that should be considered is about twelve feet. Though some changes which were made in the design of this plant and adopted at Ann Arbor, Mich., will allow the use of heads of from six to ten feet, same will not give a steady input of ozone, as it is intermittent. This, together with the use of a small blower, seems so far to be satisfactory.

The area required for plant of size installed is only about one-tenth that required for American plant, and is not to be compared with the area required for slow sand filters. The sterilization plant proper constitutes raw water chamber, aspirator heads, ozone chambers, ozone generator, as well as time contact basin or mixing cell. The latter compels the water to travel horizontally as well as vertically, so as to give water the benefit of as long contact as is possible with ozone.

The ozone generator consists of boiler plate, shell and head, containing each 109 two-inch aluminum tubes, inside of which are micanite tubes or dielectrics, inside of which is another tube or cylinder which rests on a tray, which is connected to one terminal of a special 10,000 to 15,000 volt static transformer. The other terminal, which is a ground terminal, is connected to boiler plate shell; inner and outer tubes being so close and only separated by micanite tube, allows a continuous violent discharge to take place through the dielectrics, and the passage of air through this discharge produces the ozone, the production running from eighty to one hundred grammes per kilowatt, and the concentration of five or less, depending upon the condition, velocity and the temperature of the air discharged.

Sparks must be prohibited, as when a sparking condition takes place nitrous oxide is generated, and also high temperature should be provided against in the generators.

There is under construction another type of ozone generator, which from test on a small experimental unit has given as high as sixty grammes of ozone, with concentration of twenty, but it is too soon to say how this will work out in much larger sizes. This company expects, however, to have one of these generators in use soon for test, and more definite results will be obtained. The ozone generator may be either water, oil or air cooled. If it is air cooled, the outer shell has to be removed and the top and bottom heads supported by four rods, or a frame used, and air caused to circulate by any means between and around the outside of the fixed tubes.

The ozone generator in use here will be cooled by oil, to prevent, if possible, the sweating of the tubes when water is the cooling medium, as the oil will remain for some time after current is cut off, preventing moisture collecting and giving trouble at starting. The only trouble to be feared with oil cooled system is leakage, owing to the fact that it is a hard matter to get joints that will stay tight under oil pressure, although the pressure will not exceed from two to three pounds under any condition. Oil is circulated by means of ½ h.p. motor belted to rotary pump, the oil being passed through copper coils in a tank or cylinder through which water is flowing continuously. Each generator has its thermometer for determining the temperatures, and a controlling panel on which will be mounted indicating wattmeter, potential transformer plug, high tension switch, voltage regulating head which will permit of handling 2,300 volt current on the primary side of the transformer in such a manner as will give voltage of the secondary side of the transformer range from 7,500 volts to 15,000, or to be varied to intermediate volts. In addition to this there is a voltmeter reading to 15,000 volts, power factor meter, and frequency indicator. These panels are located over a concrete vault in which are located the transformers. Each million gallons unit requires 5 kilowatts in transformer capacity. All the switching is done at 2,000 volts on the primary side, and the high tension side is connected directly to the ozone generator through varnished cambric lead-incased cable two-conductor, placed in bituminized fibre tubes, encased in concrete.

Owing to the weather conditions and the fact that some of the apparatus for this plant, such as insulators, etc., were special, and the departure from the original design, continuous tests have only just begun on this plant.

Considerable information was obtained, on some of which further experiments will be carried out, to determine what would appear to be the slip of the bubbles of ozone or air, and the fact that they do not seem to fall at the same velocity with the water, or for some reason do not receive or hold the kinetic energy imparted to them, and the fact that the bubbles seem to rise at about .75 of a foot per second, this together with the fact that the specific gravity of the air bubbles and water, when the amount of ozone or air reaches certain entrainment, is so low that it loses its kinetic energy and the blow-off is caused, previously mentioned, and is similar to the action of the air lift, the mixture looking like soap bubbles in the down pipes momentarily.

When the temperature of the atmosphere is at or below zero, the strength of the ozone seems to be greater, and the absorption by the water varies, as the strength of the ozone given off by the water in the relief chamber over the time contact basin or pit is noticeably less to the smell, and a longer or shorter time is required in high temperatures or extremely cold weather before the ozone is noticeable. But the ozone in this relief chamber becomes noticeably thin when the temperature is high, but varies. Bunsen and Carius found that one hundred volumes of water near freezing absorb four volumes of oxygen and two volumes of nitrogen; and the absorption is quickened by stirring or mixing. Tests are under way to ascertain more fully this relation to the absorption of ozone, as water absorbs more air, and the more of it the lower the temperature; also it absorbs more oxygen than nitrogen. It is to determine this relation when ozone is mixed with water, as no data are available at the present time, that experiments are being made. From this, it seems that these gases, when absorbed, are given up as pressure lessons, that is, given up in minute bubbles, similarly to water which is highly charged with air and allowed to stand in a glass, which gradually becomes clear at atmospheric pressure. A cubic foot of water holds in solution about 0.029 cubic foot of air at about freezing point, and it is possible that the absorption or change increases or decreases the CO_2 in the water when ozone is applied.

The generators require about eighteen watts per square foot surface in the electrodes at sixty cycles, and twenty-one watts per square foot at one hundred cycles, but it is hoped to materially reduce the wattage with the new form of generators.

The tests below, which have been carried on under Mr. Powell's supervision, will undoubtedly prove very interesting.

OZONE RESULTS.

	Date	Bacteria Raw	Bacteria Oz'n	Coli Raw	Coli Oz'n	Color Raw	Color Oz'n	Turbidity Raw	Turbidity Oz'n
December.	10-09	1840	6	2/4	0/4	20	15	15	15
	11-09	1800	8	4/4	0/4	20	14	16	14
	13-09	15000	80	4/4	0/4	45	12	180	180
	14-09	4000	1620	3/3	1/4	35	28	80	80
	14-09	4000	1410	2/4	0/4	34	30	80	80
	15-09	1950	22	1/4	0/4	16	11	20	20
	16-09	1500	960	1/4	0/4	16	10	18	18
	17-09	1120	870	1/4	0/4	16	12	18	18
	18-09	1960	1500	2/4	0/4	17	12	20	20