APPENDIX "L."

"THE BATTLE OF THE FORESTS."

(By Prof. B. E. Fernow.)

In an article in the *New Science Review*, October, 1894, Mr. Charles Barnard gives an account of papers read before the August meeting of the American Association for the Advancement of Science, one of them being as follows :—

The paper read at one of the evening sessions by Prof. B. E. Fernow, Chief of the Forestry Department at Washington, was profusely illustrated, and, while technical in its character, treated of subjects that are of vital importance to all the people. After an instructive and exhaustive history of the rise and progress of the vast forests that once covered the larger part of this country, and after showing the once enormous extent of our forest wealth, Professor Fernow took up the subject of man's interference in the great century-long battle that always goes on in all wooded lands between the weak and the vigorous trees, each striving for a foothold in the soil and a chance to enjoy sun and air.

Forest growth begins on barren sands or bare rocks, by the starting of shrubs and small plants, that, dying, leave their remains to form a humus or soil in which better and larger plants may grow. Trees create soil through their own decay and death, and by catching and holding water and drifting material of all kinds. A forest in active operation creates its own soil at the rate of one foot in five hundred years. The lumberman can strip an acre of forest of its trees in a few days, and leave the soil that it cost two thousand years to lay down, to be totally ruined and destroyed in a few months. The natural processes that instantly follow the cutting off or burning of a forest area, and the correct methods of controlling them and the proper means to be used in saving our forest wealth, form the science of forestry. A rapid and graphic study of this science made the most interesting and valuable part of Professor Fernow's paper.

Rain falling on forest-covered land meets with an elastic surface. The leaves break up its down-pour, and the trees and the vegetable growth under them act precisely as a sponge, checking the on-rush of the water, holding it back, and allowing it to seep slowly away, without injury to the soil. Forests act as moisture holders, and keep the air damp by checking too rapid evaporation. Drying winds and the direct sunlight act more slowly in woods than on bare hillsides. Strip the land of its trees by axe or fire, and the rain strikes the soil with full force, accumulates in swift rivulets, plows up the soil, and sweeps it away to lower levels. The process is simple; the results are enormously destructive. Streams that in forests ran evenly throughout the greater part of the year, become capricious and uncertain, now raging in destructive floods and torrents now dwindling to mere rivulets, of no value to the miller or boatman. With incredible rapidity the costly soil of mountain slopes is swept away and lost, after the forests disappear. The soil gone, the rains sweep down loose rock and cover the once fertile valleys with wastes of sand and gravel. The process begins everywhere the moment the trees are gone, and increases in destructiveness from year to year, leaving stony wastes on the mountains and a wilderness in the valleys. That we do not see more miles of ruined land and sterile mountain side; that our country is not as much impoverished and desolate as Spain and parts of France, is simply because we have not gone far enough. The process has begun already, on a gigantic scale, in several of our states, and it is only a question of time when the states, combined or singly, must interfere and control the farmer, the miner, and lumberman, who are now so barbarously destroying the present and potential wealth of the country. Well may foreign writers, seeing our wasteful methods of tree cutting, and viewing our inexcusable forest fires, say that we are "a barbarous and uncivilized people."