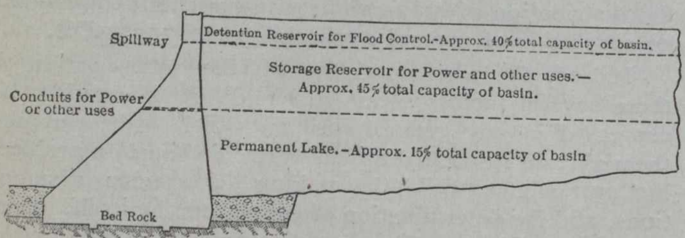
could be poured, except possibly to a small extent the overflow basins along the Mississippi. On the other hand, on almost any of the upper tributaries may be found physically practicable sites of sufficient capacity, if properly developed, to insure effective flood control. To-day, however, many of these sites are crossed by important railway systems which cannot be well re-located, or are occupied by villages and cities, rich and highly developed farms, mineral properties, etc., and, of course, almost all are traversed by public highways. It thus results that the occupancy of such sites for reservoir purposes, though physically practicable, is often economically prohibitory.

As a flood control measure, pure and simple, a reservoir may be only a trade-off, with the balance sheet against it. To quote again from the writer's early reservoir report (p. 46):—

"Floods are only occasional calamities at worst. Probably on the majority of streams destructive floods do not occur, on the average, oftener than once in five years. Every reservoir built for the purposes of flood protection alone would mean the dedication of so much land to a condition of permanent overflow in order that three or four times as much might be redeemed from occasional overflow. One acre permanently inundated to rescue three or four acres from inundation of a few weeks once in three or four years, and this at a great cost, could not be considered a wise proceeding, no matter how practicable it might be from engineering considerations alone."

It will conduce to a clearer presentation of the subject if we assume what may be called an ideal example, setting forth its possible development on the foregoing lines, and then noting the qualifying conditions which must often interfere with such development, and compel its abandonment or the acceptance of something less than the highest result. Suppose (Fig. 1) that there exists a practicable reservoir site in the valley of an important stream; that industrial and other uses in the valley can profitably utilize all the flow of the stream which could be made available; and that flood conditions in the valley are such as to justify extensive measures of relief. Let it be assumed that public authority, State or Federal, has been given the right to supervise reservoir construction, and to see that it is planned, if desirable, so as to serve all the purposes of which the development is capable.



Illustrating "Ideal" Combination of Reservoir Uses.

The first consideration would be the requirements of use. It would be necessary to determine a storage capacity sufficient to equalize the flow of the stream, at least to its mean annual volume. It might indeed be very useful to do more than this, and make the excessive run-off of some years offset the deficiency of others. If it were planned to put in a power plant immediately at the base of the dam, or at least where it could utilize the head created by that structure, it might be of advantage to make the dam permanently tight to a considerable elevation. This would insure a minimum head to be relied on at all times, and would greatly reduce the range of annual fluctuation and the resulting differences in head. With all conditions of the problem fully considered, the storage capacity would be determined, and with it the maximum level for this part of the reservoir.

The spillway would be placed at the maximum storage level just determined. The flood-control problem would then be worked out, based on the most extreme assumptions that could reasonably be made. The additional height of dam, and the spillway capacity necessary to secure the desired control, would follow, and the full dimensions of the dam would thus be determined. The portion of the reservoir below the spillway would be subject to human control; that above would not. The super-reservoir would really be of the dry type, because all that portion of the basin above the spillway level would drain out promptly after the passage of a flood, and would remain dry most of the time.

EFFECT OF CREOSOTED WOOD STAVE PIPE UPON WATER FOR DOMESTIC AND IRRIGATIONAL USES

Experiments to determine the effect of creosoting on the quality of water passing through wood stave pipe have been made recently by the Bureau of Industrial Research of the University of Washington. The tests to determine the effect upon the potability of water passing through the pipe were made with a 48-ft. section of 4-in. creosoted Douglas fir stave pipe. The treatment was 16 lbs. of creosote per cubic foot of wood. In the experiment the water was circulated through the pipe for 6 hours at a velocity of 5 ft. per second before taking each sample. The taste of the water was accepted as evidence of its potability. It was found that after the experimental pipe line had been in service for 13 days, no taste of creosote could be detected in a sample of the water diluted with two parts of ordinary city water. After the experimental pipe line had been in service for 29 days, no taste of creosote could be detected in undiluted water flowing through it.

The test was extended to determine the effect of minute quantities of creosote upon the availability of the water in irrigation. The conclusion reached as the result of the test was:—

The amount of creosote that diffuses into water in ordinary creosoted pipes does not have an appreciable injurious effect upon plants either in the time of germination, the percentage of germination, the rapidity of growth or the general vigor of the plant.

The British Trade Commissioner in Australia, after visiting the Broken Hill steel works, Newcastle, N.S.W., reports that large quantities of rails have been turned out, principally for the Government railway between Port Augusta and Kalgoorlie. The demand for rails has been so great that the company has found it impossible to carry out its intention of rolling plates and sheets. Channel sections are being rolled to the order of the New South Wales Government. Before the war practically all such sections were imported from Europe. The company, it is stated, can roll 4-ft. plate for its own use, but is not in a position to roll 5-ft. plate, the most suitable size for shipbuilding. It is thought, however, that it may be possible to utilize 4-ft. plate for shipbuilding, and if this can be done one of the hindrances to the development of the shipbuilding industry in the Commonwealth will be overcome. Other prospective developments in connection with the steel works include wire drawing and the manufacture of wire nails.