

For the Scientific American.  
**Review of the Rise, Progress, and Present Importance of Cotton Manufactures of the U. S., together with Statistics, showing the Comparative and Relative remuneration of English and American Operatives.**

BY THOMAS H. DODGE.  
[Concluded from page 363.]

How different is the condition of the American operative: commencing upon pay, as learners, which enables them to enjoy all the necessary comforts of life, they are seen at church, in the Sabbath school, and at the social gathering, side by side with their employer, who seem to take as much interest in their physical, mental, and moral welfare, as if they were bound together by ties of blood and consanguinity. And thus it will be seen that the American operative and mechanic enjoys all the pleasures and blessings of social life, while their labor, owing to the kind and benevolent policy of the American capitalist, to assist them in the successful prosecution of their various employments and in surrounding the place of their labor with all that is pleasant and agreeable; partakes more of mental feast, and an intellectual treat, than it does of the severity of physical toil and labor. And well may America be proud of her leading spirits in manufactures. And she will not be ungrateful to them when dead, for she will hand down their names and memory to latest posterity. To the table below I invite especial attention; it is based upon the most careful inquiry and information.

A TABLE showing the annual and aggregate amount of wages which the Operatives employed by the principal cotton manufacturing establishments in the United States, together with the annual amount which they have received over and above what they would in England, from 1838 to 1848, inclusive.

Years	Wages of Males	Wages of Females	Aggregate	Annual sum paid to Am. op. over and above Eng. prices.
1838	1,310,400	3,177,200	4,487,600	9,167,600
1839	1,474,000	3,380,000	4,754,000	9,776,000
1840	1,450,800	3,515,200	4,966,000	10,145,200
1841	1,291,680	3,109,600	4,401,280	8,993,920
1842	1,544,400	3,718,000	5,262,400	10,753,600
1843	1,591,200	3,988,400	5,579,600	11,382,800
1844	1,872,000	4,461,600	6,333,600	12,948,000
1845	2,059,200	4,867,200	6,926,400	14,164,800
1846	2,152,800	5,070,000	7,222,800	14,773,200
1847	2,340,000	5,746,000	8,086,000	16,510,000
1848	2,527,200	6,422,000	8,949,200	18,246,600

Average amount to each operative over and above what they would have received at English prices, is \$150.26 per annum.

Total amount that the male operative of America would have received at English prices, for 11 years, \$19,543,680.

Total amount that the female operative would have received, \$47,455,200.

Total aggregate at English prices for 11 years, \$66,998,880.

Aggregate amount paid to American operatives over and above English prices, during 11 years, \$136,861,920.

Does not the enormous sum of \$135,861,120 which has been paid to laborers employed in the Cotton Mills of this country, over and above what they would have received at English prices during the period above named, and which amounts to \$150.26 as the average to each operative per annum, over what they would have received in cotton Mills of England, go far to convince all that the productions of America must be protected by the government, or else they must cease, unless the American mechanic and operative's wages are reduced to the sickening level of the English laborer. It is said that the capital vested gets all the profits. Therefore let us examine into the subject that we may know the truth, for it is the truth we seek. There is invested capital in the manufacture of the various cotton fabrics, of \$1000,000,000

Employ male operatives to the number of	27,000
At aggregate prices per annum,	\$8,424,000
Employ female operatives to the number of	95,000
At an aggregate per annum of	\$18,772,000
Pay taxes to the amount of	\$720,000
Use leather, pounds per annum	400,000
Use in the various processes, lbs. of starch per annum,	13,800,000
Barrels of flour per annum,	23,000
Tons of coal per annum,	360,000
Bushels of charcoal per annum,	350,000
Cords of wood per annum,	90,000
Gallons of oil per annum,	830,000

To which may be added large quantities of lard, tar, tuppentine, tallow, paints of various kinds, lumber, &c.

Now every one must admit the above enormous expenditures per annum, go in the main to reward American labor. To whom the enormous sum paid per annum for cotton goes, the wealthy planter at the South can answer. Now is it more than just that we should inquire into the actual profits which do accrue to capital as invested as above. And will not all admit that the capital thus actively engaged in diffusing abroad through all classes of society, and especially the laboring class, so bountifully the means by which to obtain all the necessities and comforts of life in wide profusion, ought in justice to be permitted to reap a profitable return—one commensurate to the blessings bestowed. And yet, notwithstanding the bold assertion of some unacquainted with the subject, when by careful inquiry and attention, the profits of the above \$100,000,000 for the period above named, are gathered and added together, they do not amount to but about 5 per cent. upon an average. Six per cent., says one, for a series of 11 years, per annum is enough. But stop; there is one very important item to be considered, one which is generally left out of the account, and one to which I would most respectfully invite the careful attention of the legislators and the American press. Admitting that companies have divided 6 per cent. per annum—call it 7—and yet by the most careful and economical management they have not been able to divide even 7 or 6 per cent. per annum from the actual net earnings of the mills, without making large drafts upon their capital in one way or another. And it is a fact that cannot be denied, that the mills, machinery engines, and other apparatus belonging to the cotton manufacturing companies of America, have depreciated during the last 11 or 12 years, by reason of exposure and wear and tear, above the ordinary repairs, so much so that 25 per cent. on their capital, or \$25,000,000 would not more than make the original investment good, and enable it to compete successfully with new capital invested now, other things being equal. And it is safe to say, that those who are loudest in their cry against manufacturers would not take their machinery upon an average at 50 per cent. discount and I don't think many of them at 60, or even at 70 per cent.? Now is it not plain, that this \$25,000,000 should be deducted from the dividends declared in order to get at the actual net profits of the capital. Most certainly, all will admit, if the companies have not laid by a contingent fund to meet this exigency. But instead of laying by anything, the companies have, taking them together, made actual drafts upon the credit of their capital to meet their running expenses. After deducting the above 25 per cent. there is left for actual profits to capital, about 4 per cent per annum. Now considering the very great liability to losses by fire, breakage, and a thousand other risks that might be named, does any one believe the investment at 3½ or 4 per cent., much better than money loaned at 6 per cent. The companies have been living in hopes of better times so long, that they have well nigh come to the brink of bankruptcy—and unless government extends a helping hand soon, there must be a general crash in the business, or else the operatives' wages must go down to the starvation prices of England. For how can they compare it with English manufactures when the English have the advantage of \$18,246,800 in the item of labor, with machines and other things in proportion. Some as a last resort will say, that the supply is greater than the demand, that there is too much machinery in the world, and that government ought to withhold its aid, and let Americans stop their mills until the supply is exhausted. What! shall America! O shall free republican America ever stoop to the humiliating aspect of entering the workshops and factories where labor her industrious mechanics, artisans, and operatives, and by the potent power and influence of her laws, bid them to cease to ply the shuttle and wield the hammer—subjecting them to remain idle or to seek in vain and fruitless endeavors for employment elsewhere,

for the sake of gratifying the overgrown and distorted system of servitude in the old world, and give it a fresh opportunity to clutch its victims of oppression with a firmer grasp—the more effectually to bind them to the rack of starvation and to force them closely in the prison houses of prostitution and infamy?—God forbid that history shall ever record such a suicidal act on the land of immortal Washington and his illustrious cotemporaries.

Finally, Messrs. Editors, if I have communicated anything that shall enable any one to view the subject of cotton manufactures in a clearer light, or that shall even prompt to a spirit of honest inquiry, I shall have the satisfaction of knowing that the labors, researches and patient investigation of years have met with the reward at least of not having been utterly in vain.

[The Scientific American is the advocate of Industry, but the discussion of antagonistic political questions, like that of a Tariff, belongs to party papers, or the Merchants' Magazine. We have indulged Mr. Dodge in his article, for the purpose of bringing out his statistics of comparison. The question of Protection is one which some say should be applied to manufactures, or products only, and there is another class which say it should be applied to individuals also. The one would prohibit foreign manufactures, the other would prevent foreign emigration. These opinions are not to be discussed in our columns—every man to his trade. We think Mr. Dodge is not correctly informed in respect to the payment of English operatives, and we dissent entirely from his opinion respecting their moral character. Is it a natural consequence that poverty and licentiousness should go hand in hand? No. It is a common opinion in New York that our eastern manufacturing districts, are prolific in furnishing very bad characters for our cities. We never could see how this was a consequence of manufacturing, but we state the common opinion. Mr. Dodge states that the American operative is better clothed, educated, &c., than the middle classes of Europe. If he means the middling classes of manufacturing England, he is mistaken on the subject. The middling classes are the farmers, lawyers, authors, merchants, manufacturers, small landholders, industrious tradesmen, and artists. Fifteen years ago we travelled through that country, and again in 1839: great changes have no doubt taken place since then, but in respect to education, we must say "the middling classes of Britain are very highly educated." The factory operatives in Britain have good advantages in education—for the manufacturer is bound by law to allow his operatives, under a certain age, certain hours every day for education, which is furnished free. There is one thing not very favorable to the progress of British manufactures, that is, the decreasing wages of the operatives. Fifty years ago, they made higher wages than ever were paid to our operatives.

**The Electric Light.—Mr. Paine's Discovery Corroborated by Experiment.**

MESSRS. EDITORS—I have passed hydrogen through turpentine and found it to acquire high illuminating properties. You know there is an old experiment of the "philosophical candle," made by generating hydrogen under a stratum of turpentine; but thinking the newly generated or nascent hydrogen might have the power of decomposing or absorbing the turpentine, I led the hydrogen from the generating bottle by a bent tube dipping under the turpentine in a separate bottle. The light was very brilliant; in intensity, I thought, between the Drummond light and the solar lamp; a spirit gas light looked dingy alongside of it—as ordinary lights appear by the lime light. The taking of a daguerreotype by it would have been very easy.

I next directed my attention to ascertain the quantity of turpentine used along with a known quantity of hydrogen. I first accurately measured a portion of turpentine, and then passed the gas from 33 ounces of zinc through it, burning the gas at the jet all the time. I then again measured the turpentine, and found it not perceptibly less than before. Now, in this case the hydrogen could not have been changed

into carburetted hydrogen, for coal gas contains from four to five times as much carbon as hydrogen, and pure carburetted hydrogen has 6 times as much carbon as hydrogen; and as 33 ounces of zinc, by solution, liberate 1 ounce or 12 cubic feet of hydrogen, therefore from 4 to 6 ounces of turpentine should have been used up, supposing it to be all carbon, but turpentine is composed of 20 atoms of carbon to 15 atoms of hydrogen and consequently only one-seventh of its carbon can be taken up by the hydrogen; or in other words, 42 ounces of turpentine will be required to carburet one ounce of hydrogen. Yet still thinking that some portion of the turpentine might be evaporated, I cooled the bottle with the turpentine, and placed the whole apparatus in a cold bath, and tried the experiment over again, but the light was the same. I then heated the turpentine to 120 degrees, and then passed the hydrogen through it, but the light was the same. I then took a half gallon tincture bottle, and put in nearly three pints of cold water and three-quarters of a pint of turpentine, and let the pipe from the hydrogen generator run quite to the bottom of the water—the light appearing the same, or a little better. I have used the same lot of turpentine in all these experiments, having had a brilliant light for about three hours; and the turpentine, though frequently poured from one bottle to another, is not a teaspoonful less than before I began the first experiment.

I have now announced to you the simple facts of the matter, the rationale I leave to the scientific world. The next step, after ascertaining that hydrogen can be used for illumination, is, whether the light is according to its weight or its bulk, as compared with coal gas—that is, within 200 cubic feet of this catalyzed hydrogen will go as far for light as 200 feet of coal gas, or whether it will require 200 feet—1 pound of the hydrogen to do the work of 26 feet—1 pound of coal gas. Very truly yours, &c.

GEORGE MATHIOT.

Washington, July 27th, 1850.

[All the certificates and letters published by Mr. Paine's friends have no value at all in comparison with this of Mr. Mathiot. Now, Mr. Paine, let us have the whole discovery, and lay it open to the public, and illumine all cavilers on the subject. You can maintain your claim to gas produced by passing it through turpentine.

Mr. Mathiot is Electro Metallurgist attached to the U. S. Coast Survey; he possesses a vast amount of practical scientific knowledge. The light was seen by the scientific gentlemen attached to the survey.

**Water and Coal Gas.**

In the month of August, 1846, M. Jobard published in the *Bulletin du Musee Industriel*, the result of some of his experiments on gases for illumination, wherein he states that he caused hydrogen, made from water, to take up hydro-carburets produced by the distillation of coal gas at the moment of formation, and that thrice the quantity could thus be obtained of illuminating gases, than by the ordinary methods. In experiments made with more than 1,500 feet of gas, watched for several hours, it was found that 111 feet of gas were produced from every pound of oil.

**Blackberries.**

The Hightstown (N. J.) Village Record states that thousands of boxes of blackberries and whortleberries are daily shipped from that place to New York, being purchased by speculators at a fair price. With regard to the crops it says:—The wheat, rye and hay crops, in this section, have been gathered, and it is said that such an abundant harvest has not been known for many years. The wheat was entirely, or nearly so, free from the rust and fly; a fact that is rather unusual.

The sum derived from the foreigner's tax in California, if it could be collected, would be enormous. The number of foreigners in the territory is estimated at 10,000, and \$20 per month each would give an aggregate of nearly \$2,500,000 per annum. The tax collector's commission is three dollars on each license, yielding a monthly income of \$30,000, or \$360,000 a year.