

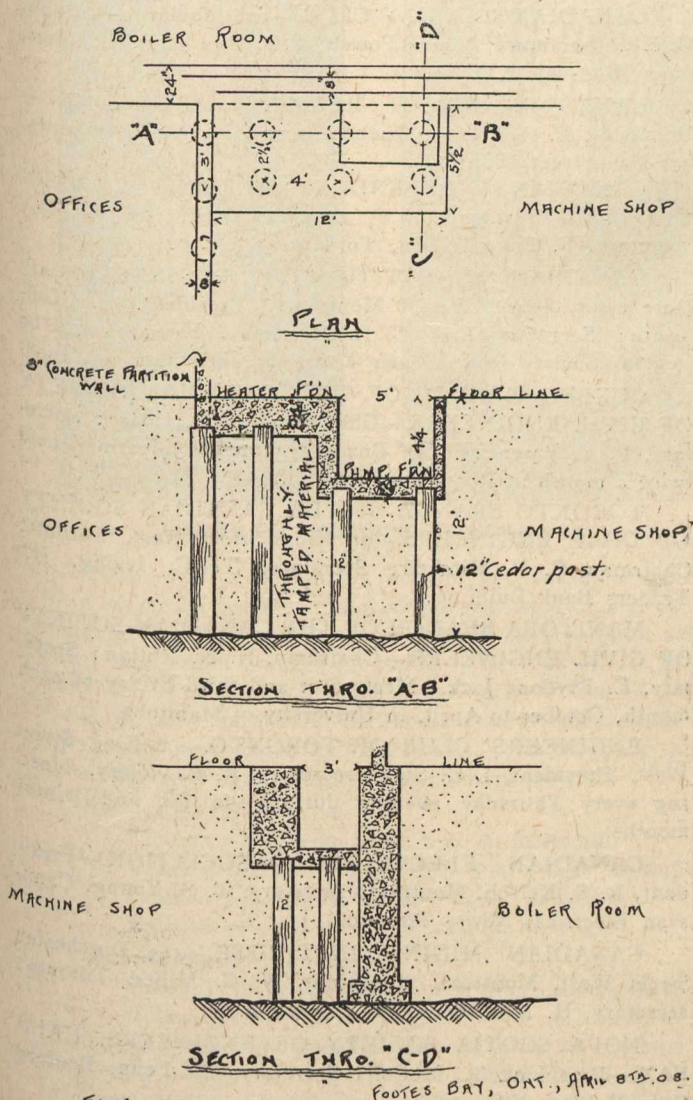
CORRESPONDENCE

[This department is a meeting-place for ideas. If you have any suggestions as to new methods or successful methods, let us hear from you. You may not be accustomed to write for publication, but do not hesitate. It is ideas we want. Your suggestion will help another. —Ed.]

FOUNDATIONS.

Sir,—Where concrete engine houses and machine shops are located in irregular ground with a solid rock foundation at a reasonable depth, it is sometimes necessary to excavate the entire area, owing to so many pits, etc., which occur within the building. If the main walls and foundation to carry heavy machinery have been brought up from solid foundations, it is then that the question arises concerning the foundation to carry light machinery—machinery with slight or practically no vibration—such foundation should be economical, and a saving in concrete is the greatest economy that can be made in actual construction.

The accompanying sketch shows the foundation for a 100 horse-power feed water heater, a $4\frac{1}{2} \times 2\frac{3}{4} \times 4$ duplex boiler feed pump; and an 8-inch concrete partition wall, as erected in the boiler house at the C.P.R. divisional yard at Muskoka, on the Toronto-Sudbury branch.



E. L. M.

Twelve-inch cedar posts were placed as shown in the accompanying plan, and the filled in material thoroughly tamped around them. In placing on the "capping" of concrete the posts were allowed to extend into the concrete a half foot or more. A perfectly rigid foundation was thus secured and great saving in concrete effected. Yours truly, Stanley Brae, April, 1908.

E. L. Miles.

REFORESTATION AND RIVER FLOW.

Sir,—I would gladly review Mr. Breithaupt's interesting discussion of River regulation on the Grand River, as reported in the Canadian Engineer of April 10th, if I had the advantage of being familiar with local conditions.

Without such local knowledge I could only speak on the generalities involved in river regulation, and especially on that part of the subject in which I am most interested,—the effect of reforestation. But this would hardly advance the practical solution of the definite problem of the Grand River floods. For, as Mr. Breithaupt fully realizes—or perhaps does not realize fully enough—local conditions vary the forest influence to such a degree, that instead of the forest cover being beneficial it may under some conditions even become detrimental, or at least nugatory, as regards regulation of water flow.

To tell the truth, while we know much of the general philosophy of the influence of forest cover on water flow, we are not so fully informed as to details of this influence as we might wish. Twenty years ago I compiled what definite knowledge was then in existence regarding these influences, and came to the following conclusions:—

"The surface drainage is retarded by the uneven forest floor more than by any other kind of soil cover. Small precipitations are apt to be prevented from running off superficially through absorption by the forest floor. In case of heavy rainfalls this mechanical retardation in connection with greater subterranean drainage may reduce the danger from freshets by preventing the rapid collection into runs. Yet, in regions with steep declivities and impermeable soil, such rains may be shed superficially and produce freshets in spite of the forest floor, and an effect upon water conditions can exist only from the following consideration:—

The well-kept forest floor, better than even the close sod of a meadow, prevents erosion and abrasion of the soil and the washing of soil and detritus into brooks and rivers.

Water stages in rivers and streams which move outside the mountain valleys are dependent upon such a complication of climatic, topographic, geological, and geographical conditions at the headwaters of their affluents that they withdraw themselves from a direct correlation to surface conditions alone. Yet it stands to reason that the conditions at the headwaters of each affluent must ultimately be reflected in the flow of the main river. The temporary retention of large amounts of water and eventual change into subterranean drainage which the well-kept forest floor produces, the consequent lengthening in the time of flow, and especially the prevention of accumulation and carrying of soil and detritus which are deposited in the river and change its bed, would at least tend to alleviate the dangers from abnormal floods and reduce the number and height of regular floods." (Bulletin 7, Forestry Division, United States Department of Agriculture, Forest Influences, 1887).

Yet even to-day we have not very far advanced in exact knowledge and must still remain doubtful as to the precise function of the forest, and all the general assertions that are found in literature on forest influences, except perhaps those on soil erosion, need more careful investigation. One point, for instance, on which Mr. Breithaupt seems to assume definite knowledge, namely the beneficial influence of forest cover on ground water has, indeed, only lately been thrown into doubt by the elaborate investigations of the Russian Otozky, who goes so far as to state:—"The doctrine of the hydrologic activity of the forest is a physiographic ideology, which is contradicted by exact observations and investigations."

In a very illuminating report before the International Forest Congress at Vienna this year, Dr. Fankhauser rehearses what knowledge exists or rather the lack of definite