

were not suited, and three were filling absolutely useless positions, leaving 40 men out of 56 men who were performing laborious work. Stating this matter in a different way, it appears that out of 715 laborers there were only 16 who were 40 years of age or older who had served the city 20 years, and who were incapacitated for laborious work, and of these 16, nine were able to serve as watchmen. This condition leads to doubt as to the necessity for establishing a pension system for the labor force unless such system is to be established for the benefit of employees who have passed their years of usefulness in the service of other employers, and who have late in life received, probably through political influence, positions upon city work.

The policy of appointing men upon the labor service after they have passed their years of usefulness in the service of other employers had turned the department into a semi-charitable institution, where aged and infirm men were employed when they should have been the charges of relatives or of the public, and not placed upon the city pay-rolls at wages higher than first-class able-bodied laborers at similar work could command from other employers.

#### Experiment to Test the Efficiency of the Day Labor Force.

All of the work upon which the previous comparisons and comments as to efficiency have been made was work done prior to the investigations, which were consequently studies of records of work already completed. It was not, therefore, possible to know accurately the conditions under which the work was done. At the request of the mayor of Boston a test was made at the Chestnut Hill stone-crusher (a municipal plant which had been shut down) to determine whether or not it was possible for the day labor force to produce broken stone at a cost fairly comparable with that of similar stone purchased by contract. The test covered a period of three months during the summer of 1908, and was under the observation of a disinterested engineer, who kept accurate record of what was done, but who did not in any way supervise or direct the forces. The work consisted of stripping and quarrying the stone, hauling it to the crusher and breaking it.

TABLE VIII.

#### Labor Employed in Boston Sewer Department, Classified According to Age.

Present Age.	No. of Men.	Per cent. of force.	No. of men above ages designated.	Per cent. of force above ages designated.	Term of service, years.		
					Avg.	Max.	Min.
Below 20..	1	0.1	....	0	2	2	2
20-24 ....	5	0.7	20-714	20-99.9	3.2	9	0
25-29 ....	10	2.7	25-709	25-99.2	3.8	12	0
30-34 ....	53	7.4	30-690	30-96.5	6.1	15	0
35-39 ....	101	14.1	35-637	35-89.1	7.5	18	0
40-44 ....	127	17.7	40-536	40-75.0	9.9	22	0
45-49 ....	136	19.1	45-409	45-57.3	13.0	28	0
50-54 ....	95	13.3	50-273	50-38.2	12.7	32	0
55-59 ....	81	11.3	55-178	55-24.9	15.3	33	2
60-64 ....	65	9.1	60-97	60-13.6	14.8	35	1
65-69 ....	21	2.9	65-32	65-4.5	13.6	21	1
70-74 ....	9	1.3	70-11	70-1.6	17.3	23	11
75-79 ....	2	0.3	75-2	75-0.3	32.0	40	24

Note.—Investigation made in 1907.

The test lasted a sufficient length of time to demonstrate with accuracy the cost of producing broken stone by day

labor under the existing conditions. The force consisted of men apparently as skilful and competent as could be selected from the employees of the Street Department, and certainly gave evidence of being reasonably skilful and competent. So far as could be observed, the foreman in charge was given an absolutely free hand to organize his force as he deemed best, and to adopt such methods of handling the work as he might desire. With slight and unimportant exceptions, tools and supplies were promptly furnished, so that there is no reason to think that the output could have been increased by the improvement of conditions depending upon the co-operation of the superior officers of the department. The net result of this test appears to be that broken stone was produced at a cost of \$1.075 per ton. These figures make no allowance for the cost of clerical service at the office or for the cost of administration, which items are estimated at \$0.50 per ton; and no allowance was made for the cost of the quarry. Depreciation of plant and the rental of tools were included in the cost of producing the stone.

TABLE IX.

#### Classification of Labor by Term of Service and Age, Boston Sewer Department.

Present Age.	Years of Service.									Total.
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	
19 .....	1	..	..	..	..	..	..	..	..	1
20-24 ....	3	2	..	..	..	..	..	..	..	5
25-29 ....	10	8	1	..	..	..	..	..	..	19
30-34 ....	19	25	8	1	..	..	..	..	..	53
35-39 ....	28	28	38	7	..	..	..	..	..	101
40-44 ....	26	26	41	30	4	..	..	..	..	127
45-49 ....	8	20	52	43	9	4	..	..	..	136
50-54 ....	7	21	26	31	7	2	1	..	..	95
55-59 ....	2	11	18	34	11	2	3	..	..	81
60-64 ....	4	6	20	28	3	..	2	2	..	65
65-69 ....	2	2	6	5	6	..	..	..	..	21
70-74 ....	..	..	2	4	3	..	..	..	..	9
75-79 ....	..	..	..	..	1	..	..	..	1	2
Total ..	110	140	212	183	44	8	6	2	1	715

The quarry and crusher selected were the most favorable of any of the eight which the city had worked in the past, and in 1895 produced broken stone more cheaply than any other of the city crushers. It is only fair to add that during the second and third periods of the tests, the time being divided into three periods, there was a marked increase in the efficiency of the force. A fair estimate of the cost of the output of broken stone during these latter periods was \$0.95 to \$1 per ton, no allowance being made for administration nor for owning and maintaining of the quarry. For comparison, an instance was found where the operations of a large broken stone company were started with certain temporary machinery, which was rented to a contractor, who crushed stone for a period of four or five months. The physical conditions were fairly comparable with those at the Chestnut Hill plant. The crusher was similar, the output was smaller, and rental was paid for the machinery. The cost to the contractor for this work was \$0.45 per ton, not including interest and depreciation, which would bring the cost up to \$0.50 per ton. It, therefore, seems fair to conclude that the work which cost the city practically \$1.12 per ton, including administration expense, would have cost a competent contractor about \$0.50 per ton. It should be borne in mind that this does not include any profit upon the work.

#### Resumé.

The foregoing discussion of a small proportion of the studies made under the direction of the late Finance Commission is very brief, for many of the studies required