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# THE INHERENT POWER IN MAPPING OWNERSHIP

*Michael P. Conzen* \*

THE CADASTRAL MAP IN THE SERVICE OF THE STATE: A HISTORY OF PROPERTY MAPPING. By *Roger J.P. Kain* and *Elizabeth Baigent*. Chicago: University of Chicago Press. 1992. Pp. xix, 423. \$49.95.

Ever since the rise of sedentary civilizations, the control of territory has been fundamental to political power. For millennia, however, understanding the location and extent of lands under particular control was a vastly imprecise art. Local potentates could grasp the detailed configuration of their domains through personal inspection, but growing empires and shifting alliances within far-flung hierarchies of subjugation and fealty rendered the understanding of exactly who controlled what slippery and an unreliable basis for exercising authority. Although systematic surveys of land, people, and resources were conducted intermittently from ancient times onward, it was not until modern times that geographical inventories became a governmental fixture. Central to these modern surveys was the rise of the cadastral map — a large-scale cartographic record of property ownership that preserves not only the dimensions and shape of an owned land parcel on the earth's surface but also the spatial relationship of all such individual parcels to each other.<sup>1</sup> The rise of this form of mapping and its social and legal value in modern society should be attributed, argue Roger J.P. Kain<sup>2</sup> and Elizabeth Baigent,<sup>3</sup> to its unique role as a tool for exerting and maintaining land-based regional and national power.<sup>4</sup> The beginnings of the connection between mapping and power are to be found in northwest Europe in the sixteenth century.

This book represents the first major attempt to examine official rural cadastral mapping as a broad societal force in conceptual and comparative terms. Kain and Baigent focus on its permanent emergence

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1. Large-scale maps are maps of relatively small areas that depict the land and its surface features "at a large scale," that is, that show small areas in great detail.

2. Montefiore Professor of Geography, University of Exeter, and a Fellow of the British Academy.

3. Lecturer in Geography, St. Hugh's College, Oxford.

4. Pp. xviii, 344. The first scholar to draw attention to cadastral maps was the noted French historian, Marc Bloch, over 60 years ago. See Marc Bloch, *Les plans parcellaires*, 1 *ANNALES D'HISTOIRE ECONOMIQUE ET SOCIALE* 60 (1929).

in Europe and its spread to regions of European colonization in selected parts of the New World and the Orient.<sup>5</sup> In dealing with the nature of the raw material, the writers faced a stiff challenge. There are hundreds of thousands of surviving cadastral maps to be found in the numerous archives of Europe and elsewhere, portraying measured land areas and owners at a wide variety of scales, in a bewildering assortment of cartographic styles, and incorporating highly variable types of accessory information. Furthermore, the purposes for which they were created, the multiplicity of their potential uses, and the array of formal agencies behind their preparation defy simplistic discussion of their provenance and impact.

*The Cadastral Map* is organized in chapters devoted to whole regions that developed and sustained distinctive traditions of cadastral mapping, with the chapters arranged in the roughly chronological order of their emergence. After a passing nod at cadastral mapping in antiquity,<sup>6</sup> the authors begin with a discussion of the Netherlands, where this type of mapping emerged in the early sixteenth century in connection with diking for land drainage and the creation of new lands — polders — on the estuarine and coastal margins of the country (pp. 9-46). The resulting maps directly aided land assignment and taxation. Once cadasters — accurate map records of land ownership — existed in the region, later efforts from time to time extended, reworked, and updated that knowledge for continued and improved control. The authors follow these developments in the Netherlands into the nineteenth century to provide a historically complete picture of how the Dutch mapping tradition evolved.

Then Kain and Baigent turn to the Nordic countries, because Sweden witnessed a particularly early campaign to establish a national cadaster, begun in 1628 (pp. 47-119). However, cadastral mapping in Scandinavia was variable, and Norway, for example, is notable more for opportunities forgone than exploited, compared with its neighboring countries. Chapters follow on Germany and the Austrian Hapsburg lands, which saw major cadastral mapping activity in the eighteenth century (pp. 120-204), and on France and England, which

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5. There is a large literature on property mapping in certain countries, notably England and parts of Western Europe. Two recent publications extend such work in old and new regions of concern: SARAH BENDALL, *MAPS, LAND AND SOCIETY: A HISTORY, WITH A CARTO-BIBLIOGRAPHY OF CAMBRIDGESHIRE ESTATE MAPS, c.1600-1836* (1992); and DOV GAVISH, *LAND AND MAP: THE SURVEY OF PALESTINE, 1920-1948* (1991) (in Hebrew).

6. This nod is perhaps too perfunctory. Although the authors are doubtless correct in assuming that non-European cultures generally did not develop widespread cadastral mapping, ongoing research is bringing to light scattered examples that suggest that land ownership mapping was not unknown in ancient, medieval, and non-Western societies. See 1 *THE HISTORY OF CARTOGRAPHY, CARTOGRAPHY IN PREHISTORIC, ANCIENT, AND MEDIEVAL EUROPE AND THE MEDITERRANEAN* 109, 113, 125, 130, 259, 493-95 (J.B. Harley & David Woodward eds., 1987); 2 *THE HISTORY OF CARTOGRAPHY* (bk. 1): *CARTOGRAPHY IN THE TRADITIONAL ISLAMIC AND SOUTH ASIAN SOCIETIES* 317, 430, 432 (J.B. Harley & David Woodward eds., 1992).

undertook large projects in the nineteenth century (pp. 205-64). Finally, a long chapter focuses on selected colonial regions around the world during the period of modern empires (pp. 265-330).

Each chapter lays out the social, economic, and political context within which cadastral mapping emerged and developed. Discussion centers on the conditions that gave rise to mapping, the mechanisms by which special efforts were undertaken, and the direct and indirect effects that mapping produced. The authors discuss important initiatives in some detail but always focus on the flow of the mapping story as a general phenomenon rather than on the peculiarities of individual maps and mapmakers. Fine black-and-white reproductions of cadastral maps, together with specially drafted thematic maps, occupy about a quarter of the space in the book and serve as essential illustrations of points made in the text. Although fanciers of old maps will find much to enjoy in these illustrations, the authors intend to survey regional mapping traditions with an eye toward conceptual trends and social context, rather than the uniqueness of individual maps. A closing chapter sums up the significance of cadastral mapping in the varied and evolving exercise of statecraft (pp. 331-44).

The regional idiosyncracies that jump out of the record of cadastral mapping in the modern world result, not surprisingly, from the complex and specific histories of government and legal experience that typify each country and region, and especially from fundamental geographical variations in natural environment and human resources. Documenting and interpreting this theme forms the core of the book. The early case of the Netherlands is especially instructive. From ancient times to the present, the Low Countries have occupied a classic node at one end of the historic continental axis of trade and cultural exchange between the North Sea basin of northwest Europe and the Mediterranean world, anchored at the latter end by the Adriatic ports of northern Italy. The cultural impulses of the Renaissance moved swiftly along this axis and, in the Netherlands, stimulated not only increased trade but also technological innovations that together improved the economy and heightened Dutch culture. Nowhere in Europe was agriculture so advanced, and the highly urbanized Dutch markets demanded intense and specialized farming that increased the value of and the pressure on land. Winning new land, in the Rhine estuaries and the *Zuider Zee*, called for elaborate diking, sluice construction, and sophisticated water management. Paying for all this meant apportioning costs in an equitable fashion, and this need led to cadastral mapping for land assignment, polder administration, and reclamation publicity. Cadastral maps were quickly prized as decorative objects in themselves and as symbols of progress, and their public use and private value led to publication in printed form, thereby creating a map genre that appeared early and influenced subsequent land mapping efforts elsewhere in Europe (pp. 18-19).

During the seventeenth and eighteenth centuries, cadastral mapping became associated with the rise of powerful monarchs and the progress of capitalism. King Gustavus Adolphus of Sweden initiated the compilation of a national cadaster that, among its various achievements, reflected the nation's glory and strengthened imperial power in the king's Baltic possessions. By contrast, Norway experienced no such mapping until the twentieth century, largely because precapitalist communal forms of land tenure persisted there so long. Although cadastral mapping did not wholly depend on the advance of capitalist economies, mapping did seem to await the appearance of those who saw in it a means to consolidate the benefits of capitalism and who therefore had a motive to extend it (pp. 117-19).

If Nordic countries revealed differences in the land-mapping impulse, German lands proved far more diverse, because their long political fragmentation and shifting alliances precluded any uniformity. Nevertheless, political and economic influences created common conditions. Wars proved a great stimulus to mapping. The suffering and dislocations of frequent war plagued Central Europe throughout the postmedieval period. Physical devastation, depopulation, and changing patterns of political ascendancy following the Thirty Years' War, the Seven Years' War, and the wars against French domination in some parts of Europe produced great geographical inequities in taxation, so regional and local cadastral mapping often accompanied efforts at agrarian reform. Perceptive monarchs realized that maps served as excellent media for collecting and presenting statistics essential for territorial administration, and during the eighteenth century maps graduated from being single-purpose artifacts to fulfilling a variety of needs. Advances in military science and printing affected cadastral mapping, too, so that by the early nineteenth century Bavarian officials switched their recording methods from discrete maps of individual districts to regional maps formed by connecting numerous local sheets. Such an innovation demanded changes in design and calculation in order to create accurate mosaics of map sheets. Such ambitious mapping could hardly have succeeded without the cost reductions brought by the spread of lithography, for cadastral mapping was by any measure an expensive proposition dependent on skilled surveyors and draftsmen. The actual incidence of such mapping depended on the assessment by particular rulers of mapping's costs and benefits (pp. 169-70).

In the chapter on Austria and its possessions, including northern Italy and much of southeastern Europe, Kain and Baigent discuss a large empire in which cadastral mapping, perhaps surprisingly, came late — only in the nineteenth century — and was not technically innovative (pp. 203-04). The reason lay in the centuries-long struggle between central authority and the provincial nobility and clergy who well understood the added power the monarch would derive from

such mapped information and who therefore heartily resisted it. Only when taxes began to come more from urban than from rural sources did a national rural cadaster proceed. The pattern in France was initially not so different, until the advent of the Revolution. Although scattered estate mapping was common by the eighteenth century, the Revolution brought land tax equity to the fore. As a logical adjunct to the *Code Napoléon*, a mapped *cadastre parcellaire* resulted that was held up as a model for other countries to emulate. Under the French emperor, cadastral mapping served a quintessentially modern purpose: begun as a streamlined aid to taxation, it soon acquired value as a basis for land transfer and recording of land resources (pp. 225-35).

England and Wales present yet another historical situation. Although the appearance of capitalism in the British countryside came earlier than on the Continent and private estate mapping was well developed by the eighteenth century, the institution of a unified national cadaster has not been fully achieved, even to this day. But official land mapping played a prominent role in the geographically piecemeal process of common field enclosure during the eighteenth and early nineteenth centuries, probably on the basis of maps' long-routine use in private estate management. Officials also prepared cadastral maps in connection with the midnineteenth-century commutation of agrarian tithes, those last vestiges of feudal society. Common though such maps were, their necessity in determining the commutation was questioned and vigorously opposed when they were proposed as models for a national cadaster. Various interests, including the legal profession and the Ordnance Survey — the national mapping agency — opposed the creation of a national land registry system based on maps (pp. 262-64).

Chapter Eight, a huge chapter devoted to colonial settlement, may well be of most interest to American readers. It covers English, French, and Spanish mapping in the colonies of North America, American mapping after independence, and British cadastral mapping in Australia, New Zealand, and India. Kain and Baigent discern in the enormous local variety of colonial surveying and mapping two essential systems, emanating from two fundamentally different social theories (p. 265). As they relate to North America, the two survey systems are recognized as the "Virginia method" of settlement before cadastral survey and the "New England method" of cadastral survey before the sale of land, the latter expressed in survey both by triangulation and by rectangulation.<sup>7</sup> The central fact that land was the single great resource that could be given to colonists influenced both systems. The methods differed, however, in their assumption of the

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7. Triangulation involves surveying by trigonometric methods and produces irregular patterns, whereas rectangulation imposes a rectilinear grid of land sections by running surveys along straight and orthogonal traverses.

role that individual and community would play in the award of land (pp. 269-71, 285-86).

The Virginia method is none other than the time-honored English system of metes and bounds, which characteristically produces irregularly shaped units of land, demarcated and recorded by reference to selected landscape features, especially river banks and trees. As employed in the Southern colonies of America, this system favored immediate individual settlement on the land in any location desired, allowing the early privatization of the best agricultural areas on a first-come, first-served basis. In its locational neutrality, the system promoted scattered, low-density occupation of the land, the emergence of large holdings suited to plantation-style management — including slaves — and the proliferation of overlapping claims, given the survey's imprecision. The system encouraged sharply unequal property distribution, increased the costs of establishing regional infrastructure through the dispersal of residents, and raised transaction costs through heightened litigation over disputed claims. But it also established people quickly on the land at first, and this short-term goal has permanently shaped the areas in which it held sway (pp. 269-76).

The New England method required the delineation of districts for allotment to intending communities of families and the internal subdivision into compact units of land just sufficient to sustain them. As the population increased, additional land in reserve within the district would be allotted, preserving the principle of a contiguous, compact advance of settlement. The geometry of the land parcels varied from irregular to rectilinear, but the principle of orderly settlement and communal association was critical. Although the authors do not quite explain the transition, this system converted to a less communal, more privatized and capitalized basis by the middle of the eighteenth century in northern New England — in plenty of time to provide a more flexible model for instituting a national scheme for land disposal in the American confederation (pp. 285-88).

The creation of the American rectangular land survey after national independence, and its extension across the central latitudes of the North American continent, represents a key mechanism in one of the most awesome displacements of indigenous people by colonists in history. The survey system developed reflected attempts to cope with past experience in land assignment and conveyance in the various former colonies.<sup>8</sup> Unsystematic surveys produced severe additional costs.

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8. The classic study of the debates and decisions that produced the federal land system is WILLIAM D. PATTISON, *BEGINNINGS OF THE AMERICAN RECTANGULAR LAND SURVEY SYSTEM, 1784-1800* (1957). The first major study to examine the geographical impact of the federal land survey on the landscape in relation to earlier systems is NORMAN J.W. THROWER, *ORIGINAL SURVEY AND LAND SUBDIVISION: A COMPARATIVE STUDY OF THE FORM AND EFFECT OF CONTRASTING CADASTRAL SURVEYS* (1966). The most comprehensive assessment of the ecological and social effects of the federal system is contained in a fine regional study:

“[M]ore money had been spent at law, in disputes arising from that mode of settlement, in New Jersey,” noted Elias Boudinot in 1790, “than would have been necessary to purchase all the land of the State.”<sup>9</sup> The township and range rectangular survey system that emerged owed much to both New England and Southern precedent, and maps constituted a fundamental part of the survey and recording process. Given the daunting task ahead, accuracy of surveying became an issue in balancing progress against cost. It is often assumed that government surveyors laid a neat square grid of land parcels across the continent, but it took half a century, as Kain and Baigent remind us, before “a well-defined system of surveying and mapping with its own bureaucracy of contract deputy surveyors working under surveyors-general and supported by register clerks and draftsmen based in a network of local land offices had been established” (p. 293). The thousands of township maps thus produced constitute a now largely hidden archive that directly served the democratic goals that the land system was designed to promote. Ultimately, these cadastral maps played multiple roles in the U.S. land system: as sources of information on land quality for prospective purchasers; as vital parts of the permanent record of subdivisions and boundaries of public and alienated lands; as marketing tools for quick sale to settlers and speculators; as reference sources for latter-day county surveyors and other public officials; and as a matrix for wider mapping (pp. 294-97).

Kain and Baigent draw on a substantial amount of literature describing the history of the American land survey and mapping, and they have selected evidence well in presenting a summary exposition that focuses on the specific role that mapping played in the larger process of democratic development. Their discussion of long-term patterns of mapping inaccuracies and how, when, and why such inaccuracies were successively corrected is most welcome (pp. 289-93). Their treatment places the American practice squarely in the context of French and Spanish activity throughout the continent. If anything, Kain and Baigent accentuate the positive outcomes to the detriment of sterner judgments that can be drawn from the evidence; for example, rectilinear ownership parcels that take no account of topographical slope, soil mechanics, river basin hydrology, and other environmental conditions have significant ecological implications.<sup>10</sup>

To their credit, the authors include a short section on American commercially produced county land ownership maps and atlases and

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HILDEGARD BINDER JOHNSON, *ORDER UPON THE LAND: THE U.S. RECTANGULAR LAND SURVEY AND THE UPPER MISSISSIPPI COUNTRY* (1976).

9. 2 ANNALS OF CONG. 1831 (1834) (statement of Elias Boudinot).

10. An elegant case study along these lines is Hildegard Binder Johnson, *Rational and Ecological Aspects of the Quarter Section: An Example from Minnesota*, 47 GEOGRAPHICAL REV. 330 (1957), somewhat updated in Hildegard Binder Johnson, *Toward a National Landscape, in THE MAKING OF THE AMERICAN LANDSCAPE* 127 (Michael P. Conzen ed., 1990).

trace their relationship to government survey work (pp. 304-07). This link is accurate for the western states, but commercial county maps began in the metes-and-bounds East, without the aid of preexisting government maps, and it should be stressed that this commercial genre is seemingly unique to the United States and Canada.<sup>11</sup> Why, for example, if commercial mapping flourished in North America, might it not be expected in Australia and New Zealand, which, as a result of European colonization, shared many common impulses and practices with the United States?

In a final chapter, Kain and Baigent draw their many threads together and review the accumulated roles of cadastral maps in advanced societies over the last four centuries and around the world (pp. 331-44). They describe the use of maps in land reclamation, in evaluation and management of state land resources, in land redistribution and enclosure, in colonial settlement, in land taxation, as symbols of state control over land, and as tools of rational government (pp. 332-42). The authors end with a succinct explanation of the rediscovery of the cadastral map in modern Europe and its subsequent wider adoption (pp. 342-44). Basically, they argue for a series of discrete, necessary conditions for cadastral mapping that were not in themselves sufficient reasons for such mapping but that, in various combinations, successfully accounted for the appearance of cadastral mapping in one region or another (p. 343). A strong, centralized state was one such necessity, but when king or emperor struggled for ascendancy over nobles and clergy, cadastral mapping — often seen as desirable from the center — could be thwarted or delayed from the periphery, as in Austria (p. 204). The advent of republics encouraged the acceptance of cadastral mapping on rationalistic grounds, as in France and the United States (p. 341). Cadastral mapping generally presupposed a universal system of individual property rights and became intimately associated with capitalist landowning and farming systems (p. 343).

Finally, “[c]onviction of the merits of mapping was a precondition for mapping itself” (p. 343), write the authors, citing the Milan surveys in Austrian Italy and the efforts of mapping proponents in France and Denmark. Conviction, however, needed power to put mapping programs into place. “It is . . . power — whether social, economic, or political — which lies at the heart of the history of cadastral mapping. The cadastral map . . . is an instrument of control which both reflects and consolidates the power of those who commission it” (p. 344). Thus, in the end, the cadastral map — which might strike the casual observer as merely an antiquarian curiosity, a charm-

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11. Canadian county land ownership maps owe much to American involvement and capitalization. See WALTER W. RISTOW, *AMERICAN MAPS AND MAPMAKERS: COMMERCIAL CARTOGRAPHY IN THE NINETEENTH CENTURY* 387-431 (1985); see generally Michael P. Conzen, *North American County Maps and Atlases, in FROM SEA CHARTS TO SATELLITE IMAGES: INTERPRETING NORTH AMERICAN HISTORY THROUGH MAPS* 186 (David Buisseret ed., 1990).

ing artifact, or an arcane source for historians — turns out to have been a historically important, partisan, and active tool of statecraft, providing power through information and communicating one conception of reality while nullifying those it challenged.<sup>12</sup> The cadastral map, therefore, played a key role in the balance of power between those governed and those who would govern, and as this balance shifted so did the incidence of cadastral mapping.

Kain and Baigent provide a fascinating and compelling first synthesis of the rise of cadastral mapping in the modern world. *The Cadastral Map* displays immense reach in its multinational scope, multilingual sources, and multifactor arguments. It places cadastral mapping in a rich social and historical context and benefits from careful judgments and intriguing visual documentation. It goes far in helping us understand how modern states mastered the landed resources within their territories. Technology may now be ushering in a whole new definition of the cadastral map — *geographic information system* identifies the current, computer-based species — but the theory underlying it is the same. That theory states that information about the control of resources is always stronger when presented in its spatial connectedness. In the past it was essential to control vast rural areas, for it was there that most wealth was created. Since the Industrial Revolution, cities have become ever more important in the production and distribution of wealth. Kain and Baigent did not cover urban cadastral maps in this book, but they promise to in their next. If this fine study is any indication, it should be well worth the wait.

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12. The general psychological and social role that maps can play is well discussed in DENIS WOOD & JOHN FELS, *THE POWER OF MAPS* (1992); a recent examination of map use in statecraft is *MONARCHS, MINISTERS, AND MAPS* (David Buisseret ed., 1992); and the numerous ways in which maps can be suborned to political purposes are explored delightfully in MARK MONMONIER, *HOW TO LIE WITH MAPS* (1991).