The Evolution of Individual Property Rights in Massachusetts Agriculture, 17th—19th Centuries

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Introduction

Economic studies of changes in property rights institutions have been hampered by the use of ideal types. Conceptually we usually identify a small number of discrete property rights regimes, e.g., "open-access," "common property" and "private property," and then try to comprehend our data in terms of these categories. But in the so-called real world ideal types are seldom encountered. Instead we usually see complex mixtures of assorted arrangements, all growing or declining or mixing or separating at different rates and in different directions. Models containing nothing but ideal-type concepts are ill-suited to the analysis of such a reality. In this paper I want to examine a case of institutional change where one institutional regime was transformed into another; not by a discrete jump from one system to another, but through a gradual process of institutional adaptation and transition.

When the first European settlers began farming in 17th Century New England, they chose to utilize most of their land in some form of commons arrangement. The reasons for this are a matter of some controversy among historians. Some have stressed the cultural inheritance of the immigrants, their reliance on common land use in New England being traced to their use of, and familiarity with, this institution in old England (Allen). Others, including myself, have placed greater weight on the efficiency of this institution within the environment of 17th-Century New England factor endowments (Bidwell and Falconer; Field and Kimball (a)). No doubt the truth is a mixture of these elements. What all can agree on, however, is the current state of affairs, which is that private land-use commons do not exist in contemporary New England agriculture. In this paper I want to examine the process of change through which the early system of common-property agriculture evolved into one of individual property.

Some writers have given the impression that the transition to individual property occurred very rapidly; that, in effect, commons were used for the first several years until the settlers could get their bearings, whereupon there commenced a rapid shift to individual property (Harris; Lemon). The transition period actually was much longer than this, over a century, in fact, in many of the early communities. From our perspective today this institutional transition is worthy of study both because it was a key developmental stage in a sector of special interest, and because it enables us to apply some contemporary thoughts about how institutional transformations are produced by changes in underlying economic, political and social factors.

In the next section I briefly describe the variety of commons arrangements used by early Massachusetts farmers. This will serve to set the stage and also establish some terms that will allow us to sort through the rich and complicated economic and institutional history of the period. Before actually launching into that history it seems appropriate to say a few words about institutional change from a conceptual point of view; these are contained in the third section. Following this we get to specifics; the fourth section is devoted to a study of the historical facts—the change in use of common property arrangements in the 17th and 18th Centuries and in the legal and economic environment that accompanied this change.

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Agricultural Commons in Early Massachusetts

One of the first tasks facing the new communities of the 17th Century was apportioning the land to individuals for undertaking agricultural operations. A variety of formulas was used for this among the new towns, but the end result was that each settler typically ended up with five types of land: home lot, land for tilled crops, meadow land for hay production, pasture, and woodland. In very few cases were an individual's lands consolidated, instead they were scattered among the various fields, meadows and outer lands contained in each town (Field and Kimball (b)).

Identification and organization of planting fields was a collective activity of each town at the beginning. In many cases planting fields were located on fields that had been developed by the departed Indians. Each settler was granted plots within the planting fields, sometimes more than one within each field on account of fertility variations. To protect these fields from livestock damage they were typically fenced in common; that is, surrounded by a single fence. Most of the early communities were located close to naturally-occurring lowland meadows; these meadow fields were also managed as units, though they may not have been fenced at first. Within each meadow field, individual grants were made. Evidence seems to show that these grants, although cast in terms of specific numbers of acres, were often in terms of "mowing rights," i.e., individual grants were in terms of acres but not tied to any specific portions of the fields.

Land not organized into home lots, planting fields and meadows was usually reserved for grazing and/or forest products such as firewood, building supplies, turpentine, and so on. Different animals were typically assigned to different parts of these lands. Milking cows were often assigned to areas close to the town centers. They were usually collected each morning at a designated meeting place and taken to pasture by a herdsperson hired for the purpose. Other, usually more remote, areas were designated for other types of livestock, such as dry cows, sheep and hogs. These pasture areas varied greatly in quality, some classifying as "improved" in the sense of having trees and brush removed or cut back, others consisting essentially of rough woodland. Most pastures were stinted, that is, subject to controls in the form of maximum animal numbers permitted each user. Others, especially the remote areas, were often unstinted. Planting fields and meadow lands after harvesting were usually opened for common, stinted grazing.

There were two senses in which the word "commons" was applied in the land tenure and use practices of the period. There were "common and undivided lands," often called simply common lands; and there were "common fields," later to become known as "common and general fields" and finally as "general fields."

The "common and undivided" lands of a community consisted of two types of areas: that which had not yet been divided (i.e., granted to specific individuals) and thus was used in common; and land that had been divided but, being unfenced, was still used in common. The extent to which towns had land in this latter category has been overlooked by many students of this period. Land owned "in severally" (i.e., by individuals) but used in common was especially plentiful in those cases where wholesale divisions were made of undivided land among large numbers of residents . Towns would frequently take large tracts of land in their outlying regions and simply divide them up into rather standard-sized plots among all those who had the right to share in such divisions. It is this act of parceling out whole divisions to named individuals that may have led some commentators to conclude that the colonists engaged in grand acts of privatization during relatively short periods of time in the 17th and 18th Centuries. In fact, the evidence shows rather clearly that much of this land was actually used in common for many years, decades, and sometimes centuries after being nominally allotted to individuals. The case of Northampton, Massachusetts is a good illustration of this. The town was established in 1653, with grants of house lots, meadow and upland. In 1663 much of the remaining commonly owned land was granted to individuals. The rest was granted in 1684, and several times after this there was a substantial amount of regranting because landowners complained of excessive scattering among their plots. During this period, however, the general public retained the right of commonage (timber, wood, stone, and grazing) on these lands as long as they were not fenced. In 1742 the landowners finally tried to extinguish the commonage rights on "their"

land. Some were, but at the price of an agreement continuing commonage rights to a large portion of the land for ten more years. In 1752 the matter came up again. Those who wanted to retain commonage rights on this "private land" were able to postpone the end for another 10 years. Finally, about a century after the land was granted to individuals, rights of commonage were extinguished. By this time, no doubt, a substantial proportion of the land had been enclosed by individuals. Nevertheless, the case illustrates ways in which a transition from one set of de facto property rights to another can be a process of gradual adjustment even though the de jure property rights change sharply and extensively at one point in time.

The "common and undivided lands" were initially under the jurisdiction of the regular town authorities. In most communities, however, the group having interests in these lands soon became distinct from the general citizenry. Thus there developed special groups, called "proprietors of the common and undivided lands," who came to have power of decision over these lands.[1] By legislative enactments, most notably that of 1692, these proprietor groups gained the power to establish grazing and other use laws; admit new members, make grants of undivided lands, levy taxes upon themselves, sue trespassers, and so on. We will have more to say about these groups below.

At the beginning "common and general fields" were the planting fields and meadows as designated by residents of the first settlements. Often they were fenced in common, especially the planting fields. Inside these fields individual lots were granted and laid out with varying degrees of precision and clarity. Often the lots were worked individually; sometimes they were cultivated in common or in some mixture of individual and common. Those holding land in any common or general field were designated as the proprietors of that particular field. Thus each of these fields had its own group of proprietors, unlike the proprietors of the common and undivided land, of which there was only one such group per town.

The exact patterns of land types and tenures varied greatly from one community to another, depending on a host of geographic, economic, social and political conditions. In some of the towns, for example, most land was left undivided at first, while in others a relatively large proportion of the town grant was regranted to individuals in the early years. As the towns grew many changes occurred. New settlers were often granted land from the remaining undivided land. Some of these grants also contained commonage rights. New common and general fields were organized and put into production. From time to time large chunks of undivided land were divided among individuals. The proprietors of the common and undivided lands had a great deal of control over these changes. The early histories of the towns are full of accounts of conflicts between proprietors groups, newcomers or residents who wanted new or enlarged or consolidated land grants, people who had some land but lacked commonage rights, people who had rights of commonage but were not using them, and so on. The common and undivided land, especially the undivided land, diminished. Much of the divided land, when it was finally fenced, was fenced in common, i.e., groups of owners of abutting grants would enclose their fields with a single fence. When this happened, the resulting field became a "common or general field" and was subsumed under this legal and institutional form.

Other portions of the undivided and common lands were never divided before being granted to groups of individuals. For example the proprietors of the common and undivided lands often set aside portions of the undivided land to be fenced as common pastures by designated groups of farmers. These fields were classic common fields; users of the field, though they might not be equal in financial interest, were not individually identified with specific portions of the field. They had the legal status of "tenants in common,[7]' quite different from the owners of "common and general fields."

Gradually, of course, substantially all of the original town land grant was transferred into individual hands, and these became consolidated and enclosed as individual farms. Evidence of the last use of common fields refers to Cape Cod in the latter part of the 19th Century (Adams, p. 35). While there is plenty of pub-

[1] It is these proprietors groups that are the subject of Akagi's well-known work. These groups are to be distinguished from the original "town proprietors" who were responsible for establishing many of the first towns. These latter were groups of named individuals to whom the town grant was made by the colonial legislature. Many of these proprietors did not become residents; their task was to secure the land grant and organize the first settlements.

licly-owned land today—village greens, areas around reservoirs, community gardens, conservation areas, public parks, etc.—there are no agricultural fields used in common by groups of farmers for their own profit.

How are we to approach this rich and complicated episode in our agricultural land use history? There was a great variety of different types of commons arrangements for different crops and livestock enterprises; there were different types of commons management groups who evolved in different directions; the legal histories of different types of commons developed along different paths; and so on. If one approaches this history with traditional property rights models one soon encounters trouble, because the models are not suited to the richness of the actual history.

In early New England the transition from common to individual land use was more gradual than is implied by these standard models. It made use of transitional forms that combined elements of common and individual property. Of course, the transition went at different speeds in different communities; they started at different places on the institutional spectrum, they occupied areas with different ecological characteristics, they were subject to different pressures from population immigration, and so on. Nevertheless, the transition was evident even in towns which changed relatively quickly.

The transition consisted, underneath all the institutional trappings, of dividing larger commons into progressively smaller commons as the communities grew. The end result of such a process is individual property. As I will discuss in greater detail below, what we have is a continuum of institutional arrangements, one end of which consists of pure common property—i.e., property open to use by anybody—and the other of pure individual property. Intermediate points on the continuum consist of an intermediate number of commons, each having a subset of the resource users and a portion of the resource. The early land-use history of Massachusetts consisted essentially of a traverse along that continuum, not all in one jump, but in a series of adjustments that in some places took more than a century to be completed. Before offering evidence on this transition, based on gleanings from the historical record, I would like to spend a little time on the topic of institutional change, both in general and in terms of common-re source use, from a conceptual point of view.

Institutional Change—The Concept

The popularity of institutional economics seems to have been waxing moderately in recent years. Some would attribute this to rising disenchantment with neoclassical models which are said to achieve their results by abstracting from institutional factors. No doubt some of the interest also stems from work in economic development, where questions of institutional design are paramount. A novel element in this latest incarnation of institutional analysis is the notion of endogenous institutional change; that the set of rules, customs and practices that comprise the institutional order are related in some systematic fashion to the characteristics of the economic situation in which they appear.

An early paper in the literature of induced institutional change—something of a classic by now—is Demsetz's work on property rights, specifically on how changes in these rights are produced by shifts in relative factor prices. This theme was used in breathtaking fashion by North and Thomas to explain the institutional history of virtually the entire western world. Other work has focused on the way changes in underlying economic factors affect choices of contractual forms (Cheung; Hayami and Kikuchi), the evolution of common law (Priest; Landes and Posner), organizational structures (Alchian and Demsetz; Williamson), and the choice of market or non-market allocation institutions. Attempts at general theories of induced institutional change have been made by Davis and North, Ruttan and Hayami, Schotter, and others.

Many scholars have utilized the notion of institutional system as rule structure that overlays and shapes the action structure where wealth and utility-maximizing individuals pursue their destinies. Changes in factor endowments and technologies produce alterations in relative returns potentials of alternative rule structures. When this happens societies are supposed to find ways to shift from institutions with relatively low potential returns to those with higher potentials.

There is value in pursuing this paradigm to increase our knowlege of the origins of institutions and the forces leading to their transformation. As with any line of inquiry, there are some problems that will have to be ironed out along the way. A major difficulty is that decisions on rules are usually made at political levels higher than that of the decisions to which they apply. Town and state legislatures,

for example, enact rules constraining choices of farmers. National legislatures enact rules constraining local political bodies, and so on. Thus, if by institutions we mean the structure of rules enacted through social choice processes, then a complete model of institutional change must contain a model of the political/ legal decision process and the way it represents and mixes the interests of those whose wealth positions would be affected by any change.

Another conceptual difficulty arises in the evaluation of changes in rules. Some have taken the position that rule shifts will be in the direction of increased economic efficiency. But the sense in which "efficiency" is being used in this case is unclear. Virtually everyone admits that real-world institutional changes benefit some while hurting others. So efficiency in the sense of Pare to-efficiency is apparently not applicable. Efficiency in the sense of maximizing value of output from given resources is perhaps what people have in mind; the literature is confused on this point, however, and needs straightening out. The efficiency school also runs afoul of another strand of the institutional literature; the economics of rent seeking. Rent seekers attempt to alter the rules to increase their own wealth, without regard to whether the alterations also conduce to increases in overall productivity—i.e., to increases in the size of the pie. In actuality any institutional change is most likely to be a complex melange of productivity-enhancing and wealth-redistributing effects.

The shortcoming of regarding institutions strictly as rules and organizations is that this tends to focus attention on collective legal/ political decision making rather than the allocation decisions of individuals. But the institutions in use at any point in time, for example the extent to which land is used individually or in common, is determined both by the set of rules in effect at the time and the decision behavior of individuals within that rule structure. Perhaps it is considerations like these that have led some scholars to develop models of institutions and institutional change that focus on the private, nonofficial behavior of individuals. The purest of these is the model of Schotter, whose concern is how people, starting from any possibly diverse set of behaviors, can work their way into some sort of useful Nash equilibrium relationship. His view of institutions, held by others as well (Runge), is that they are mainly signaling devices to allow reasonable people to coordinate their behaviors toward some mutually beneficial objective. According to this approach we could have very substantial amounts of institutional change even within an unchanging structure of formal rules.

It is not exactly clear how we reconcile the institutions-as-rules approach with the institutions-as-coordinated-behavior approach. It may not be far from the latter to models of contractual choice, which may be interpreted as attempts by individuals to structure their interrelationships more or less formally in order to capture gains from trade. And it may not be far from here to the old idea of institutions as rules, since the state of contract law is a fundamental consideration in such models. But this clearly would get us back to the political system.

For present purposes we do not have to affect such a synthesis. Rather, I think it is possible to proceed by making a very modest, and unoriginal,[2] distinction, and then using that destinction below in the study of early agricultural land tenures. The distinction to be made is between de jure and de facto property rights, or perhaps a better way of saying this would be *specified property rights* and *realized property rights.*

By specified property rights I mean the legal rules that state in a more or less formal way what the acceptable behaviors of people are vis-a-vis particular valuable assets. By realized property rights I mean how they actually behave with respect to these rights. There is clearly a vast difference between these two concepts. Most specified rights systems, for example, do not constrain actual behavior to a single alternative, but leave open a wide array of possibilities. The actual use of a valuable asset takes into account a large number of cost and returns variables that are not specified in formal systems (Scott). More importantly, the set of specified rights does not in itself set the level of enforcement, how much of the enforcement process is socialized, and so on.

The history of common land use, and transition to individual property, in colonial New England, was essentially one of large scale changes in realized property rights accompanied by a relatively static situation with respect to legally specified property rights. Realized rights were related directly to the decisions of individual farmers regarding the ap-

[2] See, for example, the distinction between formal rules and the "living law" made by Friedman.

propriate size of agricultural land commons. By size I mean extent of land area to be included and number of farmers to be allowed access. To understand how this worked, consider the following sketch (Field).

We start with a land area composed of A acres, and a total of N farmers. This could be the entire town, or some portion of the town used as a particular commons. For convenience, rule out any reduction in the number of farmers. Define X as the number of separate plots into which the total acreage and total number of farmers are divided. The variable X can take on any value between 1 and N: if the former, we have complete common property; if the latter, we have individual property. But there are N-2 intermediate values that may be taken by X, implying that the total area and population can be divided into that many commons areas. Each area is owned privately by a subset of the N farmers, but used in common by them.

A definitional note: putting property rights along this type of continuum suggests that we should not think of "common" property and "private" property as the two defining types of property rights. A piece of land worked in common by these farms is both private, because we have individuals in their private capacities making decisions about the resource, and common, because it is being used jointly among them. A better distinction is between common and individual land use. Even this is deficient, however, because anything along the spectrum other than individual land use is to some extent common. It might be better simply to jettison the whole dichotomous (or trichotomous, etc.) classification scheme for property rights systems, and talk about the size of the commons, actual, predicted, optimal, or whatever.

Farmers made decisions about land tenures in response to a large number of factors that affected the costs and returns attainable with different size commons. But we can organize these factors under these general headings: transactions costs among users of a common, exclusion costs, and common-property externalities. Transactions costs are the costs of reaching agreement among commoners as to how their resources are to be managed. Other things equal, we expect transactions costs to decrease with the size of the group using a common resource (Libecap and Wiggins). But other factors are important also, such as the extent of economic and social heterogeneity among the commoners (Johnson and Libecap) and the strength of social institutions under whose auspices the commoners attempt to reach agreement.

Exclusion costs are the cost of resources devoted to defining and enforcing boundaries, such as fencing costs, legal costs to determine ownership, cost of detecting and reducing encroachments, and so on.

Common-property externalities arise whenever two or more individuals exploit a resource in common. The extent to which these externalities vary with the number of commoners is in doubt, however. We might expect a priori that as the number of farmers using a common field declines, the externalities they inflict on one another might decline as the extent of their interconnectedness becomes more apparent to them. In the well-known commons model of Dasgupta and Heal, the assumption of Nash-type behavior among users of the common has the implication that as the number of users declines, the extent of overuse, i.e., actual use relative to the rent-maximizing use, declines. Thus, as an area is divided into a larger number of commons, each with a smaller number of users, the overruse in each commons would decline and therefore aggregate overuse would decline. As one approaches individual property, aggregate overuse approaches zero. This conclusion is disputed in the recent work of Comes and Sandier, however, whose model proceeds to full rent dissipation as long as the number of commoners exceeds one.

When resource users are faced with relatively high exclusion costs, and low external and transactions costs, the optimal size of land-use commons will be relatively large. This was the situation confronting the early farmers of New England. As time went on, these factors changed in the direction of making smaller commons relatively more efficient. As a result, farmers rearranged their land tenures, gradually reducing the sizes of the commons. I say "gradually" but of course this is not meant to imply strictly that the movement was smooth and of constant rate through the decades of the 17th and 18th Centuries. It was gradual, however, in the sense that the transition from fully common to fully individual rights did not occur all at once but in a series of steps through a great many transitional tenure arrangements that involved commons of diminishing size.

As the early New England colonial farmers

made decisions reducing the size of the realized land commons, changes in specified property rights also took place. They had impacts for both the costs of exclusion and for transactions costs among land users. Exclusion costs were affected especially by fencing legislation; but here the legal specification was set early and was changed only slightly as time went on. Changes through time in the costs of exclusion were produced primarily by private factors impinging in farmers. The other major dimension of the specified property rights system was that affecting transactions costs among commoners; here the main objective over time was to find ways of reducing the costs of gaining agreement among commoners. In this respect, colonial laws worked in the direction of slowing up the transition to individual land ownership.

The Evolution to Individual Land Use

In light of the previous discussion, what we need in order to study historically the transition from common to individual property in colonial agriculture is information on two property rights systems: the legally specified set of rights and the realized system of rights. The sources of this information must be the assorted historical records that have come to us from that period. We have quite good records pertaining to the system of specified rights, especially as they stemmed from legislative enactments of various types. For realized rights, however, information is much more difficult to find. There are plentiful data on the first land grants, but precious little on the extent to which they were enclosed in common or general fields, at the beginning and, especially, as time passed.

Public records do contain some evidence of decisions about size of commons. A good case in point are the recorded decisions made in Watertown, Massachusetts, which show a move toward smaller grazing commons. The first regulation, in 1636, stated simply that if any oxen or steers were found among the milk cows, they could be impounded and their owner fined 5 shillings per animal per violation (Watertown Records, Volume 1, p. 3). By 1648 the situation must have been getting more complex, as there was an attempt to organize to some degree the matter of grazing:

> "ordered that all cattle (except calves of this year) shall not go upon the common or highways without a sufficient keeper, after the first of May next . . . ." (Ibid., p. 17)[3]

The effect of this was probably to cause the farmers to move toward joint herding, since the individual costs of cattle keepers could have been lowered by so doing.

This state of affairs lasted for about twenty years, at which time rising external effects among farmers led them to divide the town into three separate herds:

> "The selectmen, being informed and complained unto that the inhabitants are not able to come to any orderly way for the herding of their cattle, by reason that many prefer to keep their cattle with private keepers, others drive their cattle sometimes over the water at the mill and elsewhere, others turn their cattle loose, knowing they will feed up Cambridge bounds, to the just offense of our neighbors whose love and respect we much pride, others that lie near the feed are not willing to herd nor pay any herdsman, and others, though willing to herd with the neighbors for some time but not willing to pay for the whole time . . . it is ordered: that there shall be but three herds in the town, the first shall be the Mill herd, which shall take all the cattle from William Bond's house . . . to Richard Cutting's . . . ," etc. (Ibid., p. 94)

This apparently did not get it quite right, because the next year it was:

> "... ordered that there shall be kept in Watertown four herds . . . and that they should be ordered as follows . . . ." (Ibid., p. 98)

We catch another glimpse of commons changing in size from the records of Duxbury, Massachusetts. Here we see the end result of the process, i.e., the final shift from relatively small commons to individual property. In 1712 portions of the common and undivided land in Duxbury had been granted to small groups of individuals ranging in size from two to four people. The areas were used in common by these groups for about two decades; then they were divided among the individual proprietors of each, completing the transition from com~~mon to in~~dividual property (Duxbury Town Records, pp. 94-175).

A major problem with having to rely on the public record for decisions about commons is that they would presumably contain information only on those fields that were important enough for management to be a concern of a large proportion of the town residents. When commons subsequently became smaller they

[3] In all quotes **from** early documents I have modernized the **spelling.**

ceased being matters of public policy and became situations of bargaining among smaller groups of individuals. The tracks left by these smaller groups are much more difficult to follow. From time to time, however, decisions related to relatively small groups of commoners are picked up in the public record, as is indicated by the following decision made at an early town meeting in Wateriown, Massachusetts:

> February 1647. "Memorandum: It is agreed between the commoners in Meed Field that John Lorrance, Timothy Hakings, John Brabrick, and Thomas Boydon and Sergant Bright, shall fence their upland and meadow in the field aforesaid in particular and the commoners upon the west side to close in their upland and meadow upon the aforesaid commons; provided that Thomas BoydorTs meadow is not intended in the first particular but to be fenced with the commoners on the west side, viz: Mr. Brisco, Isa Steerns, John Fleming, Mr. Bowman, John Warrin, William Hamant, Mr. Busby, which are the west commoners intended, William Hamant's upland being not included in this order." (Watertown Records, Volume 2, p. 14)

Data on actual cost levels of factors affecting the land tenure decision are also very difficult to discover. I have found no old diaries, for example, showing how some early farmers calculated net returns from fencing their lands separately rather than staying in the common or general fields. Thus, we must rely on circumstantial and indirect data and on gleanings from public and private documents.

The use of commons in early New England was a result of the relatively low levels of common-property externalities and transactions costs of reaching agreements; and the relatively high costs of exclusion. The common-property externalities inflicted by the early settlers on one another were low because they were relatively homogeneous in an economic sense. Each cultivated the same type of crops and kept the same types of animals; relatively little specialization existed. The relative price of land was low compared to the system they had just left, and compared to what it would become later in America. As time progressed, heterogeneity among farmers increased. Some began to specialize in different directions, some prospered while others did not, some ceased farming and had land to rent or sell, etc. We would expect this to lead to rising transactions costs among those using common fields, as well as rising common-property externalities.

Increasing heterogeneity would also increase potential gains from trade, and we would expect appropriate markets to develop. There is abundant evidence in the town records and histories that commons rights were bought and sold with great regularity.[4] Information is quite fragmentary on prices at which they traded. Allen notes that "gates," a right to graze one animal on the common, were trading at 3 shillings each in 1662 in Rawley, Massachusetts (Allen, p. 37). In Gloucester, Massachusetts, commonage rights were apparently selling at about 30 shillings in 1697 (Babson, p. 223). Some attempts were made to institute price controls in these markets.[5]

The market in commonage rights was complicated by the presence of uncertainty about the future balance between private and common property. Konig (p. 52) reports the result of a case in Rowley in which one farmer sued another over rights to future division of the commons. One had purchased from the other some grazing rights on the commons for ten shillings each in 1664. But when the town decided to distribute some of the undivided land in proportion to one's holding of grazing rights, these rights obviously became more valuable; in this case, they apparently increased in value to something over 20 pounds. This provoked a dispute between the two farmers over whether the purchaser of the grazing rights also owned the rights to new land in the division of the commons. He did, and this started a judicial precedent to the effect that those who purchased grazing rights had the right also to share in future land divisions.

Exclusion costs are critical in effecting the transition from common to individual property. A major factor here is the cost of constructing fences or other means of enclosure. Other things equal, the higher the cost of fencing the greater the advantage of common over individual property. The relatively low per-

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[4] For example: Sheldon (Deerfield), pp. 769 ff.; Babson (Gloucester), p. 233; Lord and Gamage (Marblehead), p. 41; Phalen (Acton), p. 8; Brooks and Usher (Medford), p. 58; Currier (Newbury), p. 94; Manchester (town records), p. 64; Hudson (Sudbury), p. 107.

[5] "... it is agreed that every man that has more than twelve great cattle or eight sheep or goats for every cow or horse that they must hire commonage of others is to be at 12 d. a year for a beast and not more." Cited in Banks (Edgartown), p. 35. This regulation was buttressed by a following regulation to the effect that if anyone did not buy sufficient commonage from others to cover their overstock, they were to pay the town 1 shilling and six pence, the six pence going to the town, and the shilling going to those who had a surplus of commonage rights.

son-land ratio characteristic of the early settlements worked to encourage common use of land. As that ratio declined through the years, the relative cost of fencing must have declined, though we have no hard data on the change. Thus, we have the same phenomenon in 17th and 18th Century New England as has been studied in western grazing lands of the 19th Century (Anderson and Hill).

When it conies to the legally specified property right system, we have far better information than for the system of realized rights. What we want for this is the records of public enactments and decisions, and these have been much more completely preserved than have the records of private decisions. There were many public laws enacted at the town, colony, and state levels dealing with common and general fields. Enactment of these laws extended over many years, despite the impression given by some writers that common and general fields were a quickly passing phenomenon. In Massachusetts, for example, legislation on common and general fields was still being enacted in the early 19th Century, almost two centuries after the first settlements.

There are pitfalls, of course, in drawing conclusions from this activity. Legislative enactments give qualitative but not quantitative evidence on a problem. In Massachusetts, state-level statutes on common and general fields were first codified in 1785. In that year a statute was enacted pulling together all of the separate clauses and enactments made theretofore on this issue. How should this be understood? Was it because many farmers throughout the state were still struggling with common-field problems at that time; or was it the last chapter in a story that had essentially run its course? Most likely it was something in between, but the legislation itself gives little help in making the correct call.

A very practical problem with interpreting early legislation is that there was so much of it, and much of that is preserved in the records. Laws were enacted at both the town and colony (later state) levels. I have not attempted to summarize all of the town by-laws passed on land-use matters during these early decades. Instead, the following discussion is based primarily on colony and state statutes, with town laws referenced where appropriate to provide additional insight. There were two major facets of the legal system affecting the use of land in common. One was the set of laws affecting transactions costs of making decisions by groups of commoners; the other was fencing laws, which vitally affected the costs of exclusion. I will take these up in reverse order.

There were two major dimensions of early fencing laws, and each affected in a vital way the efficiency of different types of land tenures. One of these was law covering the allocation of the costs of common fences among the affected commoners; the other was law pertaining to the allocation of fencing costs among abutting landowners.

Statutes on common fences were one of the most ubiquitous features of early land laws in Massachusetts. Such fences are public goods with respect to all those holding rights within them; thus, there are incentives for individual commoners to free ride on fence expenditures of others. The first law directed at this problem was in 1637:

> "In all corn fields which are enclosed in common, every party which is interested shall make good his part of the fence and shall not put in any cattle so long as any corn shall be upon any part of it, upon pain to answer all the damage which shall come thereby." (Colony Records, Volume I, p. 215)

This colony-level legislation essentially affirmed by-laws that had been passed by some of the towns, most of which contained more detail. For example:

> "Ordered that about every common field there shall be sufficient fence made up against the 1st of April next by every person having ground in the said field proportionately upon every acre, and for default hereof he shall pay 4 s. for every rod unfenced within 6 days after to the town." (Watertown Records, Volume 1, p. 3)

Here the proportion of the common fence that was the responsibility of each person was tied to their acreage inside the fence.

The history of common-fence legislation over the next two centuries is one of increasing specificity and of expanding powers for dealing with would-be free riders. In 1647 the selectmen of each town were given powers to order the repair of common fences, and to appoint fence viewers to inspect the fences.[6] The fence viewers were empowered to repair insufficient fence and recover double costs from those commoners who were deficient (~~Charters~~ and General Laws, p. 64), In 1694 a

[6] Interestingly, **this** power was withheld in cases involving farms **of** 100 acres or more.

statute was enacted specifying what constituted a sufficient fence—e.g., it had to be at Least four feet high (Acts of 1693-94, Chapter 7). In 1698 much greater detail was provided on the matter of fence viewers; they could be fined if they failed to serve, they were to be paid a certain wage, they were given powers to draft labor for repairing deficient fences, etc. (Acts of 1698, Chapter 2).

In 1718 a statute was enacted specifying more formal methods for determining the exact portions of the common fence that were assignable to each commoner (Acts of 1718-19, Chapter 3). Ten years later it was enacted that the costs of measuring and setting off the common fence, as opposed to the actual construction costs, could also be apportioned among the commoners (Acts of 1727-28, Chapter 13). Grievance procedures were also established at this time. In 1753 allowances were made for land of different quality, for example those who owned stoney or unproductive land within a common fence were exempted from fence maintenance costs (Acts of 1753-54, Chapter 29). In 1794 it was enacted that *any* commoner, not just fence viewers, could repair a section of defective common fence and recover costs from the person responsible for that section (Acts of 1794, Chapter 38).

What this history shows is the evolution of increasingly detailed and complex laws on managing common fences. This is a development we would expect for an institution that requires relatively high degrees of coordination operating in an increasingly heterogeneous economic environment.

The other major element of fencing costs that affected the history of commons was the cost facing those who wished to leave a large common field and fence together with a smaller number of farmers, or perhaps to leave a commons and fence individually.

In 1643 colony-level legislation was enacted specifying conditions for reaching agreement on management decisions, saying simply that they will be binding on all commoners "... excepting such occupiers land shall be sufficiently fenced by itself, which any occupier of land may lawfully do" (Ancient Laws, p. 62). This clearly established the right of anyone to enclose their own lands, even though their lands were currently part of a common or general field. Of course, this required that individual land holdings be identified within the field; for common fields of the "tenants-in-common" variety enclosure had to wait for the initial division of the land to individuals.

Another part of that law contained provisions for determining how fence costs were to be shared among abutting landowners. We have previously discussed the sharing of costs for common fences. In effect, however, all fences are common, even those lying between individuals; fencing expenditures by either individual usually benefit the other. The importance of the legal specification of fence cost sharing can be illustrated in the following way: Suppose several people have lots in a common field and that the fencing law reads simply: "Any individual is free to fence his or her own lot." If the cost of the fence is $k, then the fence will not be built as long as common-property externalities being experienced by each individual are less than $k. This means that aggregate externalities could reach nearly 2k without making the fence profitable for either person to build. But suppose the law reads "Anyone may fence individually, and all abutting landowners must pay a proportionate share of the fence costs." With this mandated cost sharing, the cost to each individual is now $k/2, meaning that common-property externalities need be only half as high as before to induce fence construction.

It is noteworthy that the 1643 act specified that if an individual wanted to fence his property while the abutter(s) wished to keep their land in common use, the individual doing the fencing had to bear all of the fence costs. But if two abutting land holders in a common field both wished to "improve" their land, the fence costs were to be shared equally.[7] In this case "improve" was apparently a synonym for "work individually," perhaps more intensively than is currently the case. The sharing of the costs of division fences was apparently an innovation of the colonists, since no English antecedents have been found for it (Di Stefano). While this would lower the cost of fencing between individuals both of whom wished to improve, the law would not have that effect in the case of individuals wishing to fence against everyone else who wished to remain in a commons arrangement. Thus, while the 1643 act could be interpreted as fostering individual enclosures, the strength of the incentive in this direction is reduced

[7] This arrangement did not apply to large (greater than 10 acres) house lots; in this case, everyone was responsible for half the cost of division fences, whether they wished to "improve" or not.

somewhat by withholding the cost sharing provision from anyone wishing to fence against a group desiring to remain in common use.

Use of land in common requires some type of joint decision making on the part of those having rights to a commons. The efficiency with which this decision activity can be carried out obviously affects in a vital way the relative advantage of different size commons. To the extent that commons-management groups can function effectively, common land use can be a reasonably efficient institutional form; the complement of this is that if the relative effectiveness of these groups diminishes through time, the comparative advantage will grow of smaller commons over larger commons. We have already dealt with one aspect of this: decisions pertaining to managing the common fence. From a wider perspective, the ability of groups of commoners to function efficiently was affected by a great deal of generalized legislation aimed at these groups.

In order for any commons group to function effectively, the first requirement is that there be some authoritative way to break real or potential deadlocks among commoners. The first colony-level statute addressing this was enacted in 1643:

> "For preventing disorder in corn fields which are enclosed in common, it is ordered, that those who have the greater quantity of such fields shall have power to order the whole. . . ." (Colony Records, Volume 2, p. 39)

This majority rule type of statute was apparently not sufficient because it was augmented almost immediately with:

> "... Whereas it is found by experience that there has been much trouble and difference in several towns, about the fencing, planting, sowing, feeding and ordering of common fields:
>
> It is therefore ordered by this court and the authority thereof that where the occupiers of the land, or the greatest part thereof, cannot agree about the fencing or improvement of such their said fields, that then the selectmen in the several towns shall order the same, or in case where no such are, then the major part of the freemen (with what convenient speed they may) shall determine any such difference as may arise upon any information given them by the said occupiers, excepting such occupier's land shall be sufficiently fenced by itself, which any occupier of land may lawfully do." (Chapters and General Laws, p. 62)

The point of this law is that it created a default system for making authoritative decisions when commoners of any particular field could not agree. For the next 70 years there was no further legislation pertaining to proprietors of general fields. There was legislation, however, pertaining to proprietors of common and undivided land. In a colony-level statute of 1692 the power to manage, divide and dispose of common lands was given to the "major part of the proprietors" (Acts of 1692-93, Chapter 28). In 1694 the separate, corporate power of these proprietors was recognized, and they were given the power to sue trespassers (Acts of 1694, Chapter 15). In 1726 they were empowered to tax themselves to raise money for legal and other managerial activities (Acts of 1726-27, Chapter 15).

Statutory activity on general fields began again in 1718, when a law was passed specifying certain conditions under which legal groups of proprietors might be called into meeting (Acts of 1718-19, Chapter 3). In 1758 a statute was enacted spelling out in much greater detail the rules for calling proprietors meetings (Acts of 1758-59, Chapter 33). This law also had the interesting provision that when one or two landowners owned the greater part of the lands enclosed, the minority landowners could appeal to the courts against decisions made by the majority. Votes were weighted by proportion of land owned, or "rights" within a common field. Finally, in 1785, all previous legislation on general fields was pulled together, and proprietors of such fields were extended the same corporate rights and responsibilities that had previously been given to proprietors of common and undivided fields (Acts of 1785, Chapter 53).

What these statutes reveal is the evolution through time of the organizations whose roles were the management of common fields. They started with relatively informal organizational forms, relying no doubt on other community institutions for the modest levels of sanctioning power needed during the first years. As the economic environment grew more complex, organizations of common-field proprietors evolved into formal, procedurally complicated, corporate entities.

Conclusion

The use of agricultural land in common was widespread among the farmers of New En-

gland at the beginning of its history. This was true even though the spirit of the enterprise was definitely one of individual advancement. I have sought to sketch out, conceptually and empirically, some of the major dimensions of this phenomenon, and especially the process through which common property institutions evolved into a system that is totally reliant on individual property.

The explanation for the adoption of common tenures in that period lies in the high exclusion costs relative to the transactions costs and common-property externalities that characterized the time. As these factors changed, the optimal size of land use commons decreased. Institutional change did not occur as a discrete jump in tenure practices, from "common" to "private" property. Tenure relationships progressed through a variety of intermediate forms, consisting of complex blendings of common and individual property. Models of institutional analysis that rely on discrete ideal-type tools are inadequate to the study of this phenomenon.

Early New England is often portrayed as a place where the spirit of individualism was rampant. This may have been true. But in the first part of its history, and often extending well into its second century, common land tenures were individually rational, and in fact group rational. One of the very first legislative enactments in Massachusetts made it lawful for individuals to fence against the common. One may interpret this, correctly, as legislative fostering of individual property. But much legislative energy was also devoted, over many years, to reducing the costs of group decision making; to lowering the transaction costs associated with common fences and other problems facing common-field proprietors .

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