forest, but there is a great abundance of balsam and spruce regeneration beneath the old pine trees and they will eventually displace the pine and control the stand.

Pure stands of light-demanding species cannot maintain themselves in competition with shade-endurers. When by the natural processes of elimination and decay the crown cover has been broken sufficiently to give overhead light to the forest floor, a condition in which light-demanders might establish themselves, the ground is too densely shaded by an advanced growth of shade-endurers. When they in turn have reached the dominant crown class, they have the next crop of their own species already established beneath them. So the rotation may go on generation after generation. The only way a pure stand of intolerants can be re-established on the area is by some catastrophe such as windfall, insects or fire completely removing the crown cover. Then the struggle between tolerants and intolerants will begin all over again.

Thus we see, when light values change in the forest there is a disturbance of equilibrium and the nature of the gegetation changes. Here again you must understand the significance of these progressive changes in light values, if you would successfully direct and regulate the growth-energy resulting in wood production in the forest.

Nature a Poor "Business Manager."

Foresters are dealing with an individual, an organism whose development can be fashioned and guided into the lines which they desire and that desire is for the largest quantity of the best quality of wood, adapted for some particular purpose. Nature has no economic sense. The function of foresters is to improve upon nature as expressed in the forest and guide her into economic channels, just as the farmer has improved upon nature in his work and compelled her to serve his economic purposes. Where would we be today if the farmer had allowed nature to have her own way? Why, we would have no No. 1 wheat, no dent corn, no northern spy apples, no jersey cows. Having produced these things the farmer still has to control nature or otherwise his wheat fields would be full of tares, his corn covered with smut, his apples filled with worms, and the jersey cows filled with tuberculosis.

So as time goes on foresters will be more and more concerned in controlling the destructive forces in the forest, above all the fire demon and then the fungus and insect pests.

How an American State Combats Forest Fires

HARRISBURG, Pa. — Pennsylvania now has a forest protective organiation that surpasses all other State and National fire-fighting forces, according to a statement sent to Gifford Pinchot, the State's Chief Forester, by the U.S. Forest Service. Nowhere in the United States has so complete a plan been perfected for the prompt detection and extinction of fires, and for the inspection and elimination of hazards.

Forester Pinchot has devised a better method of fixing the legal and financial responsibility for all forest fires, and in his new organiation men who combat fires will receive pay commensurate with services performed.

An appropriation of $1,000,000 by the Legislature for forest protection has made it possible for the Department of Forestry to purchase and erect 50 steel forest fire observation towers. Most of these towers are sixty feet high, and they have been put up on the highest mountain tops in the State.

Eighteen other steel towers were previously erected, giving the Department of Forestry sixty-eight stations from which observers may detect and locate forest fires. Everyone of the towers is connected by telephone with men in nearby communities whose duty it is to respond with a crew of men to attack the flames when fire is discovered.

Roads and trails have been constructed in many of the State Forests, so that the remote sections are now more accessible to Foresters and their fire-fighting crews. Each forest district has been divided into blocks of forest land, extending from 50,000 to 150,000 acres. Each area is in charge of an inspector, each tower is manned by a towerman, fire bosses have been selected from the best fire wardens located at convenient points for the suppression of fire.

Fire crews have been organized, equipped and trained so that they are ready immediately to respond when calls come to the fire bosses from towermen or inspectors. Patrolmen and wardens are other units in the fire protective organization.

This organization, heading in the office of each District Forester, has given Pennsylvania a systematic plan for the prevention of forest fires that is far better than anything of a similar nature that has been attained in the United States.

The State's forest fire fighters this summer were equipped with modern appliances. The Department of Forestry has supplied them with 1,000 compressed air tanks, which will spray water onto flames. Four gasoline water pumps have been given to Foresters in districts where they can be used advantageously. For back-firing torches were provided, as well as 3,000 collapsible pails, 1,200 hand axes, 1,000 double-bitted axes, and 5,000 canteens, and 5,000 specially constructed fire tools were distributed to the men who will protect forest lands from fires.

In the past the only equipment forest fire fighters had were the crude implements they took with them. Sometimes the men depended upon forked sticks, or branches of green pine or hemlock. Now the men are properly equipped with the best fire-fighting tools that can be provided.

In some of the State Forests, where conditions are favorable, strips of bare soil have been made through the centre of all woods, roads and trails. These strips of exposed mineral soil will permit rapid setting of back-fires, and, if a strong wind is not blowing, will also prevent surface fires from crossing trails. The strips were made with shovel plows, such as were used by the early settlers breaking new ground.

KONGO AIRPLANE SERVICE.

It is reported that the directors of the Borminiere Diamond Mines Company have suggested the inauguration of an air service by seaplane, which would operate between the mines at Djoko Punda, on the Kasai (a tributary of the Kongo) and Kinchassa, on the Kongo—from which latter point the railroad runs to Matadinoki, a steamer port on the lower Congo. The directors offer to defray the greater part o fthe initial cost of the scheme. In the meantime a survey of the route is being undertaken. The distance from Kinchassa to the mines is approximately 500 miles, which could be covered in two days, as contrasted with over a month by the existing river transport.

A strange invitation in the wilderness. The cotton sign tacked to the tree by a fire ranger of the Dominion Forestry Branch on Clearwater Forest Reserve, Alberta, reads: Dinner: menu: Bacon and beans; more bacon and beans; coffee and a smoke; water, six pails and enough elbow grease to put out the fire.