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Water Pollution in Monroe County*

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Rochester, New York 14627WATER POLLUTION IN MONROE COUNTY
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During the last couple of years there has been quite a bit of controversy on the subject of water pollution in Monroe County, and quite a bit of confusion about the extent and seriousness of the problem. To help clear this up, I would like to take you on a rather lengthy, dull, and very grubby trip through the technical reports on water pollution of our group. These reports have been submitted to your committee, and I shall present here a brief summary of the results and their significance. The samples which were taken and analyzed were handled, by and large, according to the "Standard Methods for the Examination of Water and Sewage" of the American Public Health Association, 11th and 12th editions.

According to Hilleboe and Larrimore's book, "Preventive Medicine", the following diseases are associated with human fecal contamination: diarrhea of the newborn, dysentery, staph infections, typhoid, polio, virus meningitis, virus fever and virus diarrhea, virus hepatitis, virus gastroenteritis, amebiasis, and cysticercosis. They state that "In any community there are always persons suffering from disease. Therefore sewage always contains disease-producing organisms which, if brought into contact with healthy individuals, may cause disease." We quote Robert Hennigan, Principal Engineer, State Office for Local Government, "Continued discharge of untreated or partially treated sewage from our municipalities cannot be justified under any circumstances and should not be tolerated."

In September, 1964, Drs. Berg and Bannister took counts of coliform bacteria in Irondequoit Creek immediately above and immediately below the East Rochester sewage treatment plant (STP) outfall. Upstream from the outfall they found a count of 2 to 5 thousand per 100 ml.; downstream, counts of 2 million and 3 to 5 million. In the Oak Hills housing development, 1,500 feet downstream from the outfall, the count was 200 to 300 thousand. Coliform bacteria live in intestines, and are a good measure of the contamination of water with human fecal matter. The bacterial count at

the outfall was so high that there was no difference between this effluent and completely raw, unprocessed sewage. The bacterial count at the housing development downstream was as high as one would expect from mixing raw sewage with the water of the stream. The coliform bacteria were not killed or removed by the flow of the stream, and the stream was too loaded with sewage to be self-cleaning.

During October, 1964, Drs. Bannister, Berg, Newcomb, and Christensen carried out coliform counts on the waters of the Genesee River. On the basis of 13 counts taken on three different dates they concluded that the outfall of Irondequoit's Pattonwood plant at the Genesee Yacht Club was a major source of coliform contamination of the river; and that this plant was discharging a suspension of raw human fecal matter into the river. Counts upstream from the outfall ranged from 0 to about 50,000, with a median somewhere about 5,000; counts taken in the vicinity of the Pattonwood outfall ranged from around 0.2 million to around 7 million. The samples taken from the river below this outfall contained a flocculent, grey precipitate and had a strong objectionable smell. A shaking test confirmed that the coarse suspended matter was a source of coliform organisms.

These workers noted that some sources of coliform pollution of the river still remained in Rochester, but that they were rather minor when compared with the Pattonwood plant. The authors of the report noted the proximity of the Pattonwood outfall to Ontario and Summerville Beaches.

In May, 1965, counts on Irondequoit Creek taken below the East Rochester STP ran in the neighborhood of 50,000, and a count on Allen Creek shortly before it enters Irondequoit Creek gave about 70,000. The report concluded, "Irondequoit and Allen Creeks are polluted. The presence of human wastes makes these waters a disease hazard, and specifically makes their shores unsuitable for free access and play by children. The mouth of Irondequoit Creek is rated B for recreational use. This rating is not being met. Irondequoit Creek is clearly not self-cleansing under present conditions, since it had the same amount of fecal pollution at the creek mouth as it had near the sewage outfall."

During July, 1965, Bannister and Christensen measured coliform indices on the beaches and in the river very near its mouth. On July 10, with a brisk breeze from the northwest, they obtained counts of 50,000 at Durand-Eastman Beach and 20,000 at Ontario Beach. The count at the mouth of the river was 1.5 million; this extremely high value was due to discharges from Irondequoit's Summerville and Pattonwood plants.

In October, 1965 the Committee issued a report summarizing the coliform counts taken by four groups during the preceding summer, on three beaches on Lake Ontario. Webster, Ontario, and Durand-Eastman Beaches were studied by the Monroe County Health Department, the U.S. Public Health Service, the Committee, and the State Health Department. The counts jumped around quite a bit, but a large number of extremely high counts was obtained during June, July, and the first three weeks of August. The high counts seemed to be associated with winds from a generally northerly direction. The arithmetic average of counts for the summer was 5,850; that for the the period June 17-July 28 was 11,700. It should be noted that use of medians and logarithmic averages in interpretation of the hazard of sewage pollution is quite meaningless. The arithmetic average and range are uniquely well suited to estimating hazard. Medians and logarithmic averages have nothing whatsoever to do with the number of bacteria swallowed by a bather.

Last fall Mr. Dunkleberg and I carried out a chemical study of the Genesee River. The results indicated that there is massive pollution of the river between the southern boundary of Rochester and the mouth of the river. This pollution consists of industrial wastes (such as chemicals from Eastman Kodak and brewery wastes from the Genesee Brewing Company), and sewage. Some of this sewage was not chlorinated, and most of it contained solids, both violations of state law. The extent of this organic pollution was such that the river was unable to cleanse itself by bacterial oxidation before it entered Lake Ontario. We found material of very high oxygen demand being put into the river by both Kodak, (which does, however, give its effluents treatment) and the Genesee Brewery, and also chemicals, such as strong alkali. We found spent grain discharging into the river from the brewery and being eaten by rats. We found unchlorinated sewage issuing from a combined storm-overflow

sewer near Seth Green; this sewage contained fecal pellets. We found sewage containing solids (paper, grease balls, condoms, grey sediment, and dung particles) at the Pattonwood plant outfall, and this sewage was on occasion found to contain no chlorine. The same thing can be said for the Summerville plant outfall.

This past May Dr. Christensen and I reported the following conclusions. Between April 2 and May 11, the outfalls of Irondequoit discharged into the river large quantities of sewage solids (toilet paper, black sludge, grease balls, condoms, and dung); about half of this sewage contained no free chlorine, and the unchlorinated sewage contained of the order of a million coliforms per hundred milliliters. We also noted that the chlorination of sewage containing solids is quite ineffective in disinfecting the material. The area concerned is populated, and the water is used extensively by boaters and occasionally by water skiers. Un processed sewage continued to enter the river from the storm sewer near Seth Green.

Samples taken from Lake Ontario off Durand-Eastman Beach in the vicinity of the deeply submerged discharge point of the Durand-Eastman STP of the City of Rochester contained grease balls, small pieces of dung, condoms, and toilet paper. A coliform count of 50,000 was obtained on one sample of lake water near the discharge point, indicating that this sewage is not disinfected.

Last summer some doubt was raised by local officials concerning the causal relationship between the discharge of raw sewage into the Genesee and the lake, and the occurrence of coliform counts on the beaches far in excess of the 100 to 1,000 per hundred ml commonly regarded as permissible or even the 2,400 per hundred ml permitted by New York State law. It was suggested that these were soil coliforms, or that they were of bather origin.

To assist in clearing up these points, Mr. Dunkleberg and I carried out float tests this spring at the mouth of the river and at the outfall of the Durand-Eastman STP in the lake. Also, careful examinations of the debris on the beaches were made. These are continuing.

Grease balls identical in appearance to those found in large numbers at the sewage outfalls were found in extensive deposits on Ontario Beach, on Summerville

Beach, along the entire length of Durand-Eastman Beach, and on the beach just west of Irondequoit Bay. Condoms and what appeared to be fecal pellets were noted occasionally. Floats put into the river on five occasions were generally recovered on the beach east of the river, although a few were found on Ontario Beach and some were lost. On the one occasion that floats were put into the lake at the Durand-Eastman outfall, they were recovered in large drifts of grease balls on the beach west of the mouth of Irondequoit Bay; this is a densely populated area.

Chlorine tests were run fairly regularly on the outfalls of the Pattonwood and Summerville STP's; tests on the effluent of the Pattonwood plant were negative essentially without exception up through June 4, indicating either no chlorination or inadequate chlorination. This plant discharged large amounts of black sludge on May 11 and 14. The Summerville plant discharged black sludge into the river on May 17, but has been chlorinating. Both plants have been chlorinating regularly since the first week in June, but are not effectively disinfecting, as indicated by very high coliform counts in the river water in the vicinities of the outfalls. We again note that it is impossible to disinfect sewage containing solids by chlorination.

During the last few weeks we have again observed widely fluctuating coliform counts on area beaches - including counts of 30,000 and more. We have also found sewage grease balls on the public beaches and in the water when these counts were obtained. The high counts and grease balls are generally associated with winds blowing from the Durand-Eastman plant outfall or the river mouth toward the beaches affected. Extremely heavy "wash-ins" of algae have been noted at Webster Beach; these are often a sign of over fertilization of water with nitrates and phosphates, both of which are formed in large amounts in sewage. Our recent counts on this beach are 20,000, 36,000, and 24,000.

Last fall and winter Drs. Bannister and Christensen and I carried out some studies on Honeoye Creek in the vicinity of Honeoye Falls. We concluded that the Honeoye Falls STP was responsible for the accumulation of extensive and objectionable sludge banks immediately downstream from the outfall. On all dates of observations, the

plant was chlorinating heavily. This plant was overburdened by creamery wastes which are quite difficult to break down. High coliform counts, in excess of legal standards for residential areas, occurred both above the STP (in the village, where the classification of the stream is B) and well below the plant. The possibility of faulty septic tanks or privies, or household sewer lines opening directly into the creek in Honeoye Falls or in North Bloomfield should be considered in seeking the sources of these organisms. Counts in the stream of over 100,000 were observed. We checked Honeoye Creek again last week, and found that the quality of the STP effluent was markedly improved. No sludge beds and no solids in the effluent were seen. The sewage was chlorinated. The situation is still by no means ideal, due to the small flow of water in the stream during the summer months, but significant progress has been made by the creamery and the town.

This month we have begun a study of Oatka Creek, a tributary to the Genesee; we started in the vicinity of Scottsville. Coliform counts and residual free chlorine tests indicate that the Scottsville STP puts sewage solids and undisinfected sewage into Oatka Creek. This is a clear-cut violation of the stream's state classification of B, recreational. Counts in the stream below the sewage treatment plant were 46,000 and 120,000; the sewage effluent gave counts of 13.4 million and 13.8 million, among the highest counts we have ever obtained, and indicating that this effluent is essentially raw sewage. Sludge deposits were observed in the stream.

Last week we began a study of Slater Creek, which discharges into Lake Ontario a short distance west of Ontario Beach. The creek runs by a children's playground, at which point the coliform count was 3.3 million. At the mouth of the creek, with the flow greatly augmented by a large volume of cooling water from a power plant, the count was 90,000. Slater Creek receives sewage effluent from the Town of Greece, and is literally an open sewer - foul-smelling, grey, and ruined.

We have demonstrated extensive pollution of the creeks which was not abated by public health authorities. We have demonstrated the discharge of undisinfected sewage and of sewage solids into the lake and river. We have demonstrated that this sewage drifts to the beaches, where high bacterial counts are correlated with the appearance of sewage solids. Gentlemen, we need your help. We need it desperately. Thank you.