

Looking through the FPL

A. N. ALDA

Lebrarian, Forest Products Laboratory

A Visitor: Looking through the FPL

The imposing front steps of a huge building standing amidst a sea of green lawn greeted the eyes of a group of visitors, and prompted the question: "What building is this? What is this office?"

To this, a guide answers: "This is the Forest Products Laboratory. If you care to come in and look around, come this way please," and he leads the group down a long corridor from the lobby to the Chemistry Section.

—At the Chemistry Section—

Here, Mr. Manuel Monsalud, the head of the section explains the various experiments and projects that are being conducted on the analysis of wood, the processing and testing of pulp, the manufacture of paper and wall-board, and the production of charcoal and charcoal briquettes. A greater part of this work is being performed in the basement where most of the equipment for this purpose is installed.

Mr. Monsalud showed the group a number of machines, including the Wiley mill used for grinding wood to fine powder for chemical analysis, a defibrator used for making coarse pulp from wood chips, and a Bauer mill used for grinding softened chips to pulp.

"We have two digesters here for making pulp by chemical means," Mr. Monsalud explained further. One has a capacity of 0.8 cu. ft. and one about 6.0 cu. ft. Pulp made by cooking wood with chemicals are usually of higher quality but of lower yield than pulps made mechanically from the same species.

"The bleaching of pulp is conducted in the main laboratory room but the test sheets of paper are made here with the use of this



equipment," the chief said pointing to several pieces of apparatus in front of the group. There were a disintegrator used for breaking lumps of pulp, a sheet machine used to form handsheets, and a pump and press used to press the water out of the handsheets being formed. There were also several freeness testers, a pulp beater, a pulp screen and a hot plate press capable of making wall-boards and hardboards at high temperature and pressure. The tests on the paper sheets are conducted in an air-conditioned room on the main floor which is maintained at a temperature of 73° F and a relative humidity of 50 percent. The sheets are tested for

various properties such as strength, including tensile and stretch, bursting, tearing and folding strength; thickness and weight, brightness or opacity, porosity or air permeability, and sometimes other properties.

Going out of the refreshingly cool paper-testing room, the visitors find the customary flasks, graduated cylinders, glass tubes, jars and bottles containing different chemicals used in the analysis of bamboo and wood, spent cooking liquor, and bleaching and spent bleaching liquor

"Well, that summarizes very briefly what we have in this section," the chief ended his explanations and the group of visitors proceeded to the next section.

—The Administrative Section—

Rows of desks and chairs and typewriting tables fill the long room known as the administrative section. A number of clerks and personnel were busy at their jobs of carrying on the business affairs of the Laboratory which are necessary to facilitate the research work, and the main purpose of this institution.

To the right of the Administrative section and further down the hall is,

—The Timber Physics Section—

"The main object of this section is to study the shrinkage and density properties of Philippine woods in order to be able to give lumbermen and wood users reliable information regarding these important properties of the woods they are using," Mr. Ricardo Casin of the section began. In other words, they are seeking answer to the innumerable questions on these properties that they know will be asked of them by inquirers.

"Samples for the experiments are taken from 6-in. discs from trees felled in different localities. They are cut into test specimens and weighed and measured in the green condition and then placed on racks to dry at room temperature," he continued, "after which the weight and dimensions are measured again."

Mr. Casin explained that measurements of weight and length are taken again after the specimens are dried to 12 percent mois-

ture content and after they have been dried to zero moisture content in an electrically heated drying oven. The data derived from these measurements are computed to obtain the shrinkage, moisture content and specific gravity and density of the specimens.

It was revealed that studies on the air seasoning of several species of wood are underway, to learn the drying rates of the different species and of different thicknesses.

Research on kiln drying has not yet started but there is now a 2,000 bd. ft. kiln installed in the wood preservation building. "This is rather large for preliminary experimental purposes, so an experimental kiln of 200 bd. ft. capacity will soon be constructed which will be more appropriate for our purpose," Mr. Casin explained.

The group then proceeded to

—The Timber Mechanics Section—

where Mr. Simplicio Bellosillo, the section chief, explained the work of the section.

There are four universal testing machines in the section with maximum capacities of 8800, 12000, 60,000 and 200,000 pounds respectively, all used for testing wood in bending, hardness, compression-parallel and perpendicular to the grain, and shear. "They are called universal testing machines because of their ability to perform many different types of tests in one machine," Mr. Bellosillo explained.

A toughness testing machine and an impact testing machine in another room are used in the study of the toughness and the resistance to impact of Philippine woods, the results of which will give reliable information regarding the adaptability of species for uses in which resiliency and toughness are important, as in handles for striking tools.

Since different species of wood do not have the same strength properties, and the strength may vary considerably among different trees of the same species, it is necessary to conduct thousands of tests using specimens from many carefully selected trees before a true average value of the strength properties for a species may be obtained. These properties of wood are affect-

ed by the direction of the applied force with respect to the grain and are determined for both the green or unseasoned and the air-dry condition of the wood. The strength of wood after seasoning is greater than that of the same wood in the green or unseasoned condition.

Because internationally accepted standards have set 12 percent moisture content as the basic requirement for testing air-dry wood, and since a greater percentage of the world timbers have been tested using this standard, both the Timber Mechanics and the Timber Physics sections make tests at the same percent of moisture content, for purposes of standardization and comparison.

"Our natural temperature and relative humidity conditions, however, can only bring wood down to a moisture content of 14 to 16 percent in the air-dry condition," the section chief explained, but added that they have a room with controlled temperature and relative humidity in which a relative humidity of 65% is maintained to bring the moisture content of the wood to the accepted standard for the tests.

Mr. Bellosillo remarked that "one of the main functions of this section is to help industry in the solution of all problems relating to the strength of wood in both its natural and modified forms."

—The Wood Anatomy Section—

Moving to the next section, a striking model meets the visitors. Mr. Francisco Tamolang, the section chief, explains that it is a model of a block of wood magnified about 550 times showing, in enlarged form, the details of the different elements of the structure of wood.

The Wood Anatomy section can boast of modern microscopes of the latest models. It is said that there are only six of this kind in the Philippines and two may be found in this section.

A "library of woods" also attracts the attention of the visitors as one of them picks a sample from the shelf. The label on the specimen gives the common name of the wood, its scientific name, its source, and

some identifying numbers for purposes of classification. The collection serves as a ready reference in wood identification and, according to the chief of the section, a card-sorting key to the different species of timber is currently being developed.

Mr. Tamolang listed the functions of the section as follows, among others:

1. The collection of authentic specimens of Philippine woods for the use of all sections of the Laboratory.

2. The identification of wood materials for the laboratory and for other institutions that need such information.

3. The standardization of official common names of Philippine woods.

4. The study of fiber length and fiber characteristics of Philippine woods and bamboos which may be useful for pulp and paper making.

5. The study of Philippine palms and other plants which may yield suitable fibers for brush making.

He then leads the group to another room where various species of plant fibers are under study. Some of them have already been made into brushes of various sizes and shapes depending upon the use for which the brushes are intended. Mr. Mario Eusebio, who is at present in-charge of the fiber section, explained the properties and characteristics of the different fibers he had on his working table.

—The Library—

Rows of empty and almost empty shelves greet the visitors in the library. The librarian explains that the books and back numbers of technical journals now on hand were donated by various individuals and organizations in the United States. Some \$8000 worth of books purchased by the International Cooperation Administration and the Rockefeller Foundation are on the way to the Laboratory and will go far to provide the Laboratory staff with the technical books and journals needed for research work in forest products. Years may be required,

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FOREST RESEARCH

FY 1955-56
(Accomplishments)

Activities		(Accomplishments)	
No. of studies started	29	No. of sample plot to be established	75
No. of studies started in previous years & still in progress at the beginning of the period	14	No. of old sample plots to be remeasured	100
No. of studies conducted	43	No. of new research projects or studies to be undertaken	20
No. of studies completed	6	No. of studies expected to be completed	8
No. of studies in progress at the end of the period	37	Continue observation in 37 old projects in progress	
Sample plots established	110		
Sample plots established in previous years	88		
Sample plots in existence at the end of the period	198		
No. of sample plots remeasured	48		

REMARKS

Priority is given to the establishment of sample plots for gathering data on growth of trees and yields of stands, which are basically essential in the preparation of management plans aimed at building up forest values and attaining a high degree of con-

tinuous forest productivity or sustained yield. Many of the studies must of necessity be conducted in the forest. The solutions to many of the problems in forest management call for long-range experimentations. There are five Forest Experiment Stations.

LOOKING THROUGH...

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however, before the library may be considered adequately furnished.

—The Photography Section—

Mr. Regino Gonzales, the scientific photographer, showed the group lenses, films, cameras of different sizes, and other photographing apparatus that are used to take pictures of wood samples before they are cut into different specimens; copies of bulletins and graphs; and to make photographs through the microscope of wood fibers and wood sections, thus making available to the unaided eye what the microscope shows to the investigator.

—The Forest Pathology Section—

The last section the group sees in the main building is the Forest Pathology section where Prof. Emiliano Roldan, the section chief, bids them welcome. He points out the apparatus which he said constitutes

the minimum basic requirement of a wood pathology laboratory.

According to Prof. Roldan, the primary objectives of this section are to tackle and solve various problems caused by wood destroying and wood staining fungi in timbers, lumber, finished wood products. Wood users suffer heavy losses from such deterioration each year. The purpose of these studies is to gain knowledge and information on how to preserve the brightness or prolong the life span of these materials so that they may be of longer service to their users.

(To be continued in the next issue.)

I do not know what I may appear to the world, but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding of a smoother pebble or a prettier shell than ordinary whilst the great oceans of truth lay all undiscovered before me.

—Isaac Newton