

SCIENCE.—SUPPLEMENT.

FRIDAY, OCTOBER 30, 1885.

MASSACHUSETTS LABOR STATISTICS.

THE sixteenth annual report of the Massachusetts bureau of labor statistics offers a good example of the modern method of treating social questions. It aims to establish the conduct of the common-wealth toward the laboring class on facts and safely drawn conclusions, not on theories and speculations. It is perhaps the most typical fact in the modern aspect of the state toward the workingman, that there exist bureaus of labor statistics.

A very painstaking piece of work is the tabulation of 'Wages and prices' from 1752 to 1860 in this country. The tables give (1) the price for each year of the staple articles, (2) the price of these articles from year to year, and (3) a convenient summary of the changes in prices by periods of about ten years. The value of these tables must depend largely on their great usefulness to future work in this direction. They form the text from which quite a various number of lessons may be read.

The industrial history of the country may be made to fall into three periods.

(1) The early industrial period, previous to about 1815. This period serves as a background from which future prosperity stands out the more boldly. It is a period of hand labor; of few industries; of no specialization—each artisan going through the whole series of processes of his craft; with little money, so that barter was a great factor in the mechanism of exchange; with little education for the workingman, and a more absolute control of his welfare in the hands of the employer, who not seldom took an undue advantage of his position.

(2) The period of transition (1815–1830), characterized by a gradual dissolution of the old and a gradual adoption of the new; from which finally resulted

(3) *The present period.* The first great fact which stamps this period is the development of invention. New forces were employed and labor saved; natural products were adapted to serve human wants, and waste utilized. From 1841 to 45, 2547 patents for inventions were issued; in 1856–60, 18,479. In 1855 an annual product of one million dollars (in 1875 of three million), was made by the rubber interest of Massachusetts, which thirty

years before was mere waste caoutchouc gum. Specialization completely transformed the methods of labor. Each man makes one thing alone; by this means his share of the amount produced is enormously increased. In 1855 each operator in a shoe factory (under the old *régime*) produced 455 pairs of shoes; in 1875, 1205 pairs; while the average wages have risen from \$205 per year to \$397, and the actual time of employment has decreased 12 per cent. The introduction of machinery utilizes ignorant labor, and does not create it, as is often supposed. The lowest industrial class is thus raised in the social scale. The daughters of American farmers and mechanics were formerly the operators. Now skilled labor is not required. Accordingly their places are taken by a more ignorant class, while they move upward to higher callings, in which their entire mode of life is better than that of their predecessors.

A second great difference between the present period and its forerunners, is the change in the status of the laborer before the law. The government now limits the hours of work, prevents the employment of minors, abolishes imprisonment for debt, exempts the workman's tools from attachment, provides fire-escapes, authorizes co-operative associations, extends the benefits of free education, and much besides. The "difference in scale of living between the employer class and the laborer of the early period was far less than that between the workman of to-day and his predecessor." The tables tell the same story. The general tendency, broken only by temporary fluctuations, has been toward a rise in wages. The workingman of to-day is paid better, has more time to himself, and, in many cases, has even an increasing share of the net product of his labor. Prices, however, have advanced, and the final question is, have the wages increased more than the prices? The general increase in the wages, as shown by comparing the periods ending 1830 and 1860, is 52%, while the increase in prices averages 13%. Since 1860 the Massachusetts workmen may be said to have gained a 'pecuniary betterment' of over 10%.

In the last paragraph we reached the true test of the welfare of the workman: the relation between wages and prices. To this question, the essay on the 'comparative wages and prices' in Massachusetts and Great Britain, from 1860–83, is a valuable contribution. This essay is a condensation of three previous reports by the labor bureau,

and gives the whole matter in a concise and useful shape.

In the first investigation 24 industries were compared; and the average of different modes of computation leads to the result that, in general, wages are 62% higher in Massachusetts than in Great Britain. In those cases where pay-rolls could be compared, the average weekly pay was \$10.82 in Massachusetts, and \$5.48 in Great Britain. We must remember, however, that the number of working hours is 12% greater in Massachusetts. The average wages per hour show a gain of 71% in favor of Massachusetts. Women's wages, as also those of young persons and children, show a gain of 59% in favor of Massachusetts. The next investigation covered 90 industries, and considers the wages of at least 1,250,000 of employes. The wages in Massachusetts are 77% higher than in Great Britain. Besides wages have increased since 1860 in Massachusetts by 28%, in Great Britain by 10% since 1872.

The other side of the question is represented by the cost of living. Our sources of information are prices and workingmen's budgets of expenditure. Prices are higher in Massachusetts (for everything except provisions) on an average of 43%. The average family in Great Britain is slightly larger, but a slightly larger proportion of the family are at work, thus making a direct comparison with the Massachusetts family perfectly fair. In Massachusetts the earnings per family are 55% higher than in Great Britain; the former saves 6%, and the latter 2%, of its income. The expenditures for 1883 of the two families are \$754 and \$508. If we consider the articles of expenditure, we shall find a remarkable harmony with an economic law demonstrated by Dr. Engel (Royal statistician at Berlin). This law says, 1. the greater the income, the smaller the relative percentage of outlay for subsistence; 2. the outlay for clothing remains uniform, as also; 3. does that for lodging, rent, fuel, light; 4. the outlay for 'sundries' becomes greater as the income increases. The agreement between the calculated and actual values for each item of the expense is very close, the average deviation being less than 3%. The table further teaches that the prices of articles entering into the cost of living were 17% higher in Massachusetts in 1883; of this 11% is due to higher rents in Massachusetts, leaving 6% as indicative of the higher cost of living in Massachusetts. As a final conclusion we have that the standard of living of Massachusetts workingmen to that of the workingmen of Great Britain is as 1.42 to 1. That is, while the cost of living is higher, the wages are still so much higher than those in Great Britain as to leave a margin for better living and even greater saving.

Another portion of the volume deals with the problem of Sunday labor. The questions are these: Has the Sabbath become a necessary element in modern industry, and is its abolition connected with serious evils or not? The departments in which Sunday labor is done are considered one by one. By far the greatest share of Sunday labor is done in connection with railroading. All the roads began without Sunday labor, but street cars and steam railways alike were forced to Sunday labor by public demand. The trains are run for convenience rather than for profit. While the employes generally declare that they would rather have the day of leisure than the additional wages, still the usual effects of overwork seldom occur. The important consideration is this: Sunday labor is not productive labor, but is labor for personal service, and such occupations do not call for constant exertion. If the weaver had to stand at his loom for seven days of the week, he would probably break down; but the car-conductor does it without physical deterioration. The proportion of Sunday laborers to the laboring community is probably larger than one would suppose, 32% of working females and 11% of males doing work on that day.

THE ASCENT OF POPOCATAPETL.¹

DURING the conquest of Mexico by Cortez, some of his followers ascended this volcano to obtain sulphur with which to renew their exhausted supply of powder. The ascension of Popocatepetl, as compared with that of other great mountains of the world, presents no unusual difficulties, and in the course of the present century, many parties have accomplished it with entire safety, especially since the attention of the commercial world has been called to the great value of the sulphur deposits there.

The ascent is always undertaken from the northwest side of the mountain, starting from the town of Amecameca, which lies on the railroad from Mexico to Morelos. From here a horseback ride of three or four hours brings the traveller to the rancho Tlamacas, just below the snow-line, and from this point the ascent is continued on foot. The party is provided with alpenstocks, and a sort of primitive sandals called *guaraches*, drawn on over the boots to prevent slipping. A peon goes ahead and hews steps in the hard-frozen snow; the others follow in Indian file, pausing every now and then to rest, as the exertion in the extremely rarefied atmosphere is very exhausting.

After the summit is reached, the view, if the

¹ Condensed from an article by Carlos von Gagem, in the *Deutsche Rundschau für Geographie und Statistik*,