mate of the advertising voluntarily contributed in this work approximates the sum of $18,000,000.

"Immediately after the armistice was signed Mr. Hoover was directed to proceed to Europe to investigate the part that America could play in the relief of the civilian population. Though he had but four days before sailing he arranged for the purchase and shipment of 250,000 tons of food. It was not until February of the following year that Congress appropriated $100,000,000 for European relief. At that time several hundred thousand tons of foodstuffs had been actually distributed. Up to a recent date over 3,000,000 tons of foodstuffs, valued at over $770,000,000, have been distributed.

"Certain things stand out with striking prominence. Mr. Hoover was more than a food administrator. He was a general, was an organizer in action. He got men to do things. His faith in the moral support of the people was sublime yet practical. He seemed to know the right methods to follow and the psychological moment to act in order to secure the full measure of support."

Purification-Plant Methods and Results at Albany

Sedimentation, Double Filtration, Coagulation and Chlorination Employed—Typhoid Cases Reduced—Unit Cost $12.32

DOUBLE filtration of settled water, with the use of alum at times in connection with the preliminary filters, followed by chlorination with hypochlorite and liquid chlorine used jointly, is the method employed to render the badly polluted and sometimes turbid Hudson River water fit for the supply of Albany, N. Y. The original slow-sand filtration plant, a pioneer of its kind in this country, was built in 1898-9 with Allen Hazen as engineer. Preliminary filters were put in use in 1908, chlorination in 1909 and alum coagulation in 1912.

About 90% of the supply is Hudson River water, filtered and pumped, and 10% is delivered by gravity from small streams west of the city. The amount of filtered water supplied during the year which ended Sept. 30, 1918, averaged just under 20,000,000 gal. a day. The consumption and waste of filtered and unfiltered water for the year, assuming a population of 110,000, was 213 gal. per capita, compared with 192 gal. the previous year. The extreme cold weather early in 1918 is held responsible for the increase. Only about 45% of the taps are metered.

The river water is pumped against 19-ft. head to a sedimentation basin and against 9 ft. from this basin to the preliminary filters. The treated water passes by gravity to the main pumping station some two miles distant.

The sedimentation basin affords from 12- to 18-hour detention. It is not baffled. Alum was applied 34 days in 1917 and 182 days in 1918 to the water before it went to the preliminary filters. Alum is used in times of high turbidity when the water is bypassed around the slow-sand filters. It is also used at times when bypassing in winter, when the amount of required chlorine is larger than can be used at low temperatures. The alum rate ranges from two grains in winter to 4½ grains in summer.

All water passes through the sedimentation basin and the preliminary filters and is chlorinated. From May 1 to Nov. 1, from 5 to 50% of the prefiltered water is bypassed around the slow-sand filters.

As a matter of safety, both hypochlorite and liquid chlorine are used for disinfection, the range in terms of available chlorine being from 0.25 p.p.m. in winter to 1.5 p.p.m. in summer for the two combined. Hypochlorite is applied up to the working capacity of the mixing and dosing equipment, and liquid chlorine to make up the remainder of the demand. The chlorination apparatus is in duplicate.

The 16 preliminary filters have a total area of 0.3 acres and a rated capacity of 70,000,000 to 80,000,000 gal. per acre per day. The eight slow-sand filters have a combined area of 5.6 acres and a rated capacity of 3,000,000 gal. per acre. All the sand in each type of filter is washed by Nichols washers once in two years—half each year. The average length of run of the preliminary filters between ordinary washings in 1917-18 was 34; the average rate of filtration, 76,200,000 gal. a day and the wash water averages 2.7% of the total amount filtered. The slow-sand filters were scraped an average of 6¼ times per year in 1917-18.

The cost of operating the entire water treatment plant for the year which ended Sept. 30, 1918, including extra pumping, is shown by Table I, while Table II summarizes the bacterial, physical and chemical results for the same year.

TABLE I. COST OF WATER TREATMENT AT ALBANY, 1917-18

	Per 1,000,000 Gal.
Pumping	$5.76
Sedimentation basin	.02
Preliminary filters	.54
Slow-sand filters	1.21
Laboratory	.90
Sterilization	.83
Alum plant	2.84
Superintendence	.22
Total cost	$12.32

Typhoid fever in Albany from 1891 to 1899, before the purification works were put in use, averaged 426 cases and 71 deaths a year, while from 1900 to 1918 the corresponding figures were 163 cases and 18 deaths, reductions of 76 and 74 per cent.

Wallace Greenalch is commissioner of public works of Albany and J. B. Kilbourn is superintendent of water-works. George E. Willcomb has been chemist and bacteriologist since 1906 except for a year and a half when he was in war service.

TABLE II. BACTERIAL, PHYSICAL AND CHEMICAL RESULTS AT ALBANY WATER-PURIFICATION PLANT, 1917-18

	Bacteria per Cubic Centimeter										
Water	Gelatine	Agar	Neutral Red Total	Neutral Red Coli.	Turbidity	Color	Total Hardness	Alkalinity	Oxygen Consumed	—Ammonia— Free	Alb.
Raw Hudson River water	46,000	1,030	89	24	20	42	73	78	19.1	0.083	0.116
Settled water from basin	37,000	805	...	...	13	39	...	...	17.6	0.072	0.101
Effluent primary filters	10,500	169	...	...	2.9	32	...	...	15.2	0.046	0.050
Effluent secondary filters	1,190	34	4	1	0.1	25	...	...	14.4	0.026	0.031
Water from pure well	52	5	0	0	0.1	25	75	78	14.4	0.026	0.031