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Solar Rights: Guaranteeing a Place in the Sun

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Comments

Solar Rights: Guaranteeing a Place in the Sun

> The diagnosis of the U.S. energy crisis is quite simple: demand for energy is increasing, while supplies of oil and natural gas are diminishing. Unless the U.S. makes a timely adjustment before world oil becomes very scarce and very expensive in the 1980s, the nation's economic security and the American way of life will be gravely endangered. The steps the U.S. must take now are small compared to the drastic measures that will be needed if the U.S. does nothing until it is too late.[1]
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> —*President Carter's National Energy Plan*

Although many of the specific proposals contained in the President's National Energy Plan are controversial, the factual predicates underlying the need for a national energy policy are indisputable: the demand for energy continues to increase, while known reserves decrease. Curtailments, shortages, and increased dependence on foreign energy resources are becoming the rule rather than the exception. Disagreement on these premises focuses on the timetable of depletion, rather than the fact that it will occur.[2]

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[1] EXECUTIVE OFFICE OF THE PRESIDENT, THE NATIONAL ENERGY PLAN, at vii (1977).

[2] The variations in the predictions of the life expectancy of the remaining fossil fuel reserves result at least partially from the lack of agreement on the criteria to be used to determine the critical point in fossil fuel consumption. The CIA, for example, forecasts that, "[b]y 1982 or 1983, sizable price increases are inevitable unless large-scale conservation measures cut demand sharply." CENTRAL INTELLIGENCE AGENCY, THE INTERNATIONAL ENERGY SITUATION: OUTLOOK TO 1985, at 18 (1977). Projected world demand for oil and natural gas will "substantially exceed capacity by 1985." *Id.* at 1. These forecasts are supported by a recent study conducted under the auspices of the Massachusetts Institute of Technology by energy-company analysts from fifteen countries. N.Y. Times, May 17, 1977, at 1, col. 3.

On the other hand, the Director of Shell Oil Company's British subsidiary focuses on the point at which absolute production will begin to decline, rather than the point at which demand will exceed supply. He argues that production will not peak until 1990. Address by G. Chandler to The Manchester Statistical Society, Manchester, England (Nov. 9, 1976), *reprinted in Political and Economic Factors Governing Access to Energy in the Decades Ahead: Hearing Before the Senate Comm. on Interior and Insular Affairs,* 95th Cong., 1st Sess. 24 (1977).

A Stanford Research Institute study, while eschewing a prediction, states the central problem: "[I]f one assumes that the earth's fossil fuels will last 1000 years at today's consumption rate . . . this same resource base would be consumed in 104 years" at the current rate of growth of energy consumption. DIVI-

To meet the projected world shortages of oil and natural gas, the President has proposed a program that includes both conservation measures to reduce demand and incentives to stimulate the production and utilization of other energy resources.[3] Of the alternatives suggested, solar energy[4] offers four unique advantages: it is nondepletable,[5] economically competitive in life-cycle costs,[6] nonpolluting,[7] and techno-

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SION OF SOLAR ENERGY, ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION, SOLAR ENERGY IN AMERICA'S FUTURE: A PRELIMINARY ASSESSMENT 3 (1977) (DSE–115/1) [hereinafter cited as STANFORD STUDY]. For a similar analysis, see D. MEADOWS, D. MEADOWS, J. RANDERS, & W. BEHRENS, THE LIMITS TO GROWTH (paper ed. 1972).

[3] For a short summary of these proposals, see National Energy Policy (Fact Sheet), 13 WEEKLY COMP. PRES. DOC. 573–83 (Apr. 20, 1977).

[4] While all of the earth's energy resources except nuclear energy are indirect forms of solar energy, for the purposes of this Comment "solar energy" is limited to that energy radiated through the electromagnetic spectrum from the sun. It includes energy produced in the form of heat (photothermal energy) and electricity (photovoltaic energy) caused by the direct action of insolation on manmade collecting devices. Other, less direct forms, such as aeolian energy, biomass conversion, and ocean thermal conversion, are not included.

In addition, this Comment focuses on the legal problems likely to be encountered by solar energy systems installed for personal use. The problems facing public utility installations differ from those faced by individuals due primarily to the availability of eminent domain powers.

[5] Sunlight is the only source of energy that is an incoming flow rather than a static supply. "The stable, long term supply of energy from the sun is more abundant than all other sources of energy as well as longer lasting. For example, the solar energy striking the earth's outer atmosphere in one month is equivalent to that estimated to be stored in all fossil fuel resources." 9 STANFORD RESEARCH INSTITUTE, ENERGY SUPPLY AND DEMAND SITUATION IN NORTH AMERICA TO 1990: ENERGY TECHNOLOGY 213 (1973) (Project No. ECC–2177) [hereinafter cited as ENERGY TECHNOLOGY]. *See also* F. DANIELS, DIRECT USE OF THE SUN'S ENERGY 14–16 (paper ed. 1964); Löf, *Solar Energy: An Infinite Source of Clean Energy*, 410 ANNALS 52 (1973). The primary limitations on the use of solar energy are its intermittent and diffuse nature. *See* notes 17–24 and accompanying text *infra*.

[6] Due to its capital intensive nature, all comparisons of solar and traditional costs must be made in terms of the life-cycle costs of both systems. The cost of the initial investment and the projected cost of supplemental fuels must be averaged over the expected life of the solar energy system and be compared with the projected costs of traditional fuels over the same period.

While its competitiveness with traditional fuels is affected by a number of variables, two are of primary importance: interest rates and fossil fuel costs. Although the sun provides an essentially free source of fuel, solar energy systems require a substantial capital investment for collectors and storage facilities. Due to the necessity of this capital investment, interest rates have a substantial impact on the use of solar energy. A recent congressional study concluded that the economic "feasibility of solar energy can be determined almost solely by interest rates." JOINT ECONOMIC COMM., 95TH CONG., 1ST SESS., THE ECONOMICS OF SOLAR HOME HEATING 84 (Comm. Print 1977). The effect of interest rates can, however, be reduced substantially by government subsidies or tax incentives such

logically feasible.[8] Solar energy can have a substantial impact on the nation's energy requirements; the Energy Research and Development

as those proposed by President Carter. *See* EXECUTIVE OFFICE OF THE PRESIDENT, *supra* note 1, at xiii.

Despite high interest rates, as fossil fuel costs have risen solar energy has become an increasingly competitive alternative. The degree of competitiveness, however, varies with the use to which solar energy is put. Solar water heating, for example, is presently less expensive than traditional fuels, assuming an after-tax interest rate of 8.5%. JOINT ECONOMIC COMM., *supra* at 11. Solar space heating is also approaching cost competitiveness:

> Based on comparison with conventional energy costs, . . . solar space heating installed at an equivalent system cost of $20 per square foot of collector is competitive today against electric resistance systems throughout most of the U.S. . . . [I]f the cost should be reduced to $10/ft^2 by 1980 through a combination of technical innovations and incentives, solar hot water and heat would be economically competitive against all residential fuel types.

DIVISION OF SOLAR ENERGY, ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION, AN ECONOMIC ANALYSIS OF SOLAR WATER AND SPACE HEATING, at iii (1976) (DSE 2322-1). *See generally* Ben-David, Schulze, Balcomb, Katson, Noll, & Thayer, *Near Term Prospects for Solar Energy: An Economic Analysis*, 17 NAT. RESOURCES J. 169 (1977).

Photovoltaic generation of electricity with silicon cells is not, however, economically competitive. Such systems now require a capital investment of approximately $50,000 per kilowatt, as compared with $220 per kilowatt for an equivalent gas turbine system. STANFORD STUDY, *supra* note 2, at 26. The cost of silicon cells may, however, be directly related to the total volume of production, as was the case with the analogous silicon transistor. The cost of these transistors dropped from over $25 to less than $.75 per unit between 1954 and 1968. ENERGY TECHNOLOGY, *supra* note 5, at 232. A similar cost reduction in the production of silicon cells is already evident. Between 1958, when 0.5 watts of cells were produced, and 1969, when 105 kilowatts of cells were produced, the cost per watt dropped from $1,000 to $100. A. MEINEL & M. MEINEL, APPLIED SOLAR ENERGY: AN INTRODUCTION 28 (1976). ERDA estimates that within this decade the cost of silicon cells should approach $100 to $300 per kilowatt. DIVISION OF SOLAR ENERGY, ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION, PHOTOVOLTAIC CONVERSION PROGRAM: SUMMARY REPORT 1 (1976) (ERDA 76-161).

Economic factors may not, however, be the most important incentives inducing individuals to shift to solar energy. Among other factors that may play an important role are the decentralized, democratic nature of sunlight which fulfills the general desire to personally control technology as well as ethical considerations: "Many persons perceive solar energy as ethically preferred to other energy sources. For this reason, they are willing to pay more and/or tolerate lower performance. . . . Although this choice is difficult to quantify into system cost, it is nonetheless real." STANFORD STUDY, *supra* note 2, at 32.

[7] Pollution is an unavoidable concomitant of the use of all fossil and nuclear fuels. Potential pollution from solar energy, on the other hand, is limited primarily to contamination of water supplies through a leakage of the heat transfer medium, such as ethylene glycol (antifreeze), employed in the collector. *See generally* 1 ENVIRONMENTAL & RESOURCE ASSESSMENTS BRANCH, DIVISION OF SOLAR ENERGY, ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION, SOLAR PROGRAM ASSESSMENT: ENVIRONMENTAL FACTORS—SOLAR HEATING AND COOLING OF BUILDINGS

Administration estimates that by 2020 the sun could provide at least 25% of the nation's energy.[9]

Solar energy, however, is not restricted to use in the future. The number of solar installations in this country has increased significantly since 1975.[10] If the tax incentives included in the President's proposals are enacted, the number of buildings heated or cooled by solar energy could increase even more rapidly.[11]

Despite the social and economic advantages of solar energy, numerous impediments to its wider use remain. For example, building codes frequently hinder adoption of new construction technologies,[12] zoning regulations may require an inefficient location of the collectors,[13] and

(1977) (ERDA 77-47/1). In addition, the pollution caused by the energy required to produce and fabricate solar energy systems is only four percent of that which would be produced by using the fossil fuels saved by the system. STANFORD STUDY, *supra* note 2, at 52–53.

An economy based on solar energy would also have other advantages. For example, conversion to solar energy would create more jobs because fossil and nuclear energy have been used primarily to replace human energy. Solar technologies provide approximately 2.5 times more jobs per unit of energy than nuclear technologies. S. LAITNER, THE IMPACT OF SOLAR AND CONSERVATION TECHNOLOGIES UPON LABOR DEMAND (1976).

[8] While solar energy can be employed in a wide range of applications, technology is most advanced in providing energy to heat water to be used either directly or for space heating. *See* notes 25–27 and accompanying text *infra*. If the technological problems of mass production can be solved, silicon cells will be widely used. *See* note 6 *supra*.

[9] Even if solar energy is confined to residential water and space heating it can make a significant contribution to this country's energy requirements. Residential energy use consumes 25% of the nation's total energy demand. STANFORD STUDY, *supra* note 2, at 11. Space and water heating use 86.9% of the energy used in the residential sector. 1 FEDERAL ENERGY ADMINISTRATION, PROJECT INDEPENDENCE TASK FORCE REPORT: RESIDENTIAL AND COMMERCIAL ENERGY USE PATTERNS 1970–1990, at 8 (1974).

[10] In 1975 only 183 homes were heated by the sun; the number of solar water and space heating systems in this country now approaches 10,000. N.Y. Times, Jan. 16, 1977, § 1, at 5, col. 1.

[11] The President has proposed tax credits and incentives to encourage the use of solar energy in more than 2.5 million homes by 1985. EXECUTIVE OFFICE OF THE PRESIDENT, *supra* note 1, at xiii.

[12] "Solar energy systems do not readily fit within [local building officials'] experience, education, or in some cases, ability. The likelihood of excessive or unreasonable safety, health, or materials requirements is highly probable." Region IX Counsel's Office, Federal Energy Administration, The Legal and Institutional Barriers to Solar Development: A Summary of the Issues 3 (1976) (copy on file with the Oregon Law Review). *See generally* Rivkin, *Courting Change: Using Litigation to Reform Local Building Codes*, 26 RUTGERS L. REV. 774 (1973).

[13] American Bar Foundation, Proceedings of the Workshop on Solar Energy and the Law 16 (Feb. 10, 1975), *reprinted by* National Technical Information Service, U.S. Dep't of Commerce (Mar. 1975) (Pub. No. PB-241 051).

present lending and security methods may be insufficient to finance solar installations.[14] Perhaps the fundamental legal impediment, however, is the lack of a guarantee of continuing access to insolation, that is, access to incident solar radiation.[15]

Potential owners of solar energy systems are unlikely to make the substantial capital investment required to utilize solar energy unless they can prevent shadowing of the collectors by structures or vegetation[16]

[14] Region IX Counsel's Office, *supra* note 12, at 18–20; American Bar Foundation, *supra* note 13, at 11–13. Lending problems may be particularly acute if there is no guarantee of solar access because lending institutions may either refuse to lend funds for a potentially unusable solar energy system or may require a more costly backup heating system. This problem may, however, remain largely theoretical. The Department of Housing and Urban Development has recently issued standards for solar energy systems. These standards are the minimum requirements for all housing on which the federal government will insure the financing. The standards recognize the potential shading problems, requiring that solar buildings "relate well to . . . . [e]xisting and proposed site elements such as vegetation, fences, landforms and buildings" in order to "minimize the shading of the collector." 5 U.S. DEP'T OF HOUSING & URBAN DEVELOPMENT, INTERMEDIATE MINIMUM PROPERTY STANDARDS: SOLAR HEATING AND DOMESTIC HOT WATER SYSTEMS ¶ S–303–1(d), Commentary (1977). The standards do not, however, require the builder to purchase a solar easement or take other steps to prevent access problems.

[15] This problem is beginning to attract comment. *See, e.g.*, Eisenstadt & Utton, *Solar Rights and Their Effect on Solar Heating and Cooling*, 16 NAT. RESOURCES J. 363 (1976); Moskowitz, *Legal Access to Light: The Solar Energy Imperative*, 9 NAT. RESOURCES LAW 177 (1976); Comment, *The Allocation of Sunlight: Solar Rights and the Prior Appropriation Doctrine*, 47 COLO. L. REV. 421 (1976).

The lack of a guarantee to solar insolation is not the only legal impediment to the use of solar energy. One study has identified seven other areas in which the legal system must be changed if it is to promote rather than hinder solar energy utilization. Among these impediments are optimizing the location of solar collectors, improving the public economics of solar energy systems, removing potential construction and maintenance problems, improving the climate for financing solar energy systems, improving the operation and design of systems through feasible energy backup, and utility concern with solar energy. Robbins, *Law and Solar Energy Systems: Legal Impediments and Inducements to Solar Energy Systems*, 18 SOLAR ENERGY 371, 372–73 (1976).

[16] In addition to manmade structures, trees and other vegetation present potential difficulties for a solar owner. It is well settled that the mere maintenance of nonencroaching vegetation, in the absence of special circumstances, is not actionable. *E.g.*, Merriam v. McConnell, 31 Ill. App. 241, 175 N.E.2d 293 (1961); Cannon v. Neuberger, 1 Utah 2d 396, 268 P.2d 425 (1954). The obstruction of light is not a special circumstance: "In so far as the bill alleges a deprivation of air and light by reason of height of this shrubbery, or seeks an order to cause its removal or limit its height, the bill is without equity." Granberry v. Jones, 188 Tenn. 51, 54, 216 S.W.2d 721, 722 (1949). Thus, in the absence of a recognized right to sunlight, the owner of a solar energy system is without a remedy. Throughout this Comment, shadow-casting objects will be referred to as "buildings," "structures," etc. because the legal problems of the two classes of potential obstructions are identical.

on the adjoining land. Therefore, if the increased use of solar energy is desired, a solar right must be created.

In analyzing this problem, this Comment presents four related examinations. First, the minimum content of an effective guarantee or solar right is determined. Second, the countervailing policy factors are delineated and resolved. Third, current legal doctrines are examined to ascertain if they are capable of providing the requisite solar right. Fourth, alternative methods of protecting this right are examined. Through the analysis, this Comment builds a case for legislative or judicial action to resolve the problem.

I

Form and Content of a Solar Right

In order to determine the characteristics of a solar right, a short technical digression is necessary. Without a basic knowledge of the nature of solar energy and the operation of solar energy systems, it is difficult to specify the essential nature of the right. Just as water law, for example, is dependent upon the physical attributes of water, solar energy law must be based upon the properties and utilizations of solar energy.

A. Characteristics of Solar Radiation

The sun emits energy in the form of wave particles through the electromagnetic spectrum. While the wavelengths of this energy cover a broad band of the spectrum, solar energy systems can capture the energy from only a narrow group of wavelengths that roughly correspond to those of visible light.[17]

Legally, two aspects of solar radiation are of dominant importance: it is both variable and diffuse. The energy content of solar radiation, while almost constant above the earth's atmosphere,[18] varies greatly at the surface in both intensity and availability. These variations are dependent primarily upon five factors: the hour of the day,[19] the day

[17] Visible light is between 0.4 millionths and 0.8 millionths of a meter in wavelength. Useable solar energy, on the other hand, can be recovered from a broader band ranging from 0.3 millionths to 10 millionths of a meter. F. Daniels, *supra* note 5, at 17. The energy intensity of the radiation is not, however, continuous across this band; over 90% of the energy is transmitted between 0.4 millionths and 1.7 millionths of a meter. A. Meinel, *supra* note 6, at 44.

[18] There are small variations in exoatmospheric solar radiation due to the earth's elliptical orbit. The seasonal differences vary between -3.27% at the aphelion (July) and +3.42% at the perihelion (January). A. Meinel, *supra* note 6, at 40–41.

[19] The lower the sun is in the sky relative to the collecting surface, the greater the air mass through which the radiation must pass. The size of the air mass is inversely related to the energy intensity because the atmosphere absorbs and scatters the energy. *Id.* at 45–46.

of the year,[20] the atmospheric conditions,[21] the latitude,[22] and the altitude[23] of the collector. In addition, even under optimum conditions, solar energy is extremely diffuse. The intensity of direct sunlight is less than one percent of that obtained in fossil-fuel-fired boilers.[24]

The effect of the variable and diffuse nature of solar radiation is that, in order to collect enough energy to be practical, the collecting surface must be exposed to the maximum amount of available sunlight. Thus, access to solar energy throughout the major part of winter days is required if this energy resource is to contribute significantly to the energy requirements of the structure which it is to serve.

B. Requirements of Solar Energy Systems

Solar energy systems are designed to capture the energy in solar radiation and transform it into heat or electricity. This requires four components: access to direct insolation, a mechanism to capture and convert the energy into the desired form,[25] a medium for transporting the product,[26] and a method of storing the energy.[27]

From a legal perspective, the most important requirement of a solar

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[20] The inclination of the earth's axis relative to the sun results in the sun being highest in the sky in the northern hemisphere on June 21 and lowest on December 21. The effect of this variation is a reduction in both the amount of sunlight, due to fewer hours of sunlight, and the intensity of the available energy, due to atmospheric scattering and absorption. Thus the available sunlight is approximately 56% less on December 21 than June 21 at 43° north latitude. F. DANIELS, *supra* note 5, at 21.

[21] Besides the obvious impact of clouds on available energy, air pollution also has a significant effect, cutting energy intensity by 15–20%. G. DANIELS, SOLAR HOMES AND SUN HEATING 15 (1976). *See also* Peterson & Flowers, *Interaction Between Air Pollution and Solar Radiation*, 19 SOLAR ENERGY 23, 31 (1977).

[22] During winter the intensity of solar energy increases as a collector is moved toward the equator. At solar noon the energy available at 30° latitude is more than twice that available at 45° latitude. A. MEINEL, *supra* note 6, at 92–93.

[23] The reduction in the volume of atmosphere above the collector results in an increase of 15.4% in available energy per kilometer of elevation. *Id.* at 45–46.

[24] ENERGY TECHNOLOGY, *supra* note 5, at 214.

[25] The diffuse and variable nature of solar radiation requires a substantial collector surface area. For space and water heating, two main types of collectors are available: flat-plate and focusing collectors. The flat-plate collector is basically a black surface, provided with a transparent cover and insulated on its sides and rear. The transport medium is circulated over the surface, being warmed in the process. *See generally* F. DANIELS, *supra* note 5, at 37–42; A. MEINEL, *supra* note 6, at 413–58. Focusing collectors use either lenses or parabolic mirrors to concentrate the solar radiation before heating the transport medium. F. DANIELS, *supra* note 5, at 42–50.

[26] Either water or air can be used to transfer the heat to storage.

[27] Heat may be stored in an enclosed container of rocks, a water storage tank, or in certain salts which will melt and resolidify within the desired temperature range. *See* F. DANIELS, *supra* note 5, at 97–101; A. MEINEL, *supra* note 6, at 461–83.

energy system is the necessity of access to direct insolation. While some solar collectors can capture energy from diffuse or scattered radiation, the potential recoverable energy from this source is quite low.[28] Thus, to be effective, the collector must be ensured of a continuing supply of direct solar radiation.

C. The Analytical Basis of a Solar Right

The common law currently recognizes a property interest in light. The United States Supreme Court, for example, has stated that it is established "beyond question" that "easements of light, air, and [physical] access . . . are as much property" as the land itself.[29] Except in a very few instances, however, a landowner has a right to receive light only from the area that is superjacent to the boundaries of the land; that is, the right extends only to sunlight that reaches the surface vertically.[30] But the insolation that falls vertically is, in most instances, diffuse rather than direct insolation because direct insolation reaches the surface at an oblique angle. A landowner thus has a right to only a limited amount of illumination.

Light as illumination, however, must be distinguished from light as an energy resource. While diffuse light is acceptable as illumination, for example, it is unacceptable as a source of energy. It is this requirement of direct insolation that differentiates a solar right from other property interests in light.[31] But the amount of direct insolation at any location and time is limited. Scarcity thus imposes upon society the necessity of a choice. The problem that must be resolved is essentially one of allocating a natural resource among competing uses. Studies have indicated that legal rules have a substantial impact on the allocation of resources, most significantly through the recognition and enforcement

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[28] The ratio of energy intensity in diffuse sunlight to direct insolation varies from 8% for deserts to 22% for urban areas. A. MEINEL, *supra* note 6, at 47. *See also* Tuller, *The Relationship between Diffuse, Total and Extra Terrestial Solar Radiation*, 18 SOLAR ENERGY 259 (1976).

[29] Muhlker v. New York & H. R.R., 197 U.S. 544, 571 (1905). The law has recognized property interests in illumination that arise prescriptively (*see* notes 61–71 and accompanying text *infra*), through implication (*see* notes 72–77 and accompanying text *infra*), as incidents of the ownership of lots abutting a public street (*see* notes 78–80 and accompanying text *infra*), and contractually between adjoining landowners (*see* notes 81–92 and accompanying text *infra*).

[30] This conception is embodied in the common-law maxim: *Cujus est solum, ejus est usque ad coelum et ad inferos* ["To whomsoever the soil belongs, he owns also to the sky and to the depths." BLACK'S LAW DICTIONARY 453 (4th ed. 1951)]. *See generally* Ball, *The Vertical Extent of Ownership in Land*, 76 U. PA. L. REV. 631 (1928).

[31] This distinction is also the primary limitation on the utility of current legal theories which guarantee rights to light. Doctrines applicable to light as illumination are often inapplicable to light as an energy resource. *See* note 69 *infra*.

of property rights.[32] The economic theory of property rights is thus an important analytical tool for examining the problems of allocating resources.

The creation of a property interest involves three elements: a definition of the right that is unambiguous and compatible with the nature of the resource, an initial assignment of the right, and a method of enforcing the right.[33] Both the existing right and the proposed solar right must be analyzed in relation to these elements.

The primary weakness of the current legal conception of sunlight is the fact that it views sunlight as a natural right rather than as an energy resource or an economic commodity.[34] This basic conception results in a definition of the right to light that impedes the use of solar energy. Currently, the right to light is essentially a negative interest because, while there is no right to receive direct insolation, a landowner does have the right to obstruct a neighbor's sunlight. The right

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[32] There is a systematic, but by no means uniform or static, relationship between the capacity [to participate in economic decisionmaking] conferred by property rights and economic decisions. This systematic interaction provides a basis for a market. Thus market activities evolve from and function within the institution of property rights. In turn, property rights directly affect economic outcome, *i.e.*, the pattern of resource use, the quantity and mix of goods and services produced, and the associated distribution of income and wealth.

Ditwiler, *Water Problems and Property Rights—An Economic Perspective*, 15 NAT. RESOURCES J. 663, 666 (1975). *See also* R. POSNER, ECONOMIC ANALYSIS OF LAW (1972); Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960); Demsetz, *Some Aspects of Property Rights*, 9 J.L. & ECON. 61 (1966); Stigler, *The Law and Economics of Public Policy: A Plea for Scholars*, 1 J. LEGAL STUD. 1 (1972).

[33] *See* note 32 *supra*. *See also* Deavney, Eckert, Meyers, O'Hara, & Scott, *A Property System for Market Allocation of the Electromagnetic Spectrum: A Legal-Economic-Engineering Study*, 21 STAN. L. REV. 1499, 1501–12 (1969) (similar analysis of another portion of the electromagnetic spectrum, radio waves).

[34] "The right to breath the air, and to enjoy the sunshine, is a natural one . . . ." Burke v. Smith, 69 Mich. 380, 383, 37 N.W. 838, 842 (1888). The proposed right, as is the case with most property interests, is defined in terms of its uses. Thus the right is circumscribed by the use of sunlight as an energy resource. A close analogy is offered by water rights law. As with sunlight, the corpus of water flowing in a natural stream is the property of no one; it is common or public:

> [U]pon severance from the stream flow it generally becomes private property. That is, water lawfully diverted from its natural course and reduced to possession by means of artificial devices and put to a beneficial use becomes the property [of the diverter]. This right granted under the law is called a usufructuary right. . . . This usufructuary right is regarded and protected as property.

Ditwiler, *supra* note 32, at 668. Similarly, it is the collection of sunlight by artificial means and its use as an energy resource that defines the solar right; the installation of a solar energy system powered by the sun is the criterion that is the measure of the proposed right.

is thus a concomitant of the ability to develop land with little or no regard for the effect of the development on adjoining landowners. This obscures the economic value of sunlight. The proposed solar right, on the other hand, requires the value of sunlight to be considered by economic decisionmakers.[35]

More importantly, however, the current assignment of the right is not conducive to the use of solar energy. While economic theory suggests that the initial assignment of a property interest will have no effect on resource allocation if the right is freely transferable, the theory assumes that transfer transactions are costless.[36] In fact, transaction costs are often substantial.[37] For example, *A* and *B* are adjoining landowners. If *A* decides to install a solar energy system, *A* will necessarily include the price of purchasing *B*'s right to obstruct the required direct insolation as part of the cost of the system. In a costless transaction the right would be transferred to the most efficient use because, presumably, the party with the most valuable use would pay the other party for the right. If *A* and *B* are individuals, the transaction costs (the costs of negotiation, information gathering, memorialization, and enforcement of the agreement) might well be minimal. Even in this situation, however, the initial assignment of the right is likely to affect the resource allocation if the transaction costs plus the transfer costs exceed the difference in the values of the competing uses. In other words, assume that the value to *A* of the sunlight as an energy resource is $100 and the value to *B* of the right to build in a manner that will obstruct the sunlight (rather than a manner which will not obstruct the light) is $90. If the transaction costs exceed $10, it is unlikely that

[35] Under the present system of property rights, the shadowing of a solar collector by a building on adjacent land is an externality—a beneficial or harmful effect on another person or group that results from the actions of a party if the party did not consider the effect in the cost calculations of the action. *See* P. SAMUELSON, ECONOMICS 476 (10th ed. 1976). The proposed right would require the internalization of this external cost by requiring that the builder purchase the right from the user of the solar energy system.

[36] "With costless market transactions, the decisions of courts concerning liability for damage would be without effect on the allocation of resources." Coase, *supra* note 32, at 10. *But cf.* Mishan, *The Economics of Disamenity*, 14 NAT. RESOURCES J. 55, 67 (1974) ("Once we take cognizance of negotiating, administrative and other costs that are unavoidably incurred in effecting economic changes . . . the position of the law with respect to spillover effects [such as the shadowing of a solar collector] becomes of critical importance."). *See also* Baker, *The Ideology of the Economic Analysis of Law*, 5 PHILOSOPHY & PUB. AFF. 3 (1975).

[37] *See generally* Crocker, *Externalities, Property Rights, and Transaction Costs*, 14 J.L. & ECON. 451 (1971); Randall, *Property Rights and Social Microeconomics*, 15 NAT. RESOURCES J. 729 (1975); Samuels, *The Coase Theorem and the Study of Law and Economics*, 14 NAT. RESOURCES J. 1 (1974).

A will purchase the right because the total costs would exceed the value of the light to *A* despite the fact that the use of the sunlight as an energy resource is theoretically more efficient. If *A* is a group of individuals, the transaction costs mount rapidly because there must be negotiation not only between *A* and *B* but also among the members of group *A*. Thus the initial assignment of the right can affect the efficiency of the allocation of the resource.[38]

The initial assignment of a right also affects the allocation of a resource due to the assignment's effect on the relative wealth of the parties.[39] A person assigned a property interest is made wealthier by the assignment.[40] To take an extreme example, if there are two people dying of thirst in a desert and one is given a canteen of water, it is unlikely that the person with the water will sell it regardless of the price offered by the other person. The result is that the assignment determines who uses the water. This inherent bias in favor of existing rights is also observable in rights to light: the party assigned the right is made wealthier by the assignment, and thus is better able to refuse the offers of the person seeking to purchase the right.

Due to the fact that the initial assignment of a property right affects the allocation of the natural resource, society is faced with a policy choice. If solar energy use is to be encouraged rather than retarded by the property rights structure, a right to receive direct insolation should be created.[41]

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[38] "Efficiency" in economic terminology "means exploiting economic resources in such a way that human satisfaction as measured by aggregate willingness to pay for goods and services is maximized." R. POSNER, *supra* note 32, at 4. Two problems need to be noted. First, efficiency is a function of the existing property rights system: "the establishment of any efficient situation or solution requires an antecedent specification of the rights (protected interests) in terms of which efficiency is determined." Samuels, *supra* note 37, at 6. Second, "rational individual bargaining may not always lead to socially optimal outcomes." Regan, *The Problem of Social Cost Revisited*, 15 J.L. & ECON. 427, 430 (1972). This result is especially likely in relation to energy resources because historically economists have not treated natural resources as capital goods. In addition, there is no component in energy prices for the value of the resource *in situ* for future generations: the optimal social result may require a maximum conservation of energy resources for the future, while economic decisionmakers are concerned with less lengthy time periods. *See generally* Georgescu-Roegen, *Energy and Economic Myths*, 41 S.J. ECON. 347 (1975). Thus strict economic efficiency may not be the proper goal.

[39] *See generally* Baker, *supra* note 36.

[40] Even Posner admits that "willingness to pay is . . . a function of the existing distribution of income and wealth in a society." R. POSNER, *supra* note 32, at 4. *See also* Samuels, *supra* note 37, at 6. In addition to the obvious increase in the wealth of one party when a right is transferred, the ongoing exclusive right to exploit a resource increases the wealth of the individual with the property interest in the resource. This allows the individual to refuse a higher bribe from an individual without the right.

[41] While the legal recognition of property rights traditionally has lagged be-

In itself, however, the creation of a solar right is insufficient; it is also necessary to provide a method for protecting and enforcing the right which is both effective and inexpensive. If the enforcement costs are too high, the allocation of the resource may not be efficient because it is not economically advantageous to defend the resource.[42] Enforcement costs are likely to be high when the right is defined ambiguously or when it is burdened by countervailing presumptions or procedural requirements.

While economic theory does not present unambiguous rules for creating an effective system of property rights, it does delineate the important elements of such a system: the definition, assignment, and enforcement of the right. It is against this standard that any proposed right must be measured.

Economic theory also does not provide a basis for making the central policy decision. It is limited to specifying the results of the decision. That is, economic theory can determine the probable results of the assignment of a right, but it cannot determine which assignment is best. This question must be resolved in terms of the goals of society.

II

Policy Factors

Congress has declared it to be national policy to "pursue a vigorous and viable program" to develop "solar energy as a major source of energy for our national needs."[43] Implementation of this policy will require the removal of the current impediments to the use of solar energy, including the lack of a solar right.

The creation of a solar right will necessitate a realignment of the present system of property rights. The greatest tension created by this realignment will develop because of the current policy favoring land development. Presently the owner of surface land "owns at least as

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hind social and technical developments, the creation of such interests to promote social goals is permissible. This dynamic nature of property rights has been most apparent recently in the extension of due process guarantees to things previously classed as gratuities or status, for example, welfare benefits, Goldberg v. Kelly, 397 U.S. 254 (1970), public school attendance, Goss v. Lopez, 419 U.S. 565 (1975), and a professor's interest in continuing employment, Perry v. Sindermann, 408 U.S. 593 (1972). The basic methodology of the Court is instructive. Rather than attempting to force new relationships into conventional property forms, the Court balanced the benefits flowing from a recognition of the interest against the potential detriments. The Court's approach indicates at least implicity that property rights are a means or arranging rights among persons to attain socially desirable goals.

[42] *See generally* Demsetz, *The Exchange and Enforcement of Property Rights*, 7 J.L. & Econ. 11 (1964).

[43] Solar Energy Research, Development, and Demonstration Act of 1974, 42 U.S.C. § 5551(b)(1) (Supp. V 1975).

much of the space above the ground as he can occupy or use in connection with the land. The fact that he does not occupy it in a physical sense—by the erection of buildings and the like—is not material."[44] While ownership of this airspace logically does not imply the right to develop it, the bias of the law in favor of development has fostered this belief.

Two policy arguments traditionally are advanced in support of land development. The first equates land development with progress and economic expansion and considers development to be desirable in itself.[45] The second relies upon the belief that a landowner should be free to develop land as an important example of this country's general economic freedoms.[46]

While the argument that development is intrinsically good may have had validity on the expanding frontier of the nineteenth century, it is now a questionable assumption. The increased awareness of the environmental and social impact of development is only the most obvious product of a changing perception; bigger is no longer automatically assumed to be better.[47]

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[44] United States v. Causby, 328 U.S. 256, 264 (1946). *Causby* sharply limited the force of the common-law maxim, *cujus est solum, ejus est usque ad coelum et ad inferos*. *See* note 30 *supra*. While allowing relief on the facts, the Supreme Court held that the "doctrine has no place in the modern world." 328 U.S. at 261. Although it is apparent in principle that "[t]he upper limits of the atmosphere are clearly in the public domain, and the owner's title, if any, is limited by the right of public passage," Neal, *Airspace—Air Easements, in* 1975 INSTITUTE ON PLANNING, ZONING, & EMINENT DOMAIN 309, 313, the dividing line between public and private ownership has never been specified with greater clarity. *See generally* Ball, *supra* note 30; Note, *Conveyance and Taxation of Air Rights*, 64 COLUM. L. REV. 338 (1964). The analysis in *Causby*, however, demonstrates that property entitlements associated with land are flexible and will be modified when changed circumstances require their alteration. Similar modifications to encourage the use of solar energy should be equally permissible.

[45] *See generally* Bove v. Donner-Hanna Coke Corp., 236 App. Div. 37, 258 N.Y.S. 229 (1932); Sanderson v. Pennsylvania Coal Co., 86 Pa. 401 (1878).

[46] "Many vacant lots in our cities and towns are owned by persons who reside at a distance, and who are either unable or unwilling to improve them. It would be inconvenient to compel them to do so, on the penalty of forfeiting a valuable right by neglect." Hoy v. Sterrett, 2 Watts 327, 331 (Pa. 1834). *See also* cases cited in note 63 *infra*.

[47] "Another hopeful sign . . . is the change in the values of the public over the last decade. Traditional economic indices are no longer viewed as the sole measures of progress. We are entering an era in which qualitative values and aesthetic factors are considered as important as material wealth." Jackson, *Foreword: Environmental Quality, the Courts, and the Congress*, 68 MICH. L. REV. 1073, 1074 (1970). This change in values can be seen in such diverse areas as the passage of no-growth ordinances, *see, e.g.*, Deutsch, *Land Use Growth Controls: A Case Study of San Jose and Livermore, California*, 15 SANTA CLARA LAW. 1 (1974), the increased use of open-space zoning, *see, e.g.*, Note, *What A Beautiful*

The second argument assumes that a landowner has an absolute right to develop the land. This ignores the fact that even fee simple owners do not have such a right.[48] For centuries the common law has recognized the maxim *sic utere tuo ut alienum non laedas*: "Use your own property in such a manner as not to injure that of another."[49] The common law nuisance action is one example of this principle. Zoning and other land use restrictions are other examples of permissible restraints on the ability of a landowner to develop property.

The potential difficulties in balancing these competing policy factors may appear greater than they in fact are. While the creation of a property interest in sunlight necessarily will restrict some uses of superjacent airspace,[50] the fear that the recognition of a right to light will halt all development is groundless; most uses of land will remain unaffected. In addition, in exchange for an already limited development potential, the landowner will receive a guaranteed source of energy.

The policies of promoting the use of solar energy and of allowing land development thus are not incompatible. The tension between these two goals, however, is symptomatic of a more fundamental decision that faces this nation: the choice of an energy future. This choice is between two alternatives:

> One is an economic future dominated by the nuclear breeder and/or nuclear fusion, with solar energy playing a secondary though important role. The other is a future in which society has rejected dependence on nuclear energy and has opted instead for primary dependence on solar energy with a stabilized level of energy use far less than presently projected. There are no other options.[51]

Wilderness . . . Let's Develop It, 35 U. PITT. L. REV. 179 (1973), and the recognition of aesthetics as a permissible criterion for land use decisions, *see, e.g.*, Note, *Aesthetic Nuisance: An Emerging Cause of Action*, 45 N.Y.U. L. REV. 1075 (1970).

[48] "The thought is inherent that not even a fee-simple owner has a totality of rights in and with respect to his real property. Insofar as the law of nuisance is concerned, rights as to the usage of land are relative." Riblet v. Spokane-Portland Cement Co., 41 Wash. 2d 249, 254, 248 P.2d 380, 382 (1952). *See also* Carter v. Harper, 182 Wis. 148, 196 N.W. 451 (1923).

[49] BLACK'S LAW DICTIONARY 1551 (4th ed. 1951).

[50] The most obvious limitation on the development of land will be restrictions on the height of buildings and vegetation. In Chicago, for example, at 9:00 a.m. and 3:00 p.m. on December 22, land to the southeast and southwest, respectively, of the collector must be free of all obstructions 18 feet above the height of the collector for a distance of 100 feet from the collector; there must be no obstructions higher than 90 feet above the collector for a distance of 500 feet from the collector. At noon, the airspace must be unobstructed 42 feet above the collector to a distance 100 feet south of the collector; the airspace must be unobstructed over a height of 210 feet within 500 feet of the collector. Robbins, *supra* note 15, at 373.

[51] STANFORD STUDY, *supra* note 2, at 99; *see* Lovins, *Energy Strategy: The Road Not Taken?*, FOREIGN AFF., Oct. 1976, at 65.

Thus, because solar energy will play an important role in this country's energy future under either option, it is important that a method of ensuring solar access be developed.

III

PRESENT LEGAL DOCTRINES

A. Common-Law Easements of Lights

To guarantee solar access a landowner must, for example, be able to prevent the construction of buildings or limit the height of vegetation that will shadow the collector. The common law classifies such a power as a negative easement.[52] Historically negative easements of light and air have been recognized, independently of an express grant, in four factual situations. Three of these, frequently grouped under the title "ancient lights,"[53] evolved in England prior to the American Revolution. The fourth, the easement of a property owner over an adjacent public street, is a more recent creation.

1. Ancient Lights

While the origin of the doctrine remains unclear, cases from the medieval period indicate that the common law originally conceived access to light to be a natural right, incident to the ownership of land.[54] This approach was subsequently rejected. The property interest that was eventually recognized was that of a negative easement, the right to prevent the obstruction of light. By the end of the sixteenth century, it had been determined that a proprietor of land with a structure containing old windows had the power to prevent adjoining landowners

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[52] A negative easement is defined as the aggregate of rights whereby the owner of the dominant estate may prevent the owner of the servient estate from doing otherwise permissible acts upon the servient estate. Easements of light, air, view, and subjacent lateral support are the most common examples. Negative easements are contrasted with positive easements, which allow the dominant owner to engage in otherwise impermissible acts upon the servient estate, for example, easements of way. *See generally* RESTATEMENT OF PROPERTY § 452 (1944); Cook, *Legal Analysis in the Law of Prescriptive Easements*, 15 S. CAL. L. REV. 44, 47 (1941).

[53] While the term "ancient lights" properly refers to "[w]indows or openings which have remained in the same place and condition twenty years or more," BOUVIER'S LAW DICTIONARY 71 (student ed. 1928), in this Comment it will be used in its more general sense to denominate the legal doctrines recognizing prescriptive and implied easements of light.

[54] "If a man builds a house which stops the *light* coming to my house . . . I shall have the *Assize*" ["mes si ho[m]e leve un meason q[ue] estopp[e] le *light* de ma mea[son] . . . jeo aura en[ver]s luy *Assize*]. Y.B. Mich. 22 Hen. 6, f. 14, pl. 23 (1444). *See also* Y.B. Mich. 11 Hen. 4, f. 25b, pl. 48 (1410); Y.B. Mich. 7 Edw. 3, f. 50b, pl. 25 (1333); Y.B. Trin. 19 Edw. 2, p. 679 (1325).

from obstructing the accustomed amount of light.[55] This right could be enforced in a nuisance action either for money damages[56] or for an injunction to prevent the construction of the offending building.[57] At the time of the American Revolution, negative easements of light and air had been recognized in three instances: they could arise through prescription[58] or through implication in both sales[59] and leases[60] of real property.

(a) Prescriptive Easements of Light

The English judiciary created a right to light based on a prescriptive claim, an assertion of a right or title that arose from uninterrupted and immemorial enjoyment. While the initial decision in this country uniformly followed the common-law rule,[61] judicial opinion shifted follow-

[55] In Bowry and Pope's case, 1 Leo. 168, 74 Eng. Rep. 155 (K.B. 1589), the court, while holding the doctrine inapplicable on the facts, noted that "if it were an antient [*sic*] window time out of memory, etc., there the light or benefit of it ought not to be impaired by any act whatsoever; and such was the opinion of the whole Court." *See also* Bland v. Mosely, Q.B. Roll Trin. 29 Eliz. m. 253 (1587), *reprinted in* A. KIRALFY, THE ACTION ON THE CASE 213–14 (1951); 7 W. HOLDSWORTH, A HISTORY OF ENGLISH LAW 339–42 (3d ed. 1926).

[56] *E.g.*, Johnson v. Long, 1 Ld. Raym. 370, 91 Eng. Rep. 1144 (K.B. 1699) (the court noted that while the plaintiff could not maintain a second action for the erection of the same wall, he could bring an action and recover damages for the continuance of the nuisance).

[57] *E.g.*, Ryder v. Bentham, 1 Ves. Sen. 543, 27 Eng. Rep. 1194 (Ch. 1750) (the court ordered the defendant "to pull down the scaffold, or poles and boards already raised, and be injoined from building or erecting, whereby the plaintiff's lights may be obstructed" until a court of law could determine the rights of the parties).

[58] *E.g.*,Lewis v. Price, 2 Wms. Saund. 175 n.2, 85 Eng. Rep. 924 n.2 (K.B. 1761); William Aldred's Case, 9 Co. Rep. 57b, 77 Eng. Rep. 816 (K.B. 1610); Hughes v. Keeme, Calth. 1, 80 Eng. Rep. 649 (K.B. 1610). The doctrine had been modified by the Chancery, in Fishmonger's Co. v. East India Co., Dick. 163, 21 Eng. Rep. 232 (Ch. 1752), to require a material deprivation of light for the action to lie: "[I]t is not sufficient to say that it will alter the plaintiff's lights, for then no vacant piece of ground could be built on in the city." *Id.*

[59] *E.g.*, Palmer v. Fletcher, 1 Lev. 123, 83 Eng. Rep. 329 (K.B. 1663); Cox v. Mathews, 1 Vent. 238, 86 Eng. Rep. 159 (K.B. 1663).

[60] A landlord could not obstruct the light of the lessee through actions on land retained by the landlord. *E.g.*, Rosewell v. Pryor, 6 Mod. 116, 87 Eng. Rep. 874 (K.B. 1709). This branch of the doctrine will not be examined. A slight majority of American jurisdictions, however, recognize the right of the lessee to a continuance of the preexisting light during the term of the lease. *E.g.*, Darnell v. Columbia Show-Case Co., 129 Ga. 62, 58 S.E. 631 (1907); Rainbow Shop Patchogue Corp. v. Roosevelt Nassau Operating Corp., 60 Misc. 2d 896, 304 N.Y.S.2d 92 (1969). *Contra*, Owsley v. Hammer, 36 Cal. 2d 710, 227 P.2d 263 (1951). *See also* 23 CAL. L. REV. 440 (1935).

[61] *E.g.*, Clawson v. Primrose, 4 Del. Ch. 643 (1873); Gerber v. Grabel, 16 Ill. 217 (1854); Manier v. Myers, 43 Ky. (4 Mon.) 514 (1844) (dictum); Robeson v. Pittenger, 2 N.J. Eq. 57 (1838); McCready v. Thomson, 23 S.C.L. (Dud.) 131 (1837); Berkeley v. Smith, 68 Va. (27 Gratt.) 892 (1876).

ing the decision of *Parker v. Foote*.[62]

Three primary reasons were advanced for the rejection of the doctrine: first, courts thought the doctrine would be an impediment to economic expansion;[63] second, a largely unarticulated feeling existed that light somehow differed, factually and conceptually, from other forms of property;[64] and third, the belief was expressed that the doctrine

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[62] 19 Wend. 309 (N.Y. Sup. Ct. 1838). The holding for which this case is most frequently cited, that the doctrine of ancient lights is unsuited to the economic conditions of this country, is actually dictum. The court in fact remanded the case for a new trial on the grounds that the long enjoyment of the light gave rise only to a presumption that a grant had been made. This was a factual question for the jury, not a legal question for the judge, and had to be submitted to the jury if the defendant presented evidence to counter the presumption. This miscitation is only one of many examples in ancient light cases. *See generally* Comment, *Implied Easements of Light and Air*, 4 YALE L.J. 190 (1895).

[63] "A line of decisions under [the doctrine] would palsy enterprise, cripple industry, and check advancement; and the effect would be to dampen the spirits and shackle the energies of a free people." Keiper v. Klein, 51 Ind. 316, 323 (1875). *See also* Tinker v. Forbes, 136 Ill. 221, 26 N.E. 503 (1891); Rogers v. Sawin, 76 Mass. (10 Gray) 376 (1875). This argument reflects the prevalent prodevelopment bias of courts during this period and was the primary practical reason for the rejection of the doctrine. While reflecting the prodevelopment stance of courts, the effect of this argument actually favors dormant, speculative ownership because the doctrine is not applicable unless the potentially servient estate has remained undeveloped for a substantial period due to the length of time required for a prescriptive claim to develop. In addition, the persuasiveness of the argument is undercut substantially by the economic development in England and the Commonwealth countries which have continued to recognize prescriptive easements of light.

The decisions which rely on this rationale also frequently reveal a class bias inherent in the prodevelopment position:

> The consequence of the admission of the right [to acquire easements of light by prescription] would be, that the occupants of low and inferior houses, such as are usually the first erected in new towns, at the end of a few years, would acquire rights without any act of adverse possession, which might render useless and waste the most valuable lots for business purposes or residences in our growing towns and cities.

Klein v. Gehrung, 25 Tex. (Supp.) 232, 243 (1860).

[64] Perhaps the most articulate statement of this argument is found in Stein v. Hauck, 56 Ind. 65 (1877):

> [A]n easement in light or air is unlike any other easement known to the law. It is neither an appurtenance nor a hereditament. . . . No exclusive right can be had in light or air; legislation cannot create such a right, because man has no exclusive dominion over them. They are for all in common . . . . To give a right of property in light or air, which can control the right to the use of land, is to make the incident greater than the principal, and allow the shadow to control the substance.

Id. at 69. Stripped of the rhetoric of the period, the argument was that the construction of a building with windows overlooking adjacent land was only the exercise of a legal right. Since the builder did not impinge upon any right of the

worked an injustice because such easements were not "open and apparent."[65] Frequently courts presented a jumble of these arguments

adjoining landowner, the adjoining landowner did not have a cause of action, and thus the builder was not adverse to the rights of the adjoining landowner. Lacking the element of adversity, which courts were beginning to require, no prescriptive right could arise. *See, e.g.*, Ray v. Sweeney, 77 Ky. (14 Bush) 1 (1878); King v. Miller, 8 N.J. Eq. 559 (1851); Austin v. Bloch, 165 Or. 116, 105 P.2d 868 (1940). This argument embodies a confusion between elements of adverse possession (applicable to claims of a fee interest) and those of the lost grant theory (applicable to the acquisition of easements). The common-law ability to acquire a prescriptive easement arose from the common-sense idea that long-continued use gave rise to the presumption that the use was rightful, *i.e.*, stemmed from a grant of the right. Adverse possession, on the other hand, required hostility to the interests of the rightful owner because the adverse claimant would obtain title to the land. Despite the obvious dissimilarity of both the tests and the underlying policies, courts frequently mixed elements of both tests. Thus the court in *Parker v. Foote* argued that to "authorize the presumption [of a grant] the enjoyment must not only be uninterrupted for the period of 20 years, but it must be adverse, not by leave or favor." 19 Wend. at 313. *See generally* Simonton, *Fictional Lost Grant in Prescription—A Nocuous Archaism*, 35 W. VA. L.Q. 46 (1928).

[65] Running through the cases is the often-expressed fear that the owner of undeveloped land

> may "stand by" while the invading claim, which is finally to embarrass, if not to destroy, the usefulness of his land, is gradually accruing against him, until it becomes a vested right, which he cannot dispute. . . . No one should stand in danger of unwittingly suffering burdens to be laid upon his property, nor be constantly compelled to guard against such an insidious invasion of his rights.

Stein v. Hauck, 56 Ind. 65, 69–70 (1877). This fear has been incorporated into the modern American tests for prescription. To be sufficient to support a claim of prescription, the use must be open, apparent, continuous, notorious, adverse, uninterrupted, and under a claim of right. *See generally* 2 AMERICAN LAW OF PROPERTY §§ 8.53–.58 (A.J. Casner ed. 1952); 5 RESTATEMENT OF PROPERTY §§ 457–60 (1944); Cook, *supra* note 52. Such requirements reflect the general judicial hostility to the transfer of property rights by prescription. Because the purpose served by these requirements is merely to ensure that the use be sufficiently apparent so that the potentially servient owner have constructive notice, actual notice, such as would be present from the installation of a solar collector, should be sufficient.

In addition, a few courts that were predisposed against the doctrine reasoned that no American lights were ancient because they had not existed since 1189. *Compare* Hayden v. Dutcher, 31 N.J. Eq. 217 (1879), Lynch v. Hill, 24 Del. Ch. 86, 6 A.2d 614 (1939) *and* Comment, *Ancient Lights*, 10 ALB. L.J. 65 (1874) *with* Clawson v. Primrose, 4 Del. Ch. 643 (1873) *and* Comment, *Ancient Lights*, 9 ALB. L.J. 403 (1874). *See also* Annot., 46 Am. Dec. 578 (1886).

A few states enacted statutes expressly abolishing the doctrine. *E.g.*, GA. CODE ANN. § 85–1201 (1970); MASS. ANN. LAWS ch. 187, § 1 (Michie/Law. Co-op. 1969); R.I. GEN. LAWS § 34–7–3 (1970); W. VA. CODE § 2–1–2 (1971). Even statutes that provided "the right of way, air, light or other easement, from, in, upon, or over, the land of another, shall not be acquired by adverse use, unless such use shall have continued for twenty years" were not immune from a construction which abolished the rule. Stein v. Hauck, 56 Ind. 65, 70–71 (1877); Pierre v. Fernald, 26 Me. 436, 442 (1847).

that reveals a lack of analytical thought: once opinion had clearly shifted against the rule, courts rushed to join the emerging majority.[66] At present no American common-law jurisdiction[67] affirmatively recognizes an ability to acquire an easement of light by prescription.[68]

These arguments, which seemed persuasive to nineteenth century courts, appear much less so now. The rejection of the doctrine was based upon the use of sunlight as a source of illumination rather than as an energy resource[69] and upon the economic conditions prevalent in the nineteenth century. Therefore, a reexamination of the question in light of the current social and economic environment, the need for new energy sources, and the advantages of solar energy, rather than a misplaced reliance on precedents from another era, is appropriate.[70]

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[66] *See, e.g.*, Ward v. Neal, 35 Ala. 602 (1860), *on rehearing* 37 Ala. 500 (1861); Lapere v. Luckey, 23 Kan. *534 (1880).

[67] Louisiana, a civil-law jurisdiction, still recognizes a servitude of light that may be acquired prescriptively. *See* Goodwin v. Alexander, 105 La. 658, 30 So. 102 (1901); LA. CIV. CODE ANN. arts. 674, 711, 715, 717, 782 (West 1952); Comment, *Adjoining Landowners: Right to Light and Air*, 34 TUL. L. REV. 599 (1960). The point remains theoretically open in a number of other states.

[68] A case that illustrates the failure of courts to reexamine the possible application of the doctrine is Fountainebleau Hotel Corp. v. Forty-Five Twenty-Five, Inc., 114 So. 2d 367 (Fla. Dist. Ct. App. 1959). The Eden Roc, a luxury hotel on Miami Beach, sought to enjoin an adjoining hotel from constructing an addition that would cast a shadow over the Eden Roc's swimming pool. In dismissing the temporary injunction granted by the circuit court, the appellate court noted only:

> There being . . . no legal right to the free flow of light and air from the adjoining land, it is universally held that where a structure serves a useful and beneficial purpose, it does not give rise to a cause of action . . . even though it causes injury to another by cutting off the light and air . . . .

Id. at 359.

[69] A major limitation on the utility of all current legal theories as methods of ensuring access to insolation is the fact that the law has been concerned with sunlight only as a source of illumination. Until recently concern with the use of sunlight as an energy resource has not been articulated. Doctrines applicable to illumination will require extensive modification if they are to be extended to provide for the use of sunlight as a source of energy. Rights to light as illumination may, however, be indistinguishable in fact from solar easements. While solar energy is transmitted on a broader band of the electromagnetic spectrum than visible light (because usable energy is contained in both the infrared and ultraviolet regions), the fact that there is no method of obstructing invisible solar radiation without also obstructing some visible light has led two proponents of solar energy to argue that a right to light as illumination "includes or implies" a solar easement. Eisenstadt & Utton, *supra* note 15, at 374. Because illumination does not reguire direct insolation, however, it is questionable whether the courts, with their apparent hostility to a right to light, will agree with this conclusion.

[70] England has continued to follow the doctrine and therefore offers some evidence of the possible effects of a readoption of it in this country. The modern

Even if courts reexamine their rejection of the doctrine, ancient lights is less than an ideal method of ensuring access to solar energy. Its adaptability to present conditions is limited by presumptions created for resolving problems that arise when sunlight is viewed only as a source of illumination. The substantial time generally required for prescription,[71] for example, is not suited to the use of sunlight as an energy resource. Thus, although the doctrine offers the most obvious common-law model, its potential utility is limited.

(b) Implied Easements of Light

Despite their theoretical differences, the doctrines of implied[72] and

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English formulation of the doctrine was enunciated in the decision of the House of Lords in Colls v. Home & Colonial Stores, Ltd., [1904] A.C. 179. After noting that the logical application of a rule allowing no deprivation of light "would render it almost impossible for towns to grow, and would formidably restrict the rights of people to utilise their own land," *id.* at 182, the Lord Chancellor formulated the proper test as whether the defendant has "so materially interfered with the light previously enjoyed by the plaintiffs as to amount to a nuisance." *Id.* at 185. The difficulty inherent in determining what constitutes a material interference and the development of the "grumble line" test ("the point whereat ordinary common sense people would begin to grumble at the quantum of light," Charles Semon & Co. v. Bradford Corp., [1922] 2 Ch. 737, 747–48) are examined in Fishenden v. Higgs & Hill Ltd., [1935] 153 L.T.R. (n.s.) 128 (C.A.) and Ough v. King, [1927] 3 All E.R. 859 (C.A.). *See also* R. COMBE, A TREATISE UPON THE LAW OF LIGHT (1911); Wilkinson, *Let There Be More Light*, 118 NEW L.J. 7 (1968).

The effects of heavy bombing of English cities during World War II led to the reformulation of the doctrine with the passage of the Rights of Light Act, 1959, 7 & 8 Eliz. 2, c. 56 (1959). The Act allows a potentially servient owner to interrupt the running of the prescriptive period by filing a notice. *Id.* § 2. *See also* Note, *Access to Light: Obstruction by Notice*, 230 LAW TIMES 77 (1960). The intention of the Act was to encourage more intensive development of land by discouraging the vesting of rights to light. *See* COMMITTEE ON THE LAW RELATING TO RIGHTS TO LIGHT, REPORT 8, 11 (Cmnd. 473 1958). Although over two hundred cases were filed during the early years under section 2 of the Act, the actual effect appears to have been less than expected. *See* Greene, *Rights of Light*, 109 SOLICITORS' J. 768, 769 (1965); Greene, *Rights of Light*, 112 LAW J. 467, 468 (1962). A recent Law Reform Committee report on prescription argued that the obstruction-by-notice provision employed in section two are too "cumbersome." Wilkinson, *Law Reform Committee: Fourteenth Report on the Acquisition of Easements and Profits by Prescription*, 30 MOD. L. REV. 189, 191 n.22 (1967).

The doctrine apparently remains in effect in Canada. *See, e.g.*, Feigenbaum v. Jackson, [1901] 8 B.C. 417; 10 CANADIAN ENCLYCLOPEDIC DIGEST, Easements § 5 (2d Western ed. 1960).

[71] Oregon, for example, has a ten-year statute of limitations for adverse possession. ORS 12.050 (1975). The courts have adopted the same period for the prescriptive acquisition of an easement. *E.g.*, Feldman v. Knapp, 196 Or. 453, 250 P.2d 92 (1952).

[72] The creation of an easement by implication rests upon the implied intent

prescriptive easements of light frequently have been treated as being synonymous.[73] Thus, following the initial period when courts were willing to imply an easement of light into the conveyance of a house with windows overlooking land retained by the grantor,[74] most jurisdictions rejected the common-law doctrine.[75]

A number of jurisdictions, however, recognized an exception to the majority rule in the event of necessity. The degree of necessity required varies substantially,[76] though the best position requires "reasonable necessity."

Unfortunately, the utility of this doctrine is limited in its potential application to solar collectors by the requirement that the use of the sunlight, if it is to be implied into the conveyance, must have existed when the land was transferred by the grantor. While an action could be brought to insure light to existing windows, this would not provide a solar right. Such an approach also might encounter little sympathy in the courts.

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of the parties, inferred "from the circumstances under which the conveyance was made rather than from the language of the conveyance." RESTATEMENT OF PROPERTY § 476, Comment a (1944). The grantor is presumed to include in the grant everything reasonably necessary for the enjoyment of the property conveyed. For example, if *A*, the owner of two parcels of land only one of which has access to a highway, conveys the landlocked parcel to *B*, an easement of way will be implied into the grant. *See generally* RESTATEMENT OF PROPERTY §§ 474-76 (1944); 2 AMERICAN LAW OF PROPERTY §§ 8.31–.43 (A.J. Casner ed. 1952).

[73] "[T]his doctrine of easements in light and air, founded upon sheer necessity and convenience, like the kindred doctrine of 'ancient windows,' or prescriptive right to light and air by long user . . . are [both] based upon similar reasons and considerations, and both should stand or fall together." Mullen v. Stricker, 19 Ohio St. 135, 143–44 (1869). For an example of the more common, unprincipled mingling of the theories, see McDonald v. Bromley, 24 Leg. Inst. 157, 6 Phila. Rep. 302 (C.P. Philadelphia, Pa. 1867). *See also* 23 ILL. L. REV. 399 (1928).

[74] *E.g.*, United States v. Appleton, 24 F. Cas. 841 (C.C.D. Mass. 1833) (No. 14, 463) (Story, J.); Janes v. Jenkins, 34 Md. 1 (1871); Story v. Odin, 12 Mass. 157 (1815); Sutphen v. Therkelson, 38 N.J. Eq. 318 (1884).

[75] *E.g.*, Kennedy v. Burnap, 120 Cal. 488, 52 P. 843 (1898); Baird v. Hanna, 328 Ill. 436, 159 N.E. 793 (1928); Boyd v. McDonald, 81 Nev. 642, 408 P.2d 717 (1965).

[76] The degree of necessity has been variously defined. Courts have specified standards ranging from "necessary for the reasonable enjoyment," *e.g.*, Puorto v. Chieppa, 78 Conn. 401, 62 A. 664 (1905) (dictum); Greer v. Van Meter, 54 N.J. Eq. 270, 33 A. 794 (1896); to "absolute and actual necessity," *e.g.*, Hampe v. Elia, 251 Mass. 465, 146 N.E. 730 (1925); Maioriello v. Arlotta, 364 Pa. 557, 73 A.2d 374 (1950). Some jurisdictions also require that an alternative lighting source not be readily or economically available. *E.g.*, Nomar v. Ballard, 134 W. Va. 492, 60 S.E.2d 710 (1950). Georgia has statutorily provided for an implied easement of light when it is "necessary for the reasonable enjoyment." GA. CODE ANN. §§ 85-1201 (1970). *See also* 23 ILL. L. REV. 399 (1928). New Jersey is the only jurisdiction with a significant amount of litigation on the question. *See* Kanis, *Implied Easements of Light and Air*, 63 N.J.L.J. 142 (1940).

At a minimum, however, in those jurisdictions which recognize the necessity exception, a grantor who constructs and sells a solar home, and the subsequent grantees of adjacent parcels,[77] could be prevented from obstructing the sunlight. The minority rule, therefore, should be of increasing efficacy as the number of solar developments increase. Those jurisdictions which have rejected the doctrine should reconsider the validity of their precedents in light of the changed circumstances.

2. An Abutting Landowner's Easement in a Public Street

A landowner whose property abuts a public street or highway has a "right to receive light from the space occupied by the street."[78] This right can be enforced, independent of the ownership of the fee of the roadway, either by an injunction to halt the construction or to remove the obstruction, or by a suit for damages.[79]

The value of this class of easements of light lies in the fact that the courts clearly have recognized a property interest in light, rather than in its actual utility as a method of insuring solar access. Because most buildings are not located on the north sides of streets where they would receive sunlight from the street, and because the doctrine does not prevent the obstruction of light by construction on the other side of a street, the theory in itself is insufficient. The doctrine does have significant precedential value, however, because the recognition of a property interest in light counters one of the primary justifications advanced for rejecting the doctrine of ancient lights.[80]

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[77] Subsequent grantees are barred on the grounds that the grantor is incapable of conveying a greater interest than the grantor owns. Since the grantor does not own the right to obstruct the lights, the power to do so cannot be conveyed to a grantee.

[78] Williams v. Los Angeles Ry., 150 Cal. 594, 595, 89 P. 330, 331 (1907). *See also* Story v. New York El. Ry., 90 N.Y. 122 (1882); Townsend, Grace & Co. v. Epstein, 93 Md. 537, 49 A. 629 (1901). *Contra*, Probasco v. City of Reno, 85 Nev. 563, 459 P.2d 772 (1969).

[79] The abutting owner's easement is subordinate to the public's use of the road as a road. *E.g.*, Bacich v. Board of Control, 23 Cal. 2d 343, 144 P.2d 818 (1943); Willamette Iron Works v. Oregon Ry. & Navigation Co., 26 Or. 224, 37 P. 1016 (1894); Park Hotel v. Ketchum, 184 Wis. 182, 199 N.W. 219 (1924). Thus, the abutter may enjoin a private party's interference with the easements. *E.g.*, First Nat'l Bank v. Tyson, 133 Ala. 459, 32 So. 144 (1902); Northio Theatres Corp. v. 226 Main St. Hotel Corp., 313 Ky. 329, 231 S.W.2d 65 (1950); Bischof v. Merchants' Nat'l Bank, 75 Neb. 838, 106 N.W. 996 (1906). Not all governmental interferences will be enjoined, however. The distinctions drawn between governmental actions which constitute new servitudes on a street, and thus require compensation, and those which do not frequently are metaphysical. *See generally* Cormack, *Legal Concepts in Cases of Eminent Domain*, 41 YALE L.J. 221 (1931).

[80] *See* note 64 *supra*.

B. Contractual Guarantees

Contractual agreements between adjoining landowners presently offer the most certain method of insuring uninterrupted access to sunlight. Such easements may be created through agreements directly between the concerned parties or through the inclusion of suitable restrictions contained in deeds that convey land within a certain area, frequently a residential or commercial development.

It is universally conceded that a property interest in light may be created by express grant,[81] covenant,[82] or reservation[83] in a deed or other instrument.[84] While a lawyer employed to draft the necessary instrument may encounter unfamiliar complexities such as specification of the relevant angles, height limitations, and apportionment of the costs of keeping vegetation trimmed, the instrument can be modeled on forms used for more traditional easements. The usual difficulties of ensuring that the interest will run with the land are present and must be resolved.[85]

In some instances, restrictions on the use of land that antedate the utilization of solar energy may serve to guarantee solar access. Courts

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[81] Most jurisdictions have recognized the ability to create such interests either by case or statutory law. *See, e.g.*, Baird v. Hanna, 328 Ill. 436, 159 N.E. 793 (1927); Trustees of Columbia College v. Lynch, 70 N.W. 440 (1877); CAL. CIV. CODE § 801(8) (West 1954).

[82] A covenant is an agreement between two or more landowners which will run with the land and bind subsequent owners if it fulfills certain common-law requirements. While not an interest in land, a covenant is more than a contract. *See, e.g.*, Rosenkrans v. Snover, 19 N.J. Eq. 420 (1869); M.T. Garvin & Co. v. Lancaster County, 290 Pa. 448, 139 A. 154 (1927). If the covenant does not run at law, equity frequently will enforce it as an equitable servitude against assignees of the land with notice of its provisions. *See generally* Reno, *The Enforcement of Equitable Servitudes in Land* (pts. 1–2), 28 VA. L. REV. 951, 1067 (1942).

[83] A reservation is a creation of a new interest in the grantor in the land conveyed to the grantee. *See, e.g.*, Petersen v. Friedman, 162 Cal. App. 2d 245, 328 P.2d 264 (1958); Hasselbring v. Koepke, 263 Mich. 466, 248 N.W. 869 (1933).

[84] The requirements of the Statute of Frauds must be met because an interest in land is being conveyed. *See, e.g.*, Miller v. Lawlor, 245 Iowa 1144, 66 N.W.2d 267 (1954).

[85] Jurisdictions which strictly construe the requirement that the interest must "touch and concern" land if it is to run, might hold the benefit to be too personal. Although this conclusion seems unlikely, it would prevent the running of the interest. *See generally* RESTATEMENT OF PROPERTY, §§ 454, 489–92, 537 (1944); Simes, *Assignability of Easements in Gross in American Law*, 22 MICH. L. REV. 521 (1924). A statute specifically recognizing the validity of such easements, restrictions, and covenants could eliminate potential problems that surround the question of ensuring that the agreement will run with the land. *See, e.g.*, CONN. GEN. STAT. ANN. § 47–42b (West Supp. 1977) and MASS. ANN. LAWS ch. 184, §§ 31–33 (Law. Co-op. Supp. 1977) which provide for the recognition and enforcement of conservation and preservation easements.

frequently have looked to the function, rather than the terminology, of the right in question and have given effect to easements of light that were not thus denominated. Instruments containing building line[86] and height restrictions,[87] for example, have been construed to create such easements.

Although these agreements offer the owner of a solar energy system a high degree of certainty, their potential utility is limited. Primarily, the necessity to purchase the easement adds to the cost of the system.[88] Additionally, because the easement is real property, there is the possibility that it will be included in the assessment for property tax purposes.[89] Either result will have a substantial negative impact on solar energy use, which is presently only approaching economic competitiveness with traditional energy resources. Thus agreements between landowners are not an ideal solution to the problem of ensuring access to solar energy.

Prospectively, the incorporation of restrictive covenants into deeds conveying land within a large development offers a solution to the cost problem. If the developer/grantor inserts similar restrictions[90] into deeds, or incorporates a general development plan into the conveyances by reference,[91] courts normally will enforce the restrictions. Thus a

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[86] *E.g.*, Muzzarelli v. Hulshizer, 163 Pa. 643, 30 A. 291 (1894); Settegast v. Settegast Realty Co., 242 S.W. 485 (Tex. Civ. App. 1922). *But cf.* Snyder v. Plankenhorn, 398 Pa. 540, 159 A.2d 209 (1960) (building line held to be for status rather than light). Given courts' generally lukewarm support of rights to light, it is questionable whether they will be willing to construe such restrictions to provide solar access, especially because the original parties to the restrictions are unlikely to have considered such uses when they drafted the agreement.

[87] *E.g.*, Coudert v. Sayer, 46 N.J. Eq. 386, 19 A. 190 (1890); McDonough v. W.W. Snow Constr. Co., 131 Vt. 436, 306 A.2d 119 (1973).

[88] Due to the necessity of keeping the solar horizon unobstructed over a large area, the owner of a solar energy system would be required to purchase easements over noncontiguous lots. *See* note 50 *supra.*

[89] *See generally* Macht v. Department of Assessments, 266 Md. 602, 296 A.2d 162 (1972) (tax assessment on an easement of light and air upheld); Comment, *Taxation of Easements in Airspace*, 33 MD. L. REV. 159 (1973); Note, note 44 *supra.*

[90] The restrictions inserted or incorporated into the deeds do not have to be identical. The controlling question is whether there is sufficient evidence of a general developmental scheme. *Compare* Humphreys v. Ibach, 110 N.J. Eq. 647, 160 A. 531 (1932) (general scheme found although building setback lines varied) *and* Snashall v. Jewell, 228 Or. 130, 363 P.2d 566 (1961) (general plan discerned although height restrictions not present in all deeds) *with* Tidd v. Fifty Assocs., 238 Mass. 421, 131 N.E. 77 (1921) (variation in setback lines indicative of lack of general developmental plan).

[91] *E.g.*, Russell v. Palos Verde Properties, 218 Cal. App. 2d 754, 32 Cal. Rptr. 488 (1963) (reference in deeds to recorded instrument containing restrictions); Sunset Hills Homeowners Ass'n v. Karel, 39 Ill. App. 2d 477, 189 N.E.2d 41 (1963) (restrictions contained on recorded plat); Blum v. Hodapp, 87 Ohio App. 45, 86 N.E.2d 807 (1949) (restrictions noted on recorded plat).

developer constructing a group of solar buildings can guarantee uninterrupted sunlight to the potential purchasers by including such restrictions.[92]

Unfortunately, while such areawide restrictions are an effective and relatively simple solution, they are too cumbersome to be applied to existing neighborhoods. The difficulty of obtaining the necessary degree of unanimity will generally preclude the use of this method. Unless existing restrictions can be construed to provide the necessary guarantees, the costs and negotiation difficulties of contractual agreements are likely to prevent widespread use in existing neighborhoods.

C. Legislation

1. The Response to the Energy Crisis

State legislatures have shown an increasing concern with energy-related problems. Since the energy crisis of 1973, more than half of the states have enacted energy legislation. A majority of these statutes, however, merely established advisory and planning boards.[93]

A few states have moved beyond the planning stage and have sought to encourage the development and use of alternative energy resources. At least 25 states now have some form of tax incentives for solar energy systems.[94] While varying in detail, the incentives fall into five

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[92] Generally the courts require evidence establishing an intent by the original grantor to create a general plan of development for an ascertainable area that imposes reasonably mutual burdens and benefits among the parcels conveyed. *See generally* Clark, *Equitable Servitudes*, 16 MICH. L. REV. 90 (1917); Reno, note 82 *supra*; Williams, *Restrictions on the Use of Land: Covenants Running with the Land at Law*, 27 TEX. L. REV. 419 (1949).

[93] *See, e.g.*, CAL. PUB. RES. CODE §§ 25000–25968 (West Supp. 1976); MONT. REV. CODE ANN. §§ 84–7401 to 7413 (Smith Supp. 1975); N.Y. PUB. AUTH. LAW §§ 1850–1870 (McKinney Supp. 1976); ORS 469.010–.992 (1975). In addition, the legislatures in a few states have enacted laws designed primarily to promote the most plentiful local energy resource or to obtain federal funding for an energy-related research institute. *See, e.g.*, ARIZ. REV. STAT. §§ 41–571 to 575 (West Supp. 1976) (solar energy); COLO. REV. STAT. §§ 23–41–114 to 115 (Supp. 1976) (energy-related minerals); KY. REV. STAT. §§ 152.750–.785 (Supp. 1976) (coal).

[94] For a list of these states, see notes 95–99 *infra*. *See also* 1 NATIONAL CONFERENCE OF STATE LEGISLATURES, TURNING TOWARD THE SUN (1976). The importance of a tax incentive is apparent when the potential effect of taxation on the cost competitiveness of solar devices is reduced to numbers. Since such installations are substantial capital investments, if their value is added to the assessed valuation of a house, a sizable tax increase will result. Thus a tax rate of 3%, *i.e.*, $30 per $1,000 assessed valuation, would add $150 per year to the cost of a $5,000 collector.

The President's energy program includes a tax incentive for the installation of solar energy equipment. The proposal would allow a tax credit of 40% of the initial $1,000 of cost and 25% for the next $6,400. The credit would gradually be reduced and would expire at the end of 1984. National Energy Policy (Fact Sheet), *supra* note 3, at 583. A similar tax credit proposed in 1976 was deleted in confer-

classes: first, a depreciation allowance for the cost of the solar device;[95] second, the application of a lower rate of taxation to the value of the collector;[96] third, a property tax exemption for at least part of the purchase and installation cost;[97] fourth, an income tax allowance for part of the system's cost;[98] and fifth, an exemption from sales taxes.[99] In addition, at least two states have provided for the modification of build-

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ence. *Compare* Tax Reform Act of 1976, H.R. 10612, § 2002, 94th Cong., 2d Sess. (1976) *with* I.R.C. §§ 161–220.

[95] ARIZ. REV. STAT. § 43–123.37 (West Supp. 1976) (depreciated over 36 months); TEX. TAX-GEN. ANN. art. 12.01(6) (Vernon Supp. 1976) (corporations only, over a period of not less than 60 months).

[96] COLO. REV. STAT. § 39–5–105 (Supp. 1976) (taxed at 5% rather than 30%).

[97] *E.g.*, CONN. GEN. STAT. ANN. § 12–81(56) (West Supp. 1977), *as amended by* Act of June 20, 1977, ch. 77–490, 1977 Conn. Legis. Serv. 866 (exempts difference in cost of solar and conventional system for fifteen years); ILL. ANN. STAT. ch. 120, §§ 501d–1 to 3 (Smith-Hurd Supp. 1977) (cost difference exempt); MASS. ANN. LAWS ch. 59, § 5(45) (Law. Co-op. Supp. 1977) (ten-year tax exemption); MONT. REV. CODES ANN. § 84–7403 (Smith Supp. 1975) (cost exempt up to $100,000; over $100,000 taxed at a lower rate); N.H. REV. STAT. ANN. § 72:61–64 (Supp. 1975) (cities and towns may exempt cost of solar energy systems); Act of June 28, 1977, ch. 322, 1977 N.Y. Laws 423 (to be codified at N.Y. REAL PROP. TAX LAW § 487 (McKinney)) (cost difference exempt for 15 years); ORS 307.030 (note) (1975) (ten-year exemption of cost difference); Act of July 14, 1977, ch. 364, 1977 Wash. Legis. Serv. 1293 (to be codified in WASH. REV. CODE § 34.04 (cost difference exempt)). Arizona, Hawaii, Indiana, Maryland, Michigan, Nevada, North Dakota, South Dakota, and Vermont also have enacted some form of property tax exemption.

In addition, Texas has provided incentives for businesses engaged in solar energy development by exempting receipts from the sale, lease, or rental of solar devices from taxation. TEX. TAX-GEN. ANN. art. 20.04(DD) (Vernon Supp. 1976). Similarly, corporations engaged exclusively in the manufacture, sale, or installation of solar devices are exempt from the franchise tax. *Id.* art. 12.03(r). Montana has also provided for low cost loans to finance the installation of solar energy systems. MONT. REV. CODES ANN. § 84–7405 (Smith Supp. 1975). Oregon has increased the maximum loan available under the state's veteran home loan program by $3,000 to allow the installation of alternate energy systems. Act of July 11, 1977, ch. 315, 1977 Or. Laws Adv. Sh. pt. 4, at 125.

[98] *E.g.*, CAL. REV. & TAX CODE § 17052.5 (West Supp. 1977) (income tax credit of lesser of 10% of cost or $1,000); IDAHO CODE § 63–3022C (Supp. 1977) (income tax reduction of 40% of cost in year of installation, 20% of cost in each succeeding 3 years); KAN. STAT. §§ 79–32,120(c)(v); 79–32,166–171 (Supp. 1976) (credit for lesser of 25% of cost or $1,000); N.M. STAT. ANN. § 72–15A–11.3 (Smith Supp. 1975) (credit of lesser of 25% of cost or $1,000); Act of June 15, 1977, ch. 196, 1977 Or. Laws Adv. Sh. pt. 2, at 188 (credit of lesser of 25% of cost or $1,000). In addition, Arizona, Colorado, Hawaii, Massachusetts, Montana, North Carolina, and Oklahoma have exempted solar devices from sales taxes.

[99] *E.g.*, Act of June 20, 1977, ch. 77–457, 1977 Conn. Legis. Serv. 802 (to be codified at CONN. GEN. STAT. ANN. § 12–412(dd) (West)) (solar collectors exempt from sales tax for 5 years). Georgia, Michigan, and Texas also exempt solar energy systems from sales taxes.

ing codes to meet solar heating and cooling objectives.[100]

Only two states, however, have demonstrated any recognition of the problem of solar access. In 1975 the Colorado legislature enacted a solar easement law.[101] The Act is primarily a recording statute, requiring the easement to be in writing and to include at a minimum the "vertical and horizontal angles, expressed in degrees, at which the solar easement extends over the real property subject" to it.[102]

Also in 1975, the Oregon Legislative Assembly amended the land use planning and zoning enabling statutes to include the requirement that county planning commissions consider "natural resources, including incident solar energy . . . and utilization thereof" in the formulation of "any comprehensive plan and all zoning, subdivision or other ordinances."[103] The planning commissions were also given the authority to recommend ordinances "protecting and assuring access to incident solar energy."[104]

These two approaches, Colorado's reliance upon private action and Oregon's reliance upon zoning and land use planning, represent the most acceptable alternatives. While both offer potential advantages, neither statute effectively provides the assurance of solar access required to stimulate widespread conversion to solar energy.[105]

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[100] California allows cities and counties to specify roof pitch and directional alignment to facilitate solar retrofitting. CAL. HEALTH & SAFETY CODE § 17959 (West Supp. 1977). Florida requires all single-family residences to be designed to facilitate future installation of solar water-heating equipment. FLA. STAT. ANN. § 553.87 (West Supp. 1977).

In addition, at least three states have established procedures to set standards for solar heating and cooling equipment. *See* CONN. GEN. STAT. ANN. § 16a-14(8) (West Supp. 1977); FLA. STAT. ANN. § 377.705 (West Supp. 1977); MINN. STAT. ANN. § 116H.127 (West 1977).

[101] COLO. REV. STAT. §§ 38-32.5-101 to 102 (Supp. 1977).

[102] *Id.* § 102(a). A similar measure introduced in Washington died in committee. *See* S. 360, 45th Wash. Legis., 1st Extraordinary Session (1977).

[103] ORS 215.055(1) (1975).

[104] ORS 215.110(2) (1975). The most innovative solar legislation, however, was inadvertently repealed. An amendment to the city planning requirements specified that the city "shall not unreasonably restrict construction where site slope and tree cover make incident solar collection unfeasible, except *an existing solar structure's sun plane shall not be substantially impaired.*" Act of May 19, 1975, ch. 153, § 4, 1975 Or. Laws 167 (repealed 1975) (emphasis added). When the same section of the planning law was subsequently amended, and the second amendment did not reenact the first, an anomalous provision of the Oregon Constitution automatically repealed the first amendment. Interview with Rep. David Frohnmayer, floor manager of the initial amendment, in Eugene, Oregon (Dec. 20, 1976).

[105] While recognizing the ability of a landowner to create a property interest in solar access, the Colorado statute does not change the common law. In addition, the measure will increase the cost of solar energy because the landowner seeking

The most significant legislative attempt to guarantee solar access was a bill introduced in the 94th United States Congress.[106] The bill, which died in the Banking, Currency, and Housing Committee, provided in part:

> No State or local zoning law, regulation, ordinance, or other provision may permit the construction of any building or other object . . . in any location or manner which would obstruct or otherwise interfere with sunlight necessary for the operation of any solar heating equipment, solar cooling equipment, or combined solar heating and cooling equipment which is in use on any building on the date on which any permit or other authorization for such construction is issued.[107]

As a straightforward solution to a complex problem, this bill would have resolved the question of solar access. It deserved more than the silent death that it received.

2. Zoning

Because it is widespread, adaptable, and generally accepted, several commentators have suggested zoning as the most advantageous method of ensuring solar access.[108] A number of municipalities already have adopted simple solar zoning or building ordinances which protect solar access.[109] It is clearly possible to ensure solar access through such traditional zoning devices as height limitations and setback requirements.

While the power to zone is not limitless, as an instance of the state's general police powers local zoning boards traditionally have been allowed broad discretion.[110] Solar zoning ordinances can easily be drafted to comply with the requirements of the due process[111] and equal pro-

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to install a solar energy system will be required to purchase easements. *See* notes 88–89 and accompanying text *supra*. The Oregon approach also is insufficient because it fails to create the property interest in sunlight that is necessary to protect the owner of a solar installation adequately. *See* notes 29–42 and accompanying text *supra*.

[106] H.R. 11677, 94th Cong., 2d Sess. (1976).

[107] *Id.* § 2(a).

[108] *See, e.g.*, American Bar Foundation, *supra* note 13, at 18; Eisenstadt & Utton, note 15 *supra*; Comment, *Securing Solar Energy Rights: Easements, Nuisance, or Zoning?*, 3 COLUM. J. ENVT'L L. 112 (1976).

[109] *See, e.g.*, Eisenstadt & Utton, *supra* note 15, at 387–89 (reprinting the comprehensive zoning plan for Albuquerque and Bernalillo County, Arizona).

[110] *See, e.g.*, Feiler, *Zoning: A Guide to Judicial Review*, 47 J. URB. L. 319 (1969).

[111] Section 1 of the fourteenth amendment provides, in part, that no state shall "deprive any person of life, liberty, or property, without due process of law." The due process clause has been construed to require that the ordinance be reasonably related to a permissible state goal. Sunlight as a source of illumination has been recognized to be necessary for the public's health and welfare, and ordi-

tection clauses.[112] Similarly, such ordinances should not, except in the most extreme situations, regulate the use of property to the extent necessary to constitute an unconstitutional taking of property without just compensation.[113]

Because it is practically possible and constitutionally permissible does not mean, however, that zoning is a satisfactory solution to the problem. While the landowner has the limited right that no changes in the zoning regulations affecting his land be made unless required by the public interest,[114] this right falls far short of the vested property inter-

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nances designed to secure sunlight have, therefore, been upheld as embodying a permissible state objective. In Euclid v. Ambler Realty Co., 272 U.S. 365 (1926), for example, the Court held that the desire to prevent large buildings from "monopolizing the rays of the sun which otherwise would fall upon smaller homes" was a valid state objective. *Id.* at 394. Similarly, the courts have increasingly recognized that "[e]sthetic, open space, and environmental considerations are valid bases for regulation . . . . Thus, in considering the fairness of the restrictions imposed, the burden of the Act upon local owners must be balanced against the broader interests of the region and the State." Horizon Adirondak Corp. v. State, 88 Misc. 2d 619, —, 388 N.Y.S.2d 235, 243 (Ct. Cl. 1976). *See also* Berman v. Parker, 348 U.S. 26, 33 (1954). Given the relationship between energy and the general welfare, the promotion of the use of solar energy should also be an acceptable basis for regulating property.

[112] Section 1 of the fourteenth amendment provides that no state shall "deny to any person within its jurisdiction the equal protection of the laws." The equal protection clause has been interpreted to require that the classification scheme employed in the statute not be arbitrary, irrational, or suspect. Because the group affected by a solar zoning ordinance (all of the landowners within the specified area) is not on its face a suspect classification, the ordinance would be subject to only minimum scrutiny. Solar zoning can satisfy this requirement easily.

[113] The fifth amendment specifies that "private property [shall not] be taken for public use without just compensation." By the end of the nineteenth century, this requirement had been held to be incorporated into the fourteenth amendment's due process clause. Chicago, B. & Q. Ry. v. Chicago, 166 U.S. 226 (1896). The taking issue presents potential difficulties, largely because the scope of what constitutes a taking remains unclear. For the best review of the entire question, see F. BOSSELMAN, D. CALLIES, & J. BANTA, THE TAKING ISSUE (1973).

The possibility of a constitutional challenge is present because solar zoning would require landowners to surrender the right to develop some of the airspace superjacent to their land. Such challenges appear unlikely to succeed, however, because in most cases solar zoning regulations will not reduce the value of land more than general height limitations, which have been upheld in all but the most extreme situations. *See, e.g.*, Euclid v. Ambler Realty Co., 272 U.S. 365 (1926).

[114] The very limited value of this doctrine as a means of ensuring access to solar radiation was enunciated by the Illinois Appellate Court which noted that the plaintiffs' argument that amendments to the basic Chicago zoning ordinance which had eliminated sideyard requirements and resulted in a

> deprivation of air, light, and ventilation [and] a reduced value for plaintiffs' property and, thus, the ordinance is invalid. . . . [U]nder Illinois law one property owner may not acquire a prescriptive or im-

est necessary to create a solar right.[115]

In addition to the lack of a property interest, another major impediment to the use of zoning to secure solar access is the ease and frequency with which such ordinances are modified. Since 1960 a majority of the cities in this country have extensively revised their zoning ordinances, and less substantial changes occur with greater frequency.[116]

Zoning is also under attack by those who feel that less centralized methods of land use control are more effective.[117] These critics suggest the use of covenants and private nuisance actions as preferable alternatives.[118] Unfortunately, neither of these solutions will, by them-

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> plied right to air, light, or ventilation over the land of another. It therefore follows that defendants breached no common law duty [and] [c]onsequently, even though the 1957 Chicago Zoning Ordinance permits defendants to deprive plaintiffs of air, light, ventilation . . . that ordinance does not change or modify any duty owed to plaintiffs, but merely reaffirms what has long been the law in Illinois.

Cain v. American Nat'l Bank & Trust Co., 26 Ill. App. 3d 574, 579–80, 325 N.E.2d 799, 804 (1st Dist. 1975). *See also* Baker v. City of Algonac, 39 Mich. App. 526, 198 N.W.2d 13 (1972); Fasano v. Board of County Comm'rs, 264 Or. 574, 507 P.2d 23 (1973).

[115] The Supreme Court has noted that "zoning regulations are not contracts by the government and may be modified." Reichelderfer v. Quinn, 287 U.S. 315, 323 (1932). *See also* Robinson v. City of Los Angeles, 146 Cal. App. 2d 810, 304 P.2d 814 (1956); Zopfi v. City of Wilmington, 273 N.C. 430, 160 S.E.2d 325 (1968); Eggebeen v. Sonnenburg, 239 Wis. 213, 1 N.W.2d 84 (1941).

[116] Between 1960 and 1967, 54.3% of the cities with populations over 50,000 enacted or substantially revised their zoning laws. During the same period, 63.3% of the towns with populations between 5,000 and 49,999 took similar action. MANVEL, LOCAL LAND AND BUILDING REGULATION 31 (1968) (prepared for the National Commission on Urban Problems) (Research Report No. 6). In addition, local planning and zoning commissions are frequently susceptible to political pressures. *See* Makeilski, *Zoning: Legal Theory and Political Practice*, 45 J. URB. L. 1 (1967).

A recent judicial trend may, however, obviate some of the potential problems. In Fasano v. Board of County Comm'rs, 264 Or. 574 (1973), for example, the Oregon Supreme Court reversed a local zoning commission decision because the zoning change did not conform to the county's comprehensive land use plan. If courts continue to view comprehensive plans as embodying the general criteria against which specific zoning changes are to be measured, an individual might be able to rely with some confidence on existing zoning classifications. *See generally* 53 OR. L. REV. 459 (1974).

[117] *See, e.g.*, Ellickson, *Alternatives to Zoning: Covenants, Nuisance Rules, and Fines as Land Use Controls*, 40 U. CHI. L. REV. 681 (1973); Siegan, *Non-Zoning in Houston*, 13 J.L. & ECON. 71 (1970); Note, *Land Use Control in Metropolitan Areas: The Failure of Zoning and a Proposed Alternative*, 45 S. CAL. L. REV. 335 (1972).

[118] The paradigm for the majority of these critics is Houston, Texas, the only major American city without a comprehensive zoning ordinance. It should, however, be noted that "[a]lthough Houston has no zoning ordinance, it has adopted some controls over land uses that are ordinarily found in zoning ordinances."

selves, promote the use of solar energy because they do not create a property interest in sunlight.[119] Lacking such a property interest, zoning and its alternatives are at best interim measures that are incapable of satisfactorily providing the necessary guarantees.

IV

Alternative Bases for a Solar Right

Both courts and legislatures have the power, skill, and resources to fashion the property interest that is required to encourage the use of solar energy. While the alternatives available to each institution differ, a satisfactory resolution of the problem will necessitate consideration of similar problems. Ultimately, the different solutions must arrive at the same point: the creation of a property interest in unobstructed sunlight.

A. Judicial Solutions

One possible judicial solution is the recognition of an action in nuisance for the obstruction of sunlight. Due to the fact that private nuisance law requires a balancing of the right to use one's property with the corresponding duty not to injure others through that use,[120] it is the traditional common-law method of regulating land usage. As distinguished from a public nuisance,[121] a private nuisance is essentially an unreasonable use of land that unreasonably interferes with the use or

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Siegan, *supra* note 117, at 75. These include subdivision controls, minimum lot sizes, and building lines. In addition, the city was given the authority to enforce restrictive covenants as though it was a party to them, Tex. Cities, Towns & Villages Code Ann. art. 974a–1 (Vernon Supp. 1977), and the power to deny building permits to proposed uses that would violate such covenants, *id.* art. 974a–2. In 1976 Houston adopted an extensive solar building code. *See* Houston, Tex., Building Code ch. 88 (1976).

[119] Covenants are unsatisfactory because they will add, perhaps substantially, to the cost of solar energy. *See* notes 88–89 and accompanying text *supra*. With the abolition of the doctrine of ancient lights (a nuisance action) and the current limited recognition of a property interest in sunlight, nuisance actions remain unavailable to the potential solar owner as a method of ensuring solar access.

[120] [A] general weighing process . . . must be employed to determine where the balance of interests lies. An invasion of plaintiff's interest is unreasonable "unless the utility of the actor's conduct outweighs the gravity of the harm." Some of the specific factors considered in determining the interests of the parties are the extent and character of harm involved; the social value of the respective uses; the suitability of each use to the character of the locality in which it is conducted; the ability of the defendant or plaintiff to prevent or avoid the harm.

Gronn v. Rogers Constr., Inc., 221 Or. 226, 232–33, 350 P.2d 1086, 1089 (1960) (citations omitted).

[121] Public nuisance law is considered at notes 138–41 and accompanying text *infra*.

enjoyment of another's property.[122] Liability is predicated upon an interference that is unreasonable and an injury that is substantial.[123] These principles are effectuated by balancing the gravity of the harm against the utility of the activity.[124]

Although these rules are readily applicable to the obstruction of light, and light is similar to other interests that can be protected by nuisance actions,[125] courts generally have refused to apply traditional nuisance analysis to the obstruction of light. The decisions are marked by a notable lack of analysis. Courts frequently beg the question[126] by making a leap of logic from the rejection of the doctrine of ancient lights to the general conclusion that there is no right to light: "if the light and air be shut off damage may result . . . but it is *damnum absque injuria.* It is damage which the law does not recognize because there is no injury. Where there is no right, a deprivation works no injury."[127]

Limitations on the use of land to ensure access to light under nui-

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[122] *See generally* W. PROSSER, THE LAW OF TORTS § 89 (4th ed. 1971); RESTATEMENT (SECOND) OF TORTS § 822 (Tent. Draft No. 17, 1971).

[123] *E.g.*, Amphitheaters, Inc. v. Portland Meadows, 184 Or. 336, 198 P.2d 847 (1948); Riblet v. Spokane-Portland Cement Co., 41 Wash. 2d 249, 248 P.2d 380 (1952).

[124] *See generally* RESTATEMENT (SECOND) OF TORTS §§ 826–828 (Tent. Draft No. 17, 1971).

[125] Nuisance law has been held applicable to foul odors, Higgins v. Decorah Produce Co., 214 Iowa 276, 242 N.W. 109 (1932); Alfred Jacobshagen Co. v. Dockery, 243 Miss. 511, 139 So. 2d 632 (1962), vibrations, Transcontinental Gas Pipe Line Corp. v. Gault, 198 F.2d 196 (4th Cir. 1952); Sam Warren & Son Stone Co. v. Gruesser, 307 Ky. 98, 209 S.W.2d 817 (1948), smoke, dust, or gases, Menolascino v. Superior Felt & Bedding Co., 313 Ill. App. 557, 40 N.E.2d 813 (1942); Dill v. Dance Freight Lines, 247 S.C. 159, 146 S.E.2d 574 (1966), loud noises, Kentucky & W. Va. Power Co. v. Anderson, 288 Ky. 501, 156 S.W.2d 857 (1941); Guarina v. Bogart, 407 Pa. 307, 180 A.2d 557 (1962), excessive light, Hansen v. Independent School Dist., 61 Idaho 109, 98 P.2d 959 (1940); Shelburne, Inc. v. Crossnan Corp., 95 N.J. Eq. 188, 122 A. 749 (1923), and high temperatures, Grady v. Wolsner, 46 Ala. 381 (1871).

[126] The flaw in the courts' reasoning is that it reverses the logical order of the argument. The statement that there is no right to light should be the conclusion, rather than the first premise. Instead of avoiding the question, courts should apply traditional nuisance analysis and compare the utility of the actor's conduct with the resulting harm.

[127] Musumeci v. Leonardo, 77 R.I. 255, 260, 75 A.2d 175, 177–78 (1950); *cf.* Venuto v. Owens-Corning Fiberglas Corp., 22 Cal. App. 3d 116, 127, 99 Cal. Rptr. 350, 357 (1971) ("[A] structure is not a nuisance *merely* because it obstructs the passage of light and air to the building of the adjoining owner."). The application of nuisance laws is not, however, static. One author has noted: "Automobiles when they first appeared were nuisances to horse travel; as cars began to swamp horsedrawn vehicles in number, horses were properly perceived as the nuisance." Ellickson, *supra* note 117, at 731. As the use of solar energy increases, it is possible that courts will view shadows as nuisances.

sance law have been imposed in only one instance. While courts initially held that a landowner could erect any structure that was not a nuisance per se,[128] most now recognize an exception to this rule: if the structure serves no useful purpose and was erected for a malicious motive, the structure is a nuisance.[129] It is unfortunate that courts have been unwilling to extend this precedent and to balance the advantages and disadvantages from obstructing sunlight as in a normal nuisance case.

The large number of potential remedies[130] gives nuisance law substantial flexibility and allows courts to tailor the remedy to the facts of the case. This flexibility would permit courts to protect both a right to sunlight and the conflicting desire to develop one's land.

B. Legislative Solutions

While courts are capable of responding to the need to protect solar access, the fact that the prevailing property rights structure is biased against such rights[131] makes the legislative branch the most suitable institution to resolve the complex factual and policy problems that are involved. Litigation is a slow, costly, and uncertain method of reform. A satisfactory resolution of the problem may be reached, but only at the expense of numerous litigants and false starts. Given the lack of favorable precedents and their tepid support of a right to light, courts may be unwilling to develop the necessary doctrines. Even if they are willing, the time required to resolve the myriad details will impede the use of solar energy.

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[128] The courts' reasoning was the same as that now employed in denying a nuisance action for obstruction of light: because there was no invasion of a protected interest, the construction of a structure did not become actionable solely because of the motive of the builder. *E.g.*, Ingwersen v. Barry, 118 Cal. 342, 50 P. 536 (1897); Guest v. Reynolds, 68 Ill. 478 (1873); Mahan v. Brown, 13 Wend. 261 (N.Y. 1835); Harrison v. Langlinais, 312 S.W.2d 286 (Tex. Civ. App. 1958).

[129] The leading case is Burke v. Smith, 69 Mich. 380, 37 N.W. 838 (1888). *See also* Sundowner, Inc. v. King, 95 Idaho 367, 509 P.2d 785 (1973); Hibbard v. Halliday, 59 Okla. 244, 158 P. 1158 (1916). For a good history of the development of the modern rule, see Note, *The Effect of Motive upon Actionability in the Exercise of Rights in Real Property—Spite Wells and Spite Fences*, 11 VA. L. REV. 122 (1924). Several jurisdictions have also statutorily abrogated the common-law rule. *E.g.*, ME. REV. STAT. tit. 17, § 2801 (1965); R.I. GEN. LAWS § 34-10-20 (1970); WIS. STAT. ANN. § 280.08 (West 1958).

While most courts continue to insist that the structure serves no useful purpose, at least one court has indicated a willingness to adopt the general nuisance tests in relation to spite fences: "That the invasion of another's interest may be of some benefit to the actor makes in itself no difference. That is not the criterion. The criterion is as to whether or not the benefit exceeds the harm done." Schork v. Epperson, 74 Wyo. 286, 293-94, 287 P.2d 467, 470 (1955).

[130] Potential remedies include abatement, injunction, damages, contempt, and declaratory judgment. *See generally* Comment, *Nuisance as a Modern Mode of Land Use Control*, 46 WASH. L. REV. 47 (1970).

[131] *See* notes 30-31 and accompanying text *supra*.

On the other hand, legislatures can minimize these potential difficulties. They can quickly and effectively create a structure capable of providing the necessary solar guarantees. In addition, by manipulating the presumptions and procedures attached to the right, legislatures can effectively balance the competing interests. A number of potential methods exist to create the requisite solar right.

1. Zoning and Transferable Development Rights

While, as noted above,[132] zoning is an unsatisfactory method of providing solar access, one recent adaptation of zoning, the transferable development right (TDR) concept, is a potential means of creating a minimal solar right.

In a TDR system, land ownership is divided into two components: ownership of the physical land and ownership of the development potential traditionally associated with land. Under this approach, an initial level of permissible development is specified; this becomes the standard against which all development is compared. If the local zoning board determines that a tract of land may be developed to a density lower than the standard, the owner of the land thus designated is permitted to sell the unusable development potential. The owner may sell this TDR to either a landowner in an area which the zoning board has specified for higher than normal development[133] or to the municipality which can then resell the TDR.[134] This approach has been embraced eagerly by planning officials as a more equitable and inexpensive method of land use control.[135]

The TDR concept can be applied to solar access problems through the creation of a transferable solar right (TSR). To initiate this system, the local zoning board would specify a base level of insolation to which a landowner would be entitled.[136] Certain areas, such as resi-

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[132] *See* notes 114–19 and accompanying text *supra*.

[133] The landowner in the area designated for more intensive development is required to purchase a TDR for any development that will exceed the standard level of development specified for the entire municipality. A system of this type is currently in use in New York City. Schnidman, *Transferable Development Rights: An Idea in Search of Implementation*, 11 LAND & WATER REV. 339, 356 n.4 (1975). Similar systems are used in Collier County, Florida and Buckingham Township, Pennsylvania. *Id.* at 360–61, 368–72. *See also* 82 YALE L.J. 338 (1972).

[134] This variation is employed in Chicago. The city has created a "developments right bank" from which it sells the TDRs. For the general enabling statute, see ILL. ANN. STAT. ch. 24, §§ 11–48.2–1 to 7 (Smith-Hurd Supp. 1977). The operation of the system is described in Costonis, *The Chicago Plan: Incentive Zoning and the Preservation of Urban Landmarks*, 85 HARV. L. REV. 574 (1972).

[135] *See, e.g.*, AMERICAN SOC'Y OF PLANNING OFFICIALS, TRANSFERABLE DEVELOPMENT RIGHTS (1975) (Planning Advisory Serv. Rep. No. 304); Baker, *Development Rights Transfer and Landmark Preservation—Providing a Sense of Orientation*, 9 URB. L. ANN. 131 (1975).

[136] The base level could be specified either in terms of a minimum number of hours of insolation or, its obverse, a maximum amount of solar obstruction.

dential neighborhoods, would then be zoned for a greater amount of sunlight, while others, such as commercial or industrial districts, would be zoned for a smaller amount. An owner who wished to construct a building in one of the latter areas that would obstruct more than the base level of insolation would be required to purchase enough TSRs from owners in residential areas to cover the amount of obstruction above the base level.[137] Thus the residential owner would be compensated for the loss of the potential to obstruct sunlight.

A TSR system presents potential problems, however. The initial reception in the courts of the TDR concept has been lukewarm at best. While upholding the plans against general constitutional challenges, in most cases courts have held the law to result in an unconstitutional taking as applied to the particular parcel.[138] A TSR system presents similar problems.

In addition, it is unclear whether courts would recognize the specification of the base level entitlement as a de facto property interest or as merely a zoning specification. If it is treated as the latter, the TSR approach offers no greater assurances than does zoning alone.

The constitutional questions, the uncertainty of courts' treatment of the base level insolation entitlement, and the fact that the decisions on the level of the entitlement and the location of high insolation districts remain with the local zoning boards all suggest that a TSR system may be insufficient to provide the necessary guarantees of solar access.

2. Nuisance

The creation of a statutory nuisance action for the interruption of sunlight is a more satisfactory solution than zoning or TSR systems. Because a public nuisance is "an unreasonable interference with a right common to the public,"[139] it is a particularly appropriate method

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[137] For example, a municipality could decide that four hours of sunlight was to be the base level, with residential areas zoned for six hours and industrial areas for only two hours. A landowner who decided to construct a building in an industrial district which would obstruct six hours of sunlight would be required to purchase an aggregate TSR for two hours for the proposed building.

[138] *Compare* Lutheran Church v. City of New York, 35 N.Y.2d, 316 N.E.2d 305, 359 N.Y.S.2d 7 (1974), Fred R. French Investing Co. v. City of New York, 77 Misc. 2d 199, 352 N.Y.S.2d 762 (Sup. Ct. 1973), *and In re* Sailor's Snug Harbor v. Platt, 29 A.D.2d 376, 288 N.Y.S.2d 314 (Sup. Ct. App. Div. 1968) (holding the restriction to be a taking for which the potential sale of the TDR was not "just compensation") *with* Penn Cent. Trans. Co. v. City of New York, 50 A.D.2d 265, 377 N.Y.S.2d 20 (Sup. Ct. App. Div. 1975) (upholding the application of the statute to Grand Central Station). *See also* Note, *The Unconstitutionality of Transferable Development Rights*, 84 YALE L.J. 1101 (1975).

[139] RESTATEMENT (SECOND) OF TORTS § 821B (1) (Tent. Draft No. 17, 1971). *See generally* W. PROSSER, *supra* note 121, § 88. It is not necessary that the entire community be affected by the nuisance. It is enough that the action will interfere with those who come into contact with it in the exercise of a public right. *See,*

of prohibiting conduct that is contrary to the public interest. The designation of an act as a nuisance is a utilization of the states' general police powers.[140] As such, the doctrines which limit its applicability are the same as those which restrict the use of zoning.[141] It should, therefore, be constitutionally permissible to proceed in this manner.

By enacting a statute creating a nuisance action for the obstruction of sunlight, a legislature would be protecting a solar right. If the statute conditioned the availability of the action on a requirement, for example, that the sunlight be used by a solar collector that provides a specified minimum of a structure's heating needs,[142] one of the major fears—that solar energy will be used as a ruse to halt all development[143]—could be obviated.

The use of public nuisance law to ensure solar access, however, has at least two limitations. First, the mere availability of such actions has often proved ineffective. Due to the fact that only a public official may bring an action to enforce the statute, the legislative intent may be cir-

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e.g., State v. Hooker, 87 N.W.2d 337 (N.D. 1957); Finkelstein v. City of Sapulpa, 106 Okla. 297, 234 P. 187 (1925).

[140] Most states have statutes designating certain actions or situations to be public nuisances. *See, e.g.*, ORS 602.040 (1975) (apiaries with diseased bees); ORS 616.225 (1975) (unsafe food); ORS 452.615 (1975) (the tansy ragwort plant). It is also possible to include in such statutes a private right of action to sue under the statute. *See, e.g.*, FLA. STAT. ANN. § 60.05 West 1969); WASH. REV. CODE ANN. § 7.48.210 (West 1961); WIS. STAT. ANN. § 280.02 (West 1958). *See also* Prosser, *Private Action for Public Nuisance*, 52 VA. L. REV. 997 (1966).

[141] The primary potential restriction on the use of public nuisance law is the general requirement that the police power be used only to further the public interest. As one study noted, this should present no problems: although a solar easement "will have a direct effect on only one or two individuals and their solar collectors, there should be far-reaching benefits for the entire community. The development of solar energy use promises less air pollution, reduced use of land and water for energy facilities, and conservation of conventional energy sources." Region IX Counsel's Office, *supra* note 12, at 45. Justice Brandeis noted, "[T]he purpose of a restriction does not cease to be public, because incidentally some private persons may thereby receive gratuitously valuable special benefits. Thus, owners of low buildings may obtain, through statutory restrictions upon the height of neighboring structures, benefits equivalent to an easement of light and air." Pennsylvania Coal Co. v. Mahon, 260 U.S. 393, 417–18 (1922) (Brandeis, J., dissenting). Due process and equal protection requirements must also be satisfied, and the ordinance must not result in a taking. *See generally* notes 110–13 and accompanying text *supra*; *see also* Comment, *Nuisance—As a "Taking" of Property*, 17 U. MIAMI L. REV. 537 (1963).

[142] "[Property interests] are created and *their dimensions are defined* by existing rules or understandings that stem from an independent source such as state law —rules or understandings that secure certain benefits and that support claims of entitlement to those benefits." Board of Regents v. Roth, 408 U.S. 564, 577 (1972) (emphasis added). *See also* Goss v. Lopez, 419 U.S. 565 (1975); Arnett v. Kennedy, 416 U.S. 134 (1974).

[143] Interview with Rep. David Frohnmayer, note 104 *supra*.

cumvented if the officials are unwilling or unable to bring suit.[144] Second, the requirement that, if an individual is to bring an action for a public nuisance the individual must have suffered a harm that is different in kind rather than degree than that suffered by the public,[145] is a potential impediment.[146] While the injury to the owner of a solar energy system clearly is different from that suffered by the public (and the solar owner should thus be able to bring an action under the common-law principles), it would be advantageous to include a provision in the statute which allows an individual to bring a suit for the obstruction of sunlight.[147]

The designation of the obstruction of sunlight as a public nuisance thus offers a practical means of guaranteeing solar access. By manipulating the presumptions and procedural methods contained in the statute, a legislature can balance the competing interests effectively.

3. Solar Rights Laws

The enactment of a statute designed specifically to provide a solar right is probably the most satisfactory solution to the problem of ensuring solar access. Due to the fact that the legislative process requires the recognition and consideration of potential problems, it is the best method of resolving them effectively with a minimum of uncertainty and expense. There are a number of possible models which, while creating a solar right, provide varying degrees of protection for the right created. These models can be used to balance the competing interests with considerable sophistication by altering the presumptions and conditions attached to the right.

One potential model is found in Japanese law. By municipal ordinance in both Tokyo and Osaka, a landowner has a presumptive right to sunlight which is an incident of the ownership of land.[148] Japanese

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[144] *See, e.g.*, Hill, *The Politics of Air Pollution: Public Interest and Pressure Groups*, 10 ARIZ. L. REV. 37 (1968).

[145] *See, e.g.*, Reynolds Metal Co. v. Martin, 337 F.2d 780 (9th Cir. 1964); Venuto v. Owens-Corning Fiberglas Corp., 22 Cal. App. 3d 116, 99 Cal. Rptr. 350 (1971); Boomer v. Atlantic Portland Cement Co., 26 N.Y.2d 219, 257 N.E.2d 870 (1970). *See also* Keeton & Morris, *Notes on "Balancing the Equities,"* 18 TEX. L. REV. 412 (1940).

[146] Where to draw the line between cases where the injury is more general or more equally distributed, and cases where it is not, where, by reason of local situation the damage is comparatively much greater to a special few, is often a difficult task. In spite of all the refinements and distinctions which have been made, it is often a mere matter of degree . . . .

Kaje v. Chicago, St. P., M. & O.R.R., 57 Minn. 422, 424, 59 N.W. 493, 493 (1894).

[147] Several statutes that create public nuisances include a section allowing an individual to bring suit. *See, e.g.*, FLA. STAT. ANN. § 60.05(1) (West 1969); MONT. REV. CODES ANN. § 57-110 (1969); WIS. STAT. ANN. § 280.02 (West 1958).

[148] Tokumoto, 490 JURISTO 29 (1971).

courts have been willing to enforce this right despite the fact that it can substantially restrict development.[149] In 1975 official compensation standards were promulgated by the Central Liaison Council on Land. The standards "apply to those homes which have had sunlight in winter cut down to less than four hours per day."[150] The Japanese parliament has also proposed a statute modeled on the Tokyo ordinance that would apply only to residential districts, thus limiting the adverse impact on land development.[151]

Another statute could be modeled on the English right to light.[152] A legislature could provide that the right to uninterrupted sunlight vests after a prescriptive period runs. Due to the length of time required for prescription, this option would restrict development considerably less than the creation of a presumptive right to light. It would also provide a less certain guarantee of solar access, however.[153]

A third model is the race-notice system of land registration used in a number of states in this country. Under this system, the first purchaser of land to record the purchase acquires priority over any unrecorded earlier purchasers.[154] Modified to provide a solar right, this procedure would vest a right to sunlight in the first person to file a notice of intent to install a solar collector. This notice would be effective against all structures for which building permits had not been issued. The statute could require that the notice be filed on all land that would be affected by the solar right, thus simplifying title search requirements.

Another potential model is natural resource law. Two resources

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149 In Tokyo, for example, a business executive obtained an injunction prohibiting the construction of an eight-story building that would have obstructed three hours of winter sunlight. The Japan Times (Tokyo), Dec. 15, 1974, at 2, col. 5. *See also id.* June 16, 1974, at 2, col. 5.

150 Asahi Evening News (Tokyo), Sept. 17, 1975, at 1.

151 The Japan Times (Tokyo), Dec. 15, 1974, at 2, col. 5.

152 *See* note 70 and accompanying text *supra.*

153 The statute could also incorporate the interruption-by-filing concept embodied in the Rights of Light Act, 1959, 7 & 8 Eliz. 2, c. 56, §§ 2, 3 (1959). Such a provision would be similar to an early Massachusetts statute, which provided in part:

> no right shall by lapse of time accrue . . . to have any privilege of air, or light . . . from, in, upon or over the land of any other person . . . in any case in which the owner or owners of such land . . . shall have caused to be recorded in the Registry of Deeds . . . before the time when such right would otherwise by law have accrued, a notification of his, her or their intention thereby to prevent the accruing of such right.

Act of Feb. 8, 1825, ch. 52, 1825 Mass. Act 486.

154 Under a race-notice land registration statute a subsequent purchaser or assignee of an interest in land will acquire priority in the land if the party has *both* a lack of notice of other unrecorded interests *and* priority of registration. *See, e.g.*, N.Y. REAL PROP. LAW § 291 (McKinney 1968); ORS 92.640 (1975).

have been suggested as suitable analogues, petroleum and water.[155] Of the two, water is the preferable model because of the similarities of the two resources.[156] An effective solar rights law can readily be based upon the prior appropriation doctrine common in the western states.[157] While details vary among jurisdictions, a composite statement of the appropriation procedure is that it "requires an intent to appropriate, notice of the appropriation, compliance with state laws, a diversion of the water from a natural stream, and its application, with reasonable diligence, to a beneficial use."[158]

Application of this model to solar energy would require the creation of a state agency to oversee the acquisition of solar rights. When a land-

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[155] *See* American Bar Foundation, *supra* note 13, at 18.

[156] While there are similarities between petroleum and sunlight (for example both must be "captured" and processed), there are several drawbacks to the use of petroleum law as a model for solar legislation. First, the peculiar nature of petroleum has created substantial difficulties in determining the nature of the ownership interest in the resource. *See generally* 1 E. KUNTZ, A TREATISE ON THE LAW OF GAS AND OIL §§ 2.2, 2.4, 3.1–.2 (1962). It has also led to complex leasing arrangements. *Id.* § 15.9; 2 *id.* § 18.2. Second, because not all states have petroleum deposits, a majority of jurisdictions are unfamiliar with petroleum law. Third, oil and gas taxation law is intertwined inextricably with the law governing its development.

Unlike petroleum, both sunlight and water are nondepletable resources. While the use of sunlight, like irrigation, is consumptive, the consumption does not decrease the amount that will be available for future use. Similarly, it is the use of both sunlight and water that is economically advantageous. *See generally* W. HUTCHINS, SELECTED PROBLEMS IN THE LAW OF WATER RIGHTS IN THE WEST 27–29 (1942); note 34 *supra*. Thus, on the whole, water law offers a more suitable analogy than that developed for petroleum.

There are two basic systems of water law in this country. The more humid eastern states generally have adopted the common law doctrine of riparian rights where the "owner of land that is riparian to a waterbody [*i.e.*, is adjacent to it] has the right to have the waterbody continue to stand or flow along his land, subject to the right of other riparian owners to make reasonable use of the waters." 7 R. CLARK, WATERS AND WATER RIGHTS § 610 (1976). The more arid western states, on the other hand, developed a new body of law that stresses the "beneficial use of water, not land ownership, [as] the basis of the right to water, and that priority of use, not equality of right, is the basis of the division of water among appropriators." F. TRELEASE, CASES AND MATERIALS ON WATER LAW 2 (1967). The distinction between the two doctrines is becoming less important, however, as water becomes a scarce resource in the riparian jurisdictions. A number of these states are establishing permit systems. *See, e.g.*, MISS. CODE ANN. §§ 51–3–1 to 53 (1972). This trend seems likely to continue because the National Water Commission, following a detailed study of the nation's water resources and requirements, recommended the general adoption of such a system. NATIONAL WATER COMMISSION, WATER POLICIES FOR THE FUTURE 280 (1973).

[157] For a more detailed analysis of this model as applied to solar energy, see Comment, note 15 *supra*.

[158] F. TRELEASE, *supra* note 156, at 28. *See generally* W. HUTCHINS, *supra* note 156, at 80–109.

owner is prepared to construct a solar collector, application for a solar permit would be made to the agency. Following the issuance of a temporary permit, the landowner would have a reasonable time in which to install the necessary equipment. If the landowner complied with the requirements of the act, a final permit would be issued after an inspection of the completed installation.[159] This final permit would be tantamount to a recognized property interest in the use of sunlight.

A major advantage of using water law as the model is the large body of case law available as precedent. This body of case law will help courts and administrative agencies avoid inconsistent and unsatisfactory decisions because the economic and policy considerations involved in the use of both resources are analogous.

Each of these alternatives can be varied substantially in both form and substance by the inclusion of limiting conditions in the statute creating the solar right. By allowing the municipality to condemn the solar right in the process of issuing a building permit, for example, a legislature could provide a method which, while allowing continued development of land, would also protect the interest of the owner of a solar energy system.[160] In addition, the vesting of the right could be conditioned upon the use of sunlight for heating, cooling, or electrical generation, upon specified efficiency standards for the equipment, or upon related criteria.[161] The inclusion of such conditions will allow a legislature to tailor the right to the local situation.

While other legal doctrines, such as nuisance law, can be expanded to cover the novel problems involved in encouraging solar energy utilization, the creation of a body of law designed specifically for this purpose is the most advantageous solution. The creation of a statutory framework to protect solar access will reduce the uncertainty and delay

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[159] The inclusion of a condemnation right would prevent costly holdouts by owners of sun rights in urban areas, while also establishing a property interest in the use of sunlight. Decisions to allow higher density development would thus allow condemnation awards which would include the value of sunlight as an energy resource, thus ensuring that the solar owner would be compensated. By passing the cost of the award along to the builder as part of the building permit fee, the system would require the builder to include the potential cost of the sunlight in the cost computations for the proposed structure. This would encourage the builder to construct the building in a manner which obstructed a minimum amount of sunlight, thus reducing the amount of the condemnation award and of the building permit fee.

[160] By conditioning the right on such factors as the location of the collectors or a requirement that they provide a minimum percentage of the building heating needs, frivolous litigation would be avoided, and more efficient use of solar energy would be encouraged. *See also* note 141 *supra*.

[161] *Cf.* University of Idaho Water Resources Research Institute, Modern Problems in Water Allocation 7 (n.d.) (the requirements for a valid appropriation).

that would occur from a piecemeal extension of other doctrines. Thus, if this country wishes to avoid the serious economic consequences of the energy crisis without sacrificing the environment, the enactment of solar rights statutes is vital. The large number of potential models for such a statute will allow legislatures to select a procedure that will balance the need for solar energy with the desired level of development.

CONCLUSION

The lack of a recognized property interest in the use of sunlight is an impediment to widespread conversion to solar energy. Current legal theories which treat sunlight as a source of illumination rather than as an energy resource are not capable of resolving the potential problems. There is, therefore, a need to revise the present system of property rights so that it encourages, rather than retards, the use of solar energy.

The alternative solutions to this problem are varied. This variety will allow each jurisdiction to determine the most suitable method of providing the necessary solar right in light of its climate, building patterns, and other factors.

One authority has commented:

> There's going to be a tremendous need for revision of the legal system soon. That is, if we are serious about the economy and the need to find new forms of energy such as solar, the legal policies and institutions are going to have to be considerably reshaped and revamped . . . .[162]

Now is the time to begin.

DALE D. GOBLE*

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[162] American Bar Foundation, *supra* note 13, at 22 (statement of Charles M. Haar).

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