

larch, and is collected early in the day, as it disappears with the heat of the sun. The old writers mention the Manna of Lebanon, which some authors say was afforded by the Cedar of Lebanon (*Cedrus Libani*), but others assert that it was only a synonym for gum mastic.

One of the finest pines of that country of magnificent trees, our Pacific coast, is known to cultivators as Lambert's Pine (*Pinus Lambertiana*); this reaches the height of 200, and even 300 feet, and is useful as well as grand, its wood serving there for all the purposes that the white pine does with us. Ordinarily, this tree exudes only turpentine, and but little of that; but when the tree is injured by being partially burned, it yields a saccharine substance, formerly used by the settlers for sweetening their food, on which account the tree is known all along the coast as the 'Sugar Pine.' According to Prof. J. S. Newbury, Pacific R. R. Reports, vol. 6, Botany, p. 44, the laxative properties of this pine sugar are known to the frontiersmen, who make use of it as a medicine. He says: 'Its resemblance in taste, appearance and properties to manna strikes one instantly, and but for a slight terebinthine flavor it might be substituted for that drug without the knowledge of the druggist or physician, its physical and medical properties are so very alike.'

The pine, however, among the specimens in question, is not the Sugar Pine (*P. Lambertiana*), as that species belongs to the section having five leaves in a sheath; and shows that there are at least two species of our far Western pines which produce a manna. The observation as to its production by *Libocedrus* is, so far as I am aware, quite new, and adds one more to the manna yielding genera.

As to the cause of this exudation, so long as the phenomenon in the manna ash, where there has been abundant opportunity for study and observation, remains unexplained, it is hardly worth while to conjecture in the present case, in which we have only the results.

Manna is exuded from this ash spontaneously, the tree being wounded merely to increase the product. It only occurs in warm and dry countries, and is greatly affected by the character of the season. We have in these specimens, and also in the sugar produced by the sugar pine, not only an exudation, but one very unlike that usually yielded by the tree. The ordinary exudation from these trees, in common with others of the pine family, is turpentine, an oleo-resin. In these cases the character of the exudation is entirely changed, and we have a form of sugar belonging to an entirely different class of principles. In the sugar pine this appears to be effected by destroying the vitality of the tree by partial burning; in the specimens before us it is ascribed to extreme drought.

As some of the products resembling manna are due to the punctures of insects, I examined a portion of this by dissolving the sugar from a stem; a few fragments of what appear to be remains of *aphides* were found in the solution, but none attached to the twig. I have not been able to make any examination of the optical or other properties of the sugar."