

The Plan Is The Program:

Thomas Jefferson's Plan for the Rectilinear Survey Of 1784

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Abstract

This paper studies the plan for the rectilinear survey of 1784 for the Northwest Territory of the United States contained in the Land Ordinance of 1784 authored by Thomas Jefferson in association with Hugh Williamson and others. Scholars have generally criticized the 1784 Plan for using "mathematical space" as opposed to "physical space" to facilitate land speculation. This paper suggests, however, that the plan for rectilinear survey offered a unique way to resolve the ideological tensions between the New Englanders and the Southerners for it incorporated elements of each one's survey system into it. The paper suggests that the 1784 Plan was a result of Jefferson's critical understanding of a great tradition of rectilinear land division system perfected by the Romans. Most importantly, this paper suggests that, in this 1784 Plan, Jefferson wanted to achieve a balance between classical ideals and the utilitarian attitudes of "scientific progressivism". Thus, it is quite plausible that Thomas Jefferson conceived the 1784 Plan for the rectilinear survey as a *program* to accommodate the unpredictable future of an emerging nation whose nature was yet to be defined.

The 1784 Plan: Introduction

On March 2, 1784, one day after Virginia's deed of cession was accepted, Thomas Jefferson was made chairman of a committee, made up of Southern and New England representatives,¹ "to devise and report the most eligible means of disposing of such part of the Western lands as may be obtained of the Indians by the proposed treaty of peace and for opening land office."² Taking as its area of reference not only the Northwest but also all western lands, ceded and unceded, the committee report as amended and finally approved by Congress, April 23, 1784, came to be known simply as the Ordinance of 1784. It has been called the "yoke-mate" of the proposed Land Ordinance of 1784.³ The Original Plan (henceforth, the 1784 Plan) for a federal rectangular land survey in the proposed Land Ordinance called for the land to be

. . . divided into Hundreds of ten geographical miles squares, each mile containing 6086 feet and four tenths of a foot, by lines to be run and marked due North and South, and others crossing these at right angles, the first of which lines, each way, shall be at ten miles distance from one of the corners of the state within which they shall be . . . These Hundreds shall be divided into lots of one mile square each, or 850 acres and four

tenth of an acre, by lines running in like manner due North and South, and others crossing these at right angles.⁴

Evident within this statement of the 1784 Plan, are all of the plan's central features: *Hundreds*, *geographical mile*, *square mile section*, and *the rectilinear grid* oriented toward the cardinal points. In the next few sections of this paper, I will elaborate on each of these features in order to show that this plan was not merely "an abstract rectilinear grid" which Jefferson's committee proposed to lay over the vast territory of the United States, but a brilliantly conceived plan whose constituent features had intrinsic historic, spatial/territorial, political, as well as scientific value.

Division into Hundreds

"It [the western country] shall be divided into Hundreds," the committee reported. Ancient by the time of the first English settlements in America, the *hundred*, a territorial unit with no quantitative significance, was a subordinate division of the shire or county in England.⁵ It was adopted in America in the colonies of Delaware, Maryland and Virginia,⁶ though in Virginia the *hundred* was not widely recognized.⁷ But the attempt to write the *hundred* into national land legislation was certainly the work of Jefferson, who wanted to use it as an institution as in the New England townships. At least twice he unsuccessfully attempted to introduce it into Virginia acts pertaining to land titles.⁸ On each of these occasions, Jefferson tried to establish the *hundred* as a unit which would contain a full array of local governmental functions. He wrote in a letter in 1816 that the inhabitants of each *hundred* should have a justice, a constable, a militia company, a school, the care of their own poor and their own roads, and that each *hundred* should serve as an election district. The *hundreds*, "of such size that every citizen can attend, when called on, and act in person," were to be, in a word, like the "townships of New England."⁹

Jefferson also restored the quantitative significance of the territorial unit *hundred*. As described in the proposed land ordinance, the *hundred* was to contain one hundred square-mile sections. In the Anglo-Saxon England *hundreds* were used for both fiscal apportionment and land subdivision. In many parts of the midlands, the assessment of each *hundred* approximated in a hundred *hides*, which represented amount of land holding of a peasant and his household. The correspondence of name and assessment is made more pointed by the existence of divisions assessed at 50 or 200 *hides*, and described as "*half-hundreds*" or "*double-hundreds*".¹⁰ In the Roman land subdivision pattern, which preceded the English, each square with sides of 2400 Roman Feet, measuring about 2,340 English Feet, contained 100 plots. This division of land into centuries was known as *centuriation*. It is probable that *centuriation* existed in Italy as early as the fourth century BC. Although the terminology persisted, the number of holdings in a *century* dwindled in time.¹¹

The restoration of the quantitative value of the *hundred* also owed much to Jefferson's fascination with the decimal arithmetic. Jefferson wrote: "Everyone knows the facility of Decimal Arithmetic . . . even mathematical heads feel the relief of an easier substituted for a more difficult process."¹² Thus, by restoring the quantitative significance to the *hundred* which had lost any such meaning, he wanted 1) to revive a lost tradition of land division system, and 2) to induce the general acceptance of the principle of decimal arithmetic into American life.

The Geographical Mile

Jefferson intended to alter the system of English linear measurement system in the 1784 Plan, and essential to the plan of his was the *geographical mile*. The length of the *geographical mile* -- "6086 feet and four tenths of a foot" -- Jefferson obtained by taking a currently accepted value for the length of a degree of latitude and dividing it by sixty. He then subdivided this *geographical mile* into furlongs, each of these into 10 chains, each of these into 10 paces, differing very little from the British furlong, chain and fathom. "This is surely an age of innovation, and America the focus of it,"¹³ explained Jefferson to Francis Hopkinson, as the reason for adopting a decimally graduated linear measurement system.

Under the system intended by Jefferson in 1784, the U.S. public lands would have been measured with a chain divided into 100 links, and there would have been 100 chains to the mile, 10 square chains to the acre, 1,000 acres to the square mile, and 100,000 acres to the *hundred*. Thus, the geographical mile far from being an unrelated oddity, would have entailed a sweeping reform, reaching far beyond the limits of public land surveying. At that time, Jefferson said that the *geographical mile* had been put into the law "in such a manner that it cannot possibly fail of forcing it's way on the people." But he added, "I doubt whether it can be carried through."¹⁴

The Square-Mile Section

The *hundreds*, in the 1784 Plan, were to be subdivided into "lots of one mile square each, or 850 acres and four tenth of an acre." But in the reformed Jeffersonian system of measurement, each square mile would have contained 1000 acres. The size of this smallest subdivision was simply that of unity in a decimal progression. "In a manner of speaking, the square-mile lot played the part of penny to the hundred's dollar in a scheme for the minting of land," wrote Pattison.¹⁵

Furthermore, the surveyed squares also found their justification in the mathematical operation of squaring. Nothing but square forms would have permitted to the land system the "facility of Decimal Arithmetic" which Jefferson sought for in relating lengths to areas and areas to one another. This property of "squareness" of the 1784 Plan was the sole survivor of an integrated system, which included the *geographical mile*, the *hundred*, and decimal progression of reformed units of measurement. These all became legislative casualties.

The Rectilinear Subdivision

The proposed ordinance specified 1) that the *hundreds* were to be "ten geographical miles square," and 2) that they were to be bounded by lines running "due North and South, and others crossing these at right angles." In other words, the first provision called for rectilinear subdivision, and the second for orientation to the cardinal points of the compass. Pattison wrote, "[This] rectangular subdivision offered the great advantage of simplicity . . . and it assured a standard acreage figure for subdivisions, which would simplify the marketing of land . . . [Furthermore,] orientation to the cardinal points of the compass also promised to simplify the process of wholesale subdivision of land" ¹⁶

Pattison's comments are correct for any other rectilinear subdivision system except the 1784 Plan. While the rectilinear subdivision of the 1784 Plan was certainly efficient and simple, its linear unit, the *geographical mile*, was not. It is true that the rectilinear system suited ordinary land surveying, but the sophistication of the *geographical mile* required a whole new set of professional apparatus. It also required that the surveyors be properly educated to be able to manipulate the new unit for land measurement. Moreover, the orientation requirement of the land ordinance also imposed a central control over the surveyors. In fact, Jefferson's rectilinear system with *geographical mile* as the unit of measurement required a complete new institution for land surveying. No doubt these difficulties made Jefferson himself skeptical about the system: "I doubt whether it can be carried through," he said. He proposed the system anyway, because he wanted to use it as a device to control land speculation, which he hated. As early as 1784, he wrote to Madison, "You mentioned that my name is used by some speculators in Western land jobbing, as if they were acting for me as well for themselves . . . I can with truth, therefore, declare to you, and wish to repeat on every proper occasion, that no person on earth is authorized to place my name in any adventure for lands on the western waters . . ."¹⁷

The Origin of the 1784 Plan

Though "in the early surveys of the New England town commons and of the river lands everywhere is found the germ of the modern rectangular system,"¹⁸ the two particularly striking precedents of rectilinear subdivision in the United States are Sir Robert Mountgomery's proposal of 1717 for settling his margravate of Azilia,¹⁹ between the Altamaha and Savannah Rivers, and General Henry Bouquet's plan for garrisoned settlements on the upper Ohio River, published in 1765.²⁰ The first colonization scheme, which was never put into effect, called for square districts, twenty miles on a side, each comprising a symmetrically arranged unit of settlement, made up in part of square-mile cells. This scheme also had Sir Robert's estate in its center.²¹ The second proposal suggested the settlement of one hundred families in each of a series of fortified squares, a mile on a side.²² Jefferson owned a copy of the book in which the second plan appeared.²³ He used information from it for his *Notes on Virginia*, prior to the committee report of 1784.²⁴ Thus, it is possible that Jefferson was influenced by Bouquet. But one should understand that American precedents resembled the 1784 Plan only partially, and were, in general, little more than suggestive. This is mainly because they don't account for the strict N-S orientation of the rectilinear grid over a vast area of the country. Moreover, the 1784 Plan neither had a center like Sir Robert Mountgomery's proposal, nor was it fortified like General Henry Bouquet's plan.

The Roman tradition of land survey seems to be more influential as a precedent for the 1784 Plan. Roman surveys of agricultural colonies, like their cities and camps, were commonly oriented by an east-west line, the *decumanus*, and a north-south line, the *cardo*. A standard unit in the division of agricultural land was the square *centuria*, or *hundred*. The origin of the 1784 Plan might go back to the Roman tradition via seventeenth-century Dutch land subdivision pattern. According to Sherman, General Bouquet's plan for garrisoned settlements could have been based on the example of land subdivisions in Polder Beemster, west of the city of Edem in Holland.²⁵ This tract of reclaimed land, bounded on the south by the Noord Holandsch Kanaal, is an area divided by roads into perfect squares, each measuring approximately one nautical mile on a side.

Perhaps the basic idea of the polder, inspired by relics of ancient squares such as in Limburg, might go back to the *Corpus Agrimensorum*.²⁶ But it is doubtful if these were noticed before the present century.

Jefferson's "foreign friend," Hogendorp from Holland, also could have transmitted the knowledge of the square subdivision to Jefferson. Hogendorp was in Annapolis on March 26, 1784, at which time the land ordinance was under consideration by Jefferson's committee.²⁷ Another plausible Holland connection is Hugh Williamson, Jefferson's collaborator, who was a Doctor of Medicine of Utrecht and a member of the Holland Society of Sciences and the Society of Arts and Sciences of Utrecht.²⁸ In 1674 Willem Goes had published in Amsterdam an edition of the *Agrimensores*, under the title of *Rei Agrariae auctores legesque variae* . . . This was the third illustrated edition, the first two having been those of Gallandius and Turebus, Paris 1554, and of Rigaltius, Paris, 1614. It is probable that Goes's edition would be well-known to a mathematician, interested in astronomy such as Williamson.²⁹

Jefferson himself had a direct Italian connection. Even before the Revolution, Jefferson developed a friendship with Philip Mazzei, the Tuscan intellectual, who also became his neighbor at Monticello. Jefferson gave him a tract of two thousand acres bordering his own estate. In Mazzei Jefferson found a friend who shared his taste in art, music, literature and cultivation. It is not certain whether Mazzei knew that the rectilinear land ordering system of the Po Valley went back to the Roman tradition, but it is very likely that Mazzei talked about Po Valley rice cultivation to Jefferson. And while Jefferson went to Italy for a very brief period in 1787, he made it a point to go to the Po Valley to learn about rice cultivation and milling in the plain.³⁰

For any, or all of these reasons, the 1784 Plan illustrated Roman traditions of land surveying and organization. The *hundred*, for example, had come to America from England as a territorial unit whose name by now had lost its quantitative significance. In restoring quantitative meaning to the term, Jefferson created a direct indebtedness to Roman surveying. The "squareness" of the square mile section of the 1784 Plan was also a Roman feature.³¹ The American base line and principal meridian have obvious similarities to the Roman *decumanus* and *cardo*. In addition, the 1784 Plan also followed the cardinal orientation of the Roman grid.

Reformation of the Existing Land Survey Systems

Many critics believe that the proposed land ordinance of 1784 embodied the New England principle of compact, prior survey as opposed to the Southern System's principle of indiscriminate locations. This criticism is not accurate. For Pattison brought forward three provisions in the proposed ordinance which were taken from the Southern System: First, one could claim lands on the authority of warrants. Second, the ordinance directed surveyors to proceed with the business of subdivision "beginning with the Hundreds most in demand,"³² that is, they were allowed to scatter their surveys. Third, a warrant-holder could enter for a lot or hundred before it was laid out, simply by sufficiently identifying the lands of his choice to the district surveyor concerned.³³

Although warrant-holders could claim land in advance of survey, they could receive final grants of property only in the shapes and sizes permitted by a uniform grid. By means of this innovation, the proposed ordinance in fact reformed not only the traditional Southern System but also added an element of control provided by the New England prior survey system. In this way, the 1784 Plan preserved the best of both systems.

Furthermore, the ordinance departed from a trend of Congressional policy that favored townships. While the 1784 Plan could accommodate township planting through the granting of entire hundreds of ten miles square, it did not protect or encourage the practice. The proposed ordinance threw open all western lands to direct claim by individual lots within a regularized grid, whereas the New England township system required that lots be assigned only through the agency of proprietors in whom title to the entire township was vested.

But the 1784 Plan violated an essential individual right in the Southern system, namely, the warrant holder's right to exclude undesirable land from his claim. In the 1784 Plan, the owners were compelled to include lands of mixed quality within any single purchase. On this subject of impaired freedom Jefferson's note written to Hogendorp is illuminating. Either he wrote that he expected the land to be irregularly subdivided for further sale after its purchase from the government, or that he thought that the inclusion of inferior lands in lots defined by grid would not matter much because of their low sale-price.³⁴ Jefferson's idea of a fair price, apparently committed to writing only in this note, was "the third of a dollar an acre."³⁵ However, the Land Ordinance of 1785 asked exactly three times this amount as a minimum figure.

The 1784 Plan is the Program

Throughout his life Jefferson evidenced a marked preference for agriculture over commerce. A practical farmer himself, he believed that all virtues spring from the soil. With immense pleasure he once proclaimed, "Cultivators of the earth are the most valuable citizens. They are the most vigorous, the most independent, the most virtuous, and they are tied to their country, wedded to its liberty and interests, by the most lasting bonds."³⁶ Accordingly, his comment on the city is disparaging: "The mobs of great cities add just so much to the support of pure government, as sores do to the strength of the human body." Griswold rightly points out: "No one believed so implicitly as [Jefferson] in a causal connection between the occupation of farming and the political system of democracy, and no one, before or since his time, has given that belief a greater impetus among his country man."³⁷ Thomas Jefferson,³⁸ and could have never visualized an American as a "citified citizen" for whom the country was of no concern.

Jefferson also held dearly the intellectual beliefs of an eighteenth century gentleman. Like his other progressive contemporaries he believed that the human civilization had reached its pinnacle in Rome. His love for classical architectural forms went hand in hand with a respect for classical political models. He believed that reason could prevail only through a proper understanding of these models. This rationalism was so ingrained in Jefferson's mind that his impulse to transplant mulberry trees or grape vines and upland rice became almost analogous to transplanting a pattern of Roman landscape on the soil of the United States. He wanted to create "Americans" in the way Rome wanted to create "Romans"--the archetypal farmer-as-citizen. It was the stolid Roman farmer or the country gentleman which inspired Jefferson most. Inspired by the Roman example of laying out grid on vast tracts of land, Jefferson wanted to give an order, an order which was primarily political in its nature, to a vast and unknown territory with his rectilinear grid of 1784 Plan. Jefferson's political order didn't require any effective relationship with the society/community; this is because, community would eventually take its own form within this given political order.

Despite his love for the classical world, Jefferson maintained a passion for the New World itself. He spared himself of no chance to know this New World in all its aspects. A man like Jefferson who was so much possessed by American themes could have hardly misunderstood the impulse of the country. The American passion for cities was no secret to him. Since he intensely disliked such passion, naturally he wanted to restrict it without hindering its progress. In other words, he wanted a controlled growth, and his tool was the 1784 Plan. For him, the 1784 Plan was a valuable program, which could provide a balance between the forces of history and science, of stability and mobility, to achieve the best landscape for an unpredictable future.

Notes

¹The following men served on the committee: Hugh Williamson of North Carolina, David Howell of Rhode Island, Elbridge Gerry of Massachusetts, and Jacob Read of South Carolina.

²Cited in William D. Pattison, *Beginnings of the American Rectangular Land Survey System*, Research Paper no. 50, Department of Geography, (Chicago: University of Chicago, 1957).

³A brief account of the concurrent considerations of these two ordinances in Congress appears in Edmund C. Burnett, *The Continental Congress*, (New York: The Macmillan Company, 1941), pp. 598-601.

⁴ Julian P. Boyd (ed.), *The Papers of Thomas Jefferson*, VII, (Princeton, New Jersey: Princeton University Press, 1950--), pp. 140-141.

⁵For the early history of the *hundred* in England, see F. M. Stenton, *Anglo-Saxon England*, (Oxford: Oxford University Press, 1943), pp. 295-298.

⁶For a discussion of the *hundred* in the American colonies, see George E. Howard, *An Introduction to the Local Constitutional History of the United States*, Johns Hopkins University Studies in Historical and Political Science, Extra Vol. IV, (Baltimore: Johns Hopkins University Press, 1889), pp. 272-286.

⁷Instead, the parish and the county, more or less equivalent to one another in scope, flourished in this state. "The State . . . is formed into parishes, many of which are commensurate with the counties; but sometimes a county comprehends more than one parish, and sometimes a parish more than one county," wrote Thomas Jefferson in his *Notes on the State of Virginia*. Thomas Jefferson, *Notes on the State of Virginia*, William Peden (ed.), (Chapel Hill: University of North Carolina Press, 1955), p.108.

⁸ For further description on this issue, see Pattison, *Beginnings of the American Rectangular Land Survey System*, pp.44-45.

⁹Jefferson to Samuel Kircheval, Monticello, July 2, 1816, in Liscomb and Bergh, 1903, XV, 37-38. Cited in Pattison, *Beginnings of the American Rectangular Land Survey System*, p.45.

¹⁰Stenton, *Anglo-Saxon England*, p.295.

¹¹O. A. W. Dilke, *The Roman Land Surveyors: An Introduction to the Agrimensores*, (Newton Abbot: David & Charles, 1971), pp. 133-34.

¹² Jefferson's "Notes on Coinage," in Boyd, *Papers of Thomas Jefferson*, VII, p.176.

¹³Jefferson to Francis Hopkinson, Annapolis, May 3. 1784, in Boyd, *Papers of Thomas Jefferson*, VII, p.205.

¹⁴*Ibid.*

¹⁵Pattison, *Beginnings of the American Rectangular Land Survey System*, p.57.

¹⁶*Ibid.*, pp. 50-51.

¹⁷Jefferson to Madison, in Worthington C. Ford et al. (eds.) *Journals of the Continental Congress, 1774-1789*, (Washington: Government Printing Office, 1904-1937), IV, p. 2.

¹⁸Amelia C. Ford, *Colonial Precedents of Our National Land System as It Existed in 1800*, Bulletin of the University of Wisconsin, No. 352, (Madison: University of Wisconsin, 1910), p.18.

¹⁹*Ibid.*, pp. 36-37.

²⁰*Ibid.*, pp. 37-38 and pp. 45-46.

²¹See J. Reys, *Town Planning in Frontier America*, (Princeton, NJ: Princeton University Press, 1969), p. 236. I am indebted to Professor Douglas Allen at the Georgia Institute of Technology for mentioning this particular feature of Sir Robert's Plan to me.

²²*Ibid.*

²³(William Smith), *An Historical Account of the Expedition against the Ohio Indians, in the year 1764, Under the Command of Henry Bouquet, Esq.; Colonel of Foot, and now Brigadier General in America ...* Philadelphia, 1775. Jefferson's copy of this book is in the Jefferson collection, Rare Books Division, Library of Congress. Cited in, Pattison, *Beginnings of the American Rectangular Land Survey System*.

²⁴Jefferson, *Notes on Virginia*, pp. 103-107.

²⁵C. E. Sherman, *Ohio Land Subdivision*, (Press of the Ohio State Reformatory, 1925).

²⁶The *Corpus Agrimensorum* is a collection of Roman surveyors' manuals. For details, see Dilke, *The Roman Land Surveyors: An Introduction to the Agrimensores*.

²⁷Pattison, *Beginnings of the American Rectangular Land Survey System*, p.62.

²⁸*Ibid.*

²⁹ Dilke, *The Roman Land Surveyors: An Introduction to the Agrimensores*, p.204.

³⁰George Green Shackelford, "A Peep into Elysium," in *Jefferson and the Arts: an Extended View*, William Howard Adams (ed.), (Washington: National Gallery of Art, 1976), p.237.

³¹The Romans preferred squares over rectangles. Roman forts, garrison towns, agricultural land divisions were basically square. For further details, see Dilke, *The Roman Land Surveyors: An Introduction to the Agrimensores*, p.133.

³²Boyd, *Papers of Thomas Jefferson*, VII, p. 141.

³³Pattison, *Beginnings of the American Rectangular Land Survey System*, p.40.

³⁴Jefferson to Hogendorp, in Boyd, *Papers of Thomas Jefferson*, VII, p. 220.

³⁵*Ibid.*, p.221.

³⁶Jefferson to John Jay, August 23, 1785, In Boyd, *Papers of Thomas Jefferson*.

³⁷A. Whitney Griswold, *Farming and Democracy*, (New York, 1948), p.19.

³⁸Morton and Lucia White, *The Intellectual versus the City*, (Cambridge, Mass.: Harvard University Press, 1962), pp. 12-20.