

ing cells as we know now. And so it was considered that the presence of decomposing vegetable or animal matter in water would tend to set up injurious putrefactive changes in the digestive organs and thus produce disease. Hence when analyses of the effluents from the sand filters showed only a moderate reduction of the organic matter—seldom as much as 50 per cent.—the result was considered very disappointing, and as indicating that this method of filtration, while capable of improving the appearance and taste of the water, was of slight hygienic value.

Not many years later, however, these ideas and theories were broken down by the researches of Pasteur, who demonstrated that the processes of fermentation and putrefaction were dependent upon the presence of living organisms; and that some of these organisms were capable of causing disease. A new view was now taken of organic matter in water, the presence of which was to be not necessarily dangerous in itself, except as indicating the probable presence of germs. Yet, while chemical purity was now deemed of much less importance than biological purity, the former remained the standard, owing to lack of satisfactory methods of prosecuting the study of these organisms. Then, in 1881, came the famous discovery by Dr. Robert Koch of his "plate culture" method. Hitherto, owing to the extreme minuteness of these creatures, and the enormous rate at which they increased in number under circumstances favorable to their growth, it was almost impossible, with the methods then available, to make much progress in the knowledge of the subject. But with the advent of Koch's invention these difficulties were to a great extent removed. It now became possible to determine the number of germs, to study their habits of life, functions, etc., and to classify them into species, in a manner which, considering the kind of creature dealt with, seems quite marvellous. Besides placing the germ theory of disease on a firm basis, this discovery of Koch's marks the beginning of the period during which it has been possible to deal with the subjects of the purification of water and sewage in a rational and scientific way. Numerous investigators at once began the study of these questions under the new and vastly improved circumstances. Inasmuch as the results of many of these experiments have a direct bearing upon the subject under consideration, a brief description of the nature and some of the characteristics of the bacteria will be given before proceeding further.

(To be continued).

TRUST FORMATIONS IN THE UNITED STATES.

The month of March witnessed the largest receipts for filing articles of incorporation of any in the history of the State of New Jersey. The total receipts for the month in filing fees were close to \$130,000, nearly double the amount received in any single month before. The total capitalization of the month's incorporations reached about a billion and a half dollars. Two hundred and fifty original certificates of incorporation were filed, and about a hundred certificates of increased paid-up capital stock. During the month there were thirty-four trusts and combinations of various kinds chartered by the State. These combinations, with their capitalizations are: American Steamship Company, \$1,000,000; American Woolen Company, \$65,000,000; American Ice Company, \$60,000,000; United States Cast Iron Pipe and Foundry Company, \$30,000,000; International Steam Pump Company, \$27,500,000; New England Electric Vehicle Transportation Company, \$25,000,000; Royal Baking Powder Company, \$20,000,000; Havana Commercial Company, \$2,000,000; United Electric Company of New Jersey, \$2,000,000; American Beet Sugar Company, \$2,000,000; United Fruit Company, \$2,000,000; Consolidated Street Car Company, \$18,000,000; Indo-Egyptian Compress Company, \$15,000,000; Compress Gas Capsule Company, \$12,000,000; American Brick Company, \$10,000,000; National Salt Company, \$12,000,000; Park Steel Company, \$10,000,000; Continental Cement Company, \$1,000,000; American School Furniture Company, \$10,000,000; Severy Process Company, \$7,500,000; United Zinc and Lead Company, \$6,000,000; Pacific American Fisheries Company, \$5,000,000; Helvetia Copper Company, \$5,000,000; Empire Steel and Iron Company, \$5,000,000; National Cash Register Company, \$5,000,000; Arcadian Copper Company, \$3,750,000; Isle Royal Copper

Company, \$3,750,000; Columbia Refrigerating Company, \$3,000,000; Columbia Automobile Company, \$3,000,000; Maritime Improvement Company, \$3,000,000; Boggs & Buhl, \$2,500,000; Egyptian Tobacco Company of America, \$1,500,000; Newport News Abattoir Company, \$1,500,000, and Brooklyn Gas and Electric Company, \$1,500,000.

MINERAL PRODUCTION OF NOVA SCOTIA

The following summary shows, so far as the Department of Mines has been able to learn, the mineral production of Nova Scotia for the year ending September 30th, 1898, compared with that for the year ending September 30th, 1897:

	Year Ending Sept. 30th, 1897.	Year Ending Sept. 30th, 1898.
Gold, ounces	26,579	31,104
Iron ore, tons*†.....	44,146	31,050
Manganese ore, tons†.....	100	75
Coal raised, tons†.....	2,320,916	2,281,124
Coke made, tons†.....	45,000	42,000
Gypsum, tons†**	125,000	131,000
Grindstones, etc.***	32,400	38,000
Limestone, tons†	25,000	24,000

*Not including imported ore.

†Ton of 2,240 lbs.

**Amount exported.

***Value in dollars.

A REMARKABLE AUTOMOBILE TRIP.

Promptly at 6 o'clock on Monday morning, May 22nd, Alexander Winton, president of the Winton Motor Carriage Company, started from Cleveland in company with Chas. B. Shanks, of the Cleveland Plaindealer, on a cross-country run to New York, a distance of nearly 800 miles. A large crowd cheered the autocarists as they started. They carried a message from Mayor Farley of Cleveland to Mayor Van Wyck of New York. The carriage used for the trip was built two years ago, and had covered 1,200 miles during that time. It was equipped with a cyclometer, and close reckoning was made all along the route. The route was parallel to the Lake Shore and New York Central Railway tracks, going straight along the lake front to Buffalo and then cutting at right angles across New York State to Albany. The schedule called for 100 miles a day, but this rate was greatly exceeded. Painesville, 30 miles from Cleveland, was reached in a little over an hour—the road for this distance being like a race track. The carriage passed Ashtabula at 9.20 and Conneaut at 10.06. At 1.10 Erie was reached, the journey of 95 miles having been made in 5 hours 3 minutes. Leaving Erie at 2 o'clock the carriage was reported at 3 o'clock passing Harbor Creek, Pa., at a fast rate. At 9 p.m. Buffalo was reached, the cyclometer showing 218 miles in 15 hours—an average speed of over 14½ miles per hour, not a moment up to this point having been lost on the way by reason of mishaps to the motor or machinery. The trip was not without accident, however, one of which—the breaking of an axle at Fairport—made it impossible for the travelers to cover as much ground in two days as they might in one. When the axle broke the carriage was running at top speed, and both the occupants had a narrow escape from injury. They failed to stop as abruptly as the automobile did, and were thrown twenty feet ahead in the road. This however, was the only breakdown of any kind in the trip.

The Winton carriage pulled up in front of the Astor House, New York, at 5.45 p.m., Friday, 26th May. Although the distance by rail from Cleveland to New York is but 623 miles, the cyclometer registered 707.4 miles—the extra distance being due to the fact that the wagon roads were not as direct as the railroads, and that the travelers were often sent miles out of their way by being misdirected. The total actual running time was 47 hours 29 minutes, giving an average time per mile for the entire trip of 4 minutes 2 seconds, or an average speed of nearly 15 miles per hour. Having set out to cover only 100 miles per day, the travelers really did 207.4 miles over the schedule. The route was across a diversified country, over all sorts of roads, and through sections that were extremely hilly. They twice