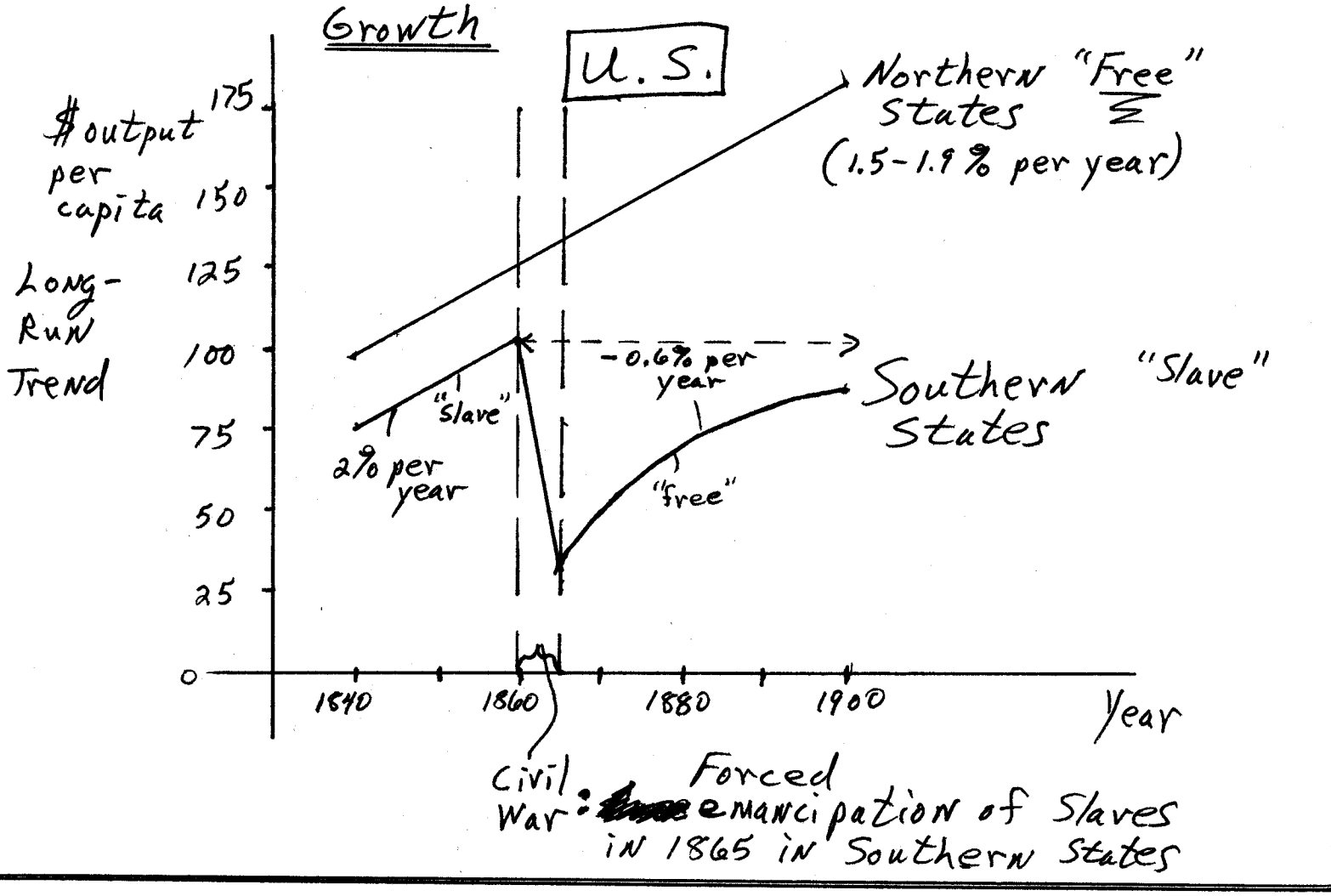
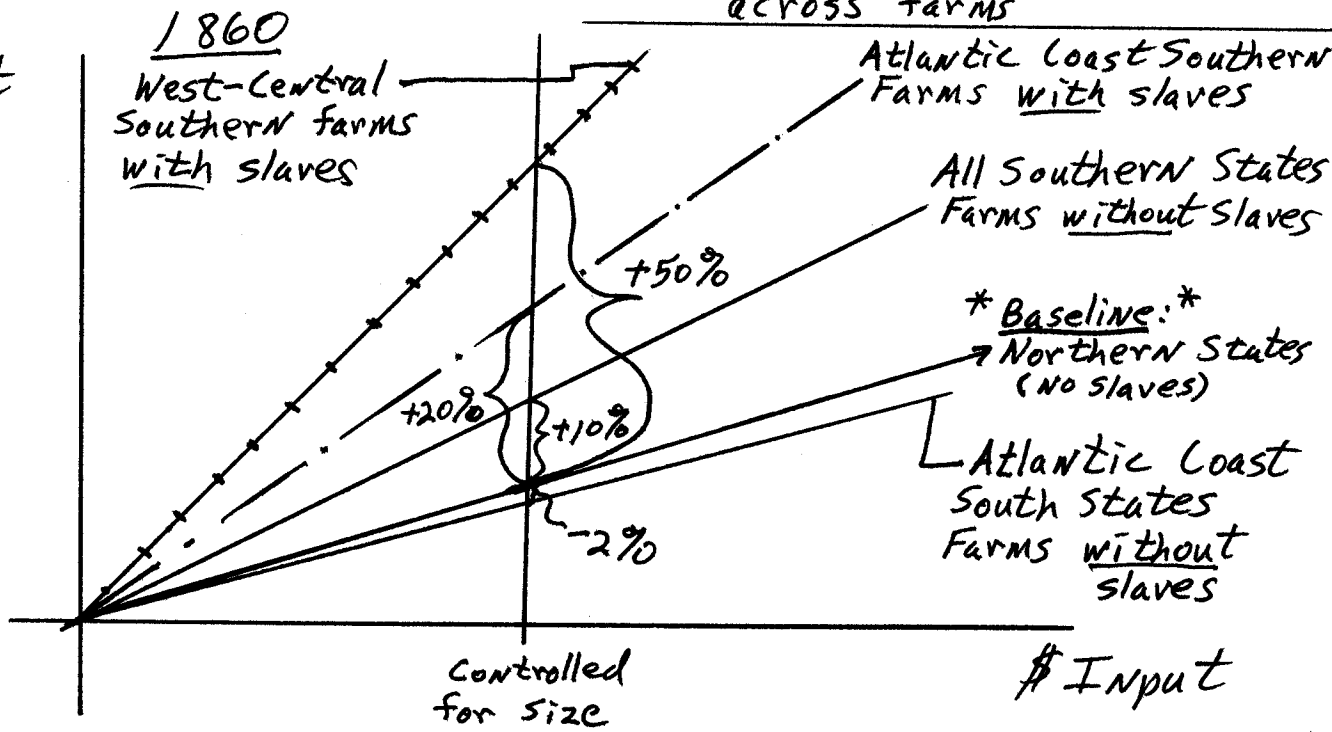


Productivity of Slave Labor

Estimate production function: $\#output = \gamma * \#Input$

(by farm per region per slave usage)

γ = productivity difference across farms



Productivity by Size of Slave Labor Force

1860 All Southern Farms

# Slaves	$\frac{\text{\# Output}}{\text{\# Input}} = \gamma$
0	Baseline
1 – 15	↑ +7.7% more
16 – 50	↑ +44.7% more
51 +	↑ +33.5% more

⟸ *gang labor* story:

slaves not forced to work more hours per year than free labor, but slave are forced to work <u>intensely</u> per hour than free labor.

Efficiency of forced team work, unison of pace, and monitoring of shirking.

After emancipation free Labor demanded 2 to 3 times the market wage rate to work in gangs.

Use of gang Labor

<u>high</u>			<u>Low</u>	
sugar	cotton	Rice	Tobacco	wheat
(West-Central South)			(Atlantic Coast South)	

High Productivity implies some constraints on mis-treatment of slaves

① high productivity ⇒ high prices for slaves
so excessive physical mistreatment is costly

② high Labor work intensity ⇒ slaves must be feed and maintained to generate this high effort.
Pure physical force alone is not enough.

$$\text{Price of a Slave} = f(\text{skills; physical characteristics; behavior})$$

- skills → occupations
- physical characteristics → age, gender, physical impairments
- behavior → Runaway, drinking alcohol

Slave Asset Pricing

Market Price of a slave (P_s) = [Present Value of Expected productivity minus maintanence over the slave's Life (NP)] + Prestige Value of slave ownership − Moral Discomfort of slave ownership

Estimates of pure economic rate of return to slave ownership:

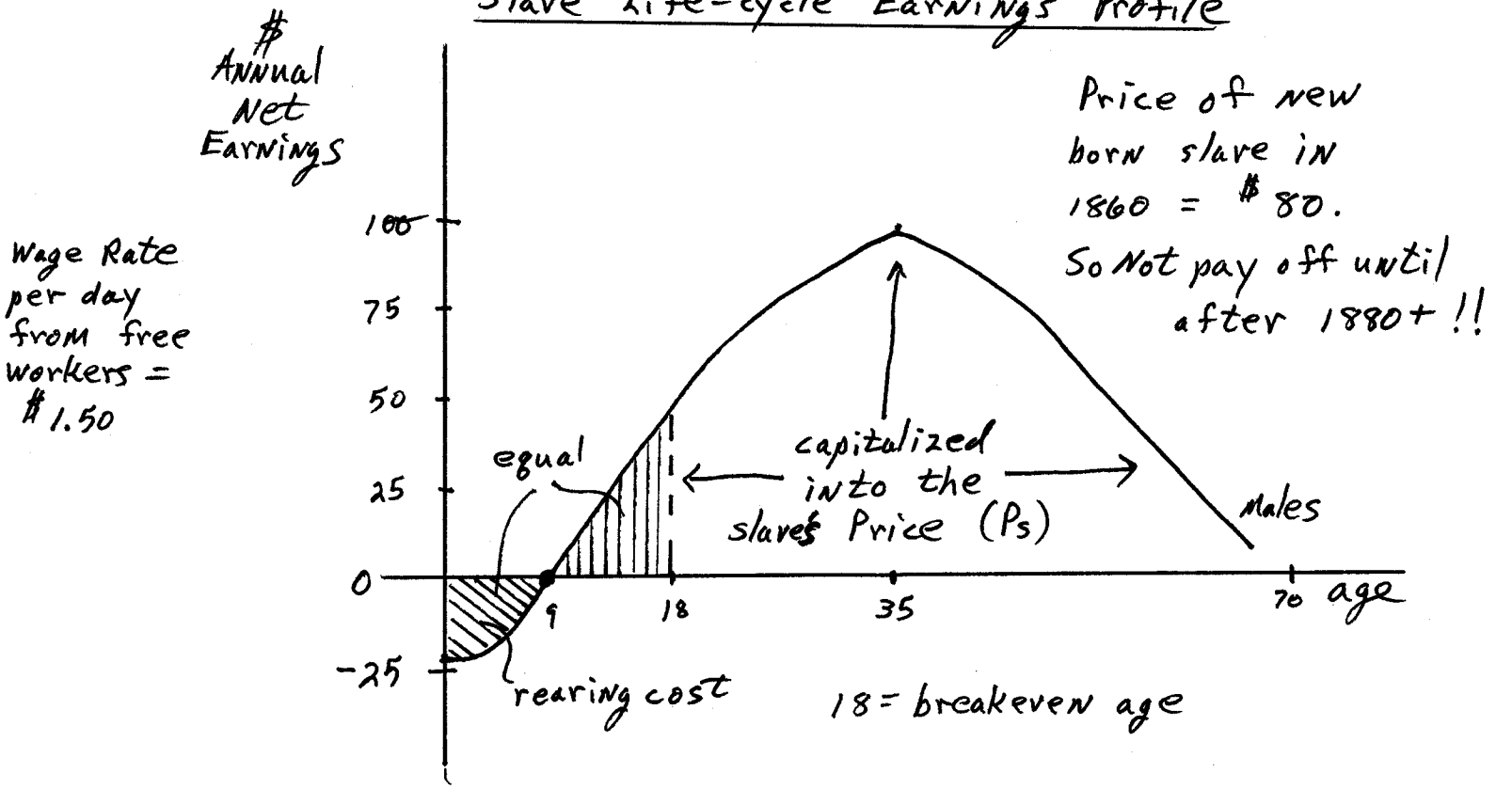
$$\left(\frac{NP - P_s}{P_s}\right) \Big/ \#\text{years held} = \underset{\text{ave.}}{5\text{-}6\%} = \underset{\text{ave.}}{\text{Return on similar physical Asset}} \text{ (land, bonds, etc.)}$$

Therefore: $\left(\text{Prestige} - \underset{\text{Discomfort}}{\text{Moral}}\right) = 0$

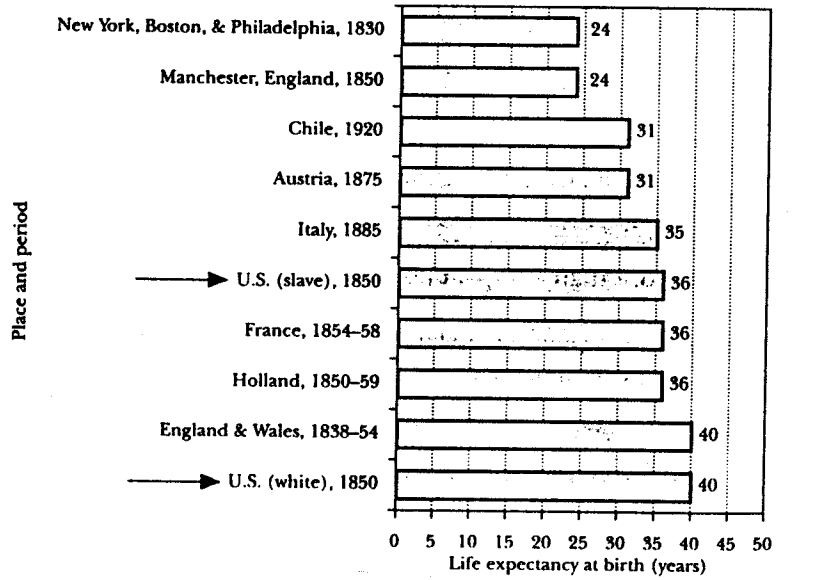
so slavery is dominate by economic considerations.

Rate of return higher in the West-Central South 10-12%
compared with the Atlantic Coast South 3-5%
So incentive to move slaves from east to west, from tobacco to cotton cultivation.

Slave Life-cycle Earnings Profile



Life Expectancy at Birth for Various Populations, 1830–1920



Source: Robert W. Fogel and Stanley L. Engerman, *Time on The Cross: The Economics of American Negro Slavery* (Boston: Little, Brown, 1974): 125, Figure 36.

Table 5. The Distribution of Slaves by the Different Types of Households in which They Lived: A Comparison of Four Populations (in percent)

	Trinidad in 1813	Jamaica in 1825	The Bahamas in 1822	The United States c.1850
Nuclear Families (mainly two-parent families but also some childless couples)	24	37	72	64
One-Parent Families (mainly headed by the mother)	26	40	13	21
Non-Family Households (men alone or together, women alone or together, children living separately)	50	23	15	15
	100	100	100	100

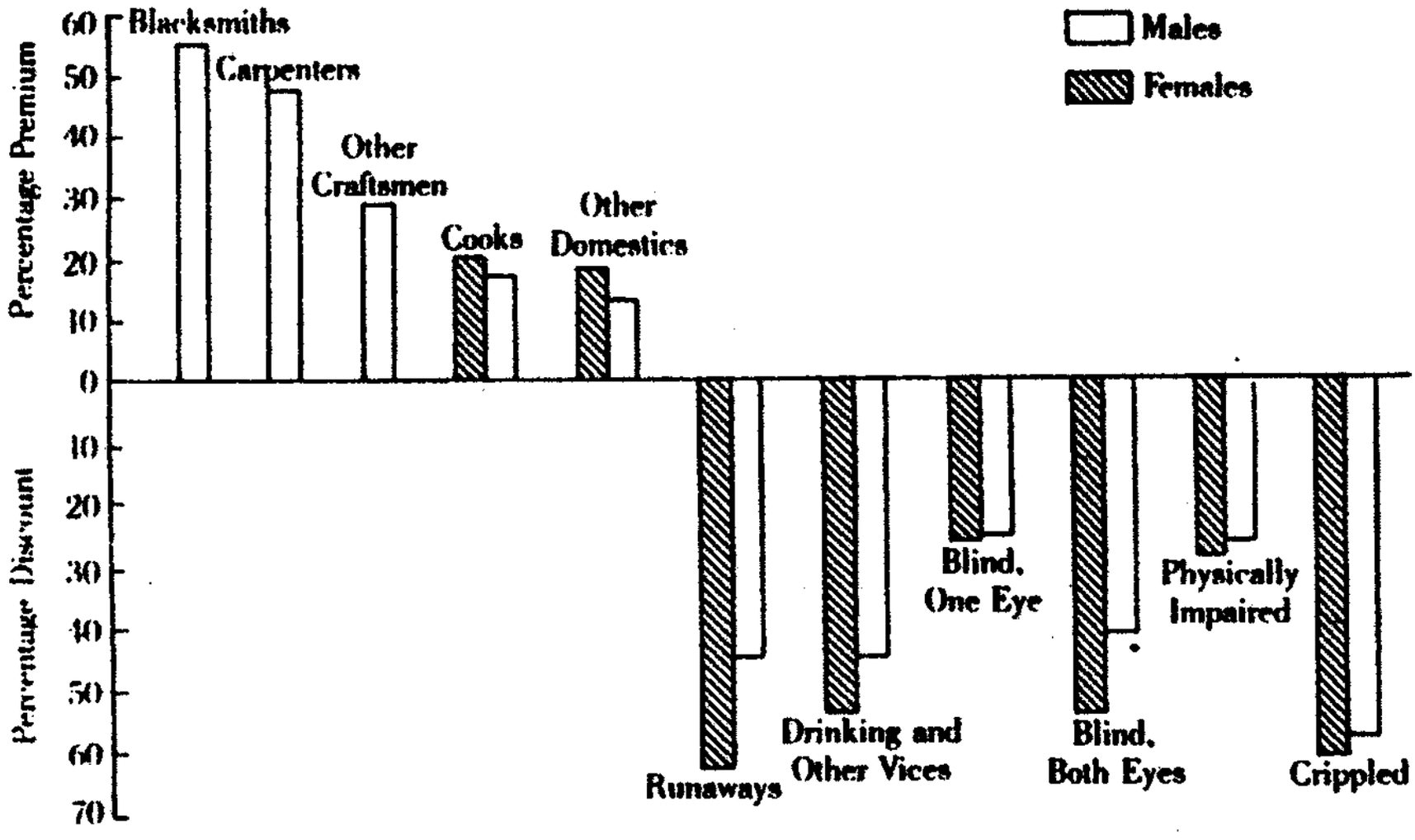


Figure 12. Premiums and discounts in slave prices for various skills and "defects." This diagram shows that there was little difference between the way in which planters priced their slaves and the way they priced their other capital assets. They were as precise in valuing human attributes as those of their livestock or equipment. The premiums and discounts are measured relative to the price of a healthy field hand of the same age and gender (the zero premium).

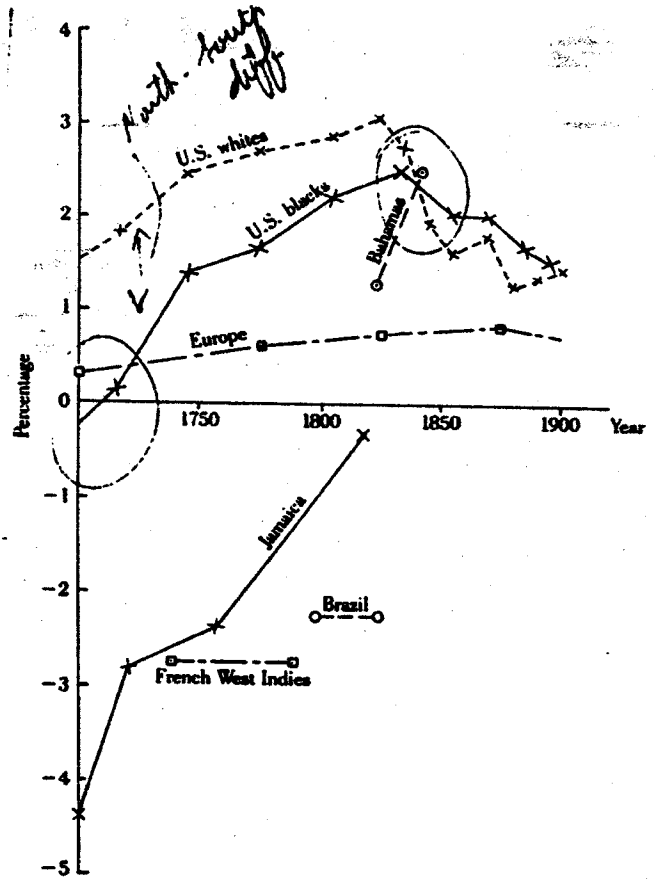


Figure 19. Approximate average annual rates of natural increase for various populations, 1700–1900. Negative percentages indicate rates of natural de-

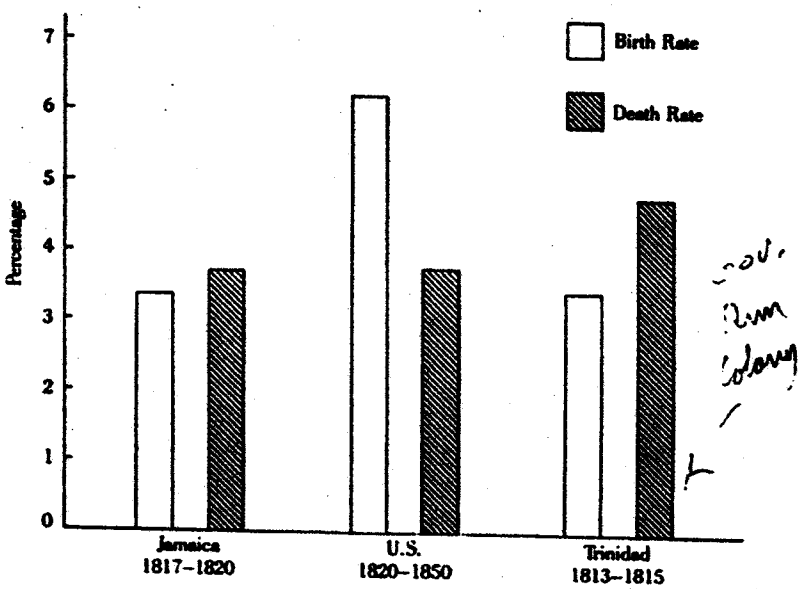


Figure 20. A comparison of slave birth and death rates in the United States, Jamaica, and Trinidad during the first third of the nineteenth century.

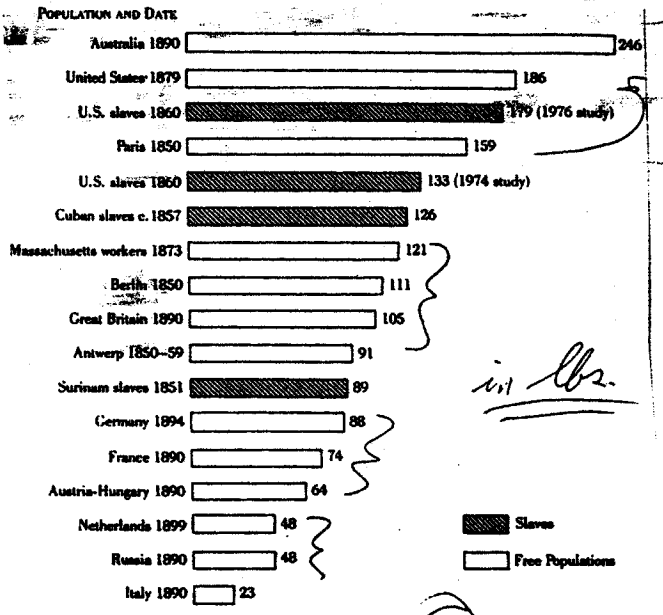


Figure 21. Average annual per capita consumption of meat in various populations during the nineteenth century (in pounds).

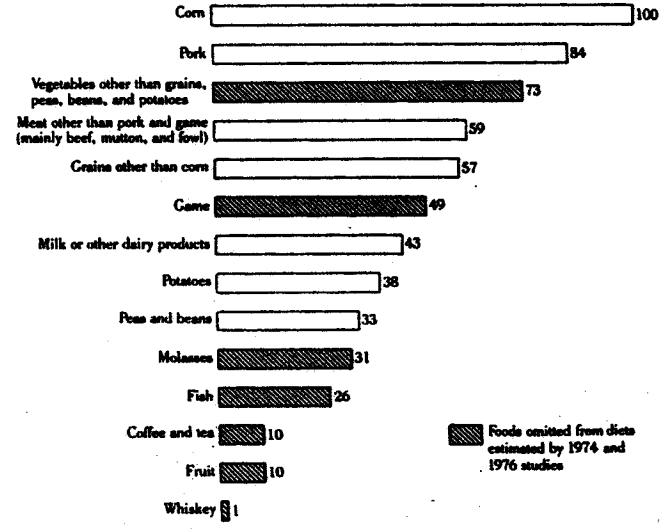
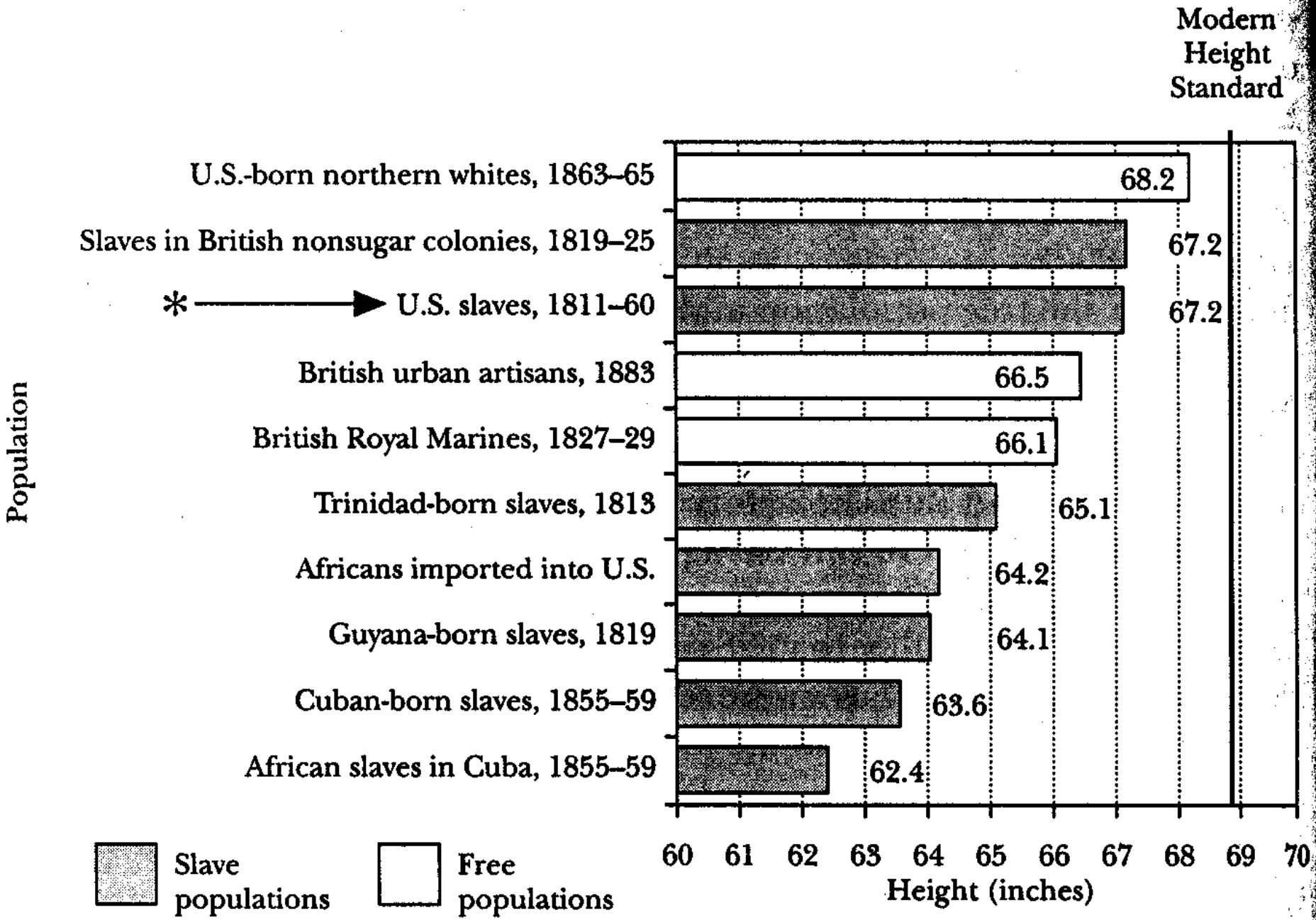


Figure 23. A diffusion index of food consumption: the extent of the regular consumption of various foods by slaves (corn = 100). The diffusion index

Height of Adult Males, Aged 25–45, from Various Populations



Source: Robert W. Fogel, *Without Consent or Contract: The Rise and Fall of American Slavery* (New York: W. W. Norton, 1989): 141, Figure 24.

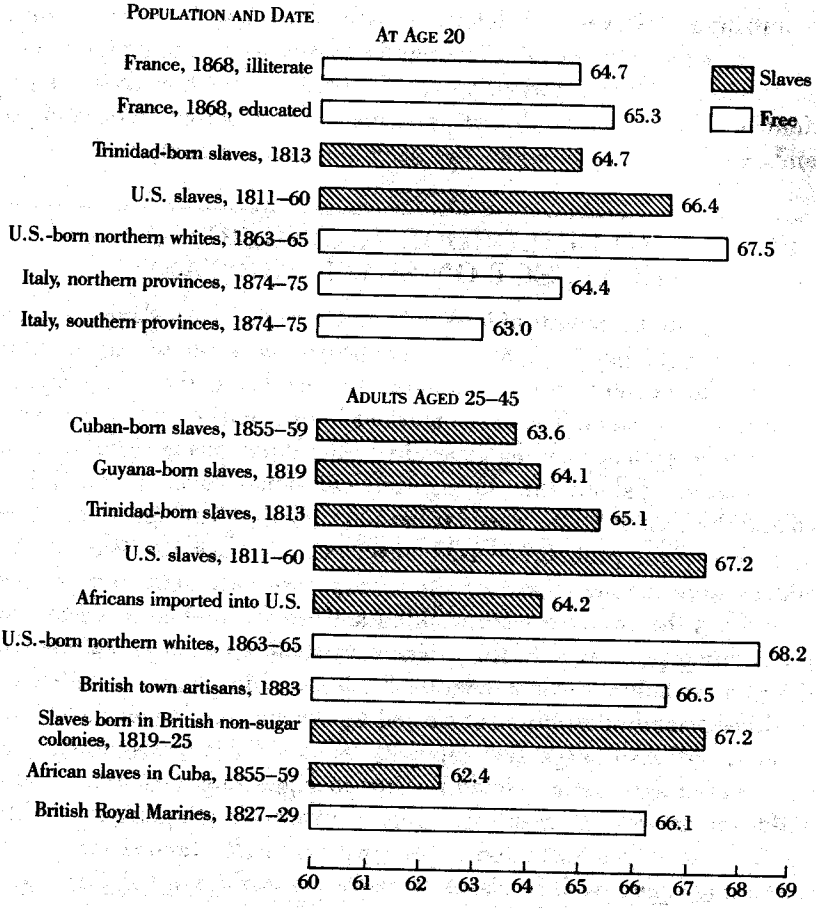
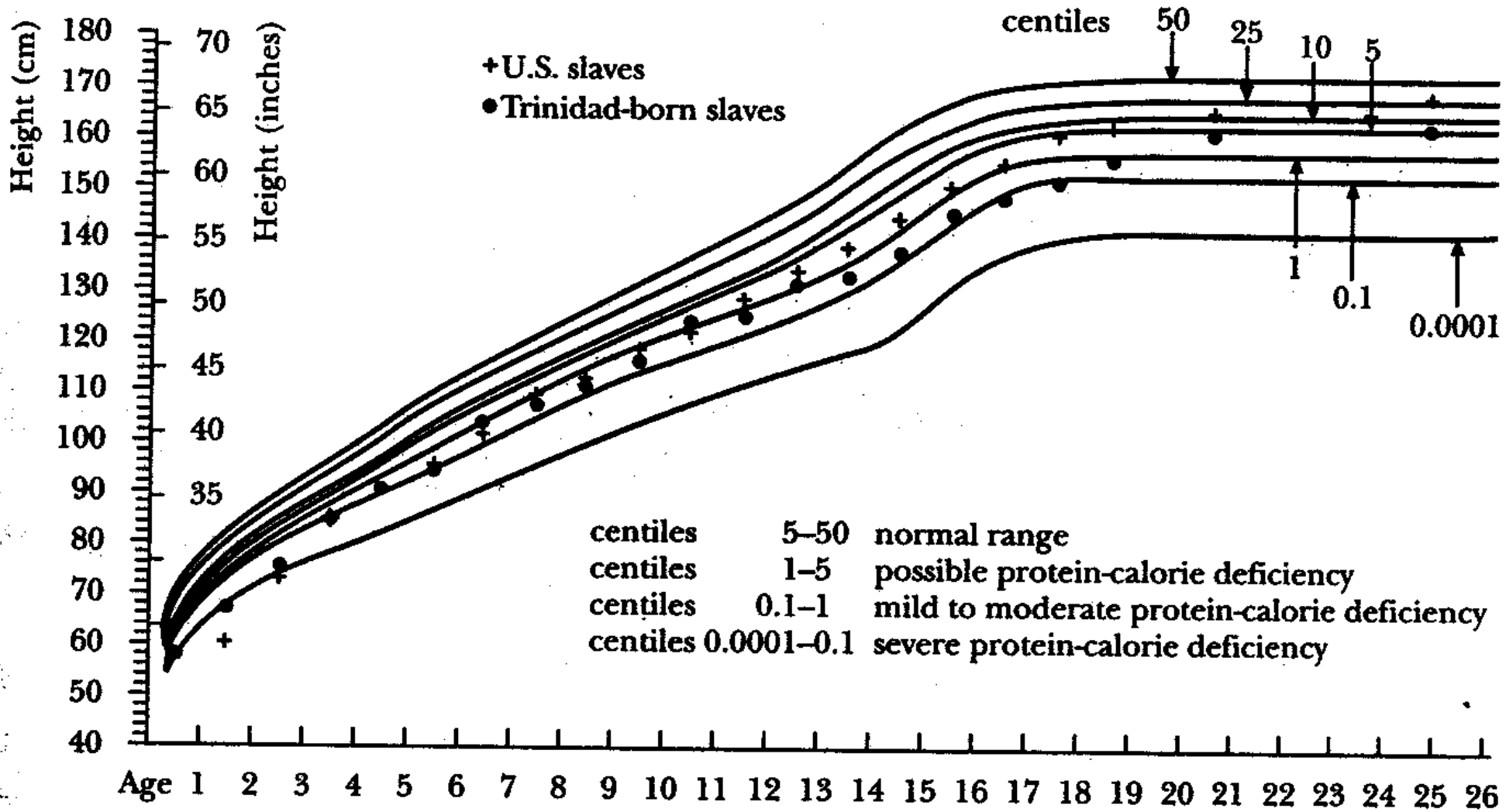


Figure 24. Heights of various slave and free male populations during the nineteenth century (in inches). The top part of the figure compares the heights of French and Italian military conscripts (who were called up when they reached their 20th birthday) with U.S. and Trinidad-born slaves and with U.S.-born whites in the Union Army of the same age. The bottom part of the figure compares the heights of adults who were between 25 and 45 years of age. Before 1900, a male usually reached about 99 percent of his final height by age 20. During the next five years he may have grown another half an inch. The average adult male height in Great Britain, which is often used as the modern standard, is currently 68.9 inches.

The Average Height of Male Slaves in the U.S. and Trinidad Compared with Modern Height Standards



Source: Robert W. Fogel, *Without Consent or Contract: The Rise and Fall of American Slavery* (New York: W. W. Norton, 1989): 143, Figure 25.