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10 Toward an Anthropometric History of African-Americans

The Case of the Free Blacks in Antebellum Maryland

John Komlos

Economic historians have been increasingly interested in the interaction between economic and biological processes, particularly as it relates to economic development.[1] Indicators such as height, weight, body-mass, age at menarche, and morbidity are all related to nutritional status and consequently to demographic variables such as life expectancy, with a feedback effect on the economy through their impact on labor productivity.[2] Within this context, the importance of the anthropometric history of African-Americans is accentuated by the debate over their material standard of living, especially their food consumption while in bondage. Calculations based on agricultural censuses indicate that the calorie and protein content of the slave diet was adequate on average. For example, slaves are said to have consumed circa 1,000

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1. The notion of using heights to gain insights into the biological maturation of human beings and its socio-economic implications was stimulated by the debate over the diet, health, and age at menarche of American slaves. For early papers see James Trussell and Richard H. Steckel, "The Age of Slaves at Menarche and Their First Birth," *Journal of Interdisciplinary History,* 8 (Winter 1978), pp. 477–505; Richard H. Steckel, "Slave Height Profiles from Coastwise Manifests," *Explorations in Economic History,* 16 (Oct. 1979), pp. 363–80. For a recollection of the inception of the nutrition project see "An interview with Robert W. Fogel," *The Newsletter of The Cliometric Society,* 5 (July 1990), p. 3ff.

2. Robert W. Fogel, "Nutrition and the Decline in Mortality since 1700: Some Preliminary Findings," in Stanley L. Engerman and Robert E. Gallman, eds., *Long-Term Factors in American Economic Growth* (Chicago, 1986), pp. 439–555; Roderick Floud, Kenneth Wachter, and Annabel Gregory, *Height, Health and History: Nutritional Status in the United Kingdom, 1750–1980* (Cambridge, 1990). For a theory of anthropometric history see John Komlos, *Nutrition and Economic Development in the Eighteenth-Century Habsburg Monarchy: An Anthropometric History* (Princeton, 1989), chap. 1.

calories more daily than European peasants.[3] The disadvantage of these estimates is that they cannot be decomposed by sex and by age, and, moreover, do not reveal temporal changes.

Anthropometric indexes were developed to overcome the limitations of these approaches. The method has become standard in assessing nutritional adequacy in third-world countries.[4] Several studies have explored the age-by-height profile of slaves to quantify their nutritional status and material well-being using two major sources of data, slave manifests and Civil War muster rolls.[5] The system of manifests was designed to discourage smuggling after the prohibition of slave imports in 1807. These shipping documents included physical descriptions used to identify slaves transported along the coast. The muster rolls pertain to black soldiers in the Union Army in the early 1860s. Both sources provide valuable information on the physical characteristics of African-Americans, but both have limitations.

Slaves, whose heights appear on the manifests, were transported in interregional trade, and thus they may not be representative of all slaves. Similarly, the military source contains information only on soldiers. Because it excludes females and youths, it cannot corroborate some of the results obtained from the manifest sample. Even with regard to males, the Civil War sample has no information on birth cohorts of the early nineteenth century and, consequently, provides only a limited trend in slave stature.[6] Moreover, the trend

3. On slave consumption see Robert W. Fogel and Stanley L. Engerman, *Time on the Cross: The Economics of American Negro Slavery* (Boston, 1974), p. 109; and for corroboration see Roger Ransom and Richard Sutch, *One Kind of Freedom: The Economic Consequences of Emancipation* (Cambridge, 1977), p. 244; for consumption of European peasants see Komlos, *Nutrition and Economic Development*, p. 101. The extent to which the diet was adequate in terms of vitamins and minerals, given the genetic make-up of slaves, is more controversial. See, for instance, Kenneth F. Kiple, "A Survey of Recent Literature on the Biological Past of the Black," *Social Science History*, 10 (Winter 1986), pp. 343–68.

4. Phyllis B. Eveleth and James M. Tanner, *Worldwide Variation in Human Growth* (2d edn., Cambridge, 1990).

5. Stanley Engerman, "The Height of U.S. Slaves," *Local Population Studies*, 16 (Spring 1976), pp. 45–50; Robert W. Fogel, Stanley L. Engerman, James Trussell, Roderick Floud, Clayne L. Pope, and Larry T. Wimmer, "The Economics of Mortality in North America, 1650–1910: A Description of a Research Project," *Historical Methods*, 11 (Spring 1978), pp. 75–108; Robert Margo and Richard H. Steckel, "The Heights of American Slaves: New Evidence on Slave Nutrition and Health," *Social Science History*, 6 (Fall 192), pp. 516–38; Richard H. Steckel, "A Peculiar Population: The Nutrition, Health, and Mortality of American Slaves from Childhood to Maturity," *Journal of Economic History*, 46 (Sept. 1986), pp. 721–41; Richard H. Steckel, "Birth Weights and Infant Mortality among American Slaves," *Explorations in Economic History*, 23 (Apr. 1986), pp. 173–98; Richard H. Steckel, "Growth Depression and Recovery: The Remarkable Case of American Slaves," *Annals of Human Biology*, 14 (Mar.–Apr. 1987), pp. 111–32; Robert W. Fogel, *Without Consent or Contract: The Rise and Fall of American Slavery* (New York, 1989), pp. 138–47.

6. In addition, the Civil War sample is not representative of the whole South because 43 percent of the black recruits were born in Tennessee and Kentucky; see Margo and Steckel, "The Heights of American Slaves." These two states had the tallest white men in the United States at that time. Therefore, the nutritional status of the black population born in the Upper South could have been above average.

obtained from the military sample differs from that of slaves shipped in interregional trade.

The trend for African-Americans obtained from Civil War military records essentially follows that of the whites. The results of the manifest sample, however, are more difficult to interpret. An early result actually resembled the one obtained from white soldiers.[7] Subsequent estimates, however, do not show a downward tendency prior to the Civil War.[8] If anything, they show the opposite.[9] The result is suspect, however, because African-born slaves, who were shorter than American-born slaves, might have been included in the early part of the sample, and the positive trend in height could be indicative of their changing share in the sample, instead of an improvement in nutritional status.

These limitations notwithstanding, major findings have emerged from the anthropometric evidence. The stature of slaves in nineteenth-century America indicates that they were well nourished as young adults, although not as children. In spite of their early nutritional deprivation, male slaves reached a terminal height exceeding 67 inches—within an inch of northern-born whites and well above contemporary African and European norms. In fact, their physical stature was closer to that of European aristocrats than to that of peasants.[10]

The evidence on slave children's nutritional status is more controversial than that on adults. Data in the manifests indicate that slave children were even shorter than children in the poorest third-world countries today.[11] They were below the first centile of modern height standards for industrialized countries. By comparison, the average slum child of Lagos, Nigeria, attains the twelfth centile. Although short children in developing countries grow into short adults, small slave children in America, according to the existing evidence, apparently grew up to be relatively tall adults, reaching the 25th centile of modern standards. The slaves' remarkable growth pattern has been attributed to a rise in food intake after a period of severe deprivation.[12] Previously, this pattern of "catch-up" growth has been observed only for shorter periods of deprivation than alleged for slaves.[13]

7. Steckel, "Slave Height Profiles," p. 377.

8. Margo and Steckel, "The Heights of American Slaves," p. 523.

9. This later result is the trend being accepted by the profession. See, for example, David Eltis, "Welfare Trends among the Yoruba in the Early Nineteenth Century: The Anthropometric Evidence," *Journal of Economic History,* 50 (Sept. 1990), pp. 521–40.

10. John Komlos, "Height and Social Status in Eighteenth-Century Germany," *Journal of Interdisciplinary History,* 20 (Spring 1990), pp. 607–21.

11. Eveleth and Tanner, *Worldwide Variation in Human Growth.*

12. Steckel refers to the degree of catch-up growth as "remarkable" in Steckel, "Growth Depression and Recovery," pp. 115, 129.

13. Technically it is incorrect to speak of catch-up growth here because the term usually is reserved for cases in which the nutritional deprivation is temporary. Slaves, in contrast, suffered prolonged deprivation. It is perhaps better to describe the pattern as moving through the centiles

Richard Steckel, using the manifest data, observed that slave children showed the first signs of improvement in height prior to adolescence, when they began to enter the labor force. As workers, Steckel reasons, they must have received greater allotments of food.[14] A weakness in this interpretation is that the initial signs of recovery among the children were fairly weak. Not much catch-up growth took place at the ages of ten and eleven, when many slaves entered the labor force and before the modern reference population experiences the adolescent growth spurt. At age eleven, slave children were still in the second or third centile of the modern height standards (Table 10.2).[15] During the early teenage years, they fall back through the centiles because the modern reference population reaches the adolescent growth spurt earlier than did slaves. But even after the adolescent growth spurt, at age seventeen the slave boys were still below the fifth centile (Figures 10.1 and 10.2). Hence the acceleration in the rate of growth appears to have been confined to a few years in the late teens.[16] Consequently, the juncture between the timing of the children's entrance into the labor force and their becoming taller relative to the modern reference population seems tentative. Why significant catch-up growth occurred earlier among females than among males is another unaddressed issue.[17] Because the degree of catch-up growth appears extraordinarily large, one might ask whether the results are a consequence of some peculiarity of the manifest sample as much as of the children's labor force participation rates. The military sample cannot illuminate the issue because it contains no evidence on slave children. Hence, the nature of the available data restricts our knowledge of slave nutritional experience in two respects: the nutritional experience of slave children and the secular trend in slave stature. It is fortunate that new data, such as the Certificates of Good Character of Louisiana and the Maryland manumission records, have been found.[18]

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of the modern standard. See James Tanner, *Foetus into Man: Physical Growth from Conception to Maturity* (2d. edn., Cambridge, Mass., 1990), p. 161.

14. Steckel, "Growth Depression and Recovery," p. 130. Short stature is also indicative of deprivation in utero, brought about by women working in the cotton fields until close to delivery. Labor force participation of pregnant females could have varied by crop specialization, and thus could have been different in the tobacco fields of Maryland. Slave children older than twelve were more easily separated from their parents. Some states forbade the importation of children under ten years of age without their mothers unless they were orphans. Perhaps these factors had an impact on which slave children ended up in the manifest sample. See Frederic Bancroft, *Slave Trading in the Old South* ([1931]; New York, 1959), pp. 197, 202, 212.

15. This means that 97 or 98 percent of today's youth are taller than the average slave child.

16. Slaves in the tobacco fields of Maryland, at least, were working full time by the age of ten (Allan Kulikoff, *Tobacco and Slaves: The Development of Southern Cultures in the Chesapeake, 1680–1800* [Chapel Hill, 1986], pp. 373, 377).

17. Children were reared by their families. It is possible that parents (and kin) supplemented children's rations from their own, particularly since slaves did produce some of their own food, cooked it mostly themselves, and often consumed it together (Kenneth M. Stampp, *The Peculiar Institution: Slavery in the Ante-Bellum South* [New York, 1967], p. 287). Some slave owners discouraged maternal neglect; see Bancroft, *Slave Trading in the Old South*, p. 86.

18. The system of certifying the good character of imported slaves was in effect between 1829 and 1831 in an attempt to keep troublemakers out of Louisiana (Herman Freudenberger and Jona-

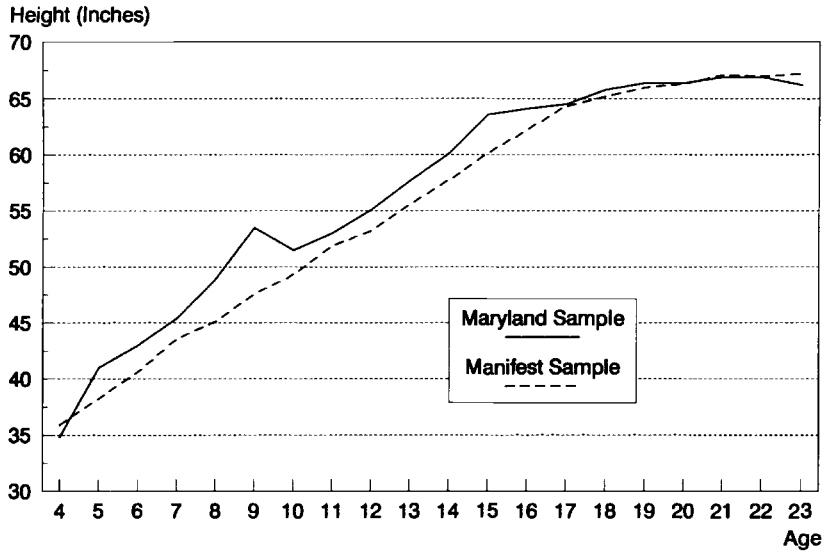

Fig. 10.1 Heights of Male African-American Youth
Source: Table 10.2.

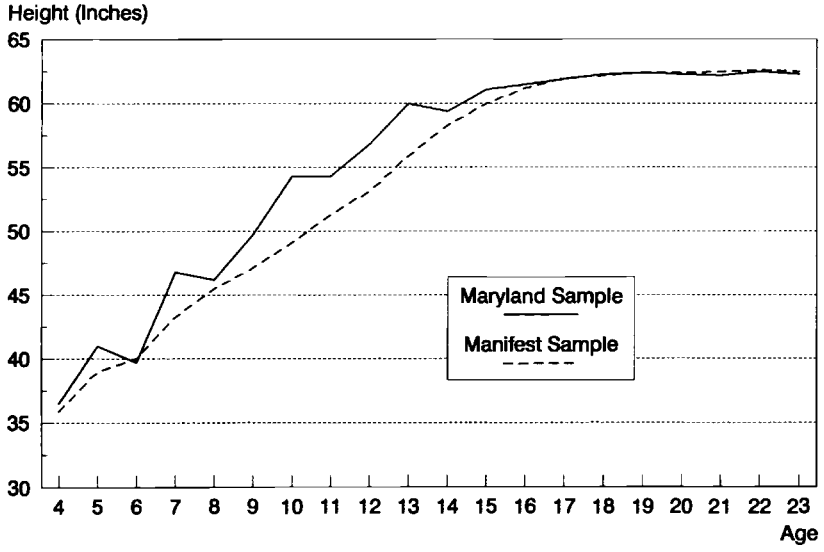

Fig. 10.2 Height of Female African-American Youth
Source: Table 10.2.

10.1 The Maryland Certificates of Freedom

The Maryland Certificates of Freedom were compiled between 1806 and 1864 to provide identification papers for blacks no longer bound to a master. The records contain information on the individual's height, age, sex, date of birth, color, county of residence and of birth, and whether the person was born free.[19] The number of records collected is 14,665; 35 percent of the females and 24 percent of the males were born free (Table 10.1).[20]

Current age, recorded to the nearest year, is not indicative of age at manumission because certificates were usually obtained when the former slave wanted to travel outside the immediate vicinity to an area where his or her status would not be common knowledge.[21] Although all ages are represented, few children are in the sample, probably because they were less mobile than adults (Table 10.1). The destination of the migrants was predominantly urban, evidenced by the fact that 39 percent of Maryland's free blacks lived in Baltimore in 1850. Like other migrant populations, most of the black migrants would have been young and probably unmarried when they applied for the certification. This explains why people in their twenties constitute nearly half of the sample and why there are so few children in the sample. There are more observations for teenage girls than boys. This could indicate that girls left home to marry or to work as domestics at a younger age than boys. Because adult migrants are frequently the more enterprising and possibly healthier, the sample may not be representative of all free blacks in Maryland.

Because physical descriptions were crucial for identification purposes, the height records are expected to be reliable. That heights were generally given to the nearest quarter of an inch supports their reliability. There was, however, some rounding to the nearest inch or half inch as indicated by the distribution of the height observations (Table 10.1). Unless otherwise stated, references to time indicate date of birth, not date of measurement, and references to Baltimore mean both the city and county.

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than B. Pritchett, "The Domestic United States Slave Trade: New Evidence," *Journal of Interdisciplinary History*, 21 [Winter 1991], pp. 447–78).

19. Certificates of Freedom, Maryland State Archives, Annapolis, Maryland. The records from Allegany, Calvert, Cecil, Charles, Howard, and Montgomery counties were not available. Among these, only the Howard County records are said to be extant but have not yet been microfilmed. All other records are included in the sample. A few of the documents contain information on where the person grew up. Information on the age of manumission, also available in some instances, was not collected. Similar records exist in Virginia.

20. In 1850 there were about 75,000 free blacks in the state (*Abstract of the Seventh Census of the United States: 1850* [Washington, D.C., 1853], p. 150). Females may outnumber males in this sample because females may have been more likely to migrate either to work or to marry.

21. Jeffrey R. Brackett, *The Negro in Maryland: A Study of the Institution of Slavery* (Baltimore, 1889), pp. 89, 163. Only 1.7 percent of the sample pertains to those under the age of fifteen. Authorities feared that the manumission of children would burden public relief, and in 1858 it was forbidden in Maryland. See James M. Wright, *The Free Negro in Maryland, 1634–1860* (New York, 1921), p. 65.

Table 10.1 Characteristics of the Sample of Maryland Certificates of Freedom

Part A: By County

County	Certificate[a]	Birthplace	Grew Up[b]
Anne Arundel	13.7%	13.4%	
Baltimore City	4.2	7.7	
Baltimore County	16.4	7.1	
Caroline	7.6	6.7	5.5%
Cecil	0.2	0.2	
Charles	0.3	0.0	
Dorchester	11.6	11.0	
Frederick	7.9	2.9	
Harford	2.5	2.0	
Kent	3.1	3.0	
Prince George	5.1	1.8	1.2
Queen Ann	3.2	0.4	0.3
St. Mary's	6.5	6.5	
Somerset	7.3	7.5	
Talbot	8.7	7.1	2.7
Washington	1.4	0.8	
Other		1.0	0.5
Unknown		20.2	89.7

Part B: By Legal Status at Birth

	Male	Female	Total
Born free	1,591 (24%)	2,802 (35%)	4,393 (30%)
Not born free	6,107 (76%)	5,165 (65%)	10,272 (70%)
Total	6,698	7,667	14,665

Part C: By Decade of Birth, Age, and Color

Decade of Birth		Age		Color	
1750	0.5%	1–9 years	0.6%	Black	14.8%
1760	1.7	10–14	1.1	Brown	5.6
1770	5.0	15–19	11.8	Dark	23.4
1780	10.4	20–24	28.9	Light	12.7
1790	15.0	25–29	19.4	Yellow	7.1
1800	18.0	30–34	14.2	Copper	1.3
1810	18.7	35–39	10.0	Chestnut	11.4
1820	15.1	40–49	10.6	Mulatto	10.0
1830	13.0	50–59	2.6	Bright	1.6
1840	2.3	≥60	0.6	Unknown	12.0
1850	0.0				
Unknown	0.1				

(*continued*)

Table 10.1 (continued)

Part D: By Precision of Height Measurement in Fractions of an Inch	
0.0 inch	46.6
0.25	11.6
0.50	30.0
0.75	11.0
Other	0.7

Source: Certificates of Freedom, Maryland State Archives, Annapolis, Maryland.
[a]County in which certificate was obtained.
[b]County in which person grew up.

10.2 Anthropometric Evidence from the Maryland Sample

10.2.1 Children

Although the Maryland sample corroborates the notion that slave children of both sexes were undernourished, they were, however, less malnourished than the manifest sample indicates (Table 10.2).[22] Free black children were several inches (about 3.5 percent) taller than the slave children transported on water to the Lower South (Table 10.3, rows 5 and 13; Figures 10.1 and 10.2 above). After age seventeen the distinction between the two results diminishes or even vanishes, even when the number of observations remains small, as in the case of seventeen-year-old boys. There is considerable variation in the centile of modern standards reached until the late teens because the number of observations in the free black sample is small. On average, children reached about the tenth centile of modern heights. Catch-up growth is evident and begins at about the same age as in the manifest sample, but it is less abrupt, and thus resembles more closely conventional growth profiles. Relative to their modern counterparts, free black girls were somewhat taller than boys (Table 10.2). Children born enslaved tended to be taller than those who were born free (Tables 10.3 and 10.4).

10.2.2 Time Trend

The time trend in stature is analyzed in three age categories for both sexes. Turning first to males, sample sizes are insufficient to explore the trend for those under age sixteen. Regression analysis on youth (ages 16 to 20) indicates that their height increased until approximately the birth cohorts of the 1820s and subsequently declined (Tables 10.5 and 10.6; Figure 10.3). Among

22. Here and elsewhere comparison is made with the hitherto published results of the manifest sample. Richard Steckel has now enlarged the sample to about 28,000 manifests, including all those housed in the National Archives. His preliminary investigation seems to indicate that slave children in Maryland and Virginia reached about the fifth centile of modern standards and were taller than those born in the Lower South. Hence, the yet unpublished results seem to be closer to the height of the free black children of Maryland.

Table 10.2 Height by Age Profile of African-American Youth

Part A: Height (in inches)

	Male				Female			
	Free		Slave Manifests		Free		Slave Manifests	
Age	N	Height	N	Height	N	Height	N	Height
1					1	27.0		
2	1	33.5			7	30.1		
3					7	34.7		
4	2	34.8	195	35.9	6	36.5	206	35.9
5	1	41.0	169	38.3	8	41.0	200	39.0
6	2	43.0	218	40.6	5	39.7	262	40.0
7	4	45.4	200	43.6	14	46.8	241	43.3
8	4	48.9	281	45.1	8	46.2	337	45.5
9	3	53.5	266	47.6	11	49.7	306	47.1
10	1	51.5	557	49.3	11	54.3	528	49.1
11	5	53.0	347	51.9	10	54.3	443	51.3
12	6	55.1	751	53.2	23	56.8	736	53.1
13	6	57.7	470	55.6	30	60.0	556	55.9
14	18	60.1	732	57.7	54	59.4	765	58.3
15	12	63.6	571	60.2	89	61.1	812	60.0
16	30	64.1	709	62.2	245	61.5	113	61.2
17	42	64.5	655	64.3	352	61.9	871	62.0
18	61	65.8	1,142	65.2	439	62.3	1,268	62.2
19	96	66.4	900	66.0	375	62.4	594	62.4
20	168	66.4	1,527	66.3	412	62.3	1,764	62.4
21	746	66.9	944	67.1	367	62.2	337	62.5
22	685	66.9	1,374	67.0	439	62.5	664	62.6
23	466	66.2	795	67.2	339	62.3	404	62.5
Total	2,359		12,806		3,253		11,807	

Part B: Standard Deviations and Centiles of Modern Height

	Standard Deviations of Heights				Centiles of Modern Height			
	Male		Female		Male		Female	
Age	Free	Slave Manifests	Free	Slave Manifests	Free	Slave Manifests	Free	Slave Manifests
2			2.2		7.6		0.02	
3			3.5				1.7	
4	6.7	5.5	2.5	5.5	0.01	0.3	0.7	0.5
5	0.0	5.3	1.8	5.2	6.8	0.3	10.6	1.6
6	2.1	5.3	1.9	5.7	5.7	0.5	0.2	0.4
7	1.1	5.0	3.6	5.5	7.5	1.5	27.8	1.8
8	2.8	5.0	1.7	5.4	21.2	0.9	3.8	2.2
9	1.6	5.1	2.7	5.0	60.3	1.7	11.9	1.4
10	0.0	5.8	3.9	5.7	9.3	1.6	40.5	1.4

(continued)

Table 10.2 (continued)

Part B: Standard Deviations and Centiles of Modern Height

	Standard Deviations of Heights				Centiles of Modern Height			
	Male		Female		Male		Female	
Age	Free	Slave Manifests	Free	Slave Manifests	Free	Slave Manifests	Free	Slave Manifests
11	3.4	4.7	4.3	4.9	7.4	3.6	13.8	2.1
12	3.3	5.0	3.1	4.7	8.4	2.4	12.7	0.9
13	3.3	4.8	2.5	4.7	10.8	3.0	20.3	0.9
14	3.4	4.5	2.6	4.1	8.5	2.1	5.0	1.7
15	3.7	3.9	2.3	3.4	12.9	1.3	12.9	5.6
16	2.6	3.7	2.6	3.1	5.7	1.2	16.6	13.3
17	3.0	3.1	2.3	2.8	5.5	4.6	21.2	21.5
18	3.0	3.0	2.4	3.4	12.7	8.9	26.4	24.5
19	2.7	3.2	2.5	3.1	18.1	14.5	28.1	27.4
20	2.8	3.0	2.3	3.0	18.1	17.6	26.4	26.8
21	2.6	2.9	2.7	2.8	23.6	26.1	25.1	28.4
22	2.6	3.0	2.7	3.0	23.6	24.8	29.5	29.5
23	2.6	3.0	2.5	3.4	23.6	26.8	26.4	28.4

Note: N = number of observations.

Sources: See Table 10.1. Slave heights are derived from the manifest sample, see Richard H. Steckel, "Growth Depression and Recovery: The Remarkable Case of American Slaves," *Annals of Human Biology*, 14 (Mar.–Apr. 1987), pp. 111–32. Modern height standards are from J. M. Tanner, R. H. Whitehouse, and M. Takaishi, "Standards from Birth to Maturity for Height, Weight, Height Velocity, and Weight Velocity: British Children, 1965, Part II," *Archives of Disease in Childhood*, 41 (Dec. 1966), pp. 613–35.

adults the trend is flatter prior to the 1820s, the coefficients being either small or insignificant. The increase of the 1820s and the decline in height among the birth cohorts of the 1830s is as evident as among the youth (Tables 10.6 to 10.8). The decline of the 1830s is more pronounced among the urban than the rural population. In spite of the decline in physical stature, adults of the 1830s were only marginally shorter than those of the late eighteenth and early nineteenth centuries. The few observations available for the 1840s suggest that the downward trend continued.

Regional differences in the extent of the decline are noteworthy as well. In Baltimore the birth cohorts of the 1830s were 0.87 inches shorter than those of the 1820s, while those for the rest of Maryland were only 0.22 inches shorter (Table 10.8). Only among those born in Baltimore was mean height in the 1830s markedly below the level that prevailed at the turn of the century. This might indicate that the decline in nutritional status among the males was initially, at least, an urban phenomenon.

If the notion of "urban" is expanded to include Anne Arundel County, be-

Table 10.3 Height Indexes of Black Children in Antebellum America[a]

Sample	Characteristics	Male		Female		Total	
		N	Height	N	Height	N	Height
1) Maryland	Rural, born slave	81	101.0	336	100.5	417	100.6
2) Maryland	All, born slave	91	100.7	373	100.4	464	100.5
3) Maryland	Rural, all	120	100.7	592	100.3	712	100.4
4) Maryland	Rural, free	39	100.0	256	100.0	295	100.0
5) Maryland	All, free	163	100.0	860	100.0	1,025	100.0
6) Maryland	All, free	72	99.3	487	99.7	559	99.6
7) Louisiana	Imported	365	98.8	350	100.3	715	99.5
8) Maryland	Urban, born slave	10	98.5	37	99.6	47	99.4
9) Maryland	Urban, free	33	98.4	231	99.4	264	99.3
10) Maryland	Urban, all	43	98.4	268	99.4	311	99.3
11) Manifests	New Orleans	866	98.9	999	98.9	1,865	98.9
12) Manifests	New Orleans	1,603	97.9	1,558	98.7	3,161	98.3
13) Manifests	Shipped	7,263	96.6	7,366	96.3	14,639	96.5
14) Manifests	Shipped	383	96.1	313	94.2	696	95.2

Notes: 1) manumitted, not born free, rural; 2) manumitted, not born free, rural and urban; 3) manumitted, free born, rural and urban; 4) free born, rural; 5) manumitted, free born, rural and urban; 6) free born, rural and urban; 7) transported to Louisiana overland and by ship; 8) manumitted, urban; 9) free born, urban; 10) manumitted, free born, urban; 11) shipped to New Orleans and sold there; 12) all slaves disembarked at New Orleans; 13) all slaves shipped in interregional trade; 14) slaves disembarked at New Orleans but not sold there.

Sources: See Tables 10.2 and 10.4; Jonathan Pritchett and Herman Freudenberger, "A Peculiar Sample: The Selection of Slaves for the New Orleans Market" (manuscript, Tulane University, 1990).

[a]Males include children between the ages of 4 and 18; females, between the ages of 4 and 17. The index is standardized for age. The calculation is made by setting the heights in the Maryland sample (row 5) equal to 100.

cause of its proximity to Baltimore, the case is strengthened. If the state is divided in this manner, one finds that urban heights began to decline in the 1820s, that is, a decade before rural areas (Table 10.8). In sum, the small number of observations, as well as the considerable regional variation in height, make it difficult to determine the turning point in the trend of the men's physical stature. It is probable that the urban population suffered a decline in height, and thus in nutritional status, earlier than the rural population (Figure 10.3). Moreover, regressions (3) and (4) in Table 10.7 indicate that the antebellum decline in nutritional status could have been greater among those who were not born free than among those who were, even though those born free tended to be shorter prior to the 1840s.

Among females the number of observations is sufficient to ascertain the trend for youth, adults, and children. The trends for all three strongly support the inference of a decline in nutritional status in the antebellum period (Tables 10.6 and 10.9; Figure 10.3). The change in average height among females after the 1820s is quite similar to that experienced by men. The decrease for females born in bondage was not greater than that of the free born. The female

Table 10.4 **Height of African-American Children by Status and Place of Birth, Antebellum Maryland**

	Males										
	Born in Baltimore					Born Outside Baltimore					
	Born Free		Born Slave			Born Free		Born Slave			
Age	(1) N	(2) Height	(3) N	(4) Height	(2)−(4)	(5) N	(6) Height	(7) N	(8) Height	(6)−(8)	ΔH
5											
6											
7											
8											
9											
10											
11											
12											
13											
14	5	60.5				2	58.4	11	60.2	−1.8	−0.3
15	1	60.5	2	61.1	−0.6	4	64.4	5	64.6	−0.2	0.0
16	3	64.9	1	63.0	+1.9	8	63.6	18	64.2	−0.6	−0.2
17	10	63.2	2	63.1	+0.1	8	63.9	22	65.5	−1.6	−1.8
18	14	64.1	5	65.6	−1.5	17	66.3	25	66.6	−0.3	−1.1
19	20	66.2	5	66.4	−0.2	21	66.7	50	66.4	+0.3	0.0
20	15	65.9	7	63.8	+2.1	51	67.1	95	66.2	+0.9	+0.8

	Females											
	Born in Baltimore					Born Outside Baltimore						
	Born Free		Born Slave			Born Free		Born Slave				
Age	(9) N	(10) Height	(11) N	(12) Height	(10)−(12)	(13) N	(14) Height	(15) N	(16) Height	(14)−(16)	ΔH	Percent Urban[a]
5	3	40.7	2	39.6				3	42.3		−0.6	55%
6	5	39.7										
7	7	46.0	1	42.0		3	47.8	3	49.0		−0.7	44
8	4	46.0				2	47.8	2	45.0		−0.4	33
9	4	48.9	2	47.0		1	49.8	4	51.8		−1.1	43
10	7	54.9				2	53.5	2	53.3		+1.3	67
11	6	54.8				1	51.8	3	54.1		+0.3	53
12	13	56.6				3	56.3	7	57.5		−0.9	52
13	12	59.4	2	60.9		5	62.1	11	59.7		+0.3	42
14	24	58.4	1	57.0		10	60.1	19	60.6	0.5	−1.5	42
15	27	60.6	5	60.1	+0.5	33	61.3	24	61.6	−0.3	−0.4	35
16	48	61.6	11	62.2	−0.6	84	61.6	102	61.3	−0.3	+0.2	23
17	71	61.4	13	62.4	−1.0	112	61.6	156	62.4	−0.8	−0.9	24
18	84	62.3	31	62.2	+0.1	153	62.0	171	62.6	−0.6	−0.5	27
19	65	62.1	21	61.3	+0.8	153	62.3	136	62.8	−0.5	−0.4	24
20	83	61.9	21	62.4	−0.5	128	61.9	180	62.7	−0.8	−0.8	22

Notes: N = number of observations. ΔH = height of all those born free minus the height of all those born enslaved.

Source: See Table 10.1.

[a]Percentage of children (male and female) born in Baltimore City and County.

Table 10.5 Regressions on the Height of Free Black Youth

	Females (1)	Males (2)
Constant	61.92*	65.79*
Age		
19	0.17	0.00
18	0.15	−0.31
17	−0.34**	−1.68
16	−0.80*	−2.76*
Birth decade		
1790s	0.92*	0.40
1800s	0.80*	0.65
1810s	1.06*	0.91**
1820s	0.40	1.32
Birthplace: Baltimore	−0.60*	−1.46*
Born free	−0.50*	0.32
N	1,603	346
R^2	.06	.09
F	9.6*	.46*

Note: The constants refer to a twenty-year-old born as a slave outside Baltimore in the 1830s.
Source: See Table 10.1.
*Significant at the 5 percent level.
**Significant at the 10 percent level.

regional trend is similar to the male pattern as the decline in height (between 1800 and 1830) was greater among those born in Baltimore than in the rest of the state, 0.77 versus 0.50 inches (Table 10.10).

An important difference between the trend in the height of males and that of females is that the decline in height among the latter group began earlier. The pattern does not change much if Anne Arundel County is included in the urban group. Baltimore women began to experience a decline in height in the 1810s, while those born in the rest of the state experienced the decline in the 1820s, that is, about a decade before men. As among men, the deterioration in nutritional status of women began earlier in urban areas. In the 1830s, rural women were between 0.5 and 0.8 inches shorter than birth cohorts of the 1800s, while rural men were about equally tall. In other words, in rural areas women appear to have fared worse in nutritional terms than did men, but in the city perhaps about the same.

Regressions on the height of female youth confirm the pattern obtained for adult women (Table 10.5). The fall in nutritional status among females between the ages of sixteen and twenty also started earlier than it did among males and was greater. By the 1830s the decline in the height of female youth appears to have been close to an inch. This is not unreasonable if one notes that the height of youth is more sensitive to nutritional stress than is terminal height because growth can cease at later ages.

Table 10.6 Indexes of the Trend in the Height of the Free Black Population

			Adults[c]	
	Girls[a]	Youths[b]	Born in Baltimore	Born Oustide Baltimore
		Females (1810 = 100.0)		
1760				99.7
1770				100.4
1780			100.5	99.8
1790	98.1	99.9	99.9	100.2
1800	99.2	99.7	100.5	100.0
1810	100.0	100.0	100.0	100.0
1820	99.7	99.1	99.4	99.6
1830	98.5	98.4	99.2	99.2
1840	98.1			98.6
		Males (1820 = 100.0)		
1760				99.0
1770			99.8	99.2
1780			99.0	99.8
1790		98.6	99.8	99.4
1800		99.0	99.9	99.8
1810		99.4	99.5	99.7
1820		100.0	100.0	100.0
1830		98.0	98.7	99.7
1840				99.3

Sources: Tables 10.5, 10.8, and 10.10

[a]Between the ages of 5 and 15.

[b]Between the ages of 16 and 20.

[c]For females, between the ages of 18 and 50; for males, between the ages of 21 and 50.

In sum, the downward tendency in nutritional status is evident among both males and females, and among all age brackets for which evidence exists. It is stronger and began earlier among females and in areas experiencing urbanization. These results are consistent with the trend obtained from the Civil War sample. Between the birth cohorts of the 1820s and the 1840s, the estimated diminution in the height of adult black recruits into the Union army is 0.4 inches.[23] This is practically identical to the decline found among West Point cadets, among white Union soldiers, and also among the free blacks of Maryland (Table 10.8).[24] Another similarity between the Union Army and Maryland samples is that the men born in the second half of the 1830s were

23. Margo and Steckel, "The Heights of American Slaves," pp. 526–27; Fogel, *Without Consent or Contract,* p. 361; John Komlos, "The Height and Weight of West Point Cadets: Dietary Change in Antebellum America, 1820–1880," *Journal of Economic History,* 47 (Dec. 1987), pp. 897–927.

24. No evidence has been collected on the height of white females in the antebellum period.

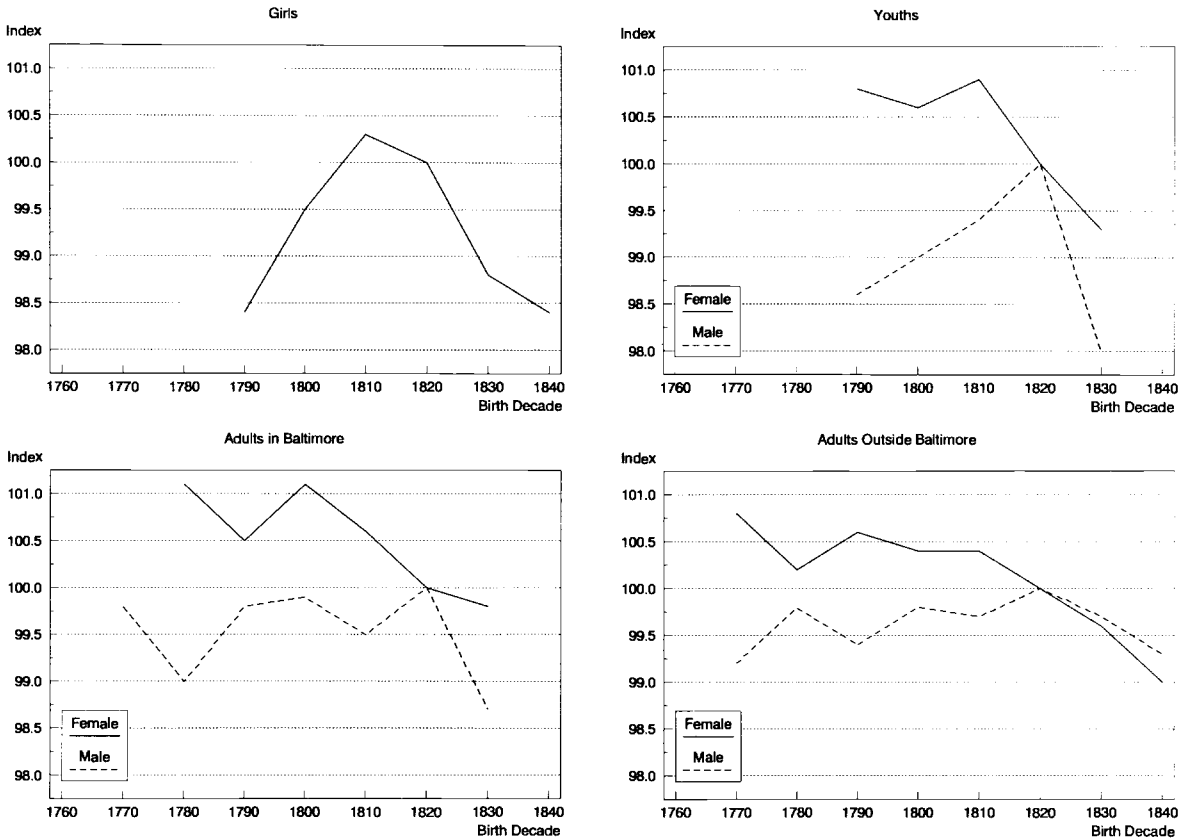

Fig. 10.3 Secular Trends in the Heights of African-Americans by Birth Decade, 1760–1840
Source: See Table 10.1.

Table 10.7 Regressions on the Height of Free Adult Black Males

	Entire Sample		Born Enslaved	Born Free	Entire Sample
	(1)	(2)	(3)	(4)	(5)
Constant	66.99*	67.02*	67.02*	66.77*	66.95*
Age, 20–22	−0.21*	−0.20*	−2.6*	−0.12*	0.22*
Birth decade					
1750	0.14	0.13			
1760	−0.35	−0.37	−0.32		−0.31
1770	−0.11	−0.14	−0.11		−0.04
1780	0.10	0.08	0.16	−0.36	−0.12
1790	−0.07	−0.08	−0.08	0.10	−0.06
1800	0.16	0.16	0.19	0.22	0.17
1810	0.10	0.10	0.16	−0.08	0.11
1820	0.30*	0.29*	0.35*	0.22	0.31*
1840	−0.16	−0.19	−0.50	0.02	−0.18
Region of birth[a]					
Eastern Shore	−0.08	−0.07	−0.18	0.41*	
Baltimore City	−0.83*	−0.84*	0.72*	−0.65*	−0.62*
Baltimore County	−0.52*	−0.51*	−0.50*		−0.55*
North[b]	−0.18	−0.20	−0.22		−0.17
South	−0.17*	0.14	−0.18	0.08	−0.05
Color					
Brown	−0.09		0.01	−0.12	−0.11
Dark	−0.06		−0.07	−0.03	−0.03
Light	0.09		0.00	0.23	0.15
Yellow	0.07		−0.01	0.47	0.05
Copper	0.60*		0.59*	0.85	0.56*
Chestnut	0.07		0.08	0.40	0.03
Mulatto	0.05		0.04	0.12	0.10
Bright	0.54**		0.58**	0.16	0.49**
Born free	0.19*	0.16**			0.17*
N	6,251	6,251	4,780	1,461	6,242
R^2	.04	.04	.04	.04	.04
F	2.8*	3.5*	2.3*	1.8*	2.9*

Notes: Dependent variable is the height of adult black males. All values are in inches. Constants refer to a male between the ages of 23 and 50, born in the 1830s; in equations (1) and (3) they refer, in addition, to a man whose place of birth was unknown and who was born a slave, with black skin color; in equation (2), to a man whose place of birth was unknown and who was born a slave; equation (4) is the same as (3), but the constant refers to a man born free instead of as a slave; equation (5) is the same as (1), but region of birth is replaced by region of residence.

Source: See Table 10.1

[a]In equation (5), region of birth is replaced by region of residence.

[b]Does not include Baltimore City or County.

*Significant at the 5 percent level.

**Significant at the 10 percent level.

unusually short in both. The terminal height of the Maryland men was identical to the one estimated from the manifest sample, almost the same as that of the Civil War black soldiers, but somewhat shorter than that of the freed slaves of Virginia (Table 10.11).[25]

25. The preliminary (Coopersmith-Steckel) sample of manifests appears to be more homogeneous than its enlarged counterpart, as the standard deviations of its height estimates are within

Table 10.8 **Height of Adult Black Men by Region of Birth**

Decade of Birth	Eastern Shore		Baltimore		North		South		Total		Outside Baltimore		Urban		Rural	
	Height	N	Height	N	Height	N	Height	N	Height	N	Height	N	Height	N	Height	N
1760	66.80	70	66.15	13	65.96	13	66.32	31	66.53	127	66.57	114			66.7	101
1770	66.93	218	66.76	61	66.58	53	66.38	72	66.73	404	66.76	343	66.7	102	66.8	300
1780	67.04	410	66.19	117	67.13	86	67.27	159	66.97	772	67.11	655	66.2	145	67.1	556
1790	66.87	555	66.73	75	66.80	119	66.93	197	66.86	946	66.87	871	66.9	82	67.0	631
1800	67.18	527	66.79	96	67.08	125	67.02	202	67.09	950	67.12	854	66.7	120	67.1	595
1810	67.10	628	66.52	60	66.64	111	67.34	171	67.05	970	67.09	910	67.3	94	67.0	579
1820	67.38	544	66.88	93	67.20	123	67.08	264	67.24	1,024	67.27	931	66.9	234	67.4	541
1830	67.09	468	66.01	93	66.78	125	67.08	303	66.95	989	67.05	896	66.7	181	67.2	352
1840	66.91	24	66.30	5	66.90	5	66.72	26	66.77	60	66.82	55				

Notes: Adult includes those between the ages of 21 and 50. Baltimore includes Baltimore City and County. Urban includes Baltimore City and County, and Anne Arundel County. N = number of observations.

Source: See Table 101.1

Table 10.9 Regressions on the Height of Adult Black Females

	Entire Sample (1)	Born Enslaved (2)	Born Free (3)
Constant	62.00*	61.92*	61.73*
Age, 20–22	0.04	0.23*	−0.21
Birth Decade			
1760	0.31	0.52	
1770	0.76*	0.92*	
1780	0.46*	0.62*	0.56*
1790	0.57*	0.70*	
1800	0.57*	0.62*	0.78*
1810	0.43*	0.57*	0.53*
1820	0.22*	0.37*	0.20
1840	−0.46		
Region of birth			
Eastern Shore	−0.16**	0.08	0.46**
Baltimore City	−0.28*	−0.31*	−0.10
Baltimore County	−0.26	−0.18	−0.18
North	0.06	0.00	2.17
South	−0.17	0.21**	−0.05
Color			
Brown	−0.28*	−0.35*	−0.07
Dark	0.01*	−0.01	0.03
Light	0.05	−0.02*	0.12
Yellow	0.15**	0.01	0.65
Copper	0.25	0.22	0.81
Chestnut	0.03	−0.05	0.13
Mulatto	0.20	0.22	0.18
Bright	0.38	0.33	0.46
Born free	0.02		
N	6,061	4,247	1,812
R^2	.01	.01	.01
F	3.8*	2.5*	2.7*

Notes: Dependent variable is the height of adult black females. All values are in inches. For definition of constants see Table 10.7.

Source: See Table 10.1

*Significant at the 5 percent level.

**Significant at the 10 percent level.

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the acceptable range (Steckel, "Slave Height Profiles," pp. 364, 368). The trend in heights from the initial sample agrees with the trend outlined above, and also with that of the Civil War sample in many respects: a) male stature increased in the 1820s and decreased in the 1830s; b) the decline in female adult stature began earlier than among males and continued into the antebellum period; and c) the decline among female youth was larger than among adults in the 1840s (Steckel, "Slave Height Profiles," p. 377). The only noteworthy difference between the first manifest sample and the Maryland results is that, according to the former, the height of female youth rose until the 1830s instead of declining monotonically as in the Maryland sample. Apparently, something important happened in the expansion of the manifest sample that influenced the estimated trends.

Table 10.10 Height of Adult Black Women By Region of Birth

Decade of Birth	Eastern Shore		Baltimore		North		South		Total		Outside Baltimore		Urban		Rural	
	Height	N	Height	N	Height	N	Height	N	Height	N	Height	N	Height	N	Height	N
1760	62.65	35	61.77	9	61.75	3	62.20	25	62.35	72	62.42	63			61.7	45
1770	62.93	139	67.81	28	62.70	19	62.53	77	62.78	263	62.78	235	62.7	76	62.8	187
1780	62.56	326	62.78	91	62.80	45	62.19	221	62.49	683	62.44	592	62.4	232	62.5	460
1790	62.91	434	62.15	156	62.91	76	62.32	342	62.59	1,008	62.67	852	62.3	409	62.8	664
1800	62.68	515	62.48	386	62.53	72	62.45	384	62.55	1,357	62.58	971	62.4	755	62.8	715
1810	62.73	429	62.20	374	62.11	81	62.42	267	62.44	1,151	62.56	777	62.3	791	62.7	593
1820	62.35	342	61.81	160	62.33	98	62.32	248	62.24	848	62.33	648	61.9	457	62.4	519
1830	62.07	257	61.71	77	61.92	98	62.17	208	62.04	640	62.08	563	61.9	310	62.0	479
1840	61.37	15	61.26	5	62.38	4	61.79	26	61.66	50	61.70	45	61.2	71	62.2	96

Notes: Adult includes women between the ages of 18 and 50. Baltimore includes Baltimore City and County. Urban includes Baltimore City and County, and Ann Arundel County. N = number of observations.

Source: See Table 10.1.

Table 10.11 Various Estimates of Heights of Adult African-Americans

			Male		Female		
Status	Birthplace	Period[a]	N	Height	N	Height	Source
1) Free[b]	Virginia	1782–1861	433	67.9	400	63.0	
2) Soldiers	Atlantic[c]	1820s	3,651	67.1			Army
3) Slaves	Baltimore[d]	1820s[e]	9,726	67.3	6,745	62.8	Manifests
5) Free	Maryland	1820s	6,251	67.3	6,048	62.2	Certificates[f]
6) Slaves[g]	Upper South	1780–1835	743	67.2	256	63.1	Manifests
7) Slaves[h]	Upper South	1780–1835	359	67.2	260	62.4	Manifests
8) Slaves[i]	Upper South	1780–1815	313	67.1	87	63.0	Certificates[j]

Sources: See Tables 10.6 and 10.8; Robert Margo and Richard H. Steckel, "Heights of American Slaves: New Evidence on Slave Nutrition and Health," *Social Science History*, 6 (Fall 1982), pp. 519, 520, 526, 533; Jonathan Pritchett and Herman Freudenberger, "A Peculiar Sample: The Selection of Slaves for the New Orleans Market" (manuscript, Tulane University, 1990).

[a]Periods, except row 1, refer to years of measurement.

[b]Numbers of males and females are approximate. Total number of observations is 833.

[c]Upper South Atlantic.

[d]Transported on ships departing from Baltimore.

[e]For women, 1780–1840.

[f]Maryland Certificates of Freedom.

[g]Sold in New Orleans.

[h]Disembarked but not sold in New Orleans.

[i]Transported to Louisiana overland and by ship.

[j]Certificates of Good Character.

10.2.3 Regional Pattern

The variation in height between urban and rural regions accords with practically all samples studied thus far. Until improvements in agricultural technology and food distribution toward the end of the nineteenth century, when the urban epidemiological environment also became healthier, the nutritional status and physical stature of urban dwellers were consistently lower than for the rural population. The relative price of nutrients was also higher in towns, and the urban population was less likely to produce even part of its food requirement.

Thus, the free adult male blacks of Baltimore were as much as 0.5 to 0.8 inches shorter than those born in rural areas (Tables 10.7 and 10.8). Among females the difference was somewhat smaller, but it was significant (Tables 10.3, 10.5, 10.9 and 10.10). The rural advantage increased over time. Before 1810, Baltimore men in the sample were about 0.36 inches shorter than rural men, while those born thereafter were 0.67 inches shorter. The pattern is similar among women: the rural-urban difference increased from 0.17 to 0.33 inches during the same period.

Nineteenth-century Maryland had three distinct economic regions. Industrial activity was located in the northern counties of the state. According to

the census of 1850, manufacturing output per capita in Northern Maryland, where 90 percent of the industrial workers were located, was about seven times as large as in the rest of the state. Baltimore held a dominant position in manufacturing. In the other parts of the northern region, truck farming, animal husbandry, and grain-growing were important agricultural pursuits. Just two of the counties produced one-third of the state's wheat crop. The value of an improved acre of farmland was almost twice that of the other counties. Slavery was tangential to this economic system; blacks were not more than one-sixth of the population.[26]

In contrast, the counties of Southern Maryland remained economically less developed. This was a relatively backward agricultural region, with the exception of areas around Washington, D.C., and Annapolis, the state capital with a population of 3,000 in 1850. Tobacco remained the primary crop, but wheat production did make some inroads. Here, the number of whites declined during the antebellum decades, and blacks constituted more than half of the population by the end of the period under consideration.

The third main region, the Eastern Shore, occupied an intermediate economic position. Less industrialized and urbanized than northern Maryland and not as dependent on tobacco as the southern counties, farmers of the Eastern Shore cultivated cereal. Blacks represented two-fifths of the population by 1850. In the rural economy, free blacks generally earned a living as hired agricultural laborers; in Baltimore they were concentrated in menial occupations.

Although heights did not vary much among the three main regions of Maryland, they did so at the county level (Tables 10.7 to 10.10). The rank order of the mean height by counties was ascertained in two ways. First, simple averages of adult heights in the entire sample were considered (Table 10.12). As these were quite similar for both sexes, more precise estimates were made using regression analysis, holding the decade of birth constant. Rank orders are similar to those based on the raw means. The final rank was calculated by averaging the rank orders of both sexes as obtained through the regressions.

Baltimore was excluded from further spatial analysis because, as noted above, it is obvious why it had the shortest population in the state. The remainder of the available sample was divided into the three main regions of Maryland, the industrially and economically developed North, the more backward tobacco-producing South, and the grain-producing Eastern Shore. Within each region the county with the tallest population (G1) was compared with the other counties (G3). The counties of the Eastern Shore were divided into three groups, instead of two, as there were enough counties represented in the sample to create a middle category, G2. Heights in the G1 counties all ranked in the top half of the fourteen counties represented in the sample. Av-

26. Blacks constituted a somewhat higher proportion of the labor force; see Barbara J. Fields, *Slavery and Freedom on the Middle Ground: Maryland during the Nineteenth Century* (New Haven, 1985).

Table 10.12 Heights of Maryland Free Blacks by County

			Raw Means[a]						Regression Results[b]					
			Male			Female			Male		Female[c]		Final Rank[d]	
		County	N	Rank	Height	N	Rank	Height	Rank	Height	Rank	Height	A	B
No	G1	Harford	164	1	68.09	148	1	63.41	1	1.74*	1	1.22*	1	1
ES	G1	Dorchester	890	4	67.26	598	2	62.81	5	.76*	3	0.72*	2	2
So	G1	Prince George	346	5	67.16	244	5	62.68	4	.81*	4	0.52*	3	4
No	G1	Washington	118	3	67.42	77	6	62.63	3	.83*	6	0.45	4	5
So	G1	St. Mary's	497	6	67.08	268	4	62.76	7	.58*	2	0.82*	5	3
ES	G1	Talbot	618	6	67.10	513	3	62.78	6	.59*	5	0.47*	6	6
ES	G1	Kent	250	2	67.52	153	12	62.16	2	.88*	10	0.17	7	7
ES	G2	Queen Ann	264	10	66.93	195	9	62.35	10	.37*	8	0.19	8	8
ES	G2	Caroline	601	9	66.98	360	11	62.24	8	.38*	11	0.12	9	9
No	G3	Frederick	641	11	66.81	408	10	62.31	11	.31*	9	0.22	10	10
ES	G3	Somerset	561	12	66.56	344	7	62.38	13	−.00	7	0.36*	11	12
So	G3	Anne Arundel	486	8	67.02	1,146	13	62.15	9	.37*	13	0.02	12	11
No		Baltimore County	525	14	66.52	1,347	8	62.37	14	−.02	12	0.12	13	13
No		Baltimore City	260	13	66.59	247	14	61.96	12	66.47	14	61.68	14	14

Notes: N = number of observations. No = North; So = South; ES = Eastern Shore. G1 = counties that had the tallest populations in their respective regions; G2 = counties whose population had intermediate physical stature within the region; G3 = counties with the shortest population.

[a]Adults only.

[b]Other coefficients of the regression are not reported. The variables included were: decade of birth, born free, and age 20–22. Results for Baltimore City are given for the birth cohorts of the 1830s. The results for the other counties are the average for the whole period by which heights exceeded that of Baltimore.

[c]Between the ages of 16 and 50; hence, in addition to the variables included in the male regression, dummy variables were included for age below 20.

[d]Final rank: A) Average rank of the two sexes. B) The rank according to the mean of the two regression coefficients.

*Significant at the 5 percent level.

eraged across the two sexes, heights in the G1 group were more than half an inch greater than those of the free black population of Baltimore City. In contrast, heights in the other counties were at most about a quarter inch above those of Baltimore. In other words, in nutritional terms there was a noticeable gap between G1 and the other counties.[27]

The black populations of Anne Arundel, Somerset, and Frederick counties (referred to as the G3 counties) were the shortest (Table 10.12).[28] These counties also tended to experience faster population growth (or slower population decline) than the G1 counties (Table 10.13). This is also true if the population is divided into three components, whites, free blacks, and slaves. Thus, the biological standard of living was higher in counties where demographic expansion did not excessively strain the resource base and did not unduly increase competition in the labor market.[29] An exception is found among the white population of Northern Maryland, which grew faster in G1 counties than in G3 counties. Yet, despite the more rapid population growth in Washington and Harford counties (G1), the per capita output of nutrients remained close to that of Frederick County. For Southern Maryland and the Eastern Shore, without exception per capita nutrient production was considerably higher in G1 and G2 than in G3 counties for both 1840 and 1850 (Table 10.13). This confirms the pattern found in other data sets, namely, that during the early stages of industrialization propinquity to nutrients improved nutritional status.

Increased money income from manufacturing employment was, by itself, not inimical to nutritional status, that is, as long as it did not displace agricultural production. Thus, in the G1 counties of Northern Maryland, per capita industrial output was higher than in the G3 county, without having a deleterious effect on nutritional status.[30] Yet manufacturing income did not compensate for, or was not as good as, agricultural income for the maintenance of nutritional status. The slightly higher per capita industrial output of Somerset County did not compensate for its lower per capita output of nutrients. The

27. In other studies, skin color has been found to be a significant correlate of slave heights, inasmuch as light-skinned slaves were born in the New World. Thus, in the Civil War sample, light-skinned slaves were 0.17 inches (and significantly) taller than average (Margo and Steckel, "The Heights of American Slaves," p. 520). This result is not found in the Maryland data, perhaps because in this sample most blacks were born in America.

28. The eighteenth-century residents of Somerset County were among the poorest of the region. Tobacco was a staple, but its land was less fertile than other areas of the Chesapeake. See Russell R. Menard and Lorena S. Walsh, "The Demography of Somerset County, Maryland: A Progress Report," *The Newberry Papers in Family and Community History* (July 1981). The discussion of food consumption based on census records should include the caveat that there is no available evidence on some items, such as game and seafood production.

29. On competition between white and free black labor, see Wright, *The Free Negro in Maryland*, pp. 159, 172. Free blacks also had to compete with slaves who were hired out and accepted smaller wages than whites; see John H. Russell, *The Free Negro in Virginia, 1619–1865* (New York, 1913), pp. 146–47.

30. The regional pattern in northern Maryland must be considered tentative because sample sizes are very small and are mostly for the early part of the century, before nutritional status declined. In addition, evidence is not available for several counties of the region.

Table 10.13 **Demographic and Economic Correlates of Regional Variation in Height within Maryland**

Demographic Indicators

Region	% Change in Population, 1790–1850			
	White	Black		Total
		Free	Slave	
Eastern Shore				
G1	−2%	324%	−29%	5%
G2	14	484	−42	−3
G3	62	1,200	−21	44
North				
G1	64	448	−10	63
G3	24	1,665	8	33
Southern Shore				
G1	−17	446	−4	−4
G3	42	472	11	43

Economic Indicators, Per Capita

	Output							
	Wheat	Corn	Tobacco	Cattle	Swine	Improved Acres	Animals Slaughtered	Industrial Output
1840								
Eastern Shore								
G1	10.6	35.9	0	0.77	1.3			
G2	6.8	37.9	0	0.72	1.1			
G3	3.5	13.1	0	0.52	0.9			
North								
G1	17.8	21.3	0	0.62	1.3			
G3	20.2	19.4	9	0.58	1.4			
South								
G1	4.5	23.3	370	0.63	1.3			
G3	7.0	19.1	136	0.47	1.1			
1850								
Eastern Shore								
G1	13.7	40.3	0	0.68	1.0	8.0	5.5	5.8
G2	10.2	49.7	0	0.71	1.0	13.0	5.5	5.8
G3	7.0	16.9	0	0.44	0.7	5.7	5.0	6.9
North								
G1	9.8	17.6	0	0.47	0.8	5.6	4.8	47.9
G3	17.9	19.9	4	0.45	0.9	6.2	5.9	39.1
South								
G1	11.0	30.4	288	0.60	1.0	8.3	5.4	13.7
G3	11.1	28.6	140	0.43	0.9	6.9	1.9	28.9

Notes: For region and group designations see Table 10.12. Grain output is measured in bushels, animal stock in heads, tobacco in pounds, industrial output in dollars.

Sources: U.S. Census Office, Seventh Census, 1850, *Statistical View of the United States . . . Being a Compendium of the Seventh Census, etc.*, J. D. B. DeBow, ed. (Washington, D.C., 1854), p. 178.

pattern is particularly revealing in Southern Maryland. There, the per capita output of industrial products was twice as high in Anne Arundel (the G3 county) as in the G1 counties (St. Mary's and Prince George). If one were to add the value of tobacco output to the value of manufactured products, the G1 and G3 counties would have about the same amount of non-nutrient output by value. Nonetheless, the population in the G1 counties was taller, even though their per capita output of nutrients was not much greater (with the exception of livestock slaughtered) than that of Anne Arundel County (Table 10.13).[31] This suggests, once again, that being close to the source of nutrients confers nutritional advantages. While tobacco and industrial goods were both inedible, tobacco was complementary to nutrient production while industrial goods were not to the same extent. Farmers who produced tobacco and raised foodstuffs did not have to pay the cost of transporting food and could supplement their earnings by gardening, which might not be reflected in the census figures. In addition, manufacturing was connected with commerce, and consequently with the movement of people, thereby increasing the exposure to childhood diseases which may have increased nutritional stress among the young.

10.3 The Maryland and Manifest Samples

As far as the adult parts of the two samples are concerned, the results are practically identical (Table 10.11), but the children's components differ. A careful comparison of the two samples is warranted, because nutritional evidence on black children is quite rare. It is difficult to determine which sample is closer to reproducing the nutritional reality of the average slave child, because both samples have weaknesses and neither was randomly drawn from the African-American population.

The Maryland sample size is small for the young. Yet the consistency with which the height of free children exceeds that of the transported children suggests that it is not the small number of observations that is causing the results to diverge (Figures 10.1 and 10.2). If sample size were the crucial factor, one would expect much more variation in height about the manifest estimates. Yet, it is possible that the free black children were taller than the slave children whose heights were recorded in the manifests on account of their legal status. To be included in the Maryland sample would require a child to have had a free mother or to have been set free by his or her master.[32] In the latter case, manumission probably depended on the religious, ethical, and political con-

31. The propinquity to Baltimore was an additional drain on nutrients for Anne Arundel County.

32. If the mother was a slave, the child became a slave even if the father was free. Manumissions were most often effective either upon the death of the owner or at some specified age of the slave (Wright, *The Free Negro in Maryland*, p. 43). In addition, a free black could purchase the freedom of slaves, and a slave could redeem him or herself as well.

victions of the owner rather than on the physical attributes of the child.[33] If masters with such convictions also treated their slaves better than was typical, then one would expect that manumitted children would have higher nutritional status than those belonging to less benevolent masters.

However, children who were born free would not have benefited from such largess. Their parents were probably common laborers whose work in rural areas complemented that of the slaves. To be sure, there was some social differentiation among free blacks, as among the slaves themselves. Some free blacks occupied skilled positions, a few accumulated property, and fewer still even became well-to-do. While the level of per capita income among free blacks is not known precisely, their average socio-economic position was probably no better than that of slaves: "the environment seemed to foster the preservation of conditions existing before they became free," and in the agricultural sector they were "offered arrangements which were strikingly like those of involuntary servitude."[34]

Slaves had certain advantages over free blacks, since they had a more secure access to medical attention, even if rudimentary, and they were not

33. Kulikoff, *Tobacco and Slaves,* p. 419. The restrictions on manumissions were eased in 1790. The Quakers and Methodists became particularly devoted to the abolitionist cause. See Wright, *The Free Negro in Maryland,* pp. 39, 44–46.

34. Wright, *The Free Negro in Maryland,* pp. 43, 152–53, 157, 160, 171, 239, 243, 247. A bushel of meal and 15–20 pounds of meat allotment for contract laborers was on the order of slave rations, but below that of white men (p. 164). "The allowances for the slaves thus became a sort of standard to which free negroes aimed to attain when providing for themselves. The majority fared apparently about as well as did the slaves excepting sometimes in the winter season" (p. 241). In 1860 about 10 percent of the free black families owned some property, but the average amounted to no more than $13 per capita, or 2.5 percent of white wealth (p. 185). "They seemed in many cases to have believed that their material condition would have been just as good in slavery as in freedom" (p. 258). "The two classes shared . . . the same standards of living . . . it seems certain that the average slave was better provided for than was many a free negro. Had the 83,942 free negroes exchanged places with the 87,189 slave negroes in 1860, but little difference in the material welfare of the majority of either class would probably have resulted" (p. 259). Also see Russell, *The Free Negro in Virginia, 1619–1865,* pp. 130, 145. "The free negro was not infrequently a better 'slave' than his kinsman in bondage" (p. 148). "The occupations of persons of this class [free blacks] are nearly the same as those of slaves" (George Tucker, *Progress of the United States in Population and Wealth in Fifty Years, as exhibited by the Decennial Census from 1790 to 1840* [New York, 1855], p. 139, as cited in Russell, p. 150). Barbers were supposedly the most prosperous occupational group among free blacks, see Russell, p. 151. See also Ira Berlin, *Slaves without Masters: The Free Negro in the Antebellum South* (New York, 1974), p. 218; and Leonard P. Curry, *The Free Black in Urban America, 1800–1850: The Shadow of the Dream* (Chicago, 1981). The poverty of free blacks exposed them to a higher incidence of cholera: "In Philadelphia, the case rate among Negroes was almost twice as great as that among whites—probably a reliable, if informal, index to the poverty in which the North's free Negroes lived" (Charles E. Rosenberg, *The Cholera Years: The United States in 1832, 1849, and 1866*[(2d edn., Chicago, 1987], pp. 59–60). Moreover, children who were born free could have had a slave father, blurring further the material significance of the legal distinction. In addition, some free children were neglected sufficiently to become wards of the county, and some were apprenticed out by county authorities. For a contemporary debate over the mental health of free blacks compared to that of slaves see William Stanton, *The Leopard's Spots: Scientific Attitudes Toward Race in America, 1815–1859* (Chicago, 1959), p. 58.

threatened by cyclical unemployment to the same extent as free blacks.[35] Hence, free-born black children probably did not fare better than their slave counterparts. Consequently their heights should approximate the overall slave average.[36] If, however, manumitted children came from benevolent owners, their nutritional status could have been higher than that of children who were born free. Perhaps this is why children in the Maryland sample who were born free tended to be shorter than those who were born enslaved (Tables 10.3 and 10.4). The pattern is most vivid among female youth, whose height difference is close to half an inch in favor of those born into slavery (Table 10.5). The pattern does not hold among adults; with more time to reach terminal height, adults' nutritional status affected mainly the tempo of growth. The nutritional advantage of having been born a slave is clearer and more consistent among rural children than among urban ones (Tables 10.3 and 10.4). Higher urban food prices may have induced urban slave owners to be more stringent than their rural counterparts. Alternatively, urban slaves, who were hired out more frequently than rural slaves, may have been fed more frequently by employers.

The comparison of the two results is confounded by the fact that the slaves in the manifests were more diverse in regional origin than in the free sample, which is limited to blacks born in Maryland. A shortcoming of the manifests is that they do not contain information on the provenance of the slaves, only on the port of embarkation.[37] This is a problem because there was considerable regional variation in stature for which we cannot control. With such a heterogeneous composition of the manifest sample of slave children it would, indeed, be possible to obtain both a small average height for a particular age and a large variance in heights. If all slave children were malnourished, one would not expect the standard deviations to be as high as the records in the manifests indicate.[38] Because height varied considerably by place of birth, it is possible that the Maryland children were taller than those in the manifests on account of their geographic distribution.

35. Wright, *The Free Negro in Maryland*, pp. 131, 133, 246; Russell, *The Free Negro in Virginia*, p. 155. Another factor to consider is that, after their emancipation, the labor force participation rates of blacks declined considerably, and it is conceivable that a similar pattern obtained among free blacks in the antebellum period.

36. From this it also follows that children imported into Louisiana would have been about as well nourished as the average, but children whose heights appear on the manifests would be shorter than the average slave child by as much as 3.4 percent (Table 10.3, rows 6, 7 and 13). This inference requires further substantiation.

37. Margo and Steckel, "The Heights of American Slaves," p. 521. Hence African-born slaves could be in the early part of the sample. See Bancroft, *Slave Trading in the Old South*, p. 22.

38. Habsburg children enrolled in schools run by the military at the turn of the nineteenth century were about two inches shorter than slave children reported in the manifest sample. Yet the standard deviation of Habsburg children's height is well within the normal range. In other words, the distribution of height is generally not affected by nutritional deprivation, as long as that deprivation is evenly distributed; see Komlos, *Nutrition and Economic Development*, p. 91.

An unpublished analysis of the manifest sample by Richard Steckel reveals a North-South gradient in children's stature along the Atlantic seaboard, with children in Virginia and Maryland being taller than those in the Carolinas. Consequently, the difference between the height of the free black children of Maryland and that of the slave children entering interregional trade from the Chesapeake region is likely to be less than between the entire samples.[39] Part of the disparity shown in Figures 10.1 and 10.2 might, therefore, be accounted for by the regional divergence between the Maryland and manifest samples. Another reason the results may differ is that neither height profile has been standardized for year of birth.[40] Because stature declined over the course of the antebellum decades, a greater share of children born in the latter part of the period could also make the manifest children appear shorter than those in Maryland.[41]

Although one might argue that freedom conferred nutritional advantages on children, this hypothesis is called into question by the fact that children in the Maryland sample who were born free were shorter on average than those born into slavery. The pattern holds for both sexes and also among those born in urban and in rural areas (Tables 10.3 and 10.4).[42] Admittedly, we do not know how long children born as slaves spent in bondage before they were freed, but it was clearly more time than for children of the same age who were born free. Thus, if freedom guaranteed a better diet, one would expect those children who gained their freedom earlier to have been taller. Since this is not the case, it is improbable that the free black children of the Maryland sample were taller on account of their legal status than those who ended up in the manifest sample.[43]

Another aspect of the manifest sample to consider is that the very high

39. Personal communication from Richard Steckel.

40. Although both samples cover the same period, the distribution within the period may vary somewhat. The number of children in the Maryland sample is too small to do a statistically adequate job of standardization. The distribution of the children under the age of seventeen by birth cohorts was: 1790s, 8.8 percent; 1800s, 15.2 percent; 1810s, 31.0 percent; 1820s, 21.0 percent; 1830s, 13.9 percent; 1840s, 9.9 percent.

41. Height tended to be greater inland, that is, in newly settled regions. But children in the Maryland sample and children in the manifests originated largely from the Atlantic seaboard. (Those who lived farther inland were more likely to have been taken South overland.) Consequently, from the perspective of the East-West height gradient, the Maryland-born children were not at a nutritional advantage compared with the slaves represented on the manifests. It might also be mentioned that urbanites tended to be shorter than those born in rural areas, but it is improbable that urban slaves appeared on the manifests more frequently than in the freedom certificates. In fact, even urban free black children were taller than the children of the manifests (Table 10.3, rows 9 and 13). It is, therefore, improbable that the urban-rural mix in the two samples accounts for the differences in stature.

42. The effect is more pronounced among the rural than among the urban born (Table 10.3). While the difference among the former is between 0.5 and 1.0 percent, among the latter it is 0.1–0.2 percent.

43. Having been born free did not necessarily confer privileges since the father could still have been a slave. See Kulikoff, *Tobacco and Slaves*, p. 375; Russell, *The Free Negro in Virginia*, p. 131.

standard deviations of children's height throughout childhood and adolescence indicate a high level of diversity in the composition of the sample over time and space and perhaps nutritional experience. Yet, the standard deviation of heights in a population is generally in the neighborhood of 2.7 inches.[44] While deviations from this standard of a few tenths of an inch are not extraordinary, the ones found in the manifests are often twice their expected value (Table 10.2). Such a large variance about the mean has never been documented in homogeneous populations, and consequently is an indication that the manifest records contain observations from several distinct segments of the slave child population. This possibility is underscored by the fact that in the preliminary version of the manifest sample, confined to just two ports of disembarkation, standard deviations were close to the normal range and the height of the children was consistently above that in the enlarged sample.[45] Moreover, a recent decomposition of the height of the slave children who disembarked at New Orleans by those who were sold there and those who were not, had variances well within the normal range, as did the heights found in the recently discovered Louisiana Certificates of Good Character.[46] In contrast, it is reassuring that standard deviations in the Maryland sample lie within the normal range.[47] Moreover, the differences between the standard deviations of height at a particular age in the two samples and the differences in heights have an almost perfectly linear relationship.[48] This means that as the standard deviations of the manifest sample approach the normal range, the average heights of the transported children approach those found in the certificates of freedom.

44. The variance in height does depend to some extent on the distribution of income, but in the case of the manifest sample all observations refer to the same class of subjects. One might expect to obtain large variances if the height observations of lower-class London paupers and upper-class gentry boys of the same age were mixed into the same sample. Note that although Trinidad slave children were even shorter than American slaves, the standard deviations of their height are much smaller than those of the heights in the manifest sample, even though they were often still somewhat above the normal range. See Barry W. Higman, "Growth in Afro-Caribbean Slave Populations," *American Journal of Physical Anthropology,* 50 (Mar. 1979), pp. 373–85. The standard deviation increases with age until adolescence and then levels off. At the time of the adolescent growth spurt the standard deviation can reach as high as 3.3 inches. See J. M. Tanner, R. H. Whitehouse, and M. Takaishi, "Standards from Birth to Maturity for Height, Weight, Height Velocity, and Weight Velocity: British Children, 1965, Part II," *Archives of Disease in Childhood,* 41 (1966), pp. 613–35.

45. Steckel, "Slave Height Profiles," pp. 364, 368. The Coopersmith-Steckel sample of slave manifests appears to be more homogeneous than its enlarged version, perhaps because it was limited to two ports of disembarkation, Mobile and New Orleans. The height of the children in that sample was also consistently greater than in its enlarged version.

46. Jonathan B. Pritchett and Herman Freudenberger, "A Peculiar Sample: The Selection of Slaves for the New Orleans Market" (manuscript, Tulane University, 1990).

47. The extraordinarily high variances found in the manifest sample need not necessarily bias the estimated mean heights, but they have that potential. The variances indicate that the sample consists of observations from different segments of the slave children population, and it is impossible to verify whether the number of observations collected from each stratum is appropriate relative to the size of the population in that stratum.

48. That is, a regression of the differences in standard deviations on the differences in height is linear.

10.4 Conclusion

The physical stature of free blacks in Maryland declined in the antebellum decades in close agreement with the trend found for other segments of the American population, both black and white. This suggests that the decline in nutritional status was widespread.[49] The cumulative decline in the height of free black males between the 1820s and the 1840s of about half an inch is similar to that experienced by whites.

The widespread decline in height among whites and blacks appears to have been caused by an acceleration in the growth of the urban population and the industrial sector. The relatively slow expansion of the agricultural labor force and the absence of technological breakthroughs in food production, coupled with the increased demand for food, meant that the price of nutrients increased both absolutely and relative to industrial products in the antebellum decades. Although incomes rose, they did not rise fast enough for many workers to compensate fully for the rise in food prices. Hence, per capita calorie and protein consumption (particularly animal protein) declined. Yet, because of out-migration, the population of Maryland was growing at a slower rate than the average for the entire United States prior to 1840. Compared with the norm of about 30 percent per decade, Maryland's growth was only about 8 percent. In the subsequent decade, however, its demographic expansion was very close to the national average. Perhaps this is why the height of men declined slowly in rural Maryland. In contrast, Baltimore's population expanded from 13,500 in 1790 to 169,000 in 1850, and that rapid growth could very well account for the deterioration in nutritional status among both its free black men and women.[50]

Relative to modern standards, free black girls were taller than boys in both the manifest and the Maryland samples, as were adult women prior to the deterioration in nutritional status. Females born in the first decade of the new century reached the 29th centile, while males reached the 27th centile of modern standards. By the 1830s, however, the rank order was reversed, 21st for women and 25th for men. The early female nutritional advantage might be attributed to two factors. Female youth may have been more likely to be engaged in domestic service, thereby gaining access to nutrients within the white household.[51] Furthermore, the sex ratio favored women. Among both

49. The relationship among the rapid economic growth of the antebellum decades, the increase in the relative price of food, and the concomitant decline in the consumption of nutrients is outlined in Komlos, "The Height and Weight of West Point Cadets," p. 919. Among free blacks, the highest per capita property holdings were in Caroline, Kent, and Queen Anne's counties, in that order. These counties were in the middle of the rank order by height, occupying the seventh, eighth, and ninth place (Table 10.12). See Wright, *The Free Negro in Maryland*, p. 185.

50. The growth of the nearby Philadelphia market would also have served as a source of demand for foodstuffs; see Diane Lindstrom, *Economic Development in the Philadelphia Region, 1810–1850* (New York, 1978), p. 62.

51. For the nutritional advantages of domestic service in Vienna see W. Peter Ward, "Weight at Birth in Vienna, 1865–1930," *Annals of Human Biology*, 14 (Nov.–Dec. 1987), pp. 495–506. Servants owned by wealthy planters had a higher social status in the black community than poor free blacks; see Russell, *The Free Negro in Virginia*, p. 133.

races, females were scarce in the eighteenth century, as there were 12 percent more men than women in the population (Table 10.14).[52] The advantage diminished over time, however, and by 1840 it had vanished altogether. The decline in the sex ratio was greatest among free blacks. Compared with the 8 percentage point decline among slaves and a 10 point decline among whites, the diminution in the sex ratio among the free blacks was 33 points. The demand for the services of black women, therefore, including those who were free, would not have been growing as fast as the supply, possibly explaining why their nutritional status began to decline earlier than it did for black men.

To the extent that the evidence above corroborates earlier findings, the following aspects of the anthropometric history of African-Americans now appear beyond debate. 1) All samples consistently indicate that heights of adult slaves, whether manumitted, born free, transported in interregional trade, or recruited into the Union Army, fell within a narrow range: about 67 inches for males and a little over 62 inches for females. By both African and European standards of the time, American blacks were quite tall, as were whites. The attainment of such physical stature is indicative of the nutritional advantages of the New World. But by modern standards, African-Americans appear to have been less well nourished. The average adult slave reached between the 20th and 25th centile of the height distribution of today's industrialized nations. Even compared with their white American contemporaries, blacks fared less well, reaching, on average, about the 35th centile of the antebellum white height distribution. 2) The nutritional status of all groups studied in the American population declined in the antebellum period. 3) Black children were shorter for their age than were black adults. Undernutrition meant that the tempo of slave growth was slower than that of whites.[53] 4) The lower and upper bounds of the black children's growth profile have now been identified as lying between about the first and tenth centile of modern standards. The height of children transported from the Upper to the Lower South on water might be considered the lower bound of all slave children. In contrast, the height of the manumitted slave children could very well constitute the upper bound. 5) Steckel's suggestion of an acceleration of growth in the late teenage years is confirmed by the Maryland sample, but seems to have been somewhat smaller than previously thought. This means that malnutrition among blacks was perhaps less severe and less widespread than the manifest sample indicates. This finding is corroborated by a number of samples recently analyzed.[54] 6) Proximity to the source of nutrients had biological advantages in

52. Earlier in the eighteenth century the sex imbalance was much greater among both races, reaching as high as 40 percent (Russell R. Menard, *Economy and Society in Early Colonial Maryland* [New York, 1985], p. 265).

53. On anthropological evidence on slave undernutrition see Ted A. Rathbun, "Health and Disease at a South Carolina Plantation: 1840–1870," *American Journal of Physical Anthropology*, 74 (Oct. 1987), pp. 239–53.

54. Pritchett and Freudenberger, "A Peculiar Sample." An intense catch-up growth during late adolescence has now been found among runaway slaves as well as among runaway white apprentices in eighteenth-century America. This pattern suggests that a late adolescent growth spurt was

Table 10.14 Sex Ratios in Maryland, 1755–1840

		Black		
	White	Slave	Free	Total
1755	1.10	1.14	1.22	1.12
1790	1.06			
1820	1.03	1.10	0.89	1.03
1840	1.00	1.06	0.89	0.99

Note: The sex ratio is the ratio of males to females in the population.

Sources: Various federal population censuses: James M. Wright, *The Free Negro in Maryland, 1634–1860* (New York, 1921), p. 85.

the early industrial period. Rural populations were taller than urban ones. Higher per capita output of food was more important in determining nutritional status than was money income.

Some findings need further confirmation on the basis of other data sets to broaden their applicability beyond the Maryland free black population. Among these are: 1) In the antebellum United States the nutritional status of black females began to decline earlier than it did among males, possibly because of a decline in the relative market value of their labor. 2) The nutritional status of females relative to males depended on the population's sex ratio. When the sex ratio favored women their nutritional status, too, was greater. 3) The decline in nutritional status affected urban black populations before it affected rural populations. 4) Owners who set their slaves free may have been especially benevolent, and consequently may have provided a better-than-average diet for their young slaves prior to manumission. If so, this part of the sample should not be considered representative of all slave children. Because black children who were born free would not have benefited from such largess, their height is probably a better proxy for the slave average than that of either the manumitted children or the children in the manifests. 5) The exact beginning of the decline in nutritional status is difficult to determine because it was region, age, and gender specific. In this regard even place of residence begins to play a role. But once one divides the sample in so many ways, the number of observations becomes insufficient to determine accurately the turning point at the county level. It appears, however, that in rural areas of Maryland the nutritional status of black men improved for those born in the 1820s, and then fell among those born in the latter half of the 1830s. Urban men were less likely to benefit from the improvements of the 1820s; on the contrary, in some cases a decline was already evident, as was the case among men living

an integral part of the human experience of the New World, probably until the end of the nineteenth century; see John Komlos, "A Malthusian Episode Revisited: The Height of Indentured Servants in Colonial America," and "The Height of Runaway Slaves in Colonial America" (manuscripts, University of Pittsburgh, 1991).

in Baltimore and in the bordering Anne Arundel County, home of the state capital, Annapolis. 6) Although the catch-up growth of the late teenage years is now beyond question, the degree of malnourishment among children prior to puberty needs further exploration.

Female height did not increase among the birth cohorts of the 1820s. The deterioration in female nutritional status began at least a decade earlier than it did for men. Like men, urban women were more likely to suffer from nutritional stress earlier than their rural counterparts. Because changes in the epidemiological environment probably would have affected men and women equally, it is unlikely to have caused the earlier onset of the decline in stature among women. The pattern, therefore, supports the notion that the decline in nutritional status was related more to a fall in nutritional intake than to an increase in the claims on the nutrients.