Daily Fire Loss is \$1,000,000

¶ That the fire loss in the United States approximates one million dollars every working day, is the startling official record.

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The Efficiency of the Large Manufacturing Plant

By Sidney Graves Koon, M.M.E.

READING between the lines of the census bulletin detailing manufactures in New York State, one of the first State reports issued, and covering 16.3 per cent of the total manufactures of the United States, a number of interesting facts are disclosed. It is found, as was to have been expected, that the proportionate output of large establishments is increasing, while that of small plants is decreasing. It also appears that the efficiency of production in the large plant is much higher than in the small one, more product per man is turned out, and (what is of greater real importance) a larger value per man is added to the product as a result of the manufacturing processes. And this "efficiency" has itself shown a marked increase during the five years between 1904 and 1909, covered by the census investigations.

The first item mentioned is due to the concentration of effort and capital, in small plants and small industries as well as large ones, to combinations of men and enterprises, to the rapidly developing idea in manufacturing which has been so aptly expressed in the State motto of Kentucky: "United we stand; divided we fall!" Co-operation is the keynote, and it is finding expression in establishments of all sizes. So it follows that the ratio of the output of the large plants to the total output is increasing.

Plants with an individual annual product of \$1,000,000 or more numbered 294 in 1904 and 470 in 1909. They employed 20.9 per cent of the total number of wage earners in 1904 and 25.4 per cent in 1909. They furnished 32.8 percent of the products in 1904 and 37 per cent in 1909. They added value through manufacturing processes amounting to 25.9 per cent of the total in 1904 and 31 per cent in 1909.

A comparison of these figures will show that these large plants produced about 50 per cent more output per man than the average of all plants, and 80 per cent more than did the 40,000 smaller plants. In value added through manufacture, the large plants showed 23 per cent more per man than the total average, and 32 per cent more than the smaller plants. This establishes our second point, the increased economy of operation of the large plant. And it is due in large measure to better facilities for handling materials, cranes and other labor-saving machinery, improved railroad connections and service, and less of the "jack-of-all-trades" in the make-up of the "hands." To what extent the new fad "scientific management" has influenced this result is problematical.

The general gain in efficiency all along the line is shown by the figures for all the five groupings given in the census bulletin, plants with less than \$5,000 output; between \$5,000 and \$20,000; between \$20,000 and \$100,000; between \$100,000 and \$1,000,000; and over \$1,000,000 annually. The gain in the establishments as a whole was from \$2,904 product per "hand" in 1904 to \$3,356 in 1909, an increase of 15.6 per cent. In value added during the processes, the gain per hand was from \$1,330 to \$1,507, or 13.3 per cent.

All of these points are best shown in the subjoined table. In the table, all figures for total values of products and total values added, represent millions of dollars. The total products amounted to \$3,369,490,192 in 1909 against \$2,488,345,579 in 1904, a gain of 35.4 per cent. The total value added in manufacturing increased from \$1,139,742,293 in 1904 to \$1,512,585,850 in 1909, or 32.7 per cent. The value added represented 45.8 per cent of the product in 1904; 44.9 per cent in 1909.

Annual Product per Plant.	Date.	Wage Earners.	Millions of Dollars.		Dollars per "Hand."	
			Product.	Value Added.	Product.	Value Added.
Over \$1,000,000	1909	255,383	1,246	469	4,879	1,835
\$100,000 to \$1,000,000	1904	179,488	816	295	4,547	1,646
Under \$100,000	1909	438,229	1,413	664	3,224	1,516
	1904	393,872	1,103	531	2,799	1,349
	1909	310,369	711	380	2,290	1,223
	1904	283,587	570	313	2,009	1,104
Totals—All Plants.						
	1909	1,003,981	3,369	1,513	3,356	1,507
	1904	856,947	2,488	1,140	2,904	1,330

Conquering Infection

THE epic work of Gorgas and his associates, by which one of the greatest plague spots on the face of the earth has been turned into a veritable health resort, is now known and appreciated throughout civilization. It is gratifying to realize that like work has been doing in many other tropical regions.

For example, the Gold Coast and other West African colonies have long been branded as graveyards of white colonists. From 1881 to 1897 the white Gold Coast mortality averaged 75.8 in the thousand for each year; in Lagos it was 53.6. Since 1897, however, mosquitoes and rats have been fought on lines laid down by the scientific bacteriologist; water supplies have been purified and protected; and anti-typhoid inoculations have been made. The result? In the years 1903-1906 the death rate was 24.3; during 1907-1911 it was 17.6; in 1911 it was 13.7. Here is a record fairly emulative of Panama.

India, the home and the source since the dawn of history of many a "world pestilence," has now a standing British army of about 72,000 men, among whom malarial fevers are the most common illness; formerly typhoid was by far the most deadly. Comparatively little progress has been made against the malarial but the enteric diseases have been so well combatted by means of sanitation and inoculations that one might almost be sanguine of their extinction. Five years ago the death rate was 2.66 in the thousand, a marked reduction from former years; in 1910 it was reduced to 1.58; in 1911 it was but 0.63. Nor was all such improvement monopo-

lized by the white residents and soldiers. Among the native Indian troops, which are nearly twice as numerous as the British similar progress has been made. While in the whole native population of "fatalistic" India (which has from time immemorial, up to a few years past, looked upon cholera and the plague as "visitations" it were impious to defy) the death rate in 1910 was 33.20 in the thousand, as against 35.40 in the preceding five years; the birth rate rising *pari passu* from 37.51 to 39.52.

Such achievements as these are in truth but part of a world-wide and constantly more and more victorious fight with disease, and especially with epidemics against which mankind has ever, up to our generation, been almost defenseless. Thus, by reason of the necessities of tropical colonization, are infectious diseases being eliminated from those regions; though of course medical science cannot remedy the high temperatures, which induce in the Caucasian the "tropical wrath," characterized as it so sadly is by intemperance, lassitude, periods of spasmodic mania and of hideously cruel acts toward inoffending and defenceless natives.

When such triumph over disease can be achieved despite the formidably adverse conditions obtaining in the tropics there should be an even greater measure of success in the temperate zone; while failure to eliminate disease-transmitting insects, and to preserve foods and waters pure, must in reciprocal degree be discreditable in those regions of the earth where sanitation is easier to effect and civilization more advanced.

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