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INTERNATIONAL JOINT COMMISSION

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RÉSUMÉ OF TESTIMONY OF  
CONSULTING SANITARY ENGINEERS

IN THE MATTER OF THE

Pollution of Boundary Waters

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CONFERENCE AT NEW YORK CITY  
MAY 26-27, 1914



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1914

INTERNATIONAL JOINT COMMISSION.

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INTERNATIONAL JOINT COMMISSION.

POLLUTION OF BOUNDARY WATERS.

FUNDAMENTAL PRINCIPLES UPON WHICH THE FOLLOWING  
CONSULTING SANITARY ENGINEERS WERE IN UNANIMOUS  
AGREEMENT.

NEW YORK, *June 27, 1914.*

To the INTERNATIONAL JOINT COMMISSION.

GENTLEMEN: The following statements represent the essence of the opinions given by us before your honorable commission at the conference held in New York on May 26 and 27, 1914:

1. Speaking generally, water supplies taken from streams and lakes which receive the drainage of agricultural and grazing lands, rural communities, and unsewered towns are unsafe for use without purification, but are safe for use if purified.

2. Water supplies taken from streams and lakes into which the sewage of cities and towns is directly discharged are safe for use after purification, provided that the load upon the purifying mechanism is not too great and that a sufficient factor of safety is maintained, and, further, provided that the plant is properly operated.

3. As, in general, the boundary waters in their natural state are relatively clear and contain but little organic matter the best index of pollution now available for the purpose of ascertaining whether a water-purification plant is overloaded is the number of *B. coli* per 100 cubic centimeters of water expressed as an annual average and determined from a considerable number of confirmatory tests regularly made throughout the year.

4. While present information does not permit a definite limit of safe loading of a water-purification plant to be established, it is our judgment that this limit is exceeded if the annual average number of *B. coli* in the water delivered to the plant is higher than about 500 per 100 cubic centimeters, or if in 0.1 cubic centimeter samples of the water *B. coli* is found 50 per cent of the time. With such a limit the number of *B. coli* would be less than the figure given during a part of the year and would be exceeded during some periods.

5. In waterways where some pollution is inevitable and where the ratio of the volume of water to the volume of sewage is so large that no local nuisance can result, it is our judgment that the method of sewage disposal by dilution represents a natural resource and that the utilization of this resource is justifiable for economic reasons, provided that an unreasonable burden or responsibility is not placed upon any water-purification plant and that no menace to the public health is occasioned thereby.

6. While realizing that in certain cases the discharge of crude sewage into the boundary waters may be without danger, it is our

judgment that effective sanitary administration requires the adoption of the general policy that no untreated sewage from cities or towns shall be discharged into the boundary waters.

7. The nature of the sewage treatment required should vary according to the local conditions, each community being permitted to take advantage of its situation with respect to local conditions and its remoteness from other communities, with the intent that the cost of sewage treatment may be kept reasonably low.

8. In general, the simplest allowable method of sewage treatment, such as would be suitable for small communities remote from other communities, should be the removal of the larger suspended solids by screening through a one-fourth inch mesh or by sedimentation.

9. In general, no more elaborate method of sewage treatment should be required than the removal of the suspended solids by fine screening or by sedimentation, or both, followed by chemical disinfection or sterilization of the clarified sewage. Except in the case of some of the smaller streams on the boundary, it is our judgment that such oxidizing processes as intermittent sand filtration, and treatment by sprinkling filters, contact beds, and the like, are unnecessary, inasmuch as ample dilution in the lakes and large streams will provide sufficient oxygen for the ultimate destruction of the organic matter.

10. Disinfection or sterilization of the sewage of a community should be required wherever there is danger of the boundary waters being so polluted that the load on any water-purification plant becomes greater than the limit above mentioned.

11. It is our opinion that, in general, protection of public water supplies is more economically secured by water purification at the intake than by sewage purification at the sewer outlet, but that under some conditions both water purification and sewage treatment may be necessary.

12. The bacteriological tests which have been made in large numbers under the direction of the International Joint Commission indicate that in most places the pollution of the boundary waters is such as to be a general menace to the public health should the water be used without purification as sources of public water supply or should they be used for drinking purposes by persons traveling in boats.

13. It is our judgment that the drinking water used on vessels traversing boundary waters should not be taken indiscriminately from the waters traversed, unless subjected to adequate purification, but should be obtained preferably from safe sources of supply at the terminals.

14. While recognizing that the direct discharge of fecal matter from boats into the boundary waters may often be without danger, yet in the interest of effective sanitary administration it is our judgment that the indiscriminate discharge of unsterilized fecal matter from vessels into the boundary waters should not be permitted.

Yours, respectfully,

GEORGE W. FULLER.  
EARLE B. PHELPS.  
GEORGE C. WHIPPLE.  
W. S. LEA.  
T. J. LAFRENIERE.

## MINORITY RÉSUMÉ OF TESTIMONY BY MR. F. A. DALLYN.

NOTE.—Mr. Dallyn's revision of the résumé report is not essentially different from the original. He insisted on the elimination of paragraphs 5, 7, and 11, which he considered to be an expression of self-evident facts and substituted monthly for yearly averages in determining the number of *B. coli* per 100 cubic centimeters of water.—A. J. McLaughlin, Chief Sanitary Expert.

1. Speaking generally, water supplies taken from streams and lakes which receive the drainage of agricultural and grazing lands, rural communities, and unsewered towns, are unsafe for use without purification, but are safe for use if purified.

2. Water supplies taken from streams and lakes into which the sewage of cities and towns is directly discharged are only safe for use after most careful purification and provided that the load upon the purifying mechanism is not too great and that a sufficient factor of safety is maintained, and, further, provided that the plant is properly operated.

3. As, in general, the boundary waters in their natural state are relatively clear and contain but little organic matter, the best index of pollution now available for public-health purposes of ascertaining whether a water purification plant is overloaded is the number of *B. coli* per 100 cubic centimeters of water expressed as a monthly average and determined from a considerable number of confirmatory tests regularly made throughout that period.

4. While present information does not permit a definite limit of safe loading a water purification plant to be established, it is our judgment that this limit is exceeded if the monthly average number of *B. coli* in the water delivered to the plant is higher than about 500 per 100 cubic centimeters, or if in 0.1 cubic centimeters samples of the water *B. coli* is found 50 per cent of the time. With such a limit the number of *B. coli* would be less than the figure given during a part of the year and would be exceeded during some periods.

5. While realizing that in certain cases the discharge of crude sewage into the boundary waters may be without danger, it is our judgment that effective sanitary administration requires the adoption of the general policy that no untreated sewage from cities or towns shall be discharged into the boundary waters.

6. In general the simplest allowable method of sewage treatment, such as would be suitable for small communities remote from other communities, should be the removal of the larger suspended solids by suitable screening or by sedimentation.

7. In general, under existing conditions no more elaborate method of sewage treatment need be required than the removal of the suspended solids by fine screening or by sedimentation, or both, followed by chemical disinfection or sterilization of the clarified

sewage, except in the case of some of the smaller streams on the boundary, inasmuch as ample dilution in the lakes and large streams can provide sufficient oxygen for the ultimate destruction of the existing discharge of organic matter. Unfortunately, water-front conditions show that the existing arrangements in many places are such as do not take advantage of this dilution.

8. Disinfection or sterilization of the sewage of a community should be required wherever there is danger of the boundary waters being so polluted that bathing beaches, summer resort waters, and the load on any water purification plant becomes greater than is in the interests of public health.

9. The bacteriological tests which have been made in large numbers under the direction of the International Joint Commission indicate that in almost all of the waters examined pollution is such as to be a general menace to the public health should the water be used without purification as sources of public water supply or should they be used for drinking purposes by people traveling in boats.

10. It is our judgment that the drinking water used on vessels traversing boundary waters should not be taken indiscriminately from the waters traversed, unless subjected to adequate purification.

11. While recognizing that the direct discharge of fecal matter from boats into the boundary waters may often be without danger, yet in the interest of effective sanitary administration it is our judgment that the indiscriminate discharge of unsterilized fecal matter from vessels into the boundary waters should not be permitted.

Yours, respectfully,

F. A. DALLYN.

