CHAPTER III

MALTHUSIAN FACTORS

Both the Malthusian and staples approaches tend to push aside other factors which might enter the land acquisition process. One such factor is the general loss of soil fertility over time. There is very little consensus on the role of soil depletion and erosion in migration and land acquisition decisions. Avery O. Craven, who was very Malthusian in his emphasis on "push" factors, believed that soil depletion was the major factor in the westward migration. Lewis C. Gray, an economic historian, noted that "the expansion of cotton and tobacco left an ever widening circle of lands suffering from soil exhaustion" (1:910). Peter Passell, a new economic historian of the "staples" school focusing mostly on soil depletion in the antebellum South, states that "tobacco grown along the Atlantic Coastal Plain caused chemical imbalance which, left uncorrected, significantly reduced crop yields" (933). However, Passell recognizes that, unlike the upland South and the Cotton Belt, "the Coastal Plain rimming the South from Virginia to Texas is virtually free of erosion damage...since these land[s] are quite flat" (935).

Most early American historians tend to downplay the importance of soil depletion and erosion. Carville Earle, following a staples approach, agrees with Craven and Passell that tobacco depleted the soil, "after which planters abandoned the field to nature and cleared a new parcel of land" (25). However, Earle believes "the abandonment was temporary while the 'old field' rested and recovered its fertility, a period of about twenty years. Through this cyclical shifting of fields, planters maintained tobacco yields" (25). Darrett Rutman, following a Malthusian approach, finds that "the demographic process men and women were caught up in seems more determinative than the soil on which they lived." He found "optimum density" independent of both soil type and topography (1975,284).

If planters combatted soil depletion by holding extra lands as Earle suggests, a higher "optimum density" would be established than without soil depletion. This "optimum density" would be a function of the particular staple since each staple depletes the soil differently. According to Earle, tobacco required at least 20 arable acres per laborer (29), although he also states that by the time of the American Revolution, 50 acres per laborer may have been considered the norm. Both Earle and Kulikoff quote the anonymous author of American Husbandry, who in 1775 wrote "'a planter should have 50 acres of land for every working hand; with less than this they will find themselves distressed for want of room'" (Kulikoff,1986,48; Earle 210). Kulikoff believes that, beyond the 20 acres for tobacco production, planters required an additional 30 acres per laborer "to grow corn, pasture to graze livestock, and forests to construct and heat their homes, make fences, and build tobacco hogsheads" (1986,47-48).

However, if planters combatted soil depletion by acquiring new land, then demand for new land due to soil depletion would show up as a function of production land. (Only land planted in tobacco would be subject to depletion.) This could be proxied in two different ways: either as a proportion of cumulative patent acreage, or, perhaps even better, as a proportion of the total labor force (since any laborer could only work 2-3 tobacco acres annually).

In either case, the effect of soil depletion would show up in the coefficients of Malthusian factors rather than staples factors. Under the "optimum density" concept, there would be demand for new land when the population density was greater than optimum and no demand for new land when population density was less than optimum. Thus, in the long run, the population density would tend to stabilize around the optimum density. Under the Craven hypothesis, demand for land would show up best as a fixed positive fraction of the tobacco labor force, approximately one acre per year for each tobacco laborer.

Population Density and Optimum Density

In order to study whether the concept of optimum population density works in the colonial Chesapeake, we first need to study how population density in the Chesapeake changed over time. Two major problems in calculating population densities are (1) the definition of what land and population should be included and (2) the determination of the actual quantity of that land and population. Land could be defined, as

Easterlin does, as all "potentially cultivable land in a given area" (72), but then the problem would be to define the area, for colonial Virginia theoretically stretched to the Pacific Ocean. Population could be defined as either labor force population or total population.

For colonial Virginia, the two most convenient options for determining the proper acreage would be to use either quit-rent acreage or cumulative patent acreage as an estimate of "owned" acreage, the "potentially cultivable land" to the present frontier. Both options have their drawbacks. Quit- rent acreages, as shown in the section on land speculation, tend to underestimate "owned" acreage, especially before 1684. Although cumulative patent acreage can be determined after 1660 from the land patent data base, determining pre-1660 cumulative acreage is problematical. Alternatively, one could use modern county soil maps, as several historians have done for local studies (Walsh 408-412; Earle 24-30), or 19th and 20th century census improved acreage totals used by others for overall studies (Easterlin 47-51; Yasuba 158-169), but it may not be advisable to apply latter-day concepts of "potentially cultivable land" to 17th century planters and to use such information would require an analysis of local land use beyond the scope of this study.

Annual tithable population totals for Virginia have been developed by Menard (1980,157-161), based on the earlier work of Edmund Morgan. The definition of a tithable changed slightly over the 17th century but it basically was a measure of the labor force, including all males and black females aged sixteen years and over. For several reasons, tithable totals are preferable to total population totals. First, the colony only kept records on tithables. Estimates of total population in the 17th century are interpolations based on data from two total censuses in 1625 and 1699. Second, and even more importantly, the tithable population might be the "preferred" population for consideration in testing the Malthusian hypothesis. The tithable population is the population that works the land. Although planters may need more land to raise a family, there is only so much acreage that a planter himself can tend before he needs an additional laborer. Nevertheless, planters may obtain additional acreage with the expectation of establishing a family farm, leaving an inheritance for their children, and allowing their grown children to live nearby. Most historians must not believe that the concept of a "family farm" heavily influenced the development of the colonial Chesapeake, since all estimates of optimum density for the colonial Chesapeake, past and present, have essentially been expressed in terms of the tithable population. However, since much of the Malthusian influenced work has emphasized total population density (Rutman,1975,271), perhaps because of the New England emphasis on family farms and family inheritance, total population cannot be ignored.

For the purpose of testing the concept of optimum density, because of the problems associated with each method, population densities were calculated in several ways. Table VII presents population densities for the entire colony based on the method of headright-estimated acreage described in the section on quit-rent analysis. Table VIII uses the same technique, but reflects only land south of the Rapphannock River. Table IX also reports population density for land south of the Rappahannock

River but cumulative acreage is interpolated between the 1663 and 1704 quit-rent totals using a 81.5% correction factor to convert patent acreage into quit-rent acreage. The tithable totals were determined using Edmund Morgan's tithable totals, correction factors, and ratio of tithables to total (1973,367-368).[1]

All of the methods of calculating inverse population density seem to show a general trend: increasing dramatically through the 1670s, levelling off in the 1680s, and declining in the 1690s. Tables VII and VIII provide more realistic estimates of population density than Table IX, since quit- rent rolls underestimate cumulative acreage. Except for the 1662 estimate in Table IX, all calculated tithable population densities are well above 100 acres per tithable and thus far exceed 20 acre or 50 acre optimum acreages and show no trend toward declining to such low values.

But the concept of optimum density is not really meant to address the entire region of settlement, only subdivisions within the region of settlement. Earle focuses on one parish in Maryland and Rutman focuses on towns in New Hampshire. Even Kulikoff refers to "tidewater Virginia" or "southern Maryland," not the entire area of settlement of Virginians or Marylanders (1986,4849). For 17th century Virginia, the closest approximations would be an analysis of population densities at the county level, as presented in Table X for the years 1674 and 1699. In order to

[1] Tithable totals for land south of the Rappahannock were determined from county totals reported in Greene and Harrington for 1682 and 1699 (145-146) and in the Blathwayt Papers, Vol. XVII, Colonial Williamsburg, for 1673. The ratio of tithables to total for land south of the Rappahannock was slightly adjusted based on 1699 county totals.

determine whether an optimum density operated as a "homeostatic governor" in colonial Virginia as Rutman found in colonial New Hampshire towns (1975,279), the counties in Table X were arranged into natural density groupings, following the logic of Wetherell's hierarchical clustering recommendations (1977,109-116). The population change from 1674 to 1699 for each grouping was then calculated so that the effect of density on population growth could be analyzed. Table XI lists results based on 1674 density groupings and Table XII lists results based on 1699 density groupings (the preferred case since later quit-rent acreages are more accurate giving greater confidence to 1699 county density calculations and groupings).

Tables XI and XII reflect the general trend that Rutman found for New Hampshire of increasing population density (or decreasing inverse population density) leading to smaller population increases. However, the pattern is not nearly so clean, although some of this can be blamed on the small size of the sample. The groupings by density tend to create some strange bedfellows. Table XI combines in the 50-75 group: York County, where both acreage and population stabilized; Nansemond County, where acreage increased rapidly but population stabilized; and Gloucester County where both acreage and population showed steady growth. Population growth rates for the years 1674 to 1699 were 13.7%, -2.6%, and 49.0% respectively.

The concept of optimum density is problematic for the colonial Chesapeake because the concept implicitly assumes a fixed area of analysis, whether it be a parish, township, county, or "tidewater

Virginia." The problem is, again, in defining "potentially cultivable land." Warwick and York counties, which by New Hampshire standards appear closest to an optimum density (both land and population stabilized), had on the quit-rent rolls only 78.4% and 76.9% of their available land area, as shown in Table V. In both Warwick and York, land continued to be patented from 1674 to 1699, albeit only 5666 and 7109 acres respectively.[2]

The concept of optimum density must assume that the population is fairly evenly distributed over the area under consideration. If the population is concentrated in only one part of the region, as is the situation in a frontier county, then the population faces a much different "population pressure" than the calculated population density might indicate. To avoid this problem, patented land is used as the basis for determining population densities, rather than modern (or even 17th century) legal definitions of county boundaries. However, choosing patented lands as the basis means that the basis can change and thus the population density of a region might change independent of population changes. This is the case for Nansemond County where tithable population decreased by 2.6%, yet inverse population density increased from 62.5 to 143.5 acres per tithable, simply because more acreage was added to the quit-rent rolls.

The basic problem is that optimum density, the way Rutman defines it for New Hampshire towns, only explains population growth whereas, for the

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[2] However, a tract map of 1704 York County at the Colonial Williamsburg Foundation shows no available unpatented land for York County.

colonial Chesapeake, we are interested in both land acquisition and population growth and the interrelationship between the two. For the colonial Chesapeake, the Malthusian model advocated by Richard A. Easterlin may serve better. In Easterlin's hypothesis, population density is just a proxy for farm values, or more simply, land costs. Higher population density leads to high land costs and subsequent reduced returns on investments which stimulates out-migration. Unfortunately, more work is needed to study local changes in population and land prices in 17th century Virginia before such a thesis can be tested.

For studies of new land acquisition, the concept of population density might work on a colony-wide basis; the general rise in land prices drives people to the frontier for less expensive land. But the concept of population density would seem illsuited to determining the specific frontier that patentees would choose. The land patent system equalized price of land at the frontier but the frontier could represent quite different types of land in different counties. Since the patentees would have had only limited knowledge of available land, perhaps such decisions were based on other criteria such as proximity to present location, personal contacts, etc.

It is conceivable that population change could be directly correlated with both population density and land prices. Figure I is a time plot of inverse tithable population density and new land patent acquisition. The upturn in land acquisition after 1700 might be attributed to the sharp drop in acres per tithable. People migrated from higher priced, more dense areas to lower priced, less dense areas. This implies a simple supply-demand market for land. Kevin Kelly believes that the key to the tremendous increase in land acquisition in Surry County in the 1680s was "that its available interior land was inexpensive" (1979, 197). But does this explain the tremendous increase in patents there as well? As Kelly points out, these people are not speculating (1979,190). Why would people patent land in an area where land values were cheap? Wouldn't they patent the best land they could get?

Why people chose to patent land in different areas at different times is uncertain. Kelly believes that Surry only gained popularity after the Middle Peninsula and the Northern Neck lost their attraction (1979,197). As he points out "it was, after all, a change in the attitudes of prospective settlers toward Surry, and not a change in the conditions within the county--its geography, its unproductive soil, its relative lack of affluence--that affected its settlement" (Kelly,1979,204). Although we can hypothesize about why certain regions became "popular" at different times, why speculators and settlers were attracted to one region or another, the answer certainly is much more complicated than can be explained by population density.

The concept of an optimum density for the colonial Chesapeake is unrealistic unless one wants to consider an optimum density which varies radically from place to place and time to time. Although this might be accounted for by changes in attitudes towards mobility, it is hardly likely. The closest concept to Rutman's optimum density might be the average density when a region changes from net in-migration to net-outmigration. For the Rutmans' Middlesex County, this occurred in the mid-1690s (1984,34) when inverse tithable density was about 70 acres per tithable. York County seemed to stabilize around 56 acres per tithable. Clearly more work at the local level will be necessary to verify such an optimum density. But even if identified, such an optimum density would address neither the tremendous turnover in people who emigrated from and immigrated to counties in spite of population density nor the steady rise in population density that occurred in almost all colonial Chesapeake counties over time due to natural increase.

Rather than an optimum density, we must think of "population pressure" as a relative concept, not an absolute concept. As Lewis Gray said, "the scarcity of land in older areas was not absolute, but relative to the great abundance of fertile land available in the frontier regions." "There was a tendancy with the passage of time for the older areas to develop a relative scarcity of easily available land of highest desirability, as a result of occupancy, progressive exhaustion of soil by single cropping, and the practice of holding large reserves...As this relative scarcity developed, it motivated emigration and gave rise to some tenancy" (2:640-1).