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## Book Review--Global Dimensions of Intellectual Property Rights in Science and Technology

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# BOOK REVIEW

GLOBAL DIMENSIONS OF INTELLECTUAL PROPERTY RIGHTS IN SCIENCE AND TECHNOLOGY. Edited by Mitchell B. Wallerstein, Mary Ellen Mogy, and Roberta A. Schone of The Office of International Affairs, National Research Council. National Academy Press, 1993, \$49.95.

*Reviewed by Mark J. Patterson\**

The editors of *Global Dimensions of Intellectual Property Rights in Science and Technology (Global Dimensions)*<sup>1</sup> faced a daunting task: providing a comprehensive yet focused analysis of intellectual property rights protection schemes on the global scale, including their respective theoretical underpinnings and real world implications. This analysis extends not only to existing systems, but also to those that may or should evolve in the developing states and in response to emerging technologies. The difficulty confronting the editors in completing an analysis of this breadth was increased by several factors. First, the information and opinions comprising the source material and presentation vehicle consisted of a collection of articles organized into chapters authored by participants at a conference sponsored by the National Academy of Sciences on the "Global Dimensions of Intellectual Property Rights in Science and Technology." One problem seemingly inherent in the use of multiple authors who have had little or no opportunity for collaboration is an inability

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1. GLOBAL DIMENSIONS OF INTELLECTUAL PROPERTY RIGHTS IN SCIENCE AND TECHNOLOGY (Mitchell B. Wallerstein et al. eds., 1993) [hereinafter GLOBAL DIMENSIONS].

to closely control or direct the content, scope, and depth of the various presentations. Inevitably, this loss of control can, and in this book does, lead to a certain level of repetition and redundancy, as well as disparity in the depth of treatment.

A second factor complicating the work of the editors in a book of this type is the use of contributors possessing differing areas of expertise and professional experience. Deriving and then integrating conclusions from the views of economists, both academic and business-oriented, of lawyers in corporate and private practice, and of scientists, from both the United States and abroad, is a significant undertaking. In their selection of contributors with such diversity of backgrounds, the editors have added value to their work, in that there is something to offer almost everyone having an interest in the protection and transfer of technology rights. The downside is that portions of the material simply will not be useful to certain readers. For example, much of the economic theory presented in Sections I and II proved beyond the ability of this reviewer, a practicing patent attorney with no formal training in economics, to digest in the course of a casual reading.

The editors, however, overcame many of the obstacles facing them by organizing the individual contributions in an effective manner. Section I (Introduction) and Section II (The Case For and Against A Uniform Worldwide Intellectual Property Rights System) consist of articles written by three economists and an international business counselor who is also an attorney. It is in these two sections that the ultimate focus of the book is outlined and established: how recent changes in technology, international trade, and international economic development are presenting unique challenges to existing intellectual property (IP) rights protection systems. The significant scientific trends and emerging technologies that have implications in the global IP protection schemes are identified.<sup>2</sup> Computer software is offered as an example of an area of technology that is "blurring the distinction" between patentable inventions and literary works.<sup>3</sup> The field of biotechnology, particularly as it relates to the pharmaceutical industry, is highlighted for two reasons. First, the contributors recognize that many states exclude certain biological and medical technologies from their patent systems altogether.<sup>4</sup> Second, pharmaceuticals are perhaps leading the trend of substantially rising costs of research and development.<sup>5</sup>

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2. *Id.* at 7.

3. *Id.* at 7-8.

4. *Id.* at 9.

5. *Id.*

Semiconductor chips are also specifically highlighted in this portion of the book, because of their unique character in the context of constituting intellectual property and because they provide an excellent example of how *sui generis* IP protection systems can or should work.<sup>6</sup>

Section I also tries to identify the issues surrounding whether and to what extent a developing state should conform its IP statutory and enforcement systems to those of the fully industrialized states. Thus, IP systems are discussed and analyzed in their roles in implementing economic public policy and in promoting or restricting international trade. Section I offers an excellent historical view of IP systems, noting that many of the major structural features of existing systems are based primarily on the historical circumstances existing at the time that these systems originated, rather than being a function of present economic realities.<sup>7</sup> Thus, Section I will have much to offer scientists, lawyers, and businessmen who may have misconceptions about why we have legal systems to protect technology. A similar benefit to be obtained from Section I is an understanding of the economic tradeoffs in the various ways that the production of technological knowledge can be organized. It is here that the authors seem critical of existing priority-based systems in which the first inventor or patent filer achieves a "winner takes all" status and by which, in the absence of a common pool of technological knowledge, wasteful inventive effort and expense is a consequence.<sup>8</sup>

Section II is primarily an economic debate on the merits of even attempting to harmonize national IP rights systems to create a more uniform worldwide system. Unfortunately, it is here that IP law attorneys and others without a rigorous background in economics may find themselves entering a trance-like state of noncomprehension. Nevertheless, there are some interesting notions to be gleaned from this section.

The first author in Section II effectively makes the point that a uniform global IP rights system does make sense, with a baseline proposition that a uniform system does not mean that the systems of individual states must be identical.<sup>9</sup> Rather, the emphasis should be on uniformity of outcomes in each state and on a system which stimulates confidence in the users that their

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6. *Id.* at 8.

7. Paul A. David, *Intellectual Property Institutions and the Panda's Thumb: Patents, Copyrights and Trade Secrets in Economic Theory and History*, in GLOBAL DIMENSIONS, *supra* note 1, at 19, 44.

8. *Id.* at 33.

9. Robert M. Sherwood, *Why a Uniform Intellectual Property System Makes Sense for the World*, in GLOBAL DIMENSIONS, *supra* note 1, at 68.

technology will be protected, no matter where the technology is developed or used. Thus, the system, the author believes, should be comprehensive in its scope of protection, be accompanied by sufficient administrative and judicial bureaucracy to be useful and enforceable, and be reasonably predictable.<sup>10</sup> Excellent use is made in this section of both anecdotal and survey evidence in which university researchers, venture capitalists, and corporate R&D directors provide information regarding how the lack of such a uniform system is affecting their business.

The case is also made in Section II for a continuation of the differentiation of national IP rights systems, according to the respective internal abilities of each state to generate technology and to manufacture products implementing that technology.<sup>11</sup> The author contends that the national interests of an "industrializing country" would not be best served by copying the statutory and IP rights enforcement schemes of developed states.<sup>12</sup> Although this position is on its face inimicable to the interest of the United States and other highly industrialized states, the author makes out a rational case. Accordingly, the author recognizes that the industrializing states who take such a position are susceptible to retaliation and are subject to having their own domestic research efforts adversely impacted.<sup>13</sup>

The experience of Brazil in its plant breeding industry is discussed with persuasive effect. Various research institutions in Brazil are recognized for their proficiency in breeding new and improved plant varieties through traditional genetic methods while having little or no competency in genetic engineering. Therefore, in the absence of a protection scheme for these plant varieties in Brazil, the development of genetic engineering programs in local research institutions has been suppressed and foreign investment in that area has been impaired.<sup>14</sup> Although anecdotal, an analysis of this type effectively enhances the reader's ability to closely correlate the experience of a local, national industry with the corresponding absence of intellectual property protection. Nevertheless, the author also cites economic simulations showing that, when great weight is placed on the intrinsic welfare of the developing states, as compared to global welfare, these states should be allowed a "free ride" through the global IP rights protection systems.<sup>15</sup>

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10. *Id.* at 70.

11. Claudio R. Frischtak, *Harmonization Versus Differentiation in Intellectual Property Rights Regimes*, in *GLOBAL DIMENSIONS*, *supra* note 1, at 89.

12. *Id.* at 90.

13. *Id.* at 94.

14. *Id.* at 101.

15. *Id.* at 104.

Section II also presents survey evidence that subjectively reports the investment and technology transfer activities of major United States firms in specific industries in a variety of developing and developed states, and correlates these activities to perceived levels of IP protection in those states.<sup>16</sup> It was interesting to observe the low correlation of the responses, in a single state, from one industry to the next. Further, there was little correlation overall to the rankings of the same states in terms of IP rights protection, as conducted by the United States International Trade Commission in 1988.<sup>17</sup>

Absent from this section, and what would have been highly informative, is survey evidence showing a trend in the attitudes of these same United States companies in those states in which United States "jawboning" or punitive trade measures have resulted in modifications in the IP rights protection schemes in recent years. To the extent that protection of IP rights in those states has resulted in measurable increases in foreign investment and technology transfer, the argument that these enhancements have directly improved the national interest, not just global interest, is clearly made.

Section III of the book (National and International Approaches to Intellectual Property Rights) attempts to outline and differentiate several national and international approaches to the protection of IP rights. It is in this section that great disparity in the depth of content is found, to the point that some sections convey virtually nothing in the way of useful information or opinions. As part of this section's discussion, an update on international negotiations concerning IP rights is provided.<sup>18</sup> For those readers who wish to acquire a familiarity with the various trade accord acronyms such as GATT (General Agreement on Tariffs and Trade), this is an excellent discussion. As this review is being completed, major GATT negotiations have just been concluded. The reader of this book may benefit by studying the results of these negotiations before becoming immersed in the theories of what may or should result from the implementation of GATT.

Section IV of the book (Scientific and Technological Advance and Its Impact on the Role of Intellectual Property Rights) probably offers the most value for IP rights attorneys and scientists who work in the business community. Once again, the

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16. Edwin Mansfield, *Unauthorized Use of Intellectual Property: Effects on Investment, Technology Transfer, and Innovation*, in GLOBAL DIMENSIONS, *supra* note 1, at 107.

17. *Id.* at 113-20.

18. Jacques J. Gorlin, *Update on International Negotiations on Intellectual Property Rights*, in GLOBAL DIMENSIONS, *supra* note 1, at 175.

editors have recognized that the globalization of IP rights protection schemes cannot be studied without a clear understanding of the trends that are recognized by the scientists themselves and by those who pay the bills for research and development. The critical issue underscored by these trends in science is whether the basic principles of existing IP law can accommodate the emerging technologies with the same level of effectiveness as these schemes deal with established technologies.<sup>19</sup> Some believe that sui generis systems should be created to deal with these new technologies. Others contend that because technological change will be rapid and constant, the preferred approach is to keep IP protection schemes flexible and global. Sui generis systems, it is logically argued, are self-limiting, lacking in reciprocity among the various states, and accompanied by delays in the protection which these systems create.<sup>20</sup>

Section IV is also useful in highlighting the different perspectives found in the various research sectors, specifically among research institutions found in industry, government, and the universities. A similar sectorial analysis is also provided on an industry basis, using the experiences and views of multinational pharmaceutical, electronics, telecommunications, and software firms. Here the reader can find some quite surprising recommendations.<sup>21</sup> For example, it is proposed that globalization of IP schemes be taken to the point that when a patent issues in one state, a presumption of issuance in all states will follow within two years.<sup>22</sup> This same author also suggests establishing rights of independent invention, thereby doing away with the "winner take all" rewards of existing IP schemes.<sup>23</sup>

The adaptation of existing IP schemes to new technologies, and the possible need for sui generis approaches to these technologies, is explored in depth in Section V (Adopting Intellectual Property Rights to New Technologies). The contributions in this section are excellent and should be required reading for members of legislative committees who deal with their respective IP statutory schemes on a regular basis. The areas of biotechnology, computer software, and integrated data networks were chosen as the paradigms presenting the most substantial challenges to existing IP systems. Alternative approaches to

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19. John A. Armstrong, *Trends in Global Science and Technology and What They Mean for Intellectual Property Systems*, in GLOBAL DIMENSIONS, *supra* note 1, at 192.

20. *Id.* at 203-04.

21. George W. McKinney III, *Sectorial Views: U.S. Industry*, in GLOBAL DIMENSIONS, *supra* note 1, at 217, 218.

22. *Id.* at 219.

23. *Id.* at 220.

addressing these challenges are analyzed, including ad hoc case law adaptation and sui generis systems. Excellent footnoted references are made to additional source material on the subject, with the author concluding that prior experience with sui generis approaches has been effective.<sup>24</sup>

Even informal approaches to protection of emerging technologies are discussed, including cross-licensing patterns found in many industries, with chemical and pharmaceutical inventions being conspicuous exceptions.<sup>25</sup> Whatever approach is used, the author encourages a quick solution to the technology adaptation problem to minimize, for example, the economic losses suffered by biotechnology companies because of an inability to obtain competent and rapid processing of their patent applications.<sup>26</sup>

A Section V case study of computer software deals principally with controversial developments within the framework of the United States system.<sup>27</sup> These include copyright protection for aspects of computer software beyond the source code, such as the program's "structure, sequence and organization."<sup>28</sup> Whether and to what extent patent protection should extend to software "inventions" is also an issue of concern on the global scale, with many questioning the need for such overlap when the industry has prospered without the aid of patent protection. Similar case studies are provided in the areas of optoelectronics, semiconductor chip protection, and biotechnology.

The book concludes with Section VI (Global Intellectual Property Rights Issues in Perspective), which attempts to place the previous contributions in perspective while addressing the question: "What next?" There is little to be gleaned from this section that has not already been adequately presented through the earlier contributions. One somewhat discouraging view at least to business owners and patent attorneys, expressed in the concluding panel discussion, is that researchers are motivated primarily by their desire to publicize.<sup>29</sup> Those of us who have endeavored to adequately protect the achievements of these researchers through existing systems have encountered this problem repeatedly. Unless we are to conclude that protection of

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24. John H. Barton, *Adapting the Intellectual Property System to New Technologies*, in GLOBAL DIMENSIONS, *supra* note 1, at 256, 271-73.

25. *Id.* at 278-81.

26. *Id.* at 281.

27. Pamela Samuelson, *A Case Study on Computer Programs*, in GLOBAL DIMENSIONS, *supra* note 1, at 284.

28. *Id.* at 296.

29. Robert W. Lucky et al., *Global Intellectual Property Rights Issues in Perspective: A Concluding Panel Discussion*, in GLOBAL DIMENSIONS, *supra* note 1, at 360, 379.



technology through global or even national IP law systems is not in the national or global interest, discussions would better be directed at how we can motivate these researchers to use the systems.

There are two subject areas that should have received greater coverage in the book. The special needs and challenges confronting small technology-based businesses in their dealings with IP rights should have been explored. Even though a business may not have multinational facilities or sales that span entire continents, many depend on the sales of their products in specific foreign states or regions. When those products contain innovations that are subject to the IP protection schemes of other states, the bottom line for that business is directly affected. Moreover, the interest of large and small companies in the use and functioning of IP rights protection systems often diverge when, for example, harmonization and globalization might result in implementation of an uniform first to file patent system.

Greater attention also could have been given to the United States patent system harmonization discussions and negotiations that have occurred under the auspices of the World Intellectual Property Organization (WIPO). These discussions, and associated internal debates that have occurred within such organizations as the American Intellectual Property Law Association (AIPLA) and the IP law section of the American Bar Association, have emphasized the global impact of the differences in how the industrialized nations protect technology, including significant disagreements on first-to-file versus first-to-invent, absolute novelty v. filing grace periods, and publication before patent grant. It is not enough to debate whether developing states should emulate the intellectual property systems of others. One must also consider what features of the advanced systems will remain to be emulated.

A complete reading of the book leaves open the question of for whom the book is primarily intended. The best answer perhaps is that it has something to offer everyone—lawyer, scientist, intellectual property owner, economist, and politician—having an intellectual curiosity in how global intellectual property systems can and should evolve. From an individual reader's perspective, a cover to cover study of the book may leave the reader feeling overwhelmed and unsatisfied. However, if viewed as a resource, from which portions applicable to the reader's own field of interest are selected for close examination, the book has much to offer. Fortunately, the editors have done an admirable job of organizing the separate contributions that facilitates use of the book in this manner.