doing so, the court seems to have given the patentee the 'benefit of the doubt'.[138]

Under the Patents Act 1977 (UK), computer programs were specifically excluded

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[134] [1966] RPC 194, at 198; see also *Gevers' Application* [1970] RPC 91, at 98.

[135] [1974] RPC 147, at 160, per Graham J; see also *International Business Machines Corporation's Application* [1980] FSR 564, at 572, referring to the *Burroughs* decision.

[136] See *Hughes Aircraft Company*, above n76, at 24. It is noted, however, that the current British criteria of commercial utility, novelty, and inventive step may be adopted in further reforms of the New Zealand Patents Act 1953: see Ministry of Commerce (1992) *Reform of the Patents Act 1953*, Ministry of Commerce: Wellington, at 8.

[137] Above n135, at 158.

[138] This outcome is consistent with the approach taken in *Rantzen's Application for a Patent* [1946] 64 RPC 63, at 66.

from patentability.[139] The European Patent Office guidelines which followed, although excluding programs from patentability, nonetheless allow admission of a claim when a program is involved in the implementation of the subject matter which makes a technical contribution to the known art.[140] The exclusion may have arisen from a fear that patenting a program could protect indirectly a discovery and/or mental activity. If so, market imperfections, including the under-utilisation of information, would follow on such a scale that the rate of information could be adversely affected. It may be predicted that the future of this exclusion is limited, given that under article 27(1) of TRIPs, "patents shall be available and patent rights enjoyable without discrimination as to the ... field of technology". Moreover, computer programs are not among the permitted exclusions from patentability. Hence, the English judgments in this area in the period 1977-1994 may foreseeably be discarded.

Following the 1977 Act, a restrictive approach to the patentability of computer programs entered English law through a decision of the European Patent Office, which was made at the time that these guidelines were being developed. In *VICOM Systems Inc Patent Application*:[141]

> ...the European Patent Office Technical Board of Appeal decided that, even if the idea underlying an invention may be considered to reside in a mathematical method, a claim directed to a technical process in which the method is used, which in *VICOM* was image processing, does not seek protection for the mathematical method as such.

Indeed, the European Patent Office found:[142]

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[139] See s1(2)(c). This section follows the European Patent Convention: Cornish, above n1, at 142.

[140] Guidelines for Examination in the EPO Part C. -IV, 2.3: quoted in Hart RJ (1993) Scope of Protection for Software-Related Patents in Europe, in: Software Information Center (SOFTIC) (ed) *Softic Symposium '93: The 4th International Symposium on Legal Protection of Computer Software*, 10-11 November 1993, Software Information Center (SOFTIC), 1, at 2.

[141] Above n74: cited in *Raytheon Co's Application* [1993] RPC 427, at 433. A similar decision was reached regarding an x-ray apparatus: Geissler BH (1994) The Patentability of Computer Software at the European Patent Office, in: Kyoto Comparative Law Center/Law Technology Group (ed) *Seminar*, Kyoto Comparative Law Center: Kyoto, 1, at 8.

[142] *VICOM*, above n74, at 21 and 22: quoted in *Raytheon*, above n74, at 449.

Generally speaking an invention which would be patentable in accordance with conventional patentability criteria should not be excluded from protection by the mere fact that, for its implementation, modern technical means in the form of a computer program are used. Decisive is what technical contribution the invention as defined in the claims when considered as a whole makes to the known art.

This passage was quoted with approval in *Merryl Lynch Inc's Application*[143], when Fox LJ found:[144]

[I]t cannot be permissible to patent an item excluded by [the 1977 Act] under the guise of an article which contains that item - that is to say, in the case of a computer program, the patenting of a conventional computer containing that program. Something further in necessary. The nature of that addition is, I think, to be found in the *VICOM* case where it is stated: 'Decisive is what technical contribution the invention makes to the known art.' There must, I think, be some technical advance on the prior art in the form of a new result (e.g., a substantial increase in processing speed as in *VICOM*).

In other words, if the computer is to be granted a patent it is the machine itself which must make the "technical contribution to the prior art".[145] This general approach has been followed in further cases concerning the patentability of programs. In *Raytheon Co's Application*[146] Jeffs QC, sitting as a Deputy Judge, held, following *Merryl Lynch*:

In my opinion the process claims do no more than provide a briefing for a computer programmer to write a program that would enable conventional pieces of apparatus to perform a particular mental act, and the apparatus claim is for no more than the apparatus incorporating such a program. It is therefore, effectively, a program for a computer and is not patentable.

Another way of expressing these post-1977 arguments is to say that the purpose of the patent claim is considered in determining whether it represents a discovery rather than making a technical contribution to the art. This approach includes consideration of the discovery, as it may be sufficient to make the invention "new" for the purpose of the

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[143] [1989] RPC 561, at 568.

[144] Ibid, at 569.

[145] Ibid.

[146] Above n141, at 451; see also *Gale's Application* [1991] RPC 305, at 333; *Wang Laboratories Inc.'s Application* [1991] RPC 463.

Patents Act 1977 (UK) and patentable "even though practical use of the discovery was a matter of the application of known technology".[147] However, this approach is less lenient than that taken in *Burroughs*, above, where a *program* could be patented if it gave a new and improved result to an old machine, the computer. Dillon LJ in *Genentech Inc and Another v Wellcome Foundation Ltd*[148] commented: "It would be nonsense for the Act to forbid the patenting of a computer program, and yet permit the patenting of a floppy disk containing a computer program, or an ordinary computer when programmed with the program."

This strict approach appears to be consistent with the interpretation of patent claims made recently in *Glaverspel SA v British Coal Corporation and Another*[149], where Staughton LJ stated:

> If possible, the meaning of the document must be moulded to conform with the purpose of its author or authors - the purpose being judged from the document as a whole and the surrounding circumstances.

Staughton LJ relied on the judgment of Lord Diplock in *Catnic Components Ltd v Hill and Smith Ltd*[150], where his Lordship said:

> A patent specification should be given a purposive construction rather than a purely literal one derived from applying to it the kind of meticulous verbal analysis in which lawyers are too often tempted by their training to indulge.

Lord Diplock appeared to want to strike a balance between accepting the limitations in the patent specifications and including minor variants, depending on the perceived intention of the patentee, as determined by a reader who is skilled in the art. Similarly, in the protocol to article 69 of the European Patent Convention it was also proposed that patent interpretation should avoid the extremes of a strict literal meaning

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[147] *Genentech Inc v The Wellcome Foundation Ltd* (1989) 15 IPR 423, at 508-9, per Dillon LJ.

[148] Ibid, at 508.

[149] [1995] RPC 255, at 269.

[150] [1982] RPC 183, at 242.

of the words in the claims, and using the claims only as a guideline.[151] In order ensure that there is no confusion between these two approaches, Millett LJ in *PLG Research Ltd and Another v Ardon International Ltd and Others*[152] stated:

> It does not, however, appear to us to be useful to consider whether it [*Catnic*] went further and may be taken as indicating the proper approach to construction under the Protocol. Such an exercise merely enters a sterile debate on the precise meaning of Lord Diplock's words, a matter which should now be left to legal historians. Lord Diplock was expounding the common law approach to the construction of a patent. This has been replaced by the approach laid down by the protocol.

Whatever the precise meaning of the interpretive balance which is held to be desirable, it appears that the outcome of this purposive approach is to the disadvantage of the patentee who is no longer given the 'benefit of the doubt'. Indeed in *Merryl Lynch*, Fox LJ went on to find that the prohibition against patenting programs is generic and so does not admit qualitative exceptions. As a result of this approach, IBM lost six cases relating to text processing patents in England, whereas all but one of these applications were granted in the United States.[153] It may follow that the English approach promotes a greater degree of market failure in the production of computer programs than the American, discussed below. Of course, it must be acknowledged that the effective incidence of market failure may be mitigated given that computer programs can now be protected under copyright, as above. In this context, the British government may be faced with lower administrative costs than in those countries, such as New Zealand, in which software can be protected under both copyright and patent law. However, under article 27 of TRIPs, as noted above, computer programs are not specifically excluded from patentability, so that the potential exists for the English to reverse their approach[154], so that these administrative savings may be of limited

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[151] Quoted in *Raytheon*, above n141, at 440-1; *PLG Research Ltd and Another v Ardon International Ltd and Others* [1995] RPC 287, at 305. Moreover, the protocol is applied under s125(3) to s125(1) of the Patents Act 1977 (UK), which relates to patent interpretation: ibid, at 305.

[152] Ibid, at 309.

[153] Hart, above n140, at 7, 9.

[154] Noted at 7.28.

duration.

(ii) American Patents

In contrast to the English approach, American courts continue to favour computer programs as being suitable subject matter for patents. This is consistent with *Diamond v Chakrabarty*[155], when the Supreme Court affirmed that "everything under the sun that is made by man" is patentable. It was found in *In re Freeman*[156] that if the claims do not directly or indirectly cite an algorithm, the claims are not rendered non-statutory. Furthermore, in *In re Walter*[157], it was held that if an algorithm is claimed under an invention, consideration should focus on the result of its application:[158]

> Once a mathematical algorithm has been found, the claim *as a whole* must be further analysed. If it appears that the mathematical algorithm is implemented in a specific manner to define structural relationships between the physical elements of the claim (in apparatus claims) or to refine or limit claim steps (in process claims), the claim being otherwise statutory, the claim passes muster under [the legislation]. If, however, the mathematical algorithm is merely presented and solved by the claimed invention, as was the case in *Benson* and *Flook*, and is not applied in any manner to physical elements or process steps, no amount of post-solution activity will render the claim statutory; nor is it saved by a preamble merely reciting the field of use of the mathematical algorithm.

Soon afterward, in *Diamond v Diehr*[159], the Supreme Court found that a rubber curing process which included a computer program was patentable. It was observed:[160]

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[155] 447 US 303, at 309 (1980).

[156] 197 USPQ 464 (1978); see also *In re Toma* 197 USPQ 852 (1978): cited in Kenji U (1993) Patentability of Software-Related Invention: Comparison of Practice in the USA, Europe and Japan, in: Software Information Center (SOFTIC) (ed) *Softic Symposium '93: The 4th International Symposium on Legal Protection of Computer Software*, 10-11 November 1993, Software information Center (SOFTIC), 1, at 8; see also Merges RP (1992) *Patent Law and Policy*, Mitchie: Charlottesville, at 60-8. Both cases concerned linguistic information processing.

[157] 205 USPQ 397, at 407 (1980).

[158] Emphasis in original.

[159] Above n75, at 185-187; see also Merges, above n156, at 73.

[160] Above n75, per Rehnquist J; reprinted in Merges, above n156, at 73.

A mathematical formula as such is not accorded the protection of our patent laws, *Gottschalk v Benson*, and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technical environment ... On the other hand, when a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (eg. transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of [the legislation].

In other words, an "application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection".[161] The Court held that although an algorithm was involved the applicants were not attempting to obtain a monopoly in that algorithm.[162] Thus, a claim which contains a mathematical formula could be patented, provided that its application was patentable. If only the application is claimed then the original discovery will remain unprotected and the future research by mathematicians is not pre-empted.

In 1989, the American Patent and Trademark Office published a statement of guidelines which concluded that mathematical algorithms are unpatentable as such, but that applications of algorithms may be patentable as new processes.[163] It appears that under this rule, not all applications would have been patentable. However, in *In re Grams*[164], even though it was held that the claim was no more than the application of a mathematical algorithm to data, it was also noted that "the presence of a mathematical formula as a step in a process involving mathematical steps could permit patent protection".[165] Then in *In re Iwahashi*[166] the Federal Circuit Court "interpreted the claims to involve the description of an apparatus in the form of a series of interrelated

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[161] *Parker v Flook* 437 US 584, at 590, 198 USPQ (BNA) 193 (1978), quoted in *Diamond v Diehr*, above n1, reprinted in Merges, above n156, at 72.

[162] See Dean, above n21, at 441.

[163] Official Gazette, September 5 1989, cited by Besen SM, Raskind LJ (1991) An Introduction to the Law and Economics of Intellectual Property, 5(1) *J Econ Persp* 3, at 9-10.

[164] 12 USPQ 2d 1824 (1989). The claims concerned an algorithm related to diagnosis of an abnormal state in a complex system, whether electrical, mechanical, chemical, biological, or a combination thereof: ibid.

[165] Discussed by Besen and Raskind, above n163, at 10.

[166] 12 USPQ 2d 1908 (1989); reprinted in Merges, above n156, at 75-82. The patent claim concerned computer pattern recognition, with relevance for the recognition of human speech: ibid.

means" and so patentable, whereas the Patent and Trademark Office had rejected the claim as unpatentable for being an algorithm.[167] Thus, there appears to be a trend toward greater patenting of computer programs through the application of algorithms.[168]

Consistent with this trend is the recent decision in *In re Allepat*[169], when a majority of six out of eleven Circuit Judges of the Federal Court of Appeals upheld a patent for an improvement to an oscilloscope. This patent involved a claim in which it was found that "many, or arguably all, of the means recited ... represent circuitry elements that perform mathematical calculations".[170] The Court followed *Diamond v Diehr*:[171]

> [T]he dispositive inquiry is whether the claim as a whole is directed to statutory subject matter, it is irrelevant that a claim may contain, as part of the whole, subject matter which would not be patentable by itself.

The Court also affirmed *In re Iwahashi*:[172]

> [T]he claimed invention as a whole is directed to a combination of interrelated elements which combine to form a machine for converting discrete waveform data ... This is not a disembodied mathematical concept which may be characterised as an "abstract idea", but rather a specific machine to produce a useful, concrete, and tangible result.
>
> The fact that the four claimed means elements function to transform one set of data to another through what may be viewed as a series of mathematical calculations does not alone justify a holding that the claim as a whole is directed to nonstatutory subject matter. See *In re Iwahashi*, 888 F.2d at 1375, 12 USPQ 2d at 1911.

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[167] Discussed by Besen and Raskind, above n163, at 10.

[168] Merges, above n156, at 80.

[169] 33 F3d 1526 (1994).

[170] Ibid, at 1537, 1544.

[171] Ibid, at 1543, per Rich, Circuit Judge.

[172] Ibid, at 1543, per Rich, Circuit Judge.

Merges[173] observes that even before *Iwahashi* there were indications of a perception amongst patent lawyers and in the courts that obtaining a patent for a program-related invention was simply a matter of careful claim drafting. Following *Allepat*, that perception may prove to be well grounded.

The trend in these cases appears to be the consideration of the application of a mathematical formula as a whole, although this may result in an emphasis on the physical outcome. Indeed, in *Walter*[174], it was suggested:

> Various indicia are helpful in determining whether a claim as a whole calls merely for the solution of a mathematical algorithm. For instance, if the end-product of a claimed invention is a pure number ... the invention is non-statutory regardless of any post-solution activity which makes it available for use by a person or machine for other purposes. If, however, the claimed invention produces a physical thing ... the fact that it is represented in numerical form does not render the claim nonstatutory.

This emphasis seems to be similar to that found prior to the English *Burroughs* case, above, in which the physical embodiment of a program could be considered to be patentable subject matter. Indeed, provided that the claims do not focus on the algorithm at the base of the program, but on its application, then the American courts appear to be ready to take a literal interpretation of those claims so as to be patentable subject matter. This seems much like the pre-1977 judgments in the English software patent cases which may include consideration of novelty and inventiveness. There does not seem to be the emphasis in the American judgements on whether the claims represent a program in contrast to the 'purposive' approach in the English courts after 1977.[175]

If the English purposive approach serves to exclude too much information, as discussed above, the problem of the American literal approach may be that too little information is excluded. There may be so many patents that market imperfections result.

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[173] Above n156, at 80-1.

[174] Above n157, at 407.

[175] Perhaps the closest the American judgments come to the post-1977 English purposive approach is demonstrated in a *dissenting* opinion by Archer, Chief Circuit Judge in *Allepat*, above n169, at 1557 (emphasis in original):

> The dispositive issue is whether the invention or discovery *for* which an award of patent is sought is more than just a discovery in abstract mathematics.

If monopolised, the price of computer programs may rise so high that price exclusion and underutilisation of the information results. Besen and Raskind[176] also note that the *Grams* and *Iwahashi* decisions have "raised fears among industry participants that overprotection of algorithms may stifle innovation by raising the costs of subsequent innovation". Following the *Allepat* decision, these fears may grow.

(iii) Australian and New Zealand Patents

The patent law in Australia and New Zealand was not amended to follow the exclusion of computer programs under the Patents Act 1977 (UK). Hence, the pre-1977 English precedents remain relevant. Further, giving patent applicants the 'benefit of the doubt' is well-established.[177] Indeed, it is recognised that refusal is final, whereas acceptance is not and may be open to further attack for infringement or for revocation.[178] In addition, Australian cases concerning the patentability of computer programs have been notably influenced by American precedents. For example, in *Re Application by Honeywell Bull Inc*[179] the *Freeman* and *Walter* judgments were followed and the claim for a data processing unit was rejected:

> I consider the distinction between performing the algorithm on signals and pure numbers to be entirely artificial ... There is no application of the algorithm to any purpose. The claim merely represents the algorithm ... The claims are not directed to operating a computer, they are merely directed to using a computer to perform a mathematical operation.

However, a development of the American approach appears to have occurred in Australia and most recently in New Zealand. The whole question whether an algorithm

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[176] Above n163, at 10.

[177] See *McDonald v Commissioner of Patents* [1913] 15 CLR 713; *Commissioner of Patents v Microcell Ltd* [1959] 102 CLR 232, at 244-5; *Microcell Limited and Other's Application* [1977] FSR 163, at 172; *IBM Corporation v Commissioner of Patents*, above n76, at 422; *Clark Limited's Application* (unreported, 30 June 1993) Application No 193718; *Hughes Aircraft Company's Applications*, above n76, at 24.

[178] *Commissioner of Patents v Microcell*, above n177, at 244-5.

[179] (1991) 22 IPR 463, at 470-1, per WJ Major, Delegate of the Commissioner of Patents.

which is inherent in a computer program is pre-empted by a claim appears to have been simplified. In *International Business Machines Corporation v Commissioner of Patents*[180], Burchett J, having reviewed English and American precedents, stated:[181]

> It is by this, by the production of some useful effect, that patent law has distinguished, so far as it has distinguished, between the discovery of a principle of science and the making of an invention.

In referring to the claimed invention, which related to an improved method and apparatus for representing images in computer graphics displays, Burchett J said:[182]

> [I]t is not suggested there is anything new about the mathematics of the invention. What is new is the application of the selected mathematical methods to computers, and in particular, to the production of the desired curve by computer. This is said to involve steps which are foreign to the normal use of computers and, for that reason, to be inventive. The production of an improved curve image is a *commercially useful effect* in computer graphics.

The *IBM* decision prompted the Australian Patent Office to adopt the test that a "claim to a mathematical algorithm *when used* in a computer is patentable so long as a commercially useful effect is produced".[183] It was also stated by the Office that a "mathematical algorithm, not being patentable subject matter, cannot confer novelty on a computer which is otherwise not novel. Novelty can only arise when the algorithm is used by the computer. That is, a claim to a computer containing (but not using) a mathematical algorithm is not novel - unless the computer per se is novel."[184] Further, the *IBM* test was adopted recently in an unreported decision of the New Zealand

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[180] Above n76.

[181] Ibid, at 423.

[182] Ibid, at 424 (emphasis added).

[183] The current Australian Patent Examination Manual, paragraph 8.1.18.4, quoted in *Hughes' Application*, above, at 23. In paragraph 8.1.18.5, the *IBM* case is given as an example of what amounts to a commercially useful effect: above n76; cf *Sumitomo*, above n133, at 604; *NV Phillips Loeilampenfabrieken v Mirabella International Pty Ltd* [1992] 26 IPR 513.

[184] Paragraph 8.1.18.6: ibid, at 23.

Commissioner of Patents, relating to a patent application by *Hughes Aircraft Company.*[185] The claims in question were directed to a method for determining en route airspace conflict alert status, which involved the use of a computer. The commercially useful effect was the improvement in air traffic control and the prevention of mid-air collisions.[186]

Under Australian and New Zealand law, the tripartite test of utility, novelty and inventiveness has not yet been adopted, as noted above. However, in *CCOM Pty Ltd v Jiejing*[187], it was observed:

> Particular grounds of invalidity, derived from the case law, were added to the modern statutes. Lack of inventiveness, as distinguished from anticipation, obtained a distinct statutory recognition only in this century and, in Australia, in the 1952 Act .. As this development continued, the phrase "manner of new manufactures" came to represent the residuum of the central concept with which NRDC was concerned, namely what the High Court called the relevant concept of invention.

Following *IBM* and *Hughes*, that residuum may be simply a criterion of patentability: a commercially useful effect; that is, commercial utility. If the *IBM* decision remains as an influence in Australasian law, it could indicate that the courts feel able to make a subjective assessment of utility without direct reference to either novelty or inventiveness. It may also be the outcome of the Australian precedents in which the patentee has been given the 'benefit of the doubt', as mentioned above.

A problem is that the Australasian threshold of utility may now be so liberal that many programs could be patented and market imperfections be even greater than expected under the American approach, discussed above. However, to put this problem in perspective, it must be noted that the standard of utility is already weak given that it is such a subjective question. Indeed, it is interesting to note that in the *Hughes* case[188] the Commissioner balanced his decision with an assessment of novelty and

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[185] Above n76.

[186] Ibid, at 25.

[187] (1994) 28 IPR 481, at 510. The "*NRDC*" case referred to is the *National Research Development Corp's Application* case, above n133.

[188] Above n76, at 25.

inventiveness similar to the *Burroughs* criteria. The Commissioner found that the method in question programmed an old machine, the computer, to operate in a new way to give a new and improved result. If the question of whether a program is suitable for patentability is simplified to one of utility, then more patent applications may follow and with them a greater emphasis on novelty and inventiveness, as for other inventions. This outcome may be advanced if more patent applications follow the rejection of copyright for computer program applications in *Lotus v Borland*, discussed above. Furthermore, given that the computer industry generates many sub-patentable trade secrets, as discussed above, the chief dispute which may develop could be over the standard of inventiveness. Therefore, the view of Terry[189] that Australia has "led the world in providing the broadest protection for computer software", and now by implication New Zealand, may prove to be an illusion. In that case, the computer industry could welcome a form of patent with a weaker standard of inventiveness, as proposed in Chapter Five: patents of improvement (PI).

II(b) *Patents of Improvement*

(i) An Overview

Numerous specialist laws have been passed in order to protect information which may protect ideas and expressions, yet fit neither the patent nor copyright paradigms. Such 'legal hybrids' include utility models, and protection for plant varieties, and industrial designs.[190] According to Brown[191], the European Community is presently considering separate *sui generis* legislation for databases.[192] In New Zealand, elements of sub-patentable trade secrets and their expression which constitute a layout design or

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[189] Above n76, at 12.

[190] See Reichman, above n8, at 2453-2476.

[191] Above n39, at 17, footnote 12.

[192] Databases appear to have gained protection under copyright in New Zealand, see above, at 7.10, n43.

an integrated circuit are protected under the Layout Designs Act 1994.[193] In time, such specific laws may be eclipsed by technological developments[194] leading to a clutter of intellectual property rights from which it is administratively costly to identify the best protection for information, to process an application, and to monitor the applications of others as well as to enforce the law. Therefore, specialist laws for the protection of sub-patentable or other trade secrets may not be desirable. The further development of copyright and patent law to cover software inventions may also have equally inefficient effects. A greater degree of monopolisation of information may result, and lead to market imperfections such as price exclusion, thereby creating an effective restriction on the natural rights of others.

Another approach is if patents of improvement (PI) were adopted in addition to the existing patent law. PI could also be established in addition to copyright, without disturbing the existing protection of software under TRIPs.[195] Under a patent-PI system, sub-patentable trade secrets could be protected without resorting to copyright or a general weakening of the threshold of existing patents. Thus, market failure and the anarchistic boundary of the intellectual property rights continuum could be avoided. The inventor's natural rights in their improvement would also be recognised. Under a patent-PI system, patents could keep the higher English standard of inventiveness and PI could adopt the lower American standard, as proposed in Chapter Five. The basis of the English standard of inventiveness relates to the likelihood of success such that a trial

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[193] Under s2 of the Act:

> "Layout design" means the three dimensional disposition, however expressed, of the elements, at least one of which is an acute element, and of some or all of the interconnections, of an integrated circuit; and includes such a three-dimensional disposition prepared for an integrated circuit intended for manufacture.
>
> "Integrated circuit" means a circuit, in its final or an intermediate form, in which the elements, at least one of which is an active element, and some or all of the interconnections are integrally formed in or on a piece of material, and that is intended to perform an electronic function.

[194] See Karjala, above n78, at 2604; Moon, above n7, above.

[195] A patent-PI system in addition to copyright may however complicate an attempt to construct a general registration or clearing system, such as Kitagawa's Copymart proposal, which would have to include contracts for patent or PI where these rights were held in addition to copyrights: see Kitagawa, above n46.

was warranted without postulating prior certainty of success[196]; whereas in American courts information has been held obvious if there was a "reasonable prospect of success".[197] The difference is that the English question is asked at an earlier stage of invention than the American so that the threshold of inventiveness is more difficult to reach. Both approaches are problematic and may lead to either the over-protection and under-protection of information. However, these approaches are applicable for the development of a two-tier standard of patentability for patents and PI.

PI would be given an immunity from infringement in order to encourage improvements on existing patents. Hence, PI would not have the same monopolistic effects as copyright or patents, as competition between the PI and patent owners could arise. Indeed, with competition, potential could exist for the patent rights to be shifted away from the monopolistic boundary of the intellectual property rights continuum. This need not result in market failure as the improvement would be limited to a sub-market of the original patent, as delineated in the PI application.[198] Alternatively, if the patent owners make the improvement they may practise price discrimination. Price discrimination is the sale of the same good in different markets at different rates of return.[199] One invention may be comprised of multiple intellectual property rights, so that the PI may be viewed as part of it for the purpose of price discrimination.[200] The potential would exist for the improvement to be sold at a different price to the patented invention in a market or sub-market that is covered by that patent.[201] The result is that the price may more closely match the needs and means of the consumer so that the consumer surplus is transferred to the producer, the patent owner. Hence, price exclusion and market imperfections may be reduced. Further, if output also increases, then the price discrimination will result in a decrease in the deadweight loss that is associated

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[196] See for example, *Genentech v Wellcome*, above n147, at 510, per Dillon LJ.

[197] See for example, *Amgen Inc v Chugai Pharmaceutical Co Ltd* 13 USPQ 2d 1737 (1989).

[198] See 5.13, 5.16.

[199] See the discussion at 2.32-2.34.

[200] See 2.34-2.36.

[201] See 2.35-2.36.

with a monopoly, although the monopoly would remain.[202]

The long term outcome of adopting a patent-PI system may be that the pattern of research develops so that patents are followed by a series of improvements[203], as suggested in Chapter Five. This may be welcomed by the computer industry if it becomes hindered by an inefficient standard that is too costly to replace[204], as it could be improved. If monopolistic pricing is practised, it may attract research that leads to an improvement and competition, so that the monopolisation would become self-limiting and restrictions on the patent and PI length would be unnecessary.[205] Further, if lower information prices result from competition and/or price discrimination, it could increase the public's access to information, leading to increased utilisation and so the creation of further information and natural rights.

(ii) PI and Computer Software Applications

The computer software industry tends to generate trade secrets that do not meet the threshold of standard patentability, so could become characterised by a series of PI, as suggested above. This includes the protection of wholly functional information under PI, such as some of the knowhow employed in the creation of interfaces.[206] When information features both ideas and expression, such as some blue-prints, there may be multiple protection under patents, PI and copyright, as occurs now when hardware embodies a program that in turn embodies an engineering design.[207] If so, then the use of PI could 'purify' copyright, in effect, of computer program inventions. Hybrid specialist legislation such as the Layout Designs Act 1994, mentioned above, could also be abolished.

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[202] See 5.18.

[203] See 5.19.

[204] On this topic, see Menell, above n27, at 1342.

[205] See 5.19-5.20.

[206] See the concerns of Samualson et al, above n8, at 2402.

[207] Kitagawa, above n46, at 2611.

(iii) PI and Reverse Engineering

The introduction of PI could resolve the controversy over reverse engineering. Those who oppose a prohibition on reverse engineering believe that if information cannot be legally reverse engineered, then the exclusive intellectual property rights, in this case copyright, will be used to hinder the growth of the computer industry.[208] Davey[209] suggests that the utilitarian nature or functional ideas of computer programs be exempted from protection against reverse engineering. Samualson et al, also suggest that decompilation should only be prohibited where behavioural equivalence has been achieved by trivial effort that may induce market failure, although such an evaluation is difficult without some standard. Indeed, Menell[210] favours some form of hybrid standard for protection of operating system technology that involves the criteria of patentability. Thus, there appears to be some support for a system in which limited reverse engineering is permitted.

The introduction of PI as well as patents would give an immunity for reverse engineering, provided improvements are made. Thus, the cloning of computer hardware, which may result in significant improvements to the existing technology[211], may be allowed, but software cloning which is used to imitate a product or process would not. As before, a functionally identical behaviour may be produced by a method that is independent of the one which is patented. Samualson et al[212] regard this as a limitation of patent law. However, provided that no imitation is involved, then an additional method may count as an improvement that could benefit society. Another consequence is that inter-operability should be allowed where there is an improvement to be gained, particularly in another sub-market. This would be an extension of the European rule that allows reverse engineering for inter-operability only, contrary to the problem of 'adaptions' under the New Zealand Copyright Act, above. This immunity would also

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[208] See Davey, above n2, at 60, 71.

[209] Ibid, at 75-6.

[210] Above n30, at 1364-5.

[211] Samualson et al, above n8, at, 2395-6.

[212] Ibid, at 2345.

amount to a 'research exemption', thereby freeing researchers to make improvements without the cost of licence fees.

Allowing reverse engineering to facilitate research and improvements is consistent with an American case, *NEC Corporation v Intel Corporation.*[213] NEC reverse engineered Intel's 8086 and 8088 microprocessor chips and developed the competing v20 and v30 chips which were a fully compatible enhancement of the Intel chip. Intel alleged that NEC had breached its copyrights. The District Court for the Northern District of California held that the Intel chip was within the American definition of a computer program. However, although NEC may have copied parts of the disassembled chip, which may have been a source of ideas for their creation of the competing electrodes, the NEC chip was held not to infringe the copyright of Intel's chip. Significantly, the final version of NEC's chip was not substantially similar to Intell's chip and the court confined its examination of infringement to that final version.[214] This example could illustrate how a PI immunity from infringement might operate in practice.

Conclusion

The computer software industry is characterised by sub-patentable trade secrets that are readily copied so that there is a danger of market failure and undermining the natural right of the inventor. In response, copyright, patent, and specialist laws are being developed to protect computer programs, but at the expense of further inefficiency and restrictions on the natural rights of others. However, if the trend toward favouring the 'commercially useful effects' of programs continues, there may be an increased emphasis on other patent criteria, including inventiveness. In that case, the protection of sub-patentable trade secrets may be better achieved by patents of improvement (PI). The royalty free immunity for improvements under the PI proposal could encourage competition and/or price discrimination. This could reduce the level of market

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[213] [1989] CCH Computer Law 60, per Gray DJ: discussed by Davey, above n8, at 79-81.

[214] Ibid.

imperfections associated with these rights, to increase the access by consumers to information. It also has the potential to increase the incentive for the further production of computer programs in New Zealand and other common law jurisdictions, without causing greater harm.

CONCLUSION

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I *The Contribution of "Trade Secrets in New Zealand"*

The aim of this thesis has been to clarify the nature and jurisdiction of trade secrets in New Zealand, and in so doing identify and address the most serious problems that exist with that law. Four categories of trade secrets were recognised as a form of property right. This involved the synthesis of legal and economic approaches to property rights.
These rights were considered in the context of the traditional legal and economic justifications for, and problems of, the intellectual property rights system to form a model: the intellectual property rights continuum.

In retrospect, natural rights theory has proved to be an attractive, though limited, justification for intellectual property rights. Intellectual property rights are recognised as natural rights which accrue from the labour of the inventor as expressed through inventive effort. Natural rights theory, however, is only a blunt instrument for analysing intellectual property rights, given that a natural right is either recognised or it is not. If information is too expensive to be purchased, this may interfere with an individual's labour and so the creation of further natural rights, but such interference depends on monopolistic price exclusion. Hence, once an intellectual property right is awarded, fine gradations in behaviour along the intellectual property rights continuum are largely expressed in terms of economic theory.

Once it is recognised that property rights are required to avert the inefficiency of anarchy, there will always be some level of inefficiency associated with those rights. This is because property rights are used to create markets and these will always be imperfect, leading to a monopolistic boundary on the intellectual property rights continuum. Hence, although anarchy from market failure may be averted, inefficiency may not, and so the intellectual property rights continuum can also be seen as being comprised of gradations of inefficiency. It follows from the harmful effects of inefficiency, that the least inefficient

position of a right on the continuum is desirable. However, this position is not an objective, fixed optimum which can be used as a yardstick with which to compare different property rights or property rights systems. Rather, the least inefficient position is a function of the given property rights system; change the property rights and what is least inefficient under those rights will also change.

The approach taken to find the least inefficient position is 'reformist conservative', in that solutions are proposed within the existing legal-economic framework. Following the proposal in Chapter Three, the introduction of industrial espionage law would not change, but would fortify existing trade secret law. Espionage may be attractive when there are commercially valuable secrets that are not readily protected, including sub-patentable trade secrets. By protecting these secrets, there is at least an opportunity for the least inefficient position of the right to be reached, whereas if there is market failure and anarchy it is impossible.

In addition, the addition of PI, as proposed in Chapter Five, does not represent a change in the patent rights system, but rather an addition which may facilitate the achievement of the least inefficient positions for both patents and what are currently sub-patentable trade secrets on the intellectual property rights continuum. The PI could protect sub-patentable trade secrets, which is important when there may be an insufficient natural lead time before the secret is learnt by competitors. This protection in itself may be used to avert anarchy, on a par with the industrial espionage proposal. It may also be useful for the protection of sub-patentable trade secrets in the biotechnology and computer software industries without the need to resort to copyright or specialist laws. Further inefficiencies may be mitigated through either of two means. When the PI is gained by a rival, competition between the patent owner and the rival may result in a shift of the patent right away from the monopolistic boundary of the continuum. Alternatively, when the PI is gained by the patent owner the monopoly is retained, and market imperfections reduced through the sale of the same invention in different sub-markets at different prices; that is, price discrimination. Either outcome may lead to a reduction in price exclusion so that the harmful monopolistic effects of the property right may be mitigated.

As a generalisation, the greater the monopolistic profit, the greater the incentive for

improvement research and development, leading to competition and a reduction in monopoly. Hence, market imperfections could, in effect, be self-limiting, so that restrictions on patent or PI length may not be necessary. Rather, the pattern of research and development could become characterised by patents followed by a series of improvements. This may mean that many of what are now patentable trade secrets may be protected as improvements. Indeed, PI may be used to exclude other improvements, even if invented independently, so that in practice it may pay an inventor to gain this protection before the information has reached a patentable stage.

In short, both the industrial espionage and PI proposals are made in response to inadequacies in the current protection of trade secrets in New Zealand. Industrial espionage may occur when trade secret law is inapplicable, whereas PI may protect secrets to which the law applies but gives insufficient protection. The option of both trade secrecy or PI may benefit inventors who may be assumed to choose the form of protection under which their gains are maximised. The reliance on trade secret law for the protection of sub-patentable as well as patentable trade secrets may decline as a result, but society could gain from the greater dissemination of valuable information through PI specifications. This could lead to the higher utilisation of information and so to an increase in the production of information to the benefit of New Zealanders, including in the biotechnology and computer software industries.

II *Future Research*

This dissertation has been concerned primarily with the legal protection of information, particularly as it affects the production and utilisation of that information. The effect on society of these proposals is assessed largely through the effect on the treatment of information; more information is assumed to be normatively desirable. As a consequence, an increase in the production of information is implicitly treated as being beneficial to society, and inventors are held to benefit when there is an incentive to create more

information or when the price of using such information decreases.

One line of further research could focus more closely on the benefit of an increase in the production and utilisation of information to society. This approach could begin with Posner's direction to award an initial assignment of rights to "those who value them the most"[1]; a proposition that could be argued to depend on the wealth of individual bidders. To this end, Veljanovski[2] suggests that Posner treats the initial distribution of rights as though it were just. Posner also asserts[3] that to "treat the inventor and idiot equally so far as their moral claims to command over valuable resources is concerned does not take the differences between persons seriously". However, at first glance, it may be questioned whether intelligent individuals who are poor and are price excluded from protected information will be able to create further valuable information. In practice, their ability to express their individual liberty to create further natural rights in information may be constrained. Moreover, if only the wealthy can afford patented information, then they are most likely to benefit from it, including through investment in further research. This outcome may lead to a more radical rejection of intellectual property rights and their distribution in society. Wright[4] rejects the establishment of intellectual property rights because the exclusionary character of property "is determined by rules that are largely racist, hierarchical, class-based and patriarchal; they ensure that only those who are most like one another will be included in relationships of property". In other words, Wright appears to question the distribution of property rights on the grounds of equity. The economist, as Maughan[5] notes, has no direct answer to such a criticism, as "[d]istribution and equity per se are not really discussed in the economic model". However, if PIs were to increase the

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[1] (1979) Utilitarianism, Economics, and Legal Theory, 8 *J Leg Stud* 103, at 125.

[2] (1981) Wealth Maximisation, Law and Ethics - On the Limits of Economic Efficiency, 1 *Int Rev L & Econ* 5, at 20, 21; see also Gardner T (1995) Who's Right About Wealth? 16(3) *NZULR* 303, at 314-5.

[3] Above n1, at 128.

[4] (1994) Property, Information, and the Ethics of Communication, 9 *IPJ* 47, at 51.

[5] (1995) The Economics of Property Rights, 1(2) *NZBLQ* 78, at 84-5.

utilisation of information through a reduction in price exclusion, more inventors may be able to undertake research, make improvements, and benefit from the financial returns. Thus, there is room for study of the distribution of wealth in society under the existing patent system and how this distribution could change through the introduction of PI. This study could move beyond New Zealand and those jurisdictions which are persuasive in New Zealand law, and consider the effects of PI upon societies in developing countries.

Another line of research could be to study the conflict between intellectual and other property rights. In particular, there may be a conflict between the owner of trade secrets and the public who want to know if that secret poses a danger to the environment. For example, the Waikato Regional Council was unable recently to advise farmers on how to dispose of hundreds of tonnes of plastic silage wrapping.[6] It could not be incinerated because the manufacturers refused to disclose all of the chemical constituents of the plastic, some of which could have been toxic. In that case, there may be a conflict between an intellectual property right, a trade secret, and some form of common or environmental property right.[7] A first step may be to define common property rights within the legal-economic terminology adopted in this thesis. This may assist with the development of a more precise identification of the points of conflict between intellectual and common property rights, which is necessary before solutions can be developed. Of course, if PIs can be used to encourage the publishing of more trade secrets, then the incidence of such conflicts may also diminish. This in turn, could benefit society through enhanced environmental quality. In short, seeking the least inefficient solution to problems of trade secret protection may have wider social and environmental effects which reach beyond the production and utilisation of trade secrets in New Zealand.

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[6] (26 February 1994) Evening Standard: Palmerston North.

[7] On the subject of common property rights, see Ciriacy-Wantrup SV, Bishop RC (1975) "Common Property" as a Concept in Natural Resources Policy, 15 *Nat Res J* 713; Taylor M (1992) The Economics and Politics of Property Rights and Common Pool Resources, 32 *Nat Res J* 633.

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