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**“THE LONG AND THE SHORT OF IT:  
- HISTORIC HEIGHT AND THE DIMENSIONS OF FURNITURE”**

By

Robin Elaine Sarratt

A thesis submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Master of Arts in Early American Culture

Summer 2001

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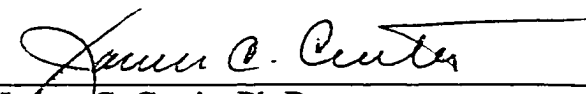
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HISTORIC HEIGHT AND THE DIMENSIONS OF  
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## ABSTRACT

Many modern Americans believe that our ancestors were significantly shorter than they are today. Examining the objects of early American history, particularly furniture, may help us understand the confusion surrounding early American stature. Analyzing the connections between stature and furniture scale give us a better understanding of design criteria for chairs, beds, and tables. It also begins to clarify why so many modern Americans believe that our ancestors were shorter “back then.” The height of Americans began to change with the first generation of settlers and stabilized by the 1750s. Both furniture scales and human stature have remained relatively constant for the past three hundred years, reflecting that early achievement of near modern heights. There are few differences in scale between modern and old furniture. Little has changed in terms of what was (and is now) the standard. Beds have stayed within the range of a modern full-sized bed since at least 1700, chairs have utilized the seventeen-inch seat as the standard since as early as 1650, and tables have consistently been between twenty-eight and thirty inches high. Variations do exist in these historic forms, yet the majority of variations in scale exist for aesthetic and cultural reasons rather than for reasons of human height. Height led to the standard, while posture, comfort, function, and decoration are most responsible for the deviations from that standard. The visual misconception of size and scale has contributed largely to the idea that our furnishings have grown significantly larger in the twentieth century. Americans and their furniture were becoming modern earlier than most of us have realized.

Many modern Americans believe that our ancestors were significantly shorter than they are. This myth has persisted despite the research conducted by anthropometric and economic historians that indicates otherwise. Examining the objects of early American history, particularly furniture, may help us understand the confusion surrounding early American stature. For instance; guides at historic house museums often point to beds and chairs for evidence of a shorter population in the eighteenth and nineteenth century. Yet for thirty years anthropometric historians have carefully examined height data and drawn remarkable conclusions about America's standard of living and economic conditions. Their research helps to create a better, more accurate and expansive picture of life in the past. Surprisingly, decorative arts scholars have not systematically tested furniture proportions against this anthropometric data. The use of anthropometric statistics in conjunction with material culture, however, has the potential to yield important information. Analyzing the connections between stature and furniture scale give us a better understanding of design criteria for chairs, beds, and tables. It also begins to clarify why so many modern Americans believe that our ancestors were "shorter 'back then'."

For all their use of height statistics, Anthropometric historians have been more interested in the *changes* in height and the economic meanings those changes carry, than in the heights themselves. They have used height data to measure biological welfare, to understand the correlation between social class and stature, to study the influence of environment and nutrition on heights, to establish an index of inequality, and to see height as a component in notions of human progress. Less well understood is how human height has impacted the material aspects of life, such as the design and creation of

furniture, architecture and clothing. One of the discoveries scholars of Anthropometric history made is that Americans achieved near-modern standards of height by the mid-eighteenth century, long before their European or African counterparts.<sup>1</sup> The height of Americans began to change with the first generation of settlers and stabilized by the 1750s, and a question that remains is whether or not that change has directly influenced the evolution of American material culture. This thesis will therefore examine what ways, if any, physical stature affected the design of furniture in early America. In order to answer that question, however, we first need to understand how tall Americans were, what factors affected their height, and then how changes in height may have impacted furniture design and production.

*In Height, Health and History; Nutritional Status in the United Kingdom, 1750-1980*, authors Roderick Floud, Kenneth Wachter and Annabel Gregory point out several key issues related to secular trends in height. Human growth is dependent upon more than genetic influences. It is keenly sensitive to changes in diet, to exposure to disease, to adequate consumption of nutrients, to work intensity and even to climate. Genetics certainly play a role, but primarily when observing trends of growth within a particular study group. “Within-group” variation of height is due to heredity, whereas “between-group” variation is due primarily to differences in childhood environment. While heredity may affect the height of an individual, it is important to remember that when looking at trends in a population’s growth, the focus must remain on the mean statistic, rather than the individual one. Genetic differences do not indicate large-scale

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<sup>1</sup> Sokoloff, Kenneth & Georgia C. Villaflor. “The Early Achievement of Modern Stature in America.” *Social Science History* 6: 4 (Fall, 1982): 521-40.

trends, only individual ones, and can only influence a study that compares two radically different populations.<sup>2</sup> Childhood environment, however, which involves the combined effects of food consumption, physical exertion, exposure to disease, and adequate care, can create remarkable differences in results for a given population. American colonization is not considered large-scale migration, as it primarily consisted of a European population's transplantation to a new area. It did not include wide-spread intermarriage with a group whose genetic growth potential was different from their own. Additionally, all European countries have comparable growth potential, as well as having a growth potential comparable to those of Africans. In other words, as the genetics did not change dramatically for the colonial Americans from one generation to the next, but childhood environment did, we can plausibly argue that the environment of the new world was largely responsible for whatever changes in height can be detected over time.

While the terminal mean height of a population can be influenced by the genetic factors of individuals, Richard Steckel cautions against being "sidetracked by genetic issues," as they do not affect studies of the evolution of human height provided that the genetic population is not changed through large-scale migration.<sup>3</sup> Food consumption is an important part of the effecting childhood environment, and can be seen in turn as an influence which relates directly to issues such as nutritional adequacy, per capita income, and the relative price of food. By itself, food is not enough to allow a body to reach its

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<sup>2</sup> Floud, Roderick, Kenneth Wachter and Annabel Gregory. *Height, Health and History : Nutritional Status in the United Kingdom, 1750-1980*. (New York: Cambridge University Press, 1990),13.

<sup>3</sup> Steckel, "Nutritional Status in the Colonial American Economy." *William and Mary Quarterly*, 3rd Series, LVI: I, (January 1999): 31. "Terminal mean height" is the average height of those who have achieved their maximum growth potential.

maximum growth potential, an outcome which is genetic but is approximately the same for all members of a given population. The body must consume food with adequate nutritional value and caloric intake, in order to achieve its growth potential, and must be protected from disease and overwork. Nutritional adequacy depends on availability of appropriate foods, income sufficient to procure such foods, or land capable of producing enough food to successfully feed the Family.<sup>4</sup>

Disease can have a major impact on terminal height as well. A child stricken with an illness will stop growing during the time that he or she is sick, as the disease uses the nutrients that would otherwise aid growth. Following recovery, a child in good circumstances will experience a period of “catch-up growth,” during which he or she will consume extra calories and recover from the interruption of growth. Should the child’s needs for additional caloric intake remain inadequate, he or she will have lost the period of growth permanently. Repeated exposure to disease will only compound this problem and lead to stunted heights.<sup>5</sup>

Completing the cycle of disease and malnutrition is the fact that poorly nourished children are more susceptible to disease, and disease compromises the body’s ability to make use of its dietary intake. In urban communities where diseases spread rapidly and frequently, the experience of illness could alter the heights of all those who have not achieved terminal growth and become ill. The focus on the childhood environment is important because of the pattern of human growth common to all populations. Growth is most rapid in infancy, slows somewhat in childhood, resumes its quick pace in

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<sup>4</sup> Steckel, “Height and Per Capita Income.” *Historical Methods*, 16: 1, (Winter, 1983): 3.

<sup>5</sup> Floud, et al, 1990: 16-17.

adolescence, and then slows again until terminal height is achieved. Nutritional deprivation and exposure to disease therefore have the greatest impact during the earliest years of development.<sup>6</sup>

Given all of these influences on a population's potential for growth, it is clear that environment played an enormous role in the potential height for a given group of people. During the eighteenth century, it was the change of environment that created a distinction between the mean heights of American-born and European or African-born individuals. Conditions in the New World were extraordinary relative to those the early colonists left behind in Europe. There was an abundance of quality land from which to choose, giving settlers a better opportunity for productive plots and requiring less physical strain to tend to the land, as well as an abundance of game and open space. Much of the population was nestled between the mainland forests and coastal regions, an environment teeming with protein from fish and game.<sup>7</sup> An English visitor to Virginia remarked in 1770 that "[Americans] eat larger quantities of animal food [than at home] ... 'you can be contented with one joint of meat' is a reproach frequently thrown into the teeth of an Englishman."<sup>8</sup> In many colonies, the spread of disease was lessened by the general low population density of rural settlements. No Americans experienced the close quarters found in cities such as London and Paris. Additionally, there is the relative income equality which

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<sup>6</sup> Steckel, "Stature and the Standard of Living." *Journal of Economic Literature*, XXXIII (December, 1995): 1910-11.

<sup>7</sup> Ibid, 1925.

<sup>8</sup> Henretta, J. *The Evolution of American Society, 1700 - 1815*. (Lexington, MA : D.C. Heath, 1973), 20.

existed between early Americans. Compared with class divisions in Europe, the socioeconomic divide between colonials was less distinct, which may have aided in the overall height of the population.<sup>9</sup>

Income can dramatically affect the outcome of terminal height for members of a given population, be it a family or a community. Impoverished families can not afford much food. Despite the fact that the poor may spend two-thirds or more of their income on food, that money may not be enough to buy foods high in calories or protein. Poor health is largely a consequence of malnourishment, a plight faced by entire developing countries today; one of the results of poor diet is compromised stature. Even within industrialized countries, socioeconomic status impacts height. Poorer classes tend to produce shorter individuals, as higher classes are able to purchase a better diet and better medical care. However, once income is enough to meet dietary needs, height generally levels off, as environmental influences intersect with genetic growth potential.<sup>10</sup>

Beginning in the mid-eighteenth century, people collected height measurements for multiple reasons. They registered the heights of soldiers and students, and used stature to identify slaves, travelers, and oath takers. Identification by features was important in an age where photography was absent or expensive. Details such as height, weight, hair color and general complexion were recorded in the event that a slave ran away, a soldier was killed, or an individual came up missing. Military recruiters recorded

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<sup>9</sup> Steckel, 1995: 1925-26.

<sup>10</sup>King, Maurice Henry. *Medical Care in Developing Countries*. (Nairobi: Oxford University Press. 1966), quoted in Steckel, 1995: 1911.

stature as part of the physical exam, and in times of higher selectivity, placed height restrictions on army recruits. They used the data to track deserters, assess the individual's physical capacity, or assure that compensation was received by the appropriate person. They also used heights to determine standard food rations, and standard uniform manufacture for the army. A constitutional provision of 1807 led to slave manifests that record slave heights as a measure to prevent smuggling. Free blacks were required to carry identification, of which height was often a requisite recorded characteristic. By the late nineteenth century, public health authorities arranged programs to measure students in urban school districts, and many universities included height as part of the physical examination upon a student's entrance.<sup>11</sup>

All of these height statistics benefit modern scholars by helping to clarify issues of human health and welfare. Richard Steckel's large body of pioneering work has primarily focused on American slaves, but he also explored the general implications for the use of anthropometric data in understanding historical welfare. Since the 1970's, economic historians, physical anthropologists, statisticians and anthropometric historians have examined hundreds of thousands of records from Europe, Asia, Africa and the Americas to produce a cross-cultural comparison of the heights and standard of living for many historic populations. Many of these recent studies were conducted under the auspices of the National Bureau of Economic Research (NBER), coordinated by Robert

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<sup>11</sup>Steckel, Richard H. "Heights and Health in the United States, 1710-1950." *Stature, Living Standards and Economic Development*. Ed. John Komlos. (Chicago: University of Chicago Press, 1994), 153-170.

Fogel. The scholarship has yielded a much clearer knowledge of work, nutrition, and disease across space and time.<sup>12</sup>

Perhaps the most surprising feature of these studies to surface was the discovery that native-born Americans had reached a near modern stature by the 1700s.<sup>13</sup> Many Americans have long believed that our predecessors were significantly shorter, and that height has been on a continual course of increasing growth. Instead, what is clear is that while the heights of Europeans and Africans remained significantly shorter than modern standards, descendants of both African slaves and European settlers born in America achieved heights that rival modern statistics as early as the mid-eighteenth century. Records of recruits for both the French and Indian War and the Revolutionary war reveal that native-born Americans during the second half of the eighteenth century were quite tall by period standards, practically equaling the mean heights recorded for American soldiers during World War II (173.2 cm / 68.2 in.). Literary records support these findings by confirming the perception of standard heights. A short story, submitted to

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<sup>12</sup> This project was first described in 1978 in Fogel, et.al. "The Economics of Mortality in North America, 1650-1910: A Description of a Research Project." *Historical Methods*, 11: 75-108. The evolution and progress of the project has been discussed in many subsequent articles, and was responsible for the publication of a compilation of articles in the 1982 6(4) volume of *Social Science History*. A number of National Bureau of Economic Research (NBER) conferences have continued to explore topics of anthropometric history over the years, and have driven the field significantly. Steckel has authored or co-authored sixty-seven articles and three books since 1978. His studies have not been limited to southern U.S. Slaves, as he has tackled everything from "Strategic Ideas in the Rise of the New Anthropometric History and Their Implications for Interdisciplinary Research," (*Journal of Economic History*, 58 (1998), 803-21) to "Swedish Historical Heights Revisited: New Estimation Techniques and Results," (with Markus Heintel and Lars Sandberg., in John Komlos and Joerg Baten (eds.), *The Biological Standard of Living in Comparative Perspective* (Stuttgart: Franz Steiner Verlag, 1998), 449-58.

<sup>13</sup>Sokoloff & Villaflor, 1982: 521-40.

*Godey's Ladies' Book* in 1839, acts as a perfect example: describing an approaching party of two gentlemen and two ladies in “The Veiled Lady,” the author describes a young man, “in height nearly six feet, or the prescribed phrase, ‘somewhat above the middle stature’.”<sup>14</sup> This indication that heights of around five feet, eight or nine inches was considered to be “the middle stature” supports the statistical findings of several anthropometric historians.

Theodore Steegman and P. A. Haseley demonstrated that American soldiers enlisted during the French and Indian War (1754- 1763) averaged a mean height of about 172.1 cm (67.8 In ), or the 24th percentile of modern height standards (as tabulated by National Center for Health Statistics data).<sup>15</sup> The ages of the men in this study were between 21 and 30, and therefore would likely have achieved their terminal growth. Examining environmental and social factors that affected their sample, Steegman and Haseley focused on the effects of American versus foreign birth, and variables such as ethnicity, environment, and area of residence. They compiled records from twenty-seven New York, eighteen Virginia, and eight Pennsylvania companies formed between 1755 and 1763. Of the 3,614 men in the study, the clearest assessment was how consistently American heights exceeded those of foreign-born men. The mean stature, averaged from

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<sup>14</sup>“The Veiled Lady,” *Godey's Ladies' Book*, V. XIX: 50 August, 1838.

<sup>15</sup>Steegmann, A Theodore and P.A. Haseley. “Stature Variation in the British American Colonies : French and Indian War Records, 1755 - 1763.” *American Journal of Physical Anthropology*. 75 (1988): 413-421.

The mostly widely used modern statistics are those compiled by the National Center for Health Statistics (NCHS, 1977). The World Health Organization has adopted the NCHS statistics as an international reference standard. Steckel explores the uses of NCHS percentiles and their implications thoroughly in “Percentiles of Modern Height Standards for Use in Historical Research,” *Historical Methods*, 29 (4) (Fall 1996): 157-166.

all separately examined age cohorts, of Colonial-born men was 171.2 cm (67.5 in.), while that of foreign-born men was 167.4 cm (66 in.). Each separate age cohort corresponded accordingly, with the American-born heights consistently higher than the foreign-born ones.<sup>16</sup>

There were regional height differences within the group. Among the American born recruits, those living in rural residences averaged a height of 171.9 cm (67.7 in.), taller than the overall mean for the group, with those residing in cities reaching a smaller average height of 169.9 cm (66.9 in.). American birth zones, established by Steegman and Haseley and based on climate, yielded further interesting results. 176 recruits living in the non coastal regions of eastern Massachusetts, Connecticut and the mid-Hudson River Valley were significantly taller at 173.5 cm (68.3 in.) than the 104 recruits from the Delaware River Valley, who topped out at a mean of 169.2 cm (66.6 in.). These findings clearly point toward a distinctive height advantage stemming from personal environment. The rural and regional advantages in height seem to indicate healthier diets and/or a life relatively free from disease in those locations where the average stature is greater. Ancestral ethnicity also shows a minor correlation to height, but because of the large numeric differences in the study groups established by Steegmann and Haseley and the lack of consideration for how contemporary residence based on ethnicity may have played into the statistics, the reliability of such figures is uncertain.<sup>17</sup>

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<sup>16</sup>Steegman & Haseley, 1988: 415-16. A minor discrepancy exists in the published data of the study. In separate tables listing mean statures, by age cohort and then by environmental factors, the colonial-born mean changes, from 171.2cm in Table 1, p. 415, to 171.6cm in Table 2, p. 416.

<sup>17</sup>The groups based on ancestral ethnicity range in number from 28 to 752 recruits per group, and do not take into account issues of ethnic placement in the colonies.

Fifty-four recruits residing in Coastal New Hampshire, western Massachusetts, and

The research team of Kenneth Sokoloff and Georgia Villaflor determined in the early 1980s that similar statistics were evident for soldiers enlisted during the Revolutionary War era (1775-1783). In a study of 5,608 native-born Revolutionary War soldiers, the mean height was 172.9 cm (68.1 in.), less than a centimeter taller than that of soldiers from 15 years earlier. Interestingly, this mean is also only 0.5 cm (0.2 in.) (Mid-Atlantic) and 1 cm (0.4 in.) (New England) inches below the average height of recruits during the Civil War, and which is nearly equal to that of soldiers in World War II. Sokoloff and Villaflor found the mean terminal height of Middle Atlantic, New England and Southern soldiers to be 7.6 - 8.9 cm (3.0 to 3.5 in.) above the mean of the British Royal Marines.<sup>18</sup>

In fact, European nations in general did not reach the same height as Americans until much later. Native-born American men reached an average stature of 172 cm (67.8 in.) by 1715, but Swedish men did not reach the same height until 1913, Norway until 1927, and Italy, Holland, Denmark and Belgium until 1940 or later. Over the last 200 years, average height for male European conscripts has varied from 159 to 181 cm (62.6 - 71.3 in.).<sup>19</sup> The shortest measure of those groups is that of the conscripts in the Hapsburg monarchy in the eighteenth century, recorded as being 159.1 cm (62.6 in.)<sup>20</sup>. A 1931 Upstate New York around Albany averaged 170.1 cm, while 494 recruits from coastal Massachusetts and Connecticut, New Jersey and parts of Pennsylvania averaged 171.6 cm.

<sup>18</sup>Sokoloff Kenneth, and Georgia C. Villaflor. "The Early Achievement of Modern Stature in America," in *Social Science History*, 6:4 (Fall, 1982): 458-9.

<sup>19</sup>Floud, et al, 1990: 25-26.

<sup>20</sup>Komlos, John. 1985. "Stature and Nutrition in the Hapsburg Monarchy : the standard of living and economic development in the eighteenth century." *American Historical Review*, 90: 1149-61.

study done on recruits in the Norwegian army in 1761 shows the average of that group to be 159.5 cm (62.8 in.).<sup>21</sup> These two groups however were comprised of the age cohort of 18 and 18.5 - year olds, respectively. Because of different nutritional circumstances, eighteenth-century growth patterns probably differed slightly from twentieth-century patterns, in that most men did not reach terminal height until the age of 20 or 21. Modern growth most commonly terminates at or around the age of eighteen.<sup>22</sup> During the third quarter of the eighteenth century, troops from Sweden attained heights on average from between 166 to 168 cm (65.4 - 66 in.), while those from the Hapsburg monarchy and Britain were 162 to 168 cm tall (63.8 - 66 in.). As late as 1913, the mean stature for Spanish army recruits was still only 163.6 cm (64.4 in.). Across the board, the United States had greater mean heights than any other nation until the end of the nineteenth century.<sup>23</sup>

A large body of statistical information is available from the Civil War, as so many men were enlisted into armies on both sides. Benjamin A. Gould compiled the statistics of 123,472 soldiers, and arrived at the average height of 173.2 cm (68.2 in.).<sup>24</sup> Studies done for the U.S. Army and by Bernard Karpinos on military men during the two World

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<sup>21</sup>Kiiil,V. *Stature and Growth of Norweigan Men During the Past 200 Years*. (Oslo: Komosjpm hos Jacobb Dybwad), quoted in Floud,et al., 23.

<sup>22</sup>Floud, et.al: 22

<sup>23</sup>Steckel, Richard, 1994:157.

<sup>24</sup>Gould, Benjamin Althorp. *Investigations in the Military and Anthropological Statistics of American Soldiers*. (Cambridge: Riverside Press, 1869).

Wars, found the average heights to be 171.4 cm (67.5 in.) for those measured between 1916-1918, and 173.2 cm (68.2 in.) for those between 1943-44.<sup>25</sup>

Richard Steckel points out that the data taken from studies such as those just mentioned seem to indicate a steady, secular trend in height for native-born Americans, but that this suggestion is one of a “temporal stability that does not exist in the American record.” Instead of a temporal stability, Steckel arranges height statistics by birth cohort, and proposes that the American experience is “better characterized by cycles or fluctuations” than by a continual stream of upward progression. Looking at various birth cohorts, he identifies the first surge as coming twenty or thirty years prior to the French and Indian War. Those born between 1720 and 1740 and measured in the muster rolls for that war were approximately constant at 171 cm (67.3 in.), but those born by 1750 had gained more than 1.5 cm over their predecessors. It appears then that this spurt was followed by a plateau of between 172.5 and 173.5 cm (68 to 68.3 in.) from 1780 to 1830. This was followed by a dip in the mid to late nineteenth century to a low of approximately 169 cm (66.5 in), which was then followed by the more constant, secular trend of height improvements that continued into the twentieth century.<sup>26</sup> The dip in height curiously took place during the Industrial Revolution, a time when per capita

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<sup>25</sup>The statistics from World War I included foreign-born enlisted men, and therefore may have potentially lowered the mean height. There were 868,445 men measured. Davenport, M.W. and A.G. Love. *The Medical Department of the United States Army in the World War*. Vol. 15, *Statistics*, pt. 1, *Army Anthropology*. Washington : Government Printing Office, 1921. The statistics from World War II here listed are of the oldest age group, and were taken from 119,443 men. Karpinos, Bernard D. “Height and Weight of Selective Service Registrants Processed for Military Service During World War II.” *Human Biology* 30 (1958): 292-321, quoted in Table 9.2, Steckel, 1994.

<sup>26</sup>Steckel, 1994: 157-8.

output rose by 50 percent between 1830 and 1860. Europeans had experienced a similar dip with the onset of the first Industrial Revolution (1760 to 1800). John Komlos argues that this was the result of many “endogenous effects”, such as the income redistribution effect which shifted income distribution unevenly in favor of the upper classes, the relative price effect which increased the cost of food products with significant nutritional value, and the epidemiological environment effect, the cause of which was a shift to urban living and thus an increased population density that fostered disease.<sup>27</sup>

Regardless of whether growth rates were cyclical or continual, the heights of Americans continued to be greater than those of any other population in the world until the very late nineteenth, or early twentieth century. These rather tall heights of Americans suggest several things about the colonial population. Caloric consumption, particularly of protein, was probably fairly high given the correlation between nutrition and height and given the evidence that colonials ingested more game and meat than their British counterparts.<sup>28</sup>

Steckel points out in another study that change in the stature of native-born Americans during the late colonial period was also remarkable when compared to contemporary African standards. While examining the standard of living for American slaves, Steckel was the first to prove that the nutritional status of adult slaves was high relative to that of contemporary Africans remaining in their native lands. This finding by no means indicated a grand lifestyle, but suggested that even the most disadvantaged

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<sup>27</sup>Komlos, John. “Shrinking in a Growing Economy? The Mystery of Physical Stature during the Industrial Revolution.” *The Journal of Economic History*. 58: 3 (Sept. 1998): 783-792.

<sup>28</sup>Sokoloff and Villaflor, 1982: 460.

cohorts of American society benefited from the fertility of American soil and relative freedom from exposure to disease. Slave children were not as fortunate. Perhaps because they were considered less important until they were functional members of the work force, slave children were actually much shorter than white children and freed black children, and they hardly reached the fifth centile of modern standards. This may have been in part because of the rapid return to work of mothers, and insufficient feeding of infants as a result. There was clearly in most average cases a period of serious catch-up growth, presumably during adolescence, as the height differences between slaves and their masters decrease as the statistics are divided by age cohorts.<sup>29</sup>

Steckel's findings were backed up by David Eltis who explored welfare trends among both slaves and their African counterparts. Using records of the courts of Sierra Leone deposited in the Public Records Office in London, Eltis was able to compare the heights of 56,935 Africans recaptured by British Cruisers en route to the Americas between 1819 and 1845. The British Navy took measurements of these recaptured slaves in an effort to provide them with proof of freedom and the British diplomatic antislavery campaign with statistics to help suppress the slave traffic from Africa. The tallest of all these populations were the Yoruba, a West African group whose superior height may have been attributable to their superior nutritional status. The mean height among this group was 166.6 cm (65.6 in.), 4.2 cm (1.7 in.) shorter than the mean for slaves born in the US.<sup>30</sup>

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<sup>29</sup>Steckel, 1994:167.

<sup>30</sup>Eltis, David. "Welfare Trends Among the Yoruba in the Early Nineteenth Century." *Journal of Economic History*. 50: 3 (September, 1990): 521 - 40.

All these studies underline the positive correlation between environment and height, a connection essential to understanding why certain populations had superior heights to others. Scholars have outlined for us the path in height that American people have taken in terms of secular trends in growth, while attempting to understand the standard of living those populations experienced in their time. Americans, both black and white, had achieved the highest stature in the world by the eighteenth century, a claim that was maintained for almost one hundred and fifty years before other nations caught up with, and in some cases eventually surpassed our extraordinary gains in height. Within the United States, height differences did exist regionally, based on issues of rural versus urban life, and per capita income, but no inter-regional differences were so great as the difference between the average American and the average European stature. From 1755 to 1977, the measurable change in mean stature increased only 4.6 cm (1.8 in) for adult American men.

A final note on the study of historic heights: women have been entirely left out of most anthropometric studies as there are simply too few statistics of female height until the twentieth century. Although some statistics of female slaves exist from the early nineteenth century, there are few bodies of information that included the heights of women. However, given the basic similarities found to exist between the modern and historic heights of men, it is reasonable to assume that the anthropometric trends of native-born American men are roughly parallel to those of women. Statistics compiled by the NCHS in November, 2000, indicate that the mean height for twenty year old men is 176.8 cm (69.6 in), and for twenty year old women is 163.4 cm (64.3 in). With no

evidence to the contrary, we can expect the ratio of modern male to female heights to parallel the ratio of historic male to female heights.<sup>31</sup>

How do these findings relate to the scale and dimensions of furniture? Is there any basis for the widely held belief that people were shorter in the past? Given that the height of Americans did not dramatically change between 1750 and the 20th century, it is reasonable to expect that furniture was scaled to the size of the population, yet with the belief of many modern Americans that people were once shorter, we might also expect to find that furniture scales and sizes may have changed, contributing to this misunderstanding. The modern emphasis on ergonomics, the study of the design of furniture and the human form, lead us to believe that the body is an essential component in successful furniture design. Accordingly, modern observers might expect a direct relationship between the size of historic furniture and the size of historic bodies. Furniture perceived to be smaller in scale may lead to false assumptions about the height of our ancestors. With this in mind, the following section will explore the relationship between height and furniture design between the eighteenth century and the present while attempting to outline basic trends in furniture scale and dimensions.

We can approach the relationship between furniture and height by beginning with an assumption: the types of material objects most likely to be affected by height would be those objects which have in common the need to accommodate the body in some way.

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<sup>31</sup>Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000). Revised and corrected, November 28, 2000. See: \_\_\_\_\_ for information.

For example, beds and chairs have to accommodate both cultural and physical notions of comfort. No early records survive to indicate what standards existed for the implementation of average-size furniture. However, we can analyze the surviving examples of beds and seating furniture and search for overall trends and patterns as they relate to height. We can also anticipate that much like today, consumers of the past expected that human comfort and form would be taken into consideration in the design of furniture. As no one has conducted a comprehensive study of the dimensions of furniture as they relate to human height, the following section will attempt to demonstrate some common trends of the dimensions of beds, seating furniture, and tables.

Using furniture from the two of the foremost collections of American furniture at the Winterthur Museum and the Museum of Early Southern Decorative Arts (MESDA), as well as several smaller collections, I have attempted to outline some basic patterns of the length and width of beds from 1690 through the present time, comparing historic trends to modern standards.<sup>32</sup>At present there is no comprehensive study or chronological comparison of beds throughout American history. The majority of studies concerning bedsteads have focused on the textiles that surround them, rather than the bed itself, primarily because of the inherent value of the textiles. A fully dressed high post bedstead was usually the most expensive item on a household inventory from the early seventeenth-century through the 1820s, with the expense concentrated in the curtains,

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<sup>32</sup>Beds included in this study came from the following collections: The Winterthur Museum, Winterthur, DE; The Museum of Early Southern Decorative Arts, Winston-Salem, N.C; Stenton, The Ebenezer Maxwell House and the Deshler-Morris House, Germantown, PA; The Mabel Brady Garvan Collection, Yale University; and The Colonial Williamsburg Collection.

bedding, and mattress rather than the wooden frame. Perhaps for that reason, bedding and bed curtains are far better understood than the frame that supported them. Several decorative arts scholars have included a handful of beds in their publications, but they receive scant attention. None of the major works focusing on early American decorative arts through the nineteenth century include more than a handful of entries in their catalogues. Most furniture scholarship concentrates on seating and case forms. Beds are either relegated to a handful of entries, or neglected entirely. The subject of American bedsteads deserves more research.<sup>33</sup>

The standard formula for measuring furniture for a museum catalogue or file is generally to measure at the widest points. This is primarily done for the purpose of identification and sound collections management. For installation purposes, knowledge of a piece of furniture's widest points helps insure that there is ample room for its installation in a certain space. In keeping with this concept, the measurements included in this study were taken at the widest point of the base of the bedstead, that is, at the section of the bed that would contain the mattress or bedding.

In this study, I have compiled data on the date, location of manufacture, and dimensions for a group of ninety-two beds. Of those beds thirteen percent came from New England, with four beds from Massachusetts, two from Rhode Island, and one from Connecticut, as well as six from an unknown part of New England. Thirty-one percent

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<sup>33</sup>Several scholars have included beds in their publications, including Kane, Patricia. *300 Years of American Seating Furniture: chairs and beds from the Mable Brady Garvan and other collections at Yale University*. (Boston: New York Graphic Society, 1976). Kane includes seven entries of beds in her catalogue of almost 300 objects. Hurst, Ronald L. and Jonathan Prown include two high-post bedsteads in *Southern Furniture 1680-1830, the Colonial Williamsburg Collection*. (Williamsburg, Va: Colonial Williamsburg Foundation; New York in association with Harry N. Abrams, 1997).

came from the Mid-Atlantic area which included Pennsylvania, New Jersey, and New York. Maryland was considered southern in keeping with eighteenth- and nineteenth-century regional structure. Of those from the Mid-Atlantic group, seventeen came from Pennsylvania, and ten from New York. Two were only identified as being “Mid-Atlantic.” Forty-eight percent of the beds in this group came from the south. Of those, sixteen came from the Chesapeake region, sixteen from the southern back country, and fourteen from the southern low country of eastern North and South Carolina. Ten of the beds were not attributed to any given region, but are known to be American beds.

**Table 1: Average Bed Dimensions by Region**

<b><u>Region</u></b>	<b><u>Number of Beds</u></b>	<b><u>Average Height:</u></b>	<b><u>Average Width:</u></b>	<b><u>Average Length:</u></b>
New England	11	77.56 inches	54.58 inches	78.23 inches
Mid-Atlantic, PA	17	71.90 inches	55.32 inches	79.52 inches
Mid-Atlantic, NY	10	82.22 inches	62.76 inches	81.61 inches
Chesapeake Region	16	81.06 inches	60.42 inches	71.19 inches
Southern Low Country	12	66.98 inches	56.27 inches	77.20 inches
Southern Back Country	16	56.13 inches	45.90 inches	75.82 inches
Total Averages:	92	70.21 inches	55.81 inches	77.04 inches

The regional trends for average dimensions of beds ( Table 1) varied slightly from area to area. With the exception of beds from New York, which proved to be the longest group at 81.61 inches (6’10”), and beds from Maryland, the shortest, at 63.53 inches (5’4”), the results of each regional group were within a range of between 74.38 inches (6’2”) average length and 79.81 inches (6’8”) average length. New England beds had an average dimension of 77.56”(h) x 54.58”(w) x 78.23”(l). Beds from Pennsylvania had the

average dimensions of 71.9” x 55.32” x 79.52,” and the beds from New York had the overall largest dimensions of all groups, at 82.22” x 62.76” x 81.61.” The large size of these New York beds may be directly connected to the time at which each of the ten beds were manufactured. Only one of the New York beds has a date as early as 1800, and the other nine were each made some time after 1815. The impact of style on the dimensions of the beds can be seen in these examples. The desire to emulate classical cultures in early nineteenth century life led to beds and other furniture forms taking on architectural dimensions in the years between 1815 and 1845. Thick pillars, and scrolling sleigh beds naturally add inches to these forms that were intended to dominate whatever rooms they were in.<sup>34</sup>

Contrary to expectation, the different averages in length and width for regional cohorts do not correspond to the average height of residents within those areas. Bed lengths have the highest averages in New England, Pennsylvania, and New York, while several studies have noted smaller stature in those areas than in the south. During the French and Indian War, troops from the Mid-Atlantic states were 0.5 cm shorter than southerners, and during the American Revolution, recruits from the Mid-Atlantic were 0.8 cm shorter than southerners, who were also 1.3 cm taller than New Englanders.<sup>35</sup> A second study finds that heights of troops from Delaware, southeastern Pennsylvania, and

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<sup>34</sup>For American neoclassical furniture and their designs, see: Cooper, Wendy. *Classical Taste in Early America: 1800-1840*. (New York: Abbeville Press Publishers, 1993), for examples of Empire style beds. See also Catherine Whalen, “‘The Consummation of Empire’: the Vansyckel Family Bedchamber Suite.” (Unpublished Master’s Thesis, University of Delaware, 1998).

<sup>35</sup>Sokoloff and Villaflor, 1982: 460.

eastern Maryland were the shortest cohort examined.<sup>36</sup> These trends continue through the Civil War, World War I, and World War II.<sup>37</sup> Given this information, the longer mean averages of beds in the Northeast and Mid-Atlantic area seem to unrelated to mean height averages. However, while the beds in this study help provide a general pattern of dimensional trends, the sampling of beds is too small to be a certain indicator of the standard for those regions.

The date of manufacture for the beds (Table 2) in this study group fall between 1700 and 1870, but trade catalogues provide information on later dates. The rarity of surviving seventeenth-century examples limits the study to beds made post-1700. Of the ninety-two beds in the study, five percent were made between 1700-1725 . Seven percent were made between 1726 and 1750, twenty-two percent between 1751 and 1775, thirty-one percent between 1776 and 1800, sixteen percent between 1801 and 1825, eleven percent between 1826 and 1850, and two percent were made between 1850 and 1870. Seven percent of the beds in this study have dates that are unknown. When examined chronologically, the differences between all dimensions is less marked than those differences determined by region. This change in length over time is not a linear evolution. Bed lengths increased and decreased cyclically. For example: where there was a 10.42” difference between the greatest and lowest average lengths regionally, the difference is less than half that at 4.87” between greatest and least lengths chronologically. From a mean of 77.22” in 1700-1725, bed lengths increase by .68” within the next twenty-five years, but the means decrease by almost 2” the following

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<sup>36</sup>Stegmann and Hasely, 1988: 415-17.

<sup>37</sup>Steckel, 1994: 159.

quarter-century. Between 1751 and 1826 there are slight variations, with less than an inch of change over the years. The most marked increase comes with the sub-category of beds made between 1826 and 1850. With an average length of 80.81", this period correlates with the rise of the Empire style in popularity. The Empire style bedsteads were longer because of the popularity of thick head and foot boards of various decorations.

**Table 2: Average Dimensions for Beds by Date**

<b><u>Earliest Date of Manufacture:</u></b>	<b><u>Number of Beds</u></b>	<b><u>Average Height:</u></b>	<b><u>Average Width:</u></b>	<b><u>Average Length:</u></b>
1700-1725	6	59.17 inches	51.80 inches	77.22 inches
1726-1750	6	67.35 inches	56.19 inches	77.90 inches
1751-1775	22	71.68 inches	55.18 inches	75.94 inches
1776-1800	29	78.62 inches	56.29 inches	76.96 inches
1801-1826	15	72.78 inches	57.39 inches	76.37 inches
1826-1850	11	71.50 inches	58.66 inches	80.81 inches

This study cannot be considered a complete analysis of dimensional trends in American beds over time; the sample is too small and we cannot know if the group of surviving beds accurately reflects the exact sizes that were once typical. However, what we can clearly see is that while the dimensions of beds have changed over time, they have never strayed far from - and especially below - the standards that we have created for modern expectations. Serta, one of the world's largest modern producers of mattresses and bedding has had these standard sizes for at least twenty-five years:

- Twin: 38 x 74 ½ inches
- Full: 53 x 74 ½ inches
- Queen: 60 x 79 ½ inches
- King: 76 x 79 ½ inches<sup>38</sup>

None of the average measurements of the bed sample I studied by chronological grouping are less than those of a modern full-sized bed, the exception is the average width for the

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<sup>38</sup>Personal correspondence. Patrick Simpkins, Consumer Relations Department of Serta, to the author. March 13, 2001.

years 1700-1725. The lengths of the beds are all greater than the 20th century “full-size” standard. While we cannot conclusively determine how bed dimensions have changed over the centuries, what is clear is that over the past three hundred years bed lengths have remained much the same. Given that both mean American height and average bed lengths have remained steady over time, we might propose a connection. Human height influenced bed lengths. As height has not changed, its continuity has acted as a catalyst for manufacturers to produce beds of consistent lengths. Therefore, it may be that the relatively unchanging mean American height led to the movement towards standardization of dimensions in the bed and bedding industry. However, there were additional factors that influenced the design and dimensions of beds that we need to consider.

Bed and bedding makers were influenced by many factors - sleeping habits and postures, the number of people in a bed at a given time, the average height and weight of those using the bed, fashion and status, and cultural expectations. For example, if contemporary health literature recommended “healthful” positions in which to sleep, we might expect the recommendations to affect bed dimensions. Based on the number of pillows and bolsters that appear in probate inventories, some curators and guides have suggested that many Americans slept propped up rather than in a prone position; this sleeping posture presumably affected bed length. At the Deshler-Morris House in Germantown, Pennsylvania, a guide suggested that George Washington was able to fit in the bed - a tall-post bed of average size - only because he would have slept propped up on several pillows and a bolster. The number of bedfellows expected to inhabit a given bed, or the space available for the bedstead in a family’s home also constrained bed width. All

of these conditions are predicated on the idea that bed sizes changed according to human need. In the pre-industrial era, bedstead dimensions represent a custom order, followed later by a standard set of dimensions that manufacturers thought would meet the needs of the average American.

The social history of sleeping habits is not well understood. Existing sources reveal very little about the intimate details of sleep, such as normal sleeping postures for people in the eighteenth and nineteenth centuries. Advice in health columns in period publications such as *Godey's Lady's Book* and the *Ladies Home Journal* or *Harper's Magazine* focus primarily on health precautions during sleep rather than with sleep itself. However, several sources help to illuminate issues such as the common suggestion that early Americans favored being propped up with multiple pillows and bolsters. Thomas Webster mentions in the 1845 *Encyclopedia of Domestic Economy* that German beds “differ remarkably from our mode in England,” in that “they make the upper part so high by means of many pillows placed underneath, that they rather sit than lie in bed; some do not use blankets, but, instead of them, have a wadded counterpane over the sheets; and, in winter, a light feather bed, sometimes of down, is added as a *couvre-pieds*. This custom, though sometimes spoken of with ridicule, is said to be extremely comfortable in very cold countries.”

In contrast, early bedding in Great Britain was described as rather reserved, and that pillows were “thought meet only for women in childbed.”<sup>39</sup> The custom of having many pillows was also said to be “characteristic of the Near and Middle East,” according

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<sup>39</sup>Webster Thomas, et al. *An Encyclopedia of Domestic Economy*. (New York: Harper & Bros., 1845), 289-90.

to Mary Eden and Richard Carrington, authors of *The Philosophy of the Bed*, perhaps implying that it was rather uncharacteristic of English and American beds.<sup>40</sup> Miss Leslie, in *The House Book* suggested that each bed should have two pillows, with a few extras in case of illness. She offered that additional bolsters should be present as well.<sup>41</sup> This grouping of two pillows and a bolster to a bed may well have become customary by Miss Leslie's time. In 1770, the Inventory of Edward Lloyd III of Wye House, Talbot County, Maryland, listed "In the Blue Room," "1 Yellow Silk Damask Bed," with "1 Boslter and 2 Pillows to this bed," and in an additional room listed "1 Bed 1 Bolster 2 Pillows, & 3 Blankets."<sup>42</sup> Health literature of the nineteenth century discouraged the use of excessive pillows, partially for the sake of the "quality of rest," but also out of concern that extra pillows could cause smothering, especially in children.<sup>43</sup>

The idea that people of the past slept while propped up has found its way into our image of the eighteenth and nineteenth century lifestyles. If sleeping propped up on pillows and bolsters was in fact part of the sleeping customs in early America, it may be that it was a social norm in predominantly German areas where, if Webster is correct, families may have brought the custom of "rather sitting than lying in bed" with them from their native country. In 1858, Jane Taylor gave a depiction of the "Proper and

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<sup>40</sup>Eden, Mary and Richard Carrington. *The Philosophy of the Bed*. (New York: Putnam, 1961), 29.

<sup>41</sup>Leslie, Miss Eliza. *The House Book; or a domestic economy for town and country*. (Philadelphia: Carey & Hart, 1841), 309.

<sup>42</sup>Lloyd, Edward III. "Inventory of Edward Lloyd III, 1770," *John Cadwalader Papers*, Historical Society of Pennsylvania. Microfilm, Property of Winterthur Museum, Joseph Downs Manuscript Collection.

<sup>43</sup> Stearns, Peter, Perrin Rowland and Lori Giarnella. "Children's Sleep: Sketching Historical Change." *Journal of Social History*. (Winter, 1996): 346.

Improper Position to Lie in Bed,” in her health manual, *Woulds't Know Thyself* (Fig. 1).<sup>44</sup> The “proper” position is illustrated as on one’s side, head on one pillow, with the body in a prone position. The “improper” position is angled upwards from the waist, with the head propped up on what appears to be two pillows and a bolster.<sup>45</sup> That this is the “improper position” implies that the habit of sleeping propped up at an angle was either rare as a result of being frowned upon in health manuals and advice columns, or that it was so common as to require instruction against it from these same sources. Given that it was singled out by Webster as being a German custom, and that Taylor was concerned enough to instruct her readers against it, there is the possibility that the habit migrated to areas of the colonies with German immigrants, but that it was “normalized” out of social custom through whatever health concerns existed at the time. There is also the possibility that this was, in fact, a common position for sleep, and that as such only merited mention by those who desired to change it. Like many social habits and ideas, its normalcy may have prevented it from being mentioned in social texts, such as diaries or letters. Another possibility is that the idea has sprung up as a reaction to the idea that Americans may have been shorter in the past. Under the impression that tall-post beds are shorter than our modern standards, many observers may arrive at the conclusion that past Americans slept propped up in order to explain how someone of Washington’s stature may have fit comfortably in a bed they perceive to be much too small for his 6’2” frame.

While bed lengths needed to accommodate an occupant’s height and sleeping position, the width of beds was determined by the number of people expected to share a

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<sup>44</sup>All Figures are located in Appendix I.

<sup>45</sup>Taylor, Jane. *Woulds't Know Thyself: Of the Outlines of Human Physiology, Designed for the Youth of Both Sexes*. (New York: George F. Coole and Brother, 1858).

bed. Sleeping together added warmth, especially during cold winters, and beds that could accommodate two or more members of the household would reduce the need for heating as well as the need for additional bedding. Eighteenth and nineteenth century Americans were accustomed to sleeping with bed partners. In *Our Own Snug Fireside*, Jane Nylander explored the sleeping habits of some eighteenth-century New Englanders:

“From the earliest childhood, they had slept together- as infants in their parents bed, then with their youngest siblings in a nearby trundle bed, and later with siblings, cousins, and perhaps friends, apprentices, or domestic help of the same sex. When visitors decided to tarry, or stay overnight, they expected to be put in beds with the family. So unused were many people to sleeping alone that they often sought out sleeping partners.”<sup>46</sup>

Edward Jenner Carpenter kept an amusing account of the benefits of shared sleeping in his diary of 1844. On July 10th he wrote, “I got Albert Field to sleep with me last night, & I must go and get somebody to sleep with me tonight for it is rather lonesome to sleep alone.” Having a bed mate was so important to Mr. Carpenter in fact, that his diary continued to describe his sleeping experience. “I got John Smith to sleep with me last night, but I have got to sleep alone tonight.” Two days later, he wrote, “I slept alone last night & have got to tonight. Dexter sleeps down to the house with his brother till Lyons gets back.”<sup>47</sup>

Sleeping with a marriage partner was much preferred over finding a stranger to share the bed. Esther Edwards Burr wrote to a friend in 1775, “Pray, what do you think

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<sup>46</sup>Nylander, Jane C. *Our Own Snug Fireside: Images of the New England Home*. (New Haven: Yale University Press, 1993), 95.

<sup>47</sup>“Edward J. Carpenter’s Journal.” *Proceedings of the American Antiquarian Society* 98: 2 (1988): 344-6.

everybody marrys in, or about Winter for? Tis quite merry, isn't it? I really believe tis for fear of laying cold, and for the want of a bedfellow."<sup>48</sup> Parents could likely expect to find themselves with new young bedfellows as their families grew, as Mary Palmer Tyler seems to have found out in 1796. While setting up a new household she made herself a new set of bed linens to fit a bed that had been "made half a foot wider than usual for the accommodation of little Master Royal."<sup>49</sup> Modern consumers are quite accustomed to the idea of increasing bed size to accommodate a growing family. Newly married couples graduate from a single sized bed to one that will allow both partners to sleep comfortably, and few parents are strangers to the notion of sharing their beds with children on occasion.

Bed design has been remarkably consistent over the centuries. The basic bed form in both Western Europe and America changed very little between 1620 and the end of the mid-nineteenth century. A typical Colonial bedstead consisted of a simple wooden frame, with either tall posts hung with draped fabric to enclose the structure, or a low-post bed over which curtains could be suspended from the ceiling. Four posts of varying height were held together by plain rails, some with both headboards and footboards, though quite often footboards were omitted completely. This basic bedstead is described by Thomas Webster in his *Encyclopedia of Domestic Economy*, published in 1845, as being "the solid constructions or frame work upon which the bed itself rests,

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<sup>48</sup>Nylander, 95.

<sup>49</sup>Ibid, 60.

together with a canopy over it.”<sup>50</sup> He was careful to differentiate between the bed and the accompanying set of bed curtains which Webster defines as “bed furniture.”

The character of the posts sometimes found on finer bedsteads are often the best indicator of age and style. Thick posts with deep turnings differentiate seventeenth-century beds from later, more delicately carved eighteenth-century examples. By the late eighteenth-century, the neoclassical influence yielded Federal beds which had reeded or fluted posts at the footboard, or straight tapered legs, often accompanied by painted cornices or canopies. Late neoclassical, or Empire beds of the mid-eighteenth century can be characterized by heavy matched head- and foot boards, or by scrolled sleigh beds. Throughout the centuries, plain “pencil” post beds were made, and are almost impossible to date. Seventeenth and eighteenth-century beds employed the use of ropes strung through holes in the rails and fastened across the bed frame to support a “bed,” or mattress of some form. This mattress typically consisted of some type of sacking filled with feathers, straw, hair, grass, or any combination of such elements. Cotton mattresses didn’t make their advent until the end of the nineteenth century, then coming as a great relief to sufferers of bed bugs and other varmints.

The changing trends in fashionable beds may best be understood through what Catherine Whalen called the “cultural hierarchy of the bed” in her thesis examining the Vansyckel Family Suite of bedroom furniture manufactured for the Philadelphia family in the 1830s. This “cultural hierarchy” looks at beds and bedchambers as they identified mechanisms for class and cultural division. A great “leap of progress,” the Colonial English and American bed kept mankind from “the general practice of [sleeping] upon

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<sup>50</sup>Webster, Thomas, et al., 289.

the skin of beasts, as it was the case with the ancient Britons, and [as it] still prevails in many of the Asiatic countries, and other parts of the world.”<sup>51</sup> Webster et al outlined a hierarchy of fashionable beds, placing the Four-post beds, “generally used in England for the best beds” well at the top of the list, following these with French beds, which had a “variety of forms.” Beneath these two types of beds fell half tester bedsteads, press bedsteads, and lowly variations on conversion beds - such as chair beds, sofa and couch beds, and cot beds or hammocks. This list terminated with a discussion of what the authors considered to be the least fashionable forms of beds: the stump bed, box bed, and folding camp or tressel bed. Miss Leslie’s *The House Book* suggested that for a “large and handsomely furnished chamber, no bedstead looks so well as the square, high post, with curtains. What are called French low post bedsteads, are preferred by many persons, who have an objection to curtains.”<sup>52</sup>

In direct opposition to the most grandiose beds were simple, low-to-the-ground options that the authors of *The Encyclopedia* said were to be found in other continents, presumably Asia and the Mideast. According to Webster et al, “Among Eastern nations, beds are seldom raised from the ground. In the evening mattresses stuffed with cotton, of which they keep a considerable number in great houses, are brought into the room, and laid down on the floor: often they have no other beds than the divan used in the day. The poorer people lie only on mats spread on the ground.”<sup>53</sup> This disparaging reference to primarily Eastern modes of bedding down for the night reaffirms the Western cultural

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<sup>51</sup>Ibid.

<sup>52</sup>Leslie, 303.

<sup>53</sup>Webster, et al., 289.

emphasis on creating an elaborately arranged system of bedsteads and curtains to elevate one off the floor and preferably surround oneself with draped cloth. The social experience of the bed was for many an opportunity to demonstrate their knowledge of the latest fashion as well as to exhibit material wealth.

The determinants of Webster's hierarchy seem to be size, style, decoration, and use of bed "furniture," and the dimensions of beds are in some ways affected by this scale of fashionability. For example, Webster clearly considered a bed that was completely furnished with curtains or an elaborate French drapery to be superior to any option that was not enclosed. This opinion is undoubtedly related to the high expense of textiles during the eighteenth and early nineteenth century, allowing the reflection of wealth and taste of a family to be found in the use or lack of cloths hung about a bed frame. In this sense, the height of beds can be taken into consideration. The taller a bed was, the more fabric it would require to enclose it, and the greater its expense. The greater expense it seems, the higher the ranking on many social scales. Because of this, the visual importance of these high-post bedsteads was often height. Indeed, sixty-three of the ninety-two bedsteads analyzed were high-post forms. Of those sixty-three, seventy-nine percent (fifty beds) were greater in height than in length. Only seven beds were longer than they are tall, and three beds had identical heights and lengths.

One result of the dimensions of fashionable high-post bedsteads may be a visual misrepresentation of bed lengths and human heights. The modern observer, unaccustomed to the high proportions of bed posts, may read these proportions of historic beds as stunted in length, and therefore conclude that their inhabitants were shorter as well. There are few examples of bedsteads that exaggerate the proportions of width and

length in the same way that they exaggerate height. The impact these proportions have on the modern observer is to create a visual misconception that these beds are shorter than beds of today.

The sufficiency of bed dimensions has long interested American consumers. Take for example the tour guides at the Deshler-Morris house in Germantown, PA, where President Washington escaped the summer heat in 1794. As the tour moves through the bedroom of the President, guides point out his height (6'2 ½" ) to their guests, and invite suggestions as to how Washington might have fit in his Philadelphia bedstead. Almost a century before, in the advice book from 1909, *Adventures in Home Making*, Robert and Elizabeth Shackelton wrote:

“That the bed should always be of a generous size would seem to be self-evident; and, in fact, shortness was much more of a fault in times past than it is to-day. More than one of the beds in which Washington slept must have given the wearied general and President poor repose unless he did like Jacob of old and “gathered up his feet into the bed”: he must more than once have thought of what Isaiah, probably under dire provocation of a sleepless night, bitterly wrote: “For the bed is shorter than that a man can stretch himself in it.”<sup>54</sup>

For all the concern, President Washington quite likely slept in relative peace and comfort. His bed at Mount Vernon was made on commission from Martha Washington in Philadelphia between 1791 and 1799. It measured 72 inches wide and 78 inches long and was hung with white dimity bed hangings.<sup>55</sup> Its length surely accommodated Washington’s stature. However, when away from home and his custom-built bed, Washington would not have suffered too much. The bed used today at the Deshler-Morris

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<sup>54</sup>Shackelton, Robert and Elizabeth. *Adventures in Home Making*. (New York: John Lane Co, 1910).

<sup>55</sup>Personal correspondence. Melissa Naulin, Associate Curator, Mount Vernon, to the author. March 26, 2001.

house to represent Washington's bed measures 56.75 inches wide and 74.5 inches long. In addition, this bed had no footboard, and should have provided ample room for his extending toes. The bed provided for Washington at his "Germantown White House," belonged to the home's owner, Isaac Franks, and by no means was specially designed to accommodate President Washington. In the last quarter of the eighteenth century, the average bed length was 76.37 inches, 1 ½ inches beyond the reach of President Washington's toes.

If Americans' heights have remained fairly constant since the eighteenth century, when and why did we create standard sizes? The path toward standardization was likely begun sometime in the eighteenth century, as a growing market economy led consumers to develop expectations about scale and size associated with certain products. By the nineteenth century, bed and mattress companies had combined the notions of the average American's need for comfort with the Industrial Revolution's idea of a set of regularized and mass-produced options. While the idea of twin, full, queen and king sized beds was not fully standardized until the 20th century, mid nineteenth-century manufacturers had established their own set of standards to offer to the public, standards which approximated those set by other contemporary bed and bedding companies.

Homeowners could order a bed based on standard sizes offered by some companies, though some allowed customers to make their own specifications. Wirts and Scholle, a bed manufacturer in Chicago Illinois, in the 1880s produced an *Illustrated Catalogue and Price List* in which they offer and describe several different styles of beds. Under the heading of "sizes and other particulars," they offered only one length,

saying that “all beds measure 6’4” long inside,” the “inside” measurement being the full length of the mattress rather than the bed frame. The only other option was “The No. 1 National” style, which was made in “only one size - 4 - 2 x 6 - 2 [inches] inside.” Wirts and Scholle also made the statement, “as all our bed springs are specially made of proper height and size, and properly adjusted to fit each bed, we do not like to sell beds less springs,” indicating that in the opinion of the Wirts and Scholle Company at least, 6’4” beds were not only the standard, but also the “proper” size.<sup>56</sup> Ostermoor mattresses, produced in New York beginning in 1853, were advertised as all being “6’3 long, with an extra dollar per foot charge for lengthening.”<sup>57</sup> The Bohnert-Brunsmann Company, of Cincinnati Ohio, offered “The Ezybed Kapok Resilient Mattress,” which was 6’3” long,<sup>58</sup> and beds made by Jon P. Fowler, “Manufacturer of Spring Beds, Cots and Cribs, Woven Wire Mattresses,” were exclusively made 6’ long. However, many of these beds did not have a standardized width. In ordering and shipping directions, for example, Fowler states : “Be Particular to state size plainly and understandingly. If you want four feet six inches wide, give it thus: 4-6; never thus: 4x6. If you want four feet wide, give it thus: 4—0; never 4 x 0.”<sup>59</sup>

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<sup>56</sup>Trade Catalogue, Wirts and Scholle. *Illustrated Catalogue and Price List*. (Chicago, Il. 1884). Winterthur Museum, Joseph Downs Collection.

<sup>57</sup> Trade Catalogue, Ostermoor and Co. *The Test of Time*. (New York. 1904). Winterthur Museum, Joseph Downs Collection.

<sup>58</sup>Trade Catalogue, Bohnert-Brunsmann Company. *The Ezybed Kapok Resilient Mattress*. (Cincinnati, Ohio. 1902). Winterthur Museum, Joseph Downs Collection.

<sup>59</sup>Trade Catalogue, Jon P. Fowler, “Manufacturer of Spring Beds, Cots and Cribs, Woven Wire Mattresses.” Office and Factory, 1434 Wabash Ave. (Chicago, Il.: Robbins Bros., Printers, Ca. 1900). Winterthur Museum, Joseph Downs Collection.

The concept of the standard sizes of “single” and “double” beds began to develop with early varieties of beds made with occupancy in mind. Designers have offered beds in different widths for some time, at least as early as Thomas Sheraton’s “A Summer Bed in Two Compartments,” which provided two separate mattresses, 3 ½’ wide, under one common canopy (Fig. 2). The Moravians of Salem, North Carolina in the eighteenth and nineteenth centuries designed beds with the number of occupants kept strictly in mind. The Single Brother’s and Single Sister’s Houses had long but narrow beds measuring only about 27-32 inches in width and 75-80 inches in length. These beds were intended for one person, and the width was designed accordingly.<sup>60</sup>

It was not until the mid-nineteenth century, however, that many mattress companies began offering a standard set of sizing based on occupancy. Bagby and Rivers, of Baltimore, Maryland offered various bedsteads by 1882, or what we might today call bed frames, both as part of a suite of furniture or as individual pieces. The company listed five styles divided into “double” or “single” bedsteads with varying height options listed. No length was prescribed, perhaps indicating that they could still be made to fit any length ordered. <sup>61</sup> A. J. Logan & Company of Pittsburgh, PA, asked that when ordering one of their mattresses, one should “state the size you desire,” based on “single” or “double” occupancy. Each particular mattress option had lengths that varied, the majority of the options ranging between 6’ and 6’3” in length. They also offered institutional beds, made for hospitals and sanitariums, at 2’6” x 6’3” and 3’ x 6’3”.

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<sup>60</sup>Sheraton, Thomas. *The Cabinet-Maker and Upholsterer’s Drawing Book*. (New York: Dover Publications, Inc., 1972), 41.

<sup>61</sup>Trade Catalogue, Bagby and Rivers Co, *Supplementary Catalogue of Beds, Mattresses and Chairs*. (Bagby and Rivers, Co. 1890). Winterthur Museum, Joseph Downs Collection.

Again, these beds were clearly made with single occupancy in mind. One invalid to a bed was certainly the norm by the germ-conscious end of the nineteenth century, though hospital beds had been shared by two or more individuals only one hundred years before.<sup>62</sup> These beds, mass produced for institutions, may have led the way in standardizing the dimensions for the twin, or single bed ( 3'2" x 6'2 ½" ).<sup>63</sup>

Logan and Co. also sold bed frames, but did not indicate lengths, suggesting that the length of the bed frame was determined by mattresses and not the other way around. However, possible width sizes are given for bed frames in order to accommodate mattresses intended for “single” or “double” occupancy. Both length and width affected this company’s prices, as did the quality of mattress filler.<sup>64</sup> The Union Wire Mattress Co, in 1881 advertised that they “use steel wire exclusively and of standard size,” and stated that their beds came in “Full and Extra Sizes.” When customers order mattresses, they suggested customers “give the exact sizes wanted, in feet and in inches.” Bed frames made by these two companies came in standard widths with removable rails that could allow the length to be dictated by the customer.

While it seems most likely that these standard bed forms were being created based on human dimensions, an issue of *Scientific American* in 1898 offers a second rationale for the average sizes of beds. Describing a metal bed that could be adjusted for either length or width by sliding rails, the article stated, “among the many advantages

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<sup>62</sup>Beldegreen, Alicia. *The Bed*. (New York: Stewart, Tabori, & Chang, 1991), 156-8.

<sup>63</sup>Personal correspondence, Patrick Simpkins, to the author. March 13, 2001.

<sup>64</sup>Trade Catalogue, A. J. Logan & Company. *Illustrated catalog of A. J. Logan and Co.* (Pittsburgh: Pittsburgh Printing Co. 1899). Winterthur Museum, Joseph Downs Collection.

claimed for this bed are its structural firmness and its ready adjustability to conform with the accommodations afforded by various rooms.” As Elizabeth Cromley suggested in “Sleeping Around: A History of Beds and Bedrooms,” the size and shape of the room could affect the dimensions of the bed more than the dimensions of the human or humans who slumbered in it.<sup>65</sup> Perhaps available space was the concern of newlywed Mary Fish Noyes’ parents. Noyes received from her parents several pieces of furniture for her new household, including two bedsteads, both of iron. One was with “a sacking bottom; The other Common, bound up with a bed cord.” This common bed troubled her father because of its length. He wrote to her that he had “intended to have it altered; But failed of it,” adding that it would be easy to have it “cut shorter” if she so desired. Mary’s father may have been imagining his daughter’s new home when he wrote to her, concerned that the bedroom appointed for the common bed was not spacious enough for its accommodation.<sup>66</sup>

It is unclear when American standard bed sizes came fully into use. Serta, one of the nation’s current leaders in mattress production has been making “twin, full, queen and king” sizes for at least the past twenty-five years at the measurements they use today. By 1910, the Murphy Door Bed Company was calling its beds “double” and “single”, and made the claim that they were “standard length bed[s].” Following the development of beds and mattresses intended specifically for single or multiple occupation in the late-eighteenth century, manufacturers progressively moved toward the standardization of

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<sup>65</sup>“A New Extension Bed.” *Scientific American*, 5 (Oct. 1898): 22, quoted in Elizabeth Collins Cromley, “Sleeping Around: A History of American Beds and Bedrooms.” *Journal of Design History* 3: 1 (1990): 11.

<sup>66</sup>As quoted in Nylander, 55.

bed sizes during the nineteenth century. This progression was certainly affected by the industrial revolution and the mass-production of a variety of household furnishings.<sup>67</sup>

While there are both regional and chronological differences in the dimensions of early American beds, the differences are subtle. Overall, the similarities between past and present are more remarkable than the differences. Just as there appears to be very little variation in the height of conscripts and other groups measured in the eighteenth or nineteenth centuries, there seems to be little variation of bed dimensions. However, because there are so few surviving examples from before 1700, it is difficult to ascertain whether the bed forms changed along with the early native-born generations of Americans. A thorough comparison of American forms with surviving English ones might yield some insight into the connection between the changing height of the first generations of Americans, and the lengths of their beds. Additionally, comparing contemporary European and American beds with height statistics may indicate a correlation between stature and bed size. Regardless, what does seem evident is that there was a general move in the eighteenth century towards a basic understanding of a sleeping person's physical needs. Domestic literature from the era indicates an interest in providing healthy sleeping spaces that could accommodate the body and its needs for rest, warmth, fresh air, and space, as well as concern for sleeping postures, partners, and bedding. Dimensions balanced the needs of a bed's occupants with the available space in a bedchamber. That beds have not changed dramatically in shape and size for three hundred years suggests that either these outside elements have been the greatest influence in American bed design, or that the consistency of American height facilitated the

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<sup>67</sup>Trade Catalogue. Murphy Door Bed Company. *Catalogue*. (New York: The Company. 1910). Winterthur Museum, Joseph Downs Collection.

implementation of a set of standard sizes employed nationally by the time of the industrial revolution.

A similar trend is apparent in the design of tables, the heights of which have remained remarkably consistent over the years. In general, table heights tend to average 28.55 inches, as indicated in a study of 54 American tables. Examined separately in chronological cohorts, the number stays remarkably even: 28.61 inches between 1675 and 1725, 28.49 inches between 1726 and 1775, 28.64 inches between 1776 and 1815, and 29.01 inches between 1816 and 1900. That gives a difference of less than 1 inch (.62 inches) between the tallest cohort and the shortest. Leaving out the last group of dates, those which correspond in large part to the Empire period, the difference in height is .15 inches. The consistency of table height may be attributed to a number of factors. First, the height of a table top needs to be at a level that allows for a multitude of functions. Food preparation, writing, display, and eating are only a few activities that people use their tables for. These activities are done both seated and standing, and clearly this height allows a wide variety of tasks to be undertaken in relative physical and visual comfort. Secondly, despite the multiplicity of its use, a table does not need to correspond to human needs of comfort in quite the same way as beds or chairs. Chairs fluctuate in height to accommodate both differences in individual bodies and intentions - working, relaxing, socializing - while tables must cater to several individuals at once. Changing the table's height to correspond with one family member's height, the wife's height, for example, would create problems for her husband or other men of the family, and would resolve nothing. There is simply no practicality in having many tables to meet many needs in the same way a nineteenth-century family might own multiple chair forms.

Clearly a standard tabletop height became a normal expectation early, and there arose no incentive to manipulate it, so it simply was maintained through the years.

Did human stature affected patterns of chair ownership or design? To see how chair dimensions varied over time, I measured 215 chairs from the same collections previously mentioned. Forty-nine chairs (23%) came from New England, seventeen (8%) from the Mid-Atlantic, eighty-four (39%) from the Chesapeake region, and forty-three (20%) from the Southern Back Country. Fifteen chairs could only be identified as “American.” There were too few chairs from the Southern Low Country to give an accurate representation of any trends for the area. The chairs were, like the beds, measured according to museum standards. Overall height, seat height, width and depth measurements were taken, but the critical dimensions for the body are seat heights and depths. Seat height was taken at the highest point of the chair seat that was attached to the chair, that is at the point where the body comes into contact with the seat, as opposed to the chair rail. This measurement does not include separate cushions that were not attached to the seat.

The study included arm and side chairs; Windsor chairs, lolling chairs, easy chairs, and so-called “slipper chairs.” These chairs were of a variety of styles and dates, and were a mixture of “high-style” and “common” chairs. Although measurements of easy, lolling and other low chairs are included in the overall analysis of chair dimensions, the trend in seat dimensions, particularly height, of these types are singled out for discussion later in this paper.

Regionally, there were some slight differences in chair dimensions (Table 3). Average width ranged from 19.34 inches in the Mid-Atlantic to 21.42 inches in the

Chesapeake area, and average depths, which had the greatest variety, ranged from 15.68 inches in the Mid-Atlantic to 19.5 inches in the Southern Back Country. Of most interest to this study is the average height of chair seats; human expectations of comfort as they relate to height would in theory have its greatest effect on this area of chair construction. The total average for seat height is 16.74 inches, with all regional averages being remarkably similar to the total. The lowest seat height average was found in the south, with back country chairs having 16.15 inch seats. The tallest was 17.09 inches, found in chairs from the Mid-Atlantic region.

**Table 3: Dimensions of Side and Arm Chairs by Region**

<b><u>Region</u></b>	<b><u>Number of Chairs</u></b>	<b><u>Average Height:</u></b>	<b><u>Average Seat Height:</u></b>	<b><u>Average Width:</u></b>	<b><u>Average Depth:</u></b>
New England	49	37.17 inches	17.00 inches	20.30 inches	16.96 inches
Mid-Atlantic	17	41.33 inches	17.09 inches	19.34 inches	15.68 inches
Chesapeake Region	84	37.57 inches	16.83 inches	21.42 inches	N/A
Southern Low Country	N/A	N/A	N/A	N/A	N/A
Southern Back Country	43	37.37 inches	16.15 inches	20.21 inches	19.5 inches
Total Averages*:	199	37.76 inches	16.74 inches	20.69 inches	18.09 inches

\*Chairs with unknown regional attributions are not included in this total

As with the connection between regional heights and bed lengths, there is no clear connection with chair seat heights and average stature. Again, southerners were taller than both coastal New Englanders and those from the Mid-Atlantic. Accordingly, if human height were the only factor in dictating the heights of chair seats, then we would expect to find that chairs made in regions with higher mean stature would be constructed with higher chair seats. As this is not the case, we may reasonably assume that other

factors influenced the design and scale of chairs, and that variations in scale are established for aesthetic and cultural reasons, not for reasons of height.

Chronologically, the dimensional trends of chairs seat heights are not linear, nor are they remarkable. Table 4 outlines the changes in averages between 1650 and 1850. Focusing primarily on seat height, the averages remain fairly constant for 75 years, between 1650 and 1725, at close to 17.5 inches on average. The greatest change comes in the years between 1726-1750, as average seat height dropped to 15.84 inches. This climbs back up to 17.13 inches between 1751 and 1775, before hovering at 16.85 inches for the fifty years after. By 1826, the seventeenth and early eighteenth-century averages of around 17.5 inches had been regained.

**Table 4: Dimensions of Chairs by Date**

215 total arm and side chairs

<b><u>Earliest Date of Manufacture:</u></b>	<b><u>Number of Chairs</u></b>	<b><u>Average Height:</u></b>	<b><u>Average Seat Height:</u></b>	<b><u>Average Width:</u></b>	<b><u>Average Depth:</u></b>
1650-1675	12	36.96 inches	17.22 inches	20.39 inches	14.72 inches
1675-1700	8	46.55 inches	17.80 inches	19.43 inches	14.25 inches
1700-1725	6	44.85 inches	17.55 inches	20.17 inches	16.58 inches
1726-1750	22	37.11 inches	15.84 inches	20.79 inches	18.79 inches
1751-1775	77	37.73 inches	17.13 inches	21.79 inches	17.06 inches
1776-1800	69	38.08 inches	16.87 inches	21.29 inches	n/a
1801-1826	16	35.79 inches	16.83 inches	19.72 inches	n/a
1826-1850	5	34.35 inches	17.43 inches	20.97 inches	n/a

In general, the dimensions of these chairs are so similar as to suggest a basic outline of an average chair form throughout the centuries, as the sizes seem to have remained fairly constant. The measurement with the greatest tendency to shift over time is the overall height of the chairs, from floor to crest rail. This change is largely attributable to varying decorative style and changing notions of fashion. The other sets of measurements - seat height, width and depth - are far more likely to be associated with

measurements - seat height, width and depth - are far more likely to be associated with changing needs of the seated body; these needs were in turn connected to changing ideas about costume and fashion.

Even with the chronological changes observed in the mean seat height, it is evident that the standard seat height has remained remarkably constant over time. This is demonstrated not only in the mean heights, both chronologically and regionally, but also from the use of this standard as a measure of regularity. Chairs that are classified as “low chairs,” a term that is particularly recurrent in the nineteenth century, have seats which fall below this seventeen-inch standard. Likewise, “high chairs,” commonly associated with use by children, are taller than seventeen inches. In 1861, *Moore's Rural New York* advised its readers that “the front edge of a chair should not be more than fifteen inches high, for the average man, nor more than fourteen for the average woman. The average chair is now seventeen inches high for all, which no amount of slanting in the seat can make comfortable.”<sup>68</sup> The evidence presented in this study would indicate that “the average chair” has been approximately seventeen inches high since at least 1650. This maintenance of a standard in seat averages closely corresponds with the continuity in American stature.

Where seat heights differ from this standard of seventeen inches, gender appears to be the greatest contributing factor. The specialization of the furniture industry beginning in the late eighteenth-century led the way toward an increasing adaptation of gender-specific furniture forms by the mid-nineteenth century. Cabinetmakers advertised various types of “ladies” chairs such as “Ladies low working chairs,” “Ladies low setting

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<sup>68</sup>*Moore's Rural New York*. (Rochester, New York, November 16, 1861), quoted in “Clues and Footnotes, *Antiques Magazine*, (March 1980): 643.

chairs,” and “Ladies Sewing Chairs” in the nineteenth century.<sup>69</sup> These chairs, closely related in form, were generally lower to the ground than standard chairs, and had either receded arms or no arms at all. As is evident in their names, they were often associated with needlework or other “women’s work.” These tasks were thought to put the body in a “constrained and often awkward posture,” and thereby required specialized chair forms to help alleviate discomfort.<sup>70</sup> The absence of arms would have accommodated the sewing posture better than an arm or easy chair, and the lowness of the seat better accommodated the shorter stature of women. In general, women tend to be four to five inches shorter than men.<sup>71</sup> Because of the gendered spheres of housework and other tasks, such as needlework and sewing, these chairs could safely be made with lower seats, and marketed toward women. Miss Leslie identified the need for chairs of this type in *The House Book*. “In every chamber,” she wrote, “there is a great convenience in having a rocking-chair, a stuffed easy chair, or something of the sort, and one or two footstools. Also, low chairs, to sit on when sewing, or to wash your feet.”<sup>72</sup> While not addressed as “sewing chairs,” Miss Leslie clearly knew of the association between low chairs and women’s handiwork. A “Martha Stewart for the 1840s,” Miss Leslie was a purveyor of

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<sup>69</sup>“Ladies Low Working Chair,” *Courier* (Charleston), 16 Feb., 1818, 2-3, 3-3; “Ladies Low Setting Chairs,” *Courier* (Charleston), 25 March, 1818, 2-4; “Ladies Sewing Chairs,” *City Gazette and Commercial Daily Advertiser* (Charleston), 26 July, 1820.

<sup>70</sup>“Nervous Disorders of Females,” *Godey’s Ladies’ Book*, Volume II. (June, 1831): 302.

<sup>71</sup>Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000). Revised and corrected, November 28, 2000. For charts see:

<sup>72</sup>Leslie, 296.

domestic advice. Her attachment of “low chairs” with a specific function is indicative of a widespread interpretation of these forms in American society.

Additional ladies’ chair types were based on the French chair known as a *chauffeuse*. These French chairs introduced in the 17th century are characterized by their very low seats, and are thought to accommodate the mother or nurse in the dressing and care of babies and small children. Sometimes called “nursing chairs,” these chairs give images of a mother seated by the hearth, nursing or tending to babies and young children. The chair with its low seat permitted the mother to reach conveniently to all things around her.<sup>73</sup> “Slipper chairs” became associated with women in the mid nineteenth century. This American furniture form of a low-seated, high backed single chair, was usually upholstered and seems to have been intended for the bedroom. Slipper chairs were made by cabinetmaker John Henry Belter and his contemporaries between 1850 and 1865. The name may have been suggested by the elongated back, which vaguely suggests the outline of a slipper, or the low seat may have been connected with slippered ease by the fireside.<sup>74</sup>

These “low” or “ladies” chairs are strongly suggestive of two arguments. First, that the standard seat height for chairs throughout the nineteenth century was 17 inches high. These variations of “low chairs” tend to be approximately 2 inches shorter than

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<sup>73</sup>Boger, Louise Ade and H. Batterson Boger. *The Dictionary of Antique and Decorative Arts*. (New York: Charles Scribner’s Sons, 1957), 97.

<sup>74</sup>Boyce, Charles. *Dictionary of Furniture*. (New York: Henry Holt and Company, 1988), 621.

Gloag, John. *A Complete Dictionary of Furniture*. (Woodstock, NY: The Overlook Press, 1991).

what both contemporary and modern observers considered normal seat height. The inclusion of the description “low” is evidence that these chairs were in no way considered standard, and that there was a standard that was generally agreed upon. Secondly, that these chairs were designed to accommodate the shorter stature of women indicates that stature did affect chair design, and therefore a correlation can be drawn between the continuity in mean stature and in seat height. Mean American stature did not dramatically change after 1750, thus chair seat height remained constant to accommodate the needs of individuals as related to comfort and height. This seems to have changed only in relation to the differing needs of women and children.

But what of additional factors that may have influenced the height of chair seats? Certain other chair types, such as the Lolling chair, have seat heights slightly below the standard, and have no attachment to gender. What variables changed to necessitate a shorter chair for an unchanged population in terms of stature? The answer may lie in such cultural influences as the social construction of posture. Seated posture underwent several metamorphoses throughout the eighteenth and nineteenth century, affecting the design of chairs accordingly. For early Americans, posture was a studied reflection of one’s refinement and gentility, as the art of “easy” sitting became a reflection of manners. “Easy” positions did not imply relaxed or slouched positions. Florence Hartley, author of *The Ladies Book of Etiquette, and Manners of Politeness*, suggested that the proper posture “let the movements be easy and flexible, and accord with the style of a lady.”<sup>75</sup> This ease was to be a measure of fluidity and restraint, with a self-mastery that

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<sup>75</sup>As quoted in Grier Katherine C. *Culture and Comfort*. (Rochester, NY: Strong Museum, 1988), 110.

gave ladies - and gentlemen - the appearance of refinement. In this sense, “easy” was more a reflection of the studied knowledge of gentility than it was a true sense of relaxation.<sup>76</sup> Several of the figures in William Hogarth’s prints, “The Cholmondely Family” and “An Assembly at Wanstead House,” (Figures 3 & 4) illustrate the proper seated posture. They are fully erect, yet maintain a sense of ease.

In contrast, just as some postures were socially recommended, others clearly were discouraged. *Hill’s Manual of Social and Business Forms*, printed in 1885 showed two prints of several ladies and gentlemen socializing in a parlor. In the print of “Ungraceful Positions,” two women and four men illustrate all the improper positions of the body. A seated woman leans forward, propped up with her elbows on her knees, while the second woman stands behind her, leaning forward, her hands on her hips. The gentlemen are in equal disarray, with one seated backwards in a chair, another leaning back on the chair’s rear legs, one leaning against a wall, and a fourth with his foot on a chair seat and his elbow on his knee. This opposes the proper positions of “Gentility in the Parlor,” where five women and three men illustrate the refined postures of sitting and standing in polite company.<sup>77</sup> Likewise, Hogarth uses posture to illustrate the moral character of his subjects in several of his print series. In *Marriage a la Mode*, for example, the newly married couple in Plate II (“Shortly After Marriage,” Figure 5), are slouching and stretching, kicking their shoes off, and generally presenting a disheveled front. In this position, the couple is representative of individuals who have clearly failed to maintain a sense of respectability and grace and are attempting to recover from a night of drinking

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<sup>76</sup>Grier, 109.

<sup>77</sup> *Ibid.*, 113.

and debauchery. In Plate III of *The Rake's Progress* (Figure 6), we see the delineation of the hero's fall into immorality, as exemplified not only by his presence in a brothel, but also by his bodily position. He sits carelessly in a chair, one foot propped up on a table, the other barely on the floor, while nearby a prostitute leans forward in her chair, pulling at her stockings<sup>78</sup>.

These socially constructed ideas about correct and incorrect posture affected seat height. More than any other furniture form, chairs make revealing statements about the proper variations of posture and carriage, and the relative importance placed on elegance and comfort at any given time. Chairs are required to change to accommodate the way we sit, and the way we sit changes based on our clothing structure, and our attitudes toward personal deportment. Men and women outfitted in elaborate costumes had ideas of how they wanted their clothing and their body presented. Cabinetmakers responded to those ideas, and created seating furniture that would allow people to maintain their appearance of manners and gentility. John Gloag, author of *The Englishman's Chair*, argues that the Victorian crinoline, for example, "inspired the production of the ladies' easy chair, low seated, with an upright shell back and vestigial arms."<sup>79</sup> Ladies in the eighteenth century nearly always sat bolt upright in public. Their training and their corsets and stays helped maintain their posture.

Likewise, men were expected to maintain a dignified carriage and to avoid slouching. Their waistcoats and vests kept their bodies in the proper "S-curve" form. Many chairs were designed to encourage and support this erect position, and certainly

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<sup>78</sup>Unglow, Jenny. *Hogarth: A Life and a World*. (London: Faber & Faber, 1997). For "Marriage a La Mode," p. 377; for "A Rake's Progress," p.250.

<sup>79</sup>Gloag, John. *The Englishman's Chair*. (London: Allen & Unwin, Ltd., 1964), 1.

seem to have been manufactured with clothing styles in mind. Formal chairs, found in public spheres in and outside of the home, were designed to allow the body to be presented in a manner considered appropriate. The seventeen-inch seat, attached to a rigid, upright back, allowed a sitter to keep his or her feet below the chair seat on the floor, with his or her body upright. While maintaining this proper position for a prolonged period of time may appear uncomfortable to modern observers, the nature of the period clothing, such as corsets and waistcoats, demanded an erect posture. Slouching in a corset equipped with a busk would be terribly uncomfortable, if not impossible. As fashions changed, posture was affected accordingly. The rigidity of the Colonial period gave way to the neoclassical influence, which temporarily freed women from the constraints of corsets as fashions yielded soft, full, dresses that did not require tightly constructed forms. Chairmakers matched this neoclassical influence with increased sales of chair types such as the Klismos chair, with its slightly curved Grecian back, or Lolling chairs, with the back tilting at a slight angle. These chairs allowed people to reconfigure the fashionable seated posture. This is illustrated in numerous portraits of the period. Adam Buck, for example, was fond of depicting his subjects, primarily ladies, seated in klimos chairs with children in their laps. Buck's portrait of "The Artist and His Family," (1813, Figure 7) shows his wife in this position, and the difference in her posture is clear. The curved back of the chair and her unrestrictive clothing allow her to mimic the chair's shape with her body, following its curves.<sup>80</sup> Mrs. John Quincy Adams (Louisa Catherine Johnson Adams), in her portrait by Charles Robert Leslie (1816, Figure 8), is in a

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<sup>80</sup>Cooper, Wendy. *Classical Taste in Early America: 1800-1840*. (New York: Abbeville Press Publishers, 1993), 52-53.

half-reclined position, resting her back and right arm on the crest rail of her chair.<sup>81</sup>

Victorine du Pont is portrayed in an almost identical pose (*Portrait of Mrs. Ferdinand Bauduy*, 1813).<sup>82</sup> This posture is found repeatedly in portraits of the neoclassical period.

The appearance of comfort becomes as fashionable as the pose of propriety had been

fifty years earlier. The Victorian era of the 1860s and 70s bought the return of

constrictive clothing, as the fashion required stays, bustles, and hoop skirts in turn. With

the use of “ladies” chairs prevalent by this time, the changes in chairs seem primarily

geared toward these gendered needs. Ladies’ chairs are made lower and without arms to

accommodate the fullness of the skirts of these dresses.

Chairs became representations of the level of formality in a given space and situation. Horace Walpole grumbled about the inability to relax fully at a Newmarket Inn, in 1743, “...I am not so much at ease as on my own sofa. I could persuade myself that it is my Lord Carteret’s fault that I am sitting in a common arm-chair, when I would be lolling in a *péché-mortel*.” (October 3, 1743)<sup>83</sup> Were Walpole at his own home, we might imagine him abandoning formality and “lolling” by a fire or in a bedchamber. The common armchair he complained about was representative to Walpole and his contemporaries of the formality of public life. Chairs came to represent the tone for any given space. As John Gloag put it, “chairs indicate whether social life was formal and

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<sup>81</sup>Ibid, 35.

<sup>82</sup>Richardson, Edgar P. *American Paintings and Related Pictures in the Henry Francis du Pont Winterthur Museum*. (Charlottesville, VA: University Press of Virginia, 1986), 104-5.

<sup>83</sup>Gloag, John. *Georgian Grace: A social history of design from 1660-1830*. (London: A&C Black, 1956), 201.

rigid, gracefully relaxed, casual and careless, austere, voluptuous, romantic, imitative, democratically standardized, affluent, vulgar, indifferent to art, dull, snobbish, or poor.”<sup>84</sup> Chairs indicate one of these many spheres of social life because they become physical representations of the ways in which the body is exhibited. Contemporaries of these chairs, as well as modern Americans, associate certain chairs with specific realms of behavior. Lolling chairs, easy chairs, sofas, daybeds, and settees were all associated with a position of relaxation. The dimensions of these types of seating furniture tend to allow the body to recline slightly, are typically upholstered to cushion the body, and some, such as easy chairs and lolling chairs, employ the use of shorter seats in order to facilitate postures of ease. As ideas of elegance and comfort change over time, we find an increase in the ownership and use of this type of seating furniture.

Lolling chairs bear particular interest to this study because of their level of formality coupled with their low seats. Although they were designed and marketed in the eighteenth century, Lolling chairs gained popularity during the Federal period and early nineteenth century. In New England, particularly, these chairs were considered to be the height of fashion. An early reference comes in 1758, in an advertisement in the *Boston Gazette*, offering, among other items, “a lolling chair frame” at auction.<sup>85</sup> David Spears wrote to his wife in 1806, “In these Arches there will be two of those Lolling Chairs you wished to have - these chairs being more fashionable.” Among her Boston possessions, Elizabeth Carter had a set of lolling chairs and a sofa. Ebenezer Storer’s 1807 inventory listed “2 Lolling Chairs” and “2 Arm Chairs.” John Hancock and Joseph Cutler each

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<sup>84</sup>Gloag, 1964: 1.

<sup>85</sup>*Boston Gazette*, Nov. 13, 1758. *The Arts and Crafts in New England, 1704-1775*, (Topsfield, Mass: The Wayside Press, 1927), 118.

owned a pair, and a portrait of the Sargent family in 1800 shows Mrs. Sargent holding a baby in her lap while seated in a lolling chair. These chairs maintained a sense of decorum and fashion, while creating a more relaxed posture for those seated in them. The seat height of these chairs tend to be slightly below average, at around 15.25 inches. The width and depth of these chairs are greater than most side chairs, at 24 inches by 19 inches on average. The backs rake backwards at a slight angle, inclining the body towards a more relaxed position than in a straight backed chair. That these chairs were placed in parlors, generally considered more formal and public spaces than bed chambers, would seem to indicate a general trend toward relaxation in public spaces and social expectations. Lolling chairs, while still formal in their own right, give a sense of lessened rigidity with the slightly reclined backs and lower seats than upright parlor arm chairs. These forms have often been referred to as “Martha Washington chairs” and carry a feminine association for that reason. However, there is no evidence linking these chairs specifically to usage by women. In fact, they were primarily found in pairs in best parlors as fashionable replacements for the standard arm chair, which would suggest that they were among those chair types specifically not identified with one gender or the other. With no attachment to gender, we can argue that the seat height of these chairs are lower not because of an association with stature, but because of an association with posture and relaxation.

Several conclusions can be drawn from this study of chairs and height. First, there was a standard seat height. Seventeen inches became standard for seats as early as 1650, and was maintained as a rule throughout periods of change and evolution. Seats that are higher or lower than this seventeen-inch standard use this rule in the definition of their

particular form, as a low chair is one which falls below the standard seat height. Secondly, the influence of the height of women on changing chair forms in the nineteenth indicates that height positively impacted seat design. With the maintenance of a fairly constant average stature for American men from at least 1750, the changing interest in developing furniture forms for women allows height to become a variable in studying chair design. Chairs began to be made to accommodate the smaller stature of women, indicating the degree of influence of height on chair design. Finally, influences other than height helped dictate the standard dimensions and scale of chairs. Cultural needs and expectations, such as posture and clothing styles affected the seat height and form of a chair. Changing notions of comfort led consumers to want a variety of seating forms that would accommodate their bodies both in the manner prescribed in social custom, as well as the desired comfort in private spheres. Chairs serve multiple functions, and as such have been subject to a series of compromises. Standard forms, created for convenience and cost-effectiveness for craftsmen and facilitated by the maintenance of an average stature, have been manipulated and altered to accommodate issues of comfort, comportment, and function. Craftsmen and consumers created standard chair forms to manage costs and to increase the numbers of seats in households. Nevertheless, we continue to manipulate and alter chairs to accommodate issues of comfort, comportment, and function. Stature is only one of the variables in the design equation.

The purpose of this paper was to examine historic human heights, determine how they have changed, and to understand how stature has affected the scale and dimensions of various furniture types. While this study of beds, chairs, and tables is not large enough

to produce the final word on the average dimensions of furniture in America since early colonization, it does conclusively point to some clear patterns of scale and standard form; it also points out the commonalties between trends in human stature and furniture scales. Both furniture scales and human stature have remained relatively constant for the past three hundred years, reflecting the early achievement of near modern heights.

Despite the belief of many modern Americans that people were once shorter, there are few differences in scale between modern and old furniture. In all instances - with beds, chairs and tables - the studies show that little has changed in terms of what was (and is now) the standard. Beds have stayed within the range of a modern full-sized bed since at least 1700, chairs have utilized the seventeen-inch seat as the standard since as early as 1650, and tables have consistently been between twenty-eight and thirty inches high. Variations do exist in these historic forms, yet the majority of variations in scale exist for aesthetic and cultural reasons rather than for reasons of human height. Height led to the standard, while posture, comfort, function, and decoration are most responsible for the deviations from that standard.

Why then, has the myth that Americans were shorter in the past persisted? Why have our material objects been cited as evidence of this as a fact? The visual misconception of size and scale has contributed largely to the idea that our furnishings have grown significantly larger in the twentieth century. Bed lengths appear stunted to observers unaccustomed to a high-post frame. Certain chair types are shorter than the standard, perhaps leading those unaware of their original function to imagine a shortness of all contemporary chairs. Curiously, these low chairs are cited disproportionately as “proof” of shorter stature for past Americans. There are far more extant chairs of the

standard dimensions than there are of low chairs. Perhaps it is the uniqueness of these chairs that can distract attention from a dozen standard forms lined against the walls, leaving a visitor with the image of the single low chair.

Perhaps it is simply that objects of smaller size help add support to an notion of progress and growth in an ideology of evolution. It has become a part of the American consciousness to use evolution as a measure of superiority. In the constant intellectual effort to gauge where we are, where we have been and where we are going, we look to our past to assess our current progress; if we are taller then we have improved ourselves, our condition, and our country. Yet if height is our standard of progress, would it not be equally as encouraging to understand that Americans achieved our stature not recently, but *early*? Stature as a measure of progress remains intact, even if it is a measure of our heights 250 years ago.

The use of height data has been a significant source of information for anthropometric historians for thirty years. Using statistics, they have made remarkable conclusions about standards of living and economic conditions for past populations, helping to create better, more accurate and expansive pictures of life in the past. Height has had a direct and lasting impact on standard forms of furniture. Despite changing styles, materials, and social expectations, the scale of furniture has remained largely consistent through time. People were not shorter back then. Instead, Americans and their furniture were becoming modern earlier than most of us have realized.

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## APPENDIX

**Figure 1**, "Proper and Improper Positions for Sleep," in Jane Taylor, *Woulds't Know Thyself*. (New York: George F. Cooledge & Bros., 1858).

**Figure 2**, Thomas Sheraton, "A Summer Bed in Two Compartments," *The Cabinet-Maker and Upholsterer's Drawing Book*. (New York: Dover Publications, Inc., 1972), Plate 41.

**Figure 3**, William Hogarth, "The Cholmondely Family," in Jenny Unglow, *Hogarth: A Life and a World*. (London: Faber & Faber, 1997).

**Figure 4**, Hogarth, "An Assembly at Wanstead House." Unglow, 1997.

**Figure 5**, Hogarth, "Marriage a la Mode, 'Shortly After Marriage'," Unglow, 1997.

**Figure 6**, Hogarth, "A Rake's Progress," Unglow, 1997.

**Figure 7**, Adam Buck, "The Artist and His Family," in Cooper, Wendy. *Classical Taste in Early America: 1800-1840*. (New York: Abbeville Press Publishers, 1993), 52.

**Figure 8**, Charles Robert Leslie, "Mrs. John Quincy Adams," in Cooper, 1993, 35.

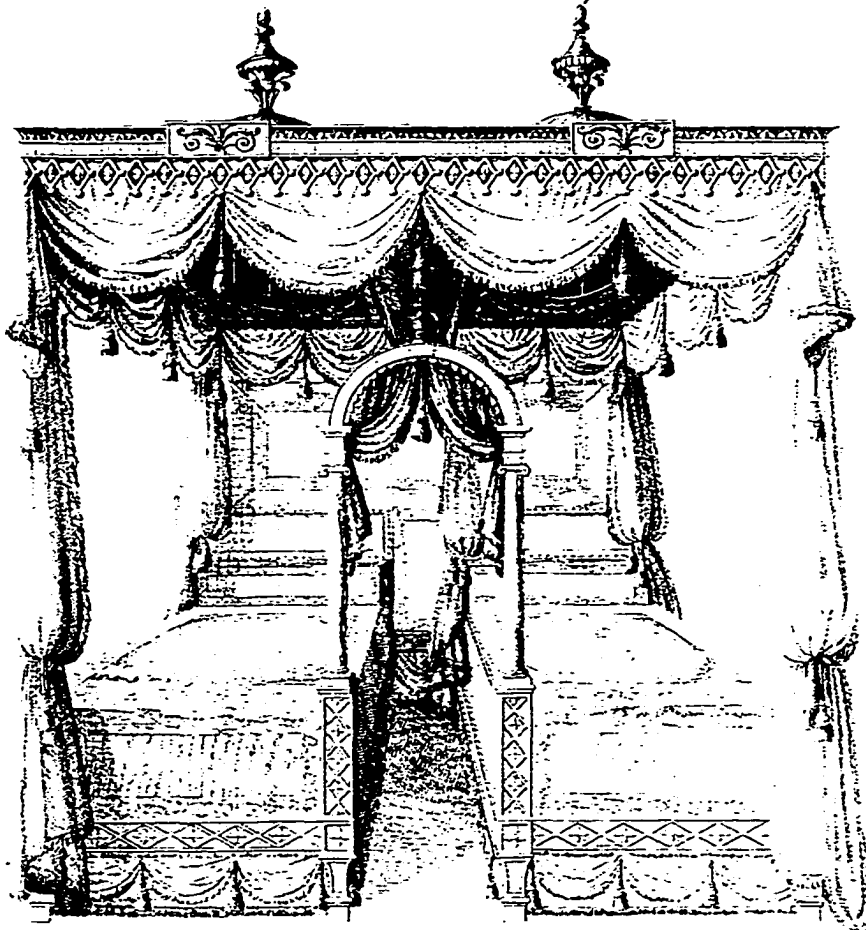
Figure 1



Proper and Improper Position to lie in Bed.

Figure 2

*A Siamce Bed in two Compartments.* Pl. 42



**Figure 3**



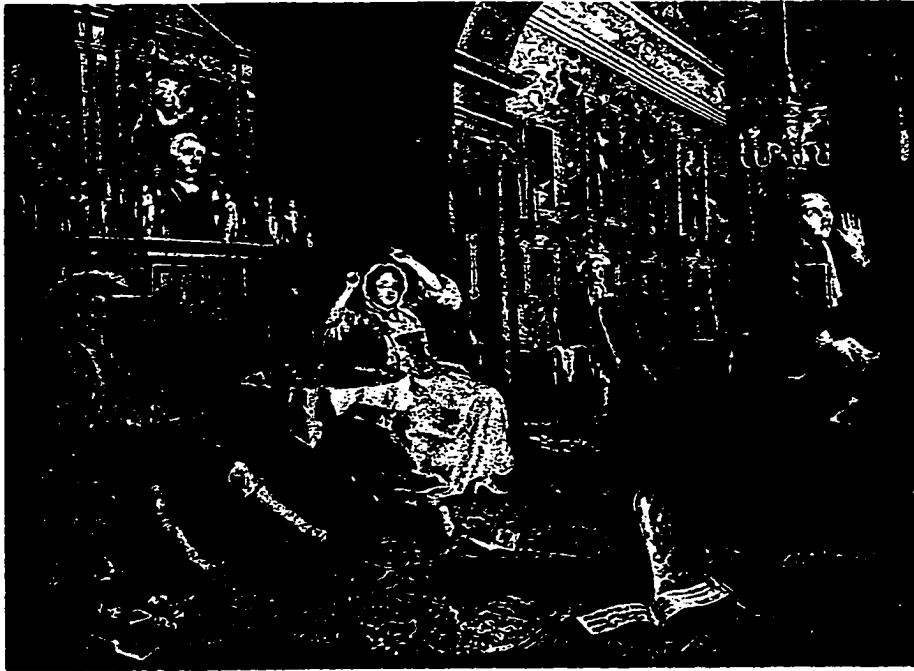
*44 The Cholmondely Family (1732)*

**Figure 4**



*41 An Assembly at Wanstead House (1730-31)*

**Figure 5**



**"Marriage A La Mode"**

**Figure 6**



**"The Rake's Progress"**

**Figure 7**



**"The Artist and his Family"**

**Figure 8**



**"Mrs. John Quincy Adams"**