The Future of the European Requirement for an Invention: Inherent Patentability as a Pre- and Post-Patent Determinant

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Introduction

In 2009, in the United Kingdom, the House of Lords held that the contribution to the art for which a European patent is granted is the invention.1 If this is true, we need a robust and meaningful definition of what constitutes an invention, and an understanding of how individual subject matter are properly conceived as inventions. Implicit is a view of the EPC2 requirement for an invention as existing

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2 Convention on the Grant of European Patents (1973) 13 ILM 268, as amended.
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to perform two (pre- and post-patent) functions. The first is to help set the threshold limits of the patent system by determining the categories of subject matter for which a patent may be granted. And the second is to restrict the protection conferred by a patent to individual subject matter conceived as inventions. In serving these functions, the requirement helps to fulfil the public benefit objectives of the patent system by mediating the balance struck by patents between individual patentees and the public.

In this chapter I consider how well the European requirement for an invention performs these functions. Of central importance in this regard is Article 52(2) & (3) of the EPC, in which the “invention” is defined. Hence the closely related question, how well does this Article elucidate the European invention, and how does it inform decision makers’ conception of individual subject matter? That these questions are difficult and important is apparent from the amount of litigation involving Article 52(2) & (3), and the social and economic issues at stake.

It is convenient to outline my central claims and assumptions at the outset, and also to clarify some central points. One point is that my concern is not with the requirement for inventive step, nor with the statutory exclusions from patentability per se, such as those contained in Article 53 EPC and Rule 29(1) of the EPC Implementing Regulations. Rather, it is with the requirement for an invention, which, even if it overlaps with other requirements and exclusions, is a legally and analytically separate thing. Also, my concern is not only with what is an invention, and therefore eligible for patent protection,

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4 In 2010 the issue was also considered by the Enlarged Board of Appeal (EBA) and US Supreme Court; see G_0003/08 (PRESIDENT’S REFERENCE/Computer Program Exclusion) (Unreported, 12 May 2010, EBA); Bilski v Kappos (Unreported, 28 June 2010, US Supreme Court).
5 See CFPH’s Application [2005] EWHC 1589, [10] (Mr Prescott QC, noting that “whoever controls the meaning of ‘invention’ controls what can be patented and hence an important aspect of industrial policy”).
6 See EPC Arts 52(1) & 56.
but also with the requirement for an invention itself. Hence my question, what role does and ought that requirement to play?

This leads to my central claims and assumptions. My main claim is that the requirement for an invention has an important role to play, including beyond the threshold point of determining inherent patentability itself. In making this argument I am trying to extend the focus of current debates by suggesting that we ought to be asking not only Is X an invention?, but also What constitutes X as an invention?. And the reason is simply (as Generics v Lundbeck confirms) that patents are granted for inventions, and the scope of protection which they confer defined with reference to the inventions for which they are granted. Among other things, this means that it is our conception of an individual subject matter as an invention that determines the scope of protection which its patent confers. Put differently, and to use the language of contract law so often employed in respect of patents, our conception of subject matter as inventions is central to ensuring that the consideration proffered by an inventor for a patent is not only sufficient, but also adequate. Thus, inherent patentability is both a pre- and a post-patent determinant.

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7 In the UK, s 125(1) PA requires that the scope of protection conferred by a patent be determined with reference to the “invention” specified by the patentee in the claims. It provides: “For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.”

8 See, eg, Kirin-Amgen Inc v Hoescht Marion Roussel Ltd [1996] RPC 511, 530 (Lord Hoffmann).

9 In the UK at least, it is a longstanding principle of contract law that to be enforceable a promise must be accompanied by consideration moving from the promisee, which consideration must be sufficient in the sense of having value in the eyes of the law, but need not be adequate in the sense of having value equivalent to the value of the promise.
Certain other claims and assumptions are central to my thesis. One is that it is both necessary and possible to define the invention positively, but that the concept of “technological” is largely unhelpful in this regard. Another is that the existing requirement for an invention is not merely a requirement for a subject matter that falls outside the (negatively cast) terms of Article 52(2) & (3). Third, I reject the premise of much contemporary law and jurisprudence that the European patent system exists – and ought to exist – for the purpose of advancing the practical arts, with the result that if a subject matter is novel, inventive and useful, it is a subject matter that ought to be patentable. Instead, I suggest that the purpose of the system ought to be linked to advancing the industrial arts, and conceptions of inherent patentability limited accordingly.\(^\text{10}\)

1. The EPC Requirement for an Invention

The EPC restricts the availability of patents to patentable inventions, defined in Article 52(1) as “inventions, in all fields of technology … that … are new, involve an inventive step and are susceptible of industrial application”.\(^\text{11}\) By Article 52(2) & (3) an “invention” is defined as not including the following subject matter, to the extent to which a patent or application relates to it “as such”: (a) discoveries, scientific theories and mathematical methods; (b) aesthetic creations; (c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers; and (d) presentations of information.

In their current jurisprudence, the EPO Boards of Appeal interpret Article 52(2) & (3) as resolving to a positive requirement for

\(^{10}\) Sivaramjani Thambisetty has also connected the concept of inherent patentability and the requirement for patentable subject matter to be linked to industry in her paper “Legal Transplants in Patent Law: Why Utility is the New Industrial Applicability” LSE Law, Society and Economy Working Papers 6/2008.

\(^{11}\) See further EPC Arts 54 (novelty), 56 (inventive step), 57 (industrial applicability).
Thus, if a subject matter has technical character it is an “invention” within the meaning of Article 52(1), and inherently capable of supporting a patent. For it to have technical character it need only include some technical feature, regardless of whether that feature predominates. Further, while the requirement for an invention is expressed as being “essentially separate and independent of” the other patentability requirements, in determining the novelty and inventive step of a subject matter it is only the “technical features” that count. The result is uncertainty regarding the relationship between the Article 52(1) requirements, which uncertainty pervades the reasoning of the EPO Boards. In T_0939/92 (AGREVO/Triazoles), for example, the Technical Board of Appeal (TBA) held that “the properties (or technical effect) of the claimed subject-matter” are relevant “to the issue of patentability”, without clarifying which or the difference between the two. Similarly in T_1616/08 (AMAZON/Gift Order), the TBA held that the art in which the notional addressee is skilled for the purpose of determining inventive step cannot be a field of business or administration, in contrast to a field of computer programming, notwithstanding that computer programs are also listed in Article 52(2).

By way of contrast, different approaches to the requirement for an invention have been proposed by the UK courts. In Biogen Inc v Medeva plc, for example, Lord Hoffmann suggested that the requirement will “almost invariably be academic”; the important issue being whether a subject matter is new, inventive and

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12 See T_0154/04 (DUNS LICENSING ASSOCIATES/Estimating Sales Activity) [2007] EPOR 38, [5], affirmed in President’s Reference (n 4).
13 Ibid.
14 [1996] EPOR 171, [2.2.3]; see also [2.4.2] (finding that the “generally accepted legal principle that the extent of the patent monopoly should correspond to and be justified by the technical contribution to the art … governs the decision that is required to be made under Article 56 EPC [in addition to Articles 83 and 84], for everything falling within a valid claim has to be inventive. If this is not the case, the claim must be amended so as to exclude obvious subject-matter in order to justify the monopoly.”).
15 (Unreported, 11 November 2009) [4.3].
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industrially applicable. Speaking extra-judicially in 2009, his Lordship confirmed this by describing the effect of the Article 52(2) exclusions as being to deny patentability to information and manners of human behaviour, which he characterized as inherently abstract subject matter. On the other hand, in Merrell Dow Pharmaceuticals Inc v HB Norton & Co Ltd his Lordship emphasized the restriction of protection to individual subject matter when conceived “under the description” of the invention, and in Kirin-Amgen Inc v Hoechst Marion Roussel Ltd he affirmed the need to consider Article 52(2) & (3) when undertaking such conception, as well as the social contract effected by a patent. Thus, while Lord Hoffmann has supported a de minimis reading of Article 52(2) & (3), consistent with the approach of the EPO, he has supported a method of conceiving individual subject matter qua invention informed expressly by Article 52(2) & (3) and public policy considerations, contradicting the approach of the EPO.

In contrast to Lord Hoffmann, Laddie J in Fujitsu Ltd’s Application construed Article 52(2) & (3) as containing independent policy exclusions having potentially different spheres of application. In so doing he claimed to be following the EPO’s approach, and in a limited sense he was. This is because prior to Fujitsu, EPO (and UK) decision makers had tended to adopt a different approach according to the type of subject matter in issue. Thus, in cases involving business methods Article 52(2) & (3) tended to be applied liberally to deny protection, whereas in cases involving discoveries they tended to be applied narrowly to permit protection. Viewed in this context, the importance of Laddie J’s analysis lay in its explanation of the differential approach of past decision makers as a

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17 See L Hoffmann, “Software Patents” (Paper delivered at the IPSANZ Conference, September 2009), on file with author.
18 See [1995] UKHL 14, [36], [40]–[42] (noting “the infinite variety of descriptions under which the same thing may be known”, and emphasizing the need for a subject matter to be novel “under the description” of “the invention”).
19 [2004] UKHL 46, [77].
21 See Pila (n 3) 196–209 (for the TBA), 253–265 (for the UK courts).
function of the exclusions’ policy rationales. In addition, his Lordship cast the requirement for an invention as having a potentially expansive role, though without considering its impact on the conception of individual subject matter.

In *CFPH’s Application and Halliburton Energy Services Inc v Smith International Inc*, Mr Prescott QC and Pumfrey J adopted Laddie J’s approach, without denying its divergence from the formal EPO (technical character) view. According to the Judges, they were justified in doing so by the nature of the EPC as an international agreement, appropriately interpreted teleologically, and the impossibility of reconciling EPO authorities.

In both *CFPH* and *Halliburton*, the policy objectives underlying the Article 52(2) exclusions were described as supporting their division along a spectrum of soft and hard exclusions; as Mr Prescott QC said in *CFPH*, “the harder the exclusion, the more it is the policy of the law to insist that the use of the information be not foreclosed under patent law”. In his view, on the “soft” side of the spectrum are the discoveries and games exclusions, which operate (respectively) to limit protection to useful artefacts or processes, and to “that which will be made and supplied commercially”. On the “hard” side are the aesthetic creations, computer programs, presentations of information, and business methods exclusions, to which he attributed the following rationales: for aesthetic creations, the availability of copyright protection; for computer programs, the view of the EPC drafters that patents would “do more harm than good”; for presentations of information, the undesirability of

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22 See [2005] EWHC 1589 (Pat); [2005] EWHC 1623 (Pat).
23 See [2005] EWHC 1589, [26]–[27].
24 See [2005] EWHC 1623, [212] (“It is idle to pretend that it is easy to reconcile the different [EPO] cases on these questions.”).
25 [2005] EWHC 1589, [33].
26 Ibid [34], [38].
27 Ibid [30].
28 Ibid [35].
allowing the monopolization of information; and for business methods, the fact that patents are not needed to encourage business innovation. In Halliburton, Pumfrey J refrained from any detailed analysis of the Article 52(2) exclusions. Nonetheless, it is clear from what he said that he understood them differently from Mr Prescott QC. In his opinion, the exclusions

...are a heterogeneous collection, some of which (aesthetic creations) have their own form of protection, others of which (discoveries, mathematical methods and scientific theories) have never been accepted as suitable subjects of monopolies on obvious, but different, policy grounds.

Further, the problems with Article 52(2) are (he suggested) “caused by (c) and (d), which, by reason of their exclusion ‘only to the extent that the patent relates to such subject matter... as such’ are remarkably difficult to assess in cases lying near the boundary, particularly as it is difficult to discern an underlying policy”:

For example, do we only exclude computer programs as such because computer programs as such are protected by copyright, like aesthetic creations which can likewise be used industrially? Or is there some other reason? Whatever the reason, surely it is not the same as the reason for excluding methods of doing business?

In the end, Pumfrey J eschewed the need to decide the reason, being content instead to determine the case pursuant to a positive conception of the invention, as any subject matter “tethered” to a specific industrial activity and directed to advancing the technical arts. In his judgment, however, “the scope of the claim should be restricted to its technical field”, consistent with the EPO approach above. With respect to this last point Mr Prescott QC differed. In reasoning reminiscent of Lord Hoffmann’s in Merrell Dow, he emphasized that it is not enough for an individual subject matter to

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29 Ibid [40].
30 Ibid [41].
31 [2005] EWHC 1623, [212].
32 Ibid.
33 See ibid [215]–[216].
satisfy the criteria of patentability; it must do so “under the description ‘invention’”. 34 Exactly what this requires he did not explain, though given his view of Article 52(2) & (3) above, it must be different from that suggested by Pumfrey J.

In Aerotel Ltd v Telco Holdings, decided in 2006, the Court of Appeal agreed broadly with Pumfrey J and Mr Prescott QC’s decisions, but adopted Pumfrey J’s approach of positively conceiving the invention itself, rather than Mr Prescott QC’s approach of treating each exclusion as a stand-alone policy-based provision. In a judgment written by Jacob LJ, and expressed as constrained by past UK authority, the Court suggested that whether a subject matter is an invention depends on whether the contribution it makes to the relevant art falls solely within excluded subject matter, and is of a technical nature. 35 In Symbian v Comptroller-General of Patents, however, this approach was all but rejected by a differently constituted Court of Appeal. According to Lord Neuberger delivering the judgment, and seeking expressly to reconcile the EPO and UK approaches in anticipation of the then awaited EBA decision, the effect of the requirement for an invention is to exclude subject matter the contribution of which “cannot be characterized as ‘technical’.” 36 As his Lordship all but acknowledged, however, this finding begged more questions than it resolved.

Since the decisions in Duns and Symbian, litigation involving Article 52(2) & (3) has continued seemingly unabated, and the law with respect to the European invention described by one UK Judge as depressingly uncertain. 37 Given this, it is reasonable to consider how

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34 [2005] EWHC 1589, [93]. In the copyright context, Laddie J made the same point in Electronic Techniques (Anglia) Ltd v Critchley Components Ltd [1997] FSR 401, when he emphasized the need when considering a claim of literary copyright to conceive the subject matter properly, “qua literary work” (at 414).
35 See [2006] EWCA Civ 1371, [40]-[41].
the EPC requirement for an invention might alternatively be understood.

2. The Future of the EPC Requirement for an Invention

Any definition of the invention within the meaning of Article 52(1) must reflect the reason for requiring an invention at all.\textsuperscript{38} If the House of Lords is right, that reason is clear: the invention represents that for which a European patent is granted, and with reference to which the scope of the monopoly conferred by a patent must therefore be defined.\textsuperscript{39} Implicit is the view advanced above of the two-fold role of the requirement. The question is how well the requirement fulfils this role, and what contribution Article 52(2) & (3) in particular make.

As has been noted, Article 52(2) & (3) contains a list of subject matter that, “as such”, are not “inventions” for which a patent might validly be granted. As also noted, Lord Hoffmann has suggested that all of the items on the list are abstract in nature, essentially supporting the EPO view that the exclusions resolve to a positive requirement for technical character. However, his view is open to criticism. For example, there is nothing abstract about a literary work, or a sculpture, or a computer program, each of which is included in Article 52(2). Further, all methods are at their base a method of human behaviour, just as all inventions are “piece[s] of information”, as Lord Hoffmann himself held in Merrell Dow.\textsuperscript{40} Thus, this conception of Article 52(2) & (3) is difficult to accept.

Similarly with respect to the EPO view, that the only subject matter excluded from the system on inherent patentability\textsuperscript{41} grounds are

\begin{itemize}
  \item The point has been made by Lord Hoffmann for the definition of anticipation; see Merrell Dow [1995] UKHL 14, [36] (Lord Hoffmann, stating that the description under which a subject matter must be known “in order to justify the statement that one knows that it exists … depends entirely upon the purpose for which the question is being asked”).
  \item See T_0409/91 (EXXON/Fuel Oils) [1994] EPOR 149, [3.3] (“the extent of the monopoly, as defined by the claims, should correspond to the technical contribution to the art in order for it to be supported or justified”).
  \item [1996] RPC 76, 86. See CFPH [2005] EWHC 1589, [28] (Mr Prescott QC).
  \item On the meaning of “inherent patentability” see Pila (n 3) 1.
\end{itemize}
those which lack technical character. According to the TBA in *Duns*, the basis for this understanding of Article 52(2) & (3) is the classical notion of invention, and the distinction it supports between “practical scientific applications and intellectual achievements”. However, computer programs are the epitome of an invention thus defined, unless conceived as a form of literary expression, in which case they are covered by the “aesthetic creations” or “presentations of information” exclusion. Similarly, it is not clear why certain schemes, rules and methods based on a scientific principle are not “practical scientific applications” as distinct from “intellectual achievements”, even if aimed at performing a mental act, playing a game, or doing business. And finally, inventions are in all cases “intellectual achievements”. Thus, while the EPO interpretation of Article 52(2) & (3) may be an *argument for* resolving those provisions to a requirement for technical character, it is not an argument that is easily derived from the terms of Article 52(2) & (3) themselves. (That this is so derives support from a non-legal taxonomy of “technology as applied science” authored in 1976, which includes all practice-oriented disciplines employing the scientific method, and most of the individual Article 52(2) subject matter.)

There remains the approach of Laddie J in *Fujitsu Ltd’s Application*, as an alternative to the EPO and Lord Hoffmann’s approach. As has been seen, the premise of Laddie J’s approach is an

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42 [2007] EPOR 38, [8].
43 See EPC Art 52(2)(b).
44 See EPC Art 52(2)(d).
47 See Bunge (n 46) 155–156 (classifying technology as material, social, conceptual and general systems disciplines).
understanding of the Article 52(2) exclusions as based on different policy rationales that support different degrees of operation, and that are sufficiently diverse not to resolve to any single conception of the “invention” itself. In a variation of that approach, Pumfrey J in Halliburton also treated the Article 52(2) exclusions as policy-based, but supported a positive definition of the invention for Article 52(1) purposes as well; and the Aerotel Court seems to have accepted this.

It is submitted that the view of the Article 52(2) exclusions as having different policy rationales is compelling given their failure to resolve to any single conception of the invention. On the other hand, the difficulty remains of unearthing each exclusion’s policy rationale, and of deciding whether there remains a generic requirement for an invention under Article 52(1), independent of Article 52(2) & (3).

My own view is that few of the exclusions have an obvious rationale. Indeed, even the reason for denying protection to aesthetic creations is unclear. While it is generally understood to be the availability of copyright protection, not all aesthetic creations are protected by copyright, and those that are so protected are protected as works, rather than as inventions. On the other hand, this raises the question what does it mean to protect something as an invention?, which brings us to the heart of the problem in this area, which is that it is difficult to make sense of Article 52(2) & (3) without some independent idea of what constitutes an invention, and in particular, of what makes a subject matter inherently suited (or otherwise) to patent protection. Given that the text of the EPC offers little help in this regard, it is natural to turn – in the first place at least – to history


49 In the UK see, eg, CFPH [2005] EWHC 1589, [30] (Mr Prescott QC, describing copyright as the “obvious” reason for the aesthetic creations exclusion); Halliburton v Smith [2005] EWHC 1623, [212] (Pumfrey J, agreeing with this understanding of the exclusion’s rationale); Patents Act 1977 (UK) s 1(2) (excluding literary, dramatic, musical and artistic works, and “any other aesthetic creation whatsoever”).
and the EPC’s interpretive context. Indeed, the Vienna Convention arguably requires that this be done.\textsuperscript{50}

(a) Insights from history

Historically, in the UK, an “invention” for patent law purposes was a “manner of new manufacture” within the meaning of section 6 of the Statute of Monopolies 1623.\textsuperscript{51} Before the early 20\textsuperscript{th} century, this was understood to mean a subject matter having mechanical or chemical utility directed to advancing the industrial arts.\textsuperscript{52} In the early 20\textsuperscript{th} century it was understood more restrictively, to mean a subject matter of mechanical or chemical utility directed to advancing the \textit{manufacturing} arts, and involving to that end the production of a physical (and vendible) product.\textsuperscript{53} Excluded under the 20\textsuperscript{th} century definition were business plans and other so-called “schemes”, subject matter distinguished by its literary or artistic content, methods aimed at modifying the natural conditions under which living phenomena pursue their course, and methods of treating or producing ephemeral subject matter.\textsuperscript{54} Also excluded were methods of treating or producing biological matter such as living plants, animals and human beings, though with some uncertainty in this regard due to the potential “vendibility” of such biological matter.\textsuperscript{55} Equally uncertain, for similar reasons, was the status of methods of medical treatment. While accepted as inherently unpatentable, the reason was


\textsuperscript{51} 21 Jac I, c 3. For the text of section 6 see Pila (n 3) 21.

\textsuperscript{52} On the invention in early UK law see Pila (n 3) chs 1–2.

\textsuperscript{53} On the invention in modern UK law prior to the EPC see Pila (n 3) ch 3.

\textsuperscript{54} See Pila (n 3) 72–81.

\textsuperscript{55} Pila (n 3) 81.
unclear. The implication of the judgments was that the exclusion was a public policy-based one, though the courts expressly denied this.\textsuperscript{56}

In conclusion therefore, early modern UK law supported a conception of the invention oriented around the manufacturing arts, and excluding in consequence three categories of subject matter – (i) surgical and therapeutic methods; (ii) agricultural, horticultural and other biotechnological subject matter; and (iii) certain informational and expressive subject matter\textsuperscript{57} – either for lack of chemical or mechanical utility (category (iii)), for failure to result in a physical (vendible) product (categories (ii) & (iii)), and/or for failure potentially to advance the manufacturing arts (categories (i), (ii) & (iii)). And note the reference to inventions as an \textit{art}, consistent with the uncertainty which then existed regarding the patentability of products as such, independent of the methods by which they were made.\textsuperscript{58}

The uncertain basis for the exclusion of methods of treating or producing biological subject matter came to a head in the 1959 case of \textit{National Research Development Corp v Commissioner of Patents},\textsuperscript{59} where the High Court of Australia, applying UK-derived patent legislation, rejected the UK courts’ conception of inherent patentability in favour of a more expansive definition to support the patenting of a method of controlling weeds. According to that definition, an invention included any subject matter regarded as suitable for patent protection applying the principles developed for application of section 6 of the Statute of Monopolies, which it understood to mean any human action on the physical world producing an artificial end of economic significance.\textsuperscript{60} Thus, while inventions were still conceived as purposive human actions on the physical world, they were no longer tethered to the manufacturing arts, nor indeed to the industrial arts; by contrast, any practical art of economic significance sufficed. The result, which the Court accepted for all but (i), was to suggest the

\textsuperscript{56} Pila (n 3) 88–90.
\textsuperscript{57} Pila (n 3) 91.
\textsuperscript{58} Pila (n 3) 82–84.
\textsuperscript{59} (NRDC) (1959) 102 CLR 252 (HCA).
\textsuperscript{60} For a similar conception see T_1002/92 (PETTERSSON/Queuing System) [1996] EPOR 1.
absence of any *per se* exclusion covering (i), (ii) and (iii), by confirming that provided a subject matter involved an action on the physical world producing an artificial end of practical utility – expressly equated by the Court with an end of economic significance – it would be inherently capable of supporting a patent. With respect to methods of medical treatment the Court demurred, suggesting that they may still have been excluded for failing to produce an end of economic significance.  

The question arises as to the relevance of this discussion, and of other national patent law histories, today. It is submitted that such histories are useful in helping to identify the relevant issues when considering the nature of the European invention. For example, the history of UK law alerts us to some of the different definitional approaches that might be adopted, by revealing the UK to have supported three such approaches at different points in the past. They are: *formal* approaches, focused on the existence of a subject matter possessing (or otherwise) certain formal characteristics; *philosophical* approaches, focused on the relationship between people and the material world; and *historical* approaches, focused on that which has historically been regarded to be an invention. Further, it alerts us to certain recurring themes regarding the content of the resulting definition itself. They are: the requirement for some degree of ingenuity or alleged advance on an (industrial, manufacturing or practical) art; the requirement for some human action on the physical world; and the ambivalent relationship between public policy and inherent patentability.

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61 On the impact of NRDC see Pila (n 3) 95–104.
63 On the latter see Pila (n 3) 336–337.
Turning to the history of the EPC, the question arises how the drafters themselves understood and intended the invention to be conceived. Given that Article 52(2) & (3) are an expression of that understanding, the question to ask more specifically is what was their intent in drafting those provisions.  

The explanation for Article 52(2) & (3) lies in the drafters’ concern to ensure the literal identity of the EPC with the terms of other international agreements. Of particular importance in this regard were rules 39.1 and 67.1 of the Patent Cooperation Treaty (PCT). That those rules were not adopted as a pre-existing definition of the invention itself is apparent from their purpose. Specifically, rules 39.1 and 67.1 contain a list of subject matter which PCT authorities are exempt from searching and examining – not for their failure to constitute an invention *per se*, but rather because of their exclusion from the patent systems of one or more PCT countries, and the consequential inability to assume that all PCT authorities are equipped to examine them and search their prior art.

In this context, the further question arises what the EPC drafters themselves intended the Article 52(2) exclusions to cover, and how they intended the requirement for an invention to apply. And the answer is that they had no clear understanding, with particular uncertainty on the following two things: the relationship between the requirement for an invention on one hand and industrial character, technical progress, technical character and public policy on the other; and the inherent patentability of computer programs, plant and animal varieties, and methods of medical and veterinary

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64 See generally Pila (n 3) ch 4.
66 See Pila (n 3) 117–121. In his account of the origins of the EPC, van Empel noted this difference in purpose, and concluded “[t]he provisions of Article 52(2) should be therefore considered and interpreted on their own merits and should not necessarily and automatically follow developments within the framework of PCT.” M van Empel, *The Granting of European Patents: Introduction to the Convention on the Grant of European Patents, Munich, October 5, 1973* (Leyden: A W Sijthoff, 1975) 30 ([67]).
And in this context, the objective of international harmonization assumed undue significance, eclipsing one might say the needs of the system.

Despite this, certain understandings can be attributed to the drafters with comparative certainty. One is that Article 52(2) & (3) would be a basis for a future European patent jurisprudence, and would not restrict unduly the discretion of future decision makers. For example, and as the travaux record: “The Conference did not adopt the idea of making an exhaustive list of items excluded from patentability in paragraph 2, so as to retain the flexibility necessary to the system.” Second, while it was assumed that inventions would be drawn from the technological arts, there is no evidence that the EPC drafters intended Article 52(2) & (3) to resolve to a requirement for “technical character” itself. Third, they understood the central aim of the European patent system as being to support social and economic growth by rewarding contributions to the industrial arts. And fourth, they sought clearly to distinguish between the requirement for an invention on one hand, and the other (public policy based) exclusions from patentability on the other, though without conceding or affirming the inherent patentability of subject

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68 This is consistent with them playing an important but limited role; see Pila (n 3) 164, 151 (describing the term “mere” as increasing future decision makers’ discretion), 154 (suggesting that conflating the computer programs and schemes exclusions would increase future decision makers’ discretion).

69 See, eg, Pila (n 3) 150 (regarding the exclusion of scientific discoveries), 151 (regarding the protection of substances existing in nature), 153–155 (regarding the exclusion of computer programs), 160–161 (generally). See also van Empel (n 66) 29 ([64]–[65]), 31, ([68]).

70 EPC Preparatory Doc BR/168/72 (15 March 1972) [26].

71 See generally Pila (n 3) 145–164.

72 See, eg, Pila (n 3) 172 (text accompanying n 117).
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matter covered by the latter. The last of these points in particular is consistent with a definition of the invention as a subject matter the constitutive properties of which make it inherently suited for protection. This is important, for it confirms that while the requirement for an invention is a concept of legal art, in the sense of being defined with the purpose of the patent system in mind, it does not necessarily cover all threshold exclusions from patentability. Thus, if the European invention is to be defined with a view to explaining all such exclusions – including those contained in Article 53 and Rule 29(1) of the EPC Implementing Regulations – it ought not to be on the basis of the drafters’ actual intent.

(b) The presumed intent of the EPC drafters: Article 52(2) & (3) as supporting (without resolving to) a positive definition of the invention

Against this background the question arises as to how to proceed, and whether to start afresh with Article 52(2) & (3), or to seek rather to interpret them in light of the EPC drafters’ presumed intent taking account of the changes in circumstances which have occurred since 1973. It is submitted that the latter is both possible and appropriate; and that while the exclusions are sufficiently diverse not to resolve to any positive definition or conception, such a conception can nonetheless be derived from the history and wider context of the EPC. Further, that conception resolves some of the principal issues of uncertainty expressed by the drafters, as well as by pre-1977 national courts, such as why methods of medical and veterinary treatment are

See van Empel (n 66) 30 ([68]: “It should be stressed that Article 52(2) does no more than settle out of hand a certain number of specific questions under the present Convention. It can hardly provide any guidance where other doubtful ‘inventions’ are concerned.”); contra G_0001/04 (DIAGNOSTIC METHODS) [2006] EPOR 15, 7.4 (finding that because diagnostic methods are not excluded from patentability under Articles 52(2) & (3), they are “inventions” within the meaning of Article 52(1)).

See Pila (n 3) 1, 152–155.

Reproduced below.

On interpreting the EPC with reference to the drafters’ presumed intent see T_0019/90 (HARVARD/Transgenic Animals) [1990] EPOR 501, [4.7].
not suitable for a patent, and the circumstances in which computer programs and other non-manufacturing methods are so suitable. It also resolves the principal issues of uncertainty expressed by the EPC drafters, which were inherited from their Council of Europe ancestors; namely, the relationship between inherent patentability and each of technical character, technical progress, industrial character and public policy. Finally, it explains many of the Article 52(2) exclusions, and in this sense is supported by those exclusions as well; leaving only the question what to do with the exclusions it does not explain.

The conception I have in mind is the NRDC definition – by which an invention is any human action on the physical world producing an artificial end of economic significance\(^77\) – but with a requirement that the end be directed to advancing the industrial arts instead of simply producing an end of commercial significance, and that the result be a material one.\(^78\) In particular, I believe an invention for the purposes of the EPC might appropriately be understood as a purposive human method of working on the physical world to produce an objectively discernible (material) result directed to advancing the industrial arts,\(^79\) where by “industrial arts” I mean the crafts and other activities of industry, as distinct inter alia from those of the civil, political, fine, administrative and professional arts, consistent with the common

\(^77\) See also Ex parte Schreiner (Red Dove / Rote Taube) [1969] Neue Juristische Wochenschrift 1713, reported in English in (1970) 1 IIC 136.

\(^78\) Even in contemporary jurisprudence, the EPC Art 57 requirement for an “industrial application” has been treated as a requirement for the production of “a profitable use or concrete benefit”; see, eg, T_0898/05 (ZYMOGENETICS INC / Hematopoietic cytokine receptor) [2007] EPOR 2, [8] (suggesting that it is enough for Art 57 purposes that a product be “definitely described and plausibly shown to be usable, e.g. to cure a rare or orphan disease, might be considered to have a profitable use or concrete benefit, irrespective of whether it is actually intended for the pursuit of any trade at all”).

\(^79\) Pila (n 3) 338.
language definition of “industry” as “[a] particular form or branch of productive labour; a trade or manufacture”. 80

Importantly, this conception is substantively different from a purposive human method of acting upon the physical world that satisfies the criteria of Article 52(1), including the criterion of susceptibility of industrial application, 81 which is closer to what the
EPO currently requires. For example, it excludes methods of hair removal, piercing, or other cosmetic treatment, “whose only possible object is to beautify the human or animal body”. According to EPO jurisprudence – and subject to Article 53(c) – such methods avoid exclusion from patentability on the basis of their use “by enterprises such as cosmetic salons and beauty parlours which are part of industry in the sense of Art.57 EPC.” On the definition proposed, however, methods of beautification would be excluded from patentability, and not on a per se policy basis, but rather on the inherent patentability ground that they are not directed to advancing the industrial arts, notwithstanding their individual susceptibility of industrial application. (By contrast are methods of manufacturing


See, eg, T_0383/03 (THE GENERAL HOSPITAL CORP/Hair Removal Method) [2005] EPOR 33, [12.3.1], though requiring an “intentional physical or psychic intervention” (emphasis added). See also T_0931/95 (PBS PARTNERSHIP/Controlling Pension Benefits System) [2002] EPOR 52, [5], supporting a view of the invention within the meaning of Art 52(1) as including any “physical entity, man-made for a utilitarian purpose”. But contra President’s Reference (n 4) [12.1]–[12.4] (rejecting the view of the EPO President that there exists in certain Board of Appeal decisions support for a requirement for a technical effect on a physical entity in the real world). Cf In re Bilski 545 F 3d 943, 954 (Fed Cir 2008) (supporting a “machine or transformation” test of inherent patentability whereby, to be an invention, must be “tied to a particular machine or apparatus”, or “transform[ ] a particular article into a different state or thing”. This test has since been affirmed by the US Supreme Court as a non-exhaustive test of patent eligibility; see Bilski v Kappos (unreported, 28 June 2010, US SC).

The insufficiency of mere susceptibility of industrial use to establish a subject matter’s inherent patentability was emphasized by the UK Patents Liaison Group in its discussion of schemes, and was also implicit in its treatment of computer programs; see Pila (n 3) 182, 185.
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cosmetics products themselves, which would be so directed, as ought most other methods of manufacture to be.) Another example is the method of applying contraceptive cream considered in T_0074/93 (BRITISH TECHNOLOGY GROUP/Contraceptive Method). According to the TBA in that case, were the method applied by prostitutes to their clients its use might leave “the private and personal sphere” to “become part of [a] business relationship”, and be potentially patentable on that basis.86 It is submitted, however, that even if prostitution were properly regarded as an “industrial art”, which it clearly is not, devising methods of preventing contraception would not be properly regarded as directed to advancing that art; rather, it is directed to advancing the non-industrial (professional) art of medicine – or, at least, of family planning.87 Similarly with respect to other methods, such as those of aesthetic composition, teaching and education, massage, selecting treatment values, navigation, operating an aircraft or other vehicle, regulating traffic, controlled forest burning, extinguishing fires, playing an instrument, organizing a government, distributing utility services, fighting wars, determining queue sequences for serving customers, selling, marketing, and running a business – to name but a few subject matter considered in the deep and recent past – none of which is directed to advancing the industrial arts. On the other hand, the proposed definition accommodates certain historically excluded categories of subject matter, such as uses of a known product for a new purpose of the MOBIL/Friction reducing additive88 type.

Needless to say, the definition proposed does not solve all definitional and methodological issues regarding the requirement for an invention. For example, there is the nature of the “industrial arts”, and the methods by which they are properly to be identified, and

86 [1995] EPOR 279, [2.2.5.1]. Compare the Board’s reasoning with respect to the application of the cream by a nurse to a patient, at [2.2.5.2].

87 On the status of medicine as a profession see A R Dyer, “Ethics, advertising and the definition of a profession” in (1985) 11 Journal of Medical Ethics 72–78, 72.

88 G_0002/88 (MOBIL/Friction Reducing Additive) [1990] EPOR 73.
individual subject matter to be conceived in their light. Nonetheless, it is submitted that it is justified on four central grounds. First, it furthers the central aims of the system. Second, it explains much historical and contemporary patent jurisprudence. Third, it improves the system’s theoretical and doctrinal coherence. And fourth, it supports a particular vision of patent Europeanization, and is informed by the history and philosophy of technology and science. Finally, it is not without support in the EPO cases, and is consistent with the European Court of Justice’s (ECJ’s) decision in *Monsanto Technology LLC v Cefetra BV et al.*

*The definition has normative value, in furthering the purpose of the EPC system*

The central aim of the EPC system is appropriately understood as being to support European social and economic growth by rewarding contributions to the industrial arts. This is consistent with its conclusion as a special agreement under the Paris Convention 1883, which classifies patents as “industrial property”, and with the

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89 On the meaning and nature of the industrial arts see n 80. On the method by which they are properly identified see *ZymoGenetics Inc* [2007] EPOR 2, [5] (“the invention claimed must have such a sound and concrete technical basis that the skilled person can recognize that its contribution to the art could lead to practical exploitation in industry”); *Eli Lilly* [2010] EWCA Civ 33. For one possible definitional approach see G_0001/07 (*MEDI-PHYSICS/Treatment by Surgery*) [3.4.2.5] (regarding “treatment by surgery”).

90 Case C-428/08 (Unreported, 6 July 2010, Grand Chamber), affirming the opinion of Advocate General Mengozzi of 9 March 2010.

91 This seems also to have been the understanding of the UK Government as expressed in its White Paper of 1975, and is consistent with the rationale for the EU Biotech Directive; see Pila (n 3) 189, 226. Cf the TBA’s view, as expressed in T_1173/97 (*IBM/Computer Programs*) [1999] EPOR 301, [10.2].

92 See Paris Convention for the Protection of Industrial Property (Paris Convention, as amended) Paris, 20 March 1883,13 UST 1) Art 1(2). See also Art 1(3) (defining “industrial property” “in the broadest sense”, as applying “not only to industry and commerce proper, but likewise to agricultural and extractive industries and to all manufactured or natural products”).
analytical framework of the EPC drafters’ ancestors in their early discussions of a European patent.\footnote{See Pila (n 3) 129–141; Pila (n 67). That the status of a subject matter as an invention ought to depend on its industrial character was the explicit premise of several of the European States, including Greece, Italy, France, and the Netherlands; see Pila (n 3) 134–135. See also Pila (n 3) 130 (the Secretariat-General, proposing on the basis of a 1951 comparative study of European laws a requirement that an object, to have a “patentable nature”, be “a real invention, have an “industrial” character”, and confirm “with the requirements of public order”, and implying that the issue of industrial character would determine the patentability of methods and principles), 140 (the Rapporteur-General, describing the definition of the “invention” proposed by the German Experts, and on which Article 52(2) is based, as “lay[ing] down negative criteria for industrial character”).} It was also the premise of the EPC drafters themselves, as recorded in the Munich Conference debates, where it determined their position with respect to chemical products\footnote{See Pila (n 3) 172. See also Council of Europe Preparatory Doc CM/WP IV (51) 17 final (7 July 1951) 4–6 (querying the appropriateness of chemical products for a patent given that the protection conferred by a product patent – valid on the basis of a single industrial application of the product – might exceed the patent’s contribution to the technological and, by implication, the industrial arts); see Pila (n 3) 165–166.} and methods of human and animal treatment.\footnote{See EPC Preparatory Doc M/PR/I (1973) [24].} Finally, it has been emphasized by national courts, including in defining the invention itself, and on occasion by the EPO. Thus, in the UK, Mr Prescott QC noted the effect of the definition of the invention in determining “an important aspect of industrial policy”,\footnote{[2005] EWHC 1589, [10].} and Pumfrey J suggested that in order for a subject matter to be an invention it needs to be “tethered” to an industrial field,\footnote{See [2005] EWHC 1623, [213].} consistent with the TBA’s reasoning in T_0016/83 (CHRISTIAN FRANCERIES/Traffic Regulation).\footnote{See [1988] EPOR 65, 70–71.} To the extent that the Article 52(1) requirement for industrial applicability achieves this it does so insufficiently, being more concerned with practical utility than
industrial character.\textsuperscript{99} Hence my suggestion, that legal conceptions of the invention ought to allude expressly to the industrial arts, and the need for a subject matter (to be eligible for protection) to be directed to advancing those arts.

The definition has explanatory value, in making sense of historical and contemporary patent jurisprudence

In addition, the definition has the virtue of explaining many of the exclusions of pre-1977 national European laws, including some not properly explained by the courts at the time, such as methods of medical and veterinary treatment, organizational plans, business methods, methods of forest burning and utility arrangement, and products distinguished by their aesthetic (cf informational) content alone.\textsuperscript{100} Consider for example methods of medical and veterinary treatment. Under Article 53(c), methods of human and animal treatment and diagnosis are excluded from patentability, with a carve-out for “products” of use in such methods. As originally drafted, this exclusion was based on the Article 52(1) requirement for an invention: methods of treatment and diagnosis being among a list of non-inventions that were (therefore) beyond the threshold limits of the system.\textsuperscript{101} At the Munich Conference 1973 at which the EPC was signed, however, it was recast around the Article 52(1) requirement for susceptibility of industrial application: the methods were deemed “not [to] be … inventions which are susceptible of industrial application”.\textsuperscript{102} Then in 2000, when the EPC was revised, it was reframed as a public policy-based exclusion, aimed at safeguarding public health, and relocated to Article 53, where it sits separate from

\textsuperscript{99} On the tension inherent in the requirement for industrial applicability between considerations of industrial character and practical utility see EEC Preparatory Doc IV/2767/61 (3 May 1961) 11.
\textsuperscript{100} See generally Pila (n 3) ch 3.
\textsuperscript{101} See Pila (n 3) 144–145.
\textsuperscript{102} Art 52(4) EPC 1973. See Pila (n 3) 152–156.
the Article 52 statement of patentability. However, as a policy-based exclusion it is somewhat irrational (as UK courts have remarked) for two reasons: first, because of the exclusion from the exclusion of medicinal products; and second, because of its extension beyond medical and veterinary methods as such. In my view, the exception only becomes rational if understood as a function of the threshold restriction of the system to subject matter directed to advancing the industrial arts. Medical and vet methods are plainly not so directed, but methods of manufacturing products are, as are methods of treating animals to improve them as sources of meat and other commercial/consumable products.

Further, the definition proposed is consistent with the submissions of many of the national delegations to the Council of Europe in the 1950s with respect to the nature of the European invention. Indeed, this is true even of those States which did not support a conception of inherent patentability with reference to industrial character, such as Germany, which nonetheless understood the invention to represent an advance (albeit in the field of a technical art), and to involve a human method of working on the world to produce an objectively discernible result. The understanding also

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103 See Art 3(c) EPC; MR/2/00 (Munich, 13 October 2000) 45.
105 See Pila (n 3) 134–137; Council of Europe Preparatory Doc EXP/Brev (53) 18 (7 November 1953) 4 (describing European states as supporting a threshold distinction between industrial and non-industrial techniques, the latter of which included “financial, accounting, commercial, publicising, educational, military, touristic, medical, etc, techniques”, which it was the national practice of European States to exclude).
106 Hence the German experts’ view was that an invention could not be “retrograde from the technical point of view” (emphasis added); see Pila (n 3) 137–138. See also Pila (n 3) 164 (noting the effect of the drafters’ rejection of a “progressive” conception of the invention in creating a distance between the EPC and earlier UK conceptions, notwithstanding the UK experts’ opposition to the recognition of any requirement of “technical progress” per se, on which see Pila (n 3) 140).
107 See Pila (n 3) 137–138 (noting the German experts’ support for a conception of the invention as subject matter having technical character, where by
explains some of the Article 52(2) exclusions, and some of the non-
Article 52(2) exclusions as well. They include the exclusion of
methods of medical and veterinary treatment contained in Article
53(c), consistent with its historical inclusion in Article 52(d) for
deemed insusceptibility of industrial application, and of “[t]he
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 a gene”, under Rule 29(1) of the EPC
Implementing Regulations, transposing the EU Biotech Directive.108
Finally, even the ordre public/morality exclusion of Article 53(a)109 –
and perhaps the animal varieties exclusion of Article 53(b)110 – might
be understood as inherent patentability exclusions. The reason is the
requirement for a subject matter directed to making an advance,
which is capable of supporting an ethical or other public interest
compoment.111

The definition improves the law’s theoretical and doctrinal coherence

By alluding expressly to the requirement for an advance on the
industrial arts, the definition ensures that the threshold limits of the

L213/13.
109 “European patents shall not be granted in respect of … inventions the
commercial exploitation of which would be contrary to ‘ordre public’ or
morality; such exploitation shall not be deemed to be so contrary merely
because it is prohibited by law or regulation in some or all of the
Contracting States”.
110 “European patents shall not be granted in respect of … plant or animal
varieties or essentially biological processes for the production of plants or
animals; this provision shall not apply to microbiological processes or the
products thereof”. On the history of this provision see Pila (n 67).
111 See in this context the concept of “moral or beneficial utility” discussed in
Thambisetty (n 10) 14.
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The definition is informed by insights from the history and philosophy of science and technology

As the EPO Boards have themselves implied, it is appropriate that conceptions of inherent patentability be informed by insights from the history and philosophy of science and technology, even accepting it as a concept of legal art. Among other reasons, this is because social theorists working in that area have a lot potentially to offer the law in its attempt to understand human inventive behaviour. The definition proposed is consistent with this. For example, it reflects a philosophical and historical conception of the invention, according to which inventions are conceived in terms of a relationship between people and the social and material worlds, and with reference to what has previously been considered to be an invention. In this

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112 See, eg, n 42 and accompanying text.
113 On what philosophers of technology in particular can offer see Bunge (n 46) 172.
114 See n 62; also P McCleary, “An Interpretation of Technology” (1983) 37 Journal of Architectural Education 2–4, 3 (“Technology is the discourse between societies and their natural environments in the production of the built environment. Technology is not only the resulting products and processes but also includes the framework of thinking generated by this
respect it is consistent with the EPO’s view of inventions as technological subject matter – albeit rejecting its view that they are constituted solely by their formal (technical) properties, and rejecting also its understanding of the constitutive properties of technology, and of the European invention itself. For example, instead of conceiving “technology” as synonymous with “applied science”, which conception social theorists have widely rejected, I would conceive it with reference to the notions of design and techne, where by “design” is meant the purposive adaptation of means to reach some preconceived human end, and by “techne” is meant an art and craft the practice of which requires skill and knowledge, and takes place in a human inventive tradition (This is consistent with a dialectical relationship between man and nature, i.e. technology is both the doing and the thinking about the doing—the action and the reflection-in-action.”; M Kranzberg, “Technology and History: ‘Kranzberg’s Laws’” (1986) 27 Technology & Culture 544–560, 557 (describing as “Kranzberg’s Sixth Law” that “Technology is a very human activity—and so is the history of technology”).


118 See R Hodgkin, “Techne, Technology and Inventiveness” (1996) 16 Oxford Review of Education 207–217, 208; Misa (n 62) 4; McCleary (n 114) 3;
the view I have elsewhere expressed of copyright works;\textsuperscript{119} and with the recent decision in \textit{Schlumberger Holdings Ltd v Electromagnetic Geoservices AS},\textsuperscript{120} where the Court of Appeal recognized the capacity of certain inventions to be “art-changing”, ie, to shift the boundaries of existing arts, just as works can shift the boundaries of artistic categories.) On the other hand, my understanding does not depend on the term “technology”, which, and as social theorists have again recognized, is too opaque and elastic to be informative. Indeed, philosophers of technology have noted the “bewildering variety of ways of understanding the word ‘technology’”,\textsuperscript{121} and the difficulty of formulating a conception that is “neither so general that it risks vacuity by fitting every conceivable case, nor so specialized that it captures only a tiny range of the phenomena to be explained.”\textsuperscript{122} The same was suggested by the Council of Europe’s Committee of Experts on Patents during the 1950s,\textsuperscript{123} and is confirmed as true by the experience of European law. Further, and as noted above, the proposed definition supports a classification of inherently patentable subject matter focused, in part, on social function, in addition to parent science or technological field.\textsuperscript{124} Such a classification has equally been proposed for technology, on the basis that technology –


\textsuperscript{120} [2010] EWCA Civ 819.

\textsuperscript{121} Bunge (n 46) 154. See also S D Fries, “Expertise against Politics: Technology as Ideology on Capitol Hill, 1966-1972” (1983) 8 Science, Technology & Human Values 6–15, 6; Misa (n 62) 4; Laudan (n 117) S17–S18.


\textsuperscript{123} See Pila (n 3) 141, 163.

\textsuperscript{124} For a strong statement against such a definition see \textit{Maeder v Busch} (1938) 59 CLR 684, 706 (HCA) per Dixon J, noted in Pila (n 3) 79 (n 53).
like the European invention – “is more directly and more extensively involved in the surrounding social systems than either philosophy or the sciences”.\textsuperscript{125} According to one theorist at least, its classification ought to reflect this fact; a view which seems particularly apposite in the context of law. Finally, the definition accepts what social theorists have also long accepted: that while inventions are neither “good” nor “bad,” nor are they “neutral.”\textsuperscript{126} For example, by excluding patents from the professions of medicine and veterinary science, the definition ensures that arts constituted in part by an ethical code\textsuperscript{127}

\begin{itemize}
\item \textsuperscript{125} See R N Giere, “A Dilemma for Philosophers of Science and Technology” (1976) 2 (Symposia and Invited Papers) PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association 194–201, 198–199.
\item \textsuperscript{126} See Kranzberg (n 114) 545 (describing as “Kranzberg’s First Law” that “Technology is neither good nor bad; nor is it neutral”); T Veak, “Whose Technology? Whose Modernity? Questioning Feenberg’s Questioning Technology” (2000) 25 Science, Technology & Human Values 226–237, 227 (“‘Little needs to be said concerning the ‘neutrality’ of technology. Since the socio-political nature of the design process has been exposed by Langdon Winner (1985) and others, few adhere to the neutrality of technology thesis’’); Bunge (n 46) 167–169 (regarding “technoethics”); M Black, “Are There Any Philosophically Interesting Questions in Technology?” (1976) 2 (Symposia and Invited Papers) PSA: Proceedings of the Biennial Meeting of the Philosophy of Science Association 185–193, 187 (‘‘[m]ost damaging is any tendency to ignore or neglect the moral aspects of a technological system’’ on the ground (quoting Goodman) that ‘‘technology is a branch of moral philosophy, not of science’’).
\item \textsuperscript{127} See D Carr, “Education, Profession and Culture: Some Conceptual Questions” (2000) 48 British Journal of Educational Studies 248–268, 248 (defining ‘‘profession’’ to mean those enterprises ‘‘in which standards of good practice are not just technically or contractually but also morally grounded’’, and in particular, which are not merely subject to but constituted by ethical regulation). Cf R A Howard, “The Ethical OR/MS Professional” (2001) 31 Interfaces 69–82, 69–70 (defining the relation of ethics to professions more loosely, consistent with a more expansive definition of a “profession” itself as “an occupation requiring considerable training or specialized study”, so as to include (in his analysis) information technologists and practitioners of operations research and management science).
\end{itemize}
do not fall within the scope of the patent system. Similarly, and as already noted, by requiring a subject matter directed to advancing the (industrial) arts, it potentially supports the importation of an ethical component.

The definition engages with and supports Europeanization

Neither the goal of Europeanization nor harmonization on its own is a valid basis for substantive legal reform. On the other hand, that conceptions of the invention ought to be formulated with Europeanization in mind seems clear, leaving the question what “Europeanization” means in the context of European patent law. As the discussion above reflects, central is a commitment to fulfilling the terms and spirit of international agreements, and to facilitating cooperation between national and European courts. Indeed, if it is accepted that the history of Article 52(2) & (3) to date has been marked by an absence of principled doctrinal and theoretical discussion on the part of the TBA, the decisions of national European courts, and interpretations of the requirements of other international (including European) instruments, have a potentially central role to play.

See President’s Reference (n 4) [7.2.7].

For a recent statement from the UK Court of Appeal on the importance of cooperation between the EPO and national courts see Eli Lilly [2010] EWCA Civ 33, [6]. See also F-K Beier, “Judicial Cooperation in European Patent Law” (1983) 14 International Review of Industrial Property and Copyright Law 709–715.
Aside from the Paris Convention, important agreements in this context include the Vienna Convention, the TRIPS Agreement, and the EU Biotech Directive. From the Vienna Convention may be derived the need to interpret agreements teleologically, in light of their underlying policy rationales. From the TRIPS Agreement may be derived the need to ensure such differential treatment of individual subject matter as is necessary to ensure that the system’s aims are consistently met across different technological fields, and between the categories of product and process inventions. And from the Biotech Directive may be derived the need to conceive the invention as having an ethical component, particularly in its interface with the natural world. Importantly, none of these principles is inconsistent with the EPC.
More difficult is discerning the wider implications of Europeanization for conceptions of the European invention, in an era of dual (national and European) jurisdiction. The constitutional implications for UK courts were considered in Symbian to be as follows:

If the judgments in the Court of Appeal cases give tolerably clear guidance which would resolve the issue on ... appeal, then [the Court] should follow that guidance, unless it is inconsistent with clear guidance from the Board, in which case we should follow the latter guidance unless satisfied that it is wrong. 137

More recently, in Eli Lilly v Human Genome Sciences Inc, the Court of Appeal affirmed this statement, by describing the practice of UK courts as being to follow “any principle of law clearly laid down by [the TBA,] only reserving the right to differ if we are sure that the commodore is steering the fleet on to the rocks”. 138 On the other hand, it rejected the argument of counsel that the courts “should go further: if the TBA has not only laid down a ‘pure’ principle of law but has also set a standard by which it was to be applied in a series of cases, we should follow that standard too”. 139 In its view, to do this would result in the courts’ “intense fact finding and evaluation process [giving] deference to the findings or evaluations of fact by the TBA in other [fact-sensitive] cases.” 140 Implicit is the recognition that national courts may legitimately differ from the EPO in their assessment of the facts of individual cases, and thereby reach different conclusions on the application of an identical law. Also implicit is a view of national/European cooperation as not including a commitment to removing all differences among states, nor an obligation on the part of national courts slavishly to follow their European counterparts. 141

137 [2008] EWCA Civ 1066, [36].
138 [2010] EWCA Civ 33, [39].
139 Ibid.
140 Ibid [41].
141 The same view was expressed extra-judicially by Floyd J; see C Floyd, “Novelty under the Patents Act 1977: the state of the art after Merrell Dow” [1996] European Intellectual Property Review 480–486, 486 (“I also disagree
possibility for divergent decision-making is in the evaluation of a case’s facts, the danger arises that fact-specificity will come to mask substantive legal difference, and thereby create legal uncertainty; a danger born out by the history of the requirement for an invention itself.142

In so far as a definition of the invention can do so, the one proposed attempts to take account of each of these factors. Among other things, it does this by: (a) readjusting the fact/law content of the inherent patentability requirement, and thereby limiting the scope for unprincipled and inscrutable decision making; (b) accommodating broadly the different European patent traditions reported to the Council of Europe in the 1950s, and the views expressed by the delegations to the Committee of Experts on Patents with respect to the future European invention;143 (c) treating the requirement for an invention as anchoring the system to its original purpose, and that purpose itself as the reference point for ensuring the non-discriminatory operation of the European patent system, consistent with a teleological and non-discriminatory application of European law; (d) supporting the recognition that the invention is not an ethically neutral concept, consistent with the EU Biotech Directive; and (e) allowing for principled and transparent divergent decision making, including on non-factual (legal) grounds.

The definition has EPO and ECJ support

Finally, it should be noted that the definition is not without EPO support. For example, the requirement for a method or result directed to advancing an art is consistent with the “contribution” approach to Article 52(2) & (3) previously supported by the TBA.144 Similarly, the principle that the scope of protection must reflect the

142 See Pila (n 3) 271–287.
143 See Pila (n 3) 134–137.
144 See, eg, the cases cited in Pila (n 3) 216–217.
 inventor’s contribution to the art was stated clearly by the TBA in T_0409/91 (EXXON/Fuel Oils). And finally, the Boards of Appeal have sometimes treated inherent patentability and industrial character as related, and the intent or purpose of the use of a product as part of what constitutes the product as an invention. On the other hand, the requirement for a purposive human method of working on the physical world is more restrictive than the TBA requirement for a technical effect. Further, in the jurisprudence of the Boards of Appeal, the “art” has always been conceived in scientific or technological terms, and the “invention” conceived formalistically.

More supportive is recent ECJ jurisprudence, including Monsanto v Cefetra. According to AG Mengozzi in that case, the Biotech Directive restricts the protection which national European patent laws can confer in respect of genetic products to so-called “purpose-bound” protection. Implicit is a view of the constitutive elements of such products as extending beyond their formal properties to include their purpose or function, as disclosed in the claim. Thus, while the AG described his opinion as confined to the scope of protection, so as to avoid a conflict with Article 27 TRIPS, such scope flowed directly from his conception of the product qua invention. Hence the three elements he raised in support of his approach: first, the Directive’s requirement that the function performed by a sequence be specified in order for the sequence to be patentable – which he regarded as evidencing the EU legislature’s view that “a DNA sequence has no importance in the context of patents if the function performed by that sequence is not...
indicated”,¹⁵⁰ second, the importance of function in permitting “a distinction to be drawn between ‘discovery’ and ‘invention’”¹⁵¹ – which implies that the conception of a gene qua “invention” must be informed by the function disclosed in the claim; and third, “the essential nature of a patent”, as a “genuine exchange” of publication for limited property rights.¹⁵² The second and third of these elements were particularly important. As the AG said, to allow protection for “all the possible functions of the sequence itself, including those not identified at the time when the patent is applied for”, would “make a mere discovery patentable”,¹⁵³ and “confer on the patent holder a disproportionate level of protection”.¹⁵⁴ The result would be to breach the two fundamental principles of patent protection; namely, that such protection is limited to “inventions”, and must be proportionate having regard to the nature of the same.¹⁵⁵

The AG’s opinion was confined to genetic products, consistent with the terms of the referral. However, it clearly has wider application. The reason is that all subject matter must be susceptible of industrial use to qualify for protection under Article 52(1), and all patents involve an exchange of publication for limited property rights. Thus, the reasons which he raised in support of his opinion apply equally in respect of other subject matter. The result is support for the understanding of the European invention advanced above; namely, as a subject matter that contributes by its purpose or function to the industrial arts. Further, that understanding does not breach the Article 27 TRIPS requirement that “patents … be available for any inventions … in all fields of technology” on the ground, among others, that it is only inventions for which a patent must be made available, and it is what constitutes a subject matter qua invention? with which we are concerned.

¹⁵⁰ Ibid [30].
¹⁵¹ Ibid [31].
¹⁵² Ibid [32].
¹⁵³ Ibid [31].
¹⁵⁴ Ibid [32].
¹⁵⁵ Ibid [31], [32].
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(c) The remaining (non-excluded) Article 52(2) subject matter

The question remains what ought to be done about the Article 52(2) subject matter which the general definition fails to exclude from threshold protection. Implicit in the analysis above is that those exclusions are the product of the realities of international treaty making. Nonetheless, in the absence of evidence regarding the drafters’ (actual or presumed) intent to the contrary, it is submitted that they ought to be read on their face, for obvious interpretive and constitutional reasons. The result is that any subject matter which depends for patentability on its conception as an Article 52(2) subject matter ought not to be regarded as an invention within the meaning of the EPC. Put differently, a subject matter which is correctly categorized as a computer program or other Article 52(2) subject matter is not an invention for which a patent may validly be granted. If this is considered undesirable, then Article 52(2) & (3) ought to be amended. For the reasons above, however, any such amendment ought to leave intact the Article 52(1) requirement for an invention, as herein defined.

3. How Ought Individual Subject Matter to be Categorized and Conceived as Inventions?

In addition to supporting the threshold exclusion of certain subject matter from the patent system, the definition proposed supports the conception of individual subject matter as inventions by suggesting that what constitutes a subject matter as an invention includes the sequence of steps comprising its method, the means by which the method achieves its result, and the advance on the industrial arts it is directed (ie, intended) to make. It follows that the correct conception of individual subject matter ought to take account of these things. In this, my proposal supports the view of Lord Walker in Generics v Lundbeck, that in conceiving a subject matter as an invention it is not enough to determine that it contributes to the art; it must do so sufficiently to justify a patent.156 Further, it is the subject matter thus

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156 See [2009] UKHL 12, [33].
conceived to which the “relative” patentability criteria\textsuperscript{157} ought to be applied, and with reference to which the scope of protection ought to be defined.

As noted above, the categorization and conception of individual subject matter as inventions raises difficult sociological and methodological issues, and is an area in which more work needs to be done. Nonetheless, some comments can be made regarding its implications for the patenting of computer software, biotechnology and methods of business.

(a) Computer programs as inventions

It is submitted that there is nothing inherent in the nature of computer software itself to support its \textit{per se} exclusion from patentability. This is because all computer programs involve a purposive human method of working on the physical world (a computer), with the result that provided the program produces an objectively discernible (material) result directed to advancing the industrial arts, it ought to be capable of supporting a patent. Thus, Article 52(2)(c) ought to be repealed, unless non-inherent patentability related justifications can be found for its retention. Further, as long as patent and copyright law protect different things and have different underlying policy rationales, there is no reason in principle for regarding the availability of copyright as a reason for denying patent protection to computer programs. On the other hand, if dual (copyright and patent) protection is regarded as inappropriate, patents would seem the more appropriate form of protection. This is because while computer programs are capable of being inherently patentable, they are less naturally conceived as authorial works – much less as \textit{literary} authorial works – which is how they are treated under UK law.\textsuperscript{158} Further, this view derives

\textsuperscript{157} See \textit{Duns} [2007] EPOR 38, [10].

\textsuperscript{158} See Copyright, Designs and Patents Act 1988 (UK) s 3. On the constitutive properties of literary and other original works, see J Pila, “Copyright and its
support from the UK cases, in which computer programs have tended to be treated as a special category of work, supporting a more policy-driven test of infringement than that supported for other categories of authorial works, and consistent with an understanding of their inclusion in copyright as having a pragmatic basis.\(^{159}\)

Of course, to suggest that Article 52(2)(c) ought to be repealed is not to support the EPO’s approach of (effectively) repealing it judicially.\(^{160}\) Rather, it is to support the EBA’s suggestion that “judiciary-driven legal development” with respect to software patents has met its limits, with the result that “it is time for the legislator to take over”.\(^{161}\)

(b) Biotechnological subject matter as inventions

Again, there is nothing inherent in the nature of biotechnology per se that renders it inappropriate for patent protection. On the other hand, certain biotechnological subject matter, such as the isolated genes linked to breast and ovarian cancer recently considered by the Southern New York District Court,\(^{162}\) and animals not excluded from patentability under Article 53(b), may validly be treated as inherently unpatentable on the ground that their method of isolation is not properly regarded as directed to advancing the industrial arts, whether or not for reasons informed by ethical considerations. In addition, and as the US case reflects, and the EPC drafters themselves


\(^{160}\) This being the effect of Duns [2007] EPOR 38 and T_0424/03 (MICROSOFT/Clipboard Formats I) [2006] EPOR 39, affirmed in President’s Reference (n 4).

\(^{161}\) President’s Reference (n 4) [7.2.7].

recognized, an important issue in this context is the proper conception of biotechnological products as inventions, and the negotiation of their interface with the natural world. On the view above, that negotiation might also take account of ethical considerations, consistent with the implication of the Biotech Directive. Further, if it is true that products are constituted in part by the history of their individual creation – the particular human method by which they are made – then newly isolated biotech products are appropriately conceived with reference to this method, rather than merely as products as such. Such method might then limit the protection conferred by the grant. So too the advance on the industrial arts which products are directed to make, as part of what constitutes the products as inventions.

(c) Business methods as inventions

In its recent decision in Amazon, the TBA held that a method of ordering a gift was unpatentable on the following Article 56 (inventive step) ground:

The only relevant criterion for inventive step is the one stated in Article 56 EPC 1973, namely whether the invention is obvious to a person skilled in the art. Since in accordance with established jurisprudence this “art” cannot be a field of business or administration, only elements of the solution falling

See Pila (n 3) 150–151.

Cf HOWARD FLOREY/Relaxin [1995] EPOR 541. Such an approach is consistent with the treatment of chemical (and other) products under pre-1977 UK; see J Pila, “Chemical Products and Proportionate Patents Before and After Generics v Lundbeck (2009) 20 King’s Law Journal 489–526. See also van Empel (n 73) 32 ([70], suggesting that a diamond having a particularly beautiful shape and produced by a new technical process would be patentable as a “product, i.e. the diamond having the particular shape when produced by the process”, citing a decision of the Dutch patent office); G Kolle, “The Patentable Invention in the European Patent Convention” (1974) 5 International Review of Industrial Property and Copyright Law 140–156, 149.
within the competence of a technically skilled person (here: a programmer or computer scientist) can be taken into account.165

On the view above this decision is correct, though not for reasons of inventive step, but rather because the method was directed to advancing the non-industrial art of business administration. This underlines the effect of that view in anchoring the European patent system to the artefactual world, and relieving pressure from the other Article 52(1) requirements, in addition to the Article 52(2) exclusions themselves. The last of these points is illustrated by Christian Franceries, where understandings of what constitutes a business method were arguably stretched to support the exclusion from patentability of methods and devices for regulating traffic flow. On the view above, the reason that such methods and devices are not inventions is not because they are business methods – which they are not – but because they are directed to advancing the civil (not industrial) arts.166

4. Conclusion

The central issue running through this chapter has been the role of policy in conceiving the European invention. Historically, in UK law, policy has expressly affected the courts’ conception of the invention. In American Cyanamid Co (Dann’s) Patent, for example, the costs associated with “searching for and finding hitherto unidentified strains of micro-organisms existing in the natural state from which useful new antibiotics can be prepared by what is now a well-known standard process”, combined with the desirability of encouraging research “in a competitive society”,167 led Lord Diplock (in dissent) to conceive the subject matter (qua invention) as a product, as distinct

165 (N 15) [4.3].
166 By civil arts here I mean the arts of organized social, economic and political life, or citizenship, consistent with the common language meaning of “civil” as “[o]f or pertaining to the whole body or community of citizens; pertaining to the organization and internal affairs of the body politic, or state” (OED).
from a method of creating the product. In *Biogen v Medeva*, on the other hand, the need to prevent “research and healthy competition” from being stifled by allowing the first who achieves an obviously desirable goal to monopolize every way of achieving that goal, led Lord Hoffmann (for the House of Lords) to conceive the subject matter (*qua* invention) as a product-by-process, as distinct from a product. And in *Kirin-Amgen*, the “social contract between the state and the inventor which underlies patent law” – by which “[t]he state gives the inventor a monopoly in return for an immediate disclosure of all the information necessary to enable performance of the invention” – led his Lordship again (for the House of Lords) to conceive the subject matter (*qua* invention) as a method, as distinct from a discovery, as the primary judge had found.

If the invention is truly a concept of legal art, it is essential that policy inform its conception, and that its informing policies be clearly expressed. That it is appropriately treated as such is consistent with the utilitarian purpose of the EPC, and with the historical treatment of the requirement for an invention in Member States’ laws. It is also consistent with the need for a mechanism to ensure the “unity” of the various patentability criteria, and in particular, to ensure that the legislative separation of the requirement for an invention from the secondary patentability requirements does not result in a fragmented doctrinal landscape. The dangers of such fragmentation are apparent from the cases, and include the existence of gaps through which individual subject matter are readily able to

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168 See also *Howard Florey* [1995] EPOR 541.
169 [1997] RPC 1, 52.
170 [2004] UKHL 46, [77].
172 See also van Empel (n 73) 2–3 (identifying three factors as playing an important, and sometimes an overriding, role “in the way the actual patent monopoly is envisaged”: the justification for granting patents, economic policy, and “the general law system of the country”).
173 See *CFPH* [2005] EWHC 1623, [93] (stating that “[t]here must be unity under the four conditions” of patentability set down in EPC Art 52(1)); contra *Duns* [2007] EPOR 38, [5] (see text accompanying n 13).
fall (into protection), and the risk of disproportionate monopoly grants having regard to the nature of the invention itself.\textsuperscript{174}

In conclusion, it is submitted that as long as a \textit{de minimis} reading of the invention prevails within the EPO, there will exist a tension in Europe between an expansive conception of inherent patentability and the \textit{Exxon} requirement that patents be proportionate to the inventor’s contribution to the art. If, as the House of Lords has stated, the contribution to the art is the invention, then we need a more meaningful definition of the invention than that which currently exists. In my suggestion, one potentially appropriate definition might be the philosophical and historical one above. Among other things, this is because it recognizes the situatedness of inventions in the material and social worlds, as manifestations of different human (inventive) traditions, and because it orients the system around its proper purpose of rewarding contributions to the industrial arts.

\textsuperscript{174} The problems that can arise when courts fail to conceive a subject matter consistently as an invention are apparent from the appellate Courts’ decisions in \textit{Generics v Lundbeck} [2008] EWCA Civ 311, [2009] UKHL 12; see Pila (n 3) 303–307. The problems that can arise when courts fail to conceive a subject matter \textit{correctly} as an invention are apparent from the primary judge’s decision in \textit{Kirin-Amgen Inc v Hoechst Marion Roussel Ltd} [2001] EWHC 433 (Pat); see Pila (n 3) 301–302.