HYDRATION OF WOOD FROM LIVING TREES.

The specimens, upon which the principal facts of this paper are based, were collected as sections of living trees, representing on the one hand, branches of two years growth, and on the other, branches from two to four years old. For the obvious reason that the bark could not be properly separated from the wood with any degree of uniformity, it was left on in every case, so that in all the determinations here given, the results show the combined percentage of water in wood and bark. Obviously, this gives a result which differs materially from that which would be obtained if bark and wood were considered separately. Also, while care was taken not to collect specimens in which the dead bark was strongly developed, thus securing as great uniformity as possible, the very fact that the bark was present, as well as the certainty of its being variable in structural character and thus also in hydration, as collected even from the same species at different seasons, rendered variations in the results unavoidable. This will doubtless appear upon examining individual cases, but the error from this source is reduced in the aggregate, so that the mean results, in view of all the precautions taken, may doubtless be accepted as correct.

From an examination of the results that follow, it will appear that, comparing the younger with the older wood, the percentage of water is sometimes greater in one, sometimes greater in the other, apparently conforming to structural peculiarities of the species. The mean results, however, show clearly what we might infer upon theoretical grounds, viz., that in the youngest growth, as also in the sap wood, the percentage of water is higher by two per cent. than in the older growth where the heart-wood is in relative excess. This is found to hold true in the mean results, not only for each season, but also for all seasons; in the former case, however, this difference shows a variation of from 0.8 per cent. to 3.3 per cent. of water.