FORESTRY LEAVES

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IN THIS ISSUE

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Director Juan L. Utleg addressing the Foresters at the Conference. Outstanding Timber Concessionaires are seated behind him.

OUTSTANDING CONCESSIONAIRES

Sitting from left to right: *Don Carlos Fernandez Alejandro Ordona, Gaudencio Mañalac, Director Juan L. Utleg, Secretary Jose Y. Feliciano, Jacob Baker, Nicolas Capistrano and Jose Sanvictores.*

Standing left to right: *Severino Nablo, Jose Soriano, Juan P. Gantioque, Luis de Jesus, Simplicio Siocon, Jose Lozano and Aurelio Lagman.*

Mrs. Rosales Juni receives the posthumous award from Secretary Jose Y. Feliciano for her husband.

Director Juan L. Utleg receives a service pin from Secretary Jose Y. Feliciano.

Forestry Regional Directors are from left to right: *Ceferino S. Abella, Reg. Dir. of Forestry, Region No. 8, Davao City: Higinio D. Rebosura, Reg. Dir. of Forestry, Region No. 5, Iloilo City; Justino A. Ybañez, Reg. Dir. of Forestry, Region No. 6, Cebu City: Rufino A. Sabado, Reg. Dir. of Forestry, Region No. 3, Manila: Director Juan L. Utleg: Pedro D. Cagalawan, Reg. Dir. of Forestry, Region No. 2, Tuguegarao, Cagayan; Enrique K. Santos, Reg. Dir. of Forestry, Region No. 4, Naga City: Jose R. Claveria, Reg. Dir. of Forestry, Region No. 7, Zamboanga City; Remigio Rivera, Reg. Dir. of Forestry, Region No. 1, Dagupan City.*

B.F. REGION NO. 1

Standing left to right: *Deogracias I. Juni, District Forester, Baguio City: Regalado Benavides, District Forester, Iba, Zambales, Bernardo Borja, District Forester, Bangued, Abra: Director Juan L. Utleg: Remigio Rivera, Reg. Dir. of Forestry, Dagupan City: Artemio Caleda, Forester in Charge, Baguio Forest Experiment Station: Cornelio Luczon, Dist. Forester, Dagupan City: Bernabe Zumel, Dist. Forester, Laoag, Ilocos Norte:*

Front. left to right: *Alejandro Tremor, Dist. Forester, Vigan, Ilocos Sur; Maximino Abuan, Dist. Forester, Tabuk, Mt. Province: Benjamin Mabesa, TMA, Baguio City: Geronimo Falloran, TMA, TZP.*

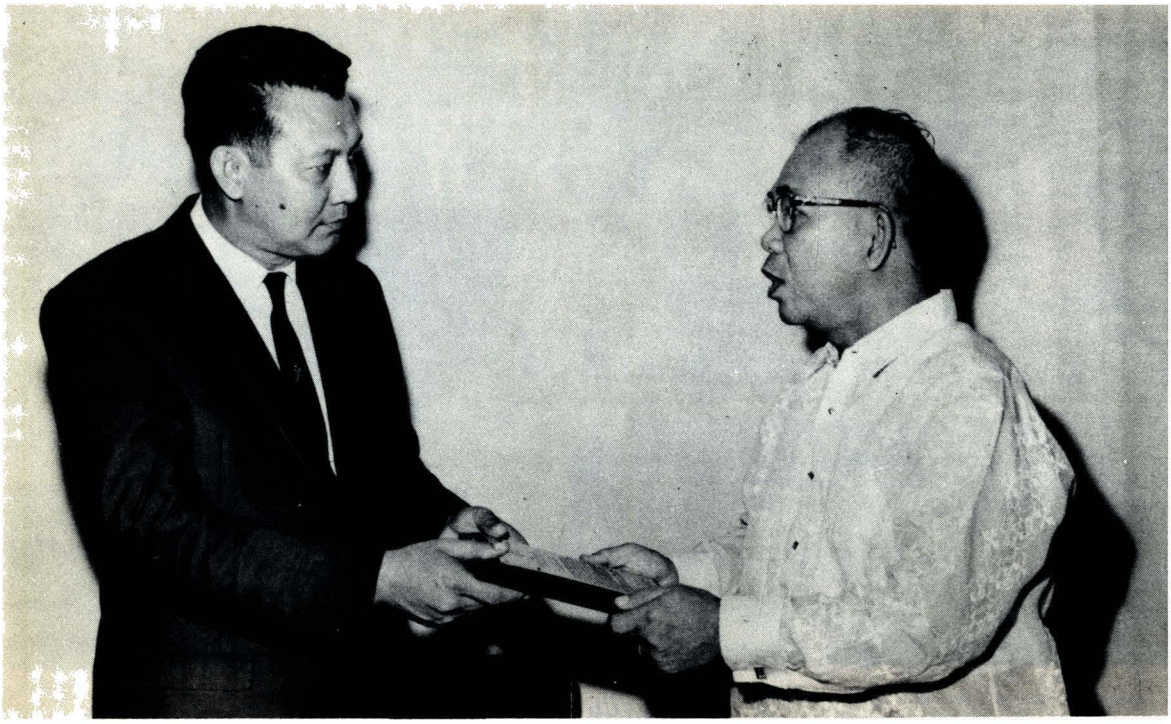
B.F. REGION NO. 2

Ambrosio Sumabat, Actg. District Forester, Western Cagayan: Eliseo Capili, Forestry Supervisor, Region No. 2 LC; Sotero Ocampo, Dist. Forester, Western Cagayan; Director Juan L. Utleg; Pedro D. Cagalawan, RDF, Region No. 2; Angel Miguel, DF, Eastern Cagayan: Domingo Ramel, DF, Nueva Vizcaya: Jose Gonzales, TMA, Cagayan.

B.F. REGION NO. 3

Teofilo A. Santos, Dist. Forester, Sta. Cruz, Laguna: Ambrosio Juinio, Dist. Forester, Cabanatuan City: Director Juan L. Utleg; Rufino A. Sabado, Reg. Dir. of Forestry, Region No. 3, Manila: Orlando C. Ordonez, Asst. Dist. Forester, Lucena City.

Sitting left to right: *Domingo de Leon, Dist. Forester, Bulanga, Bataan; Brigido Balcita, TMA; Damaso de la Cruz, TMA: Cipriano Vadil, Dist. Forester, Calapan, Oriental Mindoro.*



Acting Director Juan L. Utleg presenting a plaque of appreciation to former B.F. Director Apolonio F. Rivera, for his contribution to the success of the forest conservation during his term

Dir. Utleg is the first career man to be appointed Director of Forestry, during the Macapagal Administration.

Former FPRI Director Eugenio de la Cruz President of the Society of Filipino Foresters, addressing the delegates to the District Foresters and Regional Directors Conference.

Part of the audience showing guests and Delegates. In foreground l to r: *Forester N. P. Lansigan, Pres. of the C. F. Alumni Association, Regent and former Dir. Florencio Tamesis, and Dir. Juan Utleg.*

Another portion of the audience showing members of the B. F. (Manila) Personnel, guests and delegates.

B.F. REGION NO. 5

Left to right: *Dist. For. G. Tamayo; N. Orbigo; Dist. For. A. delos Reyes, For. A. Jastive, Dir. J. Utleg, Reg. Dir. H. Rebosura; Asst. Foresters W. Soriano, and J. Ballesteros.*

B.F. REGION NO. 6

Left to right: *Forester F. Nañagas, Dist. Forester A. Aliñabon, Director Juan L. Utleg, Regional Dir. J. Ybañez, Dist. Foresters A. Allado and F. Abraham.*

B.F. REGION NO. 7

Left to right: *Dist. Foresters L. Moroña, V. Maglaya, M. San Luis, Reg. Dir. J. Claveria, Director Juan L. Utleg, Dist. Foresters L. Sontillano; S. Morao, M. Battad; Dist. For. F. Barros, and Forester L. Torrea.*

B.F. REGION NO. 8

Left to right: *Foresters V. Blancas, P. Galindo, M. Caayupan, Dist. For. J. Cabiles, S. Fortich, Director Juan L. Utleg, Reg. Dir. C. Abella, Dist. For. E. Elayda, F. Reyes; and R. Valdez.*

Front row (l. to r.): *Foresters S. Pinalba, I. Gonzales, P. Narciso, Jr., Dist. For. F. Roy, For. I. Zapanta, Dist. For. J. Calip and For. R. Valerio.*

Collective Efforts for Forestry Glory

by
JUAN L. UTLEG
Acting Director of Forestry

Let me first take this opportunity to extend to you and other friends outside of the Bureau of Forestry my profoundest gratitude and appreciation for your congratulatory messages on the occasion of my appointment as Acting Director of Forestry; likewise, to a number of sympathetic organizations (both in the public and private sectors) who had praised President Diosdado Macapagal for having restored in the Bureau of Forestry the career system.

I have been deeply moved by your spontaneous manifestation of trust and confidence in my humble self. My soul is lifting because I have received your assurance of support and cooperation to make this administration of ours in the Bureau of Forestry a resounding success.

My appointment is not a personal triumph on my part. It is not my victory alone. It is rather the victory of the career system in the Bureau of Forestry. It is, therefore, our collective victory. It is as much my victory as it is yours.

With you let us express too our profoundest gratitude to President Diosdado Macapagal for having reposed in us his trust and confidence by appointing a career forester as head of the Bureau. Let us pledge to continue upholding the finest tradition of public service for which the administration has consistently espoused.

Fellow foresters, there had been in the past a not too savory insinuation to the effect that it would take the leadership of a non-forester to put back our Bureau to its proper place.

I am not my friends casting aspersion on the capability of the non-forester who had headed our Bureau. On the contrary, it is my personal as well as official belief that each had contributed something good into the overall structure of the Bureau.

With your permission, I would like to pay tribute to our non-forester directors who had been with us in the Bureau.

They were Dr. Mateo S. Pecson, Ex-Governor and Ex-Congressman of Masbate; Mr. Esteban Piczon, now governor of Samar; Mr. Estanislao R. Bernal, now Undersecretary of General Services; then Executive Secretary Calixto Zaldivar, now Justice of the Supreme Court; and finally, Atty. Apolonio F. Rivera, who was recalled to Malacañang.

Although they did not stay long with us, the good that they had done will always be remembered by those whom they left behind in the Bureau.

To each of them, we are grateful. The foresters as well as the rest of the forestry employees wish each of them the best of luck.

Atty. Apolonio F. Rivera was the non-forester director who stayed longest with us. Without fear of contradiction, I say that he had done much in the Bureau.

I will reiterate in this congregation what I said in the joint birthday tendered in honor of Atty. Rivera and me: Atty. Rivera is the best non-forester director the Bureau ever had.

Fellow-foresters and employees, let us give Atty. Rivera a standing ovation.

As I said there was an insinuation that it would probably require the leadership of a non-forester to put the Bureau back to the state of repair.

Now that the helm of the Bureau is back in the hands of a forester let us prove together to everybody that the forestry leadership is dead set on redeeming itself at the bar of public opinion. The fact that the forester director happens to be my humble self is incidental. What should be borne in mind is that the Bureau of Forestry is composed of men and women who have made public service their lifetime career.

The success of one in the Bureau is the success of all. The failure of one is the failure of all. This is the logic from which we can not escape. This is the logic that should guide us in charting the course of our official department.

And there is only one course that beckons us. Let us project our motives and purposes to that course which leads to success. In the forestry leadership is at stake not the honor of one man alone, not the honor of a few persons, but the honor of all officials and employees of the Bureau of Forestry.

My purpose in calling this conference is timely as it is urgent. I took advantage of the National Convention of the DANREAS to save time and money. The field service of the Bureau of Forestry is the direct implementing hand of the government in protecting and conserving the country's forest resources.

The field service should therefore be at all times effective. But it is confronted with numerous problems, most of which often hamper the smooth operation of its offices. The problems are capable of being solved. This is the reason why you are here now. Discuss the problems and propose the solutions.

There is an urgent need to maximize the effectiveness of the administration of the field offices to place them in a position where they can maximize the successful achievement of the goal of forest protection and conservation. It is in the field where the success or the failure of the Bureau of Forestry will ultimately depend.

Our forest protection campaign is beset by problems. The reports of some people tend to picture the hopelessness of the forestry situation in the country. We do not know where some critics get their figures. It is amusing to observe that figures emanating from sources other than the Bureau are highly exaggerated especially those on the rate of forest destruction.

The more figures on the rate of forest destruction are exaggerated the more obvious the implication becomes. As a matter of fact every time they make a mountain out of a molehill they at the same time make a veiled conclusion to the effect that forest officers are sleeping on their job.

We are cognizant of the fact that our Bureau sadly lacks men, money and equipment. But they say this is not a valid excuse for official negligence. Whether we like it or not, they are right. I believe this particular disadvantage should rather serve to impel us to exert more effort to achieve more.

That we need more men, more appropriation and more equipment is a fact that can not be disputed. That we should become less enthusiastic, less interested and less hardworking on account- of this disadvantage is an attitude of defeatism.

My friends, foresters in the past did not have the attitude of defeatism. They were known to have the ability to convert disadvantage into advantage, weakness into strength, perspiration into inspiration, sorrow into happiness, enemies into friends, tragedy into humor, and tears into smiles. They knew how to stand up every time they fell.

The situation is now changed. The world has become materialistic and so with the

people who live in it. We ask for more and more but give less and less. We have become more interested in what we receive than in what we give. Now one feels happy even if those around him are unhappy. And the more those around him are unhappy the more he is happy. It is the tragedy of time that one enjoys seeing others suffer and fail.

We in the Bureau of Forestry should relive those by-gone days. Let us try to make the most out of what is less. As we ask for more let us at the same time give more. Let us be more interested in what we give than in what we receive because sooner or later we will receive more if we give more. Let us give more before we expect to receive more. Let us not enjoy over the tragedy of our co-workers. As we commiserate let us at the same time help them.

The forest officers in the field are supposed to be on their job all working hours. Actually probably some are not. Perhaps there are some who go home early Friday morning and return to the office Tuesday noon. Perhaps there are some who stay in their houses upstairs most of the working hours instead of staying and working in the office downstairs. I refer to those who live with their families in the office where they also work. Perhaps some have made arrangement with their companions in the office in such a way that if one is out the other is in in a rotation basis.

It is possible that those who are supposed to do protection work in the forest are doing something else elsewhere. They record in their diaries that they are inspecting this and that, surveying this and that and guarding this and that, when actually they are not. And they collect not only their salaries but also per diems.

If some are doing this it is about time they stopped the practice. Let us not be like Nero who played his musical instrument while Rome was burning. Let us not enjoy complacency while the country's forests are destroyed. As supervisors in the field, see to it that your personnel are actually in their places of assignment and are actually doing their job.

Fellow foresters in the field I give you this assurance. Show me your worth and I will show you what you deserve. My administration in the Bureau of Forestry as acting director will underscore public service with efficiency, honesty and fairness. I will make it a point to take note of what you have succeeded to do and what you have failed to do.

At the risk of sounding monotonous to you, I will repeat to you a pledge that has been made time and again in conferences like this. I will see to it that every appointment, every promotion, every designation and every transfer is made solely according to the merit system.

To use a bold expression, I am hell-bent to fulfill that pledge. Under this administration of ours in this Bureau everybody will get what is due him provided he gives first what is due from him.

There is one attitude which I would like to be corrected. I have observed that every time some officials from the Manila office go to the district offices on official mission the red carpet of welcome is rolled for them by the fieldmen. We are not certain whether this kind of treatment is a traditional hospitality or some form of investment to inspire those in the Manila office to act fast and favorably on pending papers from the district offices. Whether it is hospitality or not, the fact is that it is a heavy drain on the pockets of the fieldmen.

It is up to you if you want to lavish your hospitality on the visiting Manila officials. But do not get the impression that the way to expediting your papers in the Manila office is through the stomach and flesh of the

Manila personnel. So long as your papers are complete and in order, I assure you they will be immediately acted upon accordingly.

If you think your case is being unnecessarily delayed do not hesitate to let me know. Unless it is urgent, do not come to Manila without prior authorization from the office of the director. If you have complaints forward them to the Forestry Project Coordinator.

I will not prolong further this speech by giving you the details of the programs and objectives which we should undertake as these will be discussed in due time. I will confine myself to briefly stating the projects that should be given more attention to place the forest resources in continuous productivity and utility by wise use, protection and conservation.

In forest management, we should strive to place all licensed areas and those under license agreements under selective logging system. We will require more concessionaires and timber licensees to submit their policy statements and timber management plans. We will see to it that selective logging is really practiced as it should be by those who are required. As a disciplinary measure, we will either cancel the licences or reduce the annual allowable cut of the licensees who fail to comply with the implementation of selective logging.

We will adopt ways to insure complete control and supervision over the existing licensees and eliminate undesirable ones. The forest resources inventory work has progressed remarkably with the completion of the job in Mindanao. We will speed up the work in Luzon and the Visayas. The data gathered from the work are very important in the formulation of sound forest policies and programs.

The forest officers in the field should give more time to checking the activities of the licensees in the cutting areas to detect acts that defraud the government. The report that some license holders are getting their supply of logs from areas other than those specified in their licenses should be looked into. There are those who credit their actual cut with the annual alllowable cut of other licensees.

We will push with more vigour the classification of the remaining unclassified public forests. The implementation of Republic Act 3092 otherwise known as the "Permanent Forest Law" should be speeded up. We are studying the practicability of reverting alienable or disposable lands into the category ot public forests.

The scaling of logs should be done actually and accurately so that the government is not defrauded of the forest charges due from the concessionaires. Rules on grading and inspection of logs and lumber for export should be enforced strictly. Are all logs cut by licensees scaled? Are all scaled logs scaled properly? These are the two questions that we should look into.

Action should be intensified on all pending special use cases through better planning of work and use of control maps. The inspection and appraisal of pasture permits and leases as required by Forestry Circular should be accelerated. We will encourage woodland leases and planting of trees of economic value to promote reforestation of badly cut over areas which can not be incorporated in another license area for reason of non-continuity. Under study is the institution of a system of bidding of remaining areas available for pasture. The present system of priority seems to be productive of conflicts and protests.

We will soon embark on the actual implementation of our program on watershed management. With the able assistance of Mr. Gulcur and the agency he represents, we expect to launch the project very soon.

More vital forest research projects should be undertaken. Results of studies and expe-

(*Continued on page 20*)

Intensification of Forest Management in the Philippines, my Impressions and Suggestions[1]

by
MACKAY B. BRYAN[2]

I like the subject that was assigned to me. Management always has been my main interest in forestry; and the field of tropical forest management is so new and unexplored that it is doubly interesting. I appreciate especially the last part of my assigned topic, "My Impressions and Suggestions." That gives me license to say almost anything I choose.

The Society of American Foresters defined forest management as "The application of business methods and technical forestry principles to the operation of a forest property." I prefer an earlier definition of the task of forest management which was "To build up, put in order, and keep in order a forest business."

The extent of possible intensification in forest management must depend upon the present status of forest management, and upon the importance of the forests to the economy of the country. From either standpoint much greater intensification is justified in the Philippines. In Germany forest management is closely related to detailed silvicultural studies with precise records of performance sometimes dating back 100 years or more. Forest management in the United States is typically extensive. True forest management there is rather new. Generally, it has not followed the well-documented example set by the European foresters. Management practices in the United States may be dictated by predicted financial return rather than by silvicultural principles. Because greater profits are expected from pines they may be grown on land best suited for hardwoods. Also trees may be planted where, with just a little more time, regeneration would take place naturally.

Forest management in the Philippines actually started about as early as it did in my country. Both the Philippines and the United States suffered under the same delusion about the unlimited abundance of their forest resources. The Americans finally woke up and have actually turned the tide. Their forest resources are now increasing.

Probably the most logical guide to the proper intensity of forest management is the ratio of forest area to population. On that basis, West Germany with only 13/100 of one hectare of forest per person is well justified in practicing more intensive forest management than the United States where there are 1.19 hectares of forest per person. The Philippines has around 4/10 hectare of forest per person. So, following this guide, its forest management should approach the intensity found in Germany. Actually, the accomplishments to date in management of the Philippines forests are extremely small when compared to the job that lies ahead. I understand that only 7 timber concessions are operated under approved management plans.

[1] Paper presented before the 1965 District Foresters' and Regional Directors' Conference of the Bureau of Forestry, Manila, September 22, 1965.

[2] Forestry Advisor, U.S. Agency for International Development.

Control of Public Forest Land

The problem of CONTROLLING THE PUBLIC FOREST LAND is so great that it overshadows all other forestry activities. Results of the recent forest inventory of Mindanao provide concrete data proving the seriousness of this problem. The area now in forest can support the present harvest of logs forever, if the land is held and properly managed for timber production. Many forest industries are doomed to extinction, however, unless the present rate of land clearing for shifting agriculture can be stopped, and stopped soon.

Progress is being made in the proclamation of forest lands as forest reserves. I understand that the total area has reached 1,600,000 hectares, leaving 8 million or so hectares that should be included without delay. The struggle to control the forest land will be much more effective when the boundaries have all been surveyed and marked and the lands have been proclaimed forest reserves.

Selective Cutting

The first step in the intensification of forest management was initiated by the Bureau about one decade ago. A system of selective cutting was implemented at that time on a few concessions. The main objective was to retain and protect high-quality trees of the intermediate and small sizes for future timber crops. Selective cutting was extended slowly to more and more concessions until it is now required in all cutting operations on public forest lands. The results of selective cutting were far from spectacular in the beginning and there remains much room for improvement today. The steady improvement of cutting practices is very obvious on many concessions. This can be demontsrated by traveling on a concession's main-line road from the earliest cutting areas up to the present yarding site. Usually the scattered residual stands in the areas of uncontrolled cutting are similar to the areas covered in the first year or two of selective cutting. But the residual stands steadily improve as you approach the recent operations. It is obvious that the efforts of the Bureau through training seminars and the individual work of its technical men have met with considerable success.

Timber Utilization

A utilization study made on cutting operations in Mindanao showed a drain of nearly 1.4 cubic meters in sound wood for each cubic meter reaching the log pond. Expressed in another way, this amounts to a 72 per cent utilization. Other studies not yet complete indicate that utilization may be a little poorer in other parts of the Philippines. Selective cutting and careful yarding will reduce the losses in trees that should be saved for future crops. Waste in high stumps, unused portions of upper logs, and abandoned logs can be overcome through closer inspection of cutting operations by the Bureau.

Forest Management Inventories

Very little has been done recently in making the concession inventories that are necessary for the preparation of management plans. This includes both inventories for new management plans and the updating of plans now in use. The diversion of forest inventory men to the nation-wide inventory is partly responsible for this. As one of those most active in creating this situation, I have been very much interested in correcting it before leaving the Philippines.

A plan was prepared to develop modern inventory techniques and give the inventory organization training and experience in making forest management inventories. The Bureau of Forestry and the National Economic Council cooperated fully in carrying out this plan.

The Taggat concession in Northern Luzon was selected as a suitable site for the pilot survey. Full coverage of aerial photography was flown by the Philippine Air Force. Forest conditions were classified and delineated on the photos by the inventory interpreters; and a forest sample was measured on the ground. Also a timber utilization study was made on the concession. At present the inventory statistics are being computed in the office.

I feel confident that the inventory organization is capable of making management inventories quickly and accurately using modern methods. Experience gained in the pilot inventory will provide greater efficiency in future world; but no major changes of the methods used in the Taggat survey seem advisable.

Timber Stand Improvement

A small amount of timber stand improvement (or TSI) has been done. To date this has been mainly on an experimental basis. Early results from a few experimental plots look very promising. TSI work on a full production scale seems well justified. There are literally millions of hectares of cut-over forests upon which the growth of high-quality trees could be accelerated by timber stand improvement.

A pilot project in timber stand improvement will get under way soon in Surigao del Sur. It is a cooperative project of the Aras-asan Timber Company, the Bureau of Forestry, and AID. Foresters from each cooperator and the Bislig Bay Lumber Company worked together in planning the project. Aras-asan will furnish most of the work supervision, the transportation, tools, etc. The Bureau will inspect the project periodically to assure compliance with the job specifications. And AID will furnish surplus American foods in exchange for voluntary work performed by local people who are now unemployed. The Bureau of Forestry, several timber companies, and AID will watch the project with interest. If it is successful, it will open up possibilities for expanded work in timber stand improvement.

Planting on Timber Concessions

If I were asked to place priorities on areas to be reforested, I would do as follows. First, plant the critical watersheds above the costly power and irrigation dams to prevent soil erosion and siltation. Second, plant the productive open areas within timber concessions. Lastly, plant the long-abandoned grasslands that have been worn out and eroded by improper cultivation and repeated burning.

The relatively large areas recently opened on timber concessions provide the best sites for growing commercial timber profitably from planting. These are the openings around spar trees, in loading areas, and along cableways and skid roads. Also fields cleared by squatters and kaiñgineros will produce good timber if planted before the soil is worn out and badly eroded.

There is a definite need for tree planting as a tool of forest management on timber concessions. The best tree-planting skills should be utilized in this work to assure complete success. More will be said on this subject in a later part of this paper.

Other Factors Favorable to Progress

I believe that the conditions are now right in the Philippines for real progress in forest conservation and development. The Bureau is better staffed than ever in the past. I know that greater efforts will be put forth now under the intelligent and able leadership of Forester Juan L. Utleg. The U.P. College of Forestry now compares well with forestry schools in Europe and America. It is graduating foresters well equipped for jobs in forest management and wood technology.

You now have better forest statistics than ever before. This knowledge of the present situation is essential in planning forestry programs. It also has awakened the public to

the importance of forest conservation. Regretably, the blame for forest destruction, wasted resources, flood damage, and so forth is often improperly placed. Nevertheless, this awakening is good. A noticeable improvement in knowledge of forestry can be detected, especially in the writings of some news commentators who have taken an interest in forest conservation.

Forest industry organizations and forestry associations have become well informed and rather outspoken about forest resource matters. More important, they want to do something to improve the situation, even at cost to themselves both in money and increased government control.

The important but long-neglected problems of watershed protection and management are being attacked now with the assistance of the United Nations. Gains from the project will be felt in all fields of forestry and by all forestry agencies.

RECOMMENDATIONS

I would like to make some suggestions regarding programs and activities that are important to forest management. These recommendations are not new, but they cannot be over-emphasized. They are listed in order as I judge their relative importance.

1. *Gain control of the public forest land.* — There are several different aspects to this problem. The most urgent are the establishment of the forest boundaries, the proclamation of the forest reserves, and the successful protection of the forest against squatters, kaiñgineros, other types of trespass, and fire.

   Also included under control of the forest land is the administration of those lands as the Bureau sees fit, without interference. This includes the granting and cancellation of licenses, the setting of allowable cuts, the prescribing of cutting rules, and so forth.

2. *Enforce the selective cutting rules.* — The most important factor affecting future timber crops is the condition in which the stands are left after cutting and logging. This condition varies greatly concession by concession. It is important that the rules for selective cutting be enforced on all operations in dipterocarp forests through adequate training, field inspection, and, where necessary, by imposing penalties.

3. *Place all cutting operations under management.* — A forest management plan based upon an adequate forest inventory should be prepared for each operation under license agreement. And within a few years, any concession should be cancelled if it is too small or too poorly operated to qualify for a license agreement. Such concessions should be combined to form forest areas of operable size, be grouped into cooperative units of manageable size, or be awarded to other concessionaires who can qualify for license agreements.

4. *Expand timber stand improvement* operations. — As funds become available, TSI work should be extended to all cut-over dipterocarp stands on productive sites. At present the Bureau should furnish training and supervision to assist licensees who are willing to do TSI at their own expense.

5. *Do not neglect forest research.* — The future progress in forest management depends a great deal upon research studies that are established now. The staff of capable men assigned to the Forest Research Division should be expanded. Many other foresters in the Bureau, the Reforestation Administration, the College of Forestry, the Forest Products Research Institute, and private industry spend part to full time on research related to forest management.

(*Continued on page 20*)

The Public Image of the American Forest Products Industries and what the Philippines can learn from it*

by NICOLAS P. LANSIGAN

INTRODUCTION

One feature readily noticeable in the American forestry scene today is the amount of effort being made by the forest products industries to create for themselves a good public image. To a Filipino forester accustomed to the paucity of efforts exerted along this line by the wood-using industries of the Philippines and where, decidedly, there is more call for these industries to project a good image, the amount of image-improving industry information reaching the American public through the various media of communications is simply amazing.

The impression one gathers is that the American forest products industries have gone all out to create a good picture of themselves before the American public. The forestry trade associations and the individual companies are beating their drums and making quite a success of it. Not only is this evident in the volume of periodicals, pamphlets and audio-visual materials reaching the public, but it also seems that cultivating public appreciation has permeated company thinking and, in many of the larger companies, this has become a top management function.

This report has a three-fold objective:

1. To attempt to draw a picture of the current public image of the American forest products industries and to explain the motivation of the industries in creating a favorable public impression;
2. To underscore the special urgency in the Philippines for the local forest-based industries to create a good public image for themselves; and
3. To offer an outline which the local forestry trade associations and individual lumber companies might use as a basis to work out an image-building program.

Public Image Consciousness of American Forest Products Industries

The flood of systematic informative matters is aside from those the government forestry agencies are themselves disseminating and quite aside, too, from the extensive space and time that the forest industries, in common with other American industries, buy and utilize for what would pass for straight advertisement of their products and services. The campaign is massive embracing the national, state and county levels; the scope has depth touching all possible publics — the government, the stockholders, the consumers, the community, the schools, the legislators, etc.

It is commonplace for companies, individually or in concert with others, to work on their communities, with the company executives, directors and key personnel taking time out to explain company objectives and pro-

* From observations from a recent study tour in the United States. Author is Executive Forester of A. Soriano y Cia., General Managers of Bislig Bay Lumber Company and Paper Industries Corporation of the Philippines.

grams over radio and television, and in formal or informal group discussions. Many companies have even gone further. They hold regular orientation workshops for their own personnel with the purpose of making everyone spread the good word outside the company compounds.

The effort has not been confined to the audio-visual media. Many private forest holdings have been opened for recreational use by the public, a gesture that has done much to improve community-company relationship. Tours and visits to woodlands and plants are being encouraged. The job of selling forestry is no longer, as it was not too long ago, that alone of the government and company foresters. It is as if management has wakened up suddenly to the realization that a good public image is essential for the business and management must accordingly provide for it.

Also, the observer will not fail to notice the discarding of the defensive strategy of old and the adoption in its place of an aggressive policy of meeting many of the issues squarely. The covering up of past mistakes and abuses in land disposition and the apologizing for the sad experiences in the handling of the forest holdings have given way to a more positive posture of informing the public of the motivations of the industries and their correct programs of improving the forest properties through better logging methods and better restocking of logged over areas. This seems to underscore the acceptance by the industries of their social responsibility of considering the general interests of the public in their utilization of the forest lands even if these are under private ownership.

It is noticeable, too, that on the part of the public, a better impression of the industries is steadily developing. At least the suspicion of long ago that the wood industries were despoilers of the forests, that lumber barons were taking advantage of the forest patrimony, is giving way to a recognition that lumbermen are builders of the economy and that the forest industries have a major role in the economic development of the country.

Keeping Tab of the Image Through ORC Polls

Also, the American forest industries take the trouble and the expense to find out at regular intervals how they rate with the public. For this purpose they avail of nationwide public opinion polls. This is being handled for them by the American Forest Products Industries, Inc., an association of over 1,300 member-companies representing all segments of the forest products industries. The prestigious Opinion Research Corporation, Princeton, New Jersey, conducts the surveys for the association. The first ORC survey was made in 1941, the second in 1952, the third in 1956 and the fourth in 1962. A fifth one is being lined up.

Through these surveys, the industries have been able to keep tab of the thinking of the American public and, where indicated, have accordingly taken remedial steps. From these surveys the industries have come to recognize:

1. That they face a continuing struggle for a favorable public image;
2. That what the public believes about the industries are not all borne out by the facts; and
3. That one of the chief deterrents to a broader appreciation of the aims and accomplishments of the industries is the widespread lack of knowledge and the large amount of misinformation people have about the forest and forestry activities.

Findings of the 1962 ORC Poll

The American forest industries are presently concerned about some specific areas indicated in the 1962 ORC poll where a significant portion of the public still enter-

tain misgivings or harbor some misconceptions or misinformation. They found out, for instance:

1. That 56% of the general public still believe that the forests are being cut faster than they are being replaced;
2. That 31% think that there is much wasteful cuttings of timber going on;
3. That 37% believe that there will be wood shortage in 1975;
4. That 25% favor more government ownership of forest lands;
5. That the lumber industry ranks next to steel and oil among those that the public thinks should be regulated more strictly;
6. That lumber ranks second only to steel among the major products the public thinks are priced too high;
7. That 18% have still an unfavorable impression of the lumber industry, while 27% are neutral or have no impression at all;
8. That 35% think that lumbering as practiced today is harmful to wildlife; and
9. That 24% think that lumber is decreasing the water supply.

Common-Front Approach Paying Off

The situation was worse even a few years back. But by concentrating and directing the informative campaign on the problem areas, the situation has been improving with the years. The various forestry trade groups — while they have still their clash of interests in many areas — present more or less a united front when it comes to developing public appreciation for the entire forest products industries. Differences among companies exist, rivalries among forestry industrial leaders will ever be present, but the common-front approach of winning the public confidence for the wood-based industries has begun to pay off. From a comparison of the results of the successive polls, the American forest industries are gratified to know that they are succeeding in improving their public image. The ORC surveys show these trends:

1. That there is a significant decrease in the number of people who think that the forests are being cut faster than they are being replaced (62% in 1952, 57% in 1956, and 56% in 1962);
2. That there is a decrease in the number of people who think there is much wasteful cutting of timber going on (35% in 1952, 32% in 1956 and 31% in 1962);
3. That there is a decrease in the number of people who think there should be more government ownership of forest lands (29% in 1952, 31% in 1956 and 25% in 1962);
4. That there is a decrease in the number of people who think the prices of lumber are too high (17% in 1952, 25% in 1956 and 18% in 1962);
5. That there is a marked increase in the number of people who have a favorable impression of the lumber industry (49% in 1952, 42% in 1956 and 55% in 1962); and
6. That more people are getting better familiar with tree farms (45% in 1952, 56% in 1956 and 59% in 1962).

Special Need for a Good Image Campaign For the Philippine Forest Industries

In the United States, it could be seen that despite the high literacy and the general awareness of the American public on national and community affairs, the ORC polls still show a disconcertingly high rate of misinformation on forestry matters. The findings reveal that only 14% of the American public are well-informed on forestry matters, 33% are moderately informed, and 53% are poorly informed.

If such an extent of misinformation exists in the United States, the condition in the Philippines can only be conjectured. Considering the very limited information reaching

the Philippine public and the amount of misinformation often times being made to pass for facts, the percentage of our public poorly and ill-informed on forestry issues would be comparatively astounding.

Again, in the United States only 27% of the commercial forest lands are owned by the federal, state and county governments; the larger bulk, or 73%, are privately owned either by corporations or by individuals. Under this situation, the private land owners can, if they wish, do as they please with their private land holdings, use them the way they choose and, generally, there is nothing that the public can do about it. Yet, as we have seen, the forestry industries make a deliberate case of creating a good public impression for themselves. The private forest owners and the public seem to have accepted that a forest land has social and community implications and that what happens to the forested property could not but have an influence on the welfare of the residents in the forest vicinities. Both recognize the built-in influences and services of a forest as protection for soil, sanctuaries for game and wildlife, a place for outdoor recreation, improvement of the landscape, etc. in which the community has decidedly an abiding interest.

Quite a contrast is the forest ownership situation in the Philippines and quite obvious is the social conscience concept that Philippine forestry entrepreneurs must follow in the utilization of the forest lands. In the Philippines, practically all the forest lands are government owned. The public owns the forest lands and this being so the people have the right to demand assurance that the public forest property is being used in a manner that will not prejudice the common weal. As primary and immediate beneficiaries of the forest property the Philippine forest industries must assume the responsibility of keeping the Philippine public well informed of the manner of their custody of the forest and of allaying whatever fears the masses might be entertaining about the safety and future of their patrimony.

The large areas of the Philippine public grown indifferent to or suspicious of the forest industries, even the rash of onerous government policies and regulations that plague and rock the industries from time to time, can in a large measure be traced to the lack of or desultory efforts of the industries at reaching the public with the facts, or in presenting a fair picture of the facts.

The danger in tolerating a situation where the public is ill-informed is obvious. When not given the facts, gossips and destructive rumors will take over. Fed with wrong information or allowed to make their own conclusions from faulty data or biased interpretation of the data, it has not been surprising why the indifference and suspicions persist. It is not even far-fetched that one day a misled but aroused public sentiment would stampede Congress to pass ill-advised legislation, or for government fiscal and financial agencies to be jittered into issuing ill-conceived regulations. Every year a number of onerous bills are introduced in Congress and from time to time stiffling rules and regulations premised on faulty information have been issued by government agencies concerned with forestry matters. These are symptomatic of the ill-temper of the public and portents of more unpleasant things if the situation is allowed to grow worse — and if many a lumberman concerned do not do some soul-searching on their responsibilities as holders of licenses they have been privileged to hold.

The various forestry associations, like the Philippine Association for Permanent Forests, the Philippine Lumber Producers' Association, the Philippine Chamber of Wood Industries, and the Plywood Manufacturers' Association of the Philippines, are doing something but not only is the effort very limited but in many cases the contradictions and varying versions of data and information have at times added more to the confusion.

Again with us in the Philippines, the industries had seemed to conveniently shrug off their shoulders and passed the job of informing the public to the government forestry agencies. Even if these agencies have the resources — which they have not — basically, the perspective of these agencies are different from that of the industries. The government has the task of regulating and perpetuating the use of the forest, the industries have the task of using the forest and informing the public that use and perpetuation have been harmonized. The latter are, and should be, their own best spokemen.

Unflattering Philippine Picture

There has been no poll of the thinking of the Philippine public relative to our forests and forest industries. But no poll is needed to show that the picture is none too flattering for the industries. A cursory study of articles and views expressed in the press, the public pulse columns, contacts with various sectors of the public, commentaries in forestry and conservation conferences, etc. would show a thick cobweb of misinformation shrouding the industries. The lumbermen have, by commission and omission, created a none-too-good picture of themselves and their industries. The amount of misinformation going around is fantastic, the grave doubts lurking in the thinking of many sections of the public on the motivations of the local forestry entrepreneurs are frightening, and denunciations of the actuations of some lumbermen have been sickening and these could not but affect the public picture of the industry as a whole.

The local forest industries, for instance, are not unaware of the following trends of thoughts of our public, or of some segments of our public:

1. That our forest lands have dwindled very fast and that the future of our forest patrimony looks very grim;
2. That lumbermen are despoilers of the forest wealth, in a class with the kaiñgineros, and do nothing to protect their holdings;
3. That the lumbermen are raking in fortunes at the expense of forest conservation;
4. That many of the lumbermen are dummies of aliens;
5. That it has become impossible to enact sound forestry legislation because lumberman-legislators themselves stand on the way;
6. That reforestation is a useless expense of public funds;
7. That lumbermen are unmindful of their destructive way of logging and the wood wastes they leave in the forest;
8. That against the fabulous profits of the lumbermen, the tax the government collects on timber is very ridiculously small;
9. That fragmentation of forest concessions is better for the industry;
10. That getting a forest concession depends on proper connections;
11. That more of the forest lands should be opened up to accommodate the landless; or
12. That the deforestation of the mountains cause floods.

What are the half-truths, what are the outright misinformation, what are the facts that can be explained away or which suggest the need for reform in the industry — all this seems to blend in a picture too distorted to recognize but which the Philippine forest industries have made no concerted effort to correct. And so long as the bad image lasts so long will the public hold the forest industries in distrust. What is worse, both the conscientious and the irresponsible lumber operators are lumped together in the public indictment. Hardly will the public bother to distinguish between the good and the bad individual companies.

Basic Approaches to Good Image Formation for the Philippine Forest Industries

A good image, like a good reputation, is long in the making. Both are formed from an attitude of confidence, both are based on integrity of character. It is aptly said that there is no difference between the way an individual becomes respected and earns the confidence of his community and the way a corporation earns a good image. And an image, like a reputation, is very brittle and easily tarnished. An overt act or an indiscretion can ruin.

The following are suggested as approaches worthwhile considering in a good image campaign:

1. The task of developing a good public image for the industries will come from sustained effort;
2. Creating a favorable impression for the industries rests on putting the industries themselves in a position of integrity and uprightness. It would be a mistake to assume that a good lasting image is formed by covering up faults, twisting the facts, or hood-winking the public. People will eventually discover the truth;
3. To assure coordination of efforts and the efficient utilization of limited resources, the larger and more common interests of the industries are better handled thru a central group; or this failing, by the various forestry trade associations working in concert with one another; and
4. The individual companies themselves should within their capacities conduct their own information campaign to complement what the associations are undertaking.

Outline of an Image Building Program for the Philippine Forestry Trade Associations

There are presently four forestry trade associations in the Philippines, namely, (1) Philippine Lumber Producers' Association, (2) Philippine Chamber of Wood Industries, (3) Plywood Manufacturers' Association of the Philippines, and (4) Philippine Association for Permanent Forests. Considering that some lumber companies have interlocking memberships in these four associations, it should not prove too difficult to arrive at some cooperative arrangement in drawing up a common program designed to promote the general interests of the industries, nor too much trouble in sharing in the expenses of such a program. Some steps have been tried towards this end, but these have been casual and half-hearted.

To provide the associations a starting point, the following is offered:

A. Organization of a central information committee:
   1. First alternative: form a unified standing committee to be composed of a representative from each of the four associations, the committee to be given adequate authority to agree on a common program;
   2. Second alternative: an *ad hoc* committee composed of a representative from each association and serving only as a clearing house to achieve even a loose coordination of efforts, or to farm out the activities to be undertaken by each association.

B. Functions of the standing committee:
   1. Assess the correct image of the forest-based industries, define the areas needing attention;
   2. Determine the scope of the information program needed;
   3. Draft (by themselves or with the assistance of an information specialist) the details of the information program;

4. Prepare a budget to finance the program and recommend ways and means of its financing;
5. Carry out or supervise the implementation of the program.

C. Suggested activities by or under the sponsorship of the associations:

1. Production of educational films on industry-wide basis;
2. Radio and TV programs to present the views of industries on pending legislation, taxes, government regulations, etc.
3. Preparation of brochures, pamphlets and other printed materials on general aspects of protection, utilization and conservation of the forests;
4. Periodic press releases and articles on commonfront industry policies;
5. Sponsorship of tours and plant visits for government officials, newspapermen, business and civic leaders, teachers and student groups, etc.;
6. Participation with suitable exhibits in industrial fairs, trade conferences, etc.;
7. Presentation of the views of the industry or the association in legislative hearings, investigations, etc.:
8. Formation of a speakers bureau for appearances in conferences, group discussions affecting the industries;
9. Furnishing legislators and policy making officials data and information helpful in the formulation of constructive laws and policies.

Pointers on Individual Company Program

Whether big or small, a lumber company is desirous somehow of having a good public image. There are many ways the desired image can be developed and undertaking a good information campaign is one of the most effective. The scope of the information program of a company depends, among others, on its resources and its particular need for the program. It will certainly be helpful for a company to get the advice of a qualified public relations specialist before going into such a campaign.

The following outline lists some pointers on planning and undertaking a good image building program:

A. Organizing for the program

1. Choices in organizing the staff
   a. Appoint a full-time public relations manager
   b. Retain the services of an outside public relations firm
   c. Assign the job to a company official as a secondary function
2. General functions of the staff
   a. Draft guide policies on the objectives and scope of the program for the consideration of management
   b. Prepare a program, including its budget, on the basis of approved plans
   c. Implement the program

B. Suggested activities and tools

1. Preparation by the staff of:
   a. Press releases and articles on company activities, products and services, objectives and programs, and anything to win respect and esteem for the company
   b. Woodland and mill tour guide pamphlets
   c. Data and information to be furnished legislators and government officials which are useful for constructive legislation and policies
2. Take charge of the arrangements for the production and showing of:
   a. Informative films on company activities
   b. Brochures, posters and pamphlets

3. Promotion and handling of:
   a. Tours of forest operations and mill departments by government officials, business and civic groups, etc.
   b. Open house for the community
4. Handling of:
   a. Company advertising
   b. Sponsorship of or participation in community civic, cultural, athletic, and social programs
   c. Company participation in fairs and trade exhibitions
   d. Company assistance to the community in emergencies and calamities
5. Arrangements and scheduling of appearance of key company officials in radio and TV programs, group discussions and assemblies.

C. Harnessing the potentials of company officials and personnel for the image building program
   1. Appreciating this potential:
      a. Company needs to start building a good image from the inside
      b. Residents of the community judge the company by the people they know working in the company
      c. Well-informed and enthusiastic company officials and employees can be effective image builders with people they come in contact with
   2. Suggested activities and tools to win and harness this potential:
      a. Publication of a house organ
      b. Holding regular assemblies and meetings, seminars and orientation courses
      c. Holding open houses for families of personnel
      d. Promoting guided tours and visits of company personnel to other departments of the company
      e. Brief and informal visits of top key officials to individual workers
      f. Making available general reports and keeping personnel up to date thru house organ or periodic bulletin on company policies and plans, increasing their knowledge about the company background and organization
      g. Showing of educational industry films and slides.

CONCLUSION

In the United States a dynamic information campaign by the forest products industries has been going on for some time and a good public image of the industries is emerging. But even here, the industries realize that there is still much to be done to improve their image.

An image building program for the Philippine forest products industries is long overdue. The Philippine public has a distorted picture of the forestry situation and an unflattering impression of the forest industries. Much of this has been the result of the limited information reaching the people or a wrong presentation of information. It is not surprising therefore to find the industry much concerned over some government rules and orders based on misinformation or wrong evaluation of facts. It is even possible that Congress reacting to public clamor might one day be stampeded into passing hasty legislation.

The various forestry trade association will do well to get together — soon — and map out a common-front information campaign. Also, the individual companies should, within their resources and in their respective communities, do their own image building as whatever good will and good image they make for themselves will be one bright facet adding to the improvement of the whole picture of the industry.

Problems and Solutions in Field Administration

by
RUFINO A. SABADO
Regional Director of Forestry

There are a thousand and one problems in field administration of the Philippine Forestry Service — from the minutest pin to the personnel. I would, however, begin with what I believe to be the most important problem and go down to the less important. Let it be understood, however, that these problems are discussed "with malice towards none and with charity for all."

DECENTRALIZATION

The WAPCO contemplated a decentralized Forestry Service. That was why provision was made for the creation of eight regional offices. The Bureau of Forestry was one of the latest, under the Department of Agriculture and Natural Resources, to create a token of its eight regional offices — six men to a region. And not all the regions have the six men under them. Out of the six men only two are technically trained foresters — the Regional Director of Forestry and the Forestry Supervisor I. There lies the futility of our regional offices.

The trend of public administration is decentralization. That is true in all progressive countries. Why we are slow in doing it here is beyond me. Ours is a small country; but its forestry service has become, and is becoming more and more, complicated. Hence, its need for decentralization.

The Philippine Forestry Service is closely patterned after the U.S. Forest Service. We have the Director of Forestry — they have the Chief, U.S. Forest Service; the Regional Director of Forestry — they have the Regional Chief; the District Forester — they have the Forest Supervisor; the Officer in Charge — they have the Ranger District. The chain of command in the US Forest Service is from the Chief down to the Ranger District. The line officers are the Chief, Regional Chief, Forest Supervisor, and the Ranger. We have the corresponding line officers, but the chain of command by-passes the Regional Director of Forestry, except on very exceptional cases, and goes down to the District Forester. Our Regional Director of Forestry's job generally is the supervision and coordination of forestry activities in the region when it should be administration, supervision and coordination of all forestry activities in a region. But how can a Regional Director of Forestry administer his region with only one forestry technically trained man in his office!

The solution of the problem is simple. We can have additional forestry technically trained men, yes; but for the moment we can spread out men from the Central Office to the different regions. Under a decentralized service there is not much need — as in centralized service — of men in the Central Office. What should be left in the Central Office are the staff officers with the consequent clerical help. Theirs is the duty to make studies, plans, and policies for implementation by the line officers. In other words, they are the ones to conceive the things to be done, and done properly, by the line officers as given out by the Director of Forestry. Theirs, too, is to go out to check for the Director of Forestry that the work is done properly.

POOR DISTRICT HEADQUARTERS

By and large our district headquarters are on buildings which are better suited

for poultry coops. It is a sad commentary to see our district personnel congested in small spaces like they are not members of the human race. Our district headquarters cannot by any means compare with provincial offices and some lucky national offices in the provinces. There are three or four exceptions in fifty six (56) district offices.

The solution of this problem is not simple. We need money to build these headquarters. It is hard to get the money but we can keep on trying. Meanwhile, District Foresters should be on the lookout for possible places to build these offices. If possible they should be set aside as Civil Reservations by Presidential Proclamation for District Foresters Office sites. There are, however, provinces or cities which have government lots for national offices. On these lots we can build our district offices. How? We really don't build them ourselves. We appeal to our forest users to build the offices and the builders donate them to the Bureau of Forestry. We can do this in our busy timbering districts. This was done before in at least one district office. We can do it again and again. Is there any objection to this?

LACK OF FORESTRY TRAINED PERSONNEL

The Philippine Forestry Service since I can long remember lacked forestry trained personnel. This shortage is more keenly felt today, what with our forestry practice becoming more and more complicated — scientific, that is. Our College of Forestry, University of the Philippines, it would seem, cannot produce the men our bureau needs. And there are the Reforestation Administration, Forest Products Research Institute, College ot Forestry, and lumber companies to absorb the graduates of that College, too. So there you are! It will take time before other colleges or Institutes of Forestry can graduate men to suit our needs. Then there is a question ot fiscal limitation in our bureau which discourages the upper bracket of graduates from joining it. Imagine a BSF graduate being appointed a forest guard! And there are vacant positions for foresters which are not filled.

There is one Forest Experiment Station which has only one forestry technically trained personnel — its Forester in Charge. Other foresters under him left for "greener pastures" in the bureau. Very soon, God forbid, all the five Forest Experiment Stations — and may be the Forest Research Division, too — will have nothing but the Foresters in Charge. Why? Because the foresters in there will seek "greener pastures" in the bureau or elsewhere.

The solution to this problem is not as easy as it seems. First let us get the necessary appropriations from Congress to enable us to give our forestry graduates better positions when they join the bureau. Meanwhile there are forester positions which must be filled with forestry graduates now in the service and those vacated by them could be given to graduates just coming in. Let us not save from our appropriation on positions which require technical training in forestry. We can sacrifice by foregoing so many clerical help, not on technically trained forestry men. But even then we do not have as many forester positions in our budget which will take care of all our forestry graduates. So they have to come in on Scaler positions. That is sad but that has to be done meanwhile.

Our forest research work has been neglected notwithstanding the fact that research is the key to management. Let us give our researchers better salaries. The WAPCO had foresight when it gave section chiefs in the Forest Research Division and Foresters in Charge of Forest Experiment Stations higher salaries than section chiefs in other divisions of the bureau and District Foresters. That is not true anymore. So what will be the incentive of Foresters to go to the Forest Research Division or to the Forest Experiment Stations? Research is a very unglamorous job. Our young forestry graduates want glamor and more money, too. So they go for land

classification and lumber grading, not for research. Let us, therefore, give our research foresters better paying jobs, better paying than those of other divisions in the bureau. And keep them there unless they resign from the service.

FOREST PROTECTION

Destruction of our forest has been going on since time immemorial. The rate of destruction increases as the years go by. We are destroying our forest faster than in any other country of the world. Now more than ever we need to protect our fast dwindling forest resources. Now is the time or never; because we can lose these resources in no time at all. If you fly above our forests you will find how badly pockmarked they are with kaingins. Our forest guards and forest officers do not seem to get much headway. It can be that there are so few over so wide a territory. And there is a sneaking suspicion that many of our forest guards are not really forestry conscious notwithstanding the law against forest destruction. The law punishes a forest officer who gets lax on forest destruction.

The solution to this problem depends upon our field men. There is a district I know that files in court hundreds of kaingin cases. There should be prosecution, yes; but prevention is much better. Prosecution is the last resort. A campaign for forestry consciousness should be carried on far and wide. This is a job for every forest officer, in addition to his normal duties. At any rate, there is need for more thoroughly trained and indoctrinated forest guards solely for forest protection work. In-service training should be given every now and then.

There are a lot of obstinate kaingineros. These are to be prosecuted. To handle the prosecution enough duly deputized lawyers be sent to the regions or districts to handle the prosecution of kaingin cases in court. Invariably the Provincial Fiscal has no time for our cases. Our lawyers will do the job. Their assignment to the regions or districts must invariably be included in our preparation of the budget. This is not easy but we must by all means try to do it. We may yet succeed.

LIMITED ALLOTMENT

Our field offices are hamstrung by very limited allotment for travelling expenses. By and large a district allotment per quarter is finished during the first one and a half months of the quarter. After this expenses are sent to Manila for reimbursement. The reimbursement of these expenses is a sixty-four dollar question.

This is a difficult problem for our budget officer to solve. Invariably there is enough amount of allotment for travelling expenses when our budget is submitted; but there are a lot of pruning knives that it must pass through, the biggest of which is the pruning knife of Congress. Our budget officers always try to do better in every budget preparation. They can yet succeed to get enough allotment for our travelling expenses.

LIMITED SUPPLIES AND EQUIPMENT

Our field offices carry on with very limited supplies — even stationery. The officers resort to asking from forest users just so the office work must go on. Lumber crayon, pencil, ink, carbon paper, pin, clip, fastener, folder, and a lot of little things that go with office administration are seldom seen in district offices. Then we have to reckon on the more important equipment — table, chair, typewriter, adding machine, filing cabinet, etc. — these, our district offices badly need. Many of our field men do not even have compass, chain, marking hatchet and leather notebook. The forest officer now is a far cry from pre-war forest officer in terms of supplies and equipment.

The situation our field offices is in can no longer stand the test of time. We should do something about it. Keymen of the Administrative Services Division should go out

and see our field offices and compare them with offices of the Provincial officials. They can see the big difference. Our Administrative Services Division should do something to get more money for our field offices. Haphazard action will not amount to anything. Some aggressive and progressive action must be done to get the desired results.

COLLECTIVE EFFORTS . . .
(*Continued from page 4*)

riments should be published and fed to the Forestry Information Section for dissemination to the public. We should conduct more studies on the growth and yield of forest stands and trees to regulate the cutting of timber and attain sustained supply of raw materials for our wood industries.

Researches on forest influences, silviculture and forest grazing should be extensively undertaken. The research projects that have been started should be completed as soon as possible.

Forest legal cases should be attended to in cooperation with the local fiscals and the Bureau Legal Division. Efforts should be exerted to preserve and collect evidence which can stand up in any court of justice. It seems that legal cases on forestry are pursued on and off.

Forest officers in the field service should take every opportunity to spread the gospel of forest protection and conservation. As part of your public relations program, you should enlist the support of the local governments and civic organizations in the campaign against forest destruction.

My fellow-foresters, I hope in this conference you will discuss intelligently your problems and propose the necessary solutions. Let us make this conference not merely an occasion to get together. It should be a fruitful one. Talking is a very easy task. We can talk to our heart's content. But doing is another thing. After this conference let us rededicate ourselves to doing things.

My friends, let us revive the forestry golden era of the past. Always remember each of us has a stake in the success of the programs of the Bureau of Forestry.

Together, my friends, we will do our very best to live up to the expectation of the public. You who are assigned in the field service face a challenge that is more immediate because you are always in the frontline of the government campaign to secure for all generations the blessings of our country's forest resources.

Forestry fieldmen onward to your march to glory.

I thank you.

INTENSIFICATION OF . . .
(*Continued from page 8*)

All of these efforts should be directed to worthwhile studies without unneeded duplication. I suggest that the Forest Research Division of the Bureau take the initiative in coordinating all efforts in forest management research.

6. *Plant open areas on concessions through cooperative arrangements with the Reforestation Administration.*—The most productive areas available for planting are those recently opened around spar trees, in skid-ways, etc. within the timber concessions. Prompt planting would prevent invasion by weed species and also would reduce the temptation of squatters to expand and cultivate such openings. It is logical that the skills and facilities of the Reforestation Administration should be utilized in this work. It is hoped that the necessary arrangements can be made by the Department to implement this inter-agency cooperation. Such planting would make very productive use of some of the reforestation funds generated on the timber concessions where the planting is needed.

For Sure Profit- Why not Establish Tree Farms

by

FLORENCIO P. MAURICIO*

A farm may be made to produce agricultural crops — it may also be made to produce tree crops. Either way is profitable. Whether your farm is on low or high land: on valleys, on slopes or tops of hills and mountains; near or far from the sea — it is prospective forest land. A sure crop would be short-rotation species: trees that grow fast enough that they can be harvested in a few years. The market is assured since our pulp and paper mills still import pulp materials from foreign countries because the local supply of pulp is very inadequate.

Trees have larger and longer roots than common agricultural crops. Even without irrigation the trees can still have adequate water supply. Unlike rice, corn or vegetables which draw most of their water supply from the upper six inches of soil, trees get most of the water needed for growth well below the surface soil and from the air. Tree seedlings, of course, get their water immediately below the soil surface but then this water supply is assured the seedlings if they are planted at the start of the rainy season. As the seedlings grow into saplings, then to poles, and then to standards until finally harvested, the roots below the soil lengthen in proportion to the growth of the stem above the ground. In the process of growth and development, debris is accummulated over the soil to be decayed and form what is called humus — the cheapest fertilizer there is. This humus will store some water and supply surface roots with the necessary moisture requirements.

In the United States and elsewhere high portions of farms are planted to trees and the lower portions to agricultural crops. If the proportion of the area planted with trees to that planted with agricultural crops is correct or balanced, then the danger from floods, soil erosion and soil impoverishment is minimized. The trees planted on higher areas will store or otherwise hold rain water for percolation into the sub-soil and then slowly supply it to the needy plants below during the dry season. Thus clear almost even flow of rivers and creeks throughout the year. Decayed organic matter in the form of humus will be carried by water, wind or other agencies from the forested portion to the agricultural portions below where it will rejuvenate the soil. In areas managed as ranches, the higher land planted to trees serve as browse area and source of miscellaneous construction materials. Some timber are even sold for much-needed cash. By being a barrier, the forest serves also as a protection against strong winds. Besides, the forest ameliorates the climate by lowering the air temperature several degrees during warm days and by increasing it on cold days. This tempering-the-climate effect of trees, of course, depends greatly upon the type, density and location of the forest tracts.

In the Philippines most farmers believe that the land is agricultural because their fathers, grandfathers and great-grandfathers before them believed so. Because everybody around them believe so. Because nobody has been planting trees extensively. But times have changed since then. Industrialization has come to stay. Look at the tobacco-raising regions, the Ilocos. Some tobacco growers even go as far as Central and Southern Luzon provinces for wood to be used to flue-cure tobacco leaves. Some resort to

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using the rachis of coconut fronds (leaves) when their bamboo fences are already exhausted. Some probably even use portions of their houses as fuel — if only to raise somewhat the price of their tobacco thru proper flue-curing. Lucky then will be the fellows who have anticipated this need of wood for flue-curing tobacco and had their lands planted with Ipil-ipil, Madre-de-cacao and other trees suitable for firewood.

Look at the average Filipino farmer of today. He works like a horse from dawn till sunset, sometimes even at night, in order to eke out a living from the soil. Still most can not get past the hand-to-mouth existence. Now, if he is a tree farmer he will be busy only during the planting (rainy) season. He can do other lighter jobs the rest of the year. In 6 years his tree farm, if planted to Moluccan Sau [*Albizzia falcata* (L.) Back.] would have produced about 650 cubic meters of pulpwood to a hectare. At ₱9.00 per cubic meter this would give him ₱975.00 net per hectare per year. Granted that this would be not as satisfactory as the amount derived from progressive rice-farming, the fact still remains the efforts he would put into it is not as wrecking as a rice farmers' task. He will not worry so much about the weather because his forest crop is assured provided he plants the species suited to the area, planting is done right, the trees are correctly spaced, and protected from insect pests and diseases.

Moluccan Sau is only one of the probable profitable crop trees. We can raise Benguet or Mindoro Pine for Christmas trees, pulpwood, mine timber and construction wood; Kaatoan Bangkal for pulpwood and veneerwood; Gubas for pulpwood and matchwood; lumbang and baguilumbang for pulpwood and from its nuts the oil extracted used in the manufacture of hardboards and paints; bamboos for pulp as well as general construction material; and Ipil-ipil, Kakawate, Bakauan and several mangrove species for firewood and general construction wood; to mention a few. For further particulars, one may consult or write the U.P. College of Forestry and the Forest Products Research Institute at College, Laguna; the Reforestation Administration at Diliman, Rizal; the Bureau of Forestry at España, Manila; and some lumber companies maintaining tree farms in their license areas like the Nasipit Lumber Co., Inc. at Tuñgao, Butuan City.

One of the far-sighted and lucky fellows I have met is a tree farmer in Upper New York. He invested most of his earnings, as a factory superintendent for 15 years, into buying abandoned farms and had Red and White Pine planted therein. He has since resigned from his job to take care of his tree farms. Whenever he needs money, he just notifies one of the sawmills or pulpmills near his place to cut some of his trees. These mills are only too willing to pay him a dollar for every tree cut from his tree farm. The fellow does nothing but receive the money — the millhands cut the trees so designated by the State Forester and transported to the mills. He told me that properly managed his tree farms could provide him comfort and luxury for the rest of his natural life. When I met him in 1960 he was a 42-year old contented family man.

So, when you are about to cut a tree in your land better think twice before felling that tree. It might be better for you in the long run if, instead of cutting it down, you plant more trees. Or better yet, convert your farm into a tree farm. A co-worker of mine found out lately that the Gubas in his 4-hectare land, untouched for ten years after purchasing it, was worth ₱4,000.00 to the hectare. Another found out that the Narra and Acacia trees in his 8-hectare unimproved land was valued at ₱3,000.00 a hectare. So, many people have found and will ultimately find tree farming profitable. Why not give it a try? Besides the profit, you might be able to understand why Joyce Kilmer wrote the immortal words:

"... Poems are made by fools like me
But only God can make a tree...."

Some Suggested Measures to Solve Kaingin Menace

by
DOROTEO U. ANTONIO
Forestry Supervisor

There is a growing apprehension that the forest of the Philippines is fast diminishing. Uncontrolled flood waters are easily blamed for destructions made by loggers in the forests. Loggers, in turn, blame kaiñgineros who follow, or are sometimes well ahead of, their logging operations.

Indeed, the *kaiñginero* seems to be the real culprit in the final destruction of the forest. For in his processes, fire is his most destructive tool. Once fire is set on dry, *kaiñgin* area, destruction of the remaining vegetation is complete. After the destruction, the land rarely permits growth of forest trees other than those planted by the *kaiñginero.*

It is, therefore, the destruction of the forest through *kaiñgin*-making that must be prevented. However, before any measure of prevention can be suggested, the factors that cause the *kaiñgineros* to destroy the forest must first be determined.

There are two motives by which *kaiñgins* are made: (1) by necessity, and (2) for speculation. Under the first category, we find *kaiñgineros* to be the native tribe of specific areas and immigrant land-seekers. Their desire to acquire land which they can rightfully call their own, also lead them to *kaiñgin*-making. Under the second category we find the more intelligent lot, recidivists in some cases, who, singly or in organized groups, make *kaiñgin* in public forest and timberland with the purpose of selling their *kaiñgins* to buyers or immigrant land-seekers. Groups in both categories are often backed up by politicians who stay behind petitions or requests for the release of certain portions or blocks of public forest or timberlands.

Efforts should be aimed at controlling the destruction of the forest which is motivated by necessity. If this can be done, it should be easy to weed out *kaiñgin*-making for speculation purposes. *Kaiñgin*-making motivated by necessity is most difficult to control because it involves trespassing on the native liberty of a person to choose where he resides and also it involves certain economic and social problems. Here, government entities charged with the protection of the forest often find themselves dealing with people who never have heard of any forest law and its processes. Most of these people can barely support their families and much less bear the time and expenses in facing their cases in court.

Prevention of *kaiñgin*-making may be effected with a sincere implementation of the following suggested, if not reiterated, measures:

1. *Intensify forestry education of the masses.*

   Monthly or quarterly meetings and programs should be conducted in barrios, sitios and municipalities near forest areas. It may be necessary to gauge the cooperation of local leaders — from congressmen down to barrio captains and engage their services as resource speakers in promoting the forestry education programs whenever possible. It may also be necessary to conduct forestry educational programs such as seminars, etc. for provincial officials and barrio leaders. Such programs should emphasize:

   a. The necessity of keeping timberlands and forest reserves fully timbered.

b. The existence and purposes of the forest entities.

2. *Organize an effective forest patrol.*

a. Aerial detection necessary:

Government forestry entities charged with the protection of our forest may need planes for aerial patrol and detection of *kaiñgin*-making. Making kaiñgins is done behind thick forests and gives the impression when seen from a trail or road that nothing amiss is being made until the area is seen from a bird's eye view. A light plane which can load at least three persons (including the pilot) can cruise at slow speed, and can land on short strips, fairly level pastures and beaches suitable for this purpose. If such planes are available they should be placed in the care of the forestry entities. Selected physically and mentally able forest officers may be trained to pilot them.

b. *Forest Patrol.*

Regular forest patrol teams must be organized and assigned at every forest station (and park and reforestation stations). Each team must be composed of:

1—forester (team leader)
1—scaler or equivalent (team assistant)
2—Forest Guards or equivalent
2—Concession guards (provided by the company whose area is patrolled.)

There should be sufficient patrol teams to be able to patrol thoroughly a predetermined area within one week although the length of time may be extended when *kaiñgin*-making is detected in order to enable the patrol to gather all the information and data necessary to bring the case to court as soon as possible. Patrol work in a particular forest area should be conducted once every quarter.

Forest patrol must be coordinated with aerial detection. This is now practiced by some timber companies which have planes. Patrol should be conducted by the team and, never by any individual member. This is necessary because *kaiñgineros* sometimes resist forest officers who singlehandedly make surveys and assessments of the extent and damages made in *kaiñgins.*

The team must be equipped with fast means of transportation such as jeeps and horses in addition to the regular equipment of a forest officer. If immediate arrest of a *kaiñginero* is effected, the forest officer should be able to transport the violator to jail or court immediately. If this could be done it might be impressed upon forest violators that the government means business and that alone may deter prospective culprits.

3. *Provide enough legal counsel.*

Lawyers employed by government forestry entities charged with the protection of the forests should be assigned, at least one in every Regional Office, to act as counsels for the government officers during court hearings of *kaiñgin* cases. The government's losses in *kaiñgin* cases are often due to legal technicalities or deficiencies. Mistakes could be avoided if proper legal counsel is available.

4. *Respective timber licensees should be required to shoulder the expenses of feeding the kaiñginero while serving sentence in prison.*

The Bureau of Forestry has required licensees to follow policies for the conservation of forest in their area. Although the requirements are implemented, they

are sometimes insufficient to be really effective against *kaiñgin*-making. A logger therefore proposed the idea that it may still be possible to include as part of the timber license regulations that the licensee should also shoulder the expense of feeding the *kaiñginero* found in his license when said person is convicted and serves his sentence in prison. This may be necessary because some municipalities lack sufficient funds for feeding prisoners. Perhaps the licensee who sees the prospect of also feeding the *kaiñginero* during his jail term may take a stricter action to stop a prospective kaiñginero right at the beginning.

5. *Set aside a portion of public land for the resettlement of deserving Kaiñgineros.*

To some *kaiñgineros,* making *kaiñgin* is necessary to maintain their livelihood. A *kaiñginero* may be a displaced native or an immigrant from another province seeking better settlement and livelihood for his family. Out of necessity, *kaiñgineros* knowingly or unknowingly violate the rules and regulations pertaining to forest lands. Of course, the law against *kaiñgin*-making must be upheld and perhaps these *kaiñgineros* will have to serve their penalties and jail sentences. But after serving their sentences, where do these people go? Certainly, out of necessity, they must go back again to *kaiñgin*-making. It is now a common knowledge that jailing *kaiñgineros* does not solve the problem.

Government forestry entities concerned should, therefore, set aside a portion of the public domain in which the deserving *kaiñgineros* should be resettled. These must fall within the scope of work of the government forestry entity in whose jurisdiction the area for resettlement has been chosen. A team composed of experienced foresters and surveyors should be assigned to choose the areas for resettlement.

Certain criteria must be evolved to serve as a basis for determining a deserving *kaiñginero.* The following criteria are suggested:

a. He must be a member of the lesser and semi-civilized tribes, such as: the Manobo and Bagobo of Cotabato, Magahat of Bukidnon, Mandaya of Davao, Subanons of Zamboanga Peninsula, Aetas of Zambales, Dumagats of Isabela, etc. Perhaps land reservation set aside for the settlement of the individual tribes would work best. Certain guiding principles used in resettling the former lawless elements in the NARRA and EDCOR reservations may be adopted.

b. He must not be a known speculator — one who makes a *kaiñgin* and sells it within a few years.

c. He must be a recidivist, and does not fall within the scope of criterion No. 2. A recidivist for the third offense may really need government assistance in seeking proper settlement without further committing violations contrary to the law.

d. He must not have any known property (real estate) in any locality of the Philippines. The government should make effort in verifying the properties of a candidate for settlement.

Areas set aside for resettlement should be subdivided according to the average area which a *kaiñginero* is able to cultivate. A study must be made to determine this. Such areas should never be released as alienable or disposable lands but should be maintained in the category as public forest lands. Long-term lease agreements renewable at certain periods should only be given. The holder must be required to pay the regular land tax (rental) for the use of the land. The government forestry entity concerned must

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Unsung Forest Concessionaires

by
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Local newspapers recently published articles depicting heavy and consistent denudation of our hills and mountains, brought about mainly by kaingineros and loggers. Those articles depict that practically all loggers are destructive and they benefit only themselves and never our country at all.

However, this picture is not totally correct because there are many forest concessionaires that systematically plan reforestation of or properly manage their respective areas to perpetuate their forest holdings, knowing fully well that it will be to their very great advantage if the forests that they are now operating can be made to yield commercial timber forever, thus assuring future supply of logs that can be sold or processed locally or exported to bring in indispensable foreign exchange.

These licensees are in many ways civic spirited. They have built kilometers upon kilometers of roads in their respective forest areas that cost, on the average, no less than ₱10,000 per kilometer. The Philippine government practically has not contributed a single centavo to the construction of said logging roads that presently traverse our forests in many parts of the country.

In addition, these enlightened logging operators have put up and financially supported schoolhouses and hospitals in their company sites. To educate the youth of the land, at least to give our young boys and girls elementary education, and to attend to the health of the people are primarily governmental functions. However, these are taken over by the management of many of these civic-spirited forest concessionaires in their respective jurisdictions.

The countless employees of these concessionaires naturally derive incomes and many of them pay income taxes to government coffers. Also, the government derives revenues from the harvested logs as well as from wood-processing factories that use these logs or wood residues, such as hardboard, sawmills, pulp mills, veneer and plywood factories and many others.

These forest concession operators have invested tremendous amounts of money in installing expensive machinery in their factories. They send pensionados to the University of the Philippines College of Forestry or elsewhere; they train forest guards and later employ them as well as professional foresters to operate and manage their respective forest concessions and logged-over areas so that in due course of time the same areas will grow desirable timbers for future logging purposes. They operate forest nurseries at their expense.

It is believed that those who picture the evils of deforestation, due to illegal cutting and kaingin making, are not fully unaware of but that they unwittingly overlook mentioning the worthwhile achievements of many bona-fide logging companies such as, if some are to be mentioned, Bislig Bay Lumber Company, Aguinaldo Development Corporation, Nasipit Lumber Company, Inc., Aras-Asan Timber Company, Inc., Alcantara and Sons Plywood Manufacturers, Mañalac Enterprises,

Inc., Misamis Lumber Corporation, Lianga Bay Logging Company, Inc., and numerous others.

Impartial observers, who may visit these forest concessions, will surely notice the desirable and costly improvements introduced by this enlightened group of operators in their respective areas. They have purchased expensive logging equipment, i.e., heavy bulldozers, logging trucks and trailers, locomotives, light airplanes, sawmilling equipment, veneer and plywood machinery and what have you. In practically all cases, they have to pay customs duties on these importations thus contributing substantially to our national treasury.

Some of these unsung forest licensees also have built private wharves, which, at times, even other people are allowed to use. In view of all the foregoing, therefore, it can not be truthfully stated that all forest concessionaires in this country are destroying our forests very fast and are not contributing at all to their regeneration. Many of them, as above mentioned, are actually doing the greater portion of what our government agencies should be doing, viz., reforestation, forest management and protection, etc., for which they really deserve to be encouraged and congratulated.

Perhaps there are hundreds, even thousands, of fly-by-night or get-rich-quick logging licensees or dummies that operate on the principle of cut and quit, especially if they are given a very short period only, say one year or so, to cut logs from their concessions. These people, under such a set-up, can not be expected to take pains in protecting, conserving or reforesting their logged-over areas, for they have no assurance that their temporary licenses will be renewed upon expiration.

To remedy this situation, therefore, our Department of Agriculture and Natural Resources should give qualified applicants for forest concessions reasonably longer period of time to operate, say 25 up to 50 years, so that these licensees may be able to recover their heavy investments and still make reasonable margin of profit. (Remember our log or wood products exportation bring the second largest amount of foreign exchange into this country.) Otherwise, our standing forests will dwindle fast and the Philippines will suffer inevitably from water scarcity, especially during summer, and destructive floods during rainy season; our fertile agricultural lands will sooner or later be covered with sand, gravel, and even with boulders from the eroded uplands; wildlife may disappear completely from the rural scene and, ultimately, this rich and beautiful country that God has given us may become dry, barren, and infertile and our people's standard of living will surely retrogress.

Some progressive forest concessionaires have recently banded themselves and organized a non-stock corporation, the Philippine Association for Permanent Forest, Inc., the main objective of which is to work for the proper protection, conservation and enlargement of our present forested areas.

Let us congratulate and give this group our unstinted support and cooperation in its determined struggle to make our country heavily forested, particularly in those areas declared by our DANR to be permanently forested.

Philippine Forest Reserves: The Wasted Treasure

by VALERIO B. MENDOZA
San Nicolas Reforestation Project

The Philippines is one of the few countries of the world which is endowed with vast natural resources. Within its 29,741,790 hectares of land area, the most vital source of wealth is its forest resources. Of the total land area, 46.70 per cent or 13,887,660 hectares comprises our forest resources. Furthermore, 31.37 per cent* or 9,329,280 hectares are classified as commercial forest, non-commercial forest represents 12.92 per cent or 3,842,120 hectares, cultivated forest is 34.88 per cent or 10,373,540 hectares, cogon and open land is 18.42 per cent or 5,480,090 hectares, and swamp forest is 2.41 per cent or 716,260 hectares. The trees on the forest when properly managed yield the greatest profits continually in terms of monetary value not considering protective, aesthetics, and other values.

VOLUME OF STANDING TIMBER

Our standing timber is classified into three distinct classifications which are as follows:

1. Commercial forest which can provide us approximately 979,703,280 cubic meters of timber is further classified into two sub-classifications:

   a. accessible forest with 707,482,680 cubic meters of timber or 65.40 per cent of the total volume.

   b. inaccessible forest with 272,220,600 cubic meters of timber or 25.17 per cent of the total standing timber.

2. Non-commercial forest, accessible with a total volume of 95,021,913 cubic meters of timber or 8.78 per cent of the total volume.

3. Mangrove forest with 7,052,720 cubic meters of timber or 0.65 per cent of the total volume.

*Bureau of Forestry 1957 figures.

MINOR FOREST PRODUCTS

The above figures are pertinent only to timber which is considered a primary or major forest product. Within the forest there are other products which contribute a huge amount to the bulk of our forest products exports but are being taken for granted. Rattan for example is a minor forest product. These minor forest products need the same amount of protection as timber. Rattan which is next to timber ranks among all the minor forest products illegally gathered need the most protection.

APPROXIMATE VOLUMES

1) Firewood (upland species)	11,259,000	cu.m.
2) Firewood (mangrove species)	2,831,000	"
3) Rattan canes (round form)	777,111,000	"
4) Rattan split	114,250,000	kg.
5) Manila copal	24,577,000	"
6) Manila elimy	327,000	"

EMPLOYMENT IN FOREST INDUSTRIES

As of 1959, there are 304 sawmills in operation. Forest industries have absorbed ₱118,000,000 in capital investments and ₱63,000,000 invested for sawmills alone. The private lumber industries have given a livelihood to 100,000 heads of families and granting there are six dependents of each head of families we have 600,000 people

dependent on the forest industry. We add to this government forestry employees, sash manufacturers, wooden shoes manufacturers, the furniture makers and their dependents.

LUMBER PRODUCTION AND OTHER EXPORTS

In the year 1962,* as shown in the table the Philippines exported the following forest products both raw and finished products.

Commodity	Total production		Total exports		Value of exports in pesos
1. Lumber	406,093,045	bd. ft.	39,196,411	bd. ft.	₱ 15,718,571.20
2. Logs	2,871,120.50	bd. ft.	1,706,792.22	bd. ft.	325,525,561.99
3. Veneer	398,927,987	sq. ft.	251,800,367	sq. ft.	8,475,943.55
4. Plywood	316,734,629	sq. ft.	144,714,819	sq. ft.	₱ 16,140,362.00
					₱365,860,438.74

PRESENT MARKETS FOR OUR FOREST PRODUCTS

LUMBER MARKETS

The United States having a strong political ties with the Philippines is the number one market for our lumber products as well as veneer and plywood products followed by Africa, Hongkong, Okinawa, Hawaii, Denmark, Belgium, Holland, England, Vancouver and West Germany. The question is: how long could we maintain our role as lumber and log vendor to these countries? With the circumstances prevailing in our forests it is very doubtful that any sensible Filipino can answer the question definitely unless he takes a very close look at present reports of the rapid and ruthless destruction of our forests.

LOG MARKETS

Japan ranks first among the countries which buy logs from our country. It absorbed around 88 per cent of our total log exports in 1962. Next to it is Korea, United States, Formosa, England and Okinawa.

Up to this time Japan is still buying huge quantities of our forest products both raw materials and finished products. Is it not strange that Japan with its vast forests and merchantable timber stands should import logs and lumber from the Philippines. Is Japan after the patronage of our products or is she after the conservation of her own forest resources?

PLYWOOD AND ALLIED INDUSTRIES

These wood using industries like veneer, plywood, wallboard, and particle board deserve the immediate attention of our government. Upon these industries lies the future of our people, our forests, our security and our country's sound economy. With these industries properly developed and supervised there are innumerable advantages, if not blessings, that could be derived by the nation. Among these are:

First — If the veneer, plywood, particle board, and pulping industry are fully developed the percentage of wood utilization could be increased from our present wasteful standard which is 45 per cent to a much higher percentage because sawdust woodbarks, trimmings, and edgings could be utilized profitably.

Second — With the increased percentage of wood utilization by volume, the amount of timber cut would also be reduced proportionately, thus minimizing forest denudation.

Third — With the increased percentage of wood utilization, proportionately, there is an increased demand for labor because there would be more industrial plants to accommodate another line of production.

In short, the Philippines should acquire the necessary equipment for the manufacture of these major products such as veneer, plywood, wallboard, particleboard, and simi-

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Arbor Week and Forest Conservation

by

MELANIO M. GACOSCOSIM

The Philippines is rich in forest resources. Some of the most durable, beautiful and versatile tree species are found in our forests. Forest products have consistently ranked among the country's top dollar and income earners. In view of its abundant supply of raw materials the lumber industry has become a pillar of the country's economy.

It is for this reason that Filipinos should think of the importance of their trees more than ever. And it is also for this reason that we should give this year's Arbor Week celebration a meaning that is both encompassingly significant and refreshing.

It can not be denied that our country is rich in timber resources. But we can not likewise deny that we are destroying them faster than anywhere else in the world! Mountains and hills once crowned with verdant grandeur that has inspired a well-known poet to call our country a chain of green emeralds strewn in the vast Pacific are now cogon lands being badly mutilated by erosion.

We can not afford to lose our forests. We can not afford the same tragedy that befell China, Mexico, Japan and Israel and other countries in Europe due to the destruction of their forests. We can not enjoy the life we have now without our forests. It is because forests are everything to us.

One can just look around without moving from where he is and he will see how trees have been helping him in his life. The tables, chairs, houses, government buildings, churches and transportation facilities are either wholly or partly made of wood. Trees are playing a major role in the progress of practically every industry in the country, like fishing, mining, agriculture and others.

Our forest are indispensable to us. They play a key role in the development of the economic, social and cultural aspects of Philippine society.

Arbor Week celebration this year should be focused on the importance of conserving and protecting our forests. It is about time we put into practice the tenets of forest conservation and protection. It has long been overdue. Although it may be late already, we can still save our forest if we start now — in earnest.

Let us draw inspiration from this year's Arbor Week celebration. Let us start being forest conservation conscious and help in the government's massive program of protecting and conserving the forests.

To us, every week should be Arbor Week. There is no more time to waste. Experts say the forest protection effort of the government is losing the race to forest destruction. If this is true then in due time we will see deserts in places where now stands the bulk of our country's forests.

This year's Arbor Week celebration should remind us of our responsibility towards our forests. Forest conservation and protection need acceleration together with reforestation. These are gigantic programs which should meet the general support of the people. Forest conservation and protection is everybody's concern.

This year's Arbor Week will again witness the usual tree planting ritual all over the country. Some politicians will use this occasion to preach their political ambitions rather than the gospel of forest conservation. The real meaning of the celebration will be lost in the midst of political bickering and mudslinging.

This year's Arbor Week should call for vigorous and concerted forest protection and conservation campaign. It calls for well-knit conservation program among the various forestry agencies in the government. It calls for action—accelerated action—to save the remaining forest resources of the country from destruction and unwise utilization.

We have to save our forest at all cost! In order to attain this objective there must be no shrinking from the performance of our obligation. If ours is the task to prosecute forest vandals then we must perform whatever right, power or duty imposed on us by law regardless of who gets hurts in the process.

The call of the moment is the prevention of our forests from further destruction. Available resources have to be mustered in order to augment the government forces now fighting the war against forest vandals. It is here where you and I can come in. We are indispensable in the success of the drive against forest denudation.

Foresters, the guardians of Philippine forests, should redouble their efforts in leading the massive forestry conservation campaign. And everybody should lend a helping and cooperative hand.

Lumbermen are called upon to perform a bigger role in the forest protection and conservation program. Logging operation should be done in accordance only with the sustained yield management of the bureau and in such other manner as maybe prescribed in order to minimize destruction of residuals and insure the perpetual supply of wood.

All segments of society are exhorted to come forward and help in the all-out effort to conserve and protect what remains of the country's timberlands.

The farmer out there in the glades of our forests should settle down in one place instead of roaming the forests as kaiñgineros. They are among those who contribute to the denudation of our forests. Local officials should look after the welfare of these kaiñgineros in the sense that they be given encouragement so as to stop their nomadic nature rather than shielding them from prosecution. Otherwise these officials would be helping in the frustration of the law.

Peace officers who have been helping in the drive against all forms of forest destruction are called upon to intensify further the drive against forest vandals.

Congress should do its part by giving the various forestry agencies in the government the necessary funds that would enable them to carry out effective program on forest protection and conservation.

Let us not forget that forest is not only for the present generation. Our children and our children's children will need the forests as we need them now.

The bureau of forestry, with its inadequate funds, personnel and equipment cannot alone cope with the forest destruction in this country. No one can expect the bureau to make miracle, especially if politicians continue to interfere in the implementation of forest protection laws. What is needed most is the cooperation of the people in the forest conservation campaign and a more vigorous effort on the part of those entrusted with the function of guarding the forests.

It is hoped that Arbor Week this year would usher in a new and more significant meaning to our people.

Bamboos in Plantation

by

FELIX O. CHINTE
Chief Forester, A. Soriano y Cia.

INTRODUCTION

The Paper Industries Corporation of the Philippines* in search for a source of long fiber pulp established in its forest concession in Bislig, Surigao del Sur, an experimental bamboo plantation in sites other than along banks of rivers and creeks.

Studies show that while moisture is an important factor on the growth and development of bamboos, successful plantations could be established in drier sites. Mathur (6) in his survey of the bamboo resources in Kalagarh Forest Division, Western Circle, Uttar Pradesh, India found bamboo more abundant in drier forests than in moister areas but best growth is attained on moist slopes with well drained soil. Gupta (4) believed that bamboo does not seem to be very particular about the soil provided a certain amount of moisture is available for its growth. Prasad (7) noted that the time of planting bamboo has a marked effect upon its growth, i.e., those planted in the earlier part of the monsoon show much better growth and development. Brown and Fisher (1) found culms of kauayan-tinik (*Bambusa blumeana* Schultes f.) and kauayan-kiling (*Bambusa vulgaris* Schrad. ex. Wendl.) started to grow during the latter part of the dry season but made slow growth until the rainy season, that bolo (*Gigantochloa levis* (Blanco) Merr.) showed rapid growth in the later part of the rainy season, and that bamboos grow better when under shade than when in the open.

MATERIALS AND METHODS

Plantation sites — Three log landings used in a 1953 logging operation, expanded to adjacent areas containing residual trees, were selected for the experiment. The miscellaneous trees, shrubs and vines were chopped flat on the ground to serve as mulch for conserving soil moisture.

The soil is generally clayloam with thin humus on the surface. When moist it could be rolled between the fingers without breaking to about ¾ inch long. In some portion of the areas, clay is mixed with little gravel and sand. The sub-soil is heavy clay turning hard after drying.

Lot I, planted in May, 1961 is generally level and sloping to about 10 degrees with northeastern exposure. Lot II, also planted this year, has a western exposure of 10 to 15 degrees slope. Lot III, planted from January to April 1962 has northeastern and southern exposures with 10 to 22 degrees slopes and with a gully going down to a southwestern direction. A portion of Lot I was also planted in 1962.

The areas planted in 1961 were without residual trees while those areas planted in 1962 were with trees from 20 to 48 inches stump diameters and from 60 to 100 feet high, about 15 trees to the hectare.

The rainfall in the locality of Bislig is well distributed throughout the year (Table 1).

Species planted — The species thriving well in the locality were selected for the study: namely; (a) kauayan-kiling (*Bambusa vulgaris* Schrad. ex. Wendl.), (b) kauayan-dilau (*Bambusa vulgaris var. striata* (Lodd.) Gamble), (c) kauayan-tinik (*Bambusa blu-*

* Formerly Bislig Industries, Inc.

meana Schultes f.) (d) Giant-bamboo (*Gigantochloa aspera* Kurz.) and (e) bolo (*Gigantochloa levis* (Blanco) Merr.).

The bamboo cuttings were prepared from culms of about a year old. Each cutting consisted of two internodes with two nodes. The upper internode was cut open to about 45 degrees angle. The cuttings were planted inclined to either about 30 degrees on fairly level ground or about 15 degrees steeper than the slope of the ground. The upper opened internode was exposed to collect rain water, essential for retarding the drying of the cuttings. The two nodes were firmly covered with soil. The spacing were 4, 6, 8, 10 and 12 meters between rows and 2 meters along the row.

The number of cuttings and the date they were planted were as follows:

May, 1961 —	
Kauayan-kiling	866
Kauayan-dilau	80
Bolo	168
June and July, 1961 —	
Kauayan-kiling	2,759
January to April, 1962 —	
Giant-bamboo	642
Kauayan-kiling	1,703
Kauayan-dilau	111
Kauayan-tinik	82

Cleaning was performed on the newly established bamboo plantation three months after planting. In subsequent years cleaning was done one or two times a year. The cuttings planted in June and July of 1961, received no treatment.

Survivals of the cuttings were counted in September of 1963. Matured culms from three rows of each lot were counted from January 20 to 22, 1965. Five matured culms from each lot were cut as samples for study on shrinkage from green to air dry condition.

Each culm was measured for its middle diameter and total length up to 2 inches diameter, then cut into specified sizes, bundled and weighed before and after drying. Aluminum tags with embossed numbers identified each bundle, placed besides the boiler of the company from January 23 to March 4, 1965 or 40 days.

The statistical methods used in the analysis of the data are: for t-test, that of Husch (5); for determination of averages, standard deviations and standard error, that of Forsaith (2); and for the determination of the regression equations, covariance analysis, confidence limit, and correlation coefficients, that of Fresse (3).

RESULTS AND DISCUSSIONS

Successful cuttings — An inventory made in September, 1963 showed 27.67 to 59.60 per cent of the cuttings were forming clumps and were considered successful (Table 2). The Kauayan-tinik and bolo failed to grow. Brown and Fisher (1) reported 34 per cent survival of kauayan-tinik, 32 per cent survival of kauayan-kiling and 6 per cent survival of bolo, 1¼ years after planting.

Kauayan-kiling cuttings in an area cleaned one or two times a year after planting showed an average of 56.96 per cent success, while those cuttings left untended only 35.12 per cent. The difference was found significant. Cleaning the area after planting was found essential in the development of bamboo plantation. Successful cuttings of kauayan-dilau and giant-bamboo averaged 59.60 per cent and 27.67 per cent, respectively.

Shrinkage of bamboos — The weight per culm from 3 to 4 years old plantation ranged from 5.26 to 11.58 kilos when green and from 2.97 to 4.62 kilos when dry, (Table 3).

The regression equations showing the relationship between green and dry bamboos for each of the species studied were compared by analysis of covariance. No significant differences were found either on the slopes or level of the regression equations. One regression equation for diameter (Fig. 1) and another for weight (Fig. 2) were

therefore computed from the combined data of all species, with confidence limit of 95 per cent, namely;

$$Y(\text{dry diam.}) = 0.009 + 0.941\ X(\text{green diam.})$$

$$Y(\text{dry wt.}) = -0.014 + 0.519\ X(\text{green wt.})$$

The correlation coefficient is 0.993 for diameter and 0.976 for weight, indicating very intimate relationship. A bamboo culm shrunk from 4.34 to 6.13 per cent of green, in diameter and from 42.03 to 59.18 per cent of green, in weight (Table 4). These results are similar to the findings of Sekhar and Rawat (9) on *Bambusa nutans* which shrunk in diameter from 4.6 to 6.6 per cent.

Yield — A ton of bamboo from the 3-4 year old plantation contained from 86 to 190 green culms or from 216 to 337 air dry culms (Table 5). At 40 per cent pulp mill utilization some 540 to 843 culms of air dry bamboo will be necessary to produce a ton of pulp. Richmond as quoted by Tamolang et al. (10) obtained yield of 43 to 45 per cent unbleached pulp of buho (*Schisostachyum lumampao*) (Blanco) Merr.). In the work of Man Mohan Singh and V. N. Mukherjea (11) on eleven species of bamboos, the yield ranged from 39.0 to 47.2 per cent bleached pulp by sulphate method of pulping.

The total yield of kauayan-kiling plantation varied from 20,967 to 24,150 kilos of air dry bamboo per hectare at the age of 3-4 years, or 8.4 to 9.7 tons of pulp at 40 per cent pulp mill utilization. This means 2.4 to 2.8 tons of pulp annually per hectare. Giant bamboo plantation produced 1,989 to 3,203 kilos of air dry bamboo at the age of 3 years, or an annual yield of 663 to 1,068 kilos per hectare (0.3 to 0.4 ton of pulp). Kauayan-dilau produced from 1,261 to 1,735 kilos (air dry) per hectare, per year at the age of three years or 0.504 to 0.694 tons of pulp.

Considering that the average annual yield is 5.5 tons of air dry bamboo per hectare, the total yield at the end of seven years, will be 38.5 tons. If only 3/5 of the matured culms are harvested, leaving 2/5 with the young ones for the next cutting cycle of three years, the total harvest per hectare will be 23.1 tons of air dry bamboos or 9.24 tons of pulp.

The cost of land preparation, planting and care of one hectare of bamboo plantation compounded annually within seven years period is as follows:

₱100.00 @ 5% interest for 7 years	₱140.70
40.00 @ 5% interest for 6½ years	54.94
40.00 @ 5% interest for 6 years	53.60
40.00 @ 5% interest for 5½ years	52.32
40.00 @ 5% interest for 5 years	51.04
40.00 @ 5% interest for 4 years	48.64
Total Cost	₱401.24

With a total harvest of 23.1 tons of dry bamboo per hectare, or 9.24 tons of pulp per hectare, the cost to produce would amount to ₱17.37 per ton of dry bamboo, or ₱43.42 per ton of pulp.

The rotation set for the bamboo is seven years. Cleaning for the first three years is necessary to facilitate early development.

SUMMARY AND CONCLUSIONS

A preliminary study on the establishment of a bamboo plantation with five species found growing naturally at Bislig, Surigao del Sur are presented in this paper. The results found are:

1. Bamboo plantation can be established in logged-over areas with well distributed rainfall throughout the year.

2. Some 28 to 60 per cent of the cuttings developed into clumps 1½ years after planting.

3. Cleaning after planting is very essential for the survival and development of bamboo plantation.

4. The relationship of green and dry bamboo is expressed in the following regression equations:

$$Y(\text{dry diam.}) = 0.009 + 0.941 \times (\text{green diam.})$$

$$Y(\text{dry wt.}) = -0.014 + 0.519 \times (\text{green wt.})$$

5. The annual yield of air dry bamboo per hectare of 3 to 4 years old plantation was found to be 5,991 to 6,900 kilos for kauayan-kiling; 1,261 to 1,735 kilos for kauayan-dilau and 663 to 1,068 kilos for giant-bamboo. At 40 per cent pulp mill utilization the corresponding pulp production figures are: 2.396 to 2.760 tons for kauayan-kiling 0.504 to 0.694 tons for kauayan-dilau and 0.265 to 0.427 tons for giant-bamboo.

6. A ton of pulp could be produced from a man-made bamboo plantation at a cost of about ₱50.00.

ACKNOWLEDGMENT

Acknowledgment is made by the author to Mr. Wilfredo Abuton for his assistance in the computation of the data.

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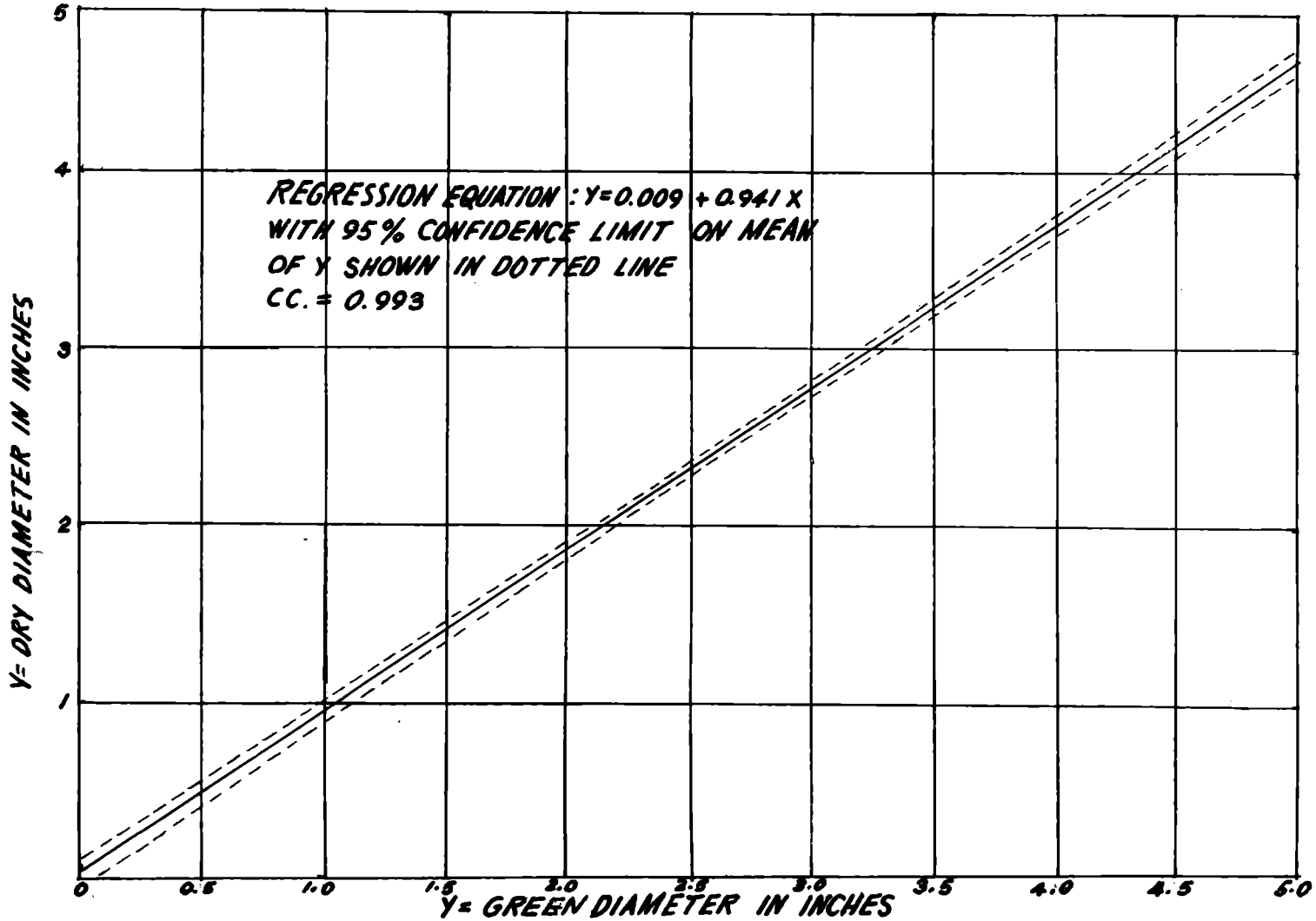

FIG. 1. RELATIONSHIP BETWEEN GREEN & DRY DIAMETER OF BAMBOOS

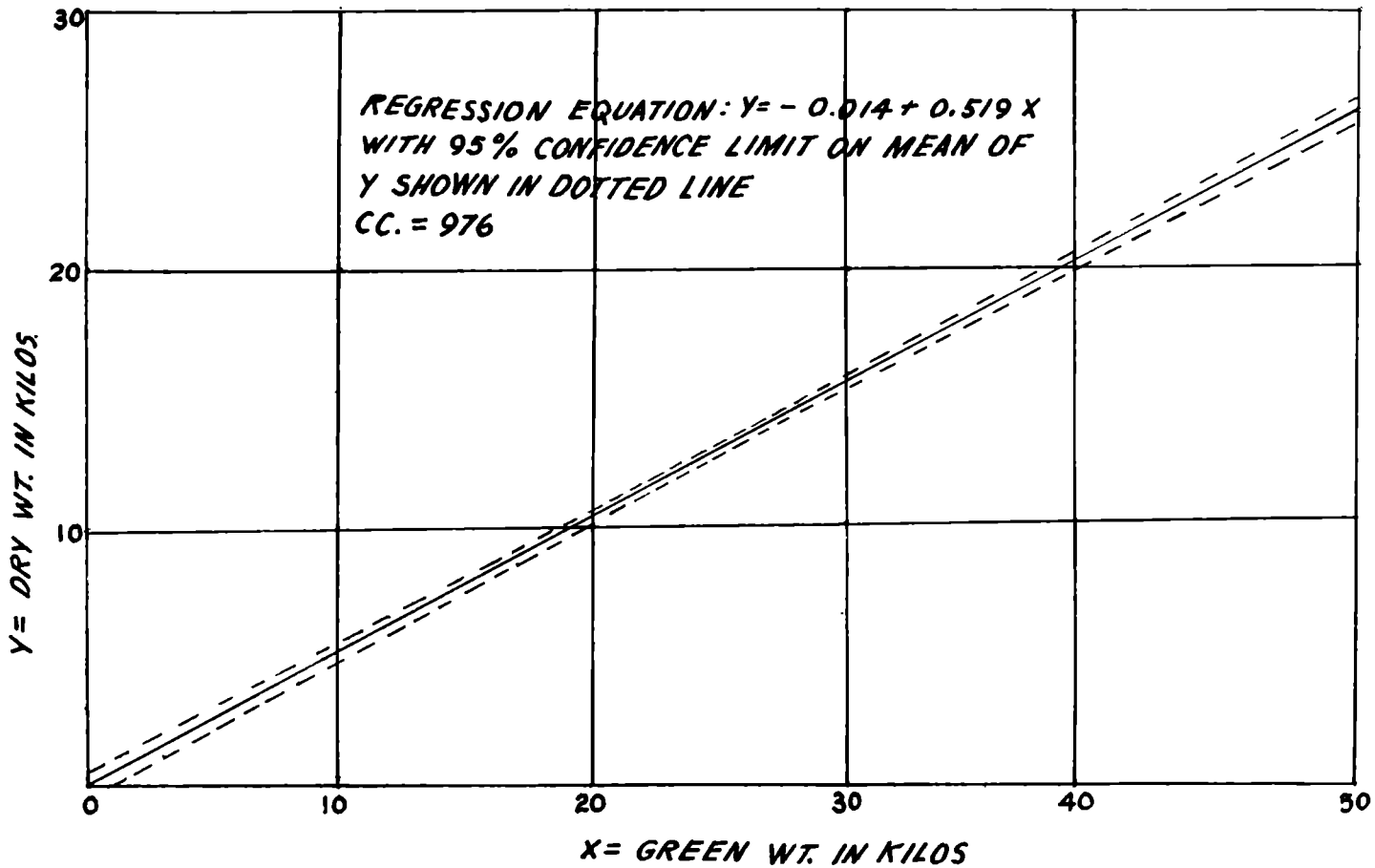

FIG. 2. RELATIONSHIP BETWEEN GREEN & DRY WEIGHT OF BAMBOOS

TABLE 1 showing rainfall at Bislig Bay Lumber Company, Inc. Camp Site
Mangagoy, Bislig, Surigao del Sur

MONTHS	YEARS											AVERAGE
	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	
	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches
January	11.19	48.71	51.83	32.85	21.72	27.97	25.13	16.9	75.2	54.9	24.9	35.57
February	8.93	19.37	25.35	26.45	17.34	11.41	17.93	21.3	45.8	69.0	50.9	28.52
March	23.90	17.26	22.04	34.04	12.85	12.52	19.06	10.6	32.5	38.2	19.7	22.06
April	12.83	13.61	19.07	15.17	4.35	7.70	18.62	13.8	15.6	7.0	14.9	12.97
May	10.89	16.12	12.57	15.68	15.23	15.15	10.60	6.2	17.8	11.3	12.4	13.08
June	12.24	14.14	9.18	19.47	1.72	6.43	4.06	8.6	5.3	5.9	8.7	8.73
July	12.78	6.40	10.77	21.06	8.08	11.03	3.87	5.9	3.6	10.0	5.4	8.99
August	4.36	5.30	6.48	11.24	7.98	3.34	1.72	3.7	8.7	8.2	6.8	6.16
September	3.65	3.92	11.12	10.89	6.25	3.94	9.98	8.7	11.7	18.5	6.6	8.66
October	4.76	9.84	16.51	10.15	9.40	13.28	7.72	6.1	6.2	11.5	2.8	8.93
November	10.71	11.83	6.99	11.53	14.09	22.45	17.89	15.3	20.7	11.5	13.4	14.21
December	34.45	27.16	27.16	33.97	15.62	10.40	19.15	31.9	27.3	7.9	10.1	22.28
TOTAL	150.69	193.93	219.07	242.50	134.63	145.62	155.73	148.73	270.4	253.9	176.6	190.16

TABLE 2 Survival of bamboo cuttings and comparison of means of paired groups

Groups	Species	Treatments	Age Years	Mean survival %	Degrees of Freedom
I	Kauayan-kiling	Area kept clean	2¼	57.14	21
II	Kauayan-kiling	Area kept clean	1½	56.96	25
III	Kauayan-kiling	Area left alone after planting	1½	36.12	26
IV	Kauayan-dilau	Area kept clean	1½	59.60	5
V	Giant-bamboo	Area kept clean	1½	27.67	15

Groups Compared	Mean Difference	Computed t	Relationship
II - III	20.84	3.887	Significant at less than 1%
II - IV	2.64	0.224	Not significant
II - V	29.29	4.103	Significant at less than 1%
III - IV	23.48	1.995	Not significant
III - V	8.45	1.184	Not significant
IV - V	31.93	2.518	Significant at less than 5%

TABLE 3 Average size and weight of a bamboo culm

Species	Age Years	Diameter (inches)		(meters) Length	Weight (kilos)	
		Green	Air-dry		Green	Air-dry
Kauayan-kiling	3-4	2.22 ± 0.05	2.10 ± 0.05	7.09 ± 0.30	8.74 ± 0.63	4.63 ± 0.33
Kauayan-dilau	3	1.82 ± 0.10	1.71 ± 0.10	5.09 ± 0.44	5.26 ± 0.83	2.97 ± 0.47
Giant-bamboo	3	2.21 ± 0.13	2.11 ± 0.13	5.82 ± 0.52	11.58 ± 1.85	4.62 ± 1.08

TABLE 4 Average shrinkage of bamboos from green to air dry. (percentage of green measurements)

Species	Age Years	Diameter %	Weight %
Kauayan-kiling	3-4	5.72 ± 0.38	46.30 ± 0.18
Kauayan-dilau	3	6.13 ± 0.76	42.03 ± 3.74
Giant-bamboo	3	4.34 ± 0.81	59.18 ± 1.48

TABLE 5 Number of culms that make a ton of bamboo

Species	Age	Green	Dry	Pulp at 40% utilization
1. Kauayan-kiling	3-4	115	216	540
2. Kauayan-dilau	3	190	337	843
3. Giant-bamboo	3	86	217	543

TABLE 6 Yield of bamboos at Bislig Bay Lumber Company, Inc. Timber Concession, Bislig, Surigao del Sur

Species	Age Years	Matured Culms per Ha.	Total yield per hectare		Annual yield per hectare		Pulp at 40% utilization in tons
			Green weight in kilos	Dry weight in kilos	Green weight in kilos	Dry weight in kilos	
Kauayan-kiling (Bambusa vulgaris)	3-4	4,869	39,488—45,623	20,967—24,150	11,282—13,035	5,991— 6,900	2.396— 2.760
Kauayan-dilau (Bambusa vulgaris var. striata)	3	1,513	6,703— 9,214	3,783— 5,205	2,234— 3,071	1,261— 1,735	0.504— 0.694
Giant-bamboo (Gigantochloa aspera)	3	562	5,468— 7,548	1,989— 3,203	1,823— 2,516	663— 1,068	0.265— 0.427

(*Continued from page 30*)

lar products and be the sole source of these materials because our log exports to Japan and other countries are being processed with the best technological process. These finished products out of our logs are sold in the same market where we sell our finished products.

Therefore, instead of selling raw materials to foreign countries these logs must be processed here at home. As a chain reaction towards the elevation of the living standard in this country, with people being contented in their life they will be more aware of their obligations to the community and the government like paying tax for example. With the increased tax collection (not necessarily tax increase) the government can pay attention to other phases of its machinery with money to finance other projects.

To cite a country which depends greatly on her forests for its existence, Finland is the number one example. Scandinavian countries produce timber for building construction next only to wood for pulp and papermaking. Canada is another example. It supplied England its wood requirement for all purposes during World War II. The Philippine government must pause and ponder on these facts because they could be easily implemented with best results if politics would not interfere.

If the government would not do something practical now, to save our remaining forest stands, a time would come when the Philippines instead of exporting logs to Japan, Korea, United States, and Formosa, these countries might be the ones exporting logs to us. We would be fortunate then if with our rapid increase of population and increased demand for wood, these countries would be willing to sell us logs. Perhaps they would be willing but the price would surely have increased greatly by then. Logically speaking, these countries are trying to keep their forests intact, willing to buy logs from us while it is still cheap and plentiful. But when our trees are gone we shall perhaps be go a-begging for logs.

The government up to this time is still reluctant in formulating the policy needed in order that the vast forest resources could be utilized to the maximum economic advantage and usefulness. Furthermore, the forest can serve the country perpetually if it is properly managed. To remind everyone, especially business minded people, there is no pulp manufacturing plant here in the Philippines which uses wood locally grown solely as raw materials. We still import pulp for our paper plants yet according to the Forest Products Research Institute, there are abundant species which are commercially suited for pulp and paper-making here in the Philippines. The truth is there are billions of pesos frozen in our forest within easy reach, but the government has not done something effective to make this money more liquid.

*Some Physical Properties of Apitong (Dipterocarpus Grandiflorus Blanco) in Relation to its Sapwood and Heartwood**

by

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INTRODUCTION

One of the factors which determine the utility of wood in the construction field is its physical properties. A knowledge of these properties and their effects on the behavior of wood in service would greatly help wood-users in selecting wooden materials for a particular purpose. Some of these properties are specific gravity, moisture content, and shrinkage.

Because of its affinity to water, wood after reaching fiber saturation point[1], has the property to shrink as a result of further moisture loss or to expand critically upon absorption of moisture below this point. This particular behavior of wood is best exemplified by the sticking of doors, windows, and all sorts of wooden construction during the rainy season or the loosening of joints during the summer months.

The degree by which wood shrinks or swells depends on several factors, one of which is its density or specific gravity. Specific gravity of wood controls to a certain extent any dimentional change that may take place with changes in moisture content below the fiber saturation point. In general, heavy woods shrink more than light woods over the same value of moisture change. Wood, therefore, should be selected with a certain content that will ensure the least subsequent shrinkage and swelling when in use (3)[2].

The above-mentioned physical properties are affected by the position of the wood in a tree from which it is cut. Results of studies indicate that specific gravity varies in the different parts of a tree. Brown, et al (3) and Balcita (2) noted that variations in the average specific gravity of wood are associated with their location in the tree from the butt to the top section as well as from the pith to the bark. Desch (4) observed that the heaviest wood is found at the base of the tree and that density decreases gradually from the pith to the bark in ring-porous wood.

Tiemann (7) and Wangaard (8) are of the opinion that specific gravity is a satisfactory criterion of clear-wood strength. Some strength properties such as maximum crushing strength, fiber stress at proportional limit, and stiffness have been found to vary directly with specific gravity, whereas other strength properties change at an exponential rate.

The indication of the variability of specific gravity, moisture content, and shrinkage properties of wood in the different parts

* The study was conducted in 1962 when Mr. B. C. Cariño was a thesis student at the U.P. College of Forestry.

[1] Fiber saturation point is the condition at which the cell lumens are assumed to be empty but the wood fibers are still fully saturated with moisture.

[2] Numbers in parenthesis refer to literature cited.

of the tree by past studies makes it imperative to assume that these properties vary from the heartwood to the sapwood for a given height of the tree. A study of the variability of these physical properties of apitong (*Dipterocarpus grandiflorus*, Blanco) with respect to its heartwood and sapwood would be contributory to the determination of the use for which this species is particularly best suited.

The object of this study, therefore, was to determine and to compare the specific gravity, moisture content, and shrinkage properties of the heartwood and sapwood of apitong for the benefit of wood-users.

MATERIALS AND METHODS

The materials used in this study were procured from the logging area of Interwood, Inc. Pañgil, Laguna. Twenty specimens 2¼ x 2¼ x 12 inches were cut from both the sapwood and heartwood of the same tree. They were dressed and cut squarely into 2 x 2 x 6 inches as prescribed by the American Society for Testing Materials (1).

Three evenly spaced lines were drawn across the tangential and radial sections and one at the middle of each end or cross-section to serve as a guide for corresponding measurements.

The tangential, radial and longitudinal measurements of each specimen at green condition were taken to the nearest 0.001 of a centimeter by the use of a vernier caliper. An Ohaus beam balance with an accuracy of 0.1 gram was used to obtain the weight of each specimen and also its corresponding green volume by the water displacement method.

In order to avoid excessive shrinkage as a result of severe drying conditions, the specimens were placed in a temperature-humidity controlled cabinet (30% equilibrium moisture content) for 60 days until the weights of representative specimens for both sapwood and heartwood remained constant. The specimens were then transferred to a paraffin oven and oven-dried at a constant temperature of 103° ± 2°C.

The ovendry radial, tangential and longitudinal measurements, ovendry volume, and weight of individual specimens were obtained by the same procedure as that of their green condition, after which the values of the moisture content, specific gravity, linear shrinkage, and volumetric shrinkage of individual specimens were calculated.

RESULTS AND DISCUSSION

The results were analyzed statistically by the comparison of the difference between two means, the summary of which may be found in Table 2.

Moisture Content:

Table 1 shows the average moisture contents for sapwood and heartwood which were found to be 79.7 and 90.7 percent, respectively, with range from 77.0 to 84.8 percent for sapwood and from 79.0 to 115.3 percent for heartwood.

Statistical analysis of the difference of the average moisture content between heartwood (90.7 percent) and sapwood (79.7 percent) of apitong shows a significant difference at the 0.01 level of probability based on a "t" distribution.

The results indicate that the heartwood for apitong from Pañgil, Laguna contained more moisture than the sapwood. This follows the conclusion of Peck (5) who stated that because of the time element involved before the cellulose molecules become heartwood they become dense so that there is a large amount of water held as absorbed water in the fibers and ray cells. Brown, et al (3) pointed out, however, that in hardwoods, the moisture is evenly distributed throughout the sapwood and heartwood at least in native species found in the United States.

Another reason that may be given is the fact that during drying the heartwood specimens exuded resin and other extraneous substances that may have been volatile, while there was no exudation from the sapwood. These substances cannot be accounted for other than they become a part of the lost weight and as such a part of the moisture loss. This then tends to increase the moisture content of the heartwood as it is expressed as a percentage of the oven-dry weight.

Specific Gravity:

The average specific gravity of apitong sapwood and heartwood are shown in Table 1 with values of 0.56 and 0.54 respectively. The values for sapwood ranged from 0.53 to 0.57 and for heartwood, the values ranged from 0.52 to 0.56.

Statistical analysis (Table 2) showed that the mean difference was found to be highly significant at 0.01 level, with the specific gravity of the sapwood higher than that of the heartwood.

This result, concurs with the conclusion of Somera (6) in his study with narra. He found that the specific gravity of the sapwood was greater than that of the heartwood.

This finding may again be explained by the fact that during the drying of the apitong specimens, the heartwood exuded extraneous substances while the sapwood did not. It follows then that since the specific gravity of wood is defined as the ratio of its oven-dry weight to its green volume (weight of an equal volume of distilled water) the heartwood would have a smaller specific gravity in spite of its heavier green weight

Brown, et al (3) pointed out, however, that the presence of extractives in the heartwood may bring about an increase in the specific gravity. This is true only if the extractives are not volatile. The findings of this study are otherwise and it would be worthwhile to study further the effect of these extractives on the physical properties of apitong.

Shrinkage:

The mean or average shrinkage values for both sapwood and heartwood are shown in Table 1. It may be noted that for sapwood specimens, the tangential section had the largest average shrinkage with 9.3 per cent followed by the radial section with 4.4 per cent and the longitudinal section with 0.23 per cent. The same trend has been observed in heartwood specimens although in all cases, the heartwood shrank more than the sapwood. The tangential section exhibited the highest average shrinkage being 11.4 per cent, the radial section, 5.4 per cent and the longitudinal section, 0.25 per cent. The volumetric shrinkage of the heartwood was 16.8 per cent.

As mentioned earlier, the sapwood was found to have a higher specific gravity than the heartwood. It should therefore, follow, that the sapwood under study would have a higher shrinkage value than the heartwood. However, the results are contradictory to those of Brown et al (3) who observed that wood of higher specific gravity shrank more than those of lower specific gravity.

This again may probably be due to the exudation of resins and other extraneous substances from the heartwood during drying which gave room for further contraction of the cell-wall resulting in higher volumetric shrinkage.

These findings may only be incidental, but they may be of value to future researches who may conduct studies along related fields.

CONCLUSION

Based on the results of the study the following conclusions may be deduced:

1. *Moisture Content:*

Apitong heartwood evidently contains more moisture than its sapwood the range of which varies from 79.0 to 115.3 per cent and from 77.0 to 84.8 per cent respectively.

2. *Specific gravity:*

The mean specific gravity of apitong heartwood was found to be lower than that of the sapwood the difference being 0.02. A comparison of the difference of the two means showed that it was highly significant at the 0.01 level.

3. *Shrinkage:*

As was expected, the average tangential shrinkage for both heartwood and sapwood was found to have the highest percentage, namely, 11.4 per cent for heartwood and 9.3 per cent for sapwood, followed by the radial section with 5.4 per cent for heartwood and 4.4 per cent for sapwood. The longitudinal shrinkage was the least with only 0.25 per cent and 0.23 per cent for heartwood and sapwood, respectively. The volumetric shrinkage of heartwood was found to have a higher percentage than that of the sapwood, namely 16.8 and 15.2 percent, respectively.

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TABLE 1. Average values of some physical properties of Apitong Heartwood and Sapwood.

Properties	Sapwood	Heartwood
Moisture Content	79.7%	90.7%
Specific gravity*	0.56	0.54
Volumetric shrinkage from green to oven dry condition	15.2%	16.8%
Radial shrinkage from green to oven dry condition	4.4%	5.4%
Tangential shrinkage from green to oven dry condition	9.3%	11.4%
Longitudinal shrinkage from green to oven dry condition	0.23%	0.25%

* Highly significant at the 0.01 level.

TABLE 2. Summary of Statistics for Comparing various properties between sapwood and heartwood of Apitong.

A. Moisture Content

Apitong	No. of specimens	Degrees of freedom	Average Moisture Content (%)	Sum of squares
Sapwood	20	19	79.7	63.02
Heartwood	20	19	90.7	2814.45
T o t a l	40	38	—11.0*	2877.47

$t_c = 4.00 > t_{.01} = 2.712$

B. Specific Gravity

Apitong	No. of specimens	Degrees of freedom	Average Specific gravity	Sum of squares
Sapwood	20	19	0.56	0.0028
Heartwood	20	19	0.54	0.0033
T o t a l	40	38	0.02*	0.0061

$t_c = 5.00 > t_{.01} = 2.712$

C. Volumetric Shrinkage

Apitong	No. of specimens	Degrees of freedom	Average Volumetric Shrinkage	Sum of squares
Sapwood	20	19	15.2	12.51
Heartwood	20	19	16.8	12.98
T o t a l	40	38	—1.8	25.49

$t_c = 6.15 > t_{.01} = 2.712$

(*Continued from page 25*)

keep tract of the transfers or sales of such property to any other party. Sales or transfers should not be made until after 25 years.

Resettlement must entirely be handled by the government forestry entities concerned. If necessary, assistance in matters of maintaining peace and order and providing supplies and transportation may be requested from local agencies of the Philippine Constabulary, Social Welfare Administration, etc. in much the same way as their assistance had been called in the resettlement of Hukbalahaps to the Narra and Edcor projects and of the Manila squatters to Sapang Palay. Under similar premises already mentioned, a Davao logger published in 1964 his intentions in implementing a resettlement program for *kaiñgineros* found in his area.

These suggested measures of preventing forest destruction due to *kaiñgin*-making are not foolproof. However, if implemented, they may serve to strengthen the forest protection force which the government presently has.

Accordingly, in 1963, the total forest land of the Phiilppines is 13,171,000 hectares. Statistics cited in similar articles on the *Kaiñgin* problem indicated that the rate of forest denudation is 172,000 hectares annually. Mathematical relationship of these figures indicate that within 75 years, or within the lifetime of a child born today, our forest shall have been gone. Only time, selective logging practices, reforestation, and the implementation of effective action in forest protection may disprove this mathematical relationship.

Brash Center or "Brittle Heart"-A Common Defect in Philippine Dipterocarps

by

TEOFILO M. LINDAYEN[1]

Brash center or "brittleheart" refers to a defect of a piece of timber which causes it to fail abruptly without splintering. It is synonymous to soft heart, spongy heart or punky heart (7)[2]. This kind of defect lowers the value of timber especially those for export and renders them unfit for many useful purposes. One of the serious adverse effects ot brittleheart is the failure of timber in service without warning. Furthermore, in both the plywood and match-making industries brittleheart causes the rejection of large cores (2). Wood considered brashy would also produce paper of inferior quality, considering that broken fibers are comparatively shorter than unbroken ones, hence, paper produced by this kind of fiber is less in strength.

A log with brittleheart is characterized by carroty appearance, torn grain at the end ot the log, low density, areas of light-colored heartwood and fuzzy appearance in longitudinal surfaces when planed. Dadswell and Langlands (5) observed in eucalyptus that the boundary between brittleheart and normal wood was not necessarily concentric about the pith, nor was it regular in vertical cross section.

Some theories have been advanced as to the causes of brash center in wood, namely; stresses and heart. Long-term stresses cause failure in longitudinal compression especially with the increase in magnitude as the tree increases in diameter. Jacobs (6) and Boyd (1) have shown that these stresses are of an order that could cause compression failures of wood in the central portion of the tree. Further test indicated that continued growth and increased stresses cause the expansion of brittleheart into wood of higher density and much greater compressive strength (4, 5). Martley as cited by Burgess (2) added that the greatest internal stresses caused by the weight of the tree in this way could account for only a small proportion of stress required to cause failure. Heart as another cause of brash center, is that center of the tree affected by decay or brittle in the absence of decay. The outstanding characteristic of heart is its brittleness and low impact strength which may be 50 per cent or less than the impact strength of the normal wood (3). Skolmen and Gerhards (9) found also that the toughness values of *Eucalyptus robusta* grown in Hawaii as defined by brash center failure, has but 29 per cent the toughness of normal wood.

Macroscopically, brittleheart could be detected by inspection, knife and splinter tests. Inspection test although not as reliable as the latter tests may be used by careful observation at the end of the log, the difference in color and density. Generally, brittleheart portion is light-colored and low in density including the presence of torn fibers. This method renders it difficult to define the boundary between normal wood and brashy wood because there are instances in which both show no difference in appearance. Knife test is used by lifting up a small sliver. A straight,

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[2] Number in parentheses refers to reference cited at the end of this paper.

clean fracture of the sliver indicates the presence of brittleheart. Breaking of small splinters between fingers reveals also the presence or absence of brash center. Abrupt and clean fracture shows the presence of such defect compared with normal wood which breaks with difficulty thus causing splintering of fibers. Sections prepared from brash wood reveal the presence of compression failures across the fibers (Fig. 1). Broken fibers of macerated wood as observed in a microscope are further evidences of brittleheart (Fig. 2).

In the Philippines, dipterocarp species which constitute about 75 percent of the stand of forest are commonly affected by brittleheart. It prevails at the center, sometimes adjacent to the center of the log particularly at the base or butt-log. In some instances it was found to be most widespread in the upper portions. These observations agree with the finding in some eucalyptus species in Australia (3).

Seventeen dipterocarp species under 6 genera collected from Agusan, Cagayan, Laguna and Quezon provinces were studied as to the occurrence of brash center. Results of the observation including the origin and diameter of these species are shown in table 1. The knife and splinter tests revealed that a great variation in the amount of brittleheart was observed in different species. This difference may be due to the resistance or susceptibility of the species to brittleheart, to geographical location, crown density and exposure of the species to wind. Furthermore, the study of different trees of a single species generally tend to show that the percent of brittleheart is proportional to the diameter. This, however, did not hold true to bagtikan collected from Agusan with 5.96 per cent defect (diameter—65 cm.), and 4.95 per cent (diameter — 70 cm.). The average per cent defect of brittleheart in the descending order are as follows: manggasinoro — 26.50; mayapis — 16.00; tangile — 12.77; red lauan — 12.76; white lauan — 12.10; malapanau — 6.59; almon — 5.50; bagtikan — 5.46; malaanonang — 5.16; afu — 3.92; manggachapui — 3.50; apitong — 3.00; broadwinged apitong—1.00; thick-leafed narig—1.00; dagang — 0.96; guijo — 0.46; and panau — 0.34. Studies of Serevo (8) on northern Mindanao species reveals that the per cent of brittleheart of mayapis, tangile, and white lauan, more or less agree with the present finding of the same species collected from Agusan, Cagayan and Laguna. Previous finding on red lauan, however, by the same author shows that this species from northern Mindanao has higher per cent of defect (15%) than those collected from Cagayan (12.76%) of the same species.

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FIG. 1.—*Radial section of tangile* (Shorea polysperma (*Blanco*) *Merr.*) *showing the minute compression failures as evidence of a brash wood or brittleheart.*

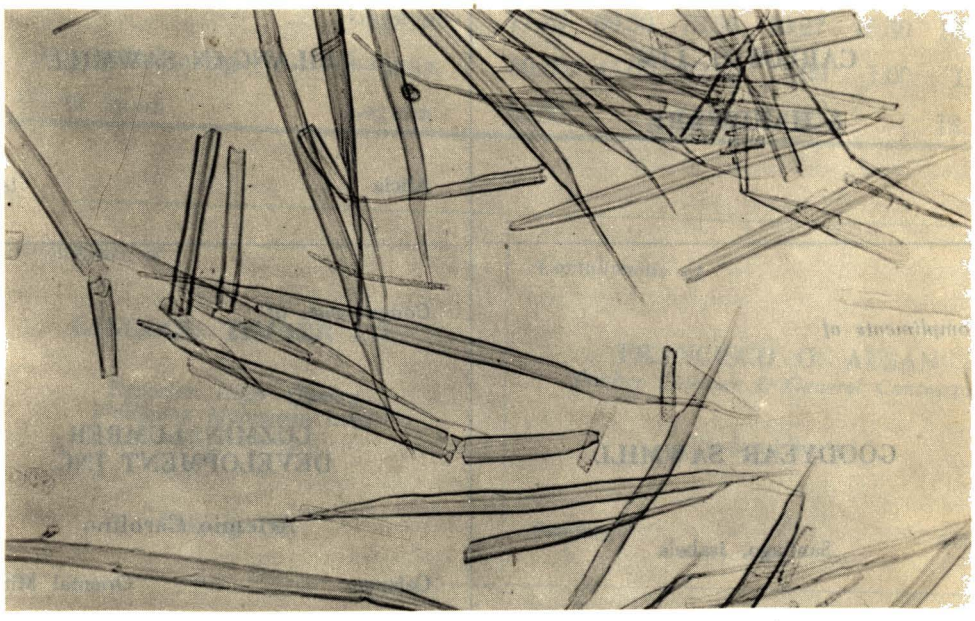

FIG. 2.—*Macerated brash wood of tangile showing broken fibers.*

TABLE 1.—*Data showing the average percentages of brittleheart by splinter and knife test.*

Species	Origin	Diameter (cm.)			Percent defect		
		Butt	Top	Average	Butt	Top	Average
1. Afu	Cagayan	80.20	76.80	78.50	3.14	4.70	3.92
2. Almon	Quezon	100.00 70.00	—	85.00	8.00 3.00	—	5.50
3. Apitong	Quezon	75.00	—	75.00	3.00	—	3.00
4. Bagtikan	Agusan	65.00 70.00	—	67.50	5.96 4.95	—	5.46
5. Broad-winged apitong	Quezon	60.00	—	60.00	1.00	—	1.00
6. Dagang	Laguna	80.00	—	80.00	0.96	—	0.96
7. Guijo	Laguna	55.00	—	55.00	0.46	—	0.46
8. Malaanonang	Cagayan	103.30	65.60	84.45	2.45	7.87	5.16
9. Malapanau	Cagayan	66.75	54.55	60.65	5.47	7.71	6.59
10. Manggachapui	Quezon	65.00	55.00	60.00	6.00	1.00	3.50
11. Manggasinoro	Cagayan	75.20	65.90	70.55	24.21	28.90	26.50
12. Mayapis	Quezon	65.00	—	65.00	16.00	—	16.00
13. Panau	Laguna	50.00	—	50.00	0.34	—	0.34
14. Red lauan	Cagayan	93.25	92.00	92.63	13.89	11.62	12.76
15. Tangile	Agusan	65.00 70.00	—	67.50 70.00	10.88 13.62	—	12.25) 12.77)
"	Cagayan	77.25	69.50	73.38	10.27	16.30	13.29)
16. Thick-leafed narig	Laguna	60.00	45.07	52.50	1.00	1.00	1.00
17. White lauan	Laguna	60.00	—	60.00	12.10	—	12.10

A Study of the Termite Resistance of Foreign Chipboard Treated with Boric Acid and Other Compound

by
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SUMMARY

Of the preservatives tested, only 1.0 percent sodium pentachlorophenate, 1.0 percent copper pentachlorophenate, 10.0 percent boric acid, and 2.0 per cent boric acid plus 0.5 percent sodium pentachlorophenate gave significant protection to chipboards against infestations of *Macrotermes gilvus* Hagen, *Microcerotermes losbañosensis* Oshima, *Coptotermes vastator* Light, and *Cryptotermes cyanocephalus* Light, for a period of 5 years. However, there were no significant differences in effectiveness between preservatives used.

Two and three percent boric acid were effective only up to two years.

M. gilvus was found to be the most destructive and voracious feeder followed by *C. vastator, M. losbañosensis,* and *C. cyanocephalus,* in that order.

INTRODUCTION

This is a cooperative study between the Forest Products Research Institute and two British firms, Borax Consolidated Limited, manufacturer of boron compounds, and British Plimber Limited, manufacturer of chipboards.

Seven sets of experimental chipboard panels were received with an accompanying letter from R. D. Warnes of British Plimber Ltd., explaining some details about the chipboard samples. Each panel measured 1/2" x 10" x 12" and treated, accordingly, as follows:

a. 50 pieces containing 1.0% copper P.C.P.
b. 50 pieces containing 1.0% sodium P.C.P.
c. 50 pieces containing 2.0% boric acid
d. 50 pieces containing 3.0% boric acid
e. 50 pieces containing 10.0% boric acid
f. 50 pieces containing 2.0% boric acid plus 0.5% sodium P.C.P.
g. 50 pieces untreated, marked "CONTROL"

This test was conducted in the Forestry Campus, College, Laguna, during the period starting in October, 1959 and ending in October, 1964.

The object of this study was to determine the relative resistance of chipboards treated with boric acid and other compounds against some species of Philippine termites.

MATERIALS AND METHODS

The panels were each cut into 1/2" x 2-1/2" x 12" test pieces, producing 200 pieces from each set. Every test specimen was labeled with aluminum tag with appropriate symbols for treatment, species of termite, replication, and test piece number.

Five active mounds or nests each of *Coptotermes vastator* Light, *Macrotermes gilvus* Hagen, and *Microcerotermes losbañosensis* Oshima were located and over each colony, a shed, about 4 feet high, was built. The sheds were walled and roofed with veneers during the first two years but later replaced

with asphalt paper. Inside each shed, a wooden platform was laid immediately above the mound or nest, where 10 bundles, each consisting of seven specimens representing the seven treatments, were exposed. Each bundle was bound securely with wire in such a way that every test specimen was sandwiched by 2 pieces of white lauan (*Pentacme contorta* (Vid.) Merr. & Rolfe) board of the same dimensions as the test specimens (Fig. 1).

The remaining 350 specimens were exposed to *Cryptotermes cyanocephalus* Light inside 5 compartments of a screened cage in the F.P.R.I. insectary. Ten specimens of each treatment were placed in each cage. The The test pieces were arranged in several layers interlaced with layers of drywood-termite-infested lumber (Fig. 2).

Originally, the statistical design for this test was "Split-Plot". However, the occurrence of mixed infestations by subterranean termites in some sheds rendered the "split-plot" design inapplicable. Another design was used wherein all subterranean termite species were treated as one group and *C. cyanocephalus* Light as another group.

Inspections of the chipboards were made at yearly intervals. Degree of termite damage was determined by visual examination. Index of effectiveness of the preservatives was based on the number of termite-infested chipboards.

RESULTS AND DISCUSSION

Table 1 shows the percentage of chipboards that were attacked by subterranean termites under each treatment. Based on the least mean percentage of board specimens damaged by termites, 1.0 percent copper pentachlorophenate, 1.0 percent sodium pentachlorophenate, 10.0 percent boric acid, and 2.0 percent boric acid plus 0.5 percent sodium pentachlorophenate were found to be significantly more effective than the control. These preservatives gave protection to chipboards against infestation of *C. vastator* Light, *M. gilvus* Hagen, and *M. losbañosensis* Oshima, for a period of 5 years. Two and three percent boric acid were not significantly better than the control.

As shown in Table 2, 1.0 percent sodium pentachlorophenate had the least mean percentage of drywood-termite-infested chipboards followed by 2.0 percent boric acid plus 0.5 percent sodium pentachlorophenate, 10.0 percent boric acid, 1.0 percent copper pentachlorophenate, 3.0 percent boric acid, and 2.0 percent boric acid, in that order. Chipboards treated with any of the four preservative treatments found effective against subterranean termites were also found to be significantly more resistant than the untreated boards against attack of drywood termite.

It was observed that 2.0 percent and 3.0 percent boric acid could give significant protection to chipboards against attack of the four species of Philippine termites for only 2 years.

After 5 years of exposure, 81.71 percent of the chipboards were damaged by subterranean termites and 52.28 percent by drywood termite.

A breakdown of the total number of chipboards attacked by subterranean termites is shown in Table 3. Degree of damage was classified into three distinct categories which are as follows:

a. Slight—damaged portion was 1/3 or less of the total volume of the chipboard.
b. Moderate—damaged portion was more than 1/3 but less than 2/3.
c. Severe — volume damaged was 2/3 or more.

As shown in the Table, damage was slight on 54.43 percent of infested chipboards, moderate on 14.57 percent, and severe on 31.0 percent.

Table 4 shows a breakdown of the total number of chipboards attacked by *C. cyanocephalus* Light, a drywood termite species.

Of the total 183 boards infested, 97.26 percent were slightly-damaged and 2.74 percent were moderately-damaged. There was no case of severely-damaged chipboards noted.

The four species of termites differed in their mode and rate of feeding (Fig. 3). *M. gilvus* was observed to be the most voracious feeder. In severe cases, infested chipboards were almost eaten up, leaving only small fragments. On the other hand, *C. cyanocephalus* was noted to be the slowest feeder. Damaged by this species was characterized by the light deep nibbles and in very few cases the holes coalesced, forming wide infested area or areas. *C. vastator* and *M. losbañosensis* were almost identical in their mode of infestation. Both species converted damaged chipboards into "semicarton" nests. However, *C. vastator* was a faster feeder than *M. losbañosensis.*

CONCLUSION

Treatments such as 1.0 percent sodium pentachlorophenate, 1.0 percent copper pentachlorophenate, 10.0 percent boric acid, and 2.0 percent boric acid plus 0.5 percent sodium pentachlorophenate gave significant protection to chipboards against attack of *Coptotermes vastator* Light, *Macrotermes gilvus* Hagen, *Microcerotermes losbañosensis* Oshima, and *Cryptotermes cyanocephalus* Light, for a period of 5 years. Since the chipboards were exposed to termites under very severe conditions in this test, it is expected that boards treated with the 4 preservatives mentioned above could give longer service when used under conditions with lesser termite hazards.

TABLE 1.—*Percentage of chipboards that were attacked by subterranean termites in each treatment, after 5 years of exposure.*

TREATMENTS	REPLICATIONS										TOTAL ANGLE	MEAN ANGLE
	I		II		III		IV		V			
	Percentage of chipboards that were attacked[1]											
	Actual	Angle	Actual	Angle	Actual	Angle	Actual	Angle	Actual	Angle		
1.0% sodium pentachlorophenate	76.6	61.07	53.3	46.89	66.6	54.70	76.6	61.07	93.3	75.00	298.73	59.55
1.0% copper pentachlorophenate	66.6	54.70	63.3	52.71	66.6	54.70	70.0	56.79	83.3	65.88	284.78	56.96
2.0% boric acid	80.0	63.44	90.0	71.56	63.3	52.71	86.6	68.53	100.0	90.00	346.24	69.25
3.0% boric acid	96.6	79.37	80.0	63.44	86.6	68.53	86.6	68.53	93.3	75.00	354.87	70.97
10.0% boric acid	96.6	79.37	80.0	63.44	60.0	50.77	83.3	65.88	90.0	71.56	331.02	66.20
2.0% boric acid plus 0.5% sodium pentachlorophenate	70.0	56.79	60.0	50.77	83.3	65.88	83.3	65.88	96.6	79.37	318.69	63.73
Control	100.0	90.0	90.0	71.56	96.6	79.37	100.0	90.00	96.6	79.37	410.30	82.06
TOTAL		484.74		420.37		426.66		476.68		536.18	2,344.63 GRAND TOTAL	

[1] Actual percentage values are based on 30 replications. Angles correspond to values of actual percentages as given in Table 11.12.1 of "Statistical Methods" by George W. Snedecor.

ANALYSIS OF VARIANCE

Source of variation	D. F.	S. S.	M. S.	Comp. F-value	Probability	H. S. D. 0.5
Treatments	6	2,062.13	343.69	6.36	$< .01$	14.87
Replications	4	1,282.48	320.62	5.94	$< .01$	
Error	24	1,296.44	54.02			
Total	34					

TABLE 2.—*Percentage of chipboards that were attacked by* C. cyanocephalus *Light, a drywood termite, in each treatment, after 5 years of exposure.*

TREATMENTS	REPLICATIONS										TOTAL ANGLE	MEAN ANGLE
	I		II		III		IV		V			
	Percentage of chipboards that were attacked[1]											
	Actual	Angle	Actual	Angle	Actual	Angle	Actual	Angle	Actual	Angle		
1.0% sodium pentachlorophenate	60.0	50.77	40.0	39.23	20.0	26.56	10.0	18.44	30.0	33.21	168.21	33.64
1.0% copper pentachlorophenate	70.0	56.79	60.0	50.77	40.0	39.23	20.0	26.56	50.0	45.00	218.35	43.67
2.0% boric acid	70.0	56.79	70.0	56.79	60.0	50.77	70.0	56.79	60.0	50.77	271.91	54.38
3.0% boric acid	60.0	50.77	50.0	45.00	50.0	45.00	90.0	71.56	30.0	33.21	245.54	49.11
10.0% boric acid	70.0	56.79	40.0	39.23	20.0	26.56	40.0	39.23	50.0	45.00	206.81	41.36
2.0% boric acid plus 0.5% sodium pentachlorophenate	60.0	50.77	50.0	45.00	50.0	45.00	20.0	26.56	20.0	26.56	193.59	38.78
Control	90.0	71.56	90.0	71.56	60.0	50.77	100.0	90.0	60.0	50.77	334.66	66.93
TOTAL		394.24		347.58		283.89		329.14		284.52	1,639.57 GRAND TOTAL	

[1] Actual values are based on 10 replicates. Angle values correspond to values of actual percentages as given in Table 11.12.1 of "Statistical Methods" by G. W. Snedecor.

ANALYSIS OF VARIANCE

Source of variation	D. F.	S. S.	M. S.	Comp. F-value	Probability	H. S. D. 0.5
Treatments	6	3,725.46	620.91	5.24	<.01	22.11
Replications	4	1,230.48	307.62	2.59	<.05>.01	
Error	24	2,845.80	118.58			
Total	34					

TABLE 3.—*Breakdown of the total number of chipboards attacked by subterranean termites in each treatment into 3 distinct categories of damage.*

Treatments[5]	Total number of chipboards attacked	Percentage of damaged chipboards		
		Slight	Moderate	Severe
1	110	65	16	29
2	105	79	7	19
3	126	63	23	40
4	133	80	21	32
5	122	77	12	33
6	117	70	14	33
7	145	33	32	80

[5] Same as those enumerated in Tables 1 and 2.

TABLE 4.—*Breakdown of the total number of chipboards attacked by* C. cyanocephalus *Light in each treatment into 3 distinct categories of damage.*

Treatments[6]	Total number of chipboards attacked	Percentage of damaged chipboards		
		Slight	Moderate	Severe
1	16	100.0	—	—
2	24	100.0	—	—
3	33	97.0	3.0	—
4	28	100.0	—	—
5	22	100.0	—	—
6	20	100.0	—	—
7	40	90.0	10.0	—

[6] Same as those enumerated in Tables 1 and 2.

FIG. 1.—*Representative bundles of chipboard exposed to subterranean termites, showing the manner chipboards were sandwiched by white lauan* (Pentacme *contorta* (*Vid.*) *Merr. & Rolfe*) *boards of same size.*

FIG. 2.—*Chipborads exposed to C.* cyanocephalus *Light, a drywood termite species, in a compartment of a screened cage in the F.P.R.I. insectary.*

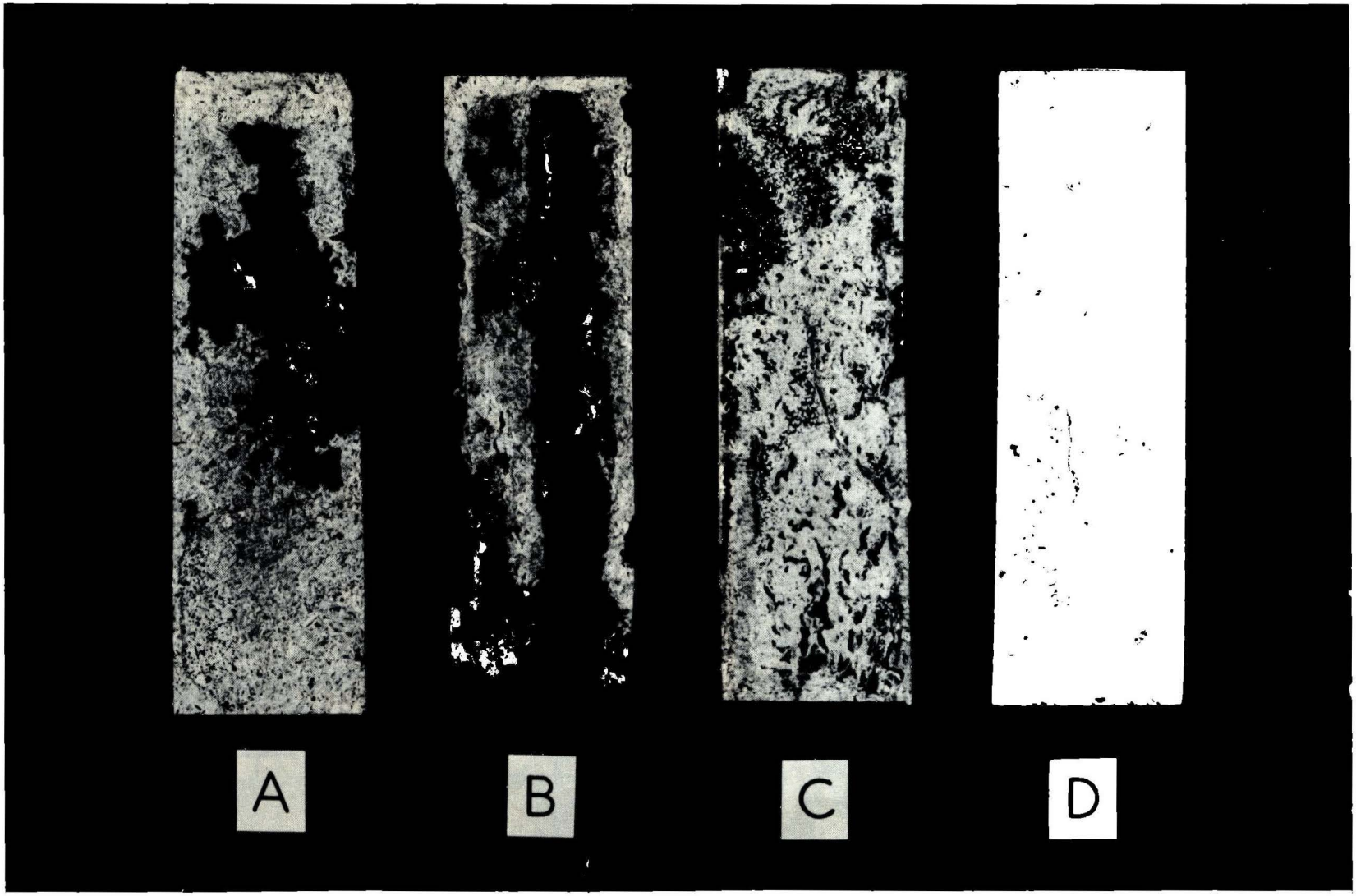

FIG. 3.—*Representative samples of untreated boards, showing the nature of damage made by the four test species of Philippine termites.* A *refers to* C. *vastator*, B *to* M. gilvus, C *to* M. losbañosensis, *and* D *to* C. cyanocephalus.

Tree Bark-An Aid to Tree Identification

by
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and BERNARDO C. SINUES[2]

INTRODUCTION

In the commercial forests of the Philippines are found a great variety of towering tropical hardwoods. Virgin in nature, foresters and botanists alike encounter great difficulties in the identification of a vast number of gigantic trees. Scientific methods involving the use of floral and leafy features are impractical especially when speed and relative accuracy is required under time pressure. The standing trees are too tall and large that the risk of collecting these materials for identification is great. To cut down the whole tree is very destructive if the only object is to be able to identify it. To partly solve the problem on hand, this paper recommends the use of the bark characters in tree identification.

In the timber trade the bark is loosely designated as the outer covering of the stem including all tissues outside the vascular cambium. Largely dependent on the species concerned, the formation of the different layers is attributed to the development of the cork that cuts off the exterior phloem tissue. In most tropical trees, the increase in the girth would stretch or tear the dead sheets of phloem and cork cells resulting in various bark patterns.

Anatomically, the bark consists of three distinct layers, namely the *phellem* or cork, *phellogen*, or cork cambium, and the *phelloderm*. The cork is the most external portion of the bark and is made up of dead cells that provides protection to the inner tissues against mechanical injury. The cork cambium is a layer of actively dividing cells that give rise to the cork and the inner tissues known as *phelloderm* (3). Record (6) suggested a more practical designation to the distinct layers of the bark by dividing them into the *outer* or dead portion and the *inner* or living portion. The latter is sustained in the description of the individual species.

Tamesis and Aguilar (8) used the bark as a supplement in the description of the members of the "Philippine mahogany" species. Tamolang (9) in his work described the occurrence of an included bark in Kulis, *Memecylon ovatum* Sm., although he reported it under *Syzygium sp.*, which distinguishes it from the rest of the species. Brockway (1) in his study of the *Eucalyptus*, used the bark color to segregate the seven tan bark eucalypts of South Western Australia.

So far literature shows that very little attempt has been made to make use of the bark as an aid in the identification of standing trees; hence, the object of this study.

MATERIALS AND METHODS

Thirty-two species available in the Makiling Forests are considered in this study. These are Lumbang, *Aleurites moluccana* (L.) Willd.; Vidal's lanutan, *Bombycidendron vidalianum* (Naves) Merr. & Rolfe; Duguan, *Myristica philippensis* Lam.; Malak-malak, *Palaqium philippense* (Pers.) C.B. Rob.; Talisay, *Terminalia catappa* L.; Tuai, *Bischofia javanica* Blume; Molave, *Vitex parviflora* Juss.; Narra, *Pterocarpus indicus* Willd;

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Kusibeng, *Sapindus saponaria* L. forma *microcarpa* Radlk.; Malaipil, *Intsia acuminata* Merr.; Duñgon late, *Heritiera littoralis* Ait.; Bitaog, *Calophyllum inophyllum* L.; Banaba, *Lagerstroemia speciosa* (L.) Pers.; Banuyo, *Wallaceodendron celebicum* Koord.; Rain tree, *Samanea saman* (Jacq.) Merr.; Ipil, *Intsia bijuga* (Colebr.) O. Ktze.; Taluto, *Pterocymbium tinctorium* (Blco.) Merr.; Malapapaya, *Polyscias nodosa* (Blume) Seem.; Ilang-ilang, *Cananga odorata* (Lam.) Hook.f. & Thoms.; Para rubber, *Hevea brasiliensis* (HBK) Muell.-Arg; Dita, *Alstonia scholaris* (L.) R. Br.; Dao, *Dracontomelum dao* (Blco.) Merr. & Rolfe; Malabuho, *Sterculia oblongata* R. Br.; Igio, *Dysoxylum decandrum* (Blco.) Merr.; Bagras, *Eucalyptus deglupta* Blume; Antipolo, *Artocarpus blancoi* (Elm.) Merr.; Tañgile, *Shorea polysperma* (Blco.) Merr.; Tamayuan, *Strombosia philippinensis* (Baill.) Rolfe; Paguriñgon, *Cratoxylum celebicum* Blume; Sakat, *Terminalia nitens* Presl; Rarang, *Erythrina subumbrans* (Hassk.) Merr.; and Earpod, *Enterolobium cyclocarpum* Griseb.

The barks of these species were studied in nature. Only matured trees were investigated The outer bark was first observed and the characters recorded. To study the inner bark a chop was made on the outer bark. An additional chop showed the inner extreme. Chopping was made in such a way that the cut was almost parallel to the axis of the stem. Using this method, the true characters of the inner bark were exposed.

Specimens of bark ranging from 6" x 8" to 8" x 10" were collected from each tree with the use of a sharp bolo and a wooden club. These were taken at about one and a half meters above the ground or at least above the buttress where the best representative portion of the bark is shown. Care was taken so as not to inflict too much injury to the cambium layer. This would enable the tree to callus as early as possible.

The bark has certain inherent characteristics that offer it a good basis for identification. In the description of the species, the following features are used namely, *texture, color, odor, taste, liquid, exudations,* and *thickness.* The mere use of any character or a combination of these characters may lead to correct tree identification.

Texture may be referred to as the physical appearance of the bark. It is classified as *rough,* when the bark has protuberances of no definite form as in Narra, Tamayuan, and Kusibeng; *smooth,* when the bark appears to be plain and solid without any cracks, scales, or ridges as in Taluto, Ilang-ilang, and Lumbang; *flaky,* when it appears to be scratched so as to present a curling or rolling paper-like fragments as in Tuai and Bagras; *ridged,* when it is fissured or furrowed or divided into partitions with depressions between them as in Paguriñgon, Tañgile, and Vidal's lanutan; *Spiny,* when it is possessed with pointed protuberances as in Rarang; and *scaly,* when it is broken into sections of similar forms and are almost peeling out from the trunk as in Rain tree, Talisay and Sakat. Other classification of texture may be *woody,* as in Molave; *fibrous,* as in Malabuho; *fleshy,* as in Dao; *stringy,* as in Duñgon late; and *brittle,* as in Dita.

Color is referred to as the pigment, hue, tone or shading. It may be *blackish,* as in the outer bark of Duguan and of the Ebenaceae group; *brownish,* as in Narra; *grayish,* as in Malapapaya; *greenish,* as in the inner barks of almost all the species; *whitish* as in Igio and Malapapaya; *yellowish,* as in the saps of Bitaog and Paguriñgon; or a *combination of hues,* as in the inner barks of Taluto and Malabuho.

Odor refers to the scent or the reaction of the sense of smell. It is *aromatic,* when it gives off a fragrant, sweet or pungent odor as in Anonggo, Para rubber, Yabnob, and Kaliñgag; *fishy,* when it smells like fresh fish or fresh beans as in Ipil, Igio and Kusibeng; *disagreeable,* when it gives off an of-

fensive odor as in Spanish Cedar, Rain tree. Hairy-leaved Himamao and Lago; and *odorless,* when it does not fall under the category of the first three.

Taste refers to the reaction of the tongue and palate with reference to flavor, savor, and tang. It is *bitter,* when it is sharp, disagreeable and galling as in Dita; *puckery,* when it produces a contracting effect in the mouth or the taste of immature bananas as in Talisay, Narra and Malak-malak; *pungent,* when it produces a biting effect as in Kaliñgag and Kayumanis; and *tasteless,* when it is indefinite.

Liquid exudations may be referred to as the wet or flowing substances contained in the bark or in the cambium layer such as sap, resin, or tannin. *Sap* is a liquid or sticky substance that exudes from the barks in red. white, or yellow colors. *Resin* is a solid or semisolid substance formed usually after the spontaneous evaporation of resinous juices which exude naturally from the trunk through the injured bark. *Tannin* is a yellowish-brown matter obtained from the bark which is used for tanning leather.

Thickness refers to the horizontal depth of the bark from the periphery inwards to the cambium. *Very thin,* when it is 5 mm. or less in depth; *thin,* when it is between 5 mm. and 10 mm.; *thick,* when it is between 10 mm. and 15.; and very *thick,* when it is more than 15 mm.

OBSERVATION AND RESULTS

Field observation of the thirty-two species considered in this study showed that no two species have the same bark characteristics. In many instances however, similarities occur in the outer bark especially in texture and color, yet they vary greatly in some aspects, such as odor, taste, liquid exudations, and thickness.

Typical of those found in the Makiling Forests, hereunder in alphabetical order are the species observed with their respective characteristics.

Antipolo. — Outer bark slightly ridged, corky postules slit-like, horizontal; grayish-brown; inner bark fleshy, reddish with 5 mm. wide light brown streaks in longitudinal lines; odorless; taste puckery; white sap very profuse; thick, 9-11 mm.

Bagras. — Outer bark flaky, rolls like paper, very thin, leaving large irregular scars which become bluish with age, grayish-blue; inner bark fleshy, reddish with numerous thread-like dark red streaks in longitudinal lines; odorless; taste puckery; very thin, 4-5 mm.

Banaba. — Outer bark smooth, thin flakes decaying with age, light brown with occasional whitish or moss-green spots; inner bark fleshy, light red turning pale brown upon exposure; odorless; taste puckery; very thin, 3-4 mm.

Banuyo. — Outer bark smooth with occasional cracks in some parts, basal portion flakes in large squares, brownish-gray; inner bark fleshy ultimately stringy, light red with yellowish-brown streaks; odorless; taste puckery; thick, 12 mm.

Bitaog. — Outer bark ridged out with flat surface, flaking in large squares in the basal portion, partly woody, yellowish-brown; inner bark fleshy, reddish; odorless; tasteless; yellow sap flows very slowly, sticky; thin at the depressed portion, thick to very thick at the elevated portion, 6-16 mm.

Dao. — Outer bark smooth with characteristic blotches of brown and white, grayish to light brown; inner bark brittle to fleshy near the cambium, light red throughout; odorless; taste puckery; thin, 7-10 mm.

Dita. — Outer bark roughened by the presence of numerous corky postules in short horizontal bands, light brown to grayish; inner bark very brittle with yellowish-brown areas; odorless; taste very bitter; white sap flows very profusely immediately after cutting, very sticky when exposed; thin, 8-10 mm.

Duguan. — Outer bark rough, dark brown to almost black with scattered whitish patches; inner bark fleshy, reddish turning pale brown upon exposure; odorless; taste puckery; red sap very profuse; thin, 6 mm.

Duñgon late. — Outer bark scaly, pale brown with isolated brown areas; inner bark fleshy, ultimately stringy, light reddish or reddish-brown with numerous pore-like structures; odorless; tasteless; thin, 5-8 mm.

Earpod. — Outer bark ridged with leaf scars in horizontal bands, light brown with occasional whitish spots; inner bark brittle, ultimately stringy, light brown with whitish veins; odorless; taste puckery; thin, 6-8 mm.

Igio. — Outer bark smooth to ridged near the base, grayish; inner bark fleshy, whitish, light brown with yellowish streaks immediately after the outer bark; odor fishy, tasteless; thin, 7-10 mm.

Ilang-ilang. — Outer bark smooth turning rough with age, dark brownish green; inner bark fibrous, light brown; odorless; tasteless; thick, 10-15 mm.

Ipil. — Outer bark smooth with numerous small, solitary corky postules which are easily rubbed off, grayish-green with occasional whitish patches; inner bark brittle becoming stringy near the cambium, yellowish-brown with numerous vein-like structures; odor fishy; tasteless; very thin, 4-5 mm.

Kusibeng. — Outer bark rough, grayish-brown with moss-green or whitish patches; inner bark brittle, yellowish-brown with horizontal narrow bands which are darker than the background; odor fishy; tasteless; very thin, 5 mm.

Lumbang. — Outer bark smooth with corky postules in vertical lines appearing as ridges, light brown to grayish with occasional whitish patches; inner bark brittle to ultimately stringy near the cambium, reddish-brown with dark brown dots, greenish-white streaks appear immediately after the outer bark; odorless; tasteless; very thin, 5 mm.

Malabuho. — Outer bark smooth becoming rough with age, light brown or grayish; inner bark fibrous, light brown with reddish streaks and numerous light brown dots; odorless; tasteless; thick, 10-12 mm.

Malaipil. — Outer bark with minute, solitary corky postules scattered, hard, becoming rough with age, light brown or grayish-green; inner bark brittle to stringy near the cambium, light brown, yellowish-green immediately after the outer bark; odor fishy; taste puckery; very thin, 4-5 mm.

Malak-malak. — Outer bark smooth with numerous solitary corky postules scattered over the surface, brownish with whitish patches; inner bark brittle, reddish with yellowish immediately after the outer bark; odorless; taste puckery; white sap flows very slowly after cutting; thin, 6 mm.

Malapapaya. — Outer bark slightly ridged, grayish to light brown; inner bark fleshy, whitish with brownish streaks; odorless; tasteless; very thin, 3-5 mm.

Molave. — Outer bark smooth, thin flakes decaying with age, light brown to grayish, turning mossy-green with age; inner bark woody, light brown throughout; odorless; tasteless; very thin, 2-5 mm.

Narra. — Outer bark rough and decaying with age, brownish to grayish-brown; inner bark fleshy to brittle and stringy near the cambium, reddish with dark red or blackish streaks; odorless; taste puckery; red sap flows slowly; thin, 5-7 mm.

Paguriñgon. — Outer bark ridged, depressions about 10 mm. apart, brownish with occasional whitish spots on the exposed portions; inner bark very brittle and hard to debark, yellowish-brown; odorless; tasteless; sap, yellowish-brown, flows very slowly appearing as reddish dots; very thin, 4-5 mm.

Para rubber. — Outer bark smooth, brownish with grayish patches; inner bark brittle, light brown with numerous dark brown dots;

odor aromatic; tasteless; white sap very profuse and dries almost instantly upon exposure; thin, 7-10 mm.

Rain tree. — Outer bark ridged when young becoming scaly with age, old bark dark brown or blackish, young bark light brown; inner bark at first reddish becoming yellowish near the cambium; odor somewhat disagreeable; taste sweetish flavor; watery substance evident in the cambium; thick, 10-15 mm.

Rarang. — Outer bark spiny with corky postules in longitudinal lines, grayish or pale brown with numerous whitish blotches; inner bark brittle, ultimately stringy, yellowish-brown with greenish-brown streaks; odor disagreeable; tasteless; thick, 10-12 mm.

Sakat. — Outer bark scaly but slightly ridged when young, dark brown to almost blackish, partly woody; inner bark stringy, coffee brown, light brown near the cambium turning pale brown upon exposure; odorless; taste puckery; tannin color evident; thin; 5-8 mm.

Talisay. — Outer bark scaly, dark brown to almost blackish; inner bark fleshy to stringy near the cambium, reddish with numerous whitish dots; odorless; taste puckery; very thin, 5 mm.

Taluto. — Outer bark smooth with enlarged leaf scars in horizontal bands, aliform shaped, grayish; inner bark fleshy to fibrous, greenish immediately after the outer bark, reddish with whitish streaks near the cambium; odorless; taste puckery; thin, 8-10 mm.

Tamayuan. — Outer bark rough, reddish-brown with occasional whitish spots on the exposed portions; inner bark brittle, yellowish-brown; odorless; taste puckery; thin, 5-7 mm.

Tañgile. — Outer bark slightly ridged becoming smooth with age or after shedding of irregular flakes, light reddish-brown; inner bark brittle to ultimately stringy, reddish with lighter colored streaks about 10 mm. apart; odorless; taste puckery; resin not evident; thin 6-10 mm.

Tuai. — Outer bark flaky, dark brown; inner bark very brittle, composed of several thin layers, dark red; odorless; taste very puckery; red sap evident but flows very slowly; thick, 10-12 mm.

Vidal's lanutan. — Outer bark slightly ridged becoming decayed with age, light brown; inner bark fibrous or stringy, yellowish-brown turning pale brown upon exposure; odorless; tasteless; thin, 7-10 mm.

As an aid to tree identification, the following dichotomous key shows that it is possible to segregate the different species with the use of the bark characters.

1.	Outer bark smooth	2
1.	Outer bark rough	15
2.	Old bark with corky postules	3
2.	Old bark without corky postules	6
3.	Corky postules, ridge-like	Lumbang
3.	Corky postules, solitary, scattered	4
4.	Milky sap present	Malak-malak
4.	Milky sap absent	5
5.	Inner bark yellowish-brown with vein-like structures	Ipil
5.	Inner bark light brown without vein-like structures	Malaipil
6.	Bark flaking	7
6.	Bark not flaking	9
7.	Flakes, paper-like	Bagras
7.	Flakes, decayed	8
8.	Inner bark fleshy	Banaba

	8. Inner bark woody	Molave
9.	Inner bark fibrous	10
9.	Inner bark not fibrous	12
	10. Streaks present	11
	10. Streaks absent	Ilang-ilang
11.	Light brown with reddish streaks	Malabuho
11.	Whitish with reddish streaks	Taluto
	12. Inner bark fleshy	13
	12. Inner bark brittle	14
13.	Color, light red	Banuyo
13.	Color, whitish	Igio
	14. Milky sap present	Para rubber
	14. Milky sap absent	Dao
15.	Bark ridged or furrowed	16
15.	Bark not ridged or furrowed	23
	16. Surface of ridges, flat, smooth	17
	16. Surfaces of ridges, sharp or nearly so	19
17.	White or yellow sap present	18
17.	White or yellow sap absent	Malapapaya
	18. White sap	Antipolo
	18. Yellow sap	Bitaog
19.	Inner bark fibrous or stringy	Vidal's lanutan
19.	Inner bark not as above	20
	20. Sap, present, yellow	Paguriñgon
	20. Sap, absent	21
21.	Bark scaly when matured	Rain tree
21.	Bark not as above	22
	22. Leaf scars in horizontal lines	Earpod
	22. Leaf scars absent, smooth with age	Tañgile
23.	Sap, present	24
23.	Sap, absent	27
	24. Color, white	Dita
	24. Color, red	25
25.	Bark flaking, composed of several layers	Tuai
25.	Bark not flaking	26
	26. Inner bark with reddish or blackish streaks	Narra
	26. Inner bark reddish turning pale brown upon exposure	Duguan
27.	Bark scaly	28
27.	Bark not as above	30
	28. Inner bark, coffee brown	Sakat
	28. Inner bark, reddish	29
29.	With pore-like structures	Duñgon late
29.	With numerous whitish dots	Talisay
	30. Bark, spiny	Rarang
	30. Bark, not as above	31
31.	Inner bark with horizontal narrow bands	Kusibeng
31.	Inner bark not as above	Tamayuan

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Differentiation of the Sapwood and Heartwood of treated Apitong (*Dipterocarpus SSP.*) by Color Indicators

by
FLORENTINO O. TESORO

There is no marked difference in the natural durability of the sapwood regardless of the species. In less-durable species there is very little difference, if any, between the natural durability of the sapwood and heartwood. The heartwood of a durable species is resistant to the attack of wood-destroying organisms due to the presence of toxic extractives.

The advancement in technology has made possible the use of sapwood, even in modern construction where durability is of prime importance. Sapwood that is adequately treated with the proper preservative for the particular end-use requirement will last as long as the untreated heartwood of the same species and cross-sectional area.

The treatability of different species is not the same. A uniform penetration and retention of the preservative is not usually obtained in the material treated in one charge, or even in the same piece, due to the heterogeneous nature of wood. In general, sapwood treats easier than heartwood, although in some species the sapwood is nearly as difficult to treat as the heartwood.

It is often necessary to distinguish the sapwood from the heartwood of both treated and untreated material. This is done to exclude untreated sapwood in construction work. The sapwood of some species is clearly delineated by its color from the heartwood. Where the difference is not very distinct, color indicators are often used.

In treated material, it is necessary to differentiate between the sapwood and heartwood in order to determine if the sapwood has been penetrated to the minimum depth of penetration as specified for a particular end-use requirement. Sample borings are taken and tested. Penetration is determined by measurement, if the color of the preservative is distinguishable from the color of the wood. For preservatives which impart no discernible color to the wood, differentiation is accomplished by color indicators.

Different species react differently to various indicators, but a particular reagent may give the same color reaction to the sapwood and the heartwood of a particular species. Because of this, no one particular reagent can be used to distinguish the sapwood from the heartwood of all species.

Studies have been made to determine the particular indicator that would distinguish the sapwood from the heartwood of treated and untreated wood. Results of these studies on local and foreign species are shown in Table 1.

Studies on the differentiation of sapwood and heartwood made on Philippine species have been limited to untreated wood. This study was conducted to determined the chemical indicator that could be used to differentiate the sapwood from the heartwood of untreated and Wolman salts treated apitong.

TABLE 1. RESULTS OF STUDIES ON THE DIFFERENTIATION OF SAPWOOD AND HEARTWOOD OF TREATED AND UNTREATED WOOD OF VARIOUS SPECIES

Reagent	Concentration or Composition	Species	Color Reaction	
			Sapwood	Heartwood
Ammonium bichromate	5 percent	Balobo (4)*	Reddish-yellow 8/4**	Yellow-red-yellow 6/4
Benedict's solution	See Appendix A	Binuang (4)	Yellow-red-yellow 5/8	Greenish-yellow 8/10
Benzidine-sodium nitrite solution	See Appendix A	Pines (1, 2, 3)***	Yellow	Dark red
Benzo-yellow pH sol.	— — — — — — — —	Oakes (1)	Yellow	Red
Fehling's solution	See Appendix A	Balobo (4)	Reddish-yellow 7/6)	Yellow-red-yellow 5/6
		Banai-banai (3)	Yellow-green yellow 5/6	Reddish-yellow-red 5/3
		Binuang (3)	Greenish-yellow	Yellow-red
Ferric chloride	10 percent	Balobo (4)	Yellow-green-yellow 6/2	Yellow 5/2
		Malapapaya (3)	Greenish-yellow 3/2	Yellow-red 5/10
Iodine	2 percent	Balobo (4)	Yellow 8/6	Yellowish-yellow-red 6/6
Methyl orange	1 percent	Balobo (4)	Yellowish-yellow-red 6/6	Yellow-red-yellow 7/10
Phenol-hydrochloric acid-ethanol sol.	See Appendix A	Douglas-fir (12)***	Light green	— — — — — — — — — —
Potassium iodide in iodine	2 percent KI added to 2 percent I	Kupang (4)	Yellow 6/10	Yellow-red-yellow 7/10
		Balobo (4)	Reddish-yellow 8/4	Yellowish-red-yellow 5/6
		Malapapaya (3)	Yellow-red 2/2	Red 7/10
Potassium permanganate solution	1 percent	Balobo (4)	Yellowish-yellow-red 7/6	Reddish-yellow-red 3/6
Sodium alizarin sulfate	0.75 percent	Douglas-fir (1)	Pink	Yellow

* Numbers inside the parentheses refer to the literatures cited.
** Fractions refer to the Munsel's Color Chart number denoting chroma and value of color.
*** The wood tested with the indicator was treated with a preservative, or that the indicator works equally well on woods treated with water-borne preservatives.

MATERIALS AND METHODS

Wood Specimens:

Ten 5 x 4 x 1/4-inch specimens were cut from the center of a 5 foot piece of airdried apitong. Five of the ten specimens were used in the color differentiation of the untreated sapwood and heartwood, while the other five were used for treated specimens. The five specimens alloted for treatment were ovendried before soaking for 42 hours in a 5 percent solution of Wolman salts (Tanalith U).

Each of the ten specimens were ripped into 10 strips of 1/2-inch, making a total of 100 strips.

Reagents:

The reagents and concentrations used in this study of treated and untreated apitong were those which have been tried on untreated Philippine species (3, 4) except Benedict's solution which was not available; and those which have also been tried on untreated and treated foreign species (1, 2, 3) except phenolhydrochloric acid-ethanol solution and benzo-yellow pH color which were also not available.

TABLE 2. REAGENTS AND CONCENTRATION USED IN THE DIFFERENTIATION OF SAPWOOD AND HEARTWOOD OF UNTREATED AND WOLMAN SALTS TREATED APITONG.

REAGENTS	CONCENTRATION AND COMPOSITION (Solutions in water)
Iodine	2-1/2 percent
Potassium iodide in iodine	2 percent potassium iodide added to 2 percent iodine
Methyl orange	1 percent
Ammonium bichromate	5 percent
Sodium alizarin sulfate	0.75 percent
Ferric chloride	10 percent
Potassium permanganate	
Fehling's solution	(See Appendix A)
Benzidine-sodium nitrite solution	(See Appendix A)

Application:

Ten strips of wood, five of which were treated and five untreated, were alloted to one indicator. Except for the benzidine-sodium nitrite solution, the rest of the reagents were applied to the cross-section and radial section of the strips with the aid of a medicine dropper. Care was taken not to use a dropper without washing it with water to avoid contamination of one reagent by another. The benzidine-sodium nitrite solution was placed in a 70 ml. test tube and the strips were immersed in the benzidine-sodium nitrite solution and ovendried for about 10 minutes at 100° plus or minus 3° Centigrade. This was done to induce reaction between the stain and the wood since reaction was not instantaneous.

DISCUSSION OF RESULTS

Untreated specimens:

Potassium iodide in iodine and benzidine-sodium nitrite solutions showed positive results on the untreated apitong specimens. The other reagents either did not react with the

wood or produced an indistinguishable color between the sapwood and the heartwood.

Potassium iodide in iodine produced a yellowish-brown color in the sapwood. Dark-blue spots were observed in the radial section, but were absent on the cross-section. A dark-brown color was observed in the heartwood. The benzidine-sodium nitrite solution turned the sapwood to a yellowish-brown and the heartwood to a reddish-brown.

Potassium iodide in iodine reacted on the cross-sectional surface in about 5 minutes while reaction was instantaneous on the radial section. Benzidine-sodium nitrite solution took about 20 minutes to react. The colors remained distinct indefinitely.

Specimens treated with Wolman salts (Tanalith U):

In all cases, the yellowish color that the Wolman salts imparted to the wood disappeared upon application of the different reagents. For benzidine-sodium nitrite solution, the wood turned to a uniform reddish-brown color before the color difference in the heartwood and sapwood appeared. For the other reagents, color reaction followed immediately.

Potassium iodide in iodine and benzidine-sodium nitrite solutions gave distinct color differences between the heartwood and the sapwood, while methyl orange, ammonium bichromate, and sodium alizarin sulfate gave color differences which were not very distinct. The other reagents either did not react or gave indistinct color reactions.

The sapwood turned to a bluish-black color as soon as the yellow color of the Tanalith U was removed when potassium iodide in iodine was applied. The heartwood gave no color reaction. Bluish spots were observed in both the sapwood and heartwood when methyl orange was applied but the spots in the sapwood were larger and less scattered. Ammonium bichromate and sodium alizarin sulfate gave bands of dark-brown to chocolate brown along the radial direction. Wider bands were observed in the sapwood while narrower and fewer bands were seen on the heartwood.

Benzidine-sodium nitrite solution turned the sapwood to a yellowish-brown color and the heartwood a reddish-brown. The color difference showed in about 20 minutes for those that were not ovendried after immersion in the stain. A deeper yellow was observed in the sapwood of the strips that were ovendried than those that were left to dry in the atmosphere.

CONCLUSIONS

1. Potassium iodide in iodine turned the untreated sapwood of apitong to a yellowish-brown with bluish spots on the radial section which were absent in the heartwood. The heartwood turned dark-brown.

The sapwood of the specimens treated with Wolman salts turned to a bluish-black color upon the application of potassium iodide in iodine. No color change was observed in the heartwood.

2. Benzidine-sodium nitrite solution produced in both the untreated and treated apitong sapwood a yellowish-brown color, and in the heartwood a reddish-brown color.

3. Most of the indicators used did not react with the treated and untreated wood. Those that did react gave indistinguishable or slightly distinguishable color. Less scattered and larger bluish spots were observed in the sapwood of treated specimens when methyl orange was applied, while dark-brown bands along the radial direction wider than those observed in the heartwood of treated specimens were seen in the sapwood when ammonium bichromate or sodium alizarin sulfate was applied.

The sapwood of untreated or Wolman salts treated apitong can be differentiated from the heartwood through color differences by the use of potassium iodide in iodine or benzidine-sodium nitrite solution.

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Urgency of Seed Orchard Establishment in the Philippines

by

BERNARDO C. SINUES[1]

INTRODUCTION

The quality of logs, timber, plywood and veneer, including some important wood products is largely dependent upon the kind of trees from which the raw materials are derived. Basically a sound, healthy, straight-boled, and fast-growing tree is called for to satisfy the need for dependable and high-quality wood products. Genetical problem of this nature confronting the wood-users could be answered quantitatively and qualitatively through the establishment of clonal seed orchards at the various forest regions. Attainment of the pre-determined objectives would lead to the creation of a certified seed production center and a nucleus of forest tree improvement research in this country.

DISCUSSION

One of the ever-burning desires of Filipino foresters is the creation of a greener and more productive forest to yield the greatest permanent service to mankind. However, to put back the green mantle of forest vegetation on approximately five million hectares is problematical. A variety of technical problems faces every forest builder. Meanwhile it is regretful to accept that most people believe in the concept that the country's forest heritage is still inexhaustible. As a consequence, unscrupulous forest users cut parcel by parcel the virgin forests and sometimes the man-made plantations that are ultimately rendered non-profitable agricultural lands. Critical watershed areas devoid of forest vegetation are now sporadically situated all over the country's high mountains.

Artificial reforestation is tremendously an expensive investment that calls for a fruitful economic return. Its success is largely dependent upon proper regard for tree physiology, forest ecology, genetics and tree breeding. Laboriously it commences with seed collection followed by planting stock production and finally forest planting. Multi-million pesos worth of high-quality seeds are necessarily needed year after year for several decades to bring forth promising seedlings to reforest vast tracts of non-vegetated forest lands. At this juncture, it is noteworthy to point out that seeds of genetic superiority to raise seedlings of unquestionable quality are seriously wanting. The failure of tree planting as evidenced by the poor quality of timber stocks existing in some of the forest plantations may be partly attributed to the lack of high-quality seeds possessing genetic identity and purity. Momentarily it is felt that the wood-using industries are gradually endangered due to the dearth of high-quality timber from both the virgin and man-made forests.

Seed collection from a nearby plantation or forest stand with fruit-laden, poor-looking, dwarf trees is unquestionably cheap and practical but it is genetically inauspicious and risky. This has been a customary practice that must be corrected as early as possible. Many juvenile trees in some of the forest plantations have degrated tremendously in quality as a result of using seeds of unknown origin. This is manifested by the

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performance of some trees that are often dwarf, crooked, or mongrel-looking individuals. Such problem is incidentally genetical that remedial measures are often unsatisfactory. Replacement of the stock is very laborious and subsequently calls for an additional expense. Silvically replacement with seedlings is not advisable because they will suffer from suppression due to unending competition against the older planting stock for light and other growth factors.

To assess the current problem the succeeding discussions would show that it is still not very late to put up a genetic solution. Inestimable number of genetically superior trees are yet existing in the virgin forest or luxuriantly growing in the man-made plantations. Seeds of superior qualities are still collectible to supply the present reforestation needs. But just imagine how inconvenient it is to locate and collect seeds from the inherently superior trees at their natural locations! Most of them are found in the heart of the forest and are relatively inaccessible! It is also an arduous task to gather seeds especially on gigantic towering trees. Besides, even those phenotypically superior trees can not be completely ascertained whether or not they are genetically superior.

Determination and accumulation of superior trees is facilitated through the application of the different methods of vegetative propagation followed by a series of progeny testing. Many studies have already indicated the feasibility of propagating most of the broad-leaved commercial species either by cutting, marcotting, or grafting. As a technical aid these techniques could be availed of to reproduce the plus trees without disturbing or altering their genetic characteristics. The urgency of this activity is felt as the inherently superior trees are now fast disappearing. It is true that it would take another half-a-century again to produce a good crop of elite trees from seedling to maturity. This justifies the accumulation and preservation of the existing desirable trees in a well-designed clonal seed orchard before they are indiscriminately cut down by loggers. The establishment of regional seed orchards makes it easier to propagate these research materials at the earliest possible time.

The value of genetically superior seed could not be over-emphasized but it can be said that a pound of investment with it means a ton of harvest tomorrow. When the acme of seed production would have been reached in a well-established seed orchard, the financial burden of forest planting would be economically reduced to an insignificant minimum. The dream of hybrid production would also be realized. In the course of time, fast-growing and high-quality timber crop would be produced to answer the scarcity problem of the wood-using industries.

Activities in the field of forest genetics and tree breeding in this country are still wanting. It is lamentable to note that not even a single tree hybrid could be brought to light yet for Filipino foresters to be proud of. Tree selection and hybridization methods of crop improvement are theoretically of multiple importance but most tree-growers are still ignorant of them. To assess the present situation it is necessary to ask the question as to how far has the practice of forest genetics and tree breeding gone in the Philippines? True is the fact that many studies have already been conducted on the sexual and asexual propagation of several species, but has there been an additional stride made beyond this phase of research? Subsequently, has there been a concerted effort to preserve the elite trees that possess exemplary characteristics, such as the straight-boled molave and narra or the disease-resistant benguet pine?

To exemplify further the role of seed orchard in genetic research, it is wiser to mention the unsolved benguet pine disease that is becoming disastrously rampant in Abra. Planting promising seedlings from re-

sistant mother trees would gradually eliminate the disease. Efforts should therefore be exerted on the preservation of the surviving trees in the infected areas. A collection of benguet pine graftage should be maintained in a well-managed seed orchard as future source of genetically superior seeds and breeding stocks to produce hybrids that are resistant to the disease. Subsequently genetic investigations could be conducted to critically evaluate their economic importance.

A problem of today is in no way a perennial problem if proper action is promptly undertaken. The foresters who are supposed to undertake this activity should not cheat the generation of foresters ahead by missing such an important research opportunity. Literature concerning genetic knowledge with particular reference to tropical trees is very scanty. It has to be enriched especially in this country where the finest hardwoods are found. The realization of this dream would be initiated and stimulated through the establishment of seed orchards for various species, such as the pines, dipterocarps, or other reforestation crops at strategically situated places.

CONCLUSION

A seed orchard is considered as the best technical aid not only for reforestation or commercial purposes but also for the advancement of science particularly forest genetics. Its establishment would insure greater scale of certified seed production to meet the seed demand of tropical countries. Modern reforestation techniques are geared towards the use of seeds possessing genetic superiority to beget seedlings that would not merely serve as forest cover but primarily as potential source of commercially high-yielding timber trees. Based on genetic principles, forest planting is ultimately aimed at meeting the increasing demand of raw materials for the industrialization of the wood-using industries.

(*Continued from page 62*)

SUMMARY

The study was conducted to determine the possibility of utilizing the bark as an aid in the identification of standing trees. It was found out that similarities in the species occurred in the characters of their outer bark. However, there are distinctions between them as exhibited by the variance in characters of the inner bark.

The construction of a workable key to the species indicates that the identification of standing trees by the mere use of the bark is possible.

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APPENDIX A
COMPOSITION OF SOME OF THE REAGENTS USED AS INDICATORS

Benedict's solution	100 grams sodium carbonate, 175.8 grams sodium citrate, 17.3 grams copper sulfate, distilled water enough to make one liter solution.
Benzidine-sodium nitrite solution: (Reagent is solution of equal volumes of Parts A and B)	Part A: 1 gram benzidine dissolved in 5 grams of 25 percent hydrochloric acid (HCL) and 194 grams of water. Part B: 20 grams sodium nitrite dissolved in 180 grams of water.
Fehling's solution (Reagent is solution of equal volumes of Parts A and B)	Part A: 34.64 grams copper sulfate dissolved in 1/2 liter of water. Part B: 60 grams sodium hydroxide (NaOH), 173 grams Rochelle salt, 1/2 liter of water.
Phenol-hydrochloric acid-ethanol	10 ml. of phenol melted by heating in water-bath. The phenol is added to 5 ml. of hydrochloric acid to which sufficient ethanol (ethyl alcohol) is added to make a volume of 60 milliliters.

Some Problems Affecting the Veneer and Plywood Industry

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INTRODUCTION

The veneer and plywood industry is one of the most profitable wood-using industries in the Philippines. There are, however, some problems reported that threaten the stable status of this industry. As a response, this study was conducted with emphasis on determining the major problems so that possible solutions might be offered for thorough discussions and analysis.

The study was conducted by personal interviews with factory executives and actual observations and analysis of manufacturing operations of selected mills located in Northern Luzon and Eastern and Southern Mindanao in Summer, 1965. This study is a part ot a continuing research about plywood and veneer mills in the Philippines.

PROBLEMS AND DISCUSSIONS

The study confirmed at least five major problems which might wipe out the profit in the veneer and plywood industry such as lack of good logs, implementation of the ₱6.00 minimum wage, high freight states, low wood utilization, and dearth of technical men.

Lack of Good Logs.

The study revealed that a number of mills were operating very much below the rated machine capacity because of lack of good logs for processing. This might be due to inefficient material inventory control or lack of net operating capital to purchase good logs. These two factors directly result in high production cost.

Inefficient material inventory control resulting in the undersupply of logs influenced the degree of machine utilization and labor cost. Its ultimate effects were low machine utilization and high indirect labor cost. A contributing factor to this unwelcome situation was insufficiency of the right attitude to gather and consolidate information about lead times and the reliability of log suppliers, particularly, if the mill was operating without its own logging concession. It was further aggravated by shallow river bottoms during summer such that rafts of logs were stranded and towing was continued only when the river swelled. It was also considered that intermittent road maintenance in both logging and public roads did not insure the delivery of logs on time.

Tight credit facilities, in addition to tempting prices offered for exportable logs, have forced some mills to export a portion of their high quality logs even to the detriment of a continuous working schedule. Although, it increased the total cost of production, the company has no other alternative, since it cannot operate without the necessary working capital.

Implementation of ₱6.00 Minimum Wage.

The implementation of R.A. 4180 otherwise known as the new minimum wage law which sets the daily wage at ₱6.00 effective April 21, 1965, has increased direct-

ly the labor cost. Its ultimate effect in production cost was seriously felt of mills with reduced machine utilization. Reliable information obtained from executives of mills operating on twenty-four hour per day indicated that the effect of the new minimum wage law should be overcome by greater production per man-hour of high grade plywood and greater plywood recovery from a given log volume.

High Freight Rates.

The high freight charged on Philippine Exports of plywood, veneer, and lumber to the United States in comparison with those shipped from Japan, Taiwan, and South Korea was a severe blow to the country's competitive position. Although, Japanese log processors imported their logs which accounted for their higher log cost from Southsea countries, particularly the Philippines, the Japanese enjoyed advantages such as low-cost plywood machinery, low-cost glues, greater production of high grades plywood, and greater wood utilization. These advantages were more than enough to offset the advantages enjoyed by Filipinos in the form of lower log cost. In this connection, the higher freight paid by Filipinos for their export might be overcome by improvement in the efficiency of the workers in terms of greater production per man-hour and greater recovery of high quality plywood and above all the creation of the Philippine merchant marine.

Low Wood Utilization.

The recovery of 3-ply, ¼" x 4' x 8' plywood on the average was 40 percent of the log volume. This represented the average recovery from sawlogs, export rejects, and small volume of veneer grades. Plywood grades recovered based on the quality of face veneers were mostly on the C and Print grades. Our recovery was way below that of South Korea which was no less than 50 percent. However, it should be considered that logs processed in South Korea were generally of exportable grades unlike in the Philippines. Log ends, log centers, and trimming waste were used only in very few mills in the Philippines.

Dearth of Technical Men.

Lack of technical men is a recognized problem in the veneer and plywood industries; those people who understand the behavior of wood as a material. The industries also require men with excellent knowledge in organization and management control as well as human relations so that work can be coordinated effectively. In this connection, it is advisable that those who are now employed in the mills shall be given the opportunity to attend in seminar or training dealing with their work.

CONCLUSIONS

The problem plaguing the veneer and plywood industries require immediate attention and intensive study in order to minimize their adverse effects on these industries. The problems are lack of good logs, implementation of the ₱6.00 minimum wage, high freight rates, low wood utilization, and dearth of technical men.

FIBERBOARD

"Fiberboard" is a broad term for various kinds of sheet materials very much thicker than paper and made from wood fibers or other vegetable fibers. Fiberboards are also known according to use as insulation boards, hardboards, wallboards or building boards.

To avoid or minimize overlapping in the classification of fiberboard by use, the Food and Agriculture Organization of the United Nations has recommended the following classification according to density:

Classification of Fiberboard

	Type of Board	Density g./cu.cm.	Density lb/cu.ft.
1	Non-compressed[a] or insulation board		
	Semi-rigid insulation board	0.02-0.15	1.25- 9.50
	Rigid insulation board	0.15-0.40	9.50-25. 0
2.	Compressed or hardboard		
	Intermediate or medium density fiberboard or semi-hardboard	0.40-0.80	25-50
	Hardboard	0.90-1.20	50-75
	Special densified hardboard	1.20-1.45	75-90

Raw Materials

Wood still remains the biggest and best source of raw material for fiberboard manufacture, although other lignocellulosic materials can be used. Without taking into account the use of pulpwood (i.e., logs primarily for pulp manufacture), the Philippines has also a tremendous amount of potential raw materials in the form of wastes from the operations of wood industries. In 1962, an estimate of these wastes and their sources are as follows:

1. Logging industry (in the form of usable tops and branches, damaged logs, and stumps) 900,000,000 bd. ft. (2,123,643 cu. m.)
2. Sawmills (as slabs, trimmings, edgings, sawdust, and bark) — 406,000,000 bd. ft. (957,-999 cu. m.)
3. Veneer and plywood plants (as bolt cores, trimmings, etc.) — 129,000,000 bd. ft. (304,-389 cu. m.)

These waste are conservatively estimated to be equivalent to 1,253,000 metric tons of dry materials annually. A very small part of the estimated waste is used for fuel and construction purposes while the rest is unused.

So far, there is only one fiberboard mill in the Philippines which uses sawmill waste profitably as its raw material. Many of the hardboard mills in existence are built near or integrated with sawmills, plywood mills and veneer mills in order to fully utiize the wood. The possibiities, therefore, of integrating fiberboard mills with other wood-using industries in the Philippines should be thoroughly explored.

One advantage of the fiberboard industry is that it can utilize wastes such as unbarked wood, small-sized wood (down to 2 inches or 5 cm. diameter). For any given board composition, of course, sawdust and bark can be used up to a certain proportion only without adversely affecting the quality. In certain cases, the addition of bark even improves some desirable properties of the board.

Among the non-wood fibrous materials, bagasse and rice straw are available in the Philippines. It should be realized, however, that the biggest problem in the use of these raw materials lies in their collection and storage and the lack of suitable equipment (in the case of rice straw) for this purpose. Another problem is the seasonal nature of sugarcane and rice crops. Furthermore, bagasse is also used to some extent as boiler fuel by sugar centrals.

Due to the springy, tough nature of the fibers, bagasse is better suited for insulation board than for hardboard. At present, intermediate density board or semi-hardboard as well as insulation board is being made from bagasse in the Philippines. Rice straw can be used for insulation board and hardboard. However, the nodes and the silica content of the straw and extraneous foreign matter such as dirt and weeds present problems during processing.

[a] (Board is "non-compressed" when it is not pressed while undergoing drying. "Compressed" board is dried while under pressure.)

Methods of Pulping

1. *Mechanical pulping.* — This is done in the same manner as in the manufacture of newsprint, using grinders except that the pulp produced is relatively "fast draining" compared with pulp produced for newsprint.

2. *Thermal and mechanical pulping.* — The raw material is given a preliminary treatment with direct steaming followed by grinding, also under steam, usually in disc refiners. The well-known Asplund process is an example of this method.

3. *Chemical and mechanical pulping.*—Some raw materials may require a mild chemical cook using neutral sulfite, sodium hydroxide or lime liquor followed by refining in a disc mill.

4. *Explosion process (Masonite process).* — The wood chips are steamed at an extremely high temperature in a high-pressure vessel and then expelled. The sudden release of pressure causes the steamed chips to explode into a fibrous mass.

The pulp made from any of the above processes may be washed, further refined and screened before the necessary additives are blended with the pulp to be followed by formation of the sheet.

Additives

Sizing is added to the pulp to improve its resistance to water absorption and, to certain extent, increase the strength of the finished board. For insulation board, rosin, paraffin, cumarone resin, or asphalt could be used. Paraffin wax and rosin are also used for hardboard sizing. The sizing material is precipitated on the fibers by alum. For dry-pressed hardboard, drying oil emulsion is used and precipitated by ferrous sulfate and sulfuric acid. For air-felted hardboard manufacture, wax is added to the chips in the digester or before or after disc refining. Phenolic resin, which is primarily used to improve the strength of the air-felted boards, is added separately in a blender.

Sheet Formation

1. *Wet-felting.*—This is the most common method and is used for all insulation board manufacture and most hardboard manufacture. The mat or sheet is formed from a water suspension of pulp on fourdrinier machines, deckle boxes, or cylinder formers.

2. *Air-felting.* — The relatively dry fibers are formed into a sheet by air or mechanical means.

Insulation Board

After cold pressing, the sheets or mats are cut and trimmed, if necessary, and dried to about 10 per cent moisture content or less. The boards are further trimmed after drying. If desired, preservative and fire-resistive treatments may be applied. The boards may be coated, painted, laminated or perforated.

Hardboard

Pressing methods

The sheet formed by either wet-felting or dry-felting may be wet-or dry-pressed in steam-or hot-water-heated presses.

1. *Wet-pressing* is generally used at present, utilizing a wire screen on one side of the mat to allow steam to escape from the board itself. The wire screen used gives the wet-pressed board its characteristics "screen-back".

2. *Dry-pressing* is applied only to make of sufficiently low moisture content. Smooth, two-side (S-2-S) boards are produced by this method since no wire screen is necessary. The pressing time is shorter, but the pressure and temperature used are higher than that used for wet pressing. Furthermore, such additives as resins are necessary and the amount of wax sizing used is higher than the amount used for wet-pressed boards.

Based on the overall method of manufacture, i.e., from pulping to pressing, hardboard processes can be classified as *wet*, *semi-dry*, and *dry*. Pulping is quite similar for the three processes. In the more common *wet process*, water is added after pulping, the pulp is wet-felted and wet-pressed; the moisture content of the mat being about 65-70 per cent before pressing. In the *dry-process*, the pulp is dried to about 6 per cent moisture content, the pulp is air felted and the mat is dry pressed. In the *semi-dry* process, the pulp is dried to about 12 to 15 per cent moisture, is air felted but water is added just before pressing increasing the moisture content to about 30 per cent.

At present, the semi-dry process does not offer any decided advantage over the wet process even in the case of water consumption. The dry process is recommended where water supply and water pollution are problems. It is also possible to make S-2-S boards and a wider range of board thicknesses in the dry process than can be made with the wet process. However, the wet process has been so highly developed that, at present, it has a lower cost of production than the other two processes.

Additional Treatment

Like insulation board, hardboard from the press may be trimmed and used as such or given further treatment:

1. *Heat treatment.* — The board is exposed to a high temperature (about 155 to 160 deg. C.) for a few hours. This process improves the strength and resistance to water absorption and lessens thickness swelling.

2. *Oil-tempering.* — The board is impregnated with drying oils like linseed or tung oil and then heated at 160 to 170 deg. C. for several hours. This treatment increases not only board strength and water resistance but also resistance to weathering and abrasion, making the board more suitable for outdoor use.

3. *Humidification.* — Boards from the hot press or after treatment or oil-tempering are humidified to 5 to 8 per cent moisture content to stabilize the dimensions and to prevent warping.

4. *Other treatment* — The hardboard may be painted, covered with overlays, given preservative or fire-resistive treatments, grooved, laminated or perforated. The smooth surface may be printed with any design such as wood grain. Hardboards with embossed patterns are made by using press cauls of the desired designs.

Standard hardboard, in American practice, refers to the product from the hot press which is subjected only to minor treatment such as humidification and trimming. In Scandinavia, as in the Philippines, heat-treated board which is subsequently humidified and trimmed is called *standard hardboard.*

Uses

1. *Insulation Board.* — Some insulation boards are used at present in the Philippines for heat insulation and accoustical applications. Other fields of use are for concrete forms, interior walls and ceilings, roof insulation, structural purposes, paddings for truck, rail and ship loading, packages, and underlays for parquet and other wood flooring.

2. *Hardboard.* — This is used widely for walls, ceilings, partitions, flush doors, cabinets, backs for radio and television sets, wall for exhibitions and other temporary structures and shipping containers. Other uses are for blackboards, concrete forms, building exterior walls, underlay for linoleum, rubber, plastic tile, and other types of flooring, doors (as core and facing materials), furniture and panelling for buses and railway coaches.

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PROSPECTIVE PULPWOOD SPECIES FOR PLANTATION IN THE PHILIPPINES

Paper, one of the many products derived from the forest has oftentimes been taken for granted; but its indispensability in our modern daily living cannot be denied. We come in contact with paper almost every hour of the day in many forms, uses and applications such as in books, newspapers, writing pads, wrappers, paper bags and a thousand other uses. This continuous need for paper has induced scientific and industrial research institutes and laboratories all over the world to look for raw materials and improve processing techniques in pulp and paper manufacture.

In the Philippines, one pressing problem of the pulp and paper manufacturer is the inadequate supply of fibrous raw material. The Forest Products Research Institute, in an attempt to help the infant pulp and paper industry, conducts research studies on fiber measurements, proximate chemical analyses, and pulp and papermaking evaluations of Philippine fibrous materials in search of promising species for pulp and paper production.

In pulp and papermaking, softwood species are the principal raw materials in producing good quality paper. In temperate countries like Sweden, Canada, and the United States, where the forests are mostly of the coniferous type, the problem of securing raw materials for paper manufacture is not as difficult

as in the tropics, where the forests consist mostly of hardwoods in varying degrees of mixture with a relatively small quantity of conifers.

The scarcity of conifers in the Philippines has focused the attention of the paper industry to the utilization of hardwoods. The number of tree species in the Philippines is estimated to be around 3,800. Less than 100 species, however, are being utilized commercially by the lumber and plywood industry and the rest are potential raw materials for the various wood-using industries like the pulp and paper industry.

The Forest Products Research Institute, in its exploratory studies on pulp and papermaking, using the Runkel[1] and Muhlsteph[2] classifications as well as other basic concepts concerning wood fiber and pulp-sheet properties, had determined the fiber dimensions of around 400 species. About 200 species were found suitable for pulp and papermaking so far.

In the utilization of these suitable species for commercial pulp and paper production, there are a number of problems involved. Not all of them can be readily used because many are not available in sufficient quantity to supply regularly the needs of the pulp and paper mills. Moreover, some of these species are difficult to propagate in plantations so that an adequate supply of planting stocks would not always be available. In addition, the cost of procurement is not reasonably economical.

Some of the pulpwood species that have been found suitable by the Forest Products Research Institute for pulp and papermaking and which could be grown in plantations are as follows:

[1] Runkel ratio — twice the cell wall thickness over the lumen width of the fiber.

[2] Muhlsteph classification — is based on the relative are of cell wall to that of the whole fiber as seen in cross section.

Common name	Scientific name	Fiber length (mm)	Runkel ratio	Muhlsteph group
1. African tulip	*Spathodea campanulata* Beauv.	0.92	0.23	III
2. Big-leafed mahogany	*Swietenia macrophylla* King	1.18	0.47	III
3. Gubas	*Endospermum peltatum* Merr.	1.62	0.52	III
4. Kaatoan bangkal	*Anthocephalus cadamba* (Roxb.) Miq.	1.43	1.42	III
5. Katmon	*Dillenia philippinensis* Rolfe	2.68	1.04	III
6. Moluccan sau	*Albizia falcata* (L.) Back.	1.11	0.41	III
7. Paper mulberry	*Broussonetia papyrifera* (L.) Vent.	0.95	0.38	III
8. Red lauan	*Shorea negrosensis* Foxw.	1.61	0.42	III
9. Toog	*Combretodendron quadrialatum* (Merr.) Merr.	2.36	1.15	III
10. Tuai	*Bischofia javanica* Blume	2.19	0.56	III
11. White lauan	*Pentacme contorta* (Vid.) Merr. & Rolfe	1.37	0.41	III
12. Benguet pine	*Pinus insularis* Endl.	3.45	0.41	II
13. Buho	*Schizostachyum lumampao* (Blco.) Merr.	2.42		
14. Bolo	*Gigantochloa levis* (Blco.) Merr.	1.80		
15. Giant bamboo	*G. aspera* Kurz	3.78		
16. Kauayan-kiling	*Bambusa vulgaris* Schrad.	2.33		

For plantation purposes, African tulip, Kaatoan bangkal, big-leafed mahogany, paper mulberry, and Moluccan sau would be profitable for pulp and papermaking. These are fast growing species. *African tulip* was introduced in the Philippines primarily for ornamental purposes. With the increasing interest in pulp and paper manufacture, however, it was found at the Institute that this species is a good source of raw materials for the manufacture of pulp. Studies made on this species showed that it can be propagated both sexually and asexually. It can thrive on elevations up to 4,000 ft. and is suitable for fairly dry regions. *Kaatoan bangkal* has been described as a "tree-guinea-pig" and has shown in 12 years a strange growth performance of 45 cm. av. diameter at breast height and 26.2 m. av. height. Big-leafed mahogany was observed to yield from a stand of 123 to 156 trees/ha., about 84 cu.m. at the age of 35 to 36 years. With a stand of 228 to 400 trees/ha., about 64 cu.m. were obtained at the age of 17 to 22 years. The mean annual diameter growth of 21-year old trees varied

from 1.13 to 1.86 cm. *Paper mulberry* can be propagated sexually and asexually and can be grown to pulpwood size in a few years. Four-year old trees of paper mulberry was observed to attain an av. dia. growth of 12 cms. and an av. height of about 12 meters. *Moluccan sau* has been widely publicized as a plantation species because of its fast growth and its prospects for groundwood pulping. It was found that Moluccan sau reached 45 to 60 ft. high (14 to 18 meters), in 3 years on good sites, and 25 to 40 ft. (7 to 12 meters), on poor sites.

Benguet pine, *red lauan*, and *white lauan* have been found at the Institute to produce satisfactory paper products by the sulfate pulping process.

Benguet pine is native to the Philippines. It was observed that the 11-year old stand of Benguet pine has a mean annual diameter growth of about 0.99 cm. and a mean annual height growth of about 0.8 meters. *Red lauan* and *white lauan* are "Philippine mahogany" species and although they are already used commercially, they have been found to be potential raw materials for pulp and paper. They grow in closed stand and each individual tree grows vigorously straight with an adequate supply of sunlight. *Red lauan* attains a height of 165 ft. (about 50 meters) and a diameter of 80 inches (200 cms.). *White lauan* attains a height of 132 ft. to 165 ft. (45 to 50 meters) and a diameter of 72 inches (182 cms.). The average diameter of 16-year old trees of white lauan in the Makiling National Park is about 10 cm. and its average height is about 8 meters. Its mean annual growth is 0.64 cm. in diameter and 0.50 meter in height.

Gubas is being utilized as match sticks. However, studies conducted in the Institute revealed that it is a promising raw material for pulp and paper. In plantations, it has been found that the mean annual increments of 11-year old stands based on actual measurements are 2.18 cm. in diameter and 1.42 m. in height. Gubas trees attain an average diameter of 24 cms. and an average height of 21.7 meters in 11 years.

Katmon and *toog* are commercially used as joists, beams, and for other construction purposes. Both species have been tried at the Institute and have been found suitable for papermaking. Toog sulfate pulps were found to be good materials for paper of moderate strength. *Katmon* would yield alkalin-cooked pulp of intermediate to moderate strength. Katmon abounds in our forests and its fruits are edible.

Tuai is at present not commercially used. By Runkel classification, tuai would yield alkaline-cooked pulp with high over-all strength. Experiments conducted at the Institute showed that strong paper can be made from tuai sulfate pulps.

The different species of bamboo like buho, bolo, kauayan-kiling, and giant bamboo were found suitable for papermaking. They are easy to propagate and they grow rapidly. Bamboo is the principal raw material for the pulp and paper industry in India, where bamboo species are reportedly exploitable from 6 to 12 years after planting at a 3- to 4-year cutting cycle.

The search for potential raw materials for pulp and paper-making at the Forest Products Research Institute is merely at its infant stage and for the last 6 years, studies along this line were purely basic. The results, however, indicate that different grades of pulp and paper can be manufactured from prolific sources of Philippine cellulosic materials.

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SOME MANUFACTURING CONSIDERATION IN WOOD GLUING

In the manufacture of wood products, it is often necessary to join two or more pieces of wood to obtain the desired design for either structural or

decorative purposes. The joining of these could be attained by using mechanical fasteners and wood adhesives or glues. In most instances, gluing proves to be more economical and efficient than fastening, and permits more versatility of design. However, in a glued assembly, the efficiency and performance of a glue joint under a specific service condition are dependent on several manufacturing variables such as: those occurring during the preparation of the wood stock, preparation and application of the glue, pressing operations, and stacking ot the glued products. In the preparation of the wood stock, variation arises in the selection of the material for grade, grain orientation, surface appearance and moisture content. The determining conditions that occur in the preparation and application of the glue are the consistency of the mix during formulation, "stand-by" time before a batch of mix is consumed, and the amount and pattern of spread on the mating surfaces. Factors to be considered in the pressing operation are assembly time, bonding pressure, pressing temperature, and pressing time. In stacking glued products especially those with glue lines cured by the aid of heat, the principal variable is usually the conditioning time between release of bonding pressure and finishing operations which in turn is influenced by atmospheric conditions in the factory. The atmospheric conditions in the store room for cold pressed products also affect stacking time.

There are five distinct phases in the bond between two glued wood surfaces. They are the wood adherend A on one side, adherend A — glue interface, the glue line, the glued-wood adherend B interface, and the wood adherend B on the other side. Under any stressed condition, the behavior of these phases are similar to those of the links in a chain. Failure always occurs in the weakest link. The behavior and properties of these phases are controlled by manufacturing variables and other factors attributable to the wood[1] and the adhesive.[2]

MANUFACTURING OPERATION

Causes of poor glue bond quality could be traced mostly to the inadequate control of manufacturing variables. It is imperative that these factors are controlled within specific ranges in order to obtain the optimum quality of glue bonds with the use of specific adhesives. The optimum range of manufacturing variables may vary considerably for different types of adhesives. It is also probable that a set of control levels in one plant may not be entirely adaptable in another plant when the same basic type of resin is used. However, the basic principles to be followed in the gluing operations are the same regardless of the scale of operation.

Preparation of the Wood Adherends

The stock should be of choice materials. Defects such as decay, loose knots and reaction wood should be minimized, if not totally eliminated, by cutting off such portions in the case of solid laminae or clipping them off in the case of veneers. The desired dimensions could be obtained from short and narrow sound stocks by such processes known as end and edge gluing.

The moisture content of the stcok should be maintained at specified levels such that when the water in the glue line is added, the resulting moisture content is approximately equal to the average equilibrium moisture content[3] it will attain in service. The optimum levels of stock moisture content will vary with the type of adhesive used, glue formulation, stock dimension and species of the wood. Proper control of moisture content tends to minimize the internal stresses in the glue line due to shrinking and swelling of the wood while in service because wood losses or absorbs moisture from its surroundings. Hence, the probability of bond failure while in service is reduced.

There is a necessity to control the moisture content of wood. Lumber intended for solid lamination should be dried preferably in a lumber kiln to the desired moisture content range. There is an optimum kiln drying schedule for each species and stock dimension that will result to maximum production with least drying degrade. This also holds true in the drying of veneer which is conducted in suitable mechanical dryers set to optimum drying conditions.

Another important operation is the surfacing of the stock. To obtain an efficient glue joint, the mating surfaces should be planed or jointed to produce a true plane thus, effecting the removal of loose and damaged fibers, and preventing the occurrence of stress concentrations in the glue line due to uneven glue line thickness. It is also suggested that the lapse of time between the preparation of stock and the gluing operation should be as short as possible to prevent surface oxidation which may interfere with adhesion.

Preparation of the Glue

The manufacturer's recommended procedure of glue mixing should be followed closely. Deviations

[1] Refer to FPRI Technical Note No. 20. Laminated wood, its manufacture and uses.

[2] Refer to FPRI Technical Note No. 13. Adhesives for wood, their characteristics and selection.

[3] Refer to FPRI Technical Note No. 1. Moisture content of wood in relation to air humidity.

from the prescribed procedure or instruction may affect the property of the resulting glue mix. This in turn can affect considerably the quality of bond produced.

The quantity of glue mix per batch should be controlled such that the total mix can be consumed within the stated pot life of the mix. It is a good practice to prepare small batches as often as practicable in order to have a constant supply of fresh mix. The glue mix should be free from lumps and the occurrence of foam should be kept at a minimum.

Application of the Glue

The glue mix can be applied by different methods depending on the geometry of the adherends. For wide and flat pieces, the common methods of application by brush, roller, spray and by mechanical spreader are very popular. The amount of glue spread depends on the type of adhesive and its available resin content, and the quality of the adherent surfaces to be glued. It is a general practice to apply higher spread with natural glues than synthetic resins for the same glue-bond quality requirements. The common range of glue spread for ordinary gluing requirements is about 150 to 200 grams per square meter of single glue line (30-30 lb/MSGL). In heavy laminations, the range of spread runs from 300 to 400 grams per square meter (60 to 80 lb/MSGL). This difference in spread should not be taken to mean that higher glue spreads will result in a higher glue bond strength. There exists an optimum glue line thickness that will develop the maximum glue bond strength The required heavier spread in lamination is to compensate for the difficulty in bringing together the matting surfaces into intimate contact on account of its thicker cross section, thus reducing the occurrence of discontinued glue lines. The important factor in the glue spreading operation is to obtain an even and continuous spread.

Assembly Time

The time lapse between glue spreading and application of bonding pressure is generally termed as assembly time. During this period, the glue line can be either exposed to the atmosphere (open assembly) or the glue spread surfaces can be preassembled, thus protecting the glue lines from the atmosphere (closed assembly). It is generally specified whether a close or an open assembly time should be used. The duration of assembly time for a particular adhesive is also specified and tabulated as dependent on the plant temperature, density of the adherends, speed of the catalyst and conditions of the stock. It is imperative that the optimum conditions of assembly time should be followed in order to minimize common gluing defects such as blisters, starved joints, and precured glue lines.

The mechanism acting during the assembly period can be summed up as follows:

1. Transfer of glue to the unspreaded surface in the case of close assembly.

2. Partial loss of solvent.

3. Partial curing of the glue lines.

The latter two mechanisms contribute to the gradual thickening of the glue. It is evident from these mechanisms that bonding pressure should only be applied after the glue line has attained a specified consistency which could resist excessive flow and penetration into the adherends. This minimizes the occurrence of blistered, starved or weak joints.

Application of Bonding Pressure

The primary role of bonding pressure in the gluing operation is to hold the adherends in intimate contact until the glue line has attained a minimum strength sufficient to overcome any stress that tends to separate the assembly. The bonding pressure also resists the tendency of the glue film to shrink thus minimizing the occurrence of crazed glue lines.

The amount of pressure required in the bonding operation depends on the type and quality of the adherends and the adhesive. It generally follows that thicker laminae requires higher bonding pressure. Certain types of adhesives require only a minimal bonding pressure while others required higher pressure to obtain the optimum glue bond strength possible.

Clamping Time and Pressing Time

The minimum length of time at which the bonding pressure is applied is known as clamping time in cold pressing and lamination works. It is also termed as pressing time in cases where the curing of the glue line is accelerated by heat. In cold pressing operations, the length of claming time is entirely governed by the type of resin and the catalyst system, where there is a definite range of curing temperature at which an optimum bond quality can be produced.

Stacking

Glued wood products especially those bonded with thermosetting adhesives should not be subjected to any finishing operation immediately after the

pressing cycle. They should be stacked to attain the plant's atmospheric conditions and allow for the residual curing of the glue lines in order to develop approximately its maximum potential strength.

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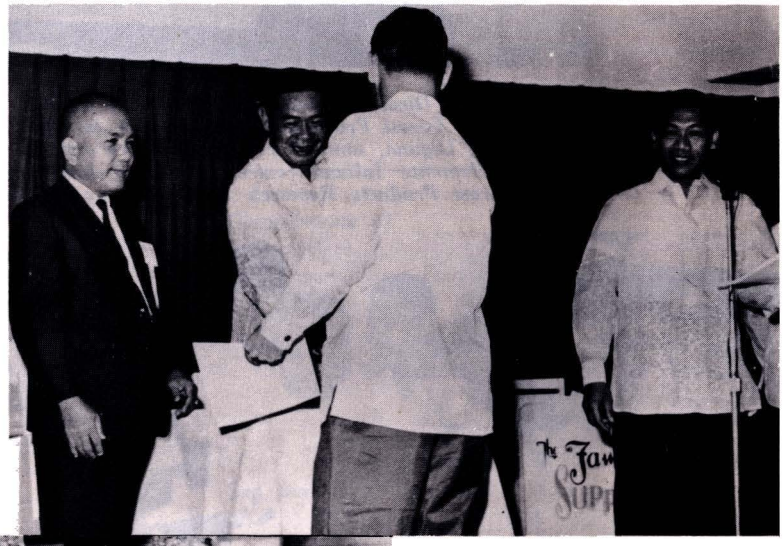
U.P. President Carlos P. Romulo (center with coat) administering the oath of office to Hon. Jose G. Sanvictores (second from right) as member of the Forest Products Research Board on September 14, 1965. This oath-taking was held in Dr. Romulo's office in Diliman.

FPRI's Director Manuel R. Monsalud standing in the center explaining some aspects of Forest Products Research work to wood workers and municipal officials of Paete, Laguna, some Bureau of Forestry officials of Laguna, and municipal councilor, Clemente Juliano (extreme left) of Los Baños. The meeting took place in the Forest Products Research Institute some months ago.

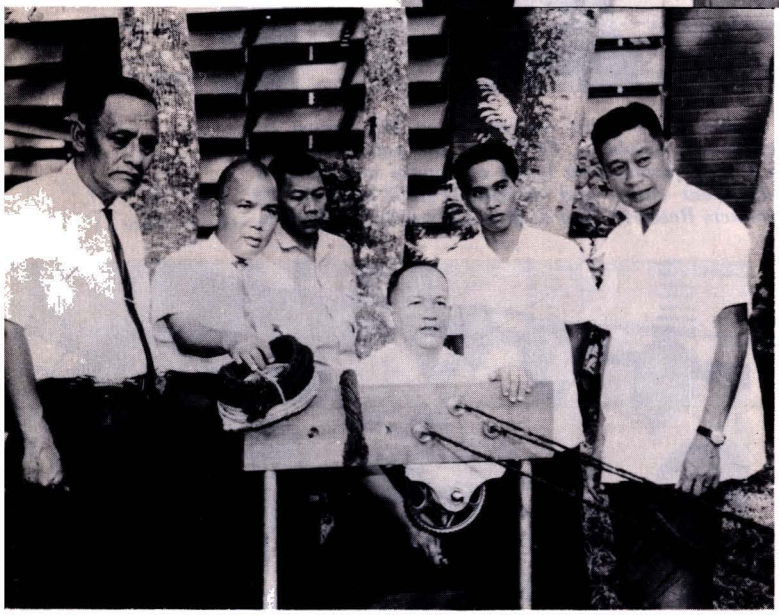
Director Manuel R. Monsalud, second from right, congratulating Mr. Lauro A. Ynalvez, Chief of the Chemical Investigations Division, FPRI, for his patent recently granted by the Bureau of Patents on a glue formulation based on tannin and coconut husk powder. Looking on are the different chiefs and assistant chiefs of divisions and the lady secretary of the Forest Products Research Board, Mrs. Liwayway A. Decena.

Philippine Committee of the International Biological Program meeting at the Forest Products Research Institute's Library. Director Manuel R. Monsalud is shown at the head of the table rendering his verbal report on his participation at the Pulp and Paper Development Conference for Africa and the Near East held in Cairo, U.A.R. last March. In this committee scientists from different government agencies such as the University of the Philippines, Commission of Fisheries, Institute of Science and Technology, and the Forest Products Research Institute are represented.

The discussants: (l. to r.) *Mr. Mervin Scott of Prentice Machinery, U.S.A., PMAP President Aurelio Lagman, FPRI Technologists Mamerto L. Garcia and Teofilo M. Lindayen, Prof. Armando Villaflor of UPCF, Mr. Andrew Zabu of Oregon Industries, Forester Gregorio Santos of the Bureau of Forestry and FPRI Technologist Romulo C. Eala.*



Mr. Alcantara of Alcantara & Sons congratulates a participant who just received his certificate from Director M. R. Monsalud (left). Looking on is Engr. R. P. Saraos, seminar coordinator for the FPRI.



"Idea Man" Mr. Dimas Micosa of the Forest Products Research Institute, seated demonstrating his improved mechanized rope-making gadget for the conversion of cabonegro and other fibers into strong ropes. From left to right are: *Regional Director Rafael Cuenca for Southern Tagalog Regional Institute of NACIDA, Director Manuel R. Monsalud of the Forest Products Research Inraos of the Institute, an stitute, Engineer Ramon Saidentified engineer from NACIDA and Deputy Administrator Hilarion A. Pilapil of NACIDA. This cooperative project of NACIDA and the FPRI is intended to help rural folks make ropes at the cottage level.*

FPRI Highlights

CAIRO . . . In Retrospect

The technical conference on pulp and paper development in Africa and the Near East sponsored by FAO of the United Nations and the Economic Commission for Africa, held recently in Cairo, UAR, had Director Manuel R. Monsalud of the FPRI as the lone Filipino delegate. Director Monsalud presented a paper entitled, "Fiber characteristics of Philippine bamboos."

Monsalud observed that the UAR and other countries in North Africa are deficient in broad-leaved and coniferous wood species. They do not have bamboos. They resort to whatever cellulosic raw materials available in their respective regions such as reeds, esparto grass, rice straw and sugar cane bagasse for pulp and paper materials. The papyrus also exists in some parts of Egypt, but this is not a good material for paper. Esparto grass is, but the feasibility and cost of harvesting render its use as raw material for pulp and paper uneconomical.

There is a big demand for quick-growing species, according to Monsalud. To help solve this problem, Director Monsalud suggested the trial growing of Kaatoan bangkal, in regions that may be suitable to it, since Kaatoan bangkal has been found to be very fast growing and produces wood that is good for pulping, bakya-making and for veneer and plywood manufacture and possibly for poles.

In one of the guided tours, Director Monsalud particularly noted the two adjacent mills located in the city of Edfu, the AL NASR Sugar Mills and the Edfu Pulp Mills. The sugar factory mills produces 4,000 tons of sugar cane daily and produces about 400 tons of washed sugar.

The bagasse is conveyed to the pulp mill also owned by the sugar company which produces 18,000 tons of unbleached bagasse pulp per year. The Pandis soda process is used in converting bagasse into unbleached pulp used by the paper mills in other places in the Arab Republic.

Another interesting feature the Director observed is the Aswan High Dam Project costing approximately U.S. $954,500,000. Once constructed, this dam will provide an additional 14.5 million cubic meters of irrigation water annually, thereby increasing the cultivated area in UAR, giving an additional annual gross income of U.S. $538,200,000 and will generate an annual electric energy of 10 billion KWH to be used for industrial and agricultural development of Egypt.

The Arabs, according to Monsalud are highly nationalistic. They would exhaust their local materials and products before resorting to use of imported goods. Only a complete deficiency of local materials would drage them to use imported goods, which rarely happens. . . .

* * *

FPRI-PMAP PLYWOOD SEMINAR

The joint efforts of the Forest Products Research Institute and the Plywood Manufacturers' Association of the Philippines is conducting a two-week plywood seminar from May 24-June 5, 1965, in Davao City, consolidated their efforts to solve problems confronting the plywood industry, such as keen competition with our Asian neighbors in American markets, production of higher grade export plywood, lack of best technical know-how in plywood processing and inadequate insight into the interrelations between management and labor.

Discussions were centered on pertinent technical aspects of plywood processing — from log preparation to evaluation of finished product, allied points of interest such as glues and gluing, pre-finishing, shimming methods which can increase the percentage of exportable plywood and new trends in plywood manufacture to increase production and minimize manpower and cost.

Forty-four participants from the supervisory level representing 15 plywood companies attended. The informal conduct of the seminar exposed the participants to free exchange of ideas with lecturers affording them the best opportunity to raise questions and voice opinions leading to a solution to some common plywood processing problems.

The panel of resource persons and discussants is composed of FPRI's T. M. Lindayen, M. L. Garcia, D. G. Faustino, R. P. Saraos, R. C. Eala, A. P. Bati, E. Jaranilla, P. M. Manzo, I. M. Laroya and F. V. Oamar, For. Gregorio Santos of BF, Mr.

Atilano Villaos of L. S. Sarmiento & Co., Carl Ottiger of Warner Barnes & Co. Ltd., Prof. Armando Villaflor of UPCF, Thomas Norman of Borden Chemicals (Phil.) Inc., Benjamin Misa of Adhesives and Binders, Resin Inc., Gabriel Rillorta and Mariano Bordon of Sta. Clara Lumber Co., Inc., Moran Batac and Dominador Policarpio, Jr. of the Dept. of Labor and Rey Sinense of U.S. Industries (Phil.) Inc.

PMAP President Aurelio Lagman, in his welcome address, appealed to the participants to meet the challenge before them if the plywood is to survive. He stressed that the major problems in plywood manufacturing at present are in the recovery from raw materials input, quality control and in plant management and supervision.

Director Monsalud of the FPRI offered the services of the Institute to help solve some of the technical problems that beset the plywood industry. He underscored the role of research in solving the many problems that the industry faces and brought to the attention of the participants the research projects being undertaken by the Institute along studies on veneer and plywood processing.

The guided tour and plant visits were very much appreciated by the participants for these gave them a chance to see actual demonstrations on plywood processing in some more technologically advanced plants.

The seminar was a success and the participants unanimously expressed a desire to have a seminar along this line regularly to help bring up the industry's operation to the technological level with that of the other countries.

* * *

FPRI ARTICLES WIN TOP AWARDS

FPRI articles entitled, "Pulping and papermaking of a naturally occurring mixtures of Philippine hardwoods," by P. B. Bawagan and J. O. Escolano "Process of preparing an adhesive composition" by L. A. Ynalvez copped the second and third prizes, respectively, in the first Graduate Research Awards sponsored recently by the Chemical Society of the Philippines.

"Quality control in lumber thru stress-grading" by TPED's Dr. A. N. Ramos, Jr. and S. B. Bellosillo was awarded first honorable mention by the Philippine Association of Civil Engineers. The article was cited for "useful information, interest aroused, originality of presentation and invaluable contribution made in the field of engineering design in timber in the Philippines."

* * *

INDUSTRY ASSISTANCE AND COOPERATIVE SCHEME

As a research servicing agency, the Forest Products Research Institute has consistently strived to bring to the wood-using industry and the general public, thru its technologists sent on field trips on cooperative work and industry assistance mission the information accumulated by its researchers to help vitalize the industrial development program of the government.

•A study on drying of lumber with the use of solar energy was undertaken by the wood seasoning section with the Inter-Island Construction Corporation. Preliminary results revealed that moisture loss is higher by 7 to 10 percent in samples dried inside the drier than the end-matched samples dried outside. . . .

•Pre-drying of lumber was undertaken with the Nasipit Lumber Company in Agusan using an experimental low temperature electrically-heated dry kiln donated to the Institute by Carlton Smith Industries, Memphis, Tennessee. About 2,000 board feet of 1-inch thick and 6 ft. long boards consisting mostly of yakal, guijo, malugai, and pahutan were used in the first run. Drying degrades that developed during the early stage of drying are surface checking on plainsawn yakal board and collapse on quartersawn malugai boards. It was observed that numerous end checks deveoped on both surfaces of the yakal sample boards on the third day of drying. It was also observed that collapse was present on quartersawn sample boards of malugai during the third day.

•Director Monsalud pledged to aid the yunot rope makers of Tanauan, Batangas and Lumban, Laguna by having some improved mechanical gadgets fabricated in the Institute to increase their production and yield better quality rope at lower cost. The improved mechanical gadgets proposed consisted of bicycle accessories designed for durability, higher efficiency and ease in production. This move was dictated by the report received by the Director from technologists who surveyed the industry, that at present the rope makers are still using antiquated gadgets posing a hindrance to the progress of the industry. . . .

•Wood preservation specialists conducted a survey of the causes of failure of railway ties in Iloilo. They found that spikes killing and rail-seat deterioration or combination of both are the main causes of failure. The Philippine Railway Company in Iloilo generally uses molave, ipil, yakal and tindalo for ties. Like the PNR this company experiences an acute shortage of molave ties.

(*Continued from page 104*)

DEMAND, TRADE HEAVY FOR FOREST PRODUCTS, 1964

The expansion in Europe's economic activity during 1964 — an aggregate rise in industrial output of about seven percent across the continent — led to a considerable rise in the aggregate consumption of forest products. Home production met the larger part of this increase, but the volume of net imports in 1964 rose by no less than 30 percent above the previous record level of 1963 to nearly 32 million m^3 (roundwood equivalent). Part of this massive increase, however, went to swell stocks in importing countries. These are conclusions contained in the supplement to the "Timber Bulletin for Europe" No. 4.*

The following table, giving the value of trade of those forest products covered in the Timber Bulletin, shows clearly that each of the main product groups contributed to the rise in the value of European net imports to an estimated US$ 1,200 million in 1964. The biggest increases in the value of net imports occurred in the roundwood and sawnwood groups.

*Timber Bulletin for Europe, Vol. XVII, No. 4, about 85 pages, published jointly by the Economic Commission for Europe of the United Nations and the Food and Agriculture Organization of the United Nations. Bilingual edition English/French. Price US$ 1.—, or the equivalent in local currency.

Value of European Trade in Forest Products
(Million US $)

	Exports (F. o. b.)			Imports (c. i. f.)			Net trade[a]		
	1962	1963	1964 (prov.)	1962	1963	1964 (prov.)	1962	1963	1964 (prov.)
Roundwood	205	190	195	535	545	620	330	355	425
Sawnwood	765	790	890	1185	1280	1500	—420	—490	— 610
Panel Products	250	275	315	275	305	365	— 25	— 30	— 50
Woodpulps	635	715	830	780	890	1020	—145	—175	— 190
Paper and Paperboard	1015	1100	1245	910	990	1165	+105	+110	+ 80
Total	2870	3075	3475	3685	4015	4670	—815	—940	—1195

[a] + net exports — net imports

Information received from a cross-section of countries indicates that industrial roundwood removals in Europe in the calendar year 1964 were as much as 10% higher than in the previous year and nearly 6% more than the previous record level in 1962.

Sawn softwood

The sharp increase in north European export prices at the start of the 1964 buying campaign had the effect of stimulating the production of sawn softwood. Europe's total output is estimated to have increased by more than half a million standards in 1964 to a new record high level of twelve and a quarter million standards. For the third year in succession Europe's sawn softwood trade in 1964 reached a new post-war level. Export (excluding those of the USSR) at 3.8 million standards were up by 6% and imports at 5.7 million standards by 12% compared with 1963.

Sweden's exports in 1964 reached a new all-time record level at 1.2 million standards slightly exceeding the previous high peak in 1929. Finnish exports showed a rise for the first time in four years, but were still substantially below the average exports of 1960-62. Poland's exports rose for the seventh consecutive year to reach a new post-war

record level in 1964. Another relatively large rise in exports was that of Portugal which attained an all-time record level. On the other hand, there was a marked drop in exports from Austria and Yugoslavia as a result of reduced Italian demand.

The expansion of Europe's imports of sawn softwood in 1964 to the new peak level of 5.7 million standards was more remarkable than that of exports in as much as the rise of nearly 600,000 standards (12%) was over and above what had been an all-time record level of imports in the previous year. The sharp increase in Europe's demand in 1964 was, once again, mainly satisfied by arrivals from outside Europe.

Compared with average arrivals in 1959-61 Europe's imports from Canada in 1964 had risen by 116%, those from the USSR by 81% and from other extra-European sources by 63%. In the same period imports from European countries increased by only 8%.

Europe's total apparent consumption of sawn softwood is estimated to have increased by about 900,000 standards in 1964 to pass the fourteen million standards mark for the first time. About half of Europe's total increase of apparent consumption last year took place in the United Kingdom and the Netherlands.

Forward buying for 1965

At the Timber Committee's session last October Europe's import requirements for 1965 were estimated to be about 6% below those of 1964. Generally speaking, however, the market for 1965, which opened very firmly in the early autumn of last year, has not yet shown any marked decrease of import demand.

Total sales by Sweden and Finland up to the end of January at 1,255,000 standards were little changed from the total of 1,230,000 standards at the same time a year ago. Sales by the USSR to Europe up to the end of February were also thought to be little changed but those of Canada to Europe were about 100,000 standards higher by the end of February this year than by the same time last year.

By the spring of 1964 north European export prices for sawn softwood had fully recovered from the drop that had occurred at the end of 1961. Since then prices have continued to advance strongly. By far the greatest rise has occurred in the prices of whitewood and the cheaper qualities of redwood and the gap between redwood and whitewood prices has now been considerably narrowed.

Hardwoods

European production of sawn hardwood in 1964 is estimated, on the basis of incomplete data, to have continued its almost unchecked post-war expansion to the new record level of 15.1 million cubic metres, about 4½% more than output in 1963. Exports of sawn hardwood from European countries in 1964 rose by 7% to about 1.81 million cubic metres. European imports of sawn hardwood in 1964 at 2.58 million cubic metres were also an all-time record.

While European exports of hardwood logs rose by only some 50,000 cubic metres to 990,000 cubic metres in 1964 and remained well below the peak exports of 1960, imports expanded by some 750,000 cubic metres of 12% above the 1963 record level to approximately 7 million cubic metres, made up of about 5.6 million cubic metres of logs of tropical origin (including re-exports from European countries) and the remainder of temperate-zone origin.

The reduction of Italian demand, coupled with the heavy stocks of imported logs in some other countries and the slight fall in plywood production in western Germany, led to some weakening of prices for tropical hardwood logs in the second half of 1964, and in the early months of 1965. The elimination of tariffs as from 1 January 1964 (initially for two years) on tropical hardwoods by a number of European countries seems the probable reason for a noticeable broadening of the pattern of imports in 1964, particularly of those of the two countries, France and the United Kingdom, which previously had tariffs on hardwood imports which offered some protection to the imports from their respective ex-territories. Particularly striking increases took place in France's imports of hardwood logs from Ghana and sawnwood from Malaysia and Ghana and in the United Kingdom's imports of both from the Ivory Coast.

Pulpwood and pitprops

After falling sharply between 1961 and 1963, Europe's exports (excluding those of the USSR) of pulpwood in 1964 at 5.7 million cubic metres were about 650,000 cubic metres higher than the level of the previous year. Imports of pulpwood also recovered last year to reach a new record level of 9.9 million cubic metres an increase of 1.8 million cubic metres or 23% above those in 1963. With imports exceeding exports by 4.3 million cubic metres the deficit in Europe's pulpwood trade was the biggest of all time.

European pulpwood imports from the USSR are estimated to have risen by about 35% in 1964 to a new record level of 3.45 million cubic metres.

Finland and Norway between them accounted from 713,000 cubic metres out of the total European incresae of roughly 900,000 cubic metres from the Soviet Union. European imports from Canada also expanded strongly in 1964, by about 38% to an estimated 1.14 million cubic metres.

Pulpwood prices, which had not followed the upward trend of sawn softwood prices in 1963, advanced strongly in 1964 with the increase in demand especially in northern Europe. European exports of pitprops declined sharply in 1964 for the third year in succession and at about 960,000 cubic metres were less than half the volume exported in 1961.

Panel Products

European output of panel products continued to expand in the fourth quarter of 1964 at about the same rates as in the first three quarters and the totals for the year attained the all-time record levels foreseen in the previous review. In trade, the past year was most notable for the increase in plywood exports from Canada and Finland to Europe. In both cases, the growth was mainly attributable to heavy import demand for exterior grade plywood. This was particularly the case in the United Kingdom where total imports rose by 23% to 864,000 cubic metres (by far the highest ever imported). Particle board output in Europe rose in 1964 by approximately half a million tons to over 2.8 million tons.

Production of fiberboard reached nearly 2½ million tons in Europe in 1964, an increase of more than 200,000 tons from the 1963 level. The faster-than-average rise in non-compressed fiberboard was noteworthy, while that of compressed fiberboard was similar to the average rate of European expansion recorded in recent years. European exports of fiberboard in 1964 increased by 7% and imports by 13%. The improvement in the supply/demand balance of the fiberboard market is indicated by the recovery in prices as exemplified by the c.i.f. cost of United Kingdom imports, the average unit price of which in 1964 was 6.7% higher than in 1963 in the case of hardboard. These prices movements were in contrast to those for plywood, which despite strong import demand remained relatively stable. Inland prices for standard particle board in western Germany, for example, fell on average by nearly 4% in the twelve months to December 1964.

Pulp and paper

It is tentatively estimated that European production of woodpulp (mechanical and chemical) in 1964 reached approximately 21 million tons and of paper and paperboard 28 million tons, increases over the record levels of 1963 of about 8% in each case. Prices for pulp and paper were generally stable during 1964 at levels on average still somewhat below the peak levels attained in 1957-58. Despite the strength of demand, Nordic export prices for pulp were held throughout the year at levels to which they were raised for first quarter shipments, but in the autumn price increases of 3% to 5% were announced for first quarter delivery in 1965. With supply and demand for most pulp grades in better balance than for several years, the northern producers were able to remove the restrictions on production operating ratios, originally introduced late in 1961. Excess world capacity still exists for such mass-produced paper grades as newsprint and kraft, for which in consequence prices remained under some pressure during 1964.

Prospects

It is almost inevitable that after a period of rapid growth in the production, consumption and trade of forest products such as took place in Europe between the second quarter of 1963 and the end of 1964, certain imbalances should emerge. In the case of sawn softwood and of tropical hardwood logs, for example, one major cause for concern at the present time is the volume of stocks in some importing countries which is excessive both from the point of view of the cost of stock-holding in the current period of higher interest rates and in relation to the likely levels of consumption in 1965.

An attempt to assess with reasonable accuracy the prospects for consumption this year, however, runs into more than the usual number of difficulties. In the first place, there are the variety of economic trends in different parts of Europe. In some countries — Italy and France — where growth has more or less come to a stop, it may be necessary to introduce measures to stimulate activity again. Indeed, in Italy an emergency programme has been drawn up, with measures aimed at reducing unemployment, in the building sector by means of a heavy public building programme and tax relief and credit incentives to private enterprise. On the other hand, official economic policy in the United Kingdom is likely to remain disinflationary for some time.

Taking Europe as a whole, however, there appears to be still enough work in hand in the form of houses and other buildings under construction or authorized, outstanding furniture orders and so on, to ensure deliveries from producers and importers continuing at high levels for some months, thus relieving the present over-stocked position.

But later in the year, if interest rates remain high and credit tight, consumers and stockholders may need to restrict replacements in order to reduce stockholdings. Consequently the rate of forward purchasing may now ease back, with the result that towards the end of 1965 imports would fall below the record levels of the corresponding period of last year.

In spite of the uncertain economic climate, however, it does not seem unduly optimistic to expect that for some months to come consumption of forest products will in general continue at last year's record level.

BEATING THE WOOD SHORTAGE WITH MAN-MADE FORESTS TEN MILLION ACRES PLANTED IN 20 YEARS

New man-made forests are springing up all over the world. During the past twenty years more than ten million acres of quick-growing trees have been planted by developing countries to meet the growing demand for more wood.

These new forest plantations are tended in much the same way as agricultural crops. They are, in fact, tree crops and as much attention is paid to planting and cultivating the trees, plying them with fertilizer and water and protecting them against pests and diseases, as would be if they were stands of corn or beans.

In many parts of the developing world these plantations are changing the look of the landscape. High, waving, leafy layers of poplar trees, running alongside ditches and canals, sheltering the field-crops from the wind have become a part of the Turkish scene.

One can drive for miles through plantations of broadleaved teak trees in Indonesia and Burma, or green-needled pine forests in Kenya. Braizl has become as much a home of the eucalyptus as its mother-country, Australia.

But what do we mean by quick-growing species? How does a planted pine forest differ for instance from a naturally-regenerated tropical rain forest?

It is now currently accepted that quick-growing species should be capable of at least 150 cubic feet per acre (or 10 cubic metres per hectare) of new growth each year, indicates a report presented by the Food and Agriculture Organization's Forestry Division at a recent UN meeting in Paris. Visualize a five-foot cube of wood standing in the middle of a football field. This is approximately the amount of extra wood which trees, planted in rows roughly ten feet apart, must grow on this amount of land in one year to be identified as 'quick-growing'.

There are many tree species which are capable of growing as fast as this when planted in good sites and given persistent and skillful attention. Eucalyptus plantations grown for fuelwood in Africa have even produced wood at more than five times this rate. More realistic experience would be South American eucalyptus pulpwood and pole plantations growing at two to three times this rate or pines and cypresses grown for timber in Africa producing over 200 cubic feet per acre per year.

In comparison, the average growth of the useful species of natural broadleaved forests is not likely to be more than a fifth of this fast-growing rate, certainly no more than a third even for natural pine forests.

Natural forests certainly contain fast-growing tree species but these can be outnumbered 100 to 1 by the many other kinds of trees found in such forests. And even these few trees do not come under the definition of 'quick-growing'. They may be excessively shaded by other trees, they are too crowded together, and do not receive the attention that is given in man-made plantations.

Natural forests have many other limitations too, the FAO report says. The hundreds of different species are of differing ages and characteristics. This makes harvesting, transporting and processing difficult and expensive. Relatively few species have the desirable technical and economic qualities needed for forest industries. Again, naturally forested areas are often remote from railways, ports and towns.

Man-made forests, on the other hand, can be planted near to transport or towns. Many more useful trees of the same age with similar characteristics, can be grown much more quickly and in much less space than is possible naturally, even though these same factors do increase the chances of pests and diseases quickly assuming plague proportions. Natural forests rarely yield more than a thousand cubic feet of marketable timber per acre, whereas man-made forests average many times this total, all of which may be long-fibred wood suitable for pulp or sawnwood. This timber, however, should not be regarded as a substitute for the slow-growing, quality timber essential for furniture making and other very exacting uses.

Man-made forests need a good deal of labour. This gives an economic advantage to the developing countries with underemployed-population at low wage

levels. In Indonesia, for instance, plantations cost one-tenth of the European figure to operate, the report states.

The total area of forest land in the developing countries is about 5.5 billion acres, according to FAO statistics, of which less than one-fifth, containing the most accessible productive areas, is being used for timber production.

These same developing countries consume over 100 million cubic metres or 30 million cords (roundwood equivalent) of industrial wood per year, and some six times that figure of fuelwood. Demand for industrial wood is expected almost to double by 1980 yet much of this is already imported. For instance, more than $150 million worth of pulp and paper is imported into Africa each year.

Forest production is being increased in most of the developing countries, but quick-growing plantations offer a short-cut to needed wood supplies. Such plantations can start producing acceptable saw logs from twenty-year-old trees, and pulpwood from ten-year old trees, according to the FAO report. Natural forests need at least five times as long to mature.

By the end of 1964 over ten million acres of fast-growing plantations representing an investment of almost $2,000 million, had been established in the developing countries: 38 per cent in the Asia-Pacific region, 37 per cent in Latin America, 22 per cent in Africa and 3 per cent in the Near East. Some 800,000 additional acres are being planted each year. Even if this current rate of planting could be maintained for the next 25 years, entailing a planting program over more than 20 million acres, and if all these plantations were successful and produced at optimum yield, the expected rise in demand could hardly be met, the FAO report says.

Many of the developing countries are facing the challenge and going ahead with more man-made forests, following the successful example of the southern United States, New Zealand and Australia, Spain and other European countries.

More than a million seedlings are being distributed each year by Turkey's Poplar Institute, a UN Special Fund project set up with the assistance of FAO to improve poplar cultivation and to aid the Turkish forest industries.

Chilean pine forests are being extended to produce more raw material for Chile's growing pulp and paper industry. In ten years Chilean newsprint production alone has increased seven times. The Chilean Institute for Forest Development is a Special Fund project, executed by FAO, and helping the country to grow more wood and to use it more efficiently.

Acacia and pine plantations in the south and west, and a green forest belt around Khartoum are two of the aims of another UN Special Fund project being carried out in the Sudan by an FAO/Sudan team. Altogether, FAO is carrying out projects in seven Asian countries, a dozen African countries and some eighteen countries in Latin America which, in one way or another, assist these countries in going ahead with their programs of planting quick-growing species.

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NUCLEAR ENERGY FOR FORESTRY RESEARCH

— IAEA/FAO International Training Course in Germany —

An eight-week international training course on the use of radioisoptopes and radiation in forestry research will be conducted under the auspices of the International Atomic Energy Agency (IAEA) and the Food and Agriculture Organization with the co-operation of the Government of the Federal Republic of Germany, the local government of Lower Saxony and the Technical University of Hanover, from 11 May - 3 July 1965.

The course is intended to provide intensive training in isotope and radiation techniques in the field of forestry; emphasis will be given to provision of a thorough background review and coverage of the principles and practices of modern techniques of radioisotope utilization with the particular objectives of indicating the kinds of investigations in which these techniques can most profitably be used and their relationship to other research techniques.

The following main fields of research will be covered:

1) Physiology of Nutrition (including mycorrhiza)
   a. Absorption by roots
   b. Foliar absorption
   c. Stem absorption
   d. Transport, nutritional requirements, photosynthesis
2) Pedology and Soil Fertilization
3) Biochemistry
4) Forest Pathology and Entomology
5) Forest Tree Breeding and Genetics
6) Radiobiology and Radioecology.

Twenty-four trainees from as many different countries (Argentina, Austria, Australia, Brazil, Bulgaria, Canada, Czechoslovakia, Finland, Federal Re-

public of Germany, Hungary, Iran, Israel, Italy, Japan, New Zealand, Pakistan, Philippines, Poland, Sweden, Syria, Thailand, Ukraine, United States of America, and Viet-Nam) will attend the course under the general direction of Prof. H. Glubrecht, Director of the Institute of Radiobiology, Hanover Technical University. The Associate Director will be Dr. D.A. Fraser, Department of Forestry, Canada. While most instructors will be German, lecturing staff will also include experts from Greece, Romania, Sweden and members of the Joint FAO/IAEA Division of Atomic Energy in Agriculture.

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WORLD PULP AND PAPER CAPACITY REACHES RECORD LEVEL

The world's capacity to manufacture paper and paperboard has passed the 100-million ton mark, the Food and Agriculture Organization's Advisory Committee on Pulp and Paper reported today, following its sixth meeting held here from May 10-11 under the chairmanship of Mr. R. M. Fowler.

The industry had grown from a world capacity of 83 million metric tons in 1960 to 106 million tons in 1965, said Mr. Fowler, who is President of the Canadian Pulp and Paper Association. New machinery installed during that period had increased capacity by five percent per year, and this rate of expansion was likely to continue up to 1968.

The committee noted that the trend in paper and board capacity appeared to be matching closely the continuing steady rise in paper and board demand. An examination of the most recent capacity estimates, however, indicated that pulp capacity was currently rising somewhat faster than paper and board capacity. Thus a short-term excess of pulp capacity might arise in 1967-8, particularly for bleached kraft market pulp in the North American region.

In opening the meeting, Dr. B. R. Sen, FAO's Director-General, said the recent Cairo Conference on pulp and paper development in Africa and the Near East had shown that many developing countries were intent upon expanding — or creating — pulp-and-paper industries. He felt that FAO needed the advice of the committee, which is made up of representatives of the world's leading pulp and paper industries, more than ever before.

The committee discussed the findings of the Cairo conference and noted that demand for paper and paperboard in Africa and the Near East was expected to more than double by 1980, but that it would be possible for new pulp-and-paper industries to be established in the region capable of meeting four-fifths of this demand.

The committee discussed ways and means of educating and training technicians from the developing countries who will be needed for these new mills, as well as ways of financing such expansion. It also discussed papers presenting the preliminary results of a new study being prepared by the Institute for International Economic Studies, in Stockholm, in co-operation with FAO. This study, expected to be ready for publication before the end of the year, examines Western Europe's future pulp and paper needs and likely sources of fibre to meet these needs.

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CHILEAN ORANGE BOXES

Rome, 30 June—Chile's pine forests will provide nearly two million boxes for Israel's citrus fruit experts this year, a Swedish forester said today.

Mr. T. S. Hederstrom made the announcement upon his return from Israel, where he had been negotiating delivery arrangements. Mr. Hederstrom has been working in Chile for the Food and Agricultural Organization, which helped the Chilean government to set up an Institute for the Development of Forest Resources and Industries. The Institute, with funds from the government and the United Nations Special Fund, is helping to develop new forest products and to find new markets for Chile's forests.

Mr. Hederstrom said an agreement recently signed by Israel and Chile covers lumber and possibly pulp and paper as well as the boxes. The Israeli Citrus Board had agreed in principle to buy increasing quantities of Chilean boxes over the next five years. The first shipment would include some $450,000 worth of boxes.

Chilean factories were currently producing some 20 million boxes yearly, and could produce half as much again. Mr. Hederstrom said there was a tremendous demand in Israel for boxes for its citrus fruit, and that next year 30 million containers would be needed for the orange crop alone.

He said the boxes must be of precise dimensions, since Israel uses machine assembly methods. An inspector of the Israeli Citrus Board would go to Chile to inspect factory facilities and the quality of the finished product.

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FORESTRY IN A CHANGING WORLD

Rome, 5 July — "The role of forestry in a changing world economy" has been announced as

Lebanon, November 1964. In the Lebanon, FAO and the UN Special Fund are engaged in a project which is aimed at the rehabilitation and reforestation of the country's mountains and hill lands, which together occupy 1½ of the 2½ million acres of the total land surface. This program forms a part of the country's "Plan Vert", a ten-year development plan started in 1963. The most famous of the Cedars of Lebanon are those at Boharre in the north of the country, inland from Tripoli. A nursery has been started within this group of very large and ancient trees which can provide 75,000 seedlings each year for planting out. Other sites where the project is operative include Barouk, above Sour (biblical Tyre), and close to the airport at Beirut. Here, and at various other places the project is terracing the land for watershed development and protection, planting eucalyptus and other tree species, as well as investigating the possibilities of citrus orchards and forage crop improvement.

The picture above shows the men potting cedar seedlings at Boharre Nursery. 150,000 *plants can be grown here.* — FAO photo by V. U. Contino.

Workers on terraces above Lala in the Bekaa. Terracing and planting for watershed protection. FAO photo by V. U. Contino.

the theme of the Sixth World Forestry Congress, to be held in Madrid almost a year from now, from 6-18 June 1966.

The Congress is sponsored by the Food and Agriculture Organization and is being held under the auspices of the Government of Spain. More than 2,000 foresters from all over the world are expected to gather at Madrid's International Congress Hall, facing the Prado Museum.

In charge of the nine preparatory committees is Dr. D. Salvador Sanchez Herrera, Director-General of the Spanish Forest Service. Secretary-General of the Congress will be Sr. Manuel Pratz Zapirain, who is also Secretary-General of the Spanish Forestry Service. National, or liaison, committees are being formed in many countries to carry out preparatory work. The Congress will feature the first presentation of FAO's world-wide appraisal-by-regions of world wood resources and future requirements, and will emphasize the problems of the developing countries.

More than 100 formal papers, and many informal contributions, will be presented during four plenary sessions and ten technical committee sessions. The plenary sessions besides dealing with world trends in wood resources and requirements will also cover: planning the case of forest potentials; the institutional framework for forestry development, and the financing of forestry and forest industries development.

The final plenary session will be attended by banking interests and representatives from the various development agencies. Discussions will cover investment problems from four points of view, the bankers', the owners' and the industries'. It will point out the financial implications of world timber trends and problems related to the financing of forestry and forest industries in the developing countries.

The ten technical sessions will be devoted to: afforestation techniques and tree improvement; forest protection; forest management methods and silviculture; wood harvesting, logging and transport; the human factor in forestry; forest questions specific to tropical regions; forest industries, national parks, forest recreation and wildlife; forest influences; and forest economics and statistics.

A special feature, and the first time such an event has been held at the Congress, will be the International Festival of Forestry Film. Some 200 film entries (maximum of four entries per country) are expected. These will be viewed by an advisory board at FAO's Rome headquarters, and the best 25 films will be selected in two categories — instructional and informational — for final showing during the course of the Congress at Madrid.

Many study tours will be carried out both before and after the Congress in France, Portugal and Morocco, in addition to numerous field trips throughout Spain.

A forest equipment exhibition will take place, featuring equipment in two main categories: afforestation and seeds; and harvesting, particularly of small sized wood.

This will be the first World Forestry Congress to be held in a Spanish-speaking country. The proceedings will be simultaneously translated into English, French and Spanish. Previous Congresses were held in Rome (1926), Budapest (1936), Helsinki (1949), Dehra Dun, India (1954) and Seattle, U.S.A., (1960).

HELPING THE HIGHLANDERS OF THE MEDITERRANEAN

The tiny country of Lebanon sits at the opposite end of the Mediterranean to the Gibraltar Straits, at the crossing point between Europe, Africa and Asia.

The Lebanese economy is based on trade and services. There is probably no other country in the world with as a high ratio of services to goods. More than a million and a half Lebanese, almost as many as those in the mother country, work as traders and businessmen in Africa, Asia and Latin America.

Each year millions of tons of merchandise pass through Beirut harbour to and from the Middle East, while more than a million passengers annually use the international airport. Luxurious hotels to accommodate these tourists dominate the city.

Beirut is like a piece of the Riviera set down in an Arab world. The snow and water skiers, the business-men on expense account watching the belly-dancers, the tourists wandering around. Biblos and Baalbeck are the life-blood of Lebanon.

Helping the Peasant Farmer

Not more than a fifth of the national income comes from agriculture. But half of the population depends upon it for their livelihood.

Lebanon holds a leading place in the region for fruit cultivation: bananas and citrus on the coast; olives, grapes and figs on the slopes; apples, pears, peaches and cherries higher up.

Above these fruitful slopes lie the arid stony wastes of the Lebanon Mountains, duplicated on the far side of the Bequaa, the rich farming valley separating the two ranges, by the Anti-Lebanon Mountains which form the frontier with Syria. These twin ranges, together, cover most of the country.

On the lower slopes of the Lebanon Mountains, farmers scratch a subsistence living from vineyards, olives and the pocket-sized cultivation of cereals. Above, from 18,000 to 3,000 metres lie eroded slopes, covered by deep snow in winter. Here can be found a few scattered pines, cypresses and cedars, the only remnants of Lebanon's once-famous forests.

The Anti-Lebanon Mountains, rearing up to the snowy peak of Mount Hermon, form an eroded plateau covered with juniper and scrub oak, the haunt of nomadic herdsmen with their flocks of goat and sheep.

These gaunt grey mountains harbouring poor farming families spread a threatening shadow over the prosperous sea-coast.

Not only is there constant emigration from Lebanon but there is also a drift from the land. Rural families, as almost everywhere in the world, tend to leave the farms for the cities.

Two aims were uppermost in the minds of the Lebanese Government when they asked for international technical assistance in rehabilitating the highlands. Firstly, to improve the lot of the small peasant farmers and to slow down this drift to the cities, by improving the water resources, reducing soil erosion and increasing forest and agricultural production generally. Secondly, to build up the region as a tourist attraction, centered around the ages-old cedar forest.

The mountain areas, covering some three-fifths of the land, are being renovated under Lebanon's 'Green Plan', helped by a United Nations Special Fund project being carried out by the Food and Agriculture Organization (FAO). Lebanese technicians are working side-by-side with FAO foresters, agronomists and land-use experts from other countries. Maurice de Coulon, a Swiss forest economist, is FAO project manager. With him as co-manager is Malek Basbouss, the Lebanese director of the Green Plan organization.

The five-year Special Fund project is helping the Lebanese to renovate the highlands, using the newest techniques of reforestation and watershed management. Lebanese tchnicians are being trained so that they can carry on this work after the project has finished.

Once a Vast Cedar Forest

Until recently, a few groves of cedars were all that remained of a once-mighty forest. The cedar tree has close historical links with ancient Egypt to which it was exported from Lebanon as long as five thousand years ago. Cedar-oil was injected into the corpses of the dead, and cedar-resin was used with bandages in preparing the mummies. The Temple fo Karnak sports a bas-relief showing prisoners-of-war from Syria felling Lebanese cedars.

Even in Roman times the mountains were still shaded with trees, though the Emperor Hadrian caused a series of rock inscriptions to be cut protecting certain trees from excessive cutting. Today, these inscriptions are found on bare eroded slopes.

For centuries, the cedars and pines of Lebanon have propped up the naval ambitions of succeeding civilizations. Two world wars ushered in the last stages of decline with timber being used as fuel and sleepers for the railways. A few years ago, four small groves remained from some half-million hectares of cedars. In the whole country there existed only some 75,000 hectares of scattered forest.

These four small groves, however, for the first time in centuries, are now on the increase. Beneath the remaining cedars hundreds of young seedlings are taking root, protected from the goats searching for fodder of any kind. Beneath the ancient cedar grove at Bcharré, thousands more seedlings are being produced in a tree nursery.

All along the Lebanon range, terraces are being carved from the rocky hillsides and holes blasted out with dynamite to receive the millions of young trees, cedar and pine, which will re-establish the forests once more. On the plains, plantations of quick-growing species, eucalyptus and poplar, are being established to help meet Lebanon's growing demand for more wood. At least four times as much wood is imported into Lebanon as is produced in the country.

Terracing and Tree Planting Underway in the Mountains

Surveys of the soil, water, livestock and vegetation resources have been completed. Forest nurseries have been established. Special studies on wood consumption, torrent control, construction and fish stocking of hill lakes, and the growing of cash-crops have been carried out.

In six selected areas terracing and road-building is underway, often in conjunction with the plant-

(*Continued from page 90*)

Forestry in the News

BARRIO COUNCILS TO HOLD SEMINARS

CALAPAN, Oriental Mindoro, June 18—(CNS) —In order to bolster the current drive for forest protection and in the detection of smuggled forest products cut illegally in this area, District Forester Cipriano M. Vadil of this province recently called a conference among his office and field personnel.

To give a wide coverage to this campaign, Vadil likewise instructed all forest guards to arrange meetings and seminars among municipal as well as barrio councils throughout the whole province where technical personnel from his office would give important pointers about forest protection and other phases regarding reforestation and improved tree propagation.

Vadil further instructed forest guards of his office to inspect "with care" the boundaries of the license areas and find out if the respective licensees concerned have already complied with instructions of his office to put placards at conspicuous places especially along creeks and trail crossings.

He emphasized to his field personnel to enforce the law against "kaingins" in some designated areas in the hinterlands, here.

Meanwhile, the district forester expressed satisfaction over the assignment of more personnel to his office saying the patrol sectors of each forest guard will now be considerably reduced in area "thus making it possible for each guard to look after his particular sector more intensively.

On the other hand, to step up revenue collections for the government, Vadil has also instructed his men to be on the alert in checking all kinds of forest products being sold or transported so that proper forest charges due to government may be collected. He has likewise demanded from all delinquent permitees here the payment of their rentals for the use of public forest lands in this area.

In this collection drive, Vadil has ordered his scalers to be on the look-out for all abandoned fallen logs and all other merchantable timbers in the cutting areas of the permitees.

In the implementation of the sustained yield management plan, Timber Management Assistant Gregorio Principe and Timber Management officer in-charge Mariano R. Peralta were enjoined to enforce selective logging by estabishing setups by tree markers.

* * *

LOGGING WORK METHODS BARED

CALAPAN, Oriental Mindoro, June 30—(CNS) —With the objective of helping in effectively conserving the virgin forests in this province, District Forester Cipriano M. Vadil has waged a campaign among timber concessionaires here regarding the dissemination of technical know-how in selective logging practices. This, according to him, would "prevent the denudation of forest zones here and thereby minimize the incidence of floods especially at this time of the year when the rainy season is almost at hand."

He said the practice of selective logging is a joint project of the forestry office and the timber concessionaires which is being implemented by the Timber Management personnel of the forestry office of this province. The concessionaires are asked to send trainees who undergo seminars and actual field practice in the art and mechanics of selective logging.

He bared that with 24 timber licensees in this area, the timber management workers of his office will "have their hands full," in this campaign especially that there are cases when there is simultaneous log-cutting in two or more areas.

In this selective-logging practice, Vadil pointed out that the following work procedure are embraced:

1. Survey of logging set-ups in order to determine the location, boundaries and extent of the logging areas;

2. Sampling check in order to determine the timber content and to estimate the total number of residuals to be marked or left uncut;

3. Tree-markings to determine which trees to cut at the same time giving indications as to the diameter and classifications;

4. Residual inventorying in order to take into account the penalty to be imposed on licensees who caused injuries on residuals marked to be left within a designated area; and

5. Timber stand improvement which includes silvicultural treatments of the forest, such as trimming of the young stand, pruning of defective

branches, removal of vines and other undesirable growths, and the seedling of bare areas. This last phase is usually done when an area has already been logged-over.

Meanwhile, Vadil expressed optimism for the success of this long-range campaign on account of the favorable reaction made by timber concessionaires here.

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WATERSHED IMPROVEMENT PROGRAM HIKED

SORSOGON, Sorsogon, July 1—(CNS)—The Sorsogon Economic Development Council today sought the intensification of a watershed management program for the province.

Its importance was underscored by the SEDC which pointed out that such a program on a province-wide basis could attack the "problem of the lose of our two most basic natural resources, soil and water, on a watershed basis for the benefit of the aquatic resources."

A watershed is the land area which contributes to the flow of a waterway and vary in size. Local Newsmen were told by the local economic council that watershed management "involves all aspects of the productive and protective use of land and water in a valley or watershed."

The SEDC declared that a watershed "is an ecological unit, a community of many facets, land, water, trees, shrubs, grasses, good crops, animals, birds, insects, fish and a human population, with multiple relationships and inter-relationships."

Proper consideration of these inter-relationships can mean an increase in basic soil wealth increased crop production by an improved agriculture, increased water supplies, stabilized stream flows and reduced flood hazards, a reduction in need and cost of downstream engineering works, increased value of forest, and improved environmental conditions for game and fish.

The SEDC advocated the organization of watershed improvement associations among sportmen's clubs, civic groups, farming communities and even individuals in order to attack the problems involved in watershed management from every possible angle and avoid duplication of effort.

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MOVE TO HALT ILLEGAL LOG OPERATIONS

CAMP VICENTE LIM, Laguna, June 2—(PNS)—Col. Segundo L. Gazmin, Second PC Zone commander, ordered yesterday his provincial PC commanders in the Bicol region to detail at least five PC soldiers to every forest sector team of the bureau of forestry to help combat illegal "kaingin" and illegal logging in the Bicol area.

Gazmin's order was spurred by a request from the bureau of forestry regional director Enrique K. Santos who informed him that the bureau had launched a massive drive against illegal "kaingin" and illegal logging in the Bicol Area.

Santos told Gazmin that his office had adopted the following measures to insure the success of the campaign:

(1) Divide each province into patrol sectors and assign in each sector two forest officers to check illegal logging and prevent forest destruction.

(2) Inspect the logging operations of concessionaires with the view to enforcing the system of selective logging.

(3) Lay out the common boundaries of timber licensees and forest concessionaires to prevent them from encroaching on each other's territory.

(4) Establish forestry sub-stations near public forests in each province for the purpose of intercepting illegal loggers.

* * *

SCHEME WILL UP TEMPO OF REFORESTATION

SORSOGON, Sorsogon, May 31—(CNS)—The Sorsogon Economic Development Council today proposed the establishment of tree nurseries in the province as a means of accelerating the tempo of reforestation in Sorsogon.

It is apparent, the SEDC said, that supply of tree seedlings at this time may not be able to cope with the demand should an intensive tree planting program be carried out.

In urging the establishment of tree nurseries, the local economic body also batted for a campaign to encourage tree planting even among private farm owners. It is not just the denuded forests that needed to be reforested but also eroded fields. "It is about time that the practice of planting trees be greatly encouraged," it added.

And in order that the rate of tree planting be increased, nurseries should be established first, the SEDC said.

"While there is lack of accurate statistics on how far reforestation has been carried out in Sorsogon, it is safe to assume that since reforestation was started in the province in the area of the

Bulusan volcano national park about the middle of 1937, not much ground have been covered up to date," the SEDC said.

Tree nurseries could be established in private lands through the representation of forestry officials and the reforestation administration so that there could be an ample supply of seedlings, according to the SEDC.

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RA WARNS AGAINST FOREST FIRE

Administrator Jose Viado of the Reforestation Administration has warned against outbreaks of forest fire in the various reforestation projects established throughout the country.

In a memorandum issued to all regional supervisors and foresters-in-charge in the field headquarters, Viado said that come summertime, incidence of forest fire always poses a grave danger to established plantations.

Already, the Reforestation Administration has lost some 4,145 hectares of established plantations through fire since its foundation in 1960. About five million trees of various species valued at approximately ₱13 million were razed to the ground, he explained.

According to the administrator, grass fire is observed to be the most common cause of wood fire. Private owners of land adjoining reforested areas do their clearing by setting grasses on fire. Uncontrolled, fire creeps toward the direction of the plantations, he said.

Administrator Viado also mentioned careless picnickers and campers as potential agents of forest fire.

All fieldmen must therefore redouble their efforts in guarding the reforestation projects. People entering any project should be closely supervised until they leave the premises so that accidents will be minimied. Excursionists who become unruly while inside the plantations must be told to behave and given a lecture on the evil effects of forest destruction, he concluded.

— The Sunday Times—April 25, 1965

* * *

GRADE RULES HIT P.I. LOGS

Philippine logs exported to Australia, under the grading rules, would become extremely uncompetitive with Borneo and Malaysia logs.

One of the consequences of the new grading rules (Forestry Administrative Order No. 19-2) adopted by the Bureau of Forestry governing exportation of logs to foreign countries is the elimination of "veneer 3" as a grade which is now classified as "sawlog 1."

The Philippine Lumber Producers Association has been reliably informed that on the basis of classification, a duty of 17.5 per cent is imposed on sawlogs by the Australian government as against five per cent on peelers and veneers.

Consequently, Philippine logs which used to be veneer 3 paying five per cent duty now would pay 17.5 per cent as sawlogs.

— Manila Bulletin—June 13, 1965

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CONSOLIDATION OF 3 FORESTRY OFFICES URGED

Consolidation of three government forestry offices into a forestry commission for effective coordination of their activities has been advocated by the University of the Philippines forestry alumni association.

The offices sought to be merged are the bureau of forestry, reforestation administration and the parks and wildlife office.

A bill to this effect is pending in both the lower house and the senate. It calls for the creation of a forestry commission to be headed by a forestry commissioner.

Placing these units under one head, according to Nicolas P. Lansigan, president of the Alumni association, is expected to bring about a much desired coordination of functions and forestall overlapping of jurisdictions. Under a unified set-up, a more economical use of plant facilities and efficient utilization of funds and limited personnel would also be possible.

— Manila Bulletin—April 6, 1965

* * *

STRESS FOREST CONSERVATION

Forestry officials yesterday exhorted private woodland owners to observe forestry practices in order to ensure the perpetual usefulness of private forest to augment the wood requirement of the country.

Forestry assistant director Juan L. Utleg said vegetative cover of private woodland must be maintained for their timber crop and the many benefits derived therefrom such as maintenance of spring, shade of animals, conservation of soil and fertility of the land.

Utleg said it was high time private woodland owners helped in the forest conservation program of the government. They should not continue with the general run of cutting and selling the timber and demolishing the forests to convert them to agricultural and pasture lands.

He said not all areas under forest are suitable for agriculture. Rolling hills may be good for pasture but those with rough topography are only suitable for timber production, he added.

The assistant director appealed to private woodland owners to remove only those trees of marketable sizes leaving the young ones uninjured to keep the forest alive. He said woodland owners should conserve their forests because of the attractive monetary returns for their timber crops.

* * *

RIVERA EXHORTS LUMBERMEN

DAVAO CITY—Former acting director of forestry Apolonio F. Rivera exhorted loggers to adopt strictly the forest conservation and protection program of the government through the selective logging system in order to ensure the perpetual utilization of the country's forests.

Rivera was the keynote speaker at the opening of the third regional selective logging seminar at barrio Maco, this city, June 21.

According to Rivera, the sustained yield management program of the bureau if properly adopted by the loggers will create a favorable atmosphere that would reconciliate forest utilization with conservation thereby enhanced a continuous balance of wood harvest and wood growth.

Rivera, who is dubbed as the best non-career man ever to head the bureau of forestry, was responsible in putting back the office into the good graces of the public. The dynamism that was generated by his leadership was so sweeping and penetrating that ti has spurred every forestry employee to do his very best.

The former director of forestry said the bureau had prepared a five-year forestry development program intended to accelerate action on forest protection and conservation. Even if he was no longer in the bureau he would continue contributing his share in forest protection and conservation, he said.

The selective logging seminar currently being held at barrio Maco of this city is attended by concessionaires, logging foremen and company foresters from the provinces of Bukidnon, Misamis Oriental, Surigao del Norte, Surigao del Sur, Davao, Cotabato and Agusan. This is the third in a series and is designed to acquaint loggers in Mindanao with the concepts of the sustained yield management under selective logging.

Meanwhile, forestry assistant director Juan L. Utleg, who is concurrently officer-in-charge of the agency said he would pursue the policies and programs started by Rivera in the bureau. He said aside from enforcing the sustained yield management program other projects would be given more impetus such as the timber inventory, land classification and the establishment of permanent forests to ensure maximum protection of the country's forests.

— Manila Bulletin—June 20, 1965

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CHALLENGE HECHANOVA ON FORESTS

Vice President Emmanuel Pelaez challenged the scretaries of finance and agriculture the other night to help President Macapagal adopt measures designed to pep up the nation's wood industries.

Pelaez challenged Secretary of Finance Rufino Hechanova, Senator Gaudencio Antonino and Rep. Vicente Pimentel, who were among the special guests at the dinner conference held at the Manila hotel, to request President Macapagal to certify to a bill exempting logs sold to local processing plants from the imposition of the seven per cent sales tax.

Pelaez also challenged Secretary of Agriculture Jose Feliciano to make good his promise to approve renewal of timber licenses to which Feliciano had pledged when he spoke before the convention's opening plenary session Monday.

Pelaez also told Secretary of Public Works Jorge Abad that he had noted in his trips around Mindanao that loggers had built roads at a cost almost one-fifth of the cost incurred by the department of public works.

Pelaez told the dinner session which officially closes the fifth national convention of the Philippine Chamber of Wood Industries that the log producers and wood processors were the "constitutional managers" of the patrimony of the nation, particularly the forest resources.

The Constitution, he explained, imposes upon every Filipino the primary obligation of conserving the patrimony of the nation. "And as you are the group directly involved in the exploitation and development of our forest resources, it is your foremost duty to conserve these resources as constitutional managers."

Pelaez assisted by Gaudencio S. Mañalac, chamber president, presented industry awards to Secretary Hechanova, Senator Antonino, former Public Works Secretary Brigido Valencia, Rep. Pimentel, Valeriano Bueno and Lorenzo Sarmiento. Hechanova received the award for President Macapagal.

This afternoon, Mañalac and Juan Utleg, acting director of forestry, will award the delegates their certificates for attending the three-day series of seminars held in Los Baños, Laguna.

President and Mrs. Macapagal will tender tea in honor of the delegates at five o'clock tomorrow afternoon at the Malacañang social hall.

— Manila Bulletin—April 9, 1965

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WOOD IS VERSATILE MATERIAL

COLLEGE, Laguna —(PNS)— Wood reputedly is a versatile material in the construction business. It has even invaded fields where steel or concrete is required.

In its mere form, however, wood cannot, in all cases, displace other construction materials, considering the fact that it finally decays and is vulnerable to fungi and insect attack.

To obiate this disadvantage in the use of wood, technologists at the Forest Products Research Institute in Los Baños has developed a chemical treatment to make wood more durable, more resistant to fire or chemical action, water repellent, stronger and harder.

F.P.R.I. researchers confirm that the use of creosote or borax render the wood decay-prof. This work eventually has set a wider field of wood utilization.

Where wood has been considered of limited use in construction works a few years ago, it now has been regarded by many as one of the more permanent construction materials.

* * *

ESTABLISHMENTS OF SEED ORCHARD URGED

COLLEGE, Laguna, May 18—(CNS)—The establishment of seed orchards in the Philippines is indispensable in forest tree improvement since they serve as sources of certified seeds and laboratory for genetic and breeding experiments, according to Bernardo C. Sinues instructor in forest botany and dendrology of the UP College of Forestry here.

In the Philippines, said Sinues, there is an urgent need of establishing a seed orchard in every region. "This would have pave the way to the accumulation of essential research materials besides serving as a temporary source of relatively superior seeds," he claimed.

"Otherwise, it would be economically advisable to maintain a small seed orchard that is manageable by every reforestation project."

The UPCF instructor added that this is now a dire necessity inasmuch as the climax species are already being planted to some areas.

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REPORT GROWING DEMAND FOR P.I. FOREST PRODUCTS

Secretary of Commerce and Industry Cornelio Balmaceda received a report yesterday about increasing demands for Philippine lumber, plywood and veneer in the U.S.

The report, from Benjamin Domingo, Philippine commercial attache in Seattle, Washington, said 50 per cent of Philippine exports cleared through the port of Seattle consisted of Philippine lumber.

In December 1964, Domingo said, Philippine lumber exports had gone up to 20,439 tons and this was followed by logs and poles with 9,828 tons and the fourth largest Philippine export — plywood and veneer—3,295 tons.

COLLEGE, Laguna, June 5 — (PNS) — The Philippine wood industry has a bright future in the world market according to Dr. Hardy L. Shirley dean of the college of forestry, New York state university.

Shirley said this was particularly true of wood carvings and furniture made in the Phiippines.

In an interview with officials at the U.P. college of forestry here, Shirley said that Philippine forests had shown capabilities of restoring themselves even after logging operations have ended.

Shirley cited the "tremendous recovery of the residual stands of forests in Mindanao."

He said, however, that the Philippines still lacked trained men to handle highly technical jobs in the wood industry.

— The Manila Bulletin—June 6, 1965

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MOVE TO IMPROVE FOREST INCOME

COLLEGE, Laguna, April 1 4— (CNS) — The planting of economic tree will be stepped up for the dual purpose of reforesting vast areas of denuded land and getting additional income.

This was announced recently by Administrator Jose Viado of the Reforestation Administration in a recent radio chat with U.P. College of Forestry extension specialists here.

According to Viado, the Reforestation Administration has already planted some 100 hectares of denuded land in Cotabato to rubber. An additional 400 hectares are slated for mass planting to rubber trees.

The reforestation boss further said that the drive to plant trees of economic importance is in line with the objective of the Reforestation Administration to sustain itself financially within the next ten years.

Viado also urged that kaingin farmers, instead of cutting trees, can do well to plant economic trees in denuded forest lands. Besides rubber, farmers can plant lumbang, almaciga, paper mulberry and Albizzia falcata to get extra cash. These trees, said Viado are of industrial importance and are vigorous and fast-growing.

He said that in the case of rubber trees, tapping can be done in six years. Besides, rubber latex is a non-perishable product and can be stored for long period or transported to distant places. Viado also pointed out that there is growing demand for natural rubber, despite the competition posed by synthetics.

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COLLEGE, Laguna, April 14—(CNS)—Studies made at the UP college of forestry here show definitely that scientific management and improved forestry techniques result in much bigger profits and better conservation.

According to the UPCF researchers, a forest will no longer be regarded merely as a natural resources to be cut at random and left alone to grow by itself. "The forest of tomorrow will be planted, cultured, fertilized and systematically harvested much like any other crop," revealed the UPCF researchers.

* * *

SEEDLINGS IN PLASTIC BAGS BETTER THAN IN EMPTY CANS

COLLEGE, Laguna, May 8—(CNS)—Forestry silviculturists of the U.P. College of Forestry here have found that planting seeds in plastic bags are better than buho or empty cans.

Prof. Teodoro C. Delizo and Ireneo L. Domingo of the U.P.C.F. said that with the use of these bags weeding is not required because the roots of seedlings are undisturbed during transplanting and that survival is high. They added that plastic bags will soon replace buho and empty cans in reforestation project.

According to the UPCF silviculturists using plastic bags for potting seedling have the following advantages: 1) they are easy to prepare; 2) they are easy to secure; and 3) they are easy to handle.

Plastic bags used at the UPCF nurseries are 7 x 8 inches. These bags are filled with prepared soil. Then on planting time, all one needs to do is to immerse the bags in water than cut the bottom part of the bags and plant them in holes of about 8 inches deep. Findings show that the percentage of survival under controlled conditions is about 90 per cent.

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FOREST GUARDS PROTECT AREA SOUGHT

COLLEGE, Laguna, April 22—(CNS)—The bureau of forestry is badly in need of forest guards to protect the remaining forests of the country from illegal loggers and smugglers, according to Assistant Director Juan L. Utleg of the bureau of forestry.

Utleg revealed that at present the bureau of forestry has only 700 forest guards to protect more than 13 million hectares of forest land. "This means that every forest guard must have to protect about 19 thousand hectares of forests," he said.

According to Utleg this is humanly impossible considering the lack of transportation facilities. He said, a forest guard should protect only 2000 hectares if he is to protect the area effectively.

The assistant director further disclosed that the problem was aggravated when the forest guards of the Emergency Employment Administration were laid off. "Thus, the lack of forest guards has literally hampered the protection of important forest areas of the country,' he claimed.

When asked what the bureau of forestry has done, Utleg said that they are again recommending additional funds for forest protection. He hopes Congress will approve the request for more funds.

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PLANTING OF ALBIZZIA URGED

COLLEGE, Laguna, May 15—(CNS)—The large-scale planting of the fastest growing tree in the Philippines for commercial purposes has been recommended by the forestry extension specialists of the UP College of Forestry here.

According to them, Albizza falcata which is today considered the fastest growing tree in the country can easily make ₱28,000 in 10 years out of a hectare of sub-marginal land. "This is possible because Albizzia falcata can grow a foot taller a month and attain a height of 80 feet in six years," they claimed.

The UPCF extension specialists said Abizzia falcata has an amazing growth rate which is six times faster than the apitong, lauan, narra, yakal and others. It can accumulate 659.3 cubic meters of wood per hectare within six years and an average annual growth of 134 cubic meters.

Ireneo L. Domingo, silviculturist of the UPCF said the fast growth of Albizzia falcata is natural because it is favored by a good climate in the Philippines.

To be more or less assured of success in Albizzia falcata raising, Domingo suggested that it is advisable for the farmer to raise the seedlings in the nursery before finally setting them permanently in the field.

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THE 'KAINGINERO' AND THE CONCESSIONAIRE

A convention on the problems caused by the "kaingin" was held several days ago by government foresters, lumbermen and associations interested in forest conservation and reforestation. A convention not only of this particular problem but also of the system of granting of forest concessions has long been overdue.

Attention was drawn to the wanton destruction of the country's forest when floods began to plague the countrysides, although it would be inaccurate to blame the "kaingero" entirely for this calamity.

Some three years ago, when floods washed away whole villages at the foot of the Zambales-Bataan mountain ranges, photographs were shown of bald mountainsides, the handiwork of the "kaingero" who burned large areas of forest land to convert them into farms. The error of his ways was there for all the world to see and condemn; the "kaingero" was the readily available vilain.

But the greater villain, although hidden from easy view, is the greedy forest or timberland concessionaire, who cuts all the trees he want, with or without the permission of the honest forest ranger or with the tacit permission of the dishonest one.

Forestry regulations are strict and effective enough to insure the conservation of the country's forest resources and their replacement through proper and adequate reforestation, if they are enforced. But they are not, either because the concessionaires take advantage of the lack of government foresters or because they have already amassed wealth to enable them to buy off some of them.

After the war, the industry became ten times more productive through the wanton violation of the forestry laws.

The gravity of this situation is best shown up by the fact that the "kainginero" is a lone and impecunious operator, while the concessionaire is not.

The solution of the problem posed by forest destruction lies in a careful re-study of the system of granting forest concessions. Should the government limit the granting of concessions to a few individuals or entities, giving them sizable areas at a fairly long period of time?

Under this system, the concessionaire will not be tempted to cut trees indiscriminately because he is afforded enough time to recover his investment with a fair enough margin of profit; he will be forced to engage in selective logging, because of stricter demands for reforestation work on his part, and because of the abolition of cut-throat competition from wild-cat operators.

These are among the compelling reasons which will endorse the adoption of this system.

— The Manila Chronicle—March 16, 1965

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TAMESIS BUCKS BIG ANNUAL LOG EXPORT

COLLEGE, Laguna, April 4—(CNS)—Florencio Tamesis, first Filipino director of the bureau of forestry and concurrent general manager of the Nasipit Lumber Co., Inc., express disfavor over the increasing annual log production and exportation of the country during a recent interview with extension specialists of the U.P. college of forestry here.

Asked how he would reconcile the increasing wood cutting for export and effective forest conservation, Tamesis said he believes that by curtailment of our production, the country could main tain continuous and better market for log exports.

The present rate of increase is alarming in the sense that we are wasting considerable raw material for a lower value, he said.

Instead, Tamesis has favored the reduction of the number of forest concessionaires the government will be in better control of the production and utilization of the forest.

The former director cited the ₱30,000 daily wood waste occurring in the forest as a result of the inability of the licensees to take advantage of the full utilization of the trees.

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UPCF PUBLISHES MONTHLY CIRCULAR

COLLEGE, Laguna, March 31 — (CNS) — A Conservation circular devoted to the cause of forestry is published monthly by the extension of the UP college of forestry in cooperation with the Joint Committee on Public Education and Information in Forestry.

Interested parties specially public school teachers who may want to avail of the informative circular can contact Prof. Domingo V. Jacalne of the UP college of forestry for free copies.

The managing editor of the Conservation circular is Anacleto C. Duldulao who is also the concurrent editor of the Forestry Leaves. Advisers are Prof. Domingo V. Jacalne, Prof. James Elwood Davis and Dean Gregorio Zamuco.

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RESETTLEMENT OF KAINGINEROS URGED

COLLEGE, Laguna, April 12 — (CNS) — The resetlement of kaingineros on lands suited to permanent agriculture has been proposed as one of the possible solutions to kaingin problem, according to Dr. John Hugo Kraemer, former visiting professor and advisor of the UP college of forestry here.

Dr. Kraemer also believed that the existing laws on forestry are adequate. However, he urged the rigid enforcement of these laws.

Likewise, the former visiting professor said that the cause of forest conservation to be successful must have the support of all officials concerned and the public at large.

Asked about his observations of forestry in the Philippines, Dr. Kraemer said that the Filipinos are not practicing intensive forestry.

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PWO BRASS DENOUNCES GOV'T ANEW

COLLEGE, Laguna, April 10 — (CNS) — The indifference of the national government to improve the Parks and Wildlife Office was denounced anew by Marcelo A. Buncio, officer-in-charge of the PWO.

Buncio said the government and lawmakers have forgotten that they have created the Parks and Wildlife Office in this country. All problems of the office emanate from lack of funds, he added.

"The Parks and Wildlife Office has never been given enough funds to carry on its vital functions," declared Buncio.

According to the parks head, the meager appropriation of the office did not allow for the hiring of necessary personnel to man the central office and the 42 national parks and game refuges. He said the office cannot even buy equipment and materials necessary in carrying out the objectives of the office.

"Most disgusting is the fact that the PWO does not even have a decent building of its own," declared Buncio. "It has long been housed in an old congested and dilapidated building in Binondo.

As a consequence of the lack of funds, said Buncio, the Philippines has remained to be a parkless country in spite of its 42 national parks.

* * *

FELICIANO URGES WOOD INDUSTRIES EXPAND OUTPUT

Jose Feliciano, secretary of agriculture and natural resources, urged the nation's log producers and wood processors yesterday to strive for "optimum production on a sustained basis."

In an address before the opening plenary session of the fifth annual convention of the Philippine Chamber of Wood Industries, the agriculture secretary explained that the campaign toward maximum output of wood products should be carried out in such a manner that forest resources are conserved and made perpetually useful.

Feliciano called on the country's lumbermen and loggers to expand domestic processing of wood products as a means of opening up more job opportunities for the Philippines' growing population and of bringing additional profits to investors.

He set 2.6 billion board feet a year as the target of production sufficient to put the logging industry on a more or less stable footing.

He lashed out at forest destruction caused by "kaingineros" professional land grabbers and unscrupulous loggers.

The cabinet official explained that the responsibility of forest conservation and wise utilization of wood products rests partially on the shoulders of the government.

However, he continued, while government should provide the atmosphere, the major responsibility rests upon those licensed by the government to conduct logging operations.

On this score, he pointed out, forestry development areas should be managed by responsible concessionaires.

Feliciano challenged the members of the Philippine Chamber of Wood Industries headed by Gaudencio Mañalac to undertake the task of promoting the conservation of the nation's forest wealth and of forestering collectively the various methods in the wise utilization of wood and timber products.

He gave to the loggers the responsibility of influencing the making of policies, rules and regulations by the government on the development of the nation's forests.

Answering a complaint aired earlier by Surigao Governor D. O. Plaza that loggers were faced with the grim prospects of foreclosures on their mortgaged properties, Feliciano said the department of agriculture and natural resources would give priority attention to loggers and their problems, and would help prevent foreclosures of mortgages.

Answering another complaint aired by Feliciano Sarmiento, immediate past president of the chamber, that renewals for timber licenses had not been acted upon, the secretary of agriculture said he would sign the papers "as soon as possible."

In his welcome address, Governor Plaza deplored that the nation's natural resources, particularly forest products, were not being fully utilized as a means to solve the unemployment problem due to government indifference and neglect.

Plaza, the convention's chairman, added that the country's economic set-backs "could have been avoided if only our government officials had the welfare of our businessmen at heart."

"Unfortunately, he went on, "the attitude of some of our government form of government of ours, public officials are the servants of the people."

"In other countries," he continued, "businessmen are accorded high respect and considerations befitting a master because these businessmen are the citizens that pay the salaries of the government employees through the taxes that they pay."

"In our country," he said further, "not even the President of the Philippines should be our master, for the people did not elect a master, but a manager to manage the affairs of our country."

Reacting to Plaza's charge, Secretary Feliciano said he is not one of the government officials alluded to.

Mañalac, President of the sponsoring chamber, gave an objective appraisal of the country's wood industries.

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A.F.P. HIKING LOGGING DRIVE

The defense department and armed forces went full blast in the drive against illegal logging in the Angat watershed in Bulacan over the weekend.

Not content with just sending a company of army and Constabulary Rangers, Secretary of Defense Macario Peralta, Jr. dispatched two more companies from the first infantry (Tabak) division in Laur, Nueva Ecija to the Angat watershed area to plug entry and exit of illegal loggers.

At the same time, the defense chief ordered dispatched airforce reconnaissance and spotter planes to pinpoint kaingineros and illegal loggers.

In the anti-smuggling drive, Peralta instructed Brig. Gen. Flaviano P. Olivares, constabulary chief, to transfer out individuals or even the whole company, who were suspected by the community of having familiar or undue relations with known smugglers.

Olivares was told to reassign the officers and men, or the whole company to areas and stations they could possibly have nothing to do with the smuggling drive.

Olivares was likewise directed to withdraw P. C. security to politicians or individuals known to be giving security to smugglers.

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NWSA, FORESTRY BRASS HELP SOUGHT IN FIGHT

MALOLOS, Bulacan, Mar. 2 — (PNS) — Gov. Jose M. Villarama yesterday sought the help of National Waterworks and Sewerage Authority and Bureau of Forestry officials in his campaign against illegal loggers in the province.

NWSA and Forestry officials will accompany the governor and constabulary authorities in an inspection of forests in San Ildefonso, San Miguel and San Jose del Monte this week.

Earlier, Villarama arranged with Philippine Air Force authorities for the use of a helicopter to view the place where illegal loggers operate. However, the governor's plan was not pushed through.

Lt. Col. Cesar V. Lucero, provincial PC commander, told the governor that it was advisable to use the road in going to the mountains despite the rough terrain because it was impossible to spot illegal logers from the air.

The operation of illegal loggers in the three municipalities was bared by Vice Governor Salvador Santiago during a recent session of the provincial board.

Santiago told the governor that an official of a law enforcement agency in the province was the owner of several trucks being used in hauling illegally felled logs.

Villarama was understood to have directed former San Ildefenso Mayor Alberto V. Lolgo, chief provincial police investigator, to check if the loggers operating in the three municipalities had permits issued by the Bureau of Forestry.

Villarama also warned sawmill operators not to buy illegally cut logs under pain of having their respective establishments closed.

The governor said he had received reports that logging firms has been selling logs to a number of sawmills in the province.

IBA, Zambales, Mar. 2—(PNS)—Col. Proceso J. Arevalo, provincial PC commander, has reported to Gov. Manuel D. Barretto the rampant illegal cutting of timber within the Olongapo watershed.

In his report, Arevalo said that 43 logs had been confiscated by elements of the 125th PC company and forestry personnel in this province.

Arevalo said that the logs, which were cut from Mt. Susung Dalaga and Sitio Panlibing both from Zambales were taken to Dinalupihan, Bataan.

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FAO RELEASES . . .

(*Continued from page 90*)

ing of fruit trees and vines. Young tree seedlings and saplings have been protected from goat-grazing. There are some 400,000 goats in the country, about a quarter too many for the land to support. Though reduction of the goat herds would solve some of the forest problems yet, in many of these areas, goats are the only animals which can find enough to eat.

One of the areas is centred on Barouk where terracing experiments are being carried out and where existing groves of cedars are being encouraged to spread. Thousands of seedlings are being planted and roads are being bull-dozed throughout the area as the nucleus of a twenty-mile wide national cedar park. In the Mount Hermon areas, oak tree forests are being encouraged. In other areas, torrent control and water storage is being carried out, combined with range improvement, which could lead to increased livestock production.

Lebanon is typical of much of the Mediterranean region. Populations are expanding at a faster rate than incomes and food supplies. The eroded mountains of the Middle East, the desert wastes of North Africa are only just being kept at bay. If the population shift from the hill-villages to the towns can be slowed down, then the newcomers can be assimilated into urban industrial life without excessive overcrowding and unemployment while, at the same time, those who are left on the farms have a fighting chance of increasing crop yields and cash incomes. Lebanon's Green Plan, aided by the United Nations agencies, is an attempt — similar to others being carried out in every Mediterranean country — to make life more worthwhile for the mountain people.

C.F. CLASS '32

Left to right (standing): *Foresters V. Blancas, L. Verzosa, A. delos Reyes, E. de Guzman, A. Jastive, A. Genio, E. Soriano, F. Reyes, E. Viste,* (sitting) *J. Calip, C. Ferreria, R. Rivera, Director Juan L. Utleg, Foresters Vic. Marababol, L, Moroña, D. de Leon.*

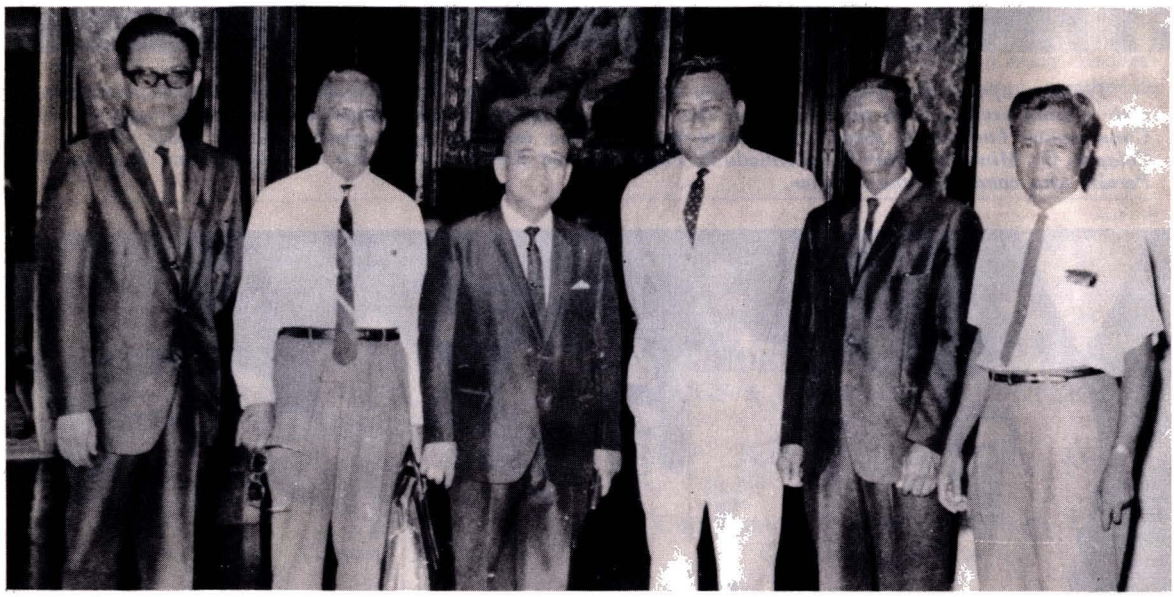
Trainees of Selective Logging Workshop Seminar for Licensees' timber management worker post during their closing exercise with the officers of the Oriental Mindoro Wood Producers Association together with Congressman Luciano A. Joson for Oriental Mindoro who was the guest speaker, Mayor Felix Cuasay of Calapan, Or. Mindoro, Prov. Fiscal Amado V. Tolentino and Foresters Gregorio P. Principe and Mariano R. Peralta who conducted the seminar.

District Forester Santos E. Dueñas, Assistant Dif. Cipriano Melchor and Personnel:

Sitting (l to r): *Forest Guards J. Parreño and Donato Piramide, Dist. For. Santos E. Dueñas, Asst. Dif. Cipriano Melchor, and Forest Guards P. Preclaro and M. Malilang.* Standing: *Forest Guards W. Mayo, A. Penales, F. Quinto; Scaler A. Zulueta, Forest Guard C. Rosales and C. Preclaro, driver.*

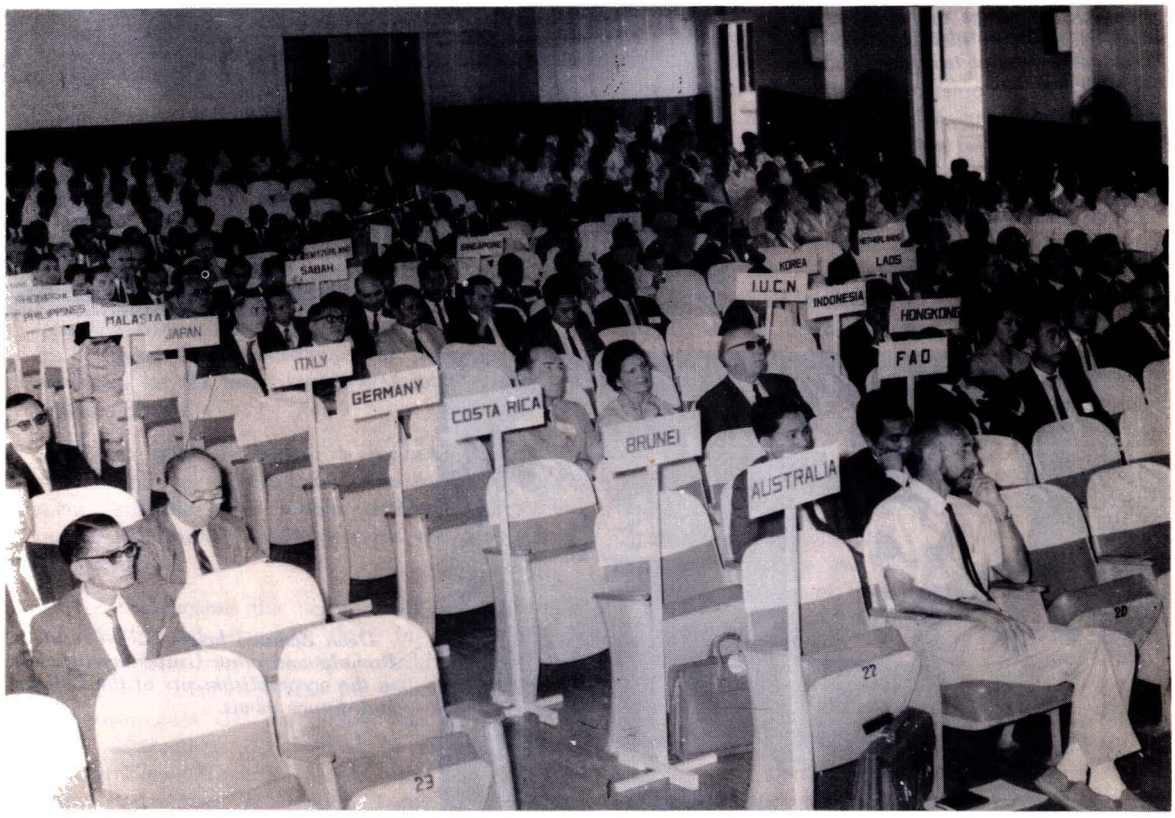
Here & There

TURN-OVER RITES.—*The nine-member delegation to the recently-concluded 13th Biennial Conference of the Food and Agricultural Organization held in Rome, Italy (Nov. 9 - Dec. 10) are shown in above photo during the turning of the Philippine Room, in simple rites, at the FAO headquarters in Rome, to FAO Director-General B. R. Sen. The Philippines has appropriated* ₱37,000 *with which to furnish this Room. An urgent appeal is hereby being made to local lumbermen, big-time loggers, and owners of wood-using industries to donate wooden panels and parquets for the walls and floor, respectively, of this Philippine Room at FAO Headquarters in Rome. This may serve as good advertisement of our Philippine woods in Italy. They are, from left: Forestry Asst. Director V. Marababol, Director M. R. Monsalud of the Forest Products Research Institute, Plant Industry Director E. E. Cruz, Asst. Foreign Affairs Secretary A. Mangila, FAO Dir.-Gen. Sen. Phil. Ambassador to Rome M. Adeva (delegation chairman), Miss L. Garabato of the Phil. FAO Committee, Animal Industry Director A. Coronel, Fisheries Commissioner A. Roldan Jr. and Dr. J. Jamias of the U.P. College of Agriculture (secretary of the Philippine delegation).*



Private forestry sector pledges unanimous support to Director of Forestry Juan L. Utleg during the oath-taking ceremonies in Malacañang September 1, 1965. In picture, left to right, *Gaudencio Mañalac, president, the Philippine Chamber of Wood Industries; Eugenio de la Cruz, president of Society of Filipino Foresters and representing also the Philippine Association for Permanent Forests; Director Utleg; Nicolas Capistrano, Jr., President, Philippine Lumber Producers' Association; Aurelio Lagman, President, Plywood Manufacturers' Association of the Philippines; and Nicolas P. Lansigan, President, U.P. Forestry Alumni Association.*

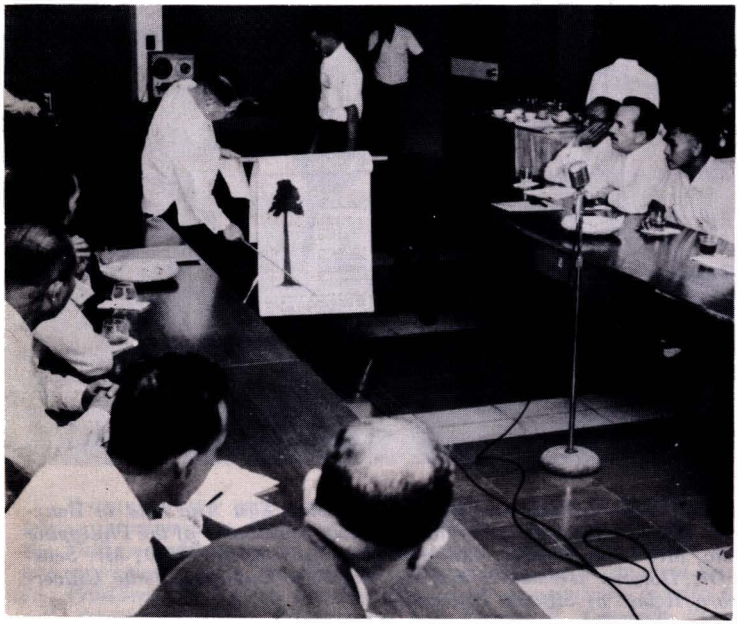
Laboratory, Madison, Wisconsin, U.S.A. Representative is shown receiving the award from Nicolas Capistrano, Jr., President of the Philippine Lumber Producers' Association at a formal dinner recently given in his honor at the Philippine Columbian Clubhouse, while Mrs. Locke and Mrs. Capistrano look on.



Conference on Conservation of Nature and Natural Resources in Tropical South East Asia held in Bangkok, Thailand, November 29 - December 4, 1965. Participated in by about 30 countries. Some of the Philippine participants were: Director Marcelo Buncio, Mr. Jesus Alvarez, and Miss Luz Castro of the PWO; Mr. Severino Nable of the Bureau of Forestry, Dr. Dolores Hernandez and Mr. Edilberto Cajucom of the University of the Philippines and Prof. Dioscoro Rabor of Siliman University.

U.P. President Carlos P. Romulo (at the head of the table) discussing some problems of the Forest Products Research Institute with members of the Forest Products Research Board at its special meeting held September 14, 1965 in the office of the U.P. President.

Dean Gregorio Zamuco enlightens university officials on the activities of the U.P. College of Forestry. The occasion was the visit of the U.P. President Romulo to the U.P. Los Baños units.



Dean Zamuco briefs U.P. President Romulo and other University officials to the accomplishments of the College and future plans.

B. F. Notes

The governments and peoples of several countries in Europe as well as Japan and Free China regard their forest resources with primary importance by adopting and implementing progressive policies and programs on forest management on a continuing national scale regardless of who the party in power is.

This was the comment of forestry director Apolonio F. Rivera who returned Wednesday (May 12) with his wife, Mrs. Luz Pilarta-Rivera, after a three-month round-the-world observation tour.

He said citizens of European countries, Japan and Taiwan treated their forests as if they were their own property. Aware of the importance of forests, they spontanously cooperate with their governments in the management, protection and conservation of forest resources, he added.

Rivera lamented the fact that in the race between forest conservation and forest destruction in our country the latter is very much ahead of the former. It was tragic, he said, that while every effort was exerted to protect and conserve the forests at the same time many of our countrymen were mercilessly destroying them.

The forestry director, a recipient of two Presidential awards for honesty and integrity, stressed that there is a need to accelerate action on forest protection and conservation. He said he would reflect on his five-year forestry development program his observations on the latest trends of forest management practice abroad.

Rivera said his bureau is confronted with the problem of lack of fund, technical men and equipment. But the more serious problem, he pointed out, is the public apathy towards the proper care of forests.

He underscored the urgent need for a massive information and education drive in our country if we are to conserve our natural wealth. The director praised the press and radio for spurring into action the government and the people into action against forest destruction. He particularly commended the *Sunday Times Magazine* for its series of articles on forest destruction by Rodolfo Tupas.

Rivera said he would recommend the expansion of the bureau's information staff to maximize its effectiveness in close coordination with the UP College of Forestry and other government forestry agencies. He instructed Amador J. Evangelista, bureau information chief, to lay the groundwork for the coordinated information program. Rivera said he would also invite loggers and civic organizations to sit down with him to formulate a collaborative working forest conservation program.

* * *

The Philippine Association for Permanent Forests, Inc. sponsored a four-week forest guard training program at the Tungao High School of the Nasipit Lumber Company in this Municipality from June 7 to July 10, 1965, assistant director Juan L. Utleg, concurrently officer in charge of the bureau of forestry disclosed.

Utleg said the training program was conceived by association members to give substance to their pledge to go into active partnership with the bureau of forestry in its program of accelerating action on forest protection and conservation anchored on active public support.

Former director Eugenio de la Cruz of the Forest Products Research Institute who is now the manager of the PAPF said participants in training were high school graduates, at least 21 years old and had completed cadre training. Member companies of the association, he said, would employ the graduates as forest guards.

De la Cruz said the bureau of forestry and the UP College of Forestry collaborated in the program. He said dean Gregorio Zamuco of the College of Forestry was the director of the training center with director Juan L. Utleg as co-director. Professor in-charge was Domingo V. Jacalne, chief of the UP College of Forestry extension department. Amando Salamatin, training officer of the forestry bureau, assisted him.

According to dela Cruz, the faculty members were regional director Ceferino Abella and district forester Felipe Abraham for general forestry, regional director Jose Bersamira, Feliciano S. Esmade and J. Talavero for elementary forest surveying; dean

Calixto Mabesa, foresters Luis Aguilar and Rosario T. Cortes for identification of commercial trees and commercial wood species; forester Epifanio B. Fernandez, Porfirio Quintana and J. Talavero for scaling and timber cruising; and Capt. Macario Bucoy, forester Rufino Sabado and ex-fiscal Benjamin Pia for forest laws and procedures.

Meanwhile, Utleg vowed he would implement to the fullest extent possible the program of forest protection and conservation started by director Apolonio F. Rivera. He said the forestry program of Rivera could stop the tide of forest destruction if needed funds and other facilities are made available. He said he had instructed Amador J. Evangelista, bureau information chief, to start the massive information and education program in critical areas.

* * *

Assistant director Juan L. Utleg, concurrently officer in-charge of the bureau of forestry, announced the approval of a memorandum of agreement to implement UN special fund pilot project on watershed management.

The memorandum was signed by 14 heads of offices under the DANR and attested by secretary Jose Y. Fliciano in the conference presided by the latter. The secretary stressed the importance of the project to the country's agriculture and industries.

Utleg sought the cooperation and participation of the agencies involved in the implementation of the project. It was learned that the assistant director was one of those instrumental in securing approval of the important project abroad despite the fact he was not given per diems.

In line with the plan of operation of the UN-assisted project, secretary Feliciano formed a coordinating committee to be headed by the DANR head and with the forestry director, reforestation administrator, parks and wildlife officer in-charge and NEC representative as members. The adviser is Macid Y. Gulcur, project manager of UN special fund pilot project on watershed management.

Utleg said with the approval of $715,500 UN assistance the Philippines was committed to undertake the project with $631,785 counterpart contribution in kind beginning July this year. Gulcur outlined the work program for each agency to undertake in the project. He was assisted by forester Julian R. Meimban, Jr., officer in-charge of the forest protection and watershed division of the bureau.

In conjunction with the implementation of the project, Utleg ordered Amador J. Evangelista, bureau information chief, to include in the massive forestry information and education program a sustained campaign to drum up public support in the protection of the country's vital watersheds against the forces of destruction.

Others who attended the conference were land reform administrator Benjamin Gozon, Stig Anderson, resident representative of the UN technical assistance board and director of special funds in the Philippines; Carlos Cunanan of the reforestation administration, NWSA general manager Jesus Perlas, Marcelo Buncio of Parks and Wildlife office, T. Angeles and R. Ibarra of bureau of soils, animal industry director A. B. Coronel, E. Hipolito of public highways, weather bureau director R. L. Kintanar, mines director F. S. Busuego, NPC general manager J. O. Lahoz, A. V. Recto and J. Cruz of the DANR and C. Valera of commission on agricultural productivity.

* * *

FORESTRY PRO WRITES 30

The remains of Felipe B. Chicano, Jr. were shipped to Taft, Samar, his birthplace, last Saturday for interment.

The deceased was the public relations officer of the bureau of forestry and assistant information chief, According to Amador J. Evangelista, bureau information chief, Chicano had been a fighting newspaperman in Samar before he worked with the bureau.

Assistant director Juan L. Utleg, concurrently officer-in-charge of the bureau, posthumously commended the deceased for his contribution in the enrichment of forestry literature.

The deceased is survived by the former Elsa Pumasen and four children.

* * *

UTLEG CITES ROLE OF FORESTRY

The bureau of forestry is one of the various agencies of the government which are presently engaged in a vigorous effort pursuing the objectives of the socio-economic program of the administration.

Forestry Assistant Director Juan L. Utleg said yesterday the bureau helps in the massive tax collection campaign, assist in the implementation of tne land reform program to increase food production, promotes the fish and dairy production, helps maintain the international dollar reserve and regulate the use of the forest to sustain domestic wood requirements and for export.

Utleg said, the forestry bureau collected or assessed for collection more than ₱36 million in

Campus Notes

F.E.D. OFFERS EXTENSION SUBJECT

The Forestry Extension Department is offering this semester a subject on forestry extension. The subject is offered as an elective for students of Junior or Senior standing who have passed English 3. It is intended to acquaint students with the principles of extension work, objectives of forestry extension, and the methods and materials used in extension activities. By offering the subject to interested students, the College hopes to give the graduating foresters a basic knowledge on forestry extension to better prepare them for the varied tasks they will meet while in the service.

* * *

NURSERY AND PLANTATION HANDBOOK OUT

The printing of the "FOREST NURSERY AND PLANTATION HANDBOOK FOR THE PHILIPPINES" is off the press. The handbook is authored by Prof. Teodoro C. Delizo. The handbook is the first attempt of Professor Delizo to publish a book about the care of forest nurseries and plantations applicable to Philippine conditions. Delizo will appreciate suggestions for further improvement of the book. The Forestry Extension Department which undertook the printing is now offering the handbook for sale to interested parties at ₱2.50 each or at ₱3.00 including mailing costs.

* * *

F.B.S. DEPARTMENT PROPOSES GRADUATE COURSES

The Forest Biological Science Department of the UPCF has come up with 28 different but related subjects proposed for graduates and advance graduate students. Descriptions of the subjects were distributed to members of the faculty. These subjects will be offered as soon as the graduate program of the College of Forestry will be approved by the University authorities. The UPCF proposes to offer graduate studies leading to Master of Science and Master of Forestry.

* * *

FIGAROLA, SINUES FIND TREE BARKS GOOD AID TO TREE IDENTIFICATION

Damaso B. Figarola and Bernardo C. Sinues have found that looking at the bark of trees is the easiest way to identify a standing trees or tree without leaves. In their study of the 32 tree species in Mt. Makiling, they found out that no two species have the same bark characteristics. They either differ in texture, color, odor, taste, liquid exudation or thickness. Working out a key to the identification of the 32 species studied, they showed the possibility of identifying the more than three thousand trees in the country with the use of their bark characteristics. The two botanists have paved the way to easier tree identification.

* * *

FIRST FOREST GUARD TRAINING SEMINAR ENDS

The first Forest Guard Training Seminar, sponsored by the members of the Philippine Association for Permanent Forests, Inc., in cooperation with the U.P. College of Forestry and the Bureau of Forestry, held at Tungao, Butuan City ended July 10, 1965. Prof. Domingo V. Jacalne, who had been designated Professor In Charge of Training left for Butuan City last July 7 to attend the closing exercises. The graduating trainees were awarded certificates.

* * *

SUNY CONTRACT ENDS

The assistance contract between the U.P. College of Forestry and the State University of New York College of Forestry at Syracuse ended June 20, 1965. The contract which began in 1960 was a continuation of the assistance contract between the U.P. College of Forestry and Cornell University. The contract aimed to help in the development of the U.P. College of Forestry in modernizing the curriculum, rebuilding and strengthening the faculty through graduate study and in-service training, improving teaching methods, student recruitment, physical plant and cooperative relationship within and without the university; developing effective program of graduate education, research and public information and acquisition of equipment.

The SUNY people felt that most of their objectives have been fairly achieved and that there is no need to further extend the contract. However, Dean Hardy L. Shirley of the SUNY College of Forestry commented that th U.P. College of Forestry has not yet reached a stage in its development from which it can continue to grow and prosper without further assistance. He said it has not become truly viable and self-regenerating institution. "The College will not be truly self-perpetuating until it is prepared to educate its own faculty, its own research workers, and the top-ranking administration forester in government and industry,' Shirley commented.

* * *

FIVE UPCF FACULTY ARE SLATED FOR U.S.

Four professors and one instructor of the College of Forestry are slated to go to U.S. this year to pursue their graduate studies. They are Professors Domingo V. Jacalne, Feliberto Pollisco, Juanito D. Lamanilao, Enriquito C. de Guzman and Mr. Romulo Casilla, Pollisco, Lamanilao, and De Guzman will get their Ph.D.'s while Jacalne and Casilla will pursue their M.S. degrees. However, the date of their departure is not yet definite. They are still busy securing their necessary papers and undergoing thorough physical examinations.

* * *

FPRI HIGHLIGHTS . . .

(*Continued from page 82*)

*Engrs. R. J. Miciano and M. B. Avanzado of the timber physics and engineering division on their survey of the Aras-Asan Timber Co. in Basay, Samar in connection with their study on rapid segregation of sinker logs, found the company beset with the problem of recovering sinker logs constituting approximately 35 percent of logs cut and towed to their shipyard for export. Logs for export are usually towed through the winding Basey river to the shipyard, about 15-20 kilometers from the compound where the logs are dumped. The duo theorized that magnitude of sinker logs may have resulted from the geographical location of the place being in the typhoon belt and trees were exposed to lateral stresses thus producing wood of high density or that the trees in the region may contain excessive moisture. Samples were cut from sinker red lauan for specific gravity, moisture content and wood structure studies. They believe that findings in this study would help solve the problems of sinker logs. . . .

*In a survey made on the abundance of lupi in Catanduanes, FPRI's I. T. Zamuco and E. C. Amio with Engr. E. Serra of NIST found that approximately 1/3 of the total land area of the province is covered with lupi; greenweight of culms without leaves available in the area is estimated to be about 1.5 million tons. This plant has been found suitable for pulp and paper. The team recommended the establishment of sample plots to determine growth maturity, cutting cycle, etc. . . .

*Technologists J. A. Meniado and M. Magsanoc of the wood technology division demonstrated the effective methods and techniques of extracting Kaatoan bangkal seeds in their visit in Zamboanga and gave advice on seed storage, germination and transplanting techniques and also on damping off diseases to technical personnel of the mills visited. . . .

*The molasses-carbide dust binder discovered through cooperation work between the FPRI and the Maria Cristina Chemical Industries has proven to be very effective and economical for briquettes production. The Maria Cristina Chemical Industries, whose charcoal and briquettes production rates 1.5 tons per hours, uses this binder and derives benefit from it by reducing the cost of production and by eliminating the drying of briquettes which is otherwise indispensable for commonly used binders. . . .

B. F. NOTES . . .

(*Continued from page 102*)

taxes last year, broken down as follows: forest charges, ₱22 million; general fund, ₱7 million and reforestation fund charges, ₱5 million.

He said the land classification program of the bureau contributes immensely to the success of the land reform program. The bureau, he said, is the only government agency charged with the classification of lands in the public forests to alienable or disposable and those suitable for pure timber production. Areas classified as alienable or disposable which are mostly agricultural are certified by the bureau to the bureau of lands to be distributed to qualified private parties. Whereas, those classified as timberland are retained by the Bureau and certified to the President for proclamation as permanent forests pursuant to RA 3092 otherwise known as the permanent forest law.

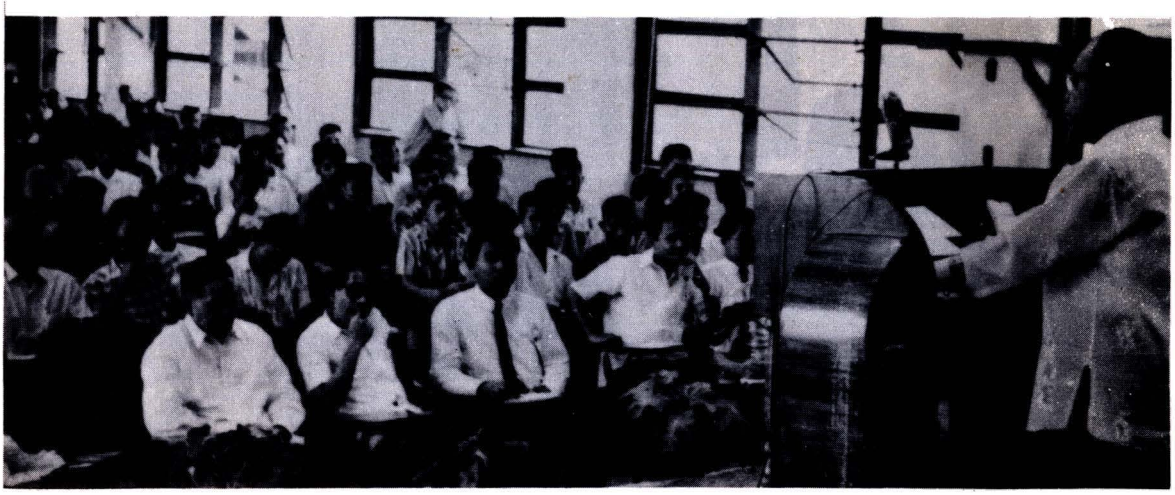
He said a total of 567,107 hectares was delimited last year out of which 69,984 hectares were alienable or disposable and 497,121 hectares timberland.

Fish and dairy production are also receiving ample support from the Bureau. Areas suitable for grazing and pasture are released to qualified applicants. Some portions of the country's swamplands are also released for fish pond purposes to accelerate fish production to sustain local fish requirement.

Utleg who is concurrently officer-in-charge of the forestry bureau viced former acting director Apolonio R. Rivera who was recalled by President Macapagal to Malacañang.

He said, productive agriculture depends in a large measure upon the favorable influence of the forests. According to him forests minimize the flow of floods and surface water after heavy rains which are destructive to lowlands crops. Besides, forests are windbreaker, soil fertilizer, soil conserver and most of all the source of the raw materials of the lumber industry which is one of the mainstays of the country's economy.

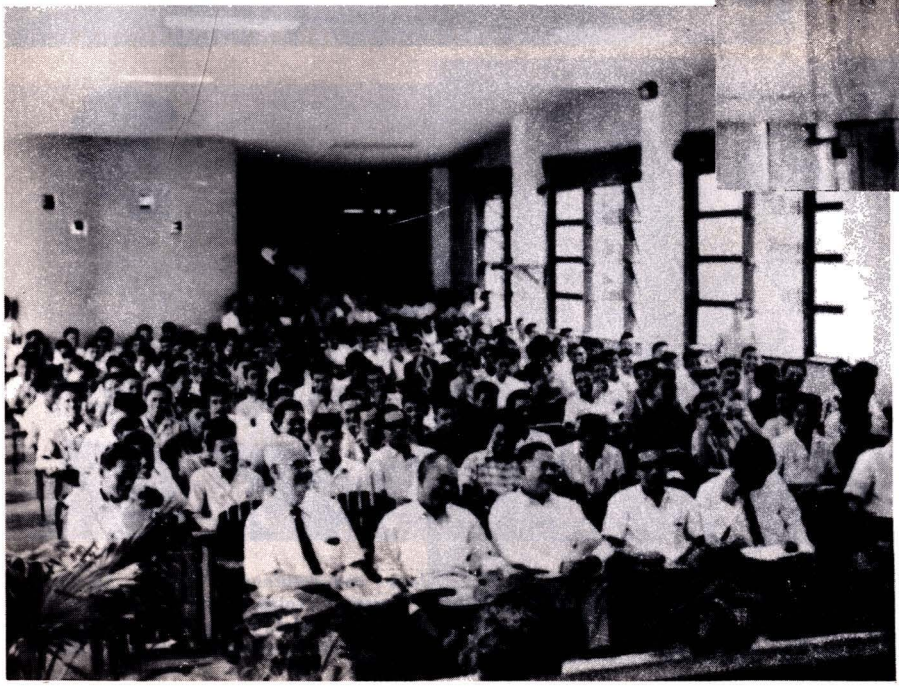
CAMPUS SCENES



Director Utleg recalls his student days and exhorts the students to prepare themselves for the many wonderful opportunities for a well-prepared graduate in the government service or in private industries.

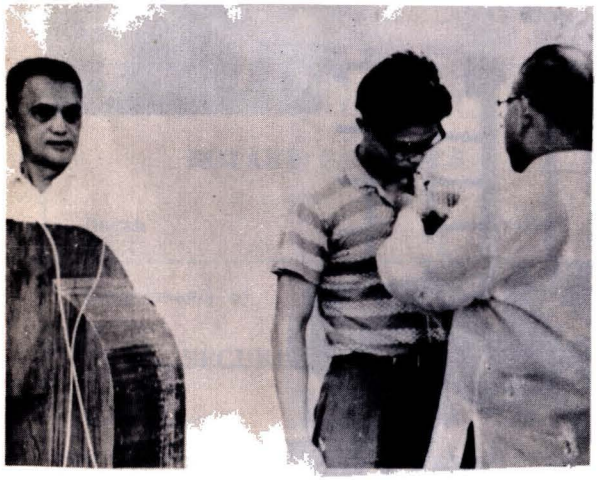
Dean Shirley of the State University of New York's College of Forestry greets the Student Body.

Part of the audience in a jovial mood during the program sponsored by the Makiling Literary Club at which Dir. Utleg and Dean Shirley were the principal speakers.

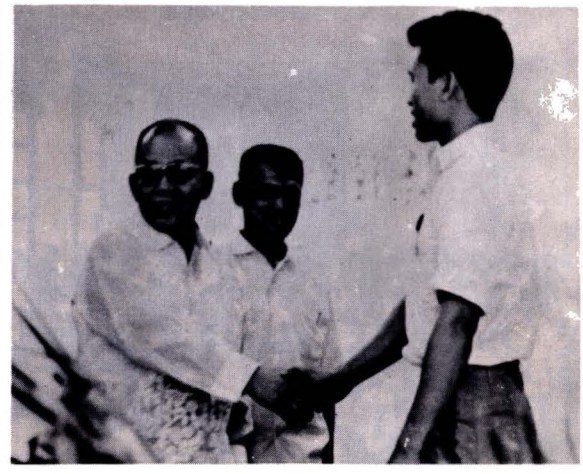


Director General Dussit Bhanijbatana of the Thai Royal Forest Department and Mrs. Bhanijbatana visit his Alma Mater. (1 to r) *Prof. C. Recto, Secretary of the College of Forestry, Dir. Gen. Bhanijbatana, Dean Gregorio Zamuco and Mrs. Bhanijbatana.*

Dir. Gen. and Mrs. Bhanijbatana with Prof. Blando, F. Leaves *Adviser, and Thai Students on the occasion of their visit to the College.*



Dir. Utleg pins the Pres. Romulo gold medal on Florencio Macaranas for winning the first prize in the Essay Writing Contest, under the auspices of the Makiling Literary Club. Professor Blando, the Club Adviser looks on.



Dir. Utlegs congratulates Narciso Mindajao, Editor of the Forestry Notes, *after pinning on him Adm. Viado's Silver Medal, for winning the second prize in the Essay Writing Contest, as Prof. Blando looks on.*

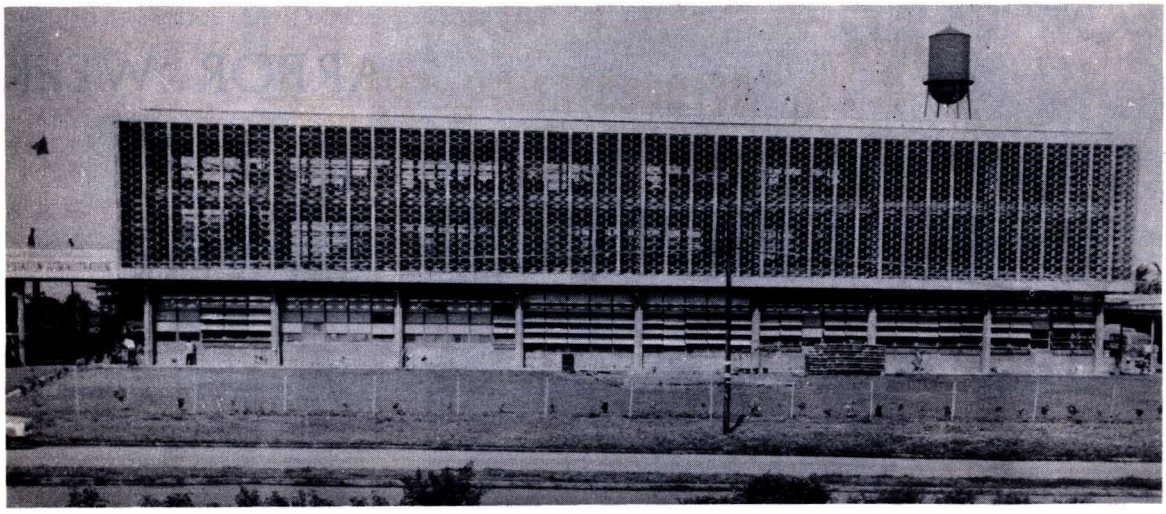
ARBOR WEEK SCENES

Dean Gregorio Zamuco all in smiles talks to the students on the importance of planting trees.

Students assemble for briefing on the road to the planting area.

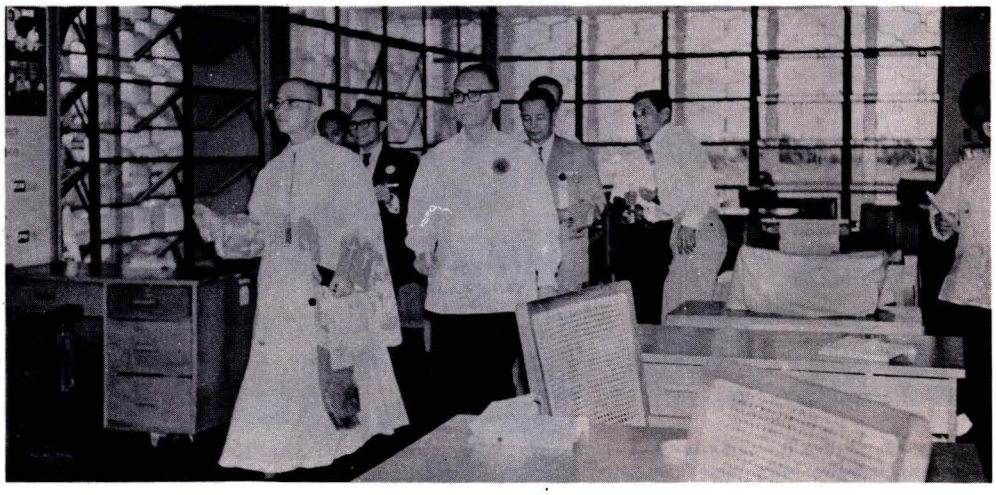
The Faculty and their wives, too, are there pitching in

Prof. Jacalne, Chairman of the Dept. of Forest Extension and Information, recounts the history of tree planting in Mt. Makiling.



The new three-storey central office building of the Reforestation Administration along Visayas Avenue at Diliman, Quezon City. The building is estimated to cost ₱400,000.00 upon completion.

The First Lady unveils the Reforestation Administration plaque on the occasion of the fifth anniversary and central office inauguration of the R.A. At the left of the First Lady are Mrs. Feliciano, Sec. Feliciano, and Mrs. Jose Viado.



Rt. Rev. Msgr. Jose C. Abriol blessing the Reforestation Administration Building. Administrator Viado is at his left.

REFORESTATION ADMINISTRATION Notes

Reforestation Administration
Diliman, Quezon City

BAJA, RESURRECCION RECEIVE CERTIFICATE OF MERIT

Forester Honorato Baja, chief of the administrative services division, and Hugo Resurreccion, a nursery farm supervisor, both of the Reforestation Administration, were awarded certificates of merit by Secretary of Agriculture and Natural Resources Jose Y. Feliciano for their outstanding services in the government.

The awarding rites were held on the occasion of the second national convention of the Department of Agriculture and Natural Resources Employees Association (DANREA) at the Manila Hotel recently.

Baja was adjudged "Outstanding Bureau Official", while Resurreccion was acclaimed "Outstanding Fieldman."

Forester Baja first started as a forest ranger in the Bureau of Forestry after graduating from the U.P. College of Forestry just before World War II. Upon the creation of the Reforestation Administration as a separate government forestry agency in 1960, he assumed the position of chief of the RA extension section till his appointment as administrative services division chief early this year.

* * *

FONTANILLA, SPEAKER AT UPCF

Forester Florentino Fontanilla, chief of the statistics and extension division of the Reforestation Administration was resource speaker at a convocation sponsored by the department of forest management, UP College of Forestry last November 24, 1965.

He discussed the development of the various reforestation projects managed and maintained by the agency, 65 in all scattered throughout the country.

The convocation was attended by forestry students taking courses in forest management including faculty members of the College.

* * *

VIADO ADDRESSES LUCENA ROTARIANS

Administrator Jose Viado of the Reforestation Administration, speaking before the Lucena City Rotary Club monthly luncheon meeting last week, warned that "we are too much in a hurry to liquidate our national patrimony — our forests — to make millionaires overnight out of a few people given concessions and licenses to exploit our forests."

This statement was made in the wake of a recent survey report by the Bureau of Forestry that in Mindanao alone, forests are vanishing at an alarming rate of 90,000 hectares annually for the last five years.

To date, there are 65 reforestation projects established throughout the country and we have increased our reforestation accomplishments from barely 1,000 hectares at the passage of Republic Act 115 in 1947 to an annual average of about 30,000 hectares only.

This figures is obviously still very much far behind the rate of forest destruction which is 90,000 hectares a year in Mindanao as according to the latest Bureau of Forestry report, and even much farther behind the estimate of the National Economic Council which is about 172,000 hectares of forests destroyed yearly.

The administrator also bewailed the recent reports that, wittingly or unwittingly, we have allowed Japan to offer stiff competition to our lumber and plywood exports to other countries such as the United States. The fact is that the raw logs from which the Japanese skillfully manufacture their relatively cheaper lumber and plywood exports to other countries are imported from the Philippines at a concededly low price.

It is internationally known that we have the world's best natural forests but the paradox of it is that we are destroying them faster than any other country in the world, according to the RA administrator.

Viado said that there is no need for dramatizing the necessity and importance of keeping our hill-

sides, mountains, especially watershed areas covered with forests. The lesson from China's tree-less mountains inviting flash floods and other disasters should be enough hard lesson for us.

"For when we speak of forest conservation," the administrator declared, "we invariably mean water conservation, soil conservation, wildlife conservation and can't it be also said, human conservation?"

The inevitable results of the denudation and ravage of our forests had left telling effects upon the people and those events are far more effective than millions of speeches put together, according to Administrator Viado. For who can ignore the annual floods during the rainy season and the droughts during the dry season?

"In order to minimize the effects of these natural phenomena, if that is the only thing now that can be done, let us put our shoulders together," the RA head appealed, "and combat the elements not just with palliative measures but go to the root causes of these phenomena for a lasting remedy."

* * *

NEC APPROVES R.A. FOOD ASSISTANCE PROPOSAL

National Economic Council Chairman Hilarion M. Henares Jr., recently succeeded by Filemon Rodriguez, has favorably recommended the approval of the Reforestation Administration's project proposal to the World Food Program of the United Nations Food and Agriculture Organization.

The proposal consists of a food assistance to be paid in kind by the World Food Program of the UN valued at more than ₱7 million to aid the reforestation efforts of the Reforestation Administration.

The assistance will aid a proposed project area composed of 18 reforestation projects in Luzon which are mostly located in the watershed area of important rivers now harnessed or projected to be harnessed for irrigation, hydro-electric power and domestic purposes.

It is expected to spearhead an accelerated forest education, reforestation schedule and allied activities.

Administrator Jose Viado likewise stressed the significance of the assistance project. He said the present rate of deforestation and forest destruction in the Philippines has surpassed by far the reforestation work done by nautre and by human beings. It has come to a point where in a few years the destruction of the forest resource will jeopardize the future economy of the country unless remedial steps are taken right away to institute an effective program of reforestation. The UN assistance project is an important and workable step, Viado said.

The proposed joint venture of the Reforestation Administration and the UN is calculated to help ameliorate the living conditions in the rural areas where this assistance will operate. Consequently, the people benefited by this UN assistance will help insure the continuity of the forest resources.

* * *

URGE NUCLEAR ENERGY COURSE INCLUDED IN FOREST CURRICULA

A course in nuclear energy should be introduced in the professional forestry course to enable would-be scientist students to grasp the fundamental techniques on the uses of atomic energy in forestry research.

This is the contention of Isidro D. Esteban, a research forester of the Reforestation Administration and a UN FAO-IAEA fellow who was just back from a two-month international training course on the use of radioisotopes and radiation in forestry research in Hannover, West Germany.

Esteban claimed that at present, the emphasis is given on the use of radioisotopes in agriculture, medicine, engineering, and industry while its use in forestry has apparently been overlooked. He asserted that atomic radiation can have various useful applications in forestry as well, such as in tree physiology, forest soils, tree breeding, silviculture, forest products utilization, forest entomology, pathology and activation analysis.

To induce forestry students who can be potential scientists to explore the vast possibilities of the use of atomic energy or radiation in these various fields of forestry, our forestry schools, especially the UP College of Forestry, should initiate the training of their students on radiation biology, Esteban asserted.

"This necessitates the inclusion of a course of courses in atomic energy or nuclear physics in our forestry curricula to keep abreast with modern trends," Forester Esteban said. "I am confident though that our forestry educators cannot have less foresight on this matter of no mean consequence," he concluded.

* * *

VIADO REPORTS ON PROGRESS OF REFORESTATION

Administrator Jose Viado of the Reforestation Administration has reported that 26,141 hectares of denuded forest lands have been reforested by the agency within the fiscal year 1964-65.

The areas reforested consist mostly of watersheds of important rivers and water sources harnessed for irrigation, hydroelectric power, and domestic purposes. The total area of reforestation plantations under maintenance now is 126,550 hectares, containing some 198.9 million trees.

Administrator Viado said that in accomplishing this task, the agency was backed up by a labor force composed of 66,000 laborers and less than a thousand permanent employees. It was learned that the casual workers were recruited from all parts of the country.

"Because of considerable progress in reforestation work, many areas which were once useless and unproductive can now be considered as assets to the agricultural and economic development of the country, Viado claimed. Besides this, we were able to at least help solve the unemployment problem by employing as many needy laborers, though on a rotation basis."

To speed up the reforestation of wide areas ravaged by loggers, kaingin farmers and natural catastrophes, the agency has utilized modern methods. Recently, it has intensified research activities through the creation of a research division.

* * *

PANEL STUDIES TURNOVER OF DENUDED AREAS TO R.A.

A special *ad hoc* committee to find ways and means of effecting the expeditious and efficient turn-over of denuded areas of the public domain requiring immediate reforestation to the Roferestation Administration was created by virtue of Special Order No. 122, series of 1965. Jose Y. Feliciano, secretary of agriculture and natural resources signed the creating order.

The special order came in an effort to accelerate the pace of reforestation work throughout the country which is being undertaken by the Reforestation Administration. It was also aimed to seek cooperation and coordination of the other bureaus and offices under the DANR whose functions may be affected for this purpose.

Valerio O. Ergino of the DANR and Regulo D. Bala of the RA, both foresters, were appointed chairman and vice-chairman respectively, of the *ad hoc* committee.

A representative from each of the Bureau of Forestry, Parks and Wildlife Office, Bureau of Lands, Bureau of Soils and Bureau of Animal Industry designated by their respective directors are members of the *ad hoc* committee.

* * *

3 R.A. MEN ELECTED TO PGEA COUNCIL

The Philippine Government Employees Association (PGEA) elected on December 10, 1965 twenty-five new council members for the fiscal year 1965-66.

Elected among the 25 to the national council are Atty. Rosario Jaramillo, Atty. Eufemio Dacanay, and Forester Regulo D. Bala.

* * *

CRITICAL WATERSHEDS NEED IMMEDIATE REFORESTATION

Macid Y. Gulcur, United Nations watershed expert and project manager of the UN assisted project, "Forest Range and Watershed Management" in the Philippines, said that in the last eleven years the country had cleared about one million hectares of forest lands.

Speaking here before the recent conference of foresters in charge, regional officers and fieldmen of the reforestation administration, the UN expert warned that as a result of such extensive exploitation of forest lands, we are losing at the average one millimeter of top soil every year, an asset costing about ₱10 million in the last 5 years.

"In the Ambuklao watershed area alone where the multi-million hydroelectric power dam is situated, the rate of erosion is one centimeter every year," Mr. Gulcur claimed. The Ambuklao watershed has an approximate area of 63,000 hectares and more than 10,000 hectares of this area now need immediate reforestation.

Such impoverished condition of lands should have been prevented if the Filipinos have not been so indiscriminate and destructive with their forests according to Gulcur.

"It would be noted that Filipinos are capable of practising the proper profitable land uses desired," the UN watershed expert said. He cited as best evidence of this assertion the 2,000-year old world famous and scenic Banawe rice terraces in Mountain Province. The terraced areas consist about 40,000 hectares with irrigation water properly managed.

Gulcur stressed confidently that reforestation is about the best remedy to minimize serious damages due to siltation, water shortage and floods. As a proper land use practice, reforestation is a basic type of watershed protection control measure.

* * *

VIADO UNDERSCORES REFORESTATION BEFORE LUZONIAN COLLEGES

The necessity of conducting massive reforestation of all the existing denuded forest lands throughout the country as a means to balance the fast rate of forest destruction was underscored by Administrator Jose Viado of the Reforestation Administration in a convocation speech at the Luzonian Colleges in Lucena City.

Viado explained how the over-exploitation of the present forest resources would result in destructive natural occurrences such as floods, droughts, erosion, etc., which destroy agricultural crops and farms, wreck havoc to public works projects worth millions, and cause the siltation and sedimentation of hydroelectric power dams thereby resulting to brownouts and lack of irrigation water.

The administrator pointed out that there are more than 5 million hectares out of the total land area of the Philippines covered with grass and therefore are a liability rather than an asset to the nation.

"This vast areas of idle lands should be rehabilitated fast because of the serious danger they pose not only to the present but to the future generations as well," Viado warned.

Reforestation is about the best solution to the prevailing ills brought about by wanton forest destruction. There is also a need for our people to appreciate the value and importance of forests in order for them to practice conservation, he concluded.

* * *

R.A. OBSERVES 5TH ANNIVERSARY; INAUGURATES CENTRAL OFFICE

The Reforestation Administration celebrated last September 21st its birth five years ago by virtue of Republic Act 2706.

Side by side with the observance of its fifth anniversary, the agency also inaugurated its three-storey central office along Visayas Avenue at Diliman, Quezon City. The building is estimated to cost ₱400,000.00 upon completion.

The inaugural and anniversary program started at four o'clock in the afternoon. Forester Jose Viado, Administrator of the Reforestation Administration, welcomed guests and the field and central office personnel of the agency followed by the reading of the address of His Excellency, President Diosdado Macapagal by the First Lady, Mrs. Evangelina M. Macapagal. Acting Secretary Jose Y. Feliciano of the Department of Agriculture and Natural Resources introduced the First Lady.

Mrs. Evangelina M. Macapagal, the First Lady, performed the traditional cutting of the ribbon, assisted by Mrs. Maria Elena N. Feliciano and Mrs. Antonia P. Viado.

The First Lady unveiled the reforestation administration plaque with Secretray Feliciano and Administrator Viado assisting after which Rt. Rev. Msgr. Jose C. Abriol blessed the building.

The main office inauguration and fifth anniversary celebration of the Reforestation Administration was preceded by a two-day conference of regional officers and foresters in charge of the various reforestation projects of the agency starting last Sunday, September 19.

* * *

FORESTRY LEAVES
College of Forestry
College, Laguna

September 2, 1965

Mr. Feliciano S. Esmade
Tungao, Butuan City

My dear Mr. Esmade:

This is to acknowledge receipt of P.M.O. No. 65/1268 in the amount of ten pesos (₱10.00) attached to your letter of August 17, 1965 as your regular subscription to the Forestry Leaves.

In behalf of the Forestry Leaves Staff I wish to thank you ever so much for your untiring support to make the Forestry Leaves always Green.

I hope you will coordinate your colleagues in the field to support our Magazine in all the succeeding issues.

My warmest regards.

Very truly yours,

Dean GREGORIO ZAMUCO
U.P.C.F.

Copy furnished:
Business Manager, Forestry Leaves

* * *

Dear Colleague:*

I would like to express to you personally my appreciation for your support and cooperation in our joint mission in the interest of higher education in our country. On Tuesday December 21st 1965 at 5:30 p.m. Mrs. Romulo and I are inviting our faculty at the Executive House. Please give us the pleasure of your company and afford us also the opportunity to extend to you our best wishes for a Merry Xmas and a Happy New Year.

Sincerely,

CARLOS P. ROMULO

*To the Members of the Faculty
College of Forestry, U.P.

October 30, 1965

Dean Gregorio Zamuco
College of Forestry
College, Laguna

Sir:

Hereunder are the positions and addresses of graduates of our College of Forestry, working with the Forest Service of Sabah, which may be of interest to students and our fellow alumni:

Headquarters, Sandakan, Sabah

1. V. M. Corpus, B. Sc. Phil.; Dip. For. Can., Assistant Conservator of Forests
2. E. R. Pascua, Timber Officer

Sandakan Forest Circle

3. L. N. Nobleza, District Forest Officer, Sandakan, North (Senior Forest Officer)
4. M. P. Fabia, B. Sc. Phil.; Dip. For. Canb., District Forest Officer, Sandakan, South (Assistant Conservator of Forests)
5. M. Leproso, Assistant District Forest Officer, Sandakan, North (Forest Officer)
6. T. V. Eusebio, Assistant District Forest Officer, Sandakan, South (Forest Officer)

Tawau Forest Circle

7. J. Alabazo, B. Sc. Phil., District Forest Officer, Tawau (Senior Forest Officer)
8. M. A. Munoz, B. Sc. Phil., District Forest Officer, Mostyn (Senior Forest Officer)
9. V. L. Dotimas, B. Sc. Phil., District Forest Officer, Lahad Datu (Senior Forest Officer)

West Coast Districts

10. F. M. Corpus, District Forest Officer, Jesselton, (Senior Forest Officer)
11. C. J. Rivera, Assistant District Forest Officer, Jesselton (Forest Officer)
12. J. H. Sario, Park Warden in Jesselton, Kinabalu National Park (Senior Forest Officer)
13. M. P. Udarbe, B. Sc. Phil., Forest Officer. Under training in Australia.

Best regards.

Sincerely yours,

(Sgd.) F. O. CHINTE

THE AUSTRALIAN NATIONAL UNIVERSITY
THE SCHOOL OF GENERAL STUDIES,
DEPARTMENT OF FORESTRY
P. O. Box 4, Canberra, A.C.T.

October 6, 1965

The Publications Officer,
College of Forestry,
University of the Philippines,
Laguna, Philippines

Dear Sir,

In 1965 the Australian National University took over the functions of the Australian Forestry School which provided the national centre for higher forestry education. A Department of Forestry in the Faculty of Science of the Australian National University has now been established for this purpose.

At present we are in the process of forming a library and are seeking publications dealing with Forestry and related subjects.

We would be most grateful if we could be placed on your exchange mailing lists. As we are a new Department in the Faculty of Science of the Australian National University we have not, as yet, published material available. It is hoped that exchange publications will be available in the very near future.

If you are agreeable to the above suggestions I should be pleased to received your advice so that I can place you on our mailing list.

Yours faithfully,

P. REEV (MRS.)
Librarian

* * *

Department of Entomology
University of Minnesota
Saint Paul, Minnesota 55101
U. S. A.
October 26, 1965

Dean Gregorio Zamuco
College of Forestry
University of the Philippines
College, Laguna
Philippines

Dear Dean Zamuco,

I am most happy to inform you that I have finally passed both my preliminary written examination (on September 20) and my preliminary orals (a few days ago, on October 20). My adviser was pleased with my performance in both of these examinations, especially in the orals. The other members of my committee also felt I had done a very creditable job.

Now that these two examinations are out of the way, I can devote the balance of my stay here to my thesis and course to my research assistanship. There is still a lot of work to be done on my thesis. In connection with my thesis, I would like to request for financial aid, from the University of the Philippines, for the typing, Xerox processing, and microfilming of my thesis. In addition to this I would also wish to inquire if it is possible to obtain money for the expenses for shipping my books and notes specially related to my field of studies. I would appreciate it very much if you could inform me on the proper procedures in applying for the above financial aids from U.P.

My wife and I are sending our warm wishes to you and your family and also to the College staff.

Very respectfully,

(Sgd.) VICENTE L. SAPLALA

A true copy:
benev/upcf
12-31-65

ROYAL FOREST DEPARTMENT
Bangkok, Thailand

24 November 1965

Gregorio Zamuco Esq.
Dean, College of Forestry
University of the Philippines
College, Laguna

Dear Sir:

I have the pleasure to acknowledge receipt with thanks your letter of the 1st inst. In reply, I would like to inform you that Mr. Placido O. Urbanes, Jr. had got in touch with me during his stay in Bangkok, and I have given him every assistance I could.

I am quite interested and very glad to hear about Mr. Urbanes's idea of putting out *The Asian Lumberman*, a sister magazine of the *Philippine Lumberman* next year. It will be of great benefit to the foresters in this region and I am willing to give full support to this publication.

I am enclosing herewith my bio-data and my photograph for the *Golden Jubilee Memorabilia* of the College of Forestry, and hoping that you will receive them in due time.

With best regards and thanks.

Yours very sincerely,

(Sgd.) DUSIT BANIJBATANA
Director General

A TRUE COPY:
ms/upcf/12-23-65

Sunshine Corner

SUNSHINE DOUBLE

Two duck hunters were sitting behind their blind, one drinking from a thermos of coffee, the other from a jug of whiskey. After some hours of sipping, one coffee, the other whiskey, they spotted a lone duck winging through the sky. Taking quick aim, the coffee drinker fired and miss. The whiskey drinker rose, let fire, and brought the bird down. His companion, properly amazed, complimented him on the shot.

He replied, "Aw, it's nothing. I usually get five or six in a flock like that."

* * *

SAFETY FIRST

The best way for a man to keep a secret from his wife is not to do it in the first place.

* * *

IT'S A DEAL

"Here's your ring. I cannot marry you, I love someone else."

"Who is he?"

"You're not going to kill him?" she asked nervously.

"No, I'll try to sell him the ring."

* * *

GOOLAROOLONGA!

The U.S. lumber tycoon, on safari in Africa, had been invited to a pygmy village where he enjoyed a native feast and was treated as a guest of honor.

To repay their hospitality he decided to tell them a few facts about his native U.S. "Back Home," he told them, spreading his arms wide in demonstration, "we have trees that grow as big around as your biggest hut!"

At this, the pygmies interrupted him with great shouts, "Goolaroolonga, goolaroolonga," they cried.

The lumberman went on: "In just one of our trees there would be enough wood to make a good house for every one of you," he told the horde about him.

Again the shout went up, "Goolaroolonga, goolaroolonga!"

"In one of our big mills," he told them, "it would take only a few minutes to cut all the lumber needed to make each of you a house."

The pygmies shouted even louder, "Goolaroolonga, goolaroolonga!" in final tribute to the lumberman's words.

Later, while walking with a chief he noticed an odd looking breed of cattle grazing in a nearby clearing. He asked the chief if he might walk among them to inspect them more closely.

"Of course," said the chief, "but be careful not to step in the goolaroolonga."

* * *

Worried over what to give his girl for her birthday, my grandson asked his mother for help. "Mom," he said, "if you were going to be 16 years old tomorrow, what would you want?"

Her heartfelt reply was: "Not another thing!"

* * *

MOTHER OUTLAW

Telegram: "We have just found your mother-in-law floating in the river with a lobster clamped to each foot. What should we do?"

Answer: "Sell the lobsters and reset her."

* * *

JUST TO BE SURE

"I heard you slap your boy friend when he brought you home last night. What happened?", the mother asked.

"I was just checking to see if he was dead!"

* * *

Who Will Fight for Forest Conservation?

For the past several years we witnessed the disappearance of our forests — the resources so vital to the national security. The Bureau of Forestry which was entrusted to protect it did not have enough funds to carry on its gigantic task. It appealed for support to the President and Congress but, what did it get? It met rebuffs and suffered frustrations.

The late President Magsaysay instituted his "Land for the Landless Policy" which turned out to be "land for the lawless," a policy which emboldened not only the kaingineros but also the squatters and the land speculators in destroying the forests. During the Macapagal era the Bureau of Forestry had experienced having six directors in less than two years — an act that has demoralized every forester to the core. The Bureau asked for more funds to hire more personnel but what did it get? It received another blow on its face from Congress. Instead of giving more funds, Congress enacted two laws which, according to the director of the Bureau of Forestry Apolonio Rivera, will not only tolerate the so called cultural minorities to squat and make kaingin in our forests but also requires the Bureau to facilitate the granting of titles over the lands they occupied. Thus, the enactment of these laws made the President and Congress the worst enemies of forest conservation.

Why did the President and Congress remain deaf and blind to forest conservation? Was it because they did not feel the misery of the masses who had experienced floods and droughts? Or was it because, we failed to let them feel through our own fault the real significance of forest conservation? Perhaps the only way we can get the cooperation of the President and Congress is to act as a solid body and tell them in no uncertain terms what we really mean by forest conservation. But, who will lead the people and have them rally behind them in the crusade for forest conservation. The persons who are more qualified to lead the people are the heads of the different forestry agencies.

This year we witnessed the invaluable cooperation of the Press in focussing the attention of the public to forest destruction. Forestry information writers have strongly denounced forest destruction. They pointed out the reasons for the failure of forest protection, such as lack of funds and political intervention. Through the different media of mass communication they have created awareness on the part of the people to forest conservation.

What we need today is a man who will lead the fight, with a courage, will and zeal that will enlist the people's support for a better forest service and conservation. Lip service to forest service has only brought disappointment. Action is the need of the hour.—A.C.D.

Conservation and Marcos' Challenge to Greatness

President Ferdinand E. Marcos' cancellation of the timber grants in Mt. Apo National Park right on his first day of office has injected a ray of hope and optimism to the forestry spirit already beleaguered by frustrations and disappointments.

Forest conservation was taken for granted during the past years. The Late Pres. Ramon Magsaysay instituted his "Land for the Landless Policy" which turned out to be "Land for the Lawless" and emboldened not only the kaingineros but also the squatters and land speculators in denuding the forests. No other period in the Philippine history have

the forests been so ruthlessly destroyed that all efforts to check the impetus of forest destruction brought about by the policy proved of little significance. Forest destruction did not also slow down during the Garcia regime.

Recovery from the demoralization of the forest conservationists as a result of the Magsaysay policy was not yet attained when the Macapagal era set in. Demoralization among the rank and file of the forest protectors was further aggravated by frequent changes of the director of the Bureau of Forestry and placing non-foresters as directors. Of course, former Pres. Macapagal did not forget to put up a smokescreen to cover from the people's view what he intended to do. Although he declared in an Executive Order the period from August 1965 to July 1975 as forestry development decade, who would believe him that he was really sincere in conserving the forests and developing the forest industries after he had permitted the issuing of timber grants over half of the Mt. Apo National Park? Thanks to Pres. Marcos the licenses were cancelled and the National Park was saved.

President Marcos is indeed the new hope in the conservation of the Philippine forests. All the efforts of the Filipino foresters, including all other citizens in forest protection, are of no avail if the president does not cooperate. In one pronouncement or one stroke of the pen he can wipe out the entire forests. On the other hand, he can make conservation succeed if he continues to be sincere in implementing our forest laws and by giving more allotments for forest protection.

With President Marcos at the helm of government and the different forestry agencies cooperating, there is no reason perhaps why we cannot succeed in forest conservation. The U.S. President Theodore Roosevelt and Forester Gifford Pinchot were able to make unprecedented success in U.S. forest conservation. If Pres. Ferdinand E. Marcos, with the zeal and sincerity of President Roosevelt and Forester Pinchot, will go after forest violators we shall have gained a beachhead against the enemies of forest conservation. Marcos is the new hope of forest conservation. Will our forests live again? — ACD

Republic of the Philippines
Department of Public Works and Communications
BUREAU OF POSTS
Manila

SWORN STATEMENT
(Required by Act 2580)

The undersigned, RODOLFO M. LEAL, Acting Business Manager of FORESTRY LEAVES (title of publication), published quarterly (frequency of issue) in English (language in which printed), at College, Laguna (office of publication), after having been duly sworn in accordance with law, hereby submits the following statement of ownership, management, circulation, etc. which is required by Act 2580, as amended by Commonwealth Act No. 201.

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1. Sent to paid subscribers	520
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RODOLFO M. LEAL
Acting Business Manager
(Title of designation)

SUBSCRIBED AND SWORN to before me this 30th day of September, 1965, at Los Baños, Laguna, the affiant issued his residence Certificate No. A-4600911 issued at Los Baños, Laguna, on Sept. 30, 1965.

GENARO V. CATALAN
Mayor, Los Baños, Laguna

NOTE: THIS FORM IS EXEMPT FROM THE PAYMENT OF DOCUMENTARY STAMP TAX. ACT 2580 REQUIRES THAT THIS SWORN STATEMENT BE FILLED WITH THE BUREAU OF POSTS ON APRIL 1 AND OCTOBER 1 OF EACH YEAR.