

what constitutes a reasonable deal. By requiring these conditions I do not imply that creativity outside the market is any the less creative; but only that it has not produced an economic product.

In the next two chapters I describe the legal and commercial nature of these creative products.

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THE BOOM IN INTELLECTUAL PROPERTY

LAW 2: PATENTS AND COPYRIGHT ARE THE CURRENCY OF THE INFORMATION AGE

'Intelligence is the new form of property.'

Charles Handy, writer

ANDREW WYLIE

New York-based Andrew Wylie has been described as 'the world's most famous literary agent' as well as the most vociferous and ferocious. It is a truism in the publishing industry that literary and commercial values are in conflict. Wylie believes the opposite: that the highest literary standards and the most aggressive business behaviour are completely compatible. His attitude flatters clients and irritates his competitors. It sums up the tension that lies at the heart of intellectual property; the balance between private ownership and public access.

Wylie is scornful of the majority of publishers and booksellers, who have been sucked into the mass market at the expense, he believes, of their clients' best interests and ultimately of their own interests too. He criticizes them for treating all books as identical commodities, merely trying to sell as many copies as possible in the shortest possible time. The result is that an increasing number of bookshops display only a very small selection of titles, albeit dozens of each title, while many good books published over a year ago are out of print and unavailable. This strategy, while suitable for the most popular books, is now applied to an ever-increasing number of titles. It brings hefty short-term revenues for the few but squeezes out the majority of the other 60,000 books published annually in America and the many

others that might be imported. Wylie says publishers believe 'the most fleeting is the most valuable'. He disagrees emphatically.

He believes people should be able to own their copyrights as robustly as they can own their physical property. Owners of trademarks and brands own them totally and for ever. But owners of literary rights do not.

As a result, he says, the Walt Disney Corporation, which operates a trademark business, can invest in its intellectual properties as confidently as someone investing in their own home. But people who own a copyright business, or a patent business, cannot. Lewis Carroll's *Alice in Wonderland*, which is a copyright business, has no permanent existence. Its owners, he says, cannot justify an investment in a Wonderland.

When the estate of P. G. Wodehouse complained about the 'Askjeeves' website, which benefits freely from the name of the author's famous valet, its reliance on a copyright was a disadvantage. A trademark business called Jeeves could have stopped the website in its tracks, but a copyright business based on Jeeves could do little. Wylie says that, if William Shakespeare had been able to protect himself by trademarks, the Shakespeare business would be bigger than the Microsoft business. He relishes the idea of representing Shakespeare.

Trademark businesses are also more skilful in raising capital finance and in marketing, and so can often squeeze extra value from a copyright. Wylie describes how companies like Microsoft and Getty Images are buying up reproduction rights to the world's pictures, and creating many times more value than the original owners. Trademark companies are also buying non-exclusive rights to picture libraries in the hope they can exploit them more successfully than do the existing owners. Wylie says Picasso is the most valuable artist of the twentieth century not only in terms of his paintings but for the reproduction rights. One car company even reproduces his signature on a 'Picasso' model. He asks, 'How much would a trademark company pay to own the rights to Picasso and be able to charge licence fees for ever?' He answers his own question: 'Huge amounts!'

He regards the limits on copyright as a failure of economics and a black hole in the law. He has made it his personal mission (twinning his love of literature with his rumbustious business acumen) to give

authors the same legal protection and the same chances of long-term capital accumulation as are currently enjoyed by owners of trademarks and designs. He points out that the copyrights in James Joyce and William Faulkner are diminishing assets and will become worthless (the latter ironically summed up his life in the phrase, 'He made the books and died'). Wylie says this discourages a proper business attitude to investment, not only in the famous but in the unknown.

IN THE MARKET

Andrew Wylie is talking about the heart of intellectual property. What is its nature? Where does its economic value lie? Where *should* it lie? In publishing, what is the right balance between paying an author more and enabling the rest of us to have cheaper access to his books? Wylie takes an extreme view: that rights should be stricter. Others like Hugh Laddie, a leading British judge, take the opposite view: that copyright already lasts too long and the penalties for infringement are too severe. The patent industry faces similar tensions. What is the prime function of a patent? And should the same rules that apply to mechanical gadgets also apply to human genes? In this chapter I look at the laws of intellectual property and their treatment of the balance between economic reward and social welfare.

Intellectual property has been described as a 'subtle and esoteric area of law'. The speaker was not a despondent plaintiff in one of Dickens's more tortuous stories, but Bruce Lehman, Commissioner of the US Patents and Trademarks Office, and the author of a US Green Paper on *Intellectual Property and the National Information Infrastructure*, published in 1994. Lehman was echoing Supreme Court Justice Story, who had said 150 years earlier that copyright and patent cases come nearer than any other kind of law 'to what may be called the metaphysics of the law where the discussions are, or at least may be, very subtle and refined and sometimes almost evanescent'. He was in good company. Mark Twain, who believed writers should be allowed to own their literature as securely as their house, wrote, 'Only one thing is impossible to God: to find any sense in any copyright law on this planet.' When Kim Howells, UK Minister for Competition and

Consumer Affairs, set up an advisory group to try to raise public awareness about copyright and creativity, he said, 'Few laws have such wide effect and yet are so little understood by the public.'

Not only the public. Many governments that are quick to promote the Internet have been slow to adjust their intellectual property laws to cope with digital copying. Many companies that have become dependent on their trademark and designs have been slow to exploit their full value (the growth in patent licensing revenues in recent years is due more to companies becoming better at exploiting existing patents than to the registering of new ones). There are many business people, adept at negotiating contracts for all other resources, who believe intellectual property is not for them; that copyright is just for print publishers and patents cover only mechanical inventions. They are wrong. In the same way as successive generations of managers have needed to learn about computers and the Internet, so they now have to learn about intellectual property.

While the possession of land and financial capital is enshrined in a thousand years of law and custom, like the ownership of most physical goods, owning and protecting ideas is fraught with complexity and confusion. Landowners sleep comfortably because they know the law (which their ancestors likely wrote) will protect them. But the marketplace of intellectual property is a more crowded and confusing place. In one corner are millions of people with ideas and inventions that they want to sell or distribute almost regardless of any law and whether or not they make any money. They want to share their ideas with anyone who wants to listen and, though technically property owners, happily waive their rights. They might want to claim what lawyers call 'moral rights', such as the right to be known as the author, but not their 'economic rights', which would bring them money. In another corner are a milling crowd who want legal protection and to make money but do not know how. They may be excellent creators but they are amateurs at the law and business (and many cannot afford professional advice). In a third we can see a smaller group of people who are professional at both creating products and protecting their rights. In a fourth, a fortunate few sit, like prosperous farmers and bankers, atop their intellectual capital. And in the middle there is a vast crowd of agents and intermediaries who want to buy and sell,

negotiating with lawyers, investors, government policy-makers, accountants and publicists. It is a volatile mix of legal nicety and shippy negotiation. Tidy it isn't. They are buying and selling words, music, pictures; gadgets, computer software, genes; copyrights, trademarks, patents; proposals, formats, fame, faces, reputations, brands, colours. The goods on sale in this noisy marketplace are the rights to intellectual property.

Use – or, in the lawyer's phrase, to exploit – intellectual property. Then I look at the main variants of intellectual property, starting with patents. I describe the way in which the American Patent Office is widening the scope of what can be patented from purely technological matters to business procedures and biology. Next I look at copyright and the threat of the Internet. Next I describe trademarks, brands, designs and trade secrets. Then, after a section on theft, I review the global market in intellectual property. I finish by asking if the 'property contract' which regulates deals between rights-owners and consumers needs to be redrafted. I suggest it does.

SEVEN PRINCIPLES OF INTELLECTUAL PROPERTY

Property

First, the determining fact of intellectual property is that it is property. Property is defined as 'belonging to someone'; i.e., it gets its character not in terms of the thing or idea itself but in terms of its relationship to someone. Thomas Raleigh, author of *An Outline of the Law of Property*, said physical property is a 'complex whole made up of many rights' including 'ownership; possession; the right to use and destroy; and the right to sell, lend and give away'. Intellectual property delivers ownership, certainly, but seldom guarantees or even offers possession, by which I mean sole physical control over the property. With physical property it is reasonable to say, 'possession is nine-tenths of the law'. With intellectual property, 'relationship is nine-tenths of the law'. Some cultures are less possessive. Islam's Sharia says the property of the brain is the property of God; Hindu societies assume that mental work is shared with the Divine and cannot be privately owned.

Intangibility

The ideas that lie at the heart of intellectual property are often hard to possess and to keep (and also, perversely, hard to give away) because they are intangible. They are a public good. This commonality was paramount in all early thinking and still persists in some legal systems. Thomas Jefferson described these qualities in a letter to Isaac McPherson in 1813, and nobody has said it better:

If nature has made one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself; but the moment it is divulged, it forces itself into the possession of everyone... Its peculiar character, too, is that no one possesses the less, because every other possesses the whole of it. He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine receives light without darkening me... Inventions then cannot, by nature, be a subject of property.

It is a persuasive case. But Jefferson was a prolific author and also knew what happens when an intangible idea is embedded in a tangible product (like words in a book, or the idea for steam power in a boiler) and was not averse to exceptions, as we shall see later.

The tangible and intangible can overlap awkwardly. Consider a book. It has two intangible elements: the literary contents, which are purportedly its chief value, and the rights to those contents. It is also a physical object, over which one or more people may have rights of ownership. (I said the literary contents were purportedly a book's chief value; but of course in some cases it might be more valuable propping up a broken table leg or holding a door open.) So a book has at least four constituent parts: the physical object; the rights to the physical object; the intellectual property like the story of which the book is a physical form; and the rights to this intellectual property.

Government

Third, intellectual property exists only insofar as a government or a law court says it does. No law, no property. That is why there are so many government policy-makers in the intellectual marketplace. Consider the term of a patent, which is generally twenty years. The

reason is not inherent in inventions, or the market for inventions, or their cost. Patents last twenty years because governments say they should.

Each government has its own mix of legal statute, regulations and case law. In Britain, the main statutes are the 1977 Patents Act, the 1988 Copyright, Designs and Patents Act, and the 1994 Trade Marks Act. America has the 1970 US Patents Act, the 1976 Copyright Act, the 1998 Digital Millennium Copyright Act and the 1999 Intellectual Property and Communications Omnibus Reform Act. In all countries, the judicial courts play an important role interpreting statute and adjudicating on common law rights; in addition, some countries have a special appeal court for patent infringements. Britain and America share strong traditions of common law, although in many areas these have been replaced by statutory rights (one major exception is the law of 'passing off', by which a company can prevent a competitor from 'passing off' goods similar to its own). The difficulty in fitting the idiosyncratic, one-off nature of intellectual property into statute and common law means that the courts play an important role in determining which ideas we can own and which should stay public.

These laws define the various kinds of property that qualify for protection, and spell out the owner's rights, notably their scope and their term, or lifetime. It is a peculiar attribute of rights that their scope is mainly negative; that is, the right to stop somebody from doing something. Copyright prevents others from copying. A patent prevents others from making. As for the term, it varies widely for each kind. There was historically a principle that terms were shorter for property with an industrial application and longer for property more expressive of artistic expression, but the quasi-permanent state of most trademarks tilts the balance. The term of a patent used to vary between about fifteen and twenty years (American patents lasted for seventeen years) but nowadays almost all countries have a standard term of twenty years. The basic copyright term is the author's lifetime plus seventy years. During their term, patents and most copyrights can be 'assigned' – given or sold to another person. Moral rights cannot be assigned, but in Britain and America they may be bequeathed in a will like any other kind of property.

International Conventions

Fourth, the ease and quickness with which creative products travel and can be copied or used in another country have encouraged governments to establish international conventions to protect their nationals' intellectual property wherever it may be traded. Someone writing a book or making a scientific invention needs to know that it will be protected not only in their own country but worldwide. When I travel to a foreign country, nobody questions that my luggage remains mine at my destination. But intellectual property has to be protected anew wherever I go. The first global convention, covering patents, trademarks and designs, was signed in Paris in 1883, and the Berne convention on copyright followed three years later. All conventions are periodically reviewed and amended to take account of technological change.

The copyright conventions have proved the most troublesome because of the need to keep pace with technological change. France was long the most friendly towards foreign nationals' works, and America the most xenophobic, saying for many years that only books 'manufactured' in America merited American protection. Nowadays, copyright protection is more standardized.

The laws on patents operate differently. An inventor must register his invention country by country. Someone who registers a patent in country A thereby gains protection only in country A, and must register it anew in country B, C, etc. for protection there. As the patent-holder in country A, he is the only person allowed to register it elsewhere (because he is the only person who can claim it is novel). So a competitor can make and sell a rival product in country B, C, etc., but cannot claim patent protection and, once the original inventor sees what is happening, he can claim a patent and stop the competitor forthwith.

The two organizations that administer these global arrangements have a major, and increasing, impact on national legislation and consequently on international trade. The World Intellectual Property Organization (WIPO) based in Geneva administers the Berne and Paris Conventions. It also administers the 1970 Patent Cooperation Treaty (PCT), which provides one-stop shopping for those seeking to establish patents based on local checks by the American, Japanese, Australian and Russian patent offices and by the European Patent Office. The

PCT started slowly but by 2000 covered over 100 countries and was receiving over 7,000 applications a month. Its members have signed a global treaty ensuring standardization and mutual recognition, so that every country recognizes a PCT patent, which may prove the first step towards a single global patent. Separately, the much newer World Trade Organization (WTO) operates a regulatory system for Trade-Related Intellectual Property Rights (TRIPS). The WTO is a very different kind of organization from WIPO. Whereas WIPO operates as a secretariat, merely coordinating its members' meetings, the WTO has independent powers of policing and can impose penalties.

In the past ten years the European Commission has taken the lead in reforming the law of European states. Britain and other EU members seldom bother to revise their own copyright laws except to implement European Union directives. The Commission would also like to introduce a single European-wide patent. Meanwhile, and separately from the European Commission, the European governments have established a European Patent Convention and a European Patent Office (based in Munich, Germany), and a Community Trade Mark Office (based in Alicante, Spain). They have also passed a Community Plant Varieties Convention (Union Internationale pour la Protection des Obreptions Végétales, UPOV).

Justifications

Fifth, the justifications for intellectual property can be summarized under four headings as: incentive; reward; disclosure; and human rights.

The *incentive* of owning what I create, of obtaining private property rights, is believed to encourage innovation. However, the evidence is quite complicated. Individuals and companies are creative for many different reasons, both internal (because they want to) and external or environmental (such as market competition). There is also a counter-argument that property rights, especially patent rights, inhibit competition and operate as a drag on innovation. In general, though, the net effect is positive, especially in the case of patents and industrial property. The incentive justification is weaker in the case of copyright.

More certain is the law as a basis for *reward*. Authors and inventors need a mechanism for recouping their investment and making a profit,

whether or not the law encouraged them to innovate in the first place. These rewards operate very differently in each industry. A patent is a block monopoly and, once granted, the patent office has little interest in its future development. In contrast, the reward to a copyright-holder is a collection of rights which are subject to amendment as technology evolves.

The benefits of *disclosure* are specific to patents. Patent offices publish every application for a patent so that others may understand how it works and take it further. Without disclosure, inventors could keep their inventions secret.

These first three points are primarily economic. There is also a moral presumption that people have a *natural right* to own whatever they create. Natural rights are strongest in products of human expression and weakest in industrial property. The theories of Thomas Hobbes and John Locke about the rights of man in the seventeenth century gave an unassailable moral push to the introduction of copyright. At the beginning of the twenty-first century, new ideas about natural rights are a factor in the debate about how far human and animal matter should be privatized.

Property Contract

Sixth, the basis of all intellectual property law is what I call the 'property contract'. It is an abiding principle of intellectual property law that it takes account of ownership's effect on social welfare. It tries to balance two principles: the principle that people deserve to be rewarded for their creative efforts, and will only work if they are rewarded, and the principle that society as a whole benefits if the resulting creations and inventions are put into the public domain and made freely available. All laws, in all countries, strike this balance between ownership/control and use/access. Of course, they tip the balance at different points, favouring either the creator or the public. People who favour the creators and rights-holders are often called 'maximalists', because they want to maximize property rights, and those who believe property rights should be restricted are called 'minimalists'. Paul Goldstein of Stanford Law School describes the former as 'optimists' who always want more and expect to get it, and the latter as 'pessimists' who believe authors and inventors should be

provided the bare minimum necessary to enable them to continue to work in their comprehensive survey, *Intellectual Property Research*, Peter Hayward and Christine Greenhalgh say, 'The knife edge on which the law tries to balance the system is that of defining enough private property rights to generate adequate incentives for creating knowledge, whilst avoiding the gift of monopoly power which leads to overpricing and complacency.' The 'property contract' is a major theme, and a controversial one, of the creative economy.

Each country draws up its own contract to reflect its cultural attitudes to the ownership of ideas, albeit within the general ground rules set by the WTO and global and regional conventions. Countries fall into four main camps. The US and Japanese take a 'utilitarian' approach, favouring commercial exploitation over the creator's rights. They like to pay authors or inventors just enough to buy them off; and no more. Most of Asia's newly industrial economies that take their business models from America follow its lead in these matters. In contrast, most European countries, notably France and those countries whose legal systems are also based on the Napoleonic Code, put a greater emphasis on protecting a creator's 'natural' rights. The UK stands somewhat awkwardly between the utilitarian and natural law approaches. Economically it favours America's commercial approach (and the two countries share a tradition of common law); but as a member of the European Union, it is politically obliged to harmonize its laws with its Continental neighbours.

The difference between the Anglo-American and European approaches is symbolized by their attitudes to 'moral rights' (the French '*droit moral*') and the similar 'personal rights'. The rights discussed so far are economic rights, regulating commercial exploitation. Moral rights spring from the belief that the author has a personal claim on his work irrespective of what deals may be done. Immanuel Kant wrote in *The Critique of Judgement* in 1790, 'Every artistic work consists of the creative spirit in a physical object. People can buy the physical object but the spirit, the soul, cannot be bought.' He believed copying was acceptable only on condition it admits and does not disturb the writer's integrity. Moral rights are in part protection against unscrupulous agents. Authors have a right to be identified as the author ('paternity'), a right to prevent derogatory treatment

('integrity'), a right to prevent false attribution, and a right to privacy in relation to photographs and films of them and their work. In France these rights are everlasting and inalienable. If I mock a nineteenth-century French novel long out of copyright, the writer's heirs can sue me. America has little truck with such sensibilities. Britain, likewise. Both countries only adopted moral rights under international pressure in the 1980s.

But there is an even greater disparity between these three Western camps and the fourth camp, which is composed of all rural, developing and still-emerging economies. It is a division between exporters and importers, between sellers and buyers, between 'commerce' and 'culture'. Sellers want their products to be protected in all countries (as I want my luggage to be mine everywhere). They want their domestic rules to be enforced worldwide. The film, music and drug companies are reluctant to sell their products where they are very likely to be copied or stolen. The importing countries, with little to protect in terms of their own equivalent intellectual property (which is why they are importers) seldom bother to have their own laws or, if they do have them, are slack at enforcing them.

India, for example, has very weak patent rules on drugs, which means that few global companies risk selling their drugs in India, and India's own R & D is minimal. But it also means that Indian drugs are cheap, whether local inventions or imported (stolen) varieties. Many non-proprietary drugs on sale throughout Asia and Africa are 'made in India', contributing to a profitable export surplus. Under WTO pressure, India has promised to recognize Western pharmaceutical patents as from 2005. The result will be a dramatic shake-up of local industry and research. Many companies will go out of business; retail prices will rise. The prize, according to the WTO and the World Bank, will be a more innovative, legitimate industry that can compete on the world market. But many Indians fear their own companies will disappear or be swamped by WTO-protected Western conglomerates.

There is an additional complication. Many developing countries (not only those following Islamic and Hindu principles) regard creativity as part of the public commons, and do not treat creative products as private property. They define authorship loosely and provide minimal levels of protection. They regard Western rules as an unwarranted,

quasi-colonial tax on the import of ideas, knowledge and technology. These countries resist the WTO's policies on stricter intellectual property rules. However, they dare not complain too strongly, for fear of being shut out of Western markets in retaliation.

Opting Out

Finally, these laws are voluntary in the sense that everyone can create and invent outside the property contract. There are many creative people who do not enter the marketplace at all, and do not sign the contract. They opt out. They do not claim their rights. Some people accept that their work has little or no economic value and that to ask for money would stifle it at birth. There is another group of people whose work is valuable but who refuse financial gain on moral grounds. Some software programmers are opposed to copyright on moral grounds, which is why most Internet protocols are not copyrighted or patented. I return to this abnegation, which has important implications, later in this chapter. And there are others who simply make mistakes, like the music companies who said copyright in the Beatles' songs wasn't worth a candle, and like Xerox, who decided not to patent its graphical user interface (GUI), thinking it valueless, and so let Apple and Microsoft copy it for free, and make substantial profits from it.

The next section discusses the four main types of intellectual property in detail. An author or inventor cannot choose which he prefers. The product determines the category. A book falls within copyright law, an industrial process falls within patent law, and a person's name falls within trademark law. Some products fall into more than one category. A written description of a scientific idea qualifies as a literary work and wins copyright protection, while the idea may (or may not) qualify for patent protection. Similarly, a film, as well as qualifying for copyright, will include many other qualifying works with their own rights. It will almost certainly include music; and the music rights will probably involve copyright, performance rights and recording rights. The last, by the way, are called 'mechanical' rights. Subtle it is.

Andrew Wylie is not alone in wanting to choose his rights. Many creators want to move from the weaker copyright forms to the stronger

the embarrassing position of granting two monopolies for the same idea. This burden of proof reveals a key difference between patents and copyright. Inventors have to file an application to win protection; they have to prove that their new invention really is new. Artists have no such burden. Their work is protected regardless of whether someone else is doing the same work, so long as there is no element of copying.

The 'priority date' on which an applications gets made is critical. In Britain and most countries, the priority date is when the application is filed (a system known as 'first to file'). America operates a 'first to invent' system and an inventor may use an idea for up to one year before filing, which tends to favour private inventors with fewer resources. In principle, inventions should not have been used in public before being filed, but rules differ from country to country. Applications are published either on filing, during investigation (most countries publish eighteen months after filing) or on award. Knowledge that is available before the priority date is known as 'prior art'.

An important if mythical person throughout the whole process is a 'person skilled in the art'. This phrase is used in many countries' patent laws in the same way as the concept of a reasonable man is used in common law. Unlike the reasonable man, however, who is held to be average, the skilled person is a specialist in existing knowledge or 'prior art'. He is used as a benchmark. An application, when disclosed, must be comprehensible to a 'person skilled in the art' but, conversely, if it is obvious to such a person, then it will not be awarded a patent. The same skilled person would not be expected to understand a patent for mechanical engineering and for DNA fragments like nucleotides. Although this assumption is reasonable, due to the specialist nature of many patent applications, it can allow people to entertain different ideas about what is novel or inventive. In theory, the patent examiner ensures standard principles are followed. In practice, this can be difficult.

The cost of applying for a patent is negligible in terms of the patent office's own charges (the UK Patent Office abolished most filing charges in 1999) but quite high in terms of what the applicant has to pay to prepare the application, especially if it is complicated, lodged in more than one territory, or challenged. A complicated application, complete with supporting research, may cost many thousands of

pounds, and a successful award will incur annual renewal fees. Many private inventors and small businesses are reluctant to pay these costs; and some are unable to do so. The European Patent Office and the Patent Cooperation Treaty have helped to cut cost and speed the filing process, but the applicant's costs remain substantial. It is mostly a European (and Japanese) problem. In the US, applications from private individuals and small business are increasing faster than those from large corporations, and there are fewer complaints.

To qualify, an application must fall within the category of patentable matter. Some things cannot be patented. The British Act has four sets of exclusions: 'a discovery, scientific theory or mathematical model; a literary, dramatic, musical or artistic work or any other aesthetic creation whatsoever; a scheme, rule or method for performing a mental act, playing a game or doing business, or a program for a computer; the presentation of information'. The exclusion covers these things only 'as such' or on their own, the meaning of which is a rich source of debate.

The first test is novelty: whether the idea or invention already exists, or whether something similar exists from which a 'skilled person' might reasonably deduce the idea in the application; if so, then the application is rejected. Here, the priority date is crucial.

The second is the inventive step. The invention must be truly inventive in the sense of being 'non-obvious'. This is defined as not being obvious to a normally educated person who is 'skilled in the art' and has some expert knowledge and experience of the subject. The need for an 'inventive step' is used by patent offices and the courts to dismiss applications that are happenstance and meaningless, and confirms meaning as an essential requirement of creativity. It is akin to copyright's requirement that a work must involve skill and expertise (discussed later in this chapter).

These two tests are made by reference to 'prior art', the body of existing knowledge deemed relevant. Prior art is used to demonstrate not only cases where existing inventions have anticipated the new one, but where they have not. For this reason, the larger the amount of prior art the stronger the application. It shows a proper search has been done and exhaustive inquiries carried out. The patent office will then do its own research, in order to support or reject the application.

The aim is to gather enough prior art to show that, while other inventions might come close, they do not cover the new applicant's 'inventive step'.

Third, it must be useful and have what is usually known as a 'technical effect'. It must have, or be capable of, an industrial use. The technical effect need not be very dramatic. The British Patent Office has granted a patent to a blue squash ball not because it admired the colour but because players could see a blue ball better than the traditional black ball, and it felt the difference constituted a 'technical' difference. The Americans require an invention to have 'utility'. This criterion was easy to evaluate when inventions were chiefly of mechanical devices and other physical objects. It is much harder when the idea or invention involves a process, and especially if the process is microscopic or intangible. When the examiners have to test an idea of an idea.

The bare bones of patenting are well established and, thanks to recent international treaties, common to many countries. Patent offices defend them strongly. However, they are now being put under severe stress by technological change and commercial ingenuity. I have selected the three areas of current patenting policy where the property contract faces the greatest pressure. In two, at least, our concepts of property are ambivalent. I will start with computer software and business methods, which are connected, since patenting a piece of business software is very close to patenting a business method involving software; and then I will move to genetics. I will show how America approved the patenting of biotechnology in 1980, computer programs in 1981 and business methods in 1998. Europe and Japan are not so generous, but I expect them to follow suit. We have come a long way from John of Speyer and his printing press.

Owning the Shopping Basket

The early computer programs were not treated as intellectual property at all, and received no protection outside the laws of contract and confidentiality. Then the US 1976 Copyright Act and the European Union's 1991 Directive on computer programs, which is implemented in British law, both categorized a program as a literary work and gave copyright protection. Most other countries have followed suit.

But the protection may not be worth much. It is an effective method for inhibiting an end-user from literally copying a program in its entirety, but it is powerless to stop another developer from copying its main features and producing another product. When Microsoft 'copied' Apple's desktop, and when Borland 'copied' Lotus's spreadsheet in the early 1990s, both Apple and Lotus sued and expected to win. They lost. The courts found in favour of the 'copiers'. They said Microsoft had not copied Apple's code line-by-line but had only picked up Apple's 'look and feel'; and that Borland had not slavishly copied Lotus's entire code but only some of its principles. Under copyright law, a qualifying work has to be new but it does not have to be unique. Microsoft and Borland were able to assert that, far from copying someone else's work, they had actually produced their own, and could claim their own copyright. The courts' decisions alerted industry to the weakness of copyright law in protecting computer programs and the need for something stronger.

If copyright was too weak, could a patent be the answer? Companies as diverse as banker Merrill Lynch and retailer Wal-Mart argued that their computer-based programs for providing customer services were patentable. Merrill Lynch had a system for managing share transactions, Wal-Mart for controlling inventory. Both companies, and thousands like them, realized these systems were valuable commercial assets and they wanted to protect them as much, if not more so, as they protected their buildings and their equipment. They wanted their ownership to be recognized in law. As they locked their warehouses at night, so they wanted to put patents on the intellectual processes inside.

The Supreme Court, in *Diamond v. Diehr*, 1981, found in favour of patenting computer programs so long as they fulfilled the three criteria (novelty, inventive step and technical effect). The case arose because the Patent Office had refused an application for a computer-based device to develop synthetic rubber. Patent laws expressly exclude mathematical formulae and algorithms, including computer programs, 'as such'. A computer program 'as such', or 'on its own', cannot be patented, but a computer program that fulfils an inventive function may be. In other words, the presence of a computer program does not debar a patent. The court distinguished between a program's

underlying algorithms, which could not be patented, and their use in a specific system, which might be.

The extension of patenting from a computer program to a business method (albeit a business method delivered by a computer program) was confirmed in 1998 when the US Court of Appeals decided, in *State Street Bank & Trust Co. v. Signature Financial Group Inc.*, that a computer-based 'business method' does fulfil the criteria for a patentable product. The Court said the principles of novelty, non-obviousness and utility worked the same way here as elsewhere. The Court was fully aware that it is difficult if not impossible to distinguish between the mathematical code of a business method and the business method itself. In computer code, the software is the method. There is no external, physical, bricks-and-mortar reality.

The *State Street* case marked a watershed in American patenting policy. It changed the link between a patent and technology. Up till then, patents were centred on technology. What's more, a patent required the technology to be novel, non-obvious and with a technical effect. From 1998, the technology was optional. The seeds had been sown back in 1991, when the courts had said technology encompassed both hardware and software; in other words, both equipment and the ideas that drive them. The *State Street* decision took this argument to its logical conclusion.

Although the American Patent Office was initially reluctant to cut the link with technology in the sense of physical apparatus, it was emboldened by the *Diamond v. Diehr* and *State Street* cases to do so. It has since given Dell Computers more than seventy patents for its business processes. Dell is the largest computer seller in the world, selling about \$35 million worth of computers every day, and its success depends on being more flexible in personalizing each computer to the customer's specification, and delivering it more quickly, than its competitors. Understandably, it wants to protect the computer processes which allow it to be so successful.

Patents for business methods are now being awarded thick and fast. The name of Peri Hartmann is not well known in the publishing world. But Peri Hartmann has won a patent (which also has the give-away name of Jeff Bezos, CEO of Amazon.com, attached) for a 'method and system for placing a purchase order via a communication network'

(US patent no. 5,960,411). The 'method and system' enables a customer to click once on the shopping basket in order to confirm an order. Bezos calls it his 1-Click system. It is hardly non-obvious and, according to James Gleick in the *New York Times*, the patent examiner initially had some doubts. But after discussion and revision she awarded the patent. Amazon.com immediately sued one of its competitors, Barnes & Noble, and forced them to change their online ordering system into a two-click process.

Hartmann and Bezos have grand ambitions for their baby. The patent's full text includes this phrase: 'Although the present invention has been described in terms of various embodiments [based on Amazon.com as it now operates] it is not intended that the invention be limited to these embodiments. Modifications within the spirit of the invention will be apparent to those skilled in the art.' Patent offices allow patents to cover as-yet unspecified applications if, as in the Amazon case, they might be imagined by such a person. The purpose is to ensure that a patent is not too narrow, and that applicants do not have to apply for a separate patent for each (minor) variation. Patent offices are liberal in allowing one patent to cover possible future uses. In the Amazon case, Hartmann and Bezos said that people who were 'skilled in the art' and likely to see future modifications could expect to find Amazon's 'No Trespassing' sign. This liberal policy encourages speculative patenting.

Priceline.com took the same approach with its software program, which provides a kind of reverse auction. Would-be buyers offer a set sum of money for a specific product without knowing if the product exists. They might offer \$50 for an airline ticket from New York to Miami at 6 p.m. on Wednesday without knowing if any airline has such a ticket (airline tickets seem the basic commodity of many Internet businesses, which gives the lie to those who say computer nerds never leave home). In 1998, the US Patent Office awarded Priceline patent no. 5,794,207 for 'buyer-driven conditional purchase offers'. One of the main investors in Priceline.com was Jay Walker, who set up Walker Digital, a 'patent farm' which has generated a number of patents in business methods.

Another company, Open Market, based in Massachusetts, has received a patent for its technique of analysing the ways in which

people go into a website and move around (measuring its 'hits' and 'stickiness'), which provides valuable information to the owner and advertisers. Critics argue that this is akin to patenting the way we read or browse a book. Sightsound.com has received a patent for the sale of digital audio and video over the Internet and consequently sued CDNow.com, MP3.com and others for a 1 per cent royalty on every transaction involving the download of CD to a customer. It says its reward would be merely similar to the royalty that Sony and Philips, co-inventors of the CD, receive for every CD sold.

The business methods now being patented are comprehensive and diverse. James Gleick says 'companies have gotten patents for keeping calendars on the World Wide Web, for downloading pages at regular intervals, for storing documents in databases, for "real-time" shopping, for auctioning cars; for creating profiles of users; for search engines, for payment systems, and for every other fundamental gear and lever in the theoretical machinery of online business'. Since he made his list, the Patent Office has awarded patents for club buying (where a group of buyers can negotiate a discount), offering professional advice, and generating footnotes in a text. It has awarded a patent for a system that 'lowers your price if your customer asks about a competitor's lower price'. Gleick quotes Lawrence Lessig, Berkman Professor of Constitutional Law, Harvard University, who advised the federal government in its anti-trust suit against Microsoft: '[granting of patents] is a disaster, a major change that occurred without anybody thinking through the consequences. In my view, it is the single greatest threat to innovation in cyberspace, and I'm extremely sceptical that anyone is going to get it in time.'

Faced with this 'marked increase in public attention', the US Patent Office published a White Paper, *Automated Financial or Management Data Processing Transactions (Business Methods)* in 2000 to explain its new policy. It began by saying that nothing much was new; it had given the Tabulating Machine Company, the forerunner to IBM, its first data-processing patent in 1889. But it did protest too much. It had given IBM a patent for a technical device that others purchased to use as the basis for their own business processes. What is happening now is that the US Patent Office is directly patenting those business processes. Its own description of suitable candidates for patenting (in

the relevant business classification no. 705) include such common commercial activities as '(1) Determining who your customers are, and the products/services they need/want; and (2) Informing customers you exist, showing them your products and services, and getting them to purchase.' The White Paper also admitted that 'This Class no. 705 is transitioning away from technology towards the end result the inventor is attempting to achieve with that technology.' It confirmed that, following the *State Street* decision, the technology, or technical effect, is being replaced by pure business. It quotes a recent patent for a sales team (no. 6,070,149), 'The present invention relates to virtual sales personnel, and more particularly, to software which is capable of assisting a computer user to complete an online sales transaction in a substantially similar manner as a human sales representative.'

According to Keith Beresford, a leading patent attorney, an inventive business method not involving any novel technology, while it may be patentable in America, is almost certainly not patentable in Europe. European patent offices take the view that inventions that lack a technical or practical input or output, or an industrial use, do not qualify. However, we should not exaggerate the differences between America and Europe on this point. America's more active approach is caused by social factors which Europe has already begun to import. Johannes Lang, a German patent attorney, says, 'Today in Europe the emphasis is put on the technical character ... while in America the discussion focuses on its useful application; i.e., a useful, concrete and tangible result.' The American office is simply responding to its own customers. In the coming years, it will be hard for Europe to withstand the trend towards patenting business procedures, and many American software companies have already filed applications at the European Patent Office in the expectation that European attitudes will change.

The options for the European Patent Office were spelled out in a European Commission report, *The Economic Impact of Patentability of Computer Programs*, in 2000. The report says the main difference between America and Europe is that 'in Europe the invention has to be of a technical character whilst in America the fact that an invention uses a computer in any way is enough to qualify' (assuming, in all cases, that the criteria of novelty and inventiveness are met). It acknowledges Europe must follow America's path. A few months earlier the EPO

had already voted 10:9 to liberalize its rules. The only question is, how quickly? The report offers three options. Even the first, minimalist, option would remove the phrase 'as such' from the European Patent Convention, which would have the effect of bringing computer processes to the centre of the patenting fold. The second option would allow the mere use of a computer to enable the invention to qualify as 'technology' (even if the use of the computer itself were neither novel nor non-obvious, nor had a technical effect). The report says this would be 'highly controversial'. The third option is to alter European law 'to have no requirement that patents be limited to technology'. This would cause 'great controversy'.

Patenting computer programs and business methods gets close to patenting the heart and soul of an organization. W. R. Cornish says, 'Computer programs lie exactly at the boundary of what previously has been thought to separate the patentable from the non-patentable.' A policy that conjures up the further possibility that business processes may be patented and privatized even if they do not involve technology has implications for economics, regulation and social equity. If you cut the link with technology the way is open to the privatization of every process so long as it is new, inventive and useful.

Private Genes

Equally awkward and even more publicly controversial is the patenting of biological matter. It is said scientists are patenting life itself, though we should be careful about what we mean by 'life'. Many countries have allowed people to own and register plant varieties for decades. America took the lead, starting with the 1930 Plant Patent Act, followed by Germany and other European countries. Britain passed its Plant Varieties and Seeds Act in 1964, awarding a full monopoly right to the owner of any plant variety that can be shown to be novel, distinct, uniform and stable. The test of novelty is much looser than that for an industrial patent (who knows what plants may be growing in the wild?). So a plant qualifies for protection even if it has a history of growing wild, so long as it has not been sold commercially for more than four years.

At the time, patenting a seed or a plant for agricultural purposes was regarded as being no different from patenting a chemical or

biological recipe for pharmaceutical purposes. Western farmers and horticulturists were eager to increase yields as their own costs grew (especially farm wages) and they had to compete with imports from low-wage countries. They were also keen to grow new varieties that could be picked and brought to market a few weeks sooner. The huge investments in faster-growing and more disease-resistant seeds over the past forty years might not have been made if the seed companies had not been able to protect their work. (In the same period, home gardeners, faced with weeds in their flowerbeds, and the modern curse of too little time, also enjoyed the benefits of buying huge quantities of glyphosate in Round-Up and other patented weedkillers.)

The number of applications for plant and genetic patents has increased with extraordinary rapidity. Technological advances in biotechnology have extended scientists' ability to exploit biological matter from whole plants to their various elements; from whole animals to parts of animals; and from animals to humans. Developments in DNA and in cell technology have allowed scientists to identify, nurture and remix cells so that they can create living material. The identification of the human genome, which contains the genes that control the design of each human (how and what the human reproduces, and how it builds and maintains itself, or not) will need a new property contract.

Should the genome be public property in the same way as, say, the knowledge of blood types is public property, or the structure of DNA itself? Or should it be private property? The American Supreme Court famously said in 1952, 'Anything under the sun that is made by man is patentable'; implying that everything that was not made by man was not patentable. Since then, its position has shifted. In *Diamond v. Chakrabarty* in 1980 it was asked to rule on a patent application by Anand Chakrabarty for a genetically modified bacterial micro-organism designed to gobble up oil spills at sea. It decided to shift the dividing line from between 'inanimate things and living things' (the former patentable, the latter not) to between the product of nature, whether living or not, and human-made inventions which may, of course, be living; and it approved the patent. In 1987 the US Patent Office issued new guidelines which said that all bio-organisms except humans could be patented. It said humans were protected by the

Thirteenth Amendment to the Constitution, which prohibits slavery (it was silent on the possibility of artificial masters).

The Patent Office later issued a patent to Harvard University for an experimental mouse known as Oncomouse, into which an oncogene had been inserted for the purpose of cancer research. The European Patent Office, after initially demurring, did likewise. It said Oncomouse was such a considerable manipulation of genetic material as to be new and unique. It was protested on ethical grounds that the mice would suffer during the research, but the EPO decided the benefit to society outweighed the loss to the mouse; a neat variation on the 'property contract' that balances the creator's reward against the social gain. his rapid shift over seven years from saying 'nothing, never' to 'everything but slaves' was a breathtaking expansion of private property and a massive shift in our (or, rather, the patent offices') attitude towards the ownership of life.

Another odd case, reinterpreting the property contract against our common instincts, occurred when a Californian university medical centre managed to own and patent the cell line found in a spleen that had been taken from a man, John Moore, who had hairy-cell leukaemia. The doctors had discovered that Moore's T-lymphocytes were extraordinarily rare and potentially of great medical value. Without telling him, they carried out intensive tests that ended with the removal of his spleen. The cells were indeed as valuable as they had expected, generating products worth hundreds of millions of dollars. When Moore discovered how the university had privatized his cells, and made its profits, he sued; but he lost. The Supreme Court of California decided that we do not own our cells after they have left our body.

The two rival organizations that are mapping the human genome are conveniently taking completely opposite approaches to patenting the results. I say 'conveniently' because it makes the alternatives very clear, in a way that seldom happens in science or patent policy. The publicly funded \$3 billion US-UK Human Genome Mapping Project (HGMP) is publishing all its results so they become public property. John Sulston of the Wellcome Trust, which sponsored the British research, said, 'Our basic information, our "software", should be free and open for everyone to play with, to compete with, to try and make

products from.' The commercially funded Celera, on the other hand, is publishing the majority of what it discovers (since the majority is scientifically unproductive) but retaining the productive and valuable parts. Both the HGMP and Celera agree in principle that genes may be patented but they disagree on the criteria, especially the 'what', the 'when' and the 'why'.

What is the what? The words 'invention' and 'discovery' are problematic. The public generally understands discovery to mean finding or identifying something that already exists, and an invention to be something that did not previously exist. But science, and patent offices, somehow such simplicity; or, rather, they have looked and found it unworkable. Thomas S. Kuhn, who introduced the idea of the 'paradigm' to scientific evolution, says in *The Structure of Scientific Revolutions*, 'We must ask how changes of this sort can come about, considering first discoveries, or novelties of fact, and then inventions, or novelties of theory. That distinction between discovery and invention, or between fact and theory, will, however, immediately prove to be exceedingly artificial.' He gives many examples, starting with the discovery of oxygen, whose authorship has been contested for over two centuries. He argues convincingly that Joseph Priestley may be said to be the first to have discovered something new, but that he did not know what it was; while Antoine Laurent Lavoisier, who followed Priestley, was the first to invent a new concept of something that might have been oxygen but which in fact was not; leaving others to identify it correctly. The US Patent Office says with some bravado that 'invention means invention or discovery'. American companies who apply for biotechnology patents use the words interchangeably, although they seem to prefer the word 'discovery'. The European Patent Convention says discoveries cannot be patented at all (they are 'excluded matter') and the UK takes the same view.

Is it sensible to ask if identifying a gene is a discovery or an invention? Given that the property contract is a social contract, in which society has half share, and that the popular meaning of both words is quite clear, the question seems worth considering. The HGMP asserts that the identification of a particular gene is a 'discovery' not an invention, and cannot be patented. It says the raw genetic data is 'obvious'. Every half-qualified scientist knows it is there. But merely knowing it is there

has no practical value. The HGMP believes that scientists must apply further skill and intelligence before they can justify a claim for a non-obvious, practical use. A patent is granted to stop others from making, selling or using the patented product, which must be novel. It cannot therefore be granted to a naturally occurring gene.

On the other hand, Celera and many other companies argue that their techniques for identifying a raw gene sequence are so difficult and out-of-the-ordinary (i.e., so novel and non-obvious) that they constitute an invention as popularly understood, and qualify for a patent. They also say that they have a large and sufficient number of ideas for industrial applications. It is a reasonable approach. To get a patent you have to show that your idea has a practical application but you do not have to prove you can deliver the practical application yourself. The Supreme Court judgement in *Diamond v. Chakrabarty*, and the US Patent Office's more recent policy statements, support Celera's case. The Patent Office has said it will award patents to genes only if the use is 'substantial, specific and credible'. But the gene grabs continue.

Cloning raises another question. The cloning of plants, fruit and vegetables has been going on for centuries (most apples and potatoes are cloned). Gene cloning has been possible for over twenty-five years. But animal cloning is new. It involves taking a donor's single cell, extracting the DNA, injecting it into a fertilized egg cell from which the DNA has been removed, and stimulating the new-cell-with-its-DNA with a burst of electricity. The resulting embryo contains embryonic stem cells that will generate specialized cells for each body function. Animal cloning, and the potential for human cloning, came to public notice when Ian Wilmut at the Roslin Institute near Edinburgh cloned Dolly the sheep by recreating, via an easily obtained body cell, an egg cell and thence an embryo which was compatible with the host. Since then, PPL Therapeutics, which has a licence from the Roslin Institute, has cloned Polly the sheep, which (or should that be 'who') contains a human gene; as well as cows, rabbits and mice. It has also cloned five piglets, including one called Dot.com. PPL has produced a compound called AAT, based on a protein in the milk of genetically altered sheep, to treat cystic fibrosis and breathing disorders.

The Roslin Institute, the UK Ministry of Agriculture and the UK

Biotechnology and Biological Research Council successfully applied for two patents (no. 2,318,578 and no. 2,331,751) to protect their techniques for cloning. The patents are mainly for animal cloning but they also cover the 'cloning of human cells'. Whether or not Roslin or its licensees will use its techniques in humans depends more on political decisions than on patent procedures.

These political pressures were expressed in March 2000 when Prime Minister Tony Blair and President Bill Clinton responded to public concern by what they called a 'moral exhortation' in support of 'unencumbered access' to the genome sequence. They said, 'We applaud the decision by scientists working on the human genome project to release raw fundamental information about the human DNA sequence and its variants rapidly into the public domain, and we commend other scientists around the world to adopt this policy.' Overnight, shares in biotech companies in London and New York fell by an average of 12 per cent.

Both leaders noticeably failed to take any action to put their words into effect, not wishing to permanently damage the biotech industry. Rather, the opposite. In 1998, the British government had voted in favour of a European Directive (no. 98/44) on the legal protection of biotechnological inventions. It did so against opposition from the Dutch government which later, supported by the Italian government, appealed to the European Court of Justice. The Council of Europe has called for the Directive to be immediately 'renegotiated', yet a month after the Blair-Clinton statement, the British Patent Office began the official implementation procedure by issuing a consultation paper which confirmed the Directive fitted with existing British law. It stated that the 'human body, at the various stages of its formation and development, and the simple discovery of one of its elements, including the sequence or partial sequence of one of its elements cannot constitute patentable inventions' (Article 5.1) but that 'An element isolated from the human body or otherwise produced by means of a technical process, including the sequence or partial sequence of a gene, may constitute a patentable invention even if the structure of that element is identical to that of a natural element' (Article 5.2). The same Article emphasizes that the application must disclose how the sequence may be used in practice. The Directive requires the applicant to list some

practical applications, but these may be quite general. In America, the Patent Office declared its policies in favour of patenting genes were 'unaffected' by the Blair-Clinton statement. Business as usual.

The Central Banks

The American, European and Japanese patent offices are the 'central banks' of patent property. They sit in the middle of a comprehensive network of researchers, inventors, entrepreneurs and corporations who increasingly believe that they must patent not only what they sell but how they sell it. For them, patents and trademarks are the core of their business: their main product and competitive advantage. For compelling reasons, they are driven to privatize as much as they can. They usually have the support of their shareholders, who want healthy balance sheets, and of their governments, who want healthy The 'central banks' issue the currency.

Their chief purpose is to award as many patents as possible. The first objective of the British Patent Office is to 'stimulate innovation and the international competitiveness of British industry through the promotion and understanding of intellectual property rights'. It has a 'clear focus on customer satisfaction'. To that end, it provides a range of educational and advisory services. It leaves Parliament to settle the social and moral framework within which it operates, although Parliament has shown little interest, discussing patents only twice in twenty years. The mission of the US Patent Office is to 'promote the use of intellectual property rights as a means of achieving economic prosperity'. Its internal noticeboards are more punchy: 'To Help Our Customers Get Patents'.

It is a profitable business, this banking of ideas. The US Patent Office had revenues of about \$830 million in 1999 and profit, depending on how the government allocates the overhead, of \$90-190 million. The British Patent Office recorded revenues in 2000 of £52 million and profits of £13 million. Its accumulated surplus was £113 million.

Meanwhile, the customers are banging on the door. The gold rush has become too general a metaphor to have much meaning, but we are seeing a gold rush in the search for patents, both old and new. It is not the first time. In 1882 the US Supreme Court, faced with a rush of applications, said, 'An indiscriminate creation of exclusive privileges

tends to obstruct rather than stimulate invention. It creates a class of speculative schemers who make it their business to watch the advancing wave of improvement, and gather its foam in the form of patented monopolies, which enable them to lay a heavy tax on the industry of the country, without contributing anything to the real advancement of the arts.' Looking at the advancing waves in Washington, Tokyo and Munich, not much has changed.

There is a boom in specialist advisers who encourage companies to apply for more patents (for instance Aurigin, QED, BTG and other 'patent mining' companies). Aurigin provide 3-D maps of industries showing where patents are crowded close together, which appear as hills, and where they are scarce, which look like valleys. They advise prospectors to head for the valleys and to take out speculative patents. Kevin Rivette of Aurigin is a specialist in maximizing a company's patent assets, including searching for patents the company has forgotten (as described in his enticingly named book, *Rembrandts in the Attic*). Many technology-based companies have a storehouse full of their own patents that are not being fully exploited. Aurigin has developed a technique for a company's patent strategy called 'patent mining' which determines which it should grow, reinforce or sell. Aurigin has many examples of companies that do not know what patents they have, and how they might help their future business. Ben du Pont, one of the heirs to the Du Pont fortune, has started a company called Yet2.com which provides a business-to-business exchange for patents and rights. Launching the company, du Pont was quoted as saying, 'I worked at Du Pont for fourteen years and hadn't the foggiest about what we had for licensing.' For a small fee, Yet2.com will list a patent and seek buyers. IPNetwork.com does the same for copyrights and trademarks, InterDigital for wireless patents.

Usually, their deals are confidential, but occasionally they become public news. BT applied for patents for its hyperlink technology in the 1970s. Most offices awarded a patent which expired over the next 15-20 years. The American patent was appealed and so not effective until 1986. By that time, BT had lost interest. Then in 2000 BT suddenly discovered its patent (no. 4,873,662) rusting somewhere in its Suffolk research centre, and started the difficult process of charging licence fees to companies which had been using the technology in the belief that it