whole, of the polluted shore waters which are thus drained into the canal and fall into the Montreal harbor without passing through our aqueduct.

Now you will also notice on this map, two points marked one in red and the other in blue, and also a blue cross. These points indicate the places where the samples of water have been taken by the commission on whose report was based the more recent and more ardent criticism against the Montreal water supply. The blue cross indicates the place in the river from which the prolonged conduit which forms a part of what is graciously called the Janin Scheme, will draw next year the water supply for Montreal. From that place, samples of water have been taken in 1906 by the bacteriologists of the city who have declared in their report, dated January, 1907, that these samples contained 75 per cent. less bacterial than the samples taken in the canal of the aqueduct.

Actually the city council has ordered, that, for the period of one year, samples of water taken from the old intake and from the new one, should be analysed. I have no doubt that the conclusions will establish that the new intake will be an improvement so important that, for a certain time at least, it will satisfy the hygienic requirements, until filtration becomes absolutely necessary.

Now, if you will kindly notice the distance between the two points, blue and red, and the blue cross marked on the map, that is 18 miles, you will be convinced that this distance, covered by Lake St. Louis, forms, an immense sedimentation basin and permits us to say that the doubtful quality of the samples taken at that distance from the present and from the future intake of the aqueduct does not justify the pessimistic opinion which has spread in the public mind against the Montreal Water Supply.

This great city is placed under natural conditions almost unique to provide itself with water from one of the greatest rivers of the world; a river which in fact is but a succession of lakes forming immense sedimentation basins, and also falls and gigantic rapids aerating its waters; a river whose banks will be for a long time to come, inhabited only by a comparatively spare population to which it will be easy to impose laws against the pollution of the water supplies; without regard to that same marvellous river which offers us just a few miles from our pumping station, an important power that my scheme means to utilize for the pumping of the said water.

During recent years, in discussing the Montreal Water Supply, allusion has often been made to the great cities of the United States which are provided, at the cost of millions, with filtration plants or who have drawn their water supplies from hundreds of miles, forgetting to say that these cities are very far from being in the conditions that I have just showed for Montreal, and that they were absolutely obliged to have recourse to those expensive means, for, instead of having within their reach our beautiful St. Lawrence, such cities as for example St. Louis, Ms., and Cincinnati, Ohio, have only streams of polluted mud, or cities like Boston and New York the undrinkable sea water.

PROBLEMS IN APPLIED STATICS.

T. R. Loudon, B.A.Sc.

This series of problems began in the issue for the week, October 22nd, 1909. It is assumed that the reader either has an elementary knowledge of the subject of Statics, or is in a position to read some text on such theory.

Take moments about the point P (the intersection of LK and KD).

$$\Sigma M = M_{AM} + M_{ML} + M_{LK} + M_{KD} + M_{DC} + M_{CB} + M_{BA} = 0.$$

$$4{,}000.20 + ML.\frac{20}{\sqrt{3}} + 0 + 0 - 1{,}000.5 - 1{,}000.10 - 1{,}000.15 = 0.$$

$$ML = -50{,}000\frac{\sqrt{3}}{20.}$$

$$= -2{,}500\sqrt{3}.$$

From the negative result we see that the M_{ML} about P is negative. ML must, therefore, act away from the

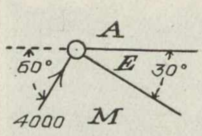

Fig. 110.

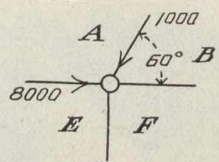

Fig. 111.

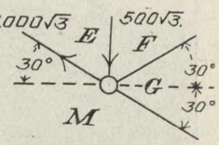

Fig. 112.

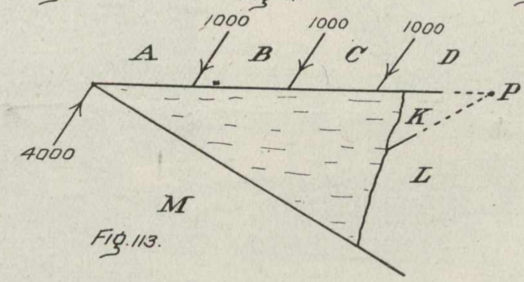

Fig. 113.

section; i.e., the member ML is in tension $2{,}500\sqrt{3}$ pounds.

Consider the Point GMLH.

$$\Sigma X = X_{GM} + X_{ML} + X_{LH} + X_{HG} = 0.$$

$$-3{,}500\sqrt{3}.\cos 30^\circ + 2{,}500\sqrt{3}.\cos 30^\circ + LH\cos 30^\circ + 0 = 0.$$

$$LH = 1{,}000\sqrt{3}.$$

The member LH is evidently in tension $1{,}000\sqrt{3}$ pounds.

$$\Sigma Y = Y_{GM} + Y_{ML} + Y_{LH} + Y_{HG} = 0.$$

$$3{,}500\sqrt{3}.\sin 30^\circ - 2{,}500\sqrt{3}.\sin 30^\circ + 1{,}000\sqrt{3}.\sin 30^\circ + HG = 0.$$

$$\tfrac{1}{2}(3{,}500\sqrt{3} - 2{,}500\sqrt{3} + 1{,}000\sqrt{3}) + HG = 0.$$

$$HG = -1{,}000\sqrt{3}.$$

The member HG is in compression $1{,}000\sqrt{3}$ pounds.

By considering the points CBFGHJ, DCJK, and KJHL, the stresses in the remaining members may be found.

Graphical Solution.

It is advisable in this problem to first construct a separate Vector Polygon for each set of forces considered, and then draw the Stress Diagram rather than try to follow the Vector Polygons on a Stress Diagram, as was done in the case of the Queen Post Truss.