

one exception, immediate connection with the science of forestry. The one exception was a descriptive illustrated paper by Horace C. Hovey of Newburyport, Mass., upon the petrified forests of Arizona. This paper while entertaining, as an account of a visit to these curious geologic remains, had no direct bearing on forestry as a science. Its most valuable point in the interest of geology was the wanton destruction of these curious and beautiful relics of ancient forest life by persons who only see in them so much money to be won from their ruin and extinction, and the suggestion that the law should be invoked to protect this remarkable deposit before it be too late.

The remaining papers were all written by experts in the science of forestry, and were valuable as showing the present position of the science in this country as far as it relates to the actual control of our woodland wealth. The forests in all our states are now being made the subject of careful study, both by individuals, scientists and Forestry Commissions under State and Federal control. In some instances the matter is under the care of state geologists and state experiment stations. The study of forest fires and their prevention is also the subject of earnest study in several states, notably in New Jersey, where a complete system of fire protection is under consideration. The consensus of opinion at the meetings seemed to be that we must copy the forestry laws of Germany, and establish regular paid forest fire departments and patrol. All the papers of this association, while almost wholly technical, seemed to be worthy of the most earnest public attention, because it was evident from the tone of the discussions of the association that the great need to-day in this country is forest education. It is not that the great mass of the people are indifferent or careless; it is not that they are willingly allowing the lumberman and farmer to ruin the public wealth invested in trees, but that the people do not realize how serious the matter is, how gigantic is the annual commercial loss occasioned by forest fires and how ill directed our forest depletion. The country seems well wooded to the uninstructed eye. The desolated hill country, bereft of its trees, is seldom seen, and the demand for wood is enormous. These things have led to a certain public indifference that is plainly reflected in all our legislatures, and it was clearly the desire of the Forestry Association that educators throughout the country should bring the public to a realizing sense of the value of forestry science in saving our woodland wealth before it is completely lost.

APPENDIX "M."

PULPWOOD AND WOOD PULP.

THE PRODUCTION OF WOOD PULP.

(From Report of Commission on Forest Reservation.)

The wood pulp industry may be said to have commenced in the year 1846. But its development during the first thirty years was decidedly slow. Since 1876, however, the production of this material has increased rapidly. Its preindustrial period was known only to the chemist. Cellulose was made in the laboratory in 1840, but it was not manufactured, commercially, till 1852. Ground wood was first used for paper-making about the year 1846, when it was manufactured by Keller, under a patent taken out in Saxony in the previous year. Since that date, many improvements have been made in the machinery and methods used in grinding, the main object being to produce a longer and finer fibre. The fibres of the wood are torn away by mechanical pressure against a revolving grindstone, in contact with water. No chemical treatment of the wood is necessary, the only requirements of this industry being cheap wood, abundant water power and suitable machinery.