

large streams which can effectually take care of wastes from waste-producing industrial plants for an indefinite period in the future.

**Legal Control Over Stream Pollution.**—A discussion of stream pollution would not be complete without some consideration of legal control. As already indicated, the cleanness of streams cannot be conserved unless under a central governmental supervision. If left to individual communities, very little could be expected in the way of results. Communities are not likely to be altruistic enough to spend large sums of money for sewage purification works to protect neighbors on the stream below, unless such altruism is induced by damage suits which render sewage purification the cheapest way out of the difficulty. But law-suits are costly if long drawn out, and the results are often unsatisfactory.

For successful solution it is essential that specific problems relating to stream pollution be placed in the hands of experts. It is, therefore, necessary, or at least strongly advisable, that every state have an expert commission. Among many there is a strong prejudice against commissions, inasmuch as the multiplication of commissions is looked upon as a delegation of legislative and executive powers to others than direct representatives of the people. This need not necessarily be so, however, for a law may be framed requiring in general terms that streams must be maintained in an inoffensive condition and that they shall not be detrimental to health. This leaves to the commission not arbitrary powers, but the simple function of determining points of fact within limits prescribed by prior legislative enactment. That is to say, the commission will determine when a stream is in danger of being made offensive and when it is in danger of being made detrimental to health, and thereupon decide what purification of sewage and industrial wastes is necessary, whether water supplies may or may not be taken from streams and to what extent they must be purified. Such a commission should be supplied with ample appropriations to enable it to obtain all necessary information for its guidance, whether this consists in maintaining laboratories or in carrying on experimental and research work. As even the best of commissions may at times grow arbitrary or become unduly biased in its views, there should always be made provision for ready appeal from the decisions of a commission to an independent special arbitration board of experts, and, of course, there must exist the inalienable right of appeal to the courts.

The Berlin Elevated and Underground Railway, Berlin, Germany, has recently completed, at a cost of over \$2,000,000 and has opened for public service, an extension from Wittenbergplatz in Berlin to the fashionable suburb of Dahlem.

One of the most wonderful structures of its kind, and one that is said to be the only large-span bridge in the world designed for four lines of railway traffic, is the Hell Gate steel arch bridge now under construction at New York. The Long Island abutment pier is well under way and the foundation for the Ward's Island pier is complete. Fabricated steel work is already being received and the erection of the arch will probably be under way before the end of the summer. The structure will be notable for the magnitude of its chord sections. Each single section will have a weight equal to twice that of the heaviest erection parts of the great bridges already existing. The weight of the structure will average about 38,000 pounds steel and 53,000 pounds total per lineal foot. The great weight is due to the large live-load capacity provided. When it is in operation there will be a constant succession of the heaviest freight trains passing back and forth over the structure.

## THE MINERAL PRODUCTION OF CANADA, 1913.

THE preliminary report on mineral production in Canada in 1913, prepared by John McLeish, B.A., Chief of the Division of Mineral Resources and Statistics, shows a total value of production in the year of \$144,031,047. Although estimates have been made in some cases where complete returns were not available it is probable that the final record will be a revision upward. The total value of the production in 1912 was \$135,048,296 compared with which the 1913 output shows an increase of \$8,982,751, or 6.65 per cent. In view of the large increase over all previous years made in mineral production in 1912 and the general trade depression and industrial restriction experienced during the latter part of 1913, the industry would appear to have made in the aggregate very satisfactory progress. The average production per capita in 1913 was \$18.57 as against \$18.27 in 1912 and \$14.93 in 1910.

The record of annual mineral production in Canada since 1886 shows the rapid growth of the industry; not only has the total output increased from a little over \$10,000,000 in 1886 to its present output, but the average production per capita has increased from \$2.23 per capita to \$18.57, or eight times the rate shown by the first record. This is shown in Table I.

Table I.—Annual Mineral Production in Canada Since 1886.

Year.	Value of production.	Value per capita.	Year.	Value of production.	Value per capita.
1886..	\$10,221,255	\$2.23	1900..	\$64,420,877	\$12.04
1887..	10,321,331	2.23	1901..	65,797,911	12.16
1888..	12,518,894	2.67	1902..	63,231,836	11.36
1889..	14,013,113	2.96	1903..	61,740,513	10.83
1890..	16,763,353	3.50	1904..	60,082,771	10.27
1891..	18,976,616	3.92	1905..	69,078,999	11.49
1892..	16,623,415	3.39	1906..	79,286,697	12.81
1893..	20,035,082	4.04	1907..	86,865,202	13.75
1894..	19,931,158	3.98	1908..	85,557,101	13.16
1895..	20,505,917	4.05	1909..	91,831,441	13.70
1896..	22,474,256	4.38	1910..	106,823,623	14.93
1897..	28,485,023	5.49	1911..	103,220,994	14.42
1898..	38,412,431	7.32	1912..	135,048,296	18.27
1899..	49,234,005	9.27	1913..	144,031,047	18.57

The continuance during 1913 of the labor strike at the mines of the Canadian Collieries (Dunsmuir) Limited, and its extension to the other collieries on Vancouver Island, seriously restricted the coal output from that district. The total value of the metals was also somewhat smaller than it might otherwise have been because of the slightly lower average prices obtained for copper and silver. A restricted demand was also reported during the latter part of the year for brick and other clay products and structural materials. While these are some of the influences that have tended to curtail the mineral output during the year, there have been, on the other hand, important increases in the production of gold, nickel, lead, amongst the metals, in asbestos, natural gas and many of the other lesser valuable non-metal products and in cement, resulting in the net increases already shown.

The production of the metals and minerals of special importance to engineers, contractors and manufacturers of their supplies is shown in Table II., in which the figures are given for the two years 1912 and 1913 in comparative form, and the increase or decrease in value shown.