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# FORESTRY LEAVES

MOVING UP DAY ISSUE 1960

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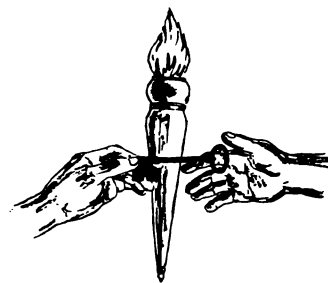
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Republic of the Philippines  
Office of the  
President of the Senate

March 18, 1960

M E S S A G E

I extend my greetings to the Alumni and student body of the College of Forestry of the state university, through their official organ, the Forestry Leaves.

To those who have graduated from the College of Forestry, to those who are about to leave the portals of that institution, and to those who will follow the footsteps of those who have come and gone before, my fervent wish is to see each and everyone of you contributing to the growth of our national economy, more particularly, in the preservation and conservation of our forests.

There is cause for alarm over the wanton destruction of our forests. I enjoin the help of all, therefore, especially you who have been trained along this line, to prevent the wastage of our God-given heritage, so that the Constitutional mandate "to conserve and develop the patrimony of the nation" may be fully realized.

I urge you to help us in the task of nation building and with that patriotic duty clearly instilled in your hearts, I hope that Divine Providence, in His infinite wisdom shall shower upon you the bounty of His blessings.

*E. Rodriguez, Sr.*  
E. RODRIGUEZ, SR.



H. R. No. 3

REPUBLIC OF THE PHILIPPINES  
HOUSE OF REPRESENTATIVES  
MANILA

OFFICE OF THE SPEAKER

M E S S A G E

I am happy to express my warm felicitations to the graduates of the UP College of Forestry and to wish them Godspeed to success in their chosen calling. Commencement is really a beginning, a beginning of new adventures, of new challenges, of new accomplishments. I know that, imbued as they are with the high ideals of their Alma Mater, the graduates will lend greater radiance to the record of the U. P. and be able to acquit themselves creditably in the years that lie ahead.

  
DANIEL Z. ROMUALDEZ





### **M E S S A G E**

I doff my hat to the 1960 graduates of the University of the Philippines College of Forestry. After having endured a weary four-year scholastic pursuit, you have now finally reached a new threshold that promises to be another decisive point in your lives.

Unlike other professions, forestry job is mostly away from the sparkling light of civilization. When you embark on a forestry career, you leave behind that part of life where material indulgence is the general rule rather than the exception. As a forester or as a ranger, you will necessarily have to stay most of the time in the forests, often away from your beloved ones.

But you will have the consolation of knowing that in performing your duties in the forests you are serving the interests not only of the present but also of the future generations. This is one characteristic that can not be claimed by most of the other professions. There can be no greater service than that performed by foresters and rangers for the benefit of all generations.

As you step out of the portals of the College, let me wish you good luck. I am sure you will succeed if you will always have the spirit you have imbibed while in the College of Forestry.

*Felipe R. Lango*  
**FELIPE R. LANGO**  
Director of Forestry



**University of the Philippines**  
COLLEGE OF FORESTRY  
COLLEGE, LAGUNA

**M E S S A G E**

Moving Up Day has always symbolized for us growth: physical, intellectual and moral. This year's Moving Up Day brings to our mind the progress that our College has made during the fifty years of its existence.

Fifty years is not really long in the life of an institution, but looking back at the old days, when the school began as a department of the College of Agriculture, we cannot help feeling proud and happy at the great strides it has made since the pioneering years.

From the humble beginnings of a small faculty and a handful of students, housed in nipa huts, it has grown in physical plant, faculty and student body, and a vitalized curriculum, streamlined to the needs of the Bureau of Forestry and the forestry industry. Her sons after their graduation have helped in the huge but thankless task of conserving our forests, of disseminating forestry knowledge or in other fields of endeavor, dedicated to the service of mankind.

May the significance of this day be instilled in the minds of this year's graduates so that they would continue contributing their share, in the noble tradition of their predecessors, to the progress, prosperity and happiness of the Nation.

  
GREGORIO ZAMUCO  
Dean

# Forest Conservation Problems and the Logging Industry \*

By JOSE G. SANVICTORES

Mr. Master of Ceremonies; Dean Zamuco and Members of the Faculty;  
Members of the Student Body; Friends:

It is a great honor to be chosen your guest speaker on this day and I wish to extend to the Student Body my heartfelt thanks. In return, I am expected, I know, to contribute to the store of knowledge on forestry or to expound a theory that can lead to the solution of some of our forestry problems. I cannot do either. All I can do is to make some observations on the problems that we face in our logging operations particularly in relation to forest conservation, to which I shall devote the full time at my disposal in today's discussion.

There are two groups whose problems deserve careful study: the lumber exploiters and the "kaingineros". It is important that we understand why they operate as they do, if we are to win them over to the cause of forest conservation and enlist their active and interested cooperation in our efforts to place the business of forestry on a lasting and profitable basis. The punitive policy in dealing with them especially the kaingineros has not proved successful. On the other hand, we are left no alternative but to punish law violators. But actually I have yet to hear of concessionaires whose licenses have been cancelled and we know that the number of successful prosecutions of kaingineros has been decreasing.

Logging to be profitable must be conducted on a big scale. The very nature of the business which calls for large capital investment places it in the big business class.

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\* Address delivered by Mr. Jose G. Sanvictores, President of the Aras-asan Timber Co. during the Forestry Day convocation held at the College of Forestry Auditorium on Nov. 30, 1959.

Notwithstanding the wish and hope of some with little capital, who venture into the lumber business lured by those who have made and are making money, to make a fortune in the shortest time and quickest way possible, nor of the shortsightedness of some officials who, in their desire to see the wealth of the nation divided as equitably as possible among the greatest number, would cut up our forests into small concessions much as agricultural land is parcelled out, find in the end that logging does not lend itself to small scale operation. Much of the destruction of our forests by loggers is attributable to small operators who have to make a quick peso to make both ends meet. With the higher and mounting cost of production, even the big lumber companies are finding it hard to make money. When low grade logs were barterable, log exporters made money — artificially. Now that logs have been removed from the barter list, log exporters are afforded another breathing spell by present high prices for export logs but this again is artificial and temporary. In the meantime, the cost of production is up and the tendency is upward — machinery, equipment, spare parts, fuel, materials and others all cost more now. The break-even production is much higher which makes it harder and harder for small operators to stay in business. If there is added to these the disturbing factor of uncertainty in the policy of the government with respect to log export, the future is none too rosy.

Recognizing these facts, the Department of Agriculture and Natural Resources is favoring, according to my information, granting



companies in financial position to put up manufacturing plants for the processing of wood products larger areas to enable them to go into industrialization and provide for the maintenance of their areas in permanent productiveness. The Department is also requiring new applicants for forest concessions to show capacity to process 30% of their allowable cut. Such a policy will lead to sound forest management. Another forward looking policy being adopted by the Department is granting long-term license agreements in deserving cases.

As it may be difficult to eliminate the small operators entirely, it may be possible to attach them to big neighboring operators with marketing connections and facilities for the manufacture of veneer and plywood and the utilization of wood wastes on a semi-cooperative basis. Some such relationship should prove of mutual benefit, if handled wisely. The big companies should not attempt to squeeze out the small operators but encourage interdependence that will profit both. There are phases of industrialization that can best be developed on such a basis; for instance, charcoal making. Small operators and even kaingineros and marginal farmers can make charcoal on kilns provided by a big company which will briquette and market the finished product. There are cottage industries that can be established utilizing wood wastes on a similar basis.

The aim of progressive lumber companies is toward maximum utilization of the trees cut. At present it is appylingly low—25% of the tree or 40% of the marketable log. There are those who believe that a minimum integrated system of operation should consist of logging, milling, making of veneer and plywood and converting of waste into pulp. And, as pointed out, there should be woven into the general pattern small industries that will push utilization higher and make use of kainginero and idle labor to general advantage.

In the United States private ownership of forests is proving successful. Here the prevailing opinion even among lumbermen

seems to point to lease for 25 years renewable for another 25 years. There seems to be doubt as to the wisdom of turning the public forests to private control even if this could be done. But the trend of official thinking is toward longer tenure for concessionaires whenever assurance is given that they are capable and willing to provide for adequate reproductiveness.

We are submitting to the Bureau of Forestry a plan of natural regeneration and reforestation for trial on 100 hectares of logged-over area which, if approved and found successful, may point to an effective way of managing logged-over areas which ordinarily fall into the hands of squatters.

Statistics on our forest resources disagree. I have listened to long and heated discussions, for instance, on the annual rate of growth of our forests which have left me quite confused. One day I would feel we have a self-replenishing timber supply and so we could contentedly rest only to be followed by another day when I would be thrown into despondency if not panic because of a gloomy picture of disaster that was fast overtaking us. Statistics have a way of playing tricks; they can be made to prove, if cleverly manipulated, either side of a question. And so a layman prefers to bypass figures and see for himself just what is happening. A plane cruise over Mindanao, the last forest treasure house of the Philippines, will convince anyone better than figures, that our forests are indeed fast disappearing. Everywhere they are receding to inaccessible mountain tops at an alarming rate in the face of the wanton destruction by kaingineros and thoughtless loggers.

Now, how to stop kaingin farming. We must try to understand the kaingineros' problem. With them it is a matter of how to eke out a living. They find it necessary to supplement their low income from their marginal farms to clear a patch of the nearby forest. Some have no permanent homestead and lead a life that is semi-nomadic; they are always on the move looking for new forest to clear and plant to temporary crops. Consider-

ing that even our officials who are charged with the duty of enforcing our laws sympathize with the kaingineros and seem ever ready to plead for them and bail them out when arraigned before the Courts, it is not surprising that violation of forest laws goes on unabated. The incident when no less than the President of the Philippines freed the prisoners he found in jail for violation of the forest laws, and, not content with that, chided publicly the Constabulary and Forestry officials connected with the case, has set back the cause of forest conservation many years. Is it any wonder that a few officials lost heart? The wonder is that quite many remained adamant and determined to save the forests. But the odds are too great—the people in general and officials from national to barrio rank seem to be on the side of law violators. However, there are notable exceptions: judges who will not be swerved from administering the law; forest officials who will not be deterred in enforcing the laws by official and popular disfavor.

This general attitude stems from a woeful ignorance of the importance of the forest to the wellbeing of the nation. No thought is given to the role that forests play to equalize climate, to conserve moisture, to control flood, to prevent erosion, to provide food for wild life and in fine to enrich and beautify the place in which we live.

At the same time that law violators must be prosecuted, a more effective way of protecting our forests and insuring their permanent productiveness must be found. We must think of ways of employing Kaingineros in more gainful occupation. In Aras-asan we are using them in weeding experimental plots in our logged-over area. If we are authorized to extend the work of weeding and thinning over a large area then we can employ more of them. Next month we shall receive five charcoal kilns and will try them in the forest and in the sawmill. It is our hope that we can develop an auxiliary industry that can give lucrative employment to kaingineros. Everything will depend on our ability to market the product. Another phase of logging

operation where we believe we can use kaingineros is in logging down small trees in the process of thinning. Every effort will be made to show to them that the prosperity of the Company is also their own prosperity; that their interests do not conflict but in fact coincide.

Under our laws loggers are subject to stricter control and closer vigilance than are the kaingineros. They stand to forfeit their licenses and go to jail for violation of our forest laws. Current impression, however, is quite the contrary. Many seem to think that there are sacred cows that can violate the laws with impunity; that some officials are vested with powers to parcel out public forests. But in truth, we are mere trustees of our forests charged with the duty of protecting and conserving them for the benefit of posterity. We must spare our descendants from the fate of the ancient peoples who destroyed their forests and whose children are now living on deserts where water is so scarce that a bath has become an expensive luxury. It is not yet too late, although time is running out fast on us, to save our people from a similar fate.

When I discussed the idea of trusteeship with our own people right in our logging camp, I did not get that one could call an enthusiastic reaction although I received to respectful hearing. When I said we were privileged to cut only the matured trees and leave the others to mature and replace what we removed, I must have puzzled them. The need for mass education seemed urgent, although I do not subscribe to the conventional campaigns consisting of meetings, inaugural dances and picnics in connection with town fiestas, pamphlets in English and the vernaculars, Presidential Proclamations setting aside certain days or weeks for a designated purpose. They have never seemed effective. I have seen and taken part in many such celebrations. The problem still remains, as far as the kaingineros and marginal farmers are concerned, one of their own survival and no other problem especially one that

concerns generations yet to be born can equal that nor have as strong an appeal to them. It just does not strike home. It lacks meaning. As I have already said, we can only hope to enlist the active cooperation of kaingineros in conserving our forests if we can show them that their selfish interest is linked with that of conservation.

In my talk before the Society of Filipino Foresters last August 1st I suggested that the issue of whether we shall conserve our forests or allow them to be destroyed should be presented squarely before the electorate. It felt to my lot to present this issue to the voters of Cagwait, Surigao where we are operating. In fact, I ran for the office of councilor on that issue. To satisfy your curiosity, I will say briefly that what induced me to run for the office of councilor was the recent grant of additional powers to municipalities by Republic Act No. 2264. I reasoned that if our municipalities misuse or abuse their new powers, the consequence might be detrimental to the development of municipal autonomy and I am for strengthening of the municipalities for they are the foundation stones on which the nation must be built. Then again a municipal council can with its new powers use these powers to repress development rather than promote it. And, finally, those who believe they can help guide our government along progressive paths should not stay on the sidelines but get into the fray. After making a hurried inventory of what Aras-asan Timber Company is and I personally am doing to help the people better their living conditions, I felt that by launching my candidacy I was doing the people a favor and that they would feel that way and figuratively offer me the position I was seeking on a silver platter. As soon as it became known that I was a candidate, many began to wonder why I should seek such a lowly position and in their failure to comprehend my real motives attributed to me some of the most ridiculous ones imaginable. The rival candidates started a whispering campaign that the moment I was elected I

would grab all the land in and around Aras-asan. And so I became a land-grabber. If not because I feared some people were capable of believing such a fantastic charge I should not have taken the trouble to explain. As the saying goes, "it is an ill wind that blows no good": that whispering campaign compelled me to bring the issue of forest conservation before the electorate of Cagwait and I was to rise or fall by the result. The people held the decision in their hands. In meetings in the barrios I explained my idea of trusteeship; said that the company, its townspeople and all are in fact partners in this enterprise; that our company has brought prosperity to our barrio such as neighboring communities of much larger size cannot boast, as shown by the large number of stores (about 24) in town, the several tailors doing a thriving business, the drugstore, the carpenters, the new houses going up; and the appearance of general wellbeing which the ₱40,000.00 the company puts in circulation monthly generates; that we are not warring against the kaingineros but that in fact we sympathize with them; that it is the law of the land that prohibits destruction of the forests; but these and more could not seem to convince them. Finally, I showed them that in one semester when we made money the breakdown of every peso of income was: for salaries and wages — 48¢; spare parts, gasoline, depreciation — 35¢; taxes — 10¢ welfare and charity — 1¢; profit — 6¢. This seemed to have given them an entirely new angle. Whereas before they felt they were the junior partners whenever I would refer to the company as "our" company, now they find their stakes in the company is really considerable and even preponderant.

At any rate, the issue of conservation vs. destruction has been presented before the people squarely and while it is hard to evaluate accurately the true significance of my topping the list of municipal candidates, certain it is that I was not repudiated because of that issue. One day before the election  
(Continued on page 41)



# Silvicultural Practices in Some Tropical Countries and their Possible Applications in the Philippines<sup>1</sup>

By  
EULOGIO T. TAGUDAR  
and  
MARTIN R. REYES  
*of the Bureau of Forestry*

## SIX PLATES

The practice of silviculture in tropical countries presents various problems that are not encountered in countries of the temperate region. Some of the problems are (1) the astonishing diversity of species, many of which are of no commercial value at present, (2) the rapid growth of vines (climbers), weeds and other secondary forest species after the opening of the forest canopy, and (3) the practice of shifting cultivation by squatters or wandering tribes in public forests. The last, known as "kaingin making" in the Philippines, is the principal cause of the destruction of vast areas of virgin and residual forests. Another problem that makes it more complicated is the method of forest exploitation in these countries, in which only the best trees are selected for the market. This method not only leaves spaces open to non-commercial and weed species but also results in the gradual deterioration of the forest.

Several attempts were made to develop some silvicultural techniques for the improvement and management of these evergreen forests through natural and artificial regeneration. Many of the present practices have been the results of years of past observations and researches in the tropics. Since the climatic conditions, forest compo-

sition and behavior of the valuable species are sometimes common within the tropical zone, it seems logical and advisable, therefore, to make use of some of these findings in these countries. This paper attempts to present the methods of these successful practices, including reasons for the changes of the techniques, forest and climatic conditions in these countries, with the hope that these practices may guide Filipino foresters in developing the silvicultural techniques suitable for Philippine forests.

### *Current Silvicultural Techniques*

The current silvicultural techniques in the tropical countries fall under four systems, as follows:

1. Tropical Shelterwood System. Natural regeneration is induced through gradual opening of the stand over natural regeneration.

2. Malayan System or clearfelling over natural regeneration. It prescribes complete felling of the whole crop over reproduction, accompanied by poisoning of the remaining useless trees. Troup (50) calls this *uniform system*, an abbreviation of the *uniform shelterwood system*, which implies a uniform opening of the canopy for regeneration purposes as well as a uniform or even-aged condition of the young crop.

3. Selective System. This system involves the removal of a portion of the timber stand by cutting cycles. The removal of mature, overmature and defective trees, leaving un-

<sup>1</sup> Adopted from Tagudar's paper submitted as a requirement in the Seminar in Silviculture at Yale School of Forestry, Yale University, in the Fall Term of 1957-58, with new developments in Philippine forestry practice integrated.

injured an adequate number and volume of healthy residual trees of commercial and other useful species necessary to assure a future timber crop, and forest cover for the conservation of soil and water, is the objective of this system.

4. Conversion of degraded forests into productive forests by artificial regeneration. The forest canopy is opened up by parallel strips, or by gaps or small openings made at random or otherwise. The desirable species are either sown, underplanted or interplanted into these openings in regular or irregular spacing. Another method that falls under this category is the *taungya system* of establishing forest plantations. A designated part of the public forest, usually divided into small blocks, is leased to local farmers or peasant contractors. These blocks are cleared and burned. Just as soon as the rainy season starts, valuable tree species are planted in regular or irregular spacing.

#### *Tropical Shelterwood System*

This silvicultural system practiced in many tropical countries is patterned after the European Shelterwood System. The system is modified to suit existing local, economic, climatic and forest conditions. The principal aim is to convert the heterogeneous forest with many species of little value to a stand of lesser species but of greater commercial value through natural process, or to let Nature do the work offering her only certain assistance with the object of hastening progress and influencing the composition of the natural crop (8, 15).

Studies on succession of tropical forest conducted by ecologists reveal that natural regeneration can be attained under the natural shelter of forest trees (15). The system evolved is known as *tropical shelterwood system* (5, 7, 8, 12, 23, 24, 29). Budowski (15) states that: "Not only is regeneration assured but the young trees in the sapling stage seem to grow well later if their release from competing vegetation is skillfully accomplished". A brief discussion of these systems as practiced by each country cited follows:

#### *A. Trinidad and Tobago*

These islands lie between 10° 3' and 10° 44' North latitude, or well within the tropical zone. They are in the same latitude as the northern parts of the Provinces of Palawan, Negros Occidental and Cebu in the Philippines. The average annual rainfall is approximately 100 inches. The dry season begins in January and ends in May (32).

The original forest consists of evergreen seasonal forest of the *Crappo-Guatemare* Associations (5, 8, 12, 32). It has been subjected to exploitation, burning and shifting cultivation in the later part of the nineteenth century. The forest consists of several tiers or layers of vegetation interlaced with woody lianas (vines) and numerous understory species with only a very few species of commercial value.

The present silvicultural system practiced is the shelterwood system, modified into high and low shelterwoods. It is described briefly as follows (5, 7, 12):

The practice has shown an interesting evolution. In 1927, the system was clear-felling and burning, followed by planting the desirable species. This was not successful because even after 24 years, the regenerated species were still very poor and the drastic openings encouraged grass invasion. In 1928 to 1929, the method was clearfelling without burning and weeding followed by planting of the useful species. In 1930 to 1931, small areas were planted under a light shelterwood and the overwood trees were removed a year later. Natural regeneration was not yet encouraged.

The present technique, known as high and low shelterwood system was started in 19-32. The operation consists of cutting all vines six to twelve months before charcoal burners are admitted. After the vines have rotted, the charcoal burners cut all the trees marked by the forest officers for removal. All trees not needed for shelterwood are sold. Timber fellings by charcoal burners and timber licensees are regulated so as to leave an exploited compartment with a shelter-

wood of dominant trees of marketable species in the initial cutting. The formation of a high-shade shelterwood, composed of tall trees with clean boles which do not interfere with the growth of the young crop but afford sufficient shade to keep weeds down, is the objective. This is accomplished by the retention of dominants so evenly spaced that their crowns form a regular, light even canopy throughout the area. After the first shelterwood cutting, subsequent tending of the established regeneration follows. It consists of cutting vines and thinning the regeneration to about 8 feet apart. From three to four years after the establishment of regeneration, removal of the remaining shelterwood (dominants and low shade trees) by poisoning begins. Cutting vines, thinning and poisoning are carried out every other year until the young crop is considered safe from competition or damaged by other climbing and inferior woody species.

Ayliffe (5) observes that the new crops established under this system are fast growing and light demanding.

### B. Nigeria

Western Nigeria, where the greater part of the tropical rain forest is, lies between 5° and 9° North Latitude. It has about the same latitude with the island of Mindanao in the Philippines. The average annual rainfall is more than 80 inches. The dry season starts from the month of November and ends in March.

The forest, as described by Barnard (6) and Jones (23) is composed of patches of closed high forest, rarely more than a few acres in extent. It is characterized by the presence of abundant large upper story trees and dense middle and lower stories. Structurally, the forest is a mosaic of closed well-stocked high forest with patches of various forms of the generating forest and scrub. The forest would give a general impression of a collection of large trees growing in a tangle of climbers rather than a dense wood or thicket of trees in which climbers occur

sporadically. Small patches with dense canopies occur where climbers are absent or scarce. The cause of the deterioration of the forest must have been due to heavy shifting cultivation sometime in the past 100 to 400 years and the heavy selective exploitation during the later part of the 19th century.

The silvicultural system practiced in Nigeria is called the *Nigerian Tropical Shelterwood System*. Barnard (7) states that the system is founded upon the old Malayan system and aimed at "inducing" economic regeneration by the gradual opening of the canopy and establishing the regeneration by cleanings before exploitation of economic (commercial) timber trees. The treatment consists of two parts, namely, pre-exploitation and post-exploitation, (7, 23, 29, 40, 41).

The pre-exploitation treatments are carried out in five years. From the first to the fourth year of the regeneration, the operation consists of cutting vines, uneconomic species and softwood species up to two inches in diameter. All poles and erect woody growth of economic species, including coppice growth of valuable trees, are left untouched. All shade-casting undesirable trees of the middle and lower stories are poisoned. In the fifth year of regeneration, the cutting of all emergent timber species for commercial purposes is done by timber contractors. Laborers from the Forest Department are sent to free all economic saplings and poles obstructed by the branches of felled trees.

After the harvest cutting and the freeing of the regeneration, the post-exploitation treatments are conducted. They consist of poisoning all non-commercial trees and other useless species interfering with the growth of the new crop. In the succeeding years, cutting of vines and repeated cleaning and thinning are conducted until the area is passed as regenerated.

Before 1953, the operation consisted of repeated complete cleanings from the first year to the fifth year of the regeneration. This encouraged the development of climbers at the expense of the worthwhile species



and set back the natural succession. It was discontinued and a new technique was adapted. To check the rapid growth of weed species, a closed canopy formed by saplings had to be established as quickly as possible during and after the removal by poisoning of most of the middle and upper stories. This was achieved by allowing the coppice from the uneconomic stems to grow freely and leaving all poles and woody growth below two inches in diameter. Robson (40, 41) states that only in this way can climbers and creepers' growths be checked by natural methods and where climbers and creepers have invaded the forest saplings of commercial species will be assisted by other species in lifting and finally suppressing them and other weed growth.

### C. Gold Coast, Africa

The Gold Coast lies between 5° and 10° North Latitude. Like Western Nigeria, it lies at about the same latitude with the island of Mindanao in the Philippines. Taylor (49) describes the forest as belonging to the *Celtis-Triplochiton* Association of the moist semi-deciduous forest and containing a reasonable proportion of present day economic species. In a one-percent estimate by strip method, there was tallied a total of 3,336 trees above three feet girth breast height, representing 100 species in 94 acres.

The silvicultural system practiced is patterned after the Nigerian Tropical Shelterwood System (T.S.S.) with modifications (50).

The past technique consisted of cutting of vines, followed by canopy openings of different densities such as heavy, medium, and light. The canopy openings were made by felling undesirable species of the lower canopy. The crowns were cut up and the slash disposed of by scattering or piling them around the base of the big trees.

The present technique consists of cutting the climbers and then opening the forest to what is called *medium density canopy opening* in the first year of the regeneration pe-

riod. This canopy opening involves poisoning of all undesirable species of understory trees and shrubs up to one foot girth breast height, leaving all larger dominant and co-dominant trees for the next operation. In the second year, further light opening of the forest canopy, called *light density canopy opening*, is made. Large-crowned understory trees, nine inches basal girth and over, are poisoned and trees and shrubs nine inches girth or less are felled by cutlass. The emergent timber species are left to future logging operation. In the third, fourth and fifth years, the treatment consists only of cutting vines and shrubs by cutlass. In the sixth year, the final felling of the exploitable trees takes place. This is followed by cleaning and coppicing of the damaged saplings. No further operation is conducted until the regeneration is about ten years old (49).

There are two important changes in the past system. The first is in the use of poison in opening of the forest canopy instead of felling the uneconomic trees, cutting the crowns and piling them as in the past technique. The advantages of poisoning are effective killing of the undesirable trees, no damage to the reproduction, no problem of slash disposal and opening of the canopy takes over a period not abruptly. The second is in the nature of the canopy opening. Heavy canopy opening or opening the upper and lower canopies, severe enough to leave only low density canopy is abandoned because natural regeneration of the desirable species hardly make any progress and the influx of fast-growing weeds which covered almost all the young regeneration. The present technique calls for the gradual opening of the lower canopy as soon as the regeneration is established by heavy poisoning of the understory trees and then later by light poisoning of the remaining larger understory trees and the undesirable species of the upper canopy.

In the first operation (medium density canopy opening), many desirable released seedlings have the useful characteristic

of retaining their juvenile form of leaves until conditions become suitable for their development (49). In the second operation (light density canopy opening), the economic seedlings are not only capable of enduring the increased light conditions but also actually require them. The regeneration, too, is sturdier and not so liable to suffer extreme danger from weeds (49).

#### *Clearfelling over Natural Regeneration*

##### *D. Malaya and North Borneo*

These two countries lie 1° and 7° North latitude. They have the same latitudinal range with Davao, Cotabato, and Basilan in the Philippines. The average annual rainfall is 100 inches well distributed over the country. In both countries, the rainfall is heavier on the east than on the west coasts. Richards (39), Walton, Barnard, and Wyatt-Smith (55) and Landon (27) mention that the forests of these two countries contain high proportion of the family *Dipterocarpaceae* and is made up of 50 to 60 per cent of the total volume of trees 12 inches and over in diameter. The forest is composed of several stories. The top or emergent story includes majority of dipterocarp species and few other principal species. These emergent species, whose crowns are usually isolated, rise above the general level of the canopy. The second story is composed of trees with smaller and more compact crowns. The third, fourth and fifth layers consist of very tolerant and small trees, shrubs, palms, ferns and seedlings.

Walton, Barnard, and Wyatt-Smith (55) state that majority of the Malayan timber species are light demanders and if light is available, they grow rapidly in height, particularly in the early stages of development.

The present Malayan silvicultural system, practised after 30 years of experience and research, is termed *clearfelling over natural regeneration*, accompanied by poisoning of the remaining useless trees, either progressively as felling is completed or over the

whole compartment immediately afterwards and before the extraction tracks are overgrown with vegetation (7, 27, 55). Barnard (7) states that if uniform forest is the aim of this silvicultural system, light conditions suitable for maximum height growth of the economic regeneration must be uniform over the whole compartment and this can be only attained by complete removal of the original canopy (except immature trees and advance growth of timber species which are of good form and considered useful enough to be retained), or by several poison-girdlings and exploitation resulting in the progressive removal of the original canopy until it is completely eliminated.

The silvicultural system in Malaya was changed in 1950 from the pre-1950 Malayan System or the *old Malayan Shelterwood System* to the post-1950 Malayan System or *clearfelling over natural regeneration* (2, 20, 26, 28, 46, 47, 55).

*The Old Malayan Shelterwood System.*—In the first year of the regeneration, inferior species are removed in one or two operations by firewood cutters. After a year or two, timber fellings of a portion of the commercial stand by timber contractors and by poisoning of some useless large trees to allow in light to the forest floor are conducted. About three years later, further removal of the undesirable species, two feet in girth, left or missed after the previous operations, is made. Five years to ten years after the establishment of the regeneration, harvest cutting of the principal or emergent species is undertaken. Poisoning the uneconomic species left by firewood cutters and timber contractors is again resorted to. Repeated cleanings thereafter follow until the area passes as regenerated.

*Clearfelling over natural regeneration.*—This procedure involves the complete removal of the original canopy except the immature and advance growth of timber species which are of good form and considered valuable to be retained. The removal of the commercial species by the timber lic-

ensees is followed by poisoning the remaining standing useless trees and poles down to two inches in diameter, except those timber species which are of good form and undamaged during logging. The important objective of this operation is the establishment or formation of a new closed canopy as quickly as possible. The early formation of a closed canopy is considered desirable to control the rapid growth of vines, shrubs and other herbaceous species, to conserve soil fertility and mostly to provide enough light needed by the many important commercial seedlings in order to keep pace with the rapid growth of the secondary species. Another reason is that, in dense woody re-growth (thicket conditions), vines struggle over the canopy that can support their weights and do not entwine themselves around individual seedlings (as they do with isolated saplings and poles after cleaning). Tending operations are not conducted until four or five years after complete removal of the original canopy. Between or after these years, the undergrowth has developed into a dense young pole crop, passed through the dense herbaceous climber stage and has naturally thinned out enough to permit movement below the 25- to 40-foot canopy. The treatments applied are cutting climbers and stemless palms and poisoning fast-growing species, badly shaped or damaged stems and any surviving trees of the original crop.

In the seventh and tenth years after harvest cutting, some or all of the above treatments are repeated.

In about 15 years to 20 years after the establishment of regeneration, poisoning of uneconomic or weed species that are still interfering with the growth of the economic species is resorted to.

The old Malayan shelterwood system worked well when labor was still cheap and when timber extraction was done by animal logging. When labor became very expensive and powerful logging machineries were introduced in Malaya, the system was changed to clearfelling over natural regeneration. Wal-

ton, Barnard, and Wyatt-Smith (52) state that this system has been evolved from a cautious shelterwood system with several successive seeding fellings at intervals of a few years, partly on account of the development of exploitation methods from selective hand sawing to sawmills and partly as a result of research and observation. The use of powerful machinery for logging requires the removal of the whole stand in one operation and destroys most of the regeneration established in the old Malayan system. This practice takes advantage of the ability of the seedlings of the many important commercial species to keep pace with secondary growth when exposed to full sunlight (24). Barnard (7) mentions that there should be no fear in the admittance of sufficient light to the forest floor; that the uneconomic species are not a serious menace to the faster-growing Malayan timber species; that, in dense woody re-growth (maintenance of closed canopy of young trees), climbers struggle over the canopy which can support their weight and do not entwine themselves around individuals as they do around isolated saplings after cleaning; and that repeated cleanings in the old Malayan system set back the natural succession and encourage the development of climbers at the expense of the economic seedlings.

#### *Selection and Irregular Shelterwood System*

##### *E. Ceylon*

Ceylon lies between 5° 57' and 7° 12' North latitude and has about the same latitude with the island of Mindanao in the Philippines. The average annual rainfall is 110 inches and well distributed over the southwest and northeast monsoons. Like other tropical countries, the western part of the country is drier than the eastern part.

The forests of Ceylon are distinctly divided into two communities, the *Mesua-Doona* (*Shorea*) and the *Dipterocarpus* (42, 43). The first type of forest is distributed throughout Ceylon, except in high altitudes, while the second type is found chiefly along



the valleys, rivers and depressions. The *Mesua-Doona* Community composes about 20 to 25 per cent of the total stock. Its associates are *Durio zeylanicus* Gardn., *Palaquim spp.* and *Doona congestifolia* Thw. This community is the most highly developed of the country's wet evergreen communities and also the most valuable high forest community economically because it contains the highest proportion of primary hardwoods and light hardwoods. The second community, *Dipterocarpus zeylanicus* Thw., is recognized as the main type and its chief associates are *Dillenia retusa* Thunb. and *Semecarpus spp.* It forms about 25 per cent of the stock. Both communities are characterized by excellent growth, diversity of species and characteristic layers or tiers of vegetation.

These communities are worked under different systems. The *Mesua-Doona* community is worked under the modified selection system and the *Dipterocarpus* community, the irregular shelterwood system (42, 43).

*Modified selection system.* — Rosayro (42, 43) states that the felling cycle is tentatively fixed at 10 years and carried out later at 6 years intervals. The exploitable diameter limit is 20 inches. Silvicultural operations, carried out immediately after harvest cutting and during the period of the cutting cycle, are mostly tending and cultural treatments designed to improve the composition of the stock. At the end of the 10-year cutting cycle, assessment of the area is carried out to determine the most exploitable species and to know the present volume of the stand.

*Irregular shelterwood system.* — The first operation consists of the gradual opening of the canopy. Complete removal of the overwood is not permitted until an understory of the advance growth and poles of the *Dipterocarpus* has been completely established. The mature and overmature trees of the *Dipterocarps*, 16 inches and over in diameter, are removed gradually by successive fellings. No tending operations are conducted in com-

partments well-stocked with smaller diameter classes until these smaller size classes reach exploitable sizes (42, 43).

#### *Conversion of Degraded Forests into Productive Forests by Artificial Regeneration*

This method is achieved by systematic openings of the forest canopy in the form of parallel strips, paths or small openings and then the desired species are underplanted or interplanted into these openings. The other method consists of opening or clearing the forest in wider gaps or blocks (*taungya system*) about an acre or more in area. Sowing or planting, in regular or irregular spacing, of the desirable species into these blocks is done by local farmers or peasant contractors. The above systems are now widely practiced in most tropical countries of America, Africa and Southeast Asia. Dawkins (17) and Brasnett (11) call this method of converting degraded forests into economic or productive forests, *refining of the forest or enrichment planting*.

The *taungya system* of converting degraded forests into productive forests has been developed and practiced in Burma since 1856 (10). From Burma, this system spread to India and to many other tropical countries. In the *taungya system* of establishing forest plantations with the aid of local farmers (18, 25, 33), the forest is cleared by peasant contractors at the beginning of the dry season and burned before the rainy season starts. At the start of the rainy season, the peasants plant the area with agricultural crops and later with forest seeds or seedlings in regular or irregular spacing. The agricultural crops and forest species are protected from animals and other destructive agencies. The peasant contractors thin the plantation and replace the casualties. Before the peasant worker moves to another area, he hands over the old area with established forest species seedling crop of two or three years to the Forest Department. He is paid for this work based on the number of survivals of seedlings. In Burma and India (35), forest trees

such as *Tectona grandis*, *Acacia* spp., *Terminalia tomentosa* and *Dalbergia sissoo* are planted in conjunction with the raising of field crops.

In Indonesia, the taungya system, called *bosakkerbouw*, has been successfully used in combination with forest agriculture (19). Plantations of about 90,000 acres of teak and 300,000 acres of other species in Java and about 40,000 acres of teak and other species outside of Java are established under this system (52).

In Trinidad and Tobago, British West Indies, teak plantations are successfully established with the assistance of peasant contractors (16). In Belgian Congo, this system has also been successfully used in establishing plantations of *Terminalia superba* in combination with bananas (15,17). Barnard (7) states that taungya system is standard practice in Nigeria in several divisions and some remarkably fine plantations have been established. The species used for planting are teak and *Triplochiton* spp.

Another method of converting degraded forests into economic forests by artificial regeneration is the systematic opening of the forest canopy in strips, paths and small blocks (3, 4, 11, 21, 36). The desired species are underplanted or interplanted into these openings. This is at present widely practiced in Gabons and Camerons, French Equatorial Africa and in Belgian Congo.

The method consists of clearing a strip of 20 meters wide with an alternate of uncleared strip of 20 meters (Plate 1, Fig.1). Trees felled in these strips or clearings are just piled sidewise, not burned. Okoume (*Aucoumea klaineana* Pierre) seeds are sown in the clearings. Frequent weeding is conducted during the first few years after germination to free the seedlings from competition. Thinnings and other silvicultural treatments are conducted thereafter until the seedlings are considered safe from competition.

The other method is accomplished by opening the canopy in parallel strips. The

strips are two meters wide and 20 meters apart. Seedlings instead of seeds are underplanted in these strips. As soon as the seedlings reach about five feet in height, the strips are opened up *fanwise* towards the top to provide adequate sunlight at the early stage of development of the seedlings. This method is used in Gabon for light-demanding useful species other than okoume. In a 15-year-old stand, worked under this method, the average height is 10 meters and the average diameter is nine centimeters. Budowski (15) states that underplanting in strips in secondary forests has been successfully used in Honduras, Guatemala, Mexico and other tropical American countries. The species planted in these countries are teak (*Tectona grandis* L.), primavera [*Cybistax donelismithii* (Rose) Seibert], mahogany (*Swietenia macrophylla* King) and *Eucalyptus deglupta* Blume.

The last method practiced in Belgian Congo is called the *Placeaux Anderson* or Anderson Plot Technique (17). It consists of opening the forest canopy in plots of 4 x 4 meters at 10 meters intervals. The seedlings are planted one meter apart and the resulting dense growth requires internal weeding and slashing around the edge of each plot in the first year of establishment. As soon as the plants reach six feet or more in height, the plots are released entirely from overhead shade by poisoning and eventual thinning to one or two stems per plot.

#### APPLICATIONS IN THE PHILIPPINES

The Philippines lies between 4° 40' and 21° North latitude, well within the tropical zone like other countries mentioned in this paper. The average annual rainfall is 90 inches. Like most of the countries in the tropics the western part of the country is generally drier than the eastern part.

#### Forest Composition

*Virgin forest.* — The forest of the Philippines, like that of Malaya and North Bor-

neo, contains a high proportion of the family *Dipterocarpaceae*. About 60 to 75 per cent of the total volume of trees, 30 centimeters and over in diameter is composed of dipterocarps. Brown and Matthews (14), Reyes (37) and Serevo (44) state that the trees are arranged in several stories.

The top story or emergent layer forms an even canopy. It reaches a height of 65 meters or more and is composed entirely of dipterocarp trees. The middle story is composed of fair-sized trees which spread their

timum development in the Philippines and that whereas, in North Borneo and Malaya, to a still greater extent, species other than members of the *Dipterocarpaceae* are noticeable constituents of the upper story and emergent canopy, in the Philippines (Basilan) the forest is almost exclusively composed of that family alone. He states further that in Malaya, the intermediate classes of saplings, poles and young trees are scarcer while in the Philippines, the intermediate classes are abundant and well distri-

Table 1. Half-Chain Square Sampling (Walton, 54):

	Total No. of Trees	Diameter Class in Inches				
		2-4	4-8	8-12	12-20	over 20
A. Philippines						
1. Dipterocarp species	205	28	41	28	84	24
B. North Borneo						
1. Dipterocarp species	147	69	27	22	20	9

leaves under the branches of the top story. The bottom story trees are small and very tolerant, about 12 meters high and have relatively small amount of foliage. The ground cover is composed of numerous ferns and herbaceous plants and it varies at different elevations. The presence of large vines is a characteristic feature of the dipterocarp forest. In poorer developed types of forests, these vines become prominent.

The dipterocarp trees need partial shade from germination to pole stage, gradually become light-loving towards maturity and finally intolerant during the dominant stages (14, 37).

The composition and stand structure of the Philippine dipterocarp forest are more or less similar to the dipterocarp forests of Malaya and North Borneo. However, it seems that the dipterocarp forest in the Philippines is better than that of the two countries. Walton (54) states that it is at once evident that dipterocarp forest reached op-

buted (Table 1 and Plates 2 and 5).

*Secondary forests.* — In logged-over areas produced by destructive logging, "high grading" (selecting only the valuable and good trees for the market), there are numerous wild bananas, climbers (vines), herbs, overmature and defective trees of the original crop and useless trees of other species (Plate 3). Some patches of reproduction in limited or small areas may be available. These cut-over areas are more or less similar to the degraded forests of Nigeria, Gold Coast, Gabon, and other countries in the tropics.

In logged-over areas where partial openings were made by selective logging and the forest floor was not much disturbed, there are many seedlings and young trees under the canopy of big trees. These dense commercial species respond to the increased light and compete vigorously with the rapid-growing secondary species. They are mostly found between cable ways and on top and sides of ridges and hills (Plate 4.)

In areas entirely and repeatedly cleared and burned for farming and abandoned after three or four years, short jungle woody plants such as *Trema*, *Mallotus*, *Homolanthus* and *Macaranga* species and cogon (*Imperata cylindrica* and *I. exaltata*) take over the premises. These cogon lands, sometimes called "cogonales" occupy wide areas, in the Philippines.

*Similar characteristic features of tropical forests.* In tropical countries, there is relatively uniform condition as to climate, forest composition and growth habits, except in stand densities of the principal species. The climate in those countries is characterized by two distinct types, the dry and the rainy seasons. The first type (dry season) generally starts in January and ends in as late as May. The second type (rainy season) starts in early June and ends in November. In some countries, the rainy season ends in February. The forests are characterized by several layers or tiers of vegetation and astonishing multiplicity of species, many of which are of no commercial value today. Large vines (climbers) are a characteristic feature of tropical rain forests and in poorer types, they are prominent. Another thing in common for most of the tropical forest trees is the growth habits of the principal species. Ayliffe (5), Barnard (7), Walton, Barnard, and Wyatt-Smith (55), Reyes (37) and Rosayro (42, 43) state that the emergent or principal species are light demanders and grow rapidly in height if light is available. In gaps or openings in the forest, several fast-growing woody species, weeds and vines grow rapidly.

*The present Malayan system and the Selection system.* — The development of silvicultural techniques in Malaya and in other tropical countries had interesting evolution. In Malaya, the system evolved from the old Malayan shelterwood system to clearfelling over natural regeneration (*Uniform System*); Trinidad and Tobago, from clear-felling followed by burning to high and low shelterwood system; in Nigeria, from

repeated cleanings in the second to the fifth years of the establishment of regeneration to the maintenance of a closed canopy in the same period of the establishment of regeneration; and in the Gold Coast from the felling of the shelterwood trees to poisoning them to effect the openings of the lower canopy and later of the upper canopy when the reproduction is established.

The uniform system practiced in Malaya is not clear-cutting all the trees in the area. Walton, Barnard, and Wyatt-Smith (56) and Barnard (7) state that in clear-felling over natural regeneration, the resulting crop will not be "uniform", in the sense that this term is applied to temperate forests, on account of the variety of tree species (economic and uneconomic) in several stories, and different growth rates. They state further that the system is just a mixture of felling and poisoning, and that the ground is by no means clear at any time during the operation, except in the immediate vicinities of felled stems and along extraction routes. In fact, the minimum exploitable diameter limit of the economic trees is 4-½ feet girth (40 centimeters diameter) at breast height and all woody growth of uneconomic species, two inches in diameter and less, are left for some years after logging.

Walton (55) states that the intermediate classes of saplings, poles and young trees are usually scarce in Malaya whereas, in the Philippines, the intermediate classes are abundant and well distributed (Table 1). Reyes (37) states that it would be a waste of useful materials to allow most of these saplings, poles and standards to be destroyed or severely injured (Plates 2 and 5).

Another point is that Malaya has still abundant unreserved forests to draw from until the regenerated crops with a much higher yield per acre shall be ready for harvest (6); while in the Philippines, practically almost all forested areas have already been covered by, or being applied for, timber licenses, except those which are presently considered inaccessible. There is very limit-

ed forested areas to tide over the operations of timber concessioners until such time as the regenerated crops shall be ready for harvest. Reyes (37) states that in the Philippines, "we are certain to succeed in the regeneration of the forest with abundant reproduction already existing or developing, but we should take into consideration the continuity of business operations, because a gap in logging operation of certain areas will certainly occur if we have to rely only on seedlings for the next cut".

Rosayro (42) states that "the introduction of the uniform system in management of rain forests is in reality only an effort towards the simplification of the problem of management. The disadvantages of such method may bring soil deterioration due to the removal of all the overwood which sometimes produces conditions of soil exposure and the necessity for revision of the succession by inducing conditions of early sub-seral stage in which a climber or dense undergrowth stage has to be passed through, have not been considered. They may also cause the gradual deterioration of the forest type".

Landon (27) states that the success of their method depends upon the presence of sufficient seedlings of timber species. He did not mention possible method to be adopted in case there is no reproduction during the operation. In the tropics an area cleared without leaving seed trees is invaded by a secondary forest type very different from the original type. In the present Malayan system of silvicultural cutting, it appears that there is no provision for leaving mature seed trees. In fact, all economic trees bigger than 4-1/2 feet girth and uneconomic trees bigger than two inches in diameter (both at breast height) left after logging, are poisoned in several successive operations. Marcello and Tagudar (31), in their studies of logged-over areas 5 to 15 years old at Basilan City, Philippines, observed that poles and standards of commercial species are not found in immediate vicinities of abandoned loading points, spar trees and junctions of log-

ging roads. These areas cleared in the process of logging, are occupied by weed trees.

Brown (13) commenting on the selection system in the symposium on the Regeneration of Tropical Rainforest during the Ninth Pacific Science Congress, said: "The 'Uniform System' had been adopted in Malaya and a selection system, now adopted on a growing scale, has been preferred in the Philippines. I mentioned my belief that the reason for North Borneo utilizing the 'uniform system' rather than the selection system was due more to political factors than the results of research in North Borneo. I pointed out that in the process of conversions by the uniform system the forest is locked up and idle for half a rotation, and that this prospect is being contemplated in Malaya where we are fully aware that there will be a shortage of log supplies before conversion is completed. If a selection system can be adopted, conversion can be completed and the whole forest can be raised to something approaching its potential sustained yield capacity much more quickly".

Considering the structure of the forests of Malaya and North Borneo, it would seem that clearfelling over natural regeneration would be the right approach to forest management. It is entirely possible that they are right about the status of the chaotic weedy growth that might be left after clearfelling of the several stories of the overwood that is, premature cleaning might actually delay rather than accelerate progress towards a good composition. On the other hand, it might also be possible that too long delayed cleaning would enable the fast-growing weeds to get the upper hand. Therefore, the key to success of clearfelling or of any other cultural operation is proper timing of the cultural treatments, such as that they be neither too early nor too late.

After reviewing the development of silvicultural practices in these countries and comparing their climatic conditions, forest compositions and the behavior and classes of the principal and secondary species to those

of the Philippines, the following problems are posed:

1. What is the silvicultural system suitable to the existing dipterocarp forest?

2. What are the cultural treatments to be conducted immediately after logging?

3. What is the cultural operation for the extensive previously unmanaged secondary forest? Can these degraded forests be improved by underplanting or by shelterwood system?

An analysis of the successful practices in many of the countries in the tropics shows that some of them may be applicable in the Philippines.

#### *Silvicultural System Adapted*

For a full appreciation of the silvicultural system adapted, it is well to review the cutting practices in Philippine Dipterocarp forests (44).

Selection system, operated by a diameter limit, has been the common practice of cutting in the forests in the Philippines. It is still very popular among the timber licensees in the country, especially among the small ones. The diameter set is 60 centimeters for the first group; 40 centimeters for the second group, provided that no trees of lauan, apitong, palosapis, tangile, and other dipterocarp species belonging to the second or lower groups less than 50 centimeters in diameter, breast-high, shall be cut, except in rights-of-ways and agricultural lands. The cutting rules also provide for the adequate protection of the residual stand from destruction and unnecessary damage from fire, felling and yarding and for the maintenance of good silvicultural conditions of the forest after cutting. However, because of inadequacy of funds and technical men in the Bureau of Forestry, all these regulations merely take the form of a simple diameter limit. After exhaustive studies on the effect of the diameter limit on the dipterocarp forests by Brown and Matthews (14) and Serevo (44), it was revealed that the system would result in what amounts to clear-cutting the dip-

terocarp forest and its replacement by another entirely different type. It will take a long time, if ever, for the dipterocarps to dominate again the site.

Fortunately, the Government foresaw this danger. To forestall under-stocked or bare areas, selective logging as a concomitant of selection system was adopted (37). The present system as practiced in the Philippines is called selection system with variations approaching that of the uniform system or accessory system for high forest (37). Generally, for the dipterocarp forest, about 60% of the number of trees of a certain group of species (Philippine Mahogany species), including softer dipterocarps and *Anisoptera* species and other commercial trees commonly cut for lumber and veneer within 20-70 centimeters class group in the virgin forest is set for residual growing stock for the next cut. This percentage is what could be practically saved from injury or destruction in mechanized logging wherein care is exercised to the limit of economical operation, as found after a supervised logging study. Such size of residual growing stock is roughly estimated to yield sizes and volume profitable to be cut 30-50 years hence. This is mainly for sawtimber management. With growth data we can evaluate on the basis of this residual growing stock the sustained yield capacity of a working circle, determine the cutting cycles and the allowable annual cut of virgin timber towards a sustained yield management of a definite forest tract, such as, a concession considered as a working circle. — Incidentally, much of the seedlings, saplings and small poles of this group of species as well as other species are saved from destruction for other objects of management, such as pulpwood, matchwood, etc.

In license areas where timber management officers are assigned, tree marking is the method of controlling cutting. It is briefly summarized as follows (37, 45, 48).

1. Before the area is logged, competent forest officers mark the trees to be left.



(when facilities are available, trees to be cut are also marked). They are guided by the 60% goal for future growing stock. Trees so marked are numbered and tallied in a field sheet. After logging, a residual inventory is undertaken and damaged marked trees are checked up in the tree marking field sheet.

Wide clearings in a high-lead show are planted with wildling stock and certain big defective trees are killed standing by girdling.

2. In particular stands where the trees are predominantly in the 60 centimeter and over diameter classes or where they are overstocked with mature and overmature trees and understocked in the lower diameter class groups, the total number of trees to be left for the growing stock will not be less than 40 per cent of the entire stand. This is to prevent too much reduction of stems and exposure of the soil.

3. In stands understocked with Dipterocarp species and other useful trees where standards are wanting, a few seed trees are left to insure natural regeneration.

4. In the pine forest (*Pinus insularis*), sufficient seed trees are primarily marked to be left with certain level of growing stock of small poles and saplings where such a stand occurs.

### *The Silvicultural Treatments*

#### (Timber Stand Improvement)

In our secondary forest (logged-over areas) are many undesirable species. Much can be done to improve the forest by the removal of some of the undesirable to favor the better and more promising species. Recently the Bureau of Forestry has given attention to timber stand improvement. Is timber stand improvement necessary in recently logged areas which are partially cut as well as heavily opened up? If so, what system is suitable? Results of researches and observations in other tropical countries reveal that some sort of partial shade for the desirable species must be left in order to con-

trol the growth of vines, herbaceous and other weed species and to promote the growth of the desirable trees.

The silvicultural treatments that are discussed in the next pages are 'interim guides'. The term 'guide' rather than instructions or rules is used because the former implies more flexibility in application (1). Besides, due to the lack of reliable data on the management practice of the dipterocarp forest, it is not yet permissible to use the statement "*rigid rules and instructions*" (1). These guides are believed to be conservative and applicable. They will, however, be revised as soon as reliable data are available. They are based mainly on research findings and observations on stand behaviour of tropical species by foresters from the United States, Great Britain, France, Belgium and the Philippines who had spent long years in these countries.

#### *A. Silvicultural Treatments immediately after logging*

In cutting areas where mechanized logging is used there are always found open spaces immediately after the operation. These are landings, cableways, skid roads and concentrations of felled tree tops. They are greatest at a radius of about 100 meters from the spar trees in a high-lead system and diminished inversely with the distance from the landing. Where powerful machinery is used, the radius of destruction is even more. In any case, however, there are still many residual trees undisturbed or slightly damaged during logging, between cableways and on tops and sides of hills and ridges. It is in these places where timber stand improvement is necessary, hence the following guides may be followed:

- a. In logged-over areas beyond 100 meters<sup>1</sup> from the spar tree, in case of high-lead set-ups and tractor-logged areas: Kill, either by girdling or by poisoning,

<sup>1</sup>The distance from the spar tree, landing or road where timber stand improvement is to be conducted shall depend upon the severity of damage and degree of the set-ups.

large non-commercial species, including dipterocarp trees, with wide crowns overtopping the residual trees. The opening occasioned by the killing of undesirable trees must provide sufficient sunlight favorable to the growth of the better species.

b. In logged-over areas within 100 meters<sup>1</sup> from the spar tree, in case of high-lead set-ups complete clearings of landings and loading stations of other logging methods: (1) All uninjured or slightly injured dipterocarp species including defective trees shall be left for at least five years after cutting as shelterwood of the desirable species and as sources of seeds.

(2) All erect woody miscellaneous species shall also be left for at least five years in order to establish a new closed canopy formed by saplings and poles as quickly as possible, to check the growth of fast growing vines and weed species, and prevent too drastic opening around the landings.

(3) Cleared portions around spar trees, on landings and along cableways, may be planted to dipterocarp wildlings, teak or large leaf-mahogany seedlings. Studies previously conducted showed about 70 per cent survival of transplanted dipterocarp wildlings (30).

(4) Other cultural operations shall not be conducted in logged-over areas, until after a dense undergrowth of young polecrop has already thinned out to permit movement below the canopy of the regeneration (Plate 6).

*How cultural treatments are to be conducted under present plans.* — A trained technical man heads a Timber Stand Improvement (TSI) crew composed of Bureau of Forestry and timber licensees' employees. The head shall designate or mark the trees

<sup>1</sup>The distance from the spar tree, landing or road where timber stand improvement is to be conducted shall depend upon the severity of damage and degree of the set-ups.

to be killed. If the crew shall compose of four men (including the head), two members make the horizontal cuts (frills or girdles) on the tree to be killed and the other applies the poison into the cuts. This phase of the work may be carried out during the residual inventory of the logged-over area or when the tree marking is well in advance. Silvicides like 2, 4, 5-T, 2, 4-D, sodium arsenite and others, if available, are recommended for the timber stand improvement work.

#### *B. Silvicultural treatments 5 to 10 years after logging*

In many unmanaged logged-over areas (formerly virgin forest), big, cull trees are often left during the logging operations, which interfere with growth of the desirable species. These trees suppress the dense seedlings, saplings and poles of dipterocarps and other useful trees; but, to some extent, they help in reseeding the area and act as nurse trees to young growths; and when the logged-over areas are re-stocked and the stand well established their removal is necessary (22, 34).

Felling these trees is expensive and causes considerable damage to the young stand. Their abrupt removal through felling creates openings for rapid-growing vines, shrubs and other undesirable species and also allows the sudden entrance of light which adversely affect the growth or causes the death of the released seedlings, saplings and young poles. On the other hand, their gradual removal through girdling or poisoning favors the growth and adjustment of the seedlings and young trees to the changed environment. In gradually opening the forest canopy, a necessary amount of shade is maintained to keep back rapid growth of vines and herbaceous species and to permit the establishment of stands of valuable commercial species (23). The ideal form of shelterwood necessary for the favorable growth of seedlings consists solely of tall and cleanboled dominant trees evenly spaced so that their crowns form a regular, light, even canopy throughout (12). Wadsworth (52) states

that the shelterwood must generally provide at least 50 per cent shade to prevent the excessive growth of vines and weeds.

*Considerations in the application of silvicultural treatments of 5 to 15 years old logged-over*

The silvicultural treatments of logged-over areas 5 to 15 years after logging must be confined on accessible areas, on moist coves and lower or middle slopes where fertile soil and favorable environment produce desirable rapid-growing species (22). Such a stand in Basilan City (31), Surigao and Agusan is already well established, comparatively free of undergrowth and has thinned out to permit movement below the canopy (19), practically free of vines and herbaceous species, and relatively with significant growth rates of the most promising species (Plate 5). Furthermore, the wolf trees can easily be distinguished from the crop trees and their elimination by poisoning or girdling is easy and cheap.

The application of silvicultural treatments presupposes careful examination of the areas with a view to determine the method and degree of such treatments. Thus in some parts of the cutover areas occupied by numerous weed species and vines, treatment of such areas may be postponed. All woody species, commercial and non-commercial, may be left for the time being to prevent too much exposure of the mineral soil. Any simple guide or rule that could be applied over wide range of conditions would be appropriate. The simplest way of conducting and increasing the efficiency of the technique does not lie in any general elaboration or over simplification but introducing flexibility, so that silviculture is more closely adjusted to the crop (23). What we can adapt from the tropical shelterwood system to planned cultural operations, in logged-over areas when selective logging was practiced preferably during the period from the fifth or seventh to the fifteenth year after logging, are the following:

1. Cutting vines, rattan and other palm species.
2. Girdling or poisoning surviving cull individuals of the commercial species and miscellaneous trees formerly used as nurse trees; weed trees (fast-growing wolf trees not acceptable for timber); all badly shaped, damaged, diseased or inferior trees; and other miscellaneous and useless trees, five centimeters and over in diameter of the understory trees and of the dominant uneconomic species.

*C. Silvicultural treatment of degraded secondary forest*

There are areas of secondary forests in the Philippines that are practically devoid of healthy and thrifty dipterocarps and other commercial species but occupied by a few defective or sickly trees of the commercial species, and mostly non-commercial trees. There are also areas where destructive logging was the rule rather than the exception and where they were entirely cleared, burned, farmed, and finally abandoned by "squatters" after three or four years of occupancy. In the former, are overmature and defective dipterocarps and many non-commercial trees; in the latter, are short jungle woody plants belonging to the genera *Trema*, *Mallotus*, *Homolanthus*, and *Macaranga*, cogon grass (*Imperata cylindrica*) and some vines in patches or in wide areas.

The suggested silvicultural treatment of this degraded secondary forest, exclusive of grasslands, is as follows:

- (1) The forest should be opened up by parallel strips of two or more meters wide, 10 or 20 meters apart; or by parallel line plot openings each plot two to four meters square, 10 meters apart along the line and 10 or 20 meters between the lines. The size of the opening of the forest canopy is directly proportional to the height of the surrounding trees.

- (2) In both methods, dipterocarp wildlings, large-leaf mahogany, teak or other useful seedlings shall be planted in the strip or plot openings.
- (3) A year or two after the seedlings shall have been well established, the strip or plot openings shall be thinned and freed of vines or weeds, if any. At about the same time, the over-wood along the edge of the openings shall be killed and worked out towards the center of the uncut strips or portions of the area, fan-wise towards the top (2) to provide adequate sunlight at the early stage of the development of the seedlings.

The reasons for leaving uncut strips and making small openings are economy, the need of the young plants for shelterwoods, and minimum disturbance of the environmental conditions affecting plant growth. Another reason as found by Reyes, et al (39), is that by maintaining "chimney-like opening" through the vegetation by light brushing one meter around each individual seedling once a year during the first two years, the survival could be increased. In this experiment (two years after planting large-leaf mahogany seedlings in Basilan Island), a survival of 47 per cent was attained. Barnard (7) and Wadsworth (53) suggest that an ideal overwood consists of dense co-dominant trees around the young plants to provide shade for their stems and the soil beneath; and the opening is directly above the young plants (Plate 1, Fig. B).

Refining the forest (17) or enrichment planting (11) to restore the productivity of degraded forests is expensive for our general practice. But the application of the above or a similar one is better than leaving them in their degraded condition for years on end. It is still cheaper, surer and better to restore a forest to productivity however degraded it may be, than to reforest a barren area.

### *Recommended forest management researches*

Efficient and scientific forest management lies on the reliable data gathered and analyzed through researches, observations and experiences of foresters in the Philippines. Our research work was set back to its initial state because the records of researches conducted for years past were burned during the Japanese occupation and the experimental plots destroyed. It would take years before appreciable and reliable data could be available to base our forestry practices. We cannot afford to wait this long. Meanwhile, we foresters must, like architects (19), devise or formulate plans from scratch, or adopt some proven successful techniques practiced in other tropical countries. When the results of our researches will become available, the forestry practices shall correspondingly be changed or revised. On this premise, the following researches in line with the timber stand improvement work being undertaken by the timber management personnel of the Bureau of Forestry, are recommended:

1. The establishment of experimental plots for conducting studies to determine the response of dipterocarp seedlings, saplings and poles to different degrees of forest canopy openings by poisoning or girdling 25 percent, 75 percent or 100 per cent of the overwood composed of dipterocarps and miscellaneous species.
2. The effectivity of different silvicides, such as sodium arsenate, 2,4-D (Dichlorophenoxyacetic acid), 2,4,5-T (Trichlorophenoxyacetic acid), and herbicides at different concentrations in miscellaneous trees and defective dipterocarp species.
  - a. Sodium arsenate solution by weight:
    - (1) One ounce of sodium arsenate to one pound of water;
    - (2) One ounce of sodium arsenate to two pounds of water;

# Illustrations for "Silvicultural Practices..."

by TAGUDAR & REYES

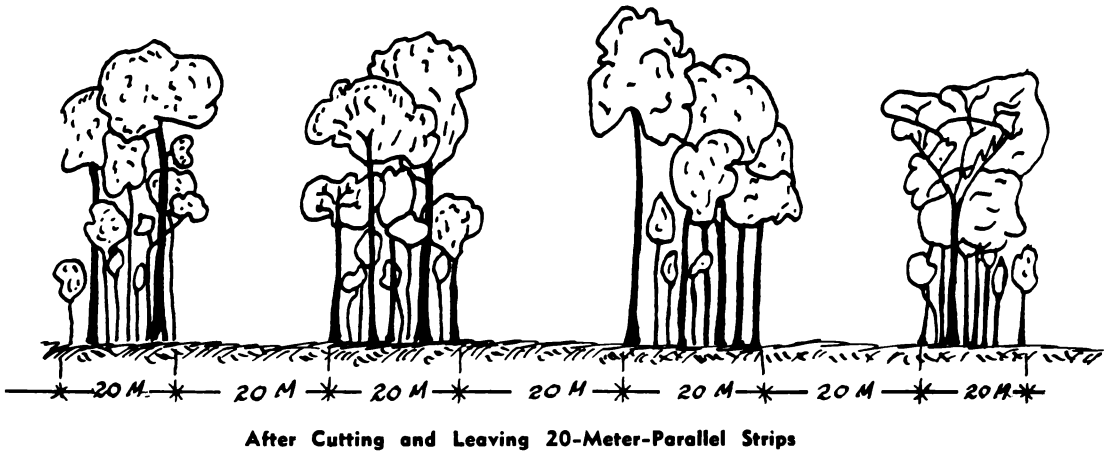


Fig. 1-A

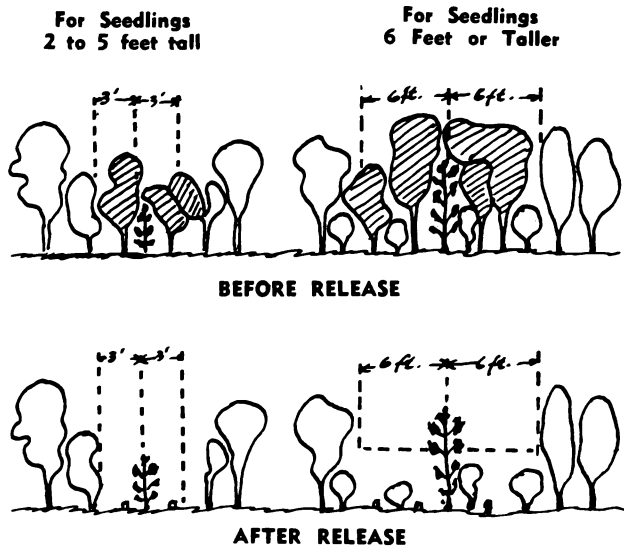


Fig. 1-B

(Traced from Jemison's (19) Illustrations)



Plate 2



Plate 3 Fig. 1

Plate 3 Fig. 2

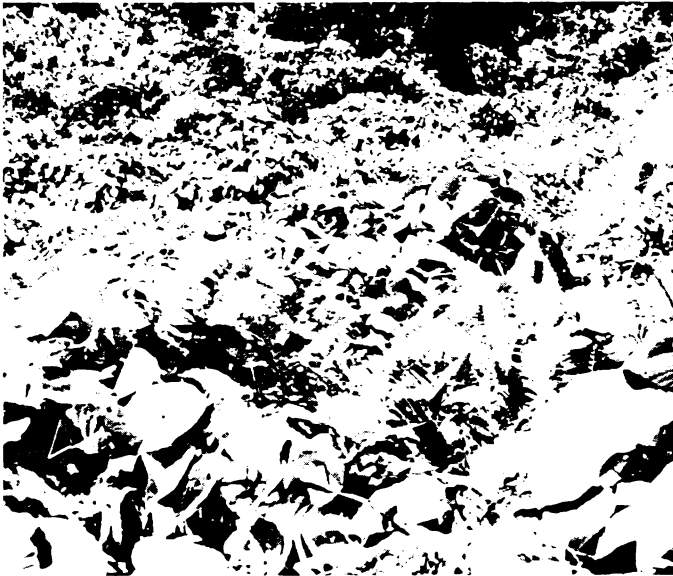


Plate 3 Fig. 3



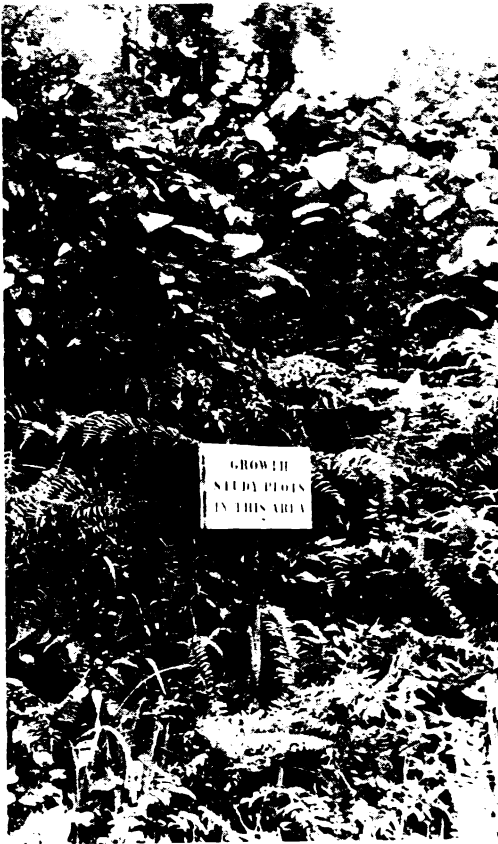


Plate 4 Fig. 1



Plate 5



Plate 4 Fig. 2

Plate 6 Fig. 2



Plate 6 Fig. 1

CONSERVE OUR  
FORESTS BY  
WISE USE

- (3) 2,4-D and 2,4,5-T or other silvicides available with diesel oil or water as carrier in 1: 10, 1: 20, and 1: 30 proportions by volume.

### CONCLUSIONS

The shelterwood system of converting degraded forests into productive forests in Nigeria, Gold Coast, Belgian Congo, Burma, Ceylon, Trinidad and Tobago, Puerto Rico, Gabon and other tropical countries has been successful and spectacular. There appears to be a bright prospect of applying this system in poor secondary forests of the Philippines.

Clear felling over natural regeneration is successful in Malaya and North Borneo. Its application in the Philippines seems unlikely because the composition of our virgin dipterocarp forests is much better than that of those countries. However, some of the techniques used in treating the secondary forests of these countries seem to be applicable in the Philippines. It must be emphasized, however, that the practices in Malaya and other countries in the tropics should not be followed in their entirety in the Philippines. Their application should be flexible so that the techniques shall be more closely adjusted to the silvicultural needs of our species and modified according to the availability of funds and to the object of our forestry program. Nevertheless, the framework of the scheme of these practices may be of general interest to us since the main principles underlying the practices remain generally the same everywhere. They may differ in their actual applications.

The taungya system of establishing forest plantations in many tropical countries is quite spectacular and surprising. It seems to be successful where there is a strong government and the people are very law-abiding. It is hard to predict at this time how this system could be successfully applied in the Philippines. A form of this system — special reforestation permits — was tried about the close of the American regime and early part

of the Commonwealth Government, but it was a failure.

The practice of silviculture in most, if not all countries in the tropics has been directed more towards the management of the forests through natural means (natural regeneration) rather than adopt elaborate and expensive planting methods. Quoting Beard (8): "Tropical forestry in nearly every country in which it has been practiced, has suffered in its youth from a disease called *planting measles*, a fixed idea that it was necessary to start plantations at great speed all over the place, often without any previous research. After the wastage of much money, the program was revised in favor of less costly, more natural methods, based on careful experiments."

In the Philippines, selective logging as a means of natural regeneration has become an important forestry program of the Bureau of Forestry. This is applied to the remaining public commercial forests in order not to add further to the vast bare denuded areas which are very expensive to reforest by planting. The selection system with some variations as the governing silvicultural system for the Philippine dipterocarp forest is adopted.

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(Continued on page 42)

# Edible fruit-bearing trees in the Philippines \*

## INTRODUCTION

The Philippine flora contain a number of edible fruit-bearing plants. This is a natural resource which is barely developed. In recent years, however, many sectors of our economy, especially the fast expanding fruit growing industry, are beginning to explore the rich economic possibilities of this resource. Because of this trend, there is a growing demand for information about these species—their names, characteristics, the nature of their fruits, etc. There is, however, a dearth of information about such plant species. Very few studies and observations have so far been made and the meager information gathered were published in various bulletins and journals which are now not only out of print but also are rather difficult to obtain or to locate.

This compilation of the trees that produce edible fruits in the Philippines, was made with the desire to consolidate in one publication, the scattered and available information, as a ready and handy reference for forestry field men, fruit growers, researchers, etc. in the pursuance of their various fields of interests and endeavors. Only brief remarks on the characteristics of the fruits and the plants, their habitats, distribution and propagation, in so far as information are available, was made for, by including detailed descriptions of the species would make

\* Compiled by Domingo V. Jacalne, Asst. Professor, U.P. College of Forestry, College, Laguna.

this work very voluminous and expensive. However, the important information pertinent to the plant as an edible fruit-bearing species have not been overlooked.

The principal sources of information in this work were the publications of: (a) Dr. W. H. Brown—Wild Food Plants of the Philippines, (Bull. 22, Bureau of Forestry, 1921;); (b) A. P. West and Dr. W. H. Brown—Philippine Resins, Gums, Seed Oils, and Essential Oils, (Bull. 22, Bureau of Forestry, 1921); (c) Dr. E. D. Merrill—An Enumeration of Philippine Flowering Plants, in four (4) volumes, (Publication No. 18, Bureau of Science, 1922, 1923, 1926); (d) L. H. Bailey—Standard Cyclopedia of Horticulture, 1919; (e) H. F. MacMillan—Tropical Planting and Gardening, 1948; (f) publications of other authors on one or two species and (g) personal observations and experiences of the writer and of other forestrymen he came in contact with during the preparation of this paper.

In addition to the enumeration and description of endemic (natural) and fully acclimatized introduced species, those plants of recent introduction into the Philippines were also included.

This compilation is nowhere complete, but it is hoped, it will serve the purpose of disseminating existing knowledge which we sorely lack on the edible fruit trees of the Philippines.

## TREES AND OTHER PLANTS IN THE PHILIPPINES THAT PRODUCE EDIBLE FRUITS

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Agas-as	Flacourtia rukam Zoll. et Merr.  (Flacourtiaceae)	A medium size tree growing in forests at low and medium altitudes. Its fruits are small, violet colored, fleshy, sub-acid and of good flavor. It is not cultivated.

Common Name	Scientific and Family Name	Remarks
Aliñgaro	Elaeagnus philippensis Perr.  (Elaeagnaceae)	This plant is a shrubby vine growing in thickets and forests at low and medium altitudes, ascending to 1,500 meters. The ripe fruits are sweet and edible. Not in cultivation.
Alupag	Euphoria didyma Blanco  (Sapindaceae)	It is a tree of medium size, distributed in most or all islands and provinces, usually common in hill forests at low and medium altitudes. The fruits are greenish, very rough and occur in loose cluster similar in appearance to the Chinese litchi. The flesh is whitish, sweet, juicy, and of good flavor. It is rarely cultivated, and if so by seeds.
Anonas	Anona reticulata Linn. (Anonaceae)	It is cultivated and propagated by seeds and thrives at low and medium altitudes.
Atibulnak	Rubus pectinellus (Maxim)  (Rosaceae)	This species is a trailing plant with heart-shaped leaves. It is common in the mossy forest on the highest mountains. This is considered to be one of the choicest species of the genus in the Philippines. The fruits are bright red, juicy, sub-acid, and of good quality and flavor. It is not cultivated.
Atis*	Anona squamosa Linn. (Anonaceae)	The tree thrives in ordinary, well-drained soil, up to about 3,500 feet. It is cultivated and propagated by seeds.
Avocado*	Persea americana Mill.  (Lauraceae)	The tree thrives best at medium elevations or under sub-tropical conditions. It is propagated by layering or grafting on young stock or from seed, which is of short vitality and should be selected and sown as fresh as possible.
Ayo	Tetrastigma harmandi Planch  (Vitaceae)	A woody vine with smooth, fleshy fruits which are edible. The sour leaves and fruits are used for flavoring. It grows in thickets at low and medium altitudes. It can be propagated by cuttings and is occasionally cultivated for ornamental purposes.
Bago	Gnetum gnemon Linn.  (Gnetaceae)	A medium-sized tree bearing fruit (seeds) which is eaten boiled or roasted. The flowers and leaves are also edible. Thrives in forest at low and medium altitudes.
Balubo	Diplodiscus paniculatus Turcz.  (Tiliaceae)	A large tree, very common and widely distributed in primary forests at low and medium altitudes. The starchy seeds when boiled have a good flavor. Propagated by seeds but not in cultivation.

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>R e m a r k s</i>
Baluno	Mangifera caesia Jack.  (Anacardiaceae)	A large tree, found in forests at low altitudes, sometimes semi-cultivated. The fruit resembles the mango. Propagated from seeds.
Balukok	Grewia edulis Merr. (G. philippinensis Perk.)  (Tiliaceae)	It is a small tree growing in forests at low altitudes. The fruits are yellowish and of good flavor.
Bansalagin	Mimusops parviflora R. Br.  (Sapotaceae)	This species is a large tree, very common and widely distributed in most or all of the provinces. In forests at low altitude, often immediately back of the beach along the seashore. The fruit is oval, with a firm outer covering and contains a single seed surrounded by fleshy, aromatic, edible pulp.
Bariuatwat	Tetragium loheri Gagnep.  (Vitaceae)	A woody vine with round, fleshy fruits which are edible. The sour leaves are used for flavoring. It thrives commonly in thickets and forests at low and medium altitudes ascending to 1,400 meters.
Bariu-an	Grewia eriocarpa Juss.  (Tiliaceae)	This plant is a shrub or small tree thriving in forests along streams at low altitudes. The fruit is small, round, bluish, and edible.
Bating	Castanopsis philippensis Vid.  (Fagaceae)	A medium-sized tree which grows in forest at medium altitudes. The fruit grows on spikes, and contains an edible oblong nut, the flavor resembles that of chestnuts.
Bignai	Antidesma bunius Spreng.  (Euphorbiaceae)	A small tree, common and widely distributed in thickets, open places and second-growth forests in the vicinity of towns and settlements, occasional in forests. The red, ovoid fruits are fleshy, acid and edible. It contains a single seed. Propagated by seeds and by marcottage.
Bignai pogo	Antidesma pentandrum (Blanco) Mrr.  (Euphorbiaceae)	A shrub-like or small tree common in thickets at low and medium altitudes, ascending to 1,800 meters. Its small fruits which are in clusters are sour but edible when ripe.
Bika	Ampelocissus martini Planch.  (Vitaceae)	It is a large, woody vine with conspicuous tendrils. The fruits are borne in grape-like clusters, greenish salmon in color, fleshy, acid and of fairly good flavor.
Balimbin*	Averrhoa carambola Linn.  (Oxalidaceae)	The tree should be propagated by layering or grafting, though usually, the tree is raised by seeds.



Common Name	Scientific and Family Name	Remarks
Binayoyo	<p><i>Antidesma ghaesembilla</i> Gaertn.</p> <p>(Euphorbiaceae)</p>	<p>A small tree common and characteristic tree of open cogonals at low and medium altitudes throughout the Philippines. Its fruit which is rather small is sour and edible when ripe.</p>
Binukau	<p><i>Garcinia binucao</i> Choisy.</p> <p>(Guttiferae)</p>	<p>A medium-sized tree, common and widely distributed; growing in primary forests at low altitudes. The yellowish, somewhat rounded fruits have a firm outer covering and contain an acidic pulp and several seeds. It is propagated by seeds but seldom found in cultivation.</p>
Biriba*	<p><i>Rollinia deliciosa</i> Saford.</p> <p>(Anonaceae)</p>	<p>A small size tree of recent introduction in the Philippines. It yields a delicious, large, juicy fruit resembling the cherimoya. It is propagated by seeds.</p>
Bitongol	<p><i>Flacourtia indica</i> (Burm. f.) Merr.</p> <p>(Flacourtiaceae)</p>	<p>It is a shrub or small tree thriving in dry thickets at low altitudes. The smooth fruit is rounded, purple or nearly black. The pulp is fleshy, edible with an agreeable flavor. It is not cultivated.</p>
Bolon	<p><i>Alphonsea arborea</i> (Blanco) Merr.</p> <p>(Anonaceae)</p>	<p>This is a medium-sized tree occurring in forests at low and medium altitudes. The fruit is rounded or somewhat oval. The fleshy pulp of the seeds is edible, sweet, with a good flavor.</p>
Bo-o or Pangungan	<p><i>Ximenia americana</i> Linn.</p> <p>(Olacaceae)</p>	<p>A spiny shrub growing in thickets immediately back of the beach along the seashore. The fruits of this species taste like sour apples, and are eaten either fresh or pickled. The nuts are purgative when cooked and powdered they mixed with sago to make bread. The fruits are yellow and egg-shaped.</p>
Breadfruit or (Kamansi, Rimas)	<p><i>Artocarpus communis</i> Forst.</p> <p>(Moraceae)</p>	<p>The tree grows up to about 2,000 feet and can be propagated by root-suckers, layering and from seeds when obtainable.</p>
Bulala	<p><i>Nephelium mutabile</i> Blume</p> <p>(Sapindaceae)</p>	<p>A medium-sized tree. The fruits are red and completely covered with numerous rather soft projections. The flesh is white, abundant, juicy and of very good flavor. It surrounds a single, rather large seed. It grows in primary forests at low and medium altitudes.</p>
Buli	<p><i>Euphoria nephelioides</i> Radlk.</p> <p>(Sapindaceae)</p>	<p>A medium-sized tree growing in forests at low altitudes and reported in Basilan only. The pulp around the seed is edible. It is not in cultivation.</p>
Bulog	<p><i>Aglaia everettii</i> Merr.</p> <p>(Meliaceae)</p>	<p>A medium-sized tree found in primary forests at low and medium altitudes. The fruits are oval, red containing an edible pulp. Propagated by seeds. It is not in cultivation.</p>

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Bunut	Rubus elmeri Focke (Rosaceae)	This plant is a scrambling shrub armed with few small spines. It is reported only in Mt. Prov. where it is common but not cultivated. It grows on open slopes at about 1,300 to 2,200 meters elevation. The orange-yellow berry is edible and well flavored.
Caimito* or Star apple	Chrysophyllum cainito Linn. (Sapotaceae)	It is a thick-headed evergreen medium sized tree. The fruit is the size of the apple, globular and smooth, hard, varying from white to purple in color of skin and also of the flesh. The pulp is delicious (used uncooked) if the fruit is allowed to remain on the tree until ripe. Propagation is by seeds and by marcottage.
Cajel*	Citrus aurantium Linn. (Rutaceae)	It is usually or always planted throughout the Philippines in settled areas. Propagated by seeds and layering.
Cashew nut*	Anacardium occidentale Linn. (Anacardiaceae)	The tree is especially adapted to moderately dry districts near the sea but also thrives up to 3,000 feet. Propagated by seeds.
Citron*	Citrus medica Linn. (Rutaceae)	Occasionally planted, but nowhere spontaneous.
Cherimoya*	Anona cherimolia Mill. (Anonaceae)	It is a delicious fruit somewhat resembling the atis in appearance but is far superior to the latter fruit. It is propagated by grafting. It may also be raised from seeds, but the best varieties are almost seedless. The tree is best suited to hilly places, preferring a rather dry climate, and thrives best in deep, rich soil.
Chico*	Achras zapota Linn. (Sapotaceae)	Luscious, cool and agreeable fruit. Grows best at low elevations. Propagated by seed but preferably by grafting and marcottage. Medium-sized tree.
Chico* mamie	Calocarpum sapota (Jacq.) Merr. (Sapotaceae)	Planted, introduced from Mexico. The fruit is russet-brown, containing one or more polished seeds embedded in the pulp, which is sweet and of reddish tint when fully ripe. It is made into marmalade. The seeds are said to be used with cocoa for making chocolate. Propagated by seeds.
Dalangita*	Citrus nobilis Lour. (Rutaceae)	Widely scattered in cultivation, but sometimes planted in large scale in some provinces.

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Dalinas	Cyathocalyx globosus Merr.  (Anacardiaceae)	A medium-sized tree growing in primary at low and medium altitudes. The seeds of the tree are used by the Negritos as a substitute for areca nut for chewing.
Dao	Dracontomelum dao (Blanco) Merr. & Rolfe  (Anacardiaceae)	A large tree, common and widely distributed throughout the country in forests at low altitudes. The fruits are yellow, rounded having an edible pulp around the seed. Propagated from seeds.
Datiles*	Muntingia calabura Linn.  (Tiliaceae)	A small or medium-size tree. The small yellow berries are said to make good tarts or jam. An infusion of the leaves is used as tea. Planted. Propagated by seeds or by root sprouts.
Dayap*	Citrus aurantifolia (Christm.) Swingle  (Rutaceae)	It is usually planted throughout the Philippines in settled areas. Propagated by seeds and layering.
Dayap*	Citrus aurantifolia Christm.  (Rutaceae)	A small spiny tree, cultivated for its acid, juicy fruit, which takes the places of lemon in the tropics. The tree thrives up to 3,500 feet preferring a rich, friable soil with good natural drainage. It is propagated by seeds (pips), or preferably by budding on stocks of strong growing kind as the pomelo.
Dauag	Toddalia asiatica (Linn.) Kurz.  (Rutaceae)	A spiny woody vine common in second growth forests and is also found in virgin forests and in thickets at low and medium altitudes, ascending to 1,700 meters. The fruits are used to flavor many dishes, and also as a tonic for the stomach, and to prevent fevers.
Duhat*	Syzygium cumini (Linn.) Merr.  (Myrtaceae)	It is a medium-sized tree, occurring throughout the Philippines, planted and in many regions spontaneous in open places and second-growth forests. Its oval or elliptical fruit is dark purple or nearly black, fleshy, with a very agreeable flavor when ripe.
Dukep	Telosma procumbens (Blanco) Merr.  (Asclepiadaceae)	The young fruits of this woody vine are cooked and eaten as vegetables. It is widely distributed and common in thickets and secondary forests at low altitudes.
Dulitan or Nato	Madhuca obovatifolia Merr.  (Sapotaceae)	This species is a small tree reported only in Camarines. Its fruit is like the chico, but it is twice larger. Its skin is light-colored, thin and rough, but its color, consistency, flavor and the seeds are similar to chico. It can be propagated from seeds.

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Durian	Durio zibethinus Murr.  (Bombacaceae)	The white custard-like pulp surrounding the seed is highly relished. It has been described as resembling "blane-mange, delicious as the finest cream". The tree thrives in low moist country up to 2,000 feet and luxuriates in deep, alluvial or loamy soil. The tree is readily propagated by seeds, which should be sown fresh.
Dutung	Rubus rolfei Vid.  (Rosaceae)	A scrambling shrub growing in the mossy forest on the highest mountains. The berries are yellowish, fleshy, and well flavored. It is not cultivated.
Galo	Anacolosa luzoniensis Merr.  (Olocaceae)	A medium tree size in forests at low altitudes ascending to 1,200 meters in Benguet. The plant produces a nut which is of good quality and flavor. It is apparently rare and never cultivated.
Gatasan	Garcinia venulosa Choisy.  (Guttiferae)	It is a medium size tree thriving often abundantly in primary forests at low altitudes. The fruit is sour, somewhat rounded but flattened. The edible portion is surrounded by a hard rind and contains several flat seed but seldom cultivated.
Gatmo	Vaccinium myrtilloides (Blume) Miq.  (Ericaceae)	The fruit of this species is a blue berry having an excellent taste and makes fine preserves and pies. It is a shrub widely distributed and is common in Benguet, Luzon. It is not cultivated.
Ginlin	Ochrosia oppositifolia (Lam.) K. Schum.  (Apocynaceae)	The fruit of this species contains an edible seed. It is a fairly large tree found in Mindanao and Basilan growing in forests along the sea-shore..
Gisaw	Canarium williamsii C. B. Bob.  (Burseraceae)	A small tree found in primary forests at low altitudes in Mindanao and neighboring islands. This species produces a nut similar to the pili nut. Propagated by seeds.
Governor's* plum	Flacourtia ramontchi L'Her.  (Flacourtiaceae)	It is a variable shrub or small tree with spines. The fruit is a berry, round, sour, and is eaten raw or cooked when ripe. It is propagated by seeds.
Granadilla* (Parola or kasafloa)	Passiflora quadrangularis Linn.  (Passifloraceae)	A strong, quick-growing vine. The large oblong green or greenish-yellow fruit is like a watermelon, and contains in its hollow center a mass of purplish sweet-acid, edible pulp, mixed with the flat seeds. In the unripe state the succulent shell may be boiled and used as vegetable. The root is usually swollen and fleshy and is sometimes cooked and eaten like a yam. Propagated by seeds or cuttings, and thrives up to 3,000 feet or higher.

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Grape vine*	Vitis vinifera Linn.  (Ampelidae)	Occasionally found in cultivation in the Philippines, but seldom produces fruits. It is not suited to a hot and moist tropical climate. Conditions essential for its success are a fairly dry and warm temperature, a rainfall not over 40 inches, a calcareous soil, and cold season for resting or wintering. It is readily raised by cuttings, 12-15 inches long.
Guayabano*	Anona muricata Linn.  (Anonaceae)	Cultivated and propagated by seeds or from cuttings. Thrives up to 3,000 feet.
Guava*	Psidium guajava Linn.  (Myrtaceae)	It is a small tree occurring throughout the Philippines in all islands and provinces, usually common in thickets and secondary forests at low altitudes, ascending to at least 1,500 meters or in open places and second-growth forests in the lowlands, and is also cultivated. The fruit is rounded, green, turning yellow when ripe. The outer covering is firm and encloses a pink or nearly white, aromatic, edible pulp in which very numerous seeds are embedded. The fruit is used extensively in the manufacture of jelly. Propagated from seeds or root sprouts.
Gumihan	Artocarpus elastica Reinw.  (Moraceae)	A large tree which grows in forests at low and medium altitudes. The fruit is heavy and covered with brownish hairy appendages. The seeds are embedded in a whitish, more or less gummy pulp of delicious, tart flavor. They are about the size of peanuts; are eaten roasted, and in flavor, also, resemble peanuts.
Halubagat baging	Capparis horrida Linn.  (Capparidaceae)	A thorny woody vine thriving in thickets at low and medium altitudes. The fruits are rounded with an edible pulp which has a poor flavor.
Halubagat kahoi	Capparis micracantha DC  (Capparidaceae)	This species is a vine or half erect shrub with drooping branches, commonly found in thickets, second growth forests, etc., at low and medium altitudes. The pulp of the ovoid or globose fruit is edible.
Hinlalaki saging	Uvaria purpurea Blume.  (Anonaceae)	A woody vine found growing in thickets at low and medium altitudes. Apparently rare. The fruits which are borne is a cluster from a disk-like structure are aromatic and edible.
Huani	Mangifera odorata Griff.  (Anacardiaceae)	A medium-sized tree sometimes cultivated or semi-cultivated for its fruits which is similar to that of the mango. Propagated from seeds.

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Hedyachras	Hedyachras philippinensis Radlk.  (Sapindaceae)	A small to medium-size tree, growing in thickets and forests along streams at low altitudes. The fruit is shaped somewhat like a peach, yellow, smooth, thin-skinned, fleshy, sub-acid, edible though a trifle astringent, and contain two large seeds.
Iba	Cicca acida (Linn.) Merr.  (Euphorbiaceae)	This species is a small deciduous tree widely distributed in and about towns in the Philippines and is occasionally cultivated for its edible fruits. The fruit is rounded greenish-white, fleshy, acid, edible and contains a hard bony stone. Propagated by cuttings or seeds.
Init	Rubus rosaefolius Sm.  (Rosaceae)	The plant is a spiny shrub common in thickets and forests at low and medium altitudes ascending in some regions to 1,900 meters. The fruits are red, occurring singly or in clusters. They are juicy, but rather insipid. The leaves are somewhat astringent, and are eaten both raw and cooked. It is not cultivated.
Ipil-ipil*	Leucaena glauca (Linn.) Benth.  (Leguminosae)	This species is a shrub or small tree found throughout the Philippines in the settled areas at low and medium altitudes, locally gregarious and abundant. In some provinces the seeds are roasted and ground, and then used as a substitute for coffee. Propagated by seeds and cuttings. Young leaves make a good salad.
Is-is	Ficus ulmifolia Lam.  (Moraceae)	This species is a shrub or small tree very common in open places and in thickets at low and medium altitudes, ascending to 1,500 meters. The soft and fleshy mature fruits are edible and have a good flavor, especially when eaten with sugar and cream.
Jackfruit or Nangka	Artocarpus integra (Thumb.) Merr.  (Moraceae)	The tree is suited to moist or semi-dry places up to 2,000 feet or higher. In planting, the seed should be sown in situ or first in bamboo pots or tin cans then transplanted. The fruit is the largest known tree fruit in the world, sometimes exceeding 35 kilos in weight. The flesh is rich, yellow in color, sweet and very aromatic. It makes good preserve and other sweets.
Kabuyau	Citrus hystrix DC.  (Rutaceae)	It grows in secondary and primary forests, sometimes in or near settlements at low and medium altitudes. Propagated by seeds.
Kalamunding*	Citrus mitis Blanco (Rutaceae)	Scattered here and there in cultivation but not known wild. Propagated by seeds, budding or layering.

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Kalomala	Elaeocarpus calomala (Blanco) Merr.  (Elaeocarpaceae)	A medium size tree with edible oval, red fruits, containing a single large, rough stone. The inner bark is also used for rope making. It grows in primary forest at low altitudes.
Kalubkub	Syzygium calubcub C. B. Rob.  (Myrtaceae)	This species is a large tree, very common and widely distributed in thickets and forests at low and medium altitudes. Its greenish fruits are edible with a good flavor. It is not in cultivation.
Kalumpang	Sterculia foetida Linn.  (Sterculiaceae)	A large tree, common in most or all islands and provinces along the seashore and in semi-open forests at low and medium altitudes. The seeds are edible and have a purgative effect. They are flavored like cacao, but are not bitter and are used to adulterate cacao. Propagated by seeds.
Kalumpit	Terminalia edulis Blanco  (Combretaceae)	It is a large size tree, common in primary forests at low altitudes. The smooth fruit is dark red, fleshy and acidic. It can be eaten raw or made into preserves. Not cultivated.
Kamachile*	Pithecolobium dulce (Roxb.) Benth.  (Leguminosae)	A small to medium-sized tree thoroughly naturalized in the Philippines; growing at low and medium altitudes. Introduced from Mexico. The pods contain 6 to 8 seeds surrounded by whitish, sweet, edible pulp of good flavor.
Kamanla	Syzygium ahernii C. B. Rob.  (Myrtaceae)	This species is a medium-sized tree occurring in primary forests at low and medium altitudes. Its fruits are rounded, yellow, and edible. It is not cultivated.
Kamandiis	Garcinia rubra Merr.  (Guttiferae)	This plant is a small tree found in primary forests at low altitudes. The edible fruits are fleshy, yellowish to red and somewhat rounded but flattened. It is propagated by seeds but not in cultivation.
Kamias*	Averrhoa bilimbi Linn.  (Oxalidaceae)	The tree thrives up to medium elevations and is readily propagated by seeds.
Kamuling	Grewia stylocarpa Warb.  (Tiliaceae)	It is a small tree, very common and widely distributed in primary forests at low and medium altitudes in most or all islands and provinces. The fruits have an edible pulp of good flavor.



<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Kaong* or sugar palm	<i>Arenga pinnata</i> (Wuramb) Merr.  (Palmae)	It is a palm planted here and there about towns and abundant in some forested areas but never at any great distance from settled areas; generally planted in most islands and provinces. The flesh of the young fruits makes a delicious dessert and the sap made to vinegar, etc.
Karamiras	<i>Aglaia glomerata</i> Merr.  (Meliaceae)	A medium-sized tree commonly found in primary forests at low and medium altitudes. The fruits are red, velvety, fairly juicy, and edible though lacking in flavor. Propagated from seeds. Not cultivated.
Kariis	<i>Garcinia mindanaensis</i> Merr.  (Guttiferae)	It is a small tree, thriving in forests at medium altitudes. The fruit is edible. It is not cultivated.
Katmon-Kalabau	<i>Dillenia reifferscheidia</i> F. Vill.  (Dilleniaceae)	It is a medium-sized tree, occurring most abundantly at medium elevations and in some places is very common. The fruit is green, fleshy and about the size of a small apple. The edible part is green, juicy, acid resembling that of the apple. It is eaten raw and it also makes an excellent sauce or jam.
Katmon	<i>Dillenia philippinensis</i> Rolfe  (Dilleniaceae)	A medium-sized tree, common in forests at low and medium altitudes. The fruit is rounded and contains a soft, fleshy, green pulp, with a flavor resembling that of the apple. It is used for flavoring fish and it makes an excellent sauce or jam. It can also be eaten raw.
Katmon-bayani	<i>Dillenia megalantha</i> Merr.  (Dilleniaceae)	A large tree, found in primary forests at low altitudes. The fruits are large and rounded. The edible part is green, fleshy and juicy, with an acid taste. It is suitable for preserves.
Katurai*	<i>Sesbania grandiflora</i> (Linn.) Pers.  (Leguminosae)	A medium-sized tree introduced and now commonly found in the settled areas at low and medium altitudes; often planted. The young fruits are eaten in the same manner as are string beans. The flowers are cooked as a vegetable. Propagated by seeds or cuttings.
Katmo	<i>Vaccinium whitfordii</i> Merr.  (Ericaceae)	The fruits are small, black, juicy, sub-acid sweet, and of good quality; produced singly in the axils of the leaves. This species is a shrub found in thickets and forests, at about 1,000 to 2,400 meters elevations.
Kayam*	<i>Inocarpus edulis</i> Forst.  (Leguminosae)	The unripe seeds boiled and roasted are considered palatable. It is propagated by seeds. Cultivated.

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Kinubot	Rubus moluccanus Linn.  (Rosaceae)	A scrambling shrub, armed with medium-sized spines, found commonly growing in forests at medium and higher altitudes, in wet regions, also at low altitudes. The berries are red and edible but with an insipid flavor. Not cultivated.
Kubili	Cubilia blancoi Blume.  (Sapindaceae)	A medium size tree, thriving in primary forests at low altitudes, distributed from Luzon to Mindanao. The fruit is oval and covered with very numerous pointed projections. It contains a nut of good quality. It is not in cultivation but it can be grown from seeds.
Kuliat	Gnetum indicum (Lour.) Merr.  (Gnetaceae)	The kernels of the fruit are eaten either boiled or roasted. When freshly cut, the stems yield a good quality of drinking water; and the plant is commonly utilized for this purpose by people in the forest when other drinking water is not available. It grows in forest at low and medium altitudes.
Lamio	Dracontomelum edule (Blanco) Skeels.  (Anacardiaceae)	A medium-sized tree, common and distributed throughout the Philippines in primary forests at low altitudes. The fruits are rounded, yellow having edible pulp around the seed. Propagated from seeds.
Lamon	Enhalus acoroides Steud.  (Hydrocharitaceae)	In some parts of the Malayan region the seeds of this plant are eaten raw or cooked. The fruit contains eight or nine green seeds. It grows in shallow waters of sheltered bays along the seashore.
Lanagon	Flacourtia euphlebia Merr.  (Flacourtiaceae)	This plant is a tree-like shrub found in forests up an altitude of about 900 meters. The fruit which is edible occurs singly or in small clusters in the axils of the leaf.
Lanzones	Lansium domesticum Correa  (Meliaceae)	Cultivated, thrives up to 2,000 feet in moist places. Propagated by seeds and by marcottage.
Lemon*	Citrus limonia Osbeck  (Rutaceae)	A small-size tree. Lemon fruits are very largely used for flavoring in confectionery and in the preparation of beverages, etc. The rind yields a valuable essential oil which is largely used for making candled lemon peel. They grow freely at medium and high elevations and requires conditions of climate and soil like the orange. Propagation is by budding or layering but are also easily raised from seeds.

Common Name	Scientific and Family Name	Remarks
Libas	<p><i>Spondias pinnata</i> (L.F.) Kurz. (Anacardiaceae)</p>	<p>A tree of medium size growing in primary forests at low altitudes, distributed from Luzon to Mindanao, but apparently not common. The fruit is rounded, yellow, with a finely flavored, edible pulp. The leaves and fruits are sour and are used for stews.</p>
Ligas	<p><i>Semecarpus cuneiformis</i> Blanco (Anacardiaceae)</p>	<p>A small tree, common in dry thickets and second-growth forests at low altitudes. The fruit resembles the cashew in form but smaller. The drupe is ovoid, oblique and is borne on a fleshy, purple receptacle. It is not in cultivation but can be propagated from seeds.</p>
Limoncito* or Kalamansito	<p><i>Triphasia trifoliata</i> (Burm.) P. Wiels. (Rutaceae)</p>	<p>A small spiny shrub and a good hedge plant. The small, red berry-like fruit can hardly be considered edible, though in China and Ceylon, it is made into a favorite preserve or crystallized fruit. The fruits can also be eaten raw or cooked as sweet. It is found in thickets and sometimes cultivated.</p>
Lipote	<p><i>Syzygium curranii</i> C. B. Rob. (Myrtaceae)</p>	<p>A medium size tree thriving in primary forests at medium altitudes. The fruit is small, but edible. Not in cultivation.</p>
Loquat*	<p><i>Eriobotrya japonica</i> (Thunb.) Lindl. (Rosaceae)</p>	<p>A medium-sized, evergreen and symmetrical tree. The small ovoid or pear-shaped yellow fruits have a sweetish acid flavor and maybe used for dessert or for stewing, etc. It is cultivated and is suited to medium elevation in the tropics. Plants may be raised from seeds, but superior varieties should be propagated by layering or grafting.</p>
Mabolo	<p><i>Diospyros discolor</i> Willd. (Ebenaceae)</p>	<p>This species has large rounded, fleshy fruits with a disagreeable odor and containing a few large seeds. The fruits are edible with a good flavor. It is a medium size tree common and widely distributed throughout the Islands occurring in primary and secondary forests at low and medium altitudes. It is also commonly planted in and about towns. A seedless variety has been propagated. It can be grown from seeds and by marcottage.</p>
Makopa	<p><i>Syzygium javanica</i> Lam. (Myrtaceae)</p>	<p>A small ornamental tree, producing clusters of pretty, glossy, rose-pink, or pinkish-white, waxy-looking fruits, which taste sweetish acid but usually too fragrant and pitchy to be agreeable. Propagated by seed; thrives best at low and medium altitudes.</p>

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Maigang	<i>Syzygium polycephaloides</i> C. B. Rob.  (Myrtaceae)	This is a large tree, occurring in primary forests at low and medium altitudes. Its fruit is rounded, similar in color and flavor to that of the duhat, but is less sweet and juicy. It makes a delicious, tart jelly.
Malaboho	<i>Sterculia oblongata</i> R. Br.  (Sterculiaceae)	It is a small tree, commonly growing in secondary and open forests at low and medium altitudes. The fruits are red, inflated, hairy, with a thick leathery covering, containing a number of nuts which are eaten by the people of the Mountain Province.
Malatampui	<i>Syzygium xanthophylla</i> C.B. Bob.  (Myrtaceae)	This tree is of medium size growing in forests at low altitudes. Its fruits are small but edible.
Malanangka	<i>Parartocarpus woodii</i> Merr.  (Moraceae)	A medium size tree found in forests at low and medium altitudes. The chestnut-like seeds contained in a rounded fruit are eaten either roasted or boiled.
Malatumbaga	<i>Aglaia harmsiana</i> Perk.  (Meliaceae)	A medium-sized tree, common in primary forests at low and medium altitudes. The rounded, and red to russet colored fruits have a hard outer covering containing a single seed. The pulp around the seed has a good flavor. Not in cultivation but can be propagated from seeds.
Malak-malak	<i>Palaquium philippense</i> C.B. Rob.  (Sapotaceae)	This species is a large tree very common and widely distributed throughout the country in forests at low and medium altitudes. The fruit is oval, containing a seed, and is edible.
Malunggai* or Horse-radish tree	<i>Moringa oleifera</i> Lam.  (Moringaceae)	This species is planted throughout the settled areas of the Philippines at low and medium altitudes. Propagated by either seeds or cuttings. The leaves, flowers and immature fruits are cooked and eaten as a vegetable.
Mamata-babae	<i>Lansium dubrium</i> Merr.	A small-sized tree which bears edible rounded, brownish yellow fruits surrounded by a hard outer covering and contain a single seed. It grows in primary forests at low and medium altitudes.
Manalu	<i>Semecarpus gigantifolia</i> F. Vill.  (Anacardiaceae)	A medium-sized tree, common and distributed in forest at low altitudes throughout the country. The fruits are deep purple, fleshy, juicy, edible but somewhat astringent. They are produced in great abundance on the trunk in panicles. Not in cultivation but it can be propagated from seeds.

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Manangkil	<i>Syzygium manangkil</i> Blanco  (Myrtaceae)	It is a big size tree, very common and widely distributed in primary forests at low and medium altitudes. The fruits are red, fleshy, acidic, and of good flavor, borne in large numbers. It is not cultivated.
Mango*	<i>Mangifera indica</i> Linn.  (Anacardiaceae)	Introduced, cultivated and in deserted cultivation throughout the Philippines. It is a large, erect or spreading tree.. Its fruit is one of the most delicious of all tropical fruits. It is simply propagated by inarching or grafting, budding and by seeds.
Mangosteen*	<i>Garcinia mangostana</i> Linn.  (Guttiferae)	Its globular, purplish-brown, smooth fruit, about the size of an apple, is famed as one of the most delicious fruits of the tropics, and considered by some to partake of the flavor of the strawberry and the grape. The delicate, snow-white, melting, juicy pulp surrounding and adhering to the seed is the part eaten. The tree grows best in hot, moist climate; deep rich, and well-drained soil and in sheltered locality up to about 2,000 feet. Propagation is by seed but may be done also by layering.
Marang*	<i>Artocarpus odoratissima</i> Blco.  (Moraceae)	A medium-sized tree. The fruit is large; the flesh white, sweet, very rich, juicy, and aromatic. Propagated like nangka.
Nipa	<i>Nipa fruticans</i> Wuramb.  (Palmae)	It is a palm thriving along tidal streams in brackish swamps throughout the Philippines; in favorable habitats gregarious over large areas. The flesh of the young nuts make good desserts or may be eaten raw.
Pahunan	<i>Mangifera altissima</i> Blanco  (Anacardiaceae)	A big tree, rather common and is widely distributed in the country in primary forests at low altitudes. The fruit is shaped like the mango, smooth, green to yellowish and resinous. It is used for making pickles.
Pakoidan	<i>Ochrosia littoralis</i> Merr.  (Apocynaceae)	The seeds of this species are edible. The fruit is fleshy and united at the base. It is a small tree widely distributed throughout the Islands in thickets and forests along the seashore.
Palanau	<i>Rubus fraxinifolius</i> Poir.  (Rosaceae)	This species is a scrambling shrub armed with fair-sized, sharp spines. It grows in damp forests at low and medium altitudes, ascending to 1,800 meters. The berries are in clusters; bright red, fairly juicy, edible, but rather tasteless. Not cultivated.

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Pañgi	<i>Pangium edule</i> Reinw. (Flacourtiaceae)	A medium size tree, growing in primary forests at low and medium altitudes. The fruit is large, brown, containing several seeds in an edible, yellowish pulp. The fresh seeds are poisonous, but are rendered edible by steeping in water. It is propagated by seeds and is sometimes cultivated.
Passion fruit or Flor de pasion	<i>Passiflora edulis</i> Sims. (Passifloraceae)	A perennial vine bearing smooth ovoid fruit becoming purple when ripe. The fruit contains in its hollow center a quantity of fragrant, sweet, juicy pulp; this when emptied out of the shell and beaten up in a glass with a pinch of bicarbonate of soda and sugar makes a delicious drink. The passion-fruit can be cultivated from 2,000 feet upwards. Rich humus soil and a moist sheltered situation suit it best. Propagated by seeds or cuttings.
Pedada	<i>Sonneratia alba</i> Sm. (Sonneratiaceae)	This species is a small tree occurring along the upper stretches of tidal streams. The fruit is slightly acid and is used as an article of food and also for making vinegar. The fruit contains many seeds.
Pilai	<i>Rubus nivens</i> Thumb. (Rosaceae)	This species is a very spiny scrambling shrub thriving in thickets at 1,300 to 1,600 meters elevations. The fruits occur in terminal clusters and have a good flavor. It is not cultivated.
Pili	<i>Canarium ovatum</i> Engl. (Burseraceae)	The kernel is edible, resembling sweet almonds. It yields by expression an oil used for burning in lamps and for cooking. It thrives in hot and moist places up to about 2,000 feet and prefers deep, well-drained soil.
Piling-liitan	<i>Canarium luzonicum</i> (Blume) A. Gray (Burseraceae)	A medium-sized tree, common in primary forests at low and medium altitudes. The fruits are somewhat oval in shape containing a thick-shelled triangular edible nut. Propagated by seeds. Not in cultivation.
Pinit	<i>Rubus copelandii</i> Merr. (Rosaceae)	A scrambling, spiny shrub reported only in Benguet growing in thickets on limestone formations at about 1,300 meters altitude. The orange-red berries are fairly juicy, and edible but not well flavored.
Pingkapingkahan	<i>Oroxylum indicum</i> (Linn.) Vent. (Bignoniaceae)	The immature fruits of this small tree are cooked or prepared in several ways and eaten as a vegetable. It is common and widely distributed throughout the Islands in thickets and secondary forests at low and medium altitudes.

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Piris	Garcinia vidalii Merr.  (Guttiferae)	A medium size tree, thriving in primary forests at low and medium altitudes. The fruit has a firm, acid, fleshy pulp with a pleasant flavor. It is not cultivated.
Pitogo	Cycas rumphii Mig.  (Cycadaceae)	In times of famine, the ripe seeds of this plant are prepared as food in some of the isolated parts of the Philippines. To do this, the ripe seeds are crushed and the resulting products soaked in water which must be changed several times. The product is then dried, and the flour-like substance cooked in the form of small cakes or a porridge.
Pomegranate* or granada	Punica granatum Linn.  (Lythraceae)	A small tree or large shrub. The juicy coating of the closely packed seeds is in some varieties of a sweet-acid pleasant taste but usually it is scanty, tart and astringent. Cultivated and grows best near the sea coast in dry places. Propagation is by layering or grafting, though plants are easily raised from seeds.
Rambutan or Usau	Nephelium lappaceum Linn.  (Sapindaceae)	A small to medium size tree. The pulp of the fruit has an excellent flavor. It grows in the forest but is now cultivated in many places in the Island.
Rain Tree* or acacia	Samanea saman (Jacq.) Merr.  (Leguminosae)	A large tree now widely planted in and about towns in the Island as shade trees or fuelwood; in some places spontaneous. The sweet, somewhat sticky substance enclosing the seeds is edible with a good flavor.
Roselle*	Hibiscus sabdariffa Linn.  (Malvaceae)	The enlarged fleshy sepals makes excellent jelly. The unripe fruit is adapted for pickles and a refreshing beverage is made from it. The young, tender, acid leaves are sometimes used as vegetables in curries. Thrives at all elevation up to about 4,000 feet. It is propagated by seeds.
Sampalok*	Tamarindus indica Linn.  (Leguminosae)	Medium to large tree of prehistoric introduction into the Philippines, now commonly planted throughout the settled areas. In between the constricted pods are seeds, which are surrounded by an acid pulp of good flavor. The young leaves are boiled as a flavoring with meat or fish. Propagated by seeds.
Santol*	Sandoricum koetjape (Burm. f.)  (Meliaceae)	Besides eating the fleshy pulp covering the seeds, an intoxicating drink is prepared from the fruit by fermenting and mixing it with rice. Propagated from seeds and is suited to hot and moist places up to about 3,000 feet.

<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Sapote*	Lucuma mammosa Gaertn.  (Sapotaceae)	This is a large erect tree bearing fruits that are commonly elliptical, containing a soft melting flesh of a beautiful reddish salmon color within the thick woody skin that is somewhat rough and rusty brown in the surface. Propagation is by seed. Introduced recently in the Philippines.
Seneguelas*	Spondias purpurea Linn.  (Anacardiaceae)	Grows best in dry places and is propagated by cuttings. The scanty pulp of the fruit is eaten raw.
Strawberry*	Grageira vesca Linn.  (Rosaceae)	The form of the strawberry now commonly cultivated in the vicinity of Baguio is probably one of the races of this species. It may become established at higher altitudes in the Mountain Province.
Suha or Lukban	Citrus maxima (Burma.) Merr.  (Rutaceae)	It is usually planted in the settled areas throughout the Philippines. Propagated by seeds and layering.
Susung kalabau	Uvaria rufa Blanco  (Anonaceae)	A climbing shrub growing in thickets and forests at low altitudes. Sometimes cultivated. The oval, hairy, red fruits which are borne in clusters are edible and have an agreeable odor.
Tagibalos	Uvaria sorsogonensis Presl.  (Anonaceae)	A large woody vine with large leaves common in thickets and forests at low and medium altitudes. The fruits which are oval, and marked with prominent, transverse grooves are aromatic and edible.
Tagpo	Ardisia squamulosa Presl.  (Myrsinaceae)	The flowers and fruits of this small tree are cooked as a flavoring with fish. The fruits are dark blue, or purple and rounded. It is very common and widely distributed in the Islands in thickets or in forests at low or medium altitudes.
Taklang-anak	Garcinia dulcis Kurz.  (Guttiferae)	This species is a small size tree, widely distributed and common in primary forests at low and medium altitudes. Its smooth, yellow fruit has a firm outer covering, and an acidic, soft and juicy pulp. It is good for preserves. Propagated by seeds but seldom found in cultivation.
Talisai	Terminalia catappa Linn.  (Combretaceae)	This species is a medium size tree distributed throughout the Philippines along the seashore up to 2,000 feet. Often cultivated in many provincial towns as a shade tree. The kernel of the fruit yields as fixed oil which is sweet and savory. It is, however, difficult to extract the seed from the fruit.



<i>Common Name</i>	<i>Scientific and Family Name</i>	<i>Remarks</i>
Tambis	Syzygium aqueum Burm.  (Myrtaceae)	A large tree occurring in thickets and forests at low and medium altitudes. The fruits are edible.
Tampoi*	Syzygium jambos Linn.  (Myrtaceae)	white fruit with a sweetish rose-water taste, and is said to be sometimes used in preserves. It thrives best in most places, at medium elevations up to about 4,000 feet, preferring a deep, rich soil.
Tibig	Ficus nota (Blanco) Merr.  (Moraceae)	A medium size tree common in thickets and forests at low and medium altitudes. The fruits which are borne on the trunks and branches are rounded, yellowish to yellowish-red, fleshy with a good flavor.
Tiesa*	Lucuma nervosa A. DC.  (Sapotaceae)	A small tree bearing broadly oval to round, orange yellow fruit when ripe. The tree can grow even on thin poor soils and is propagated by seeds or by marcottage.
Titau	Rubus ellipticus Sm.  (Rosaceae)	This species is a scrambling shrub with rather large spines. It is reported only in Bontoc and Benguet growing in thickets and on open slopes at 1,300 to 1,600 meters elevations. The fleshy pale yellow berries have fairly good flavor.

\* Introduced in the Philippines

### FOREST CONSERVATION PROBLEM...

(Continued from page 4)

the candidate of the opposition who spread the rumor that I was out to grab land tried to get word to me that he did not say the things attributed to him. It was the same candidate who promised to subdivide the A-ras-asan forest once he was elected. This too was exposed in public meetings as preposterous.

The result of the elections in our little municipality confirmed my idea that if properly explained the people would vote for conservation. In future elections the issue of forest conservation should be brought before the electorate in all the municipalities and provinces. We have long labored in the belief that the people are on the side of kasingineros and that is the reason that politi-

cians take the side of forest law violators under the cloak of course that they are helping the poor and giving land to the landless. This has been possible because even those who should take the lead in changing public opinion so that it will support and not oppose forest conservation have assumed an attitude of indifference. They, too, seem to have assumed that the people are against conservation. We have preferred to follow the line of least resistance and do nothing about it. We seem to have been afraid along to provoke discussion when what we should do is to expose the problem in public forums whenever an opportunity presents itself for it is a national problem and it concerns everyone vitally. The College of Forestry is such a forum and an occasion like this is a

most appropriate one. I am glad to note that inviting men engaged in the lumber industry to speak on Forestry Day once a year on November 30th is one of your traditions. I heartily endorse this custom. If I may be permitted one suggestion I should like to recommend that you enlarge the scope of Forestry Day. The College of Forestry should be developed to be the fountainhead of the latest information on tested practical methods of forest management. Faculty members and students should go to the field to observe the problems that face the industry in order that they may have practical work materials for classroom and laboratory study. Likewise, representatives of the industry should be invited for consultation, so that in that way the maximum cooperative effort can be enlisted in the cause of good forestry.

I do not know what is the definition of a modern college or the modern definition of a college. Whether the idea of making a college an open forum for the discussion of the nation's important problems accords with the new or old concept, I should like to see our colleges converted into living, progressive workshops for generating and testing new ideas and clearing house for channeling such ideas to those who can profit from their use. Let us move away from the idea that a college is an archive of knowledge where it gathers dust and grows mildew. Better that we err, in my opinion, on the side of being a little precipitate in trying new ideas than that we err on the side of being too conservative. Lumber companies will, I am sure, be glad to lend their cooperation in all progressive undertakings.

I thank you.

## SILVICULTURAL PRACTICES . . .

(Continued from page 22)

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# *Standardized Cold-Soda Pulping Evaluation of Some Philippine Cellulosic Materials*<sup>1</sup>

By MANUEL R. MONSALUD<sup>2</sup>

## SUMMARY

Standardized cold-soda pulping evaluations of 47 Philippine species of cellulosic materials (agricultural wastes, bamboos, hardwoods, and softwoods) are reported. Katurai gave the highest pulp yield, 95.9 percent, and abaca fiber cold-soda pulp exhibited the highest strength characteristics.

## INTRODUCTION

Cellulosic fibers are of plant origin. There are several methods of converting them into pulp for paper making, namely, chemical (sulfate, sulfite, soda), semi-chemical (neutral sulphite semichemical), mechanical or groundwood process, chemi-groundwood method, mechano-chemical, cold-soda, and possibly others.

This article reports the results of exploratory studies made since 1956 in the Forest Products Research Institute in a standardized, cold-soda-pulping evaluation of Philippine cellulosic materials, including hardwoods, a few softwoods, bamboos and agricultural wastes.

The so-called cold-soda process was first developed in 1949 by the U.S. Forest Laboratory, Madison, Wisconsin, U.S.A. (1, 3). In the main, it consists of soaking wood chips for a few hours in dilute sodium hydroxide solution under normal pressure and temperature to soften them before passing them thru an attrition mill to effect the separation of

the individual fibers. It is claimed that some advantages of cold-soda pulping are: "High pulp yield (80 to 90 percent), simplicity and cheapness of the pulping process and applicability to hardwoods for the production of pulps for use in the manufacture of cheap grades of paper, where high strength and permanence are not essential — "(2).

The cold-soda pulping process is actually being employed commercially on an ever growing scale in several countries, namely, United States, India, Australia, Italy, and possibly others.

Recently, the original process has been improved by the use of hydrostatic pressure to enable efficient impregnation of the chips by the pulping chemical in a matter of minutes, thus effecting "rapid cycle" digestion (5).

Due to its potential adaptability as a pulping process under conditions obtaining in the Philippines, where there are many hardwood species, this process has been studied in the Forest Products Research Institute to test the responses of various native fibrous raw materials such as hardwoods, agricultural wastes, bamboos, and softwoods.

Cold-soda pulps, bleached or unbleached, have many uses. For example, this pulp can be used as a substitute for groundwood pulp in the manufacture of cheap tissue paper, newsprint, book, magazine, and other kinds of printing paper, food board, and writing paper. It can also be used 100 percent in making corrugating medium, boxboard, insulating and building boards, roofing felt, and molded products (3, 5).

Considering the low requirements for ca-

<sup>1</sup> This research was undertaken by the staff of the Chemical Investigations Division of the Forest Products Research Institute, College, Laguna.

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pital investment and operating costs and simplicity of operations involved in the pulping process, it is deemed promising for a place in our country's economy. Hence, this study.

#### *Standardized Cold-soda Process*

As employed in the Forest Products Research Institute, this process is carried out as follows: Wood is first hand-barked and chipped (Fig. 1) and the chips screened (Fig. 2). Accepted chips are about 5/8-inch in length along the grain. Bamboo is first crushed and then chipped and screened as in the case of wood.

The agricultural wastes are cut by hand into small pieces about 1/2 an inch long.

Each species is pulped separately.

The dry-solid content of each material for pulping is first determined. Then about 2.5 kilos (oven-dry weight) of the material, are soaked in sodium hydroxide solution containing 50 grams of NaOH per liter. The water-to-dry-material ratio employed is 6:1, including the moisture present in the fibrous material.

The soaking is done under room temperature and atmospheric pressure for three hours. Later, after a composite sample of the spent liquor is taken for analysis, the soaked chips are drained of the spent liquor, which is discarded.

The softened material is then passed thru an 8-inch attrition (Bauer), single-disc rotating mill (Fig. 3) using Bauer mill plate No. 6946 for coarse fiberization. The coarse pulp is received in a screen box provided with 100-mesh stainless steel screen wire at the bottom. The coarse pulp is Bauer-milled once more using Bauer Plate No. 6945. At the second passing, the plates are set almost touching each other for final and finer fiberization.

The cold-soda pulp is washed thoroughly in the screen box, screened (Fig. 4), dewatered, weighed and sampled for dry-solids determination. From the data obtained, the percentage pulp yield is calculated on the oven-dry weight basis. The percentage of screen rejects is included in the over-all pulping yield (6).

#### *Mechanical Processing or Beating*

The cold-soda pulp produced from each species was beaten or mechanically processed in a 1-1/2 pound experimental Niagara-type beater with controlled bedplate, following Tappi (10) Standard methods of laboratory processing of pulp (Beater Method, T-200 m-45), modified as follows: One thousand two hundred and sixty (1260) ml. of pulp slurry, equivalent to 19.7 grams of oven-dry pulp, for two Canadian Standard freeness tests and 9 handsheets, were taken from the beater at each time interval instead of the usual 800 grams (T 200 m-45). Time intervals, were 5, 10, or 20 minutes depending on the drop in freeness.

After each beating period, 8 paper handsheets were prepared in accordance with TAPPI Standard methods (T .205 m-53) The handsheets were conditioned for sometime in drying rings placed inside the paper testing room of the Institute (maintained at 73 deg. F. and 50 per cent relative humidity) until the handsheets reached constant weight. Then they were tested for thickness, ream weight, burst, tear, folding endurance, tensile strength, density, brightness, and opacity.

#### *Discussion of Results*

Table I shows the average fiber lengths of the cellulosic materials dealt with in this study. The fiber measurements were made by the Wood Technology Division of this Institute. Some of these fiber measurements were reproduced from the published article of Tamolang, et. al. (9).

Table II shows the chemical analysis of these materials.

Table III shows the standardized pulp yields and chemical consumptions obtained in the pulping operations.

Table IV shows the chemical analysis of the standardized cold-soda pulps produced in the study. The methods of analysis used were those of Tappi (10).

The analysis of the woody and non-woody materials pulped in this study was made following the methods described by Monsalud and Nicolas (7).

Table I. Fiber lengths of the cellulosic materials dealt  
with in this study <sup>1/</sup>.

	Common names	Scientific names	Average fiber lengths (mm.)
<b>A. Agricultural wastes:</b>			
1	Abaca (waste)	<u>Musa textiles</u> Nee	3.15
2	Coconut (husk)	<u>Cocos nucifera</u> L.	0.58
3	Coconut (trunk)	<u>Cocos nucifera</u> L.	1.94
4	Cogon	<u>Imperata cylindrica</u> (L.) Beauv.	1.15
5	Rice straw	<u>Oryza sativa</u> L.	1.14
6	Sugar cane bagasse	<u>Saccharum officinarum</u>	1.67
<b>B. Bamboos:</b>			
1	Bayog	<u>Dendrocalamus merrilianus</u> (Elm.) Elm	2.07
2	Buho	<u>Schizostachyum lumampao</u> (Blanco) Merr.	2.42
3	Giant bamboo	<u>Gigantochloa aspera</u> Kurz	3.78
4	Kawayan tinik	<u>Bambusa blumeana</u> Schultes f.	2.02
5	Pole vault bamboo	<u>Phyllostachys nigra</u> Munro	1.86
6	Kawayan killing	<u>Bambusa vulgaris</u> Schrad.	2.33
7	Bulo	<u>Gigantochloa levis</u> (Blanco) Merr.	1.80
<b>C. Hardwoods (broadleaved):</b>			
1	Acacia	<u>Samanea saman</u> (Jacq.) Merr.	0.87
2	Agoho	<u>Casuarina equisetifolia</u> L.	1.04
3	Anableng	<u>Trema orientalis</u> (L.) Blume	1.19
4	Apitong	<u>Dipterocarpus grandiflorus</u> Blanco	1.56
5	Bagtikan	<u>Parashorea plicata</u> Brandis	1.20
6	Balakat-gubat	<u>Sapium luzonicum</u> (Vid.) Merr.	1.27
7	Balobo	<u>Diplodiscus paniculatus</u> Turcz.	1.50
8	Balsa	<u>Ochroma pyramidale</u> (Cav.) Urb.	1.59
9	Dita	<u>Alstonia scholaris</u> (L.) R. Br.	1.48
10	Dulit	<u>Canarium hirsutum</u> Willd.	1.06
11	Gubas	<u>Endospermum peltatum</u> Merr.	1.62
12	Hagimit	<u>Ficus minahassae</u> (Teijam. & De Vr.) Miq.	1.29
13	Hamindang	<u>Macaranga bicolor</u> Muell. - Arg.	1.37
14	Ipil-ipil	<u>Leucaena glauca</u> (L.) Benth.	1.01
15	Kaatoan-bangkal	<u>Nauclea horsfieldii</u> (Miq.) Salv. (Comb. Now.)	1.43
16	Katmon	<u>Dellenia philippinensis</u> (Rolfe) Dill.	2.68
17	Katurai	<u>Sesbania grandiflora</u> (L.) Pers.	0.98
18	Kupang	<u>Parkia javanica</u> (Lam.) Merr.	1.02
19	Lanipan	<u>Terminalia crassiramea</u> Merr.	1.41
20	Lisak	<u>Neonauclea bartlingii</u> Merr.	1.40
21	Lumbang	<u>Aleurites molucana</u>	1.35
22	Malakalumpang	<u>Sterculia ceramica</u> R. Br.	1.57
23	Mayapis	<u>Shorea squamata</u> (Turcz.) Dyer	1.42
24	Red lauan	<u>Shorea negrosensis</u> Foxw.	1.59
25	Taluto	<u>Pterocymbium tinctorium</u> (Blanco) Merr.	1.40
26	Tanag	<u>Kleinhovia hospita</u> L.	1.18
27	Tangile	<u>Shorea polysperma</u> (Blanco) Merr.	1.28
28	Tangisang-bayawak	<u>Ficus variegata</u> Blume	1.26
29	Toog	<u>Petersianthus quadrialata</u> Merr.	2.36
30	Tuai	<u>Bischofia javanica</u> Blume	2.19
31	White lauan	<u>Pentacme contorta</u> (Vid.) Merr. and Rolfe	1.37
<b>D. Softwoods (conifers):</b>			
1	Almaciga	<u>Agathis philippinensis</u> Warb.	5.31
2	Benguét-pine	<u>Pinus insularis</u> Endl.	3.45
3	Zambales (Mindoro) pine	<u>Pinus merkusii</u> Jungh and De Vr.	4.01

<sup>1/</sup> These data were determined by the Wood Technology Division of the Forest Products Research Institute

**TABLE II. Proximate chemical analysis of the cellulose materials used in this study.**

Sample No.		SPECIES	Ash	Alcohol-benzene extract	Solubility in hot-water after alcohol-benzene extract	Solubility in hot-water without prior leaching	Lignin	Holocellulose	Pentosans	Silica	Solubility in 1% NaOH
<b>A. Agricultural wastes:</b>			<b>Values in percentage of oven-dry weight</b>								
1-2 A.W.	1	Abeca	5.7	2.8	5.1	5.6	14.8	71.6	34.3	1.42	39.8
1-131	2	Coconut (husk)	2.7	1.7	2.4	2.8	30.9	62.2	9.6	0.82	25.5
1-131A	3	Coconut (trunk)	3.3	3.9	3.7	6.8	23.0	66.1	22.5	0.35	22.0
1-11 A.W.	4	Cogon	7.3	7.4	7.2	11.2	16.4	61.3	16.6	4.41	48.2
1-7 A.W.	5	Rice straw	30.1	4.2	1.6	1.9	14.0	50.1	7.6	23.44	62.6
202A	6	Sugar-cane bagasse (undepithed)	2.39	2.8	3.1	3.8	20.5	71.2	23.7	1.41	35.0
1-10 A.W.	7	Remie	1.6	0.9	5.2	5.7	25.8	66.5	8.0	0.17	20.6
<b>B. Bamboos:</b>											
1- 4B	1	Bayog	4.2	3.6	3.4	6.1	24.4	66.5	23.8	2.1	26.1
1- 2B	2	Buho	9.5	1.7	4.4	5.6	20.6	65.9	21.5	7.45	28.1
1- 3B	3	Giant bamboo	4.2	5.8	4.1	6.8	23.5	62.4	20.1	2.4	13.1
1- 5B	4	Kawayen tink	4.8	3.1	4.3	7.0	20.4	67.4	19.0	3.4	39.5
	5	Pole-vault bamboo	-	-	-	-	-	-	-	-	-
1- 1B	6	Kawayen killing	2.43	4.1	5.1	7.8	21.9	66.5	21.1	1.1	27.9
1- 7B	7	Bulo	5.15	2.5	4.2	5.9	22.6	60.6	19.1	2.5	28.5
<b>C. Hardwoods:</b>											
1-88A)											
2-174A)	1	Acacia	2.0	7.1	4.6	8.6	25.3	63.8	17.9	1.19	26.7
1-102A	2	Agoho	0.8	2.5	2.2	4.1	26.1	68.4	19.4	-	13.0
1- 8A	3	Anebliong	1.5	2.1	3.4	4.5	22.1	70.9	20.6	0.04	18.6
1-21A)											
2-126A)	4	Apitong	1.5	8.1	2.1	6.3	28.9 <sup>b/</sup>	60.3	16.5	1.02	21.1
1-12A)											
2-92A)	5	Bagtikan	1.1	3.0	1.4	2.6	29.0	65.5	15.0	-	12.5
3-117A)											
1-135A	6	Balaka t-gubat	3.8	4.1	2.4	6.7	23.2	66.5	17.0	2.2	17.0
1-27A	7	Balobo	3.9	6.0	3.5	8.9	27.7	58.9	16.2	-	21.3
1-134A	8	Balsa	2.7	3.0	5.9	5.1	29.9	58.5	19.2	0.14	17.2
1-146A	9	Dita	1.8	2.8	3.2	5.2	30.6	62.1	14.1	-	17.0
1-77A*	10	Dulit	1.2	2.5	-	8.9	22.0	-	11.4	-	24.6
1-70A)											
2-90A)	11	Gubas <sup>a/</sup>	1.3	1.9	2.9	4.2	27.7	66.3	16.6	-	15.4
1-68A)											
2-136A)	12	Hagimit	2.7	2.1	3.5	3.8	26.3	65.4	18.5	0.11	17.1

<sup>b/</sup> Lignin including ash

TABLE II, Continued

1-63A ) 2-137A)	13	Hamindang	1.8	3.5	3.8	6.2	35.6	55.7	12.9	0.24	21.0
1-30A ) 2-140A) 3-190 )	14	Ipil-ipil	0.8	7.8	2.7	5.7	25.6	63.2	17.9	-	18.6
1-7A ) 2-77A)	15	Keatoan-bangka <sup>a/</sup>	0.8	3.8	2.6	5.9	23.8	69.0	21.2	-	20.2
1-57A ) 2-181A)	16	Katmon	1.9	4.1	6.0	9.8	25.2	62.8	13.3	0.29	26.1
1-41A	17	Katurai	1.7	2.9	2.6	5.0	26.4	66.4	20.0	-	16.4
1-56A	18	Kupang	2.5	5.0	2.7	5.5	26.0	63.7	18.9	1.4	16.6
1-114A	19	Lenipau	0.7	1.5	4.0	3.4	30.5	63.3	17.1	-	13.9
1-36A	20	Lisak	0.7	6.6	2.3	8.5	31.4	59.0	15.2	-	15.1
1-80A	21	Lumbang	2.2	1.8	6.4	10.7	27.1	62.5	20.5	1.1	23.6
1-31A	22	Malakalumpang <sup>a/</sup>	2.8	2.9	5.6	7.3	22.3	66.5	12.8	0.20	21.5
1-74A ) 2-178A)	23	Mayepis	0.35	4.5	2.3	4.2	33.3	59.7	11.9	0.05	14.8
1-46A ) 2-11A ) 3-122A)	24	Red leuan <sup>a/</sup>	0.3	3.9	2.2	4.3	33.7	59.9	10.7	-	18.3
1-69A ) 2-129A)	25	Taluto	2.5	2.1	9.8	10.9	18.2	67.4	17.6	0.09	23.4
1-62A ) 2-145A)	26	Tanag	2.3	2.7	2.8	4.7	29.0	63.3	16.6	0.07	15.8
1-11A ) 2-113A) 3-236A)	27	Tangile	0.23	3.2	1.3	2.8	34.5	60.8	13.3	-	13.6
1-33A ) 2-59A)	28	Tangisang-bayawak <sup>a/</sup>	4.4	4.2	4.8	9.4	27.3	60.0	15.2	0.06	21.4
1-116A	29	Toog	2.5	3.5	0.9	2.5	37.4	55.7	12.7	1.8	17.9
1-147A	30	Tuai	1.1	1.4	4.2	5.8	42.0	51.3	9.7	-	29.4
1-71A ) 2-105A) 3-112A) 4-170A)	31	White leuan <sup>d/</sup>	1.0	3.6	1.7	2.8	29.4	64.3	14.3	-	13.9

<sup>a/</sup> Average of 2 samples

<sup>b/</sup> Lignin including ash

<sup>c/</sup> Average of 3 samples

<sup>d/</sup> Average of 4 samples

D. Softwoods:

1-185A	1	Almacion <sup>a/</sup>	0.3	1.5	-	2.1	34.2	-	0.4	-	14.3
1-165A ) 2-172A)	2	Benguet pine	0.3	2.0	1.4	1.5	33.3	63.0	12.0	-	11.4
1-212A	3	Zambales (Mindoro) pine	0.5	4.5	2.5	3.0	28.5 <sup>a/</sup>	64.0	11.3	-	17.5

<sup>a/</sup> Including ash.

TABLE III. Standardized cold-soda pulping yields

Cook No.	Species	Percent		1/ Cold soda pulp yield (% based on oven dry material pulped)
		Consumption of chemicals charged	Chemical consumption based on oven dry material	
<u>A. Agricultural wastes</u>				
521	1 : Abaca (wastes) plantation	21.80	6.54	68.50
153	2 : Coconut (husk)	68.10	18.44	56.1
591)				
599)	3 : Coconut (trunk)	32.45	9.73	58.78
452	4 : Cogon	58.1	23.25	47.18
399)				
412)	5 : Rice straw	33.90	13.54	41.65
434)				
292)				
297)	6 : Sugar-cane bagasse (undepithed)	37.2	15.0	54.08
<u>B. Bamboos</u>				
135)				
144)	1 : Bayog	54.10	16.2	67.2
223)				
241)	2 : Buho	25.10	7.5	76.3
101	3 : Giant bamboo	22.5	7.3	65.2
157)				
158)	4 : Kawayan tinik	32.70	9.8	66.1
613	5 : Pole-vault bamboo	26.25	7.87	68.78
66	6 : Kawayan kiling (52 gm per l. NaOH)	33.90	6.83	62.70
653	7 : Bulo	24.92	7.48	76.12

1/ Including screened pulp-rejects.



Cook No.	Species	Percent		1/ Cold soda pulp yield (% based on oven dry material pulped)
		Consumption of chemicals charged	Chemical consumption based on oven dry material	
	C. : <u>Hardwoods</u>			
253)				
256)	1 : Acacia	32.6	10.28	80.5
360)				
367)	2 : Agoho	25.30	8.11	75.8
160)				
162)	3 : Anabiong	43.4	13.02	59.8
147)				
150)	4 : Apitong	57.3	14.2	74.7
111)				
114)	5 : Bagtikan	22.0	6.59	78.3
207)				
210)	6 : Balakat gubat	14.5	4.3	69.3
129)				
132)	7 : Balobo	56.5	16.9	63.9
417)				
421)	8 : Balsa	32.3	8.95	71.5
470)				
213)				
216)	9 : Dita	34.0	10.18	68.4
196)				
199)	10 : Dulit	32.1	9.02	75.11
170)				
173)				
277)	11 : Gubas	37.8	11.24	66.5
315)				
316)				

1/ Including screened pulp-rejects.

Cook No.	Species	Percent		1/ Cold soda pulp yield (% based on oven dry material pulped)
		Consumption of chemicals charged	Chemical consumption based on oven dry material	
220)				
225)	12 : Hagimit	27.5	9.09	77.2
261)				
299)	13 : Hamindang	33.5	10.22	68.7
313	14 : Ipil-ipil	26.6	8.12	68.1
96)				
98)	15 : Kaatoan-bangkal	29.3	8.79	69.4
284)				
289)	16 : Katmon	42.4	10.5	58.2
4	17 : Katurai	18.40	5.52	95.90
424)				
430)	18 : Kupang	23.3	7.05	66.9
87)				
90)	19 : Lanipau	79.7	23.9	76.4
330	20 : Lisak	26.6	11.23	73.1
182)				
185)	21 : Lumbang	66.5	19.94	76.3
266)				
269)	22 : Malakalumpang	39.9	11.9	70.1
117)				
120)	23 : Mayapis	26.8	8.05	68.0
123)				
126)	24 : Red lauan	37.40	11.2	71.4
176)				
179)	25 : Taluto	66.7	20.03	72.8

1/ Including screened pulp-rejects.

Cook No.	Species	Percent		<u>1/</u> Cold soda pulp yield (% based on oven-dry material pulped)
		Consumption: of chemicals charged	Chemical consumption: based on oven dry material	
198)				
200)	26 : Tanag	37.2	11.16	70.9
94	27 : Tangile	23.80	7.14	72.6
250	28 : Tangisang-bayawak	24.4	7.25	74.4
105)				
108)	29 : Toog	22.9	6.86	64.2
322	30 : Tuai	36.3	11.10	66.9
644)				
633)				
619)	31 : White lauan	24.10	7.23	79.6
611)				
595)				
244)				
	D. : <u>Softwoods</u>			
333	1 : Almaciga	24.10	6.41	94.5
233)				
236)	2 : Benguet pine	15.00	9.58	86.1
375	3 : Zambales (Mindoro) pine	21.60	6.48	78.0

1/ Including screened pulp-rejects.

TABLE IV. Proximate chemical analysis of the standardized gold-soda pulps produced in this study.

Cook No.		SPECIES	Lignin	Pentosen	A S h	Solubility in:			Alpha-cellulose
						Alcohol-benzene	Hot-water	1 % NaOH	
	A.	<u>Agricultural wastes:</u>							
501	1	Abaca	-	-	-	-	-	-	-
	2	Coconut husk (pre-hydrolyzed)	28.27	1.43	-	-	-	8.79	73.63
	3	Coconut trunk	-	-	-	-	-	-	-
452	4	Cogon	18.87	-	4.31	-	-	20.1	65.30
399,412	5	Rice straw	14.8	16.89	15.29	-	-	31.44	55.28
434									
297	6	Sugar-cane bagasse (undepithed)	1.87	22.40	1.49	0.43	2.18	16.00	-
	B.	<u>Bamboos:</u>							
135	1	Beyog	24.9	23.3	1.94	0.28	1.62	11.45	-
26,27,223,241	2	Buhc	18.9	19.6	2.0	0.72	2.51	19.11	-
56,101	3	Giant bamboo	21.0	18.7	2.1	0.73	4.02	18.84	-
157,158	4	Kawayan tinik	24.5	21.9	3.6	0.57	3.6	19.3	-
	5	Pole-vault bamboo	-	-	-	-	-	-	-
	6	Kawayan kilang	-	-	-	-	-	-	-
	7	Bulo	-	-	-	-	-	-	-
	C.	<u>Hardwoods:</u>							
253,256	1	Acacia	22.56	14.85	0.90	0.33	1.00	7.50	-
367	2	Agoho	21.95	14.53	1.29	-	-	12.06	-
160,162	3	Anebiong	25.28	16.27	0.90	0.28	0.96	6.90	-
147-150	4	Apitong	28.73	15.06	0.89	0.47	0.70	-	-
111	5	Bagtiken	27.70	13.53	0.89	0.72	9.57	6.52	-
207,210	6	Balaket-gubat	25.32	15.00	1.30	0.69	1.31	6.16	-
129	7	Balobo	29.56	16.21	1.54	0.38	1.25	5.51	-
421	8	Balsa	24.35	13.31	0.99	-	-	8.59	60.45
213-216	9	Dita	33.99	14.11	1.06	0.66	1.19	9.61	-
199	10	Dulit	22.01	16.25	1.38	2.33	4.37	15.21	-

TABLE IV. Continued

Cook No.		S P E C I F S	Lignin	Pentosen	A s h	Solubility in:			Alpha cellulose
						Alcohol-benzene	Hot-water	1 % NaOH	
170,173	11	Gubas	30.00	13.39	1.24	0.50	1.25	4.91	-
230	12	Harimit	25.69	16.74	1.28	2.01	1.46	9.36	-
261	13	Hamindeng	35.25	12.72	0.94	0.04	0.80	18.24	-
	14	Ipil-ipil	-	-	-	-	-	-	-
96	15	Keatoan-bangkal	27.00	17.40	0.76	0.20	1.66	9.03	-
284,289	16	Katmon	31.64	17.30	1.70	-	-	10.95	-
	17	Katurai	-	-	-	-	-	-	-
424,430	18	Kupang	30.00	12.61	0.95	-	-	6.16	61.08
87	19	Lanipau	2.60	16.20	0.93	0.20	1.34	5.46	-
330	20	Lissak	27.64	21.30	0.94	-	-	4.92	-
182,185	21	Lumbang	11.61	17.26	1.18	0.72	1.31	9.80	-
266	22	Malakalumpeng	21.55	14.70	0.94	0.76	-	9.79	-
117	23	Mayapis	29.80	13.29	0.72	0.40	1.71	5.64	-
123	24	Red lauan	31.67	13.04	0.67	0.45	1.30	4.63	-
176	25	Taluto	19.70	14.48	1.31	0.24	1.41	5.38	-
198,200	26	Tanag	36.67	15.06	1.41	0.64	1.02	7.22	-
16	27	Tangile	31.80	12.00	0.93	0.97	2.15	4.13	-
250	28	Tangisang-bayewak	26.06	14.28	1.79	0.47	0.61	9.80	-
105	29	Toog	29.30	17.00	1.05	0.70	1.02	11.46	-
322	30	Tuai	29.24	20.70	1.42	-	-	8.42	-
244	31	White lauan	29.08	15.13	0.88	0.87	1.29	2.19	-
	D.	<u>Softwoods:</u>							
333	1	Almaciga	23.2	13.3	1.01	-	-	1.55	-
233,236	2	Benguet-pine	28.6	12.6	0.80	0.64	0.76	0.03	-
375	3	Zambales (Mindoro) pine	27.2	14.0	1.01	-	-	10.00	-

Table V. Showing physical tests data on the standardized cold-soda pulps.

Physical Tests On Pulp and Stuff			Time processed	Freeness (C)	Ream weight 25" x 40" - 500	Thickness	Burst	Tear	Folds (MIT)	Tensile break ing length	Density	Brightness	Opacity
Test No.	Cook No.	Sample											
<u>Agricultural residues</u>				cc.	lbs.	mils	Pt./lb /rm	Gm./lb /rm	double	meters	gm./cc	Per- cent	
508	576	Abaca waste -----	0	365	58.04	3.85	1.074	0.934	760	9399	0.8346	12.9	89.3
			5	270	58.40	3.72	1.209	0.884	739	9728	0.8691		90.3
			10	225	59.23	3.70	1.261	0.856	586	9923	0.8862		88.5
			15	165	59.57	3.70	1.323	0.859	731	9927	0.8911		89.9
518	521	Abaca fibers -----	0	480	67.93	5.70	1.197	2.941	853	8544	0.6615	33.4	95.1
			5	370	53.82	4.16	1.550	1.744	1351	11283	0.7162	33.1	89.3
			10	235	54.05	4.25	1.628	1.754	1657	11065	0.7040	32.5	88.8
			15	180	58.23	4.39	1.591	1.538	1542	10937	0.7343	30.7	88.5
216	153	Coconut husk -----	0	460	62.6	9.0	0.026	0.153	0	729	0.383	19.3	
			20	265	54.8	8.0	0.10	0.219	0	1479	0.377	20.3	
			40	185	55.1	7.8	0.12	0.232	0	1711	0.392	20.9	
			60	175	57.8	8.1	0.12	0.214	0	1804	0.393	21.4	
431	452	Cogon -----	0	540	56.33	5.98	0.267	1.043	6	3531	0.5210		
			5	425	54.69	5.28	0.468	1.055	15	4971	0.5732		
			10	300	54.47	5.08	0.517	1.033	20	5049	0.5932		
			15	190	51.09	4.38	0.756	0.889	34	6700	0.6454		
417	412	Rice straw -----	0	385	77.90	5.51	0.120	0.292	11	4252	0.557		
			5	300	83.44	5.68	0.124	0.363	14	4996	0.579		
			10	235	84.63	5.78	0.126	0.404	17	5244	0.579		
			15	205	82.76	5.44	0.119	0.438	19	5621	0.599		
			20	175	81.08	5.30	0.116	0.432	21	5366	0.602		

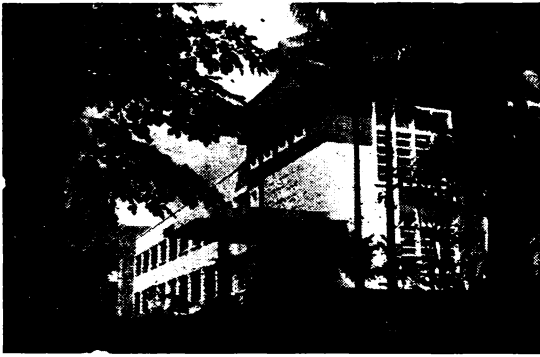
Table V. Continued

Physical Tests On Pulp and Stuff			Time processed	Freeness (C)	Beam weight 25" x 40" - 500	Thickness	Burst	Tear	Folds (MIT)	Tensile break- ing length	Density	Brightness	Opacity
Test No.	Cook No.	Sample											
<u>Agricultural residues - cont'd</u>													
				cc.	lbs.	mils.	Pts/lb	Gm./lb	double	meters	gm./cc	Per cent	
299	292	Sugar cane bagasse (average)	0	622.5	57.52	6.14	0.356	0.8455	11	3452	0.519	30.4	95.5
			10	532.5	57.79	5.86	0.493	0.8315	21.5	4321	0.547	28.7	94.5
			20	442.5	55.62	5.4	0.5575	0.7615	26.5	4898	0.5715	30.8	91.6
			30	365	57.11	5.3	0.609	0.7165	41.5	5628	0.5975	27.9	93
			40	285	56.45	4.98	0.6225	0.6695	57.0	6199	0.630	27.5	93
			50	212.5	54.55	4.73	0.703	0.6395	87.0	6113	0.642	26.5	92
<u>Bamboos</u>													
161	144	Bayog	0	550	54.7	10.9	0.002	0.146	0	555	0.278	29.7	
			20	450	56	10.9	0.018	0.371	0	753	0.284	30.5	
			40	365	57.4	10.4	0.031	0.278	0	933	0.305	30.8	
			60	310	55.2	9.5	0.042	0.348	1	1048	0.321	31.7	
			80	255	56.4	9.4	0.034	0.192	0	1076	0.332	32.4	
			100	200	55.3	9.5	0.028	0.235	0	1337	0.322	32.9	
8	7	Buho	0	736	59.2	10.7	0	0.49	0	556	0.306	38	
			20	713	60.5	10.2	0.04	0.73	0	1105	0.328	40	
			40	688	59.1	9.2	0.09	0.87	1	1476	0.356	41	
			60	658	55.4	8.7	0.13	0.97	1	1668	0.352	41	
			80	616	54.9	8.3	0.17	1.17	3	1917	0.366	42	
			100	586	56.0	8.3	0.22	1.27	4	2260	0.373	43	
52	56	Giant bamboo	0	380	60.0	9.6	0.24	1.30	7	2133	0.346	32.0	
			20	266	59.0	9.3	0.34	1.34	11	2523	0.351	32.3	
			40	220	58.8	8.6	0.36	1.31	11	2580	0.378	33.0	
			60	195	60.0	8.4	0.59	1.28	13	2868	0.396	32.8	
			80	155	59.7	8.0	0.39	1.14	11	3168	0.413	33.3	
			100	143	58.5	7.8	0.38	1.19	11	3030	0.412	33.3	
162	158	Kawayan tinik	0	275	52	8.2	0.151	0.477	1	1677	0.351	36.4	
			10	180	50.2	7.2	0.187	0.510	1	2304	0.386	37.1	
			20	135	50.9	7.05	0.255	0.495	3	2673	0.399	38.2	
			30	100	52.3	6.9	0.279	0.466	3	2955	0.419	38.8	

Table V. Continued

Physical Tests On Pulp and Stuff			Time processed	Freeness (C)	Ream weight 25" x 40"- 500	Thickness	Burst	Tear	Folds (MIT)	Tensile breaking length	Density	Brightness	Opacity
Test No.	Cook No.	Sample											
<u>Bamboos - continued</u>				cc.	lbs.	mils	pts/lb'Gm./lb' /rm.	Gm./lb' /rm.	double	meters	gm/cc.	Per- cent	
380	358	Pole vault bamboo	0	620	58.13	8.4	0.146	0.571	1	488	0.383	31.0	
			20	440	57.1	7.53	0.282	0.546	2	720	0.419	31.8	
			40	320	56.93	7.0	0.330	0.562	2	796	0.450	32.2	
			60	205	55.96	6.55	0.385	0.515	2	915	0.472	32.8	
379	333	<u>Softwoods:</u> Almaciga	0	780	59.0	14.6	0	0.129	0	65.9	0.224	32.5	
			20	775	53.5	10.53	0.0022	0.254	0	164	0.281	33.5	
			40	720	54.6	8.87	0.0046	0.358	0	208	0.340	34.8	
			60	630	53.09	7.56	0.0435	0.392	1	289	0.388	37.0	
			80	450	54.79	7.63	0.0641	0.423	1	346	0.397	39.2	
			100	340	52.81	6.97	0.0844	0.386	1	436	0.420	38.6	
			120	205	55.15	6.17	0.162	0.428	2	521	0.494	41.2	
			140	145	55.99	6.1	0.189	0.443	2	616	0.508	42.5	
250	233	Benguet-pine	0	785	57.7	12.6	0.001	0.090	0	172	0.253	30.9	
			20	715	58.7	9.4	0.029	0.218	0	783	0.345	33.8	
			40	610	58.0	8.4	0.052	0.248	0	883	0.382	34.7	
			60	495	59.9	8.3	0.093	0.260	1	1385	0.399	35.4	
			80	465	60	7.5	0.129	0.260	1	1833	0.442	36.5	
			100	270	57.1	6.6	0.151	0.259	1	2133	0.478	37.8	
			120	180	60.2	6.2	0.209	0.318	1	2567	0.537	38.6	
381	375	Mindoro pine	0	810	58.65	13.1	0	0.094	0	---	0.248	30.8	
			20	750	56.14	9.99	0.002	0.171	0	128	0.311	33.8	
			40	650	59.66	9.5	0.005	0.180	0	190	0.336	34.8	
			60	510	56.7	8.21	0.011	0.240	0	202	0.382	36.2	
			80	375	57.37	7.49	0.052	0.293	0	332	0.424	38.2	
			120	175	58.2	6.92	0.121	0.316	1	493	0.465	40.2	





The Forest Products Research Institute Building

# FPRI Technical Note

Number 1

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## MOISTURE CONTENT OF WOOD IN RELATION TO AIR HUMIDITY

Wood in the tree (green wood) contains much water, frequently more water than wood. It is very common for the water content of green wood to amount to  $1/3$  or  $1/2$  of the total weight and it can be higher. Air also contains water in varying amounts which is referred to as humidity. The "relative humidity" of the air is expressed as a percentage and refers to the degree of saturation of the air. For example, when the relative humidity of the air is reported as 80 percent, it means that the air contains 80 percent of the total amount of water it can hold at that temperature. The relative humidity of air is continually changing, not only from day to day but even from hour to hour, but most of the time it is less than 100 percent. When the relative humidity is lower than 100 percent the air absorbs water from any source that will give up water. The lower the relative humidity, the more thirsty the air becomes and the more rapidly it tries to absorb water from its surroundings.

When green wood is exposed to air at less than 100 percent relative humidity, the air absorbs moisture from the wood, rapidly or slowly according to the relative humidity. Thus the process of seasoning the wood begins and it continues as long as the air is dryer than the wood. When the moisture content of the wood comes down to about 30 per cent, (percentage based on the oven-dry weight of the wood), the wood begins to shrink. Thereafter the shrinkage will continue as long as drying continues.

But wood will not give all its water to the air because wood also has an affinity for water.

Very dry wood will absorb water from air at high relative humidity just like dry air will absorb water from green wood. If the humidity of the air remains constant, the moisture content of the wood will eventually come into balance with it and, in doing so, will swell or shrink in proportion to the amount of water it absorbs from or gives off to the air. For each relative humidity there is a corresponding wood moisture content. This is called the "equilibrium moisture content" or "EMC" of the wood. The temperature of the air also has an influence on the EMC of the wood at a given humidity but this is not enough to require discussion here. Following are a few examples of the relation between the equilibrium moisture content of wood (EMC) and the relative humidity of the air surrounding it:

Relative humidity of the air (at a temperature of 70°F)	Approximate mois- ture content of wood in equi- librium
<i>percent</i>	<i>percent</i>
90	21
80	16
70	13
60	11
50	9
40	8
30	6
20	5
10	3

The humidity of the air can change quickly as the air temperature changes but the moisture content of wood in ordinary sizes cannot change quickly. Therefore, after wood has once reached approximate equilibrium with the average humidity of the surrounding air, its moisture con-

tent does not change appreciably with the hourly or even the daily changes in relative humidity of the air. It is in a constant state of trying to accommodate to the rapid changes in humidity but because of its slowness, never is able to attain complete equilibrium until humidity changes cease — which practically never happens under normal living conditions.

Although dry wood does not respond to hourly or daily changes in the relative humidity of the air, it does respond to long-continued or seasonal changes. For example, in long periods of dry weather, the average relative humidity of the air is considerably lower than during long periods of wet weather. Wood that has reached approximate equilibrium during wet weather will therefore, lose moisture and shrink during extended periods of dryness until it reaches approximate equilibrium with the average new conditions. When the wet season comes again the wood will reabsorb water from the air and swell again as it seeks equilibrium. This constant struggle to attain equilibrium with the air continues as many years as the wood is exposed to changing humidity.

To obtain best service from articles made of wood for use in buildings, therefore, it is important that the wood be seasoned to the right moisture content before the articles are made. Failure to do so may result in much dissatisfaction. The "right" moisture content is determined by the conditions under which the wood will be used.

For general use in the Philippines, where the buildings are open to the free circulation of air and no artificial heating is used, lumber for furniture manufacture should be seasoned to about 12 percent moisture content before the furniture is manufactured. This is close to or slightly

below the average moisture content the wood will attain in normal service and no trouble should be encountered from shrinking or swelling later.

In the United States and Canada, however, it is best to season wood to about six to eight percent before making it into furniture because, in heated houses during cold weather, air humidities are very low and the moisture content of the wood may go as low as five or six percent. In the summertime in these countries, however, the windows are open, the humidities are higher and the moisture content of wood furniture may go as high as 10 percent. If the wood is between these extremes at the time of manufacture there will be less shrinking and swelling in service than if the manufacturing is done when the wood is at some other moisture content.

The seasonal changes in relative humidity of the air are very much less in the Philippines than in the United States and Canada. Much more care is required, therefore, in seasoning wood for products to be exported to these countries than products to be used in the Philippines. This is why wood products that give entirely satisfactory service in the Philippines may shrink and crack excessively when exposed to the extremely dry air of a North American house in winter.

Some species shrink or swell less than others with a given change in moisture content and, to that extent, may be preferred. The design and construction of the product, of course, also have much to do with its performance in service.

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Table V. Continued

Physical Tests On Pulp and Stuff			Time Pro- cessed	Freeness (C)	Ream weight (25" x 40" 500)	Thickness	Burst	Tear	Folds (MIT)	Tensile break- ing length	Density	Brightness	Opacity
Test No.	Cook No.	Sample											
<u>Hardwoods:</u>													
286	256	Acacia	0	1560	156.52	7.81	10.191	10.637	3	12235	10.401	147.9	98.25
			20	1455	155.88	6.45	10.32	10.616	6	13187	10.481	147.5	98.25
			40	1360	155.6	6.15	10.392	10.604	6	13696	10.502	147.4	99
			60	1300	156.32	5.66	10.453	10.625	14	14217	10.552	148	98.75
			80	1240	155.61	5.28	10.505	10.669	20	14701	10.584	145.6	99
			100	1180	156.65	5.03	10.554	10.621	29	15259	10.625	144.8	99.25
371 373	360 367	Agoho (average)	0	1707.5	159.77	9.51	10.198	10.237	0.5	1116	10.342	141.8	
			20	1605	154.81	7.66	10.0868	10.2885	1	1355.5	10.3955	142.8	
			40	1487.5	165.54	6.96	10.142	10.3635	1.5	1521	10.451	143.8	
			60	1427.5	154.47	6.50	10.216	10.4215	2	1649.5	10.464	144.8	
			80	1262.5	157.12	6.46	10.304	10.506	3	1805.5	10.489	145.2	
			100	1142.5	156.52	5.74	10.428	10.575	6	1970.5	10.550	146.2	
193 205	160 162	Anabiong (average)	0	1117.5	153.7	6.24	10.1805	10.4305	2	12515	10.476	137.1	
			20	172.5	157.5	6.15	10.243	10.509	3	13042	10.517	137.5	
			40	150	156.5	5.72	10.2815	10.485	4	13488	10.5465	136.7	
			60	142.5	158.35	5.855	10.313	10.5145	6	13521.5	10.5515	136.7	
185	147	Apitong	0	1620	162.0	10.4	10	10.058	0	10	10.330	129.3	
			20	1490	153.5	8.4	10	10.075	0	160	10.352	131.1	
			40	1360	156.5	8.6	10.009	10.106	0	478	10.363	132.4	
			60	1190	154.6	7.7	10.028	10.110	0	729	10.392	134.4	
			80	90	135.6	7.3	10.047	10.137	0	1032	10.421	135.6	

Table V. Continued

Physical Tests On Pulp and Stuff			Time Pro- cessed	Freeness (C)	Ream weight (25" x 40" - 500)	Thickness	Burst	Tear	Folds (MIT)	Tensile break- ing length	Density	Brightness	Opacity
Test No.	Cook No.	Sample											
<u>Hardwoods: Cont'd.</u>													
153	111	Bagtiken	0	1717	157.1	11.9	10.004	10.001	0	478	0.265	38.2	
			20	1638	156.0	9.8	10.006	10.157	0	863	0.316	39.7	
			40	1570	155.8	8.8	10.059	10.430	0	1206	0.351	39.5	
			60	1517	155.6	8.2	10.099	10.374	1	1534	0.375	41.1	
			80	1440	157.9	7.6	10.131	10.311	1	1834	0.421	39.5	
			100	1360	153.9	6.8	10.165	10.214	1	2110	0.438	42.1	
			120	1219	153.9	6.2	10.204	10.289	1	2585	0.481	42.9	
236 254	207 210	Balakat-gubat (average)	0	1755	158.55	9.8	10.4555	10.230	0.5	1800.5	0.3375	45.5	
			20	1665	158.65	7.44	10.1255	10.392	1	1751	0.4365	47.05	
			40	1545	157.35	6.525	10.222	10.401	2	2258.5	0.487	47.75	
			60	1392.5	157.1	5.72	10.3325	10.546	4	3439	0.550	48.2	
			80	1252.5	157.4	5.22	10.447	10.5895	10.5	3938	0.6085	48.55	
			100	1132.5	158.35	4.78	10.5165	10.5755	25.5	4981.5	0.6755	47.4	
173	129	Balobo	0	1695	151.7	10.4	10	10.542	0	0	0.275	38.4	
			20	1605	153.8	10.0	10	10.111	0	0	0.298	39.7	
			40	1430	158.4	10.3	10	10.082	0	65	0.314	41.2	
			60	1220	156.3	9.37	10	10.098	0	337	0.332	43.0	
			80	95	152.6	8.54	10	10.114	0	469	0.341	44.2	
428	417	Balse	0	1565	159.13	7.83	10.313	1.190	7	3177	0.4181		
			20	1465	159.03	7.42	10.465	1.209	12	3864	0.4403		
			40	1385	157.30	6.69	10.555	1.228	14	4236	0.4747		
			60	1335	156.06	6.35	10.572	1.176	22	4828	0.4891		
			80	1260	158.23	6.57	10.575	1.149	23	5149.7	0.4902		
			100	1215	157.00	6.45	10.620	1.219	28	6158	0.5169		
			120	1180	157.44	5.96	10.655	1.132	33	6545	0.5335		

Table V. Continued

		Physical Tests On Pulp and Stuff											
Test No.	Cook No.	Sample	Time processed	Freeness (C)	Ream weight 25" x 40" 500	Thickness	Burst	Tear	Folds (MIT)	Tensile break- ing length	Density	Brightness	Opacity
		<u>Hardwoods - continued</u>											
		cc.	lbs.	mils	Pts/lb /rm	Gm./lb /rm	double	meters	gm./cc	Per- cent			
239	216	Dita -----	0	790	61	14.2	0	0.016	0	0	0.238	34	
			20	720	58.1	9.96	0.011	0.076	0	490	0.33	36.5	
			40	635	59.7	10.0	0.023	0.067	0	699	0.330	37.3	
			60	505	58.8	9.3	0.048	0.102	0	887	0.350	38.8	
			80	315	58.0	8.1	0.085	0.131	0	1373	0.396	40.4	
212	199	Dulit -----	0	645	60.5	7.7	0.190	0.578	3	2304	0.437	44	
			20	535	57.7	6.6	0.324	0.582	6	3302	0.484	44.9	
			40	445	57.1	6.2	0.415	0.707	8	3951	0.509	45.2	
			60	365	58.6	5.9	0.495	0.689	16	4788	0.549	44.8	
			80	300	57.8	5.5	0.535	0.616	23	4535	0.581	44.6	
			100	260	59.7	5.4	0.692	0.750	34	5883	0.611	44.5	
			120	200	58.0	5.1	0.683	0.710	30	6216	0.624	44.7	
140	145	58.6	5.0	0.718	0.539	99	5516	0.643	44.5				
201	170	Gubas -----	0	505	58.7	10.2	0.005	0.136	0	565	0.318	46.1	
			20	355	60.1	9.2	0.040	0.180	0	1073	0.361	47.5	
			40	290	57.2	7.5	0.076	0.224	1.0	1483	0.422	48.3	
			60	205	57.0	7.0	0.119	0.295	1	1913	0.450	49.3	
			80	100	57.2	6.9	0.148	0.315	0	2287	0.459	50.4	

Table V. Continued

		Physical Tests on Pulp and Stuff											
Test No.	Cook No.	Sample	Time processed	Freeness (C)	Ream weight 25" x 40" - 500	Thickness	Burst	Tear	Folds (MIT)	Tensile breaking length	Density	Brightness	Opacity
				cc.	lbs.	mils	Pts/lb /rm.	Gm./lb /rm.	'double	meters	gm./cc	Per-cent	
		<u>Hardwoods - continued</u>											
242	220	Hagimit -----	0	720	59.2	9.1	0.090	0.378	1	1273	0.360	40.5	
			20	570	56.8	7.4	0.221	0.577	2	2220	0.424	41.6	
			40	400	57.7	6.5	0.355	0.596	8	3261	0.491	42.1	
			60	250	57.3	6.2	0.445	0.544	13	3623	0.511	42.3	
			80	140	57.8	5.7	0.476	0.543	31	4006	0.558	42.1	
283	261	Hamindang -----	0	730	59.04	11.81	0.024	0.108	0	394	0.277	35.2	99
			20	650	56.33	8.85	0.039	0.163	0	698	0.353	37	98
			40	545	62.72	9.25	0.053	0.198	0	988	0.376	38.1	99
			60	455	56.87	7.69	0.069	0.211	0	1210	0.410	39.1	99.5
			80	290	55.18	6.94	0.083	0.203	0	1422	0.555	39.5	99
			100	120	55.1	6.26	0.115	0.211	0	1780	0.555	39.8	99
374	313	Ipil-ipil	0	555	57.83	9.03	0.072	0.373	1	321	0.354	23.8	
			10	465	59.16	8.12	0.122	0.433	2	417	0.403	24.5	
			20	380	58.26	7.7	0.172	0.556	2	479	0.18	25	
			30	275	57.86	7.37	0.226	0.595	3	602	0.434	25.5	
			40	200	59.24	6.67	0.300	0.614	5	692	0.491	26.0	
144	98	Kaatoan-bangkal -----	0	745	61.1	12.9	0.060	0.255	1	977	0.262	50.7	
			40	560	56.5	8.5	0.213	0.425	2	2567	0.368	52.1	
			60	460	59.1	7.8	0.286	0.568	2	3112	0.419	52.7	
			80	370	57.7	6.9	0.319	0.534	3	3647	0.462	52.3	
			100	275	56.5	7.1	0.418	0.566	4	3658	0.440	53.3	
			120	200	57.5	6.5	0.436	0.452	4	3822	0.489	54	

Table V. Continued

Test No.		Cook No.		Sample	Time processed	Freeness (C)	Ream weight 25" x 40" - 500	Thickness	Burst	Tear	Folds (MIT)	Tensile breaking length	Density	Brightness	Opacity
Physical Tests On Pulp and Stuff															
				cc.	lbs.	mils	Pts/lb	Gm./lb			double	meters	gm./cc	Per-	cent
<u>Hardwoods - continued</u>															
296	284	Katmon	-----	0	795	53.67	11.5	0.017	0.089	0	193	0.259	30.2		
				20	670	53.34	9.63	0.027	0.173	0	533	0.307	32.2		
				40	520	56.06	8.89	0.049	0.257	0	897	0.350	34.1		
				60	350	54.87	8.03	0.084	0.277	0	1171	0.379	35.2		
				80	225	55.7	7.86	0.113	0.323	0	1597	0.393	36.2		
				100	130	53.51	7.24	0.130	0.292	1	1734	0.410	36.6		
1	4	Katurai	-----	0	750	60.1	12.8	0	0.15	0	304	0.259	42.2		
				20	713	59.4	11.2	0	0.20	0	606	0.294	43.9		
				40	653	57.7	9.5	0.009	0.30	0	895	0.336	44.9		
				60	560	55.2	8.4	0.03	0.36	0	1253	0.364	45.6		
				80	430	57.6	7.6	0.109	0.36	1	1975	0.419	46.4		
				100	245	55.6	6.6	0.17		2	2353	0.466	47.0		
430	424	Kupang	-----	0	520	57.78	9.03	0.079	0.333	1	1518	0.354			
				20	415	57.92	7.74	0.1268	0.417	1	2382	0.414			
				40	320	56.73	6.94	0.2085	0.461	2	3071	0.453			
				60	225	49.58	6.35	0.2325	0.412	2	3334	0.480			
				80	135	55.58	5.77	0.2929	0.417	2	5892	0.533			
42	90	Lanipau	-----	0	650	62.2	12.8	0.018	0.096	0	442	0.269	35.4		
				20	572	61.1	11.4	0.040	0.131	0	869	0.269	35.5		
				40	472	59.2	10.01	0.062	0.162	0	1185	0.324	36.4		
				60	350	59.5	9.2	0.109	0.316	1	1514	0.358	37.1		
				80	220	58.6	8.4	0.143	0.239	0	1957	0.386	38.2		
				100	120	57.4	7.6	0.206	0.226	1	2230	0.418	39.1		

Table V. Continued

Physical Tests On Pulp and Stuff			Time processed	Freeness (C)	Ream weight 25" x 40" - 500	Thickness	Burst	Tear	Folds (MIT)	Tensile break- ing length	Density	Brightness	Opacity
Test No.	Cook No.	Sample											
<u>Hardwoods - continued</u>			cc.	lbs.	mils	Pts/lb /rm.	Gm./lb /rm.	double	meters	gm/cc.	Per- cent		
378	320	Lisak -----	0	785	58.41	12.7	0.	0.342	0	2.37	0.254	45.0	
			15	695	53.96	10.5	0	0.459	0	4.4	0.284	46.5	
			30	510	56.19	9.42	0.0021	0.712	0	15.6	0.330	48.5	
			45	320	51.63	8.46	0.0023	0.968	0	19.4	0.338	49.5	
			60	120	56.70	8.64	0.0044	0.966	0	19.5	0.363	51.0	
208	185	Lumbang -----	0	815	63.1	8.2	0.152	0.602	2	1961	0.379	44.8	
			20	625	56.5	5.7	0.432	0.694	14	4211	0.548	45.5	
			40	370	57.8	5.2	0.547	0.623	47	5576	0.615	44.7	
			60	195	57.2	4.8	0.577	0.594	70	5958	0.659	43.5	
			80	80	59.3	4.1	0.769	0.560	179	6895	0.802	37	
277	266	Malakalumpang -----	0	715	56.83	7.12	0.202	0.697	3	2310	0.443	49.2	
			20	650	56.45	6.22	0.334	0.843	6	3728	0.504	49.7	
			40	570	55.84	5.49	0.475	0.867	15	5132	0.567	49.3	
			60	480	57.42	5.25	0.596	0.871	34	5989	0.607	40.5	
			80	365	55.88	4.98	0.675	0.852	67	6392	0.623	48.8	
			100	250	57.51	4.67	0.807	0.835	79	7204	0.683	47.9	
			120	150	55.01	4.27	0.902	0.742	149	7738	0.715	45.8	
174	117	Mayapis -----	0	600	61.2	11.4	0	0.090	0	511	0.297	32.5	
			20	500	55.6	9.2	0.011	0.144	0	818	0.334	33.9	
			40	425	59.2	9.34	0.035	0.196	0	1193	0.351	34.5	
			60	320	57.5	7.6	0.079	0.216	0	1731	0.418	35.5	
			80	200	55.5	7.05	0.093	0.223	0	1879	0.435	36.4	
			100	110	53.9	6.36	0.119	0.215	0	2146	0.469	36.8	



Table V. Continued

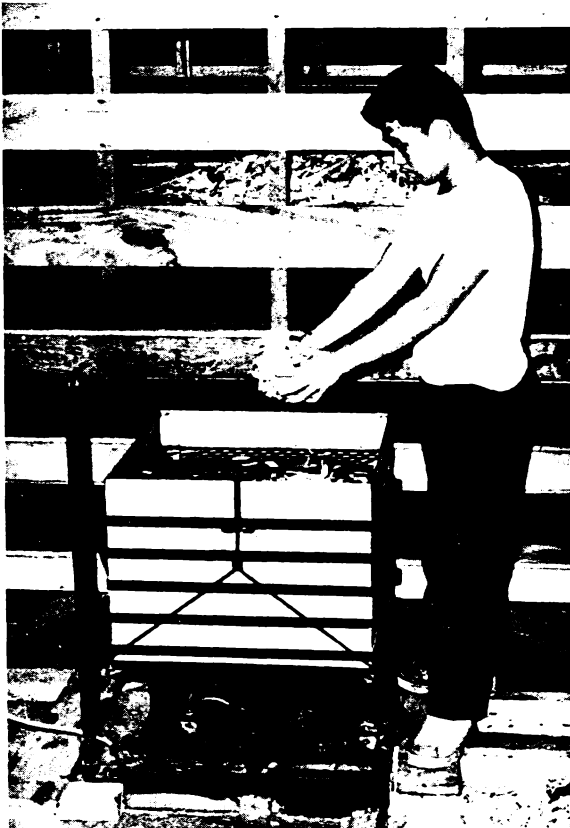
Physical Tests On Pulp and Stuff			Time Pro- cessed	Freeness (°C)	Ream weight (25" x 40" 500)	Thickness	Burst	Tear	Folds (MTT)	Fensile breaking length	Density	Brightness	Opacity
Test No.	Cook No.	Sample											
<u>Hardwoods- cont'd.</u>													
170	123	Red lauan	0	567.5	56.8	10.93	0.0015	0.185	0	545	0.2875	32.9	
179	126	(average)	20	410	56.5	8.78	0.0395	0.254	0.5	1250.5	0.3565	35.05	
			40	237.5	56.15	7.23	0.0865	0.267	0.5	1776.5	0.430	37	
			60	120	55.3	6.55	0.109	0.330	1	2101	0.467	38.05	
191	179	Taluto	0	560	61.25	5.9	0.4375	0.852	21	4013	0.574	41.4	
202	176	(average)	20	292.2	55.55	4.57	0.8235	0.775	152	7457	0.735	38.7	
			40	142.5	55.81	4.16	0.107	0.7105	346	8114	0.725	34	
			60	72.5	56.6	4.0	0.1077	0.6245	454.5	8031	0.7665	28.1	
226	198	Tanag	0	710	60.45	11.45	0.0285	0.212	0	796.5	0.293	38.75	
213	200	(average)	20	645	59.35	10.35	0.0515	0.233	0	1081	0.317	41	
			40	562.5	58.25	9.05	0.0935	0.2825	0	1588.5	0.356	41.6	
			60	475	60.8	8.95	0.120	0.3255	1	1966.5	0.376	42.25	
			80	375	58.85	7.9	0.1695	0.3265	1	2527.5	0.4125	42.85	
			100	232.5	59.4	7.55	0.2115	0.311	1	3245	0.436	44	
			120	127.5	58.55	6.7	0.2355	0.3485	1	3133	0.485	45.1	
271	94	Tangle	0	750	57.54	11.13	0.013	0.113	0	323	0.282	21.8	
			20	615	57.07	8.82	0.040	0.182	0	964	0.359	23.0	
			40	575	56.6	8.55	0.051	0.24	0	1147	0.367	23.2	
			60	495	56.79	8.01	0.077	0.24	1	1536	0.393	23.9	
			80	405	55.09	6.92	0.113	0.276	1	1923	0.442	24.5	
			100	315	57.5	6.6	0.155	0.211	1	2477	0.483	25.8	
			120	200	56.81	6.15	0.190	0.331	1	2720	0.512	26.0	

Table V. Continued

Physical Tests On Pulp and Stuff			Time Pro- cessed	Freeness (G)	Ream weight (25" x 40" - 500)	Thickness	Burst	Tear	Folds (MIT)	Tensile break- ing length	Density	Brightness	Opacity
Test No.	Cook No.	Sample											
<u>Hardwoods - cont'd.</u>													
263	250	Tangisang-bayawak	0	1655	157.72	8.71	10.125	10.319	1	1716	10.396	34.2	
			20	1500	155.35	7.02	10.220	10.347	1	2309	10.437	35.9	
			40	1305	156.51	6.25	10.291	10.361	1	3129	10.500	35.1	
			60	1115	155.48	5.27	10.404	10.353	1	4037	10.582	33.1	
272	108	Toog	0	1775	159.28	10.98	10.030	10.142	0	420	10.300	33.8	
			20	1685	152.13	8.9	10.036	10.261	0	818	10.325	36.0	
			40	1600	159.08	8.68	10.080	10.359	1	1215	10.378	36.5	
			60	1480	155.2	7.55	10.120	10.391	1	1662	10.406	38	
			80	1375	157.02	7.35	10.126	10.386	1	1787	10.403	39.4	
			100	1290	158.56	7.56	10.172	10.437	2	1866	10.430	39.5	
			120	1195	160.65	7.13	10.225	10.475	2	2122	10.472	40.5	
377	322	Tuae	0	1785	152.41	10.4	10.0023	10.133	0	15.88	10.279	30.2	
			10	1665	149.69	8.16	10.0052	10.249	0	20.8	10.337	31.8	
			20	1510	155.62	8.32	10.036	10.31	1	31.0	10.370	33.2	
			30	1355	154.42	7.17	10.094	10.375	1	44.1	10.420	34.8	
			40	1170	156.45	6.72	10.132	10.33	1	49.8	10.465	36.2	
258	244	White Iauan	0	1745	155.3	112	10.032	10.089	0	386	10.255	38.9	
			20	1725	153.7	9.8	10.053	10.134	0	768	10.303	39.5	
			40	1680	156.4	8.8	10.092	10.270	1	1462	10.354	41	
			60	1610	156.9	8.7	10.129	10.288	1	1766	10.362	41.5	
			80	1525	158.2	8.0	10.196	10.474	1	2150	10.402	42.3	
			100	1400	157.4	7.7	10.210	10.355	2	2849	10.412	43.1	
			120	1280	155.3	6.7	10.266	10.420	1	3308	10.456	45.5	
			140	1140	158.6	6.4	10.333	10.491	2	3454	10.506	45.7	



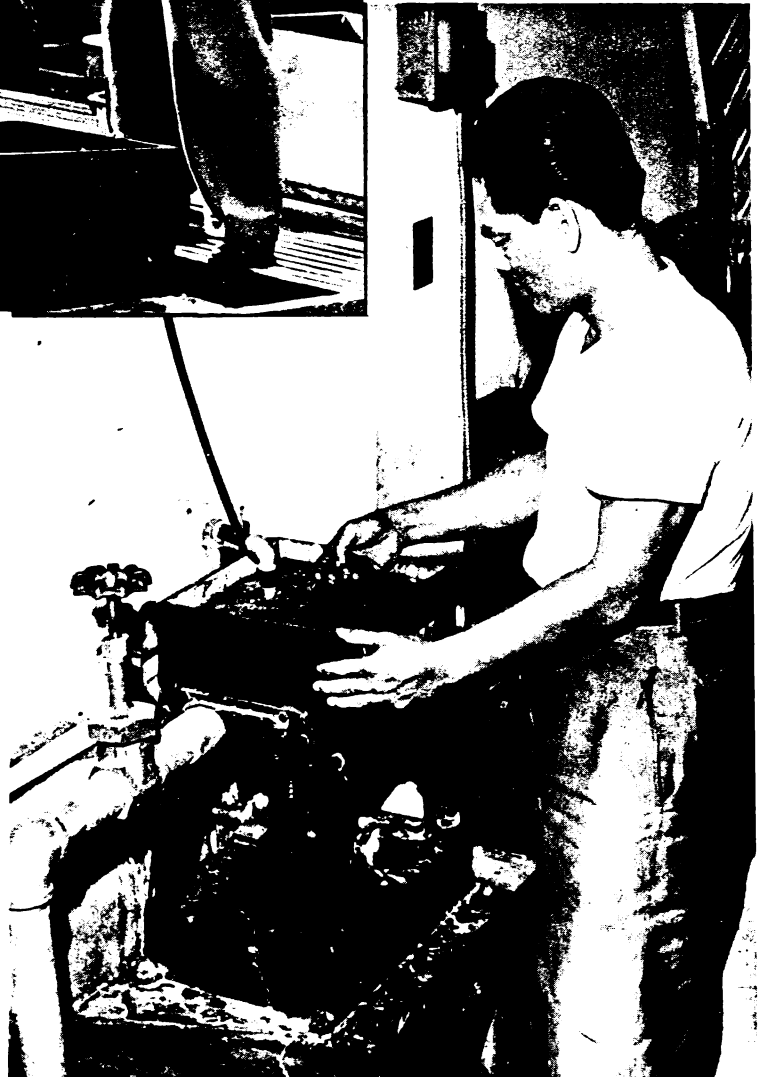
**Fig. 1. Wood being chipped in the chipper.**



**Fig. 2. Wood chips being screened.**



**Fig. 3. Soaked chips being passed thru the Bauer mill.**



**Fig. 4. Cold soda pulp being screened.**

Table V shows the physical tests on the pulp handsheets made from the pulps of the different species investigated.

From table I, it appears that, among the agricultural wastes tested, abaca has the longest average fiber length (3.15 mm.), while coconut husk has the shortest, only 0.58 mm.

Among the seven bamboos studied, giant bamboo has the longest average fiber length, 3.78 mm. and bulo, the shortest, 1.80 mm.

Among the 31 hardwood species tried, katmon has the longest average fiber length, 2.68 mm., and acacia the shortest, 0.87 mm.

Table I further shows that the coniferous woods (softwoods) have the longest average fiber lengths. Of the three softwoods used in this study, almaciga has the longest average fiber length, 5.31 mm. and Benguet-pine the shortest, 3.45 mm., but even Benguet-pine has fibers longer than those of the hardwoods and the agricultural wastes.

J. d'A Clark, as cited by Emerton (4), found that, empirically, tensile strength is proportional to the square root of the average fiber length whereas the bursting strength is approximately directly proportional to it; also the tearing strength is roughly proportional to (fiber length)  $3/2$ .

Emerton (4) also cited the work of Nadelman, et al, and Cattrall regarding the influence of fiber length on tearing strength. These investigators found that fiber length is the major factor affecting tearing strength. Papers made from hardwoods, due to their lower average fiber lengths are, as a rule, inferior to those made from coniferous pulps in tearing strength.

From Table II, it can be seen that tuai has the highest lignin content, (42.0 percent) and rice straw, the lowest, (14.0 percent).

Abaca has the highest percentage of holo-cellulose (71.6), and rice straw the lowest (50.1).

The main purpose in pulping is to eliminate the lignin and other non-fibrous materials and to recover the cellulose in the form of pulp. If other things are equal, as far

as chemical pulping is concerned, the lower the lignin and the higher the cellulose content of the raw material, the less pulping chemicals are needed, and the greater will be the pulp yield.

Table III shows that the highest pulp yield was obtained from katmon (95.9 percent) and the lowest from rice straw (41.65 percent.)

Regarding chemical consumption during pulping, based on chemicals charged, coconut husk registered the highest while balakat-gubat, the lowest (14.5 percent). Basing on the oven-dry weight of the material used, lanipau consumed the greatest amount of chemicals during pulping (23.9 percent), while balakat-gubat, the lowest (4.3 percent).

Table IV shows that, of the unbleached cold-soda pulps produced in this study, the tanag pulp shows the highest lignin content, (36.67 percent) and that of the sugar cane bagasse, the lowest, (1.78 percent).

Pentosans (falling in the hemicellulose group) have favorable bearing on the strength characteristics of cold-soda pulps (8).

Of the pulps under discussion, bayog had the highest pentosan content (23.3 percent) and coconut husk, the lowest, (1.43 percent).

Referring to ash, the pulp from rice straw registers the highest content, 15.29 percent; that of red lauan, the lowest, 0.67 percent.

From Table V, it appears that in burst, at Canadian standard freeness of 235 cc., or thereabouts, the cold-soda pulp produced from abaca fibers exhibited the highest value, 1.628 pts./lb./ream; while balobo and almon, both hardwoods had the lowest, 0.

The cold-soda pulp from abaca fiber at 0-minute beating exhibits the highest tearing strength, 2.941 gm./16./ream. While bagtikan, at 0-minute beating, the lowest, 0.001 gm./lb./ream.

In double-folding endurance, the cold-soda pulp from abaca fibers shows the highest value, 1657, at 235 cc. Canadian Standard freeness while coconut husk, bayog, apitong,

balobo, dita, gubas, hamindang, katmon, lanipau, lisak, mayapis, and Mindoro pine register zero.

In tensile strength, the cold-soda pulp from abaca fibers registers the highest value, 11,283 m. breaking length, at C.S. freeness of 370 cc., while apitong, balobo, and dita, at zero minute beating, exhibit zero meter.

The cold-soda pulp from abaca waste has the highest density, 0.8911 gm./cc. at 165 cc. C.S. freeness. On the other hand, the lowest cold-soda pulp density is registered by that of dita, at 790 cc. C. S. freeness, 0.238 gm./cc.

Lastly, among the hand sheets prepared from the unbleached cold-soda pulps listed in Table V, those of kaatoan-bangkal register the highest brightness, 54 percent G.E. at 120 minute beating and 200 cc. C.S. freeness; whereas, that of abaca waste exhibits the lowest brightness, 12.9 percent G. E. at 365 cc. C.S. freeness and 0-minute beating.

### CONCLUSION

Within the limits of the pulping and testing studies reported herein, the following conclusions may be drawn:

That out of the 47 species of local cel-

lulosic raw materials explored in this study, katurai gave the highest percentage of cold-soda pulp yield, based on the oven-dry weight, and the cold-soda pulp from abaca fibers gave the highest values for burst, tear, tensile, folding endurance, and density. Lastly, kaatoan-bangkal cold-soda pulp registers the highest percentage of brightness and abaca waste, the lowest.

In this connection, however, it should be remembered that the pulp producer and the paper maker have many ways of handling their raw materials and of mixing pulps from different sources. It does not necessarily follow, therefore, that a species that showed low values in the foregoing tests cannot be used. It is true that some test are better than others and will be preferred but it is probable that all of the fibrous materials covered in these tests can be used in some way for making some kind of pulp or paper products. The extent to which they actually will be used will depend on cost, local availability, product to be made and various other economic factors as well as their standing in these tests.

### SILVICULTURAL PRACTICES . . .

*(Continued from page 42)*

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*Compliments of:*

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*Main Office:*

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# Additional Random Observations Made During My Travels In Japan Last Year

By MANUEL R. MONSALUD

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During the first week of August, 1959, I made a trip to visit the only bamboo pulp and paper mill in the whole Japanese Empire. This mill is located at Hagi City, roughly located in the southwestern part of Honshu Island. From my headquarters in Tokyo, it took me about twenty-five hours of continuous trip by express train and bus to reach Hagi.

During the trip, I kept observing what I could of Japanese cities, rural districts, and country sides. I passed thru Hiroshima, the atomic-bombing of which, including that of Nagasaki in Kyushu Island, led to the unconditional surrender of Japan to the allies in 1945, thus ending World II, the bloodiest of all wars that man has ever experienced thus far.

There are countless pulp and paper mills, oil refineries, foundries, and other factories along rivers and sea coasts of Japan.

Japanese rural districts are clean. On both sides of the roads in rural places, countless, unfenced, small patches of land are planted to diversified crops such as corn, rice, wheat, potatoes, silk-worm mulberry, radishes, cabbage, beans, squash, tea, gabi, sweet potato, ginger, onions, eggplants, tomatoes, garlic and many others. This is made possible because there are practically no stray animal such as pigs, goats, chickens, cattle, horses, etc., roaming around in rural districts destroying or feeding on said crops.

The average Japanese farmer is very industrious and almost indefatigable. He begins work very early in the morning up to

very late in the afternoon with short interval for rest and meal at high noon. He works in the field until he can no longer see due to darkness.

Outside of residential and factory sites, there are practically no fences in Japan.

Locally made black tile roofing is predominantly used in Japan outside of cities. Ceramic factories are numerous.

The average Japanese is fond of indulging in hot baths.

Japan has many rivers. Her rivers and coastal lines are well exploited. Her countless ships sail the seas surrounding Japan for fishing purposes or for transporting cargo from one place to another.

Fishing, oyster raising, and pearl culture dot Japanese sea coasts and the mouths of her rivers. The manufacture of cement, metallic alloys, steel, fertilizer, electronics, heavy equipment, ships, textile, toys, chemicals, etc., are going on in full blast in many places all over Japan. She imports raw materials from foreign countries and converts them into capital and consumers' goods for export; thus Japan prospers.

Japanese rice fields are small. Rice farmers use some contrivances to scare or drive away rice birds. Fine nets and twisted, multi-colored strips of tinsel are installed over rice paddies with maturing grains. The latter sway with the breeze thus scaring away rice birds. The nets prevent the birds from eating the maturing grains. These gadgets are very effective, much better than the ordinary scarecrow.

Numberless fishing boats ply night and day near the sea coasts or in the open seas, regularly bringing in bountiful fish catches and seaweeds that help feed millions of Japanese mouths. The Japanese nation is predominantly fish eating; raw fish and seaweeds are favorite foods of the masses.

To the tourists, the following are some very well known Japanese dishes:

1. *Sukiyaki*—beef and fresh (usually leafy) vegetables, short-time fried in animal fat and eaten after dipping in beaten raw egg, seasoned with soy sauce, with every little cooked rice eaten at almost the end of the meal.
2. *Batayaki*—beef fried with butter in frying pan. No vegetable.
3. *Tempura*—fried shrimps and other sea foods with fresh vegetables.
4. *Aburayaki*—beef, without vegetables, broiled in vegetable oil.
5. *Suse* —raw fish (octopus, tuna, fish eggs, shell fish, seaweeds, etc.,) on cooked rice blocks, with pickled or salted ginger, radish, egg-plant; followed by tea.
6. *Prunier* — (derived from the French) —consists of all sea foods obtainable in the market.

The food of the ordinary Japanese consists of:

1. fish — any kind — salted, dried, or raw.
2. salted or pickled vegetables
3. miso — soup from soya bean curd dispersed in water.
4. cooked rice

The average Japanese seldom eats meat because it is scarce and therefore expensive.

It was told that taxi dancers or cabaret girls are not looked down upon. Instead their calling is a source of pride and cash. When

the girls reach 26 to 30 years of age, they begin settling down to raise a family. They then seldom go out to eke a living. They expect their male life-partners to be their meal tickets. The women do the household chores in addition to raising kids.

When walking in the streets or in public places, the husbands are ahead, usually followed by their wives. Even eating at home, the men eat first while the women serve them. The women eat later.

The geisha is an institution in Japan established since time immemorial. A geisha is a singing and dancing girl, trained ever since her early teens, to entertain and please paying customers usually in first class Japanese-type restaurants and hotels. She always wears silk Kimono with her hair arranged in the characteristic Japanese coiffure while plying her trade.

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*Proprietor*

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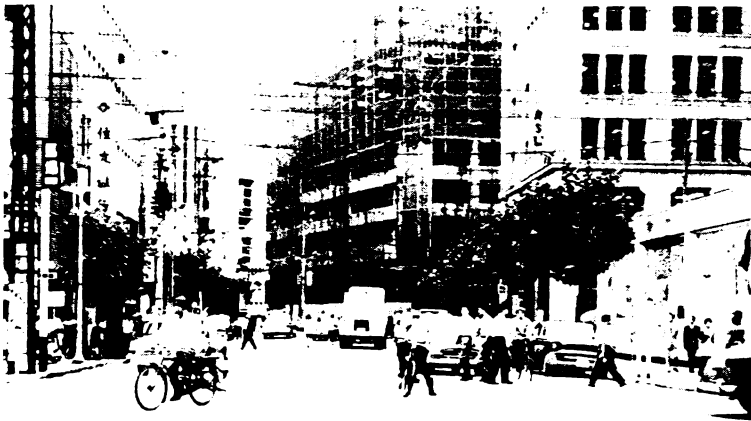
FIG. 1—The Hagi bamboo pulp and paper mills, the only one of its kind in the whole Japanese empire. The author is shown in the foreground.

FIG. 2—A typical Japanese ceramics worker inside a pottery shop.



FIG. 3—Women workers in a typical bamboo curtain factory in Hagi City, Japan.

**FIG. 4—The author in front of a famous shrine in Hagi City.**



**FIG. 5—A portion of the heart of Tokyo where apartments or hotels are rising up like mushrooms.**

**FIG. 6—Modern means of transportation in Japan like elevated trains and buses.**



# *Reforestation and Afforestation in the Philippines for Fiscal Year 1957-1959*

By

JOSE VIADO and CARLOS CUNANAN

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## I. GENERAL STATEMENT

Afforestation and Reforestation work in this country began in 1910 in conjunction with the establishment of the Forest School (now College of Forestry), at the base of Mt. Makiling, town of Los Baños, province of Laguna, island of Luzon. This area was brushed and cleared and the ground broken and planted to seeds and seedlings of the timber species in connection with the students' required work in the Silviculture Class. The area was later expanded to include the adjacent brush lands. This was brought about by the opening of the first reforestation project.

It was only in 1916 when a specific appropriation was created by the Philippine Legislature thereby giving impetus to the start of actual afforestation work. Act No. 2649 provided ₱10,000.00 "for the Bureau of Forestry, for expenditures as may be deemed necessary for carrying the work of reforestation of unclassified public lands and on lands known as friar lands not reserved or set aside for other purposes."

This fund was followed by periodic appropriations. On June 7, 1947, Republic Act No. 115 was passed by the Congress of the Philippines creating a permanent reforestation fund thru the imposition of an additional tax on all timber cut from the public forests for commercial purposes. This fund is for yearly expenditure.

## II. PLANNING

The plans and programs in afforestation and reforestation work for the three fiscal year-period (1957-59) consisted of the inspection of denuded areas, grasslands, marginal lands, swamps or marsh lands, sand dunes, national parks and logged-over areas; investigation in a general way of the various critical areas needing immediate planting in order to help in the harnessing of hydroelectric power, water works, irrigation and domestic water system, restoration of soil cover; preparation and execution of planting plans; continuation of the operation, protection and management of the existing projects and forest nurseries; opening of the new projects (depending upon the availability of funds during the period); carrying of the reforestation work in a wider scale; extension of cooperative planting activities to government, civic and religious organizations and other parties interested in tree planting; progressive prosecution on the work on cultivation, maintenance and development of the Cinchona Plantation, and intensified collection of the reforestation charges.

## III. OPERATION

Efforts have been exerted during the three fiscal years to improve the operational technique every now and then. This was true to our various plantation operations, nursery practices and planting surveys. A system of around the clock inspection of the different projects scattered throughout the

TABLE I — SHOWING NO. OF PROJECTS AND CORRESPONDING AREAS BY  
REGION INVESTIGATED DURING FISCAL YEAR 1957-59

Fiscal Year	Northern Luzon inc. Zamb.		Central Luzon inc. Bataan		S. Luzon incl. Mindoro		Eastern Visayas		Western Visayas		Mindanao incl. Davao & C. de Oro Cities		Bicol Region		Total	
	No. Proj.	Area Has.	No. Proj.	Area Has.	No. Proj.	Area Has.	No. Proj.	Area Has.	No. Proj.	Area Has.	No. Proj.	Area Has.	No. Proj.	Area Has.	No. Proj.	Area Has.
1956-57	2	12,726.00	1	870.00			3	84,355.00	2	13,832.00			1	65.00	9	31,848.00
1957-58	5	93,989.00	2	11,797.00	2	14,060.00			4	55,506.00	5	16,018.00	5	31,067.36	23	222,437.36
1958-59							3	5,657.60	2	34,420.00					5	40,077.60
<b>TOTAL</b>	<b>7</b>	<b>106,715.00</b>	<b>3</b>	<b>12,667.00</b>	<b>2</b>	<b>14,060.00</b>	<b>6</b>	<b>10,012.60</b>	<b>8</b>	<b>103,758.00</b>	<b>5</b>	<b>16,018.00</b>	<b>6</b>	<b>31,132.36</b>	<b>37</b>	<b>294,362.96</b>

No area reported on the planting survey made for the proposed Maribojoc Reforestation Project.

The tabulated statement below (Table II) shows the amount of seeds in the various nursery operations of the individual project.

TABLE II — SHOWING THE AMOUNT OF SEEDS HANDLED IN THE NEW REFORESTATION PROJECTS OPENED DURING THE FISCAL YEAR 1957-58 AND THE AREAS OF THE PROJECTS AND NURSERIES

Name of Projects	S E E D S T O C K T A B L E							
	No. Begin- ning of the period (liters)	Sown in Seedbeds (liters)	Directly Seeded (liters)	Total Disposed (liters)	Balance in (liters)	Nursery Area (Has.)	Area to be Reforested (Has.)	Condemned in Liters
1. Aganan Ref. Proj.	3,793.24	1,583.74	3.00	20.50	2,186.00	2.69	6,400.00	—
2. Bessang Pass Proj.	114.90	65.40	—	—	49.50	1.93	1,021.00	—
3. Cabangan Ref. Proj.	4,022.00	3,104.00	235.00	150.00	533.00	6.20	14,000.00	—
4. Callao-Cave Proj.	2,589.65	2,198.65	—	—	391.00	4.00	31,460.00	—
5. Cauayan Ref. Proj.	944.50	332.50	155.00	—	442.00	5.00	2,910.00	15.00
6. Campo Verde Proj.	2,082.27	502.47	—	1,311.50	121.30	12.20	5,039.00	147.00
7. Dupax Ref. Proj.	515.00	327.50	—	—	37.50	.86	1,710.00	150.00
8. Loboc Ref. Proj.	918.00	378.00	540.00	—	—	4.78	1,490.00	—
9. Mabini Ref. Proj.	1,460.00	860.80	—	—	599.20	1.10	4,640.00	—
10. Magallon Ref. Proj.	705.55	669.00	—	—	36.55	2.00	1,183.00	—
11. Pili Ref. Proj.	470.16	399.30	—	—	5.86	1.00	1,842.00	65.00
12. Mapaso Ref. Proj.	1,126.30	444.78	92.00	—	589.52	—	38,074.00	—
13. Talinis Ref. Proj.	531.70	134.45	110.50	.20	255.75	2.00	1,154.00	30.80
14. Mt. Tagao Ref. Proj.	1,143.20	710.65	—	—	348.55	11.50	2,627.00	84.00
15. Tumeditdted Ref. Project	4,266.90	389.90	—	515.00	3,362.00	2.00	4,126.00	—
16. Valderama Ref. Project	3,723.25	1,457.25	605.00	—	1,466.00	3.50	5,927.00	195.00
17. Nueva Era	3,562.45	1,786.45	—	532.00	1,244.00	—	—	—
T O T A L	31,969.07	15,344.84	1,740.50	2,529.20	11,667.73	60.76	123,603.00	686.80

Archipelago was instituted. True, the work was hampered due to the shortage of funds, but the result was very encouraging. The aim of the operational technique is to produce one peso worth of work for every peso spent.

#### IV. PLANTING SURVEY

Planting survey is necessary before any proposal for the establishment of a reforestation project could be entertained or considered. The area proposed has to be thoroughly examined to determine whether it is needed for forest purposes, the critical areas needing immediate planting, the nursery site or sites, the claims' and squatters' problem, the status of the parcel or parcels of land involved in the proposed project, the purpose of the establishment, the species to be suitably grown, etc.

The tabulated statement (Table-I) below shows that there were 37 proposed reforestation project covering a total area of 294,362.96 hectares scattered throughout the different regions of the country where planting surveys were conducted during the three fiscal years. The regions covered by the so-called Western Visayas led with 18 planting surveys, or 21.6% involving 103,758.00 hectares. This was followed by Northern Luzon (including Zambales) with 19.9%. The forestry problems in these two regions are serious, if not critical.

The smallest areas investigated consisted of 30.40 and 65.00 hectares of Bacacay, Albay and Luyang, Catanduanes, respectively, both of the Bicol Region. The former was proposed for the Boy and Girl Scouts Camp, while the latter was for recreational purposes and as a source of the supply for the timber needs of the local residents. The purpose of the other planting surveys was to determine the extent of the area needed for watershed protection and for soil erosion control work.

#### V. REFORESTATION PROJECTS

The purposes of the establishments of these reforestation projects may be summed up to the following: the protection of the watersheds of important rivers, the conservation of our water supply, agricultural, industry and domestic use, the control or minimizing of soil erosion, the provision of fuel and wood needs for the use of the future generations, the improvement of the site and environmental factors, the perpetuation of wild-life (animals, birds and plants) by providing and improving their sanctuaries, etc.

There were 38 old Reforestation Projects in operation during the period (1957-59). One of these Projects (Cebu Reforestation Project) was established as early as 1916.

The tabulated statement below shows the amount of seeds handled by these projects during the three fiscal year period.

Fiscal Yr.	Seeds Handled	Sown in Seed Beds	Directly sold	Condemned	Given or Sold	Balance
1956-57	201,927.94	63,490.86	70,397.96	15,621.29	27,938.11	84,479.72
1957-58	244,641.41	110,257.25	39,453.00	5,987.27	34,059.03	54,884.84
1958-59	464,895.79	135,604.31	137,793.55	12,395.64	104,146.13	74,946.16
<b>T O T A L</b>	<b>911,405.14</b>	<b>309,352.42</b>	<b>247,644.51</b>	<b>34,004.20</b>	<b>166,143.27</b>	<b>214,310.72</b>

The planting stock table below shows the amount of seedlings raised and planted to their permanent places during the three fiscal year period.

Fiscal Yr.	Seedlings Handled	Set Out	Given or Sold	Condemned	Balance
1956-57	15,411.498	3,821.974	936.862	1,312.068	9,340.594
1957-58	22,938.231	4,537.955	937.634	1,042.690	16,031.613
1958-59	30,699.210	10,121.496	1,435.664	3,470.103	15,671.947
<b>TOTAL</b>	<b>69,048.939</b>	<b>18,481.425</b>	<b>2,910.160</b>	<b>5,824.861</b>	<b>41,044.154</b>

There was a total of 4,740,971 seedlings of the timber species raised in the forest nurseries during the fiscal year 1957-58 of the 17 newly opened projects as shown in the Table III below. Of this amount, 181,866 seedlings were set out to their permanent places in the field during the same fiscal year.

TABLE III — PLANTING STOCK TABLE OF THE NEW REFORESTATION PROJECTS FOR 1957-58

<i>Name of Project</i>	<i>Beginning of Period</i>	<i>Set Out</i>	<i>Disposed</i>	<i>Mortality</i>	<i>Balance</i>
Aganan Reforestation Project	350,568	126	2	11,415	339,025
Bessang "	287,632	11,746	148	130	275,608
Cabangan "	843,357	28,900	415	1,651	812,291
Callao-Cave "	809,000				
Cauayan "	61,194	100	700	816	59,578
Campo Verde "	861,824	18,299	3,942	8,222	830,361
Dupax "	352,185	900	122	6,520	344,643
Loboc "	1,654	1,654			
Mabini "	45,054	400		850	43,804
Magallon "	12,004			264	11,740
Pili "	44,236	9,631		6,382	28,223
Mapaso "	384,413	75,363	135	16,376	292,539
Talinis "	25,707	3,736	405	215	21,351
Mt. Tagao "	27,380	1,500	189	1,204	24,487
Tumedtedted "	35,117				35,117
Valderrama "	44,800	401		2,982	40,417
Nueva Era "	554,846	28,110	17,976	1,336	507,424
<b>T O T A L</b>	<b>4,740,971</b>	<b>181,866</b>	<b>24,034</b>	<b>204,363</b>	<b>4,320,708</b>

Of these 17 reforestation projects, 11 were new; the rest or 6 were old abandoned projects reopened. During the year, there was a total of 1,745.66 hectares with 1,206, 044 living trees under maintenance. There were also 1,870 linear meters of firelines with an average width of 10 meters.

Table IV shows the area planted and replanted in these 17 projects during fiscal year 1957-58.

#### VI. COOPERATIVE FOREST NURSERIES

There were 15 Cooperative Forest Nurseries in operation during the three fiscal year period: four in Luzon, seven in the Visayas and four in Mindanao. The primary purpose of these nurseries was to provide planting materials for the improvement and beautification of public parks and grounds, the premises of religious, educational and civic institution, etc.

#### VII. COOPERATIVE PLANTING

The Bureau of Forestry in view of the insistent public demand had to maintain its cooperative planting activity during the period. There was a total of 877,463 seedlings used for this purpose alone. Most of these planting materials came from the nurseries of the regular reforestation projects. The

greater bulk of the planting work was done during the Arbor Week celebration of each fiscal year.

#### VIII. CINCHONA PLANTATION

The Cinchona Revolving Fund (C.A. No. 646) was augmented by the general fund and the regular reforestation appropriation. Two nurseries with an area of 6.03 hectares were maintained.

The plantation is 474,168 hectares. The area planted to Cinchona is 365,462 hectares, of which 270.876 is fully stocked and the rest, partially stocked. There are 993, 252 Cinchona trees living at the end of the three fiscal year period. The area not fitted for Cinchona was planted to the timber species, mostly Benguet pine, Podocarpos sp. Eucalyptus, Mahogany, etc.

There is at present 113 tons of dried Cinchona in storage which should be disposed.

TABLE IV—SHOWING THE AREAS PLANTED AND REPLANTED IN THE REFORESTATION PROJECTS DURING THE FISCAL YEAR 1957-58, ETC.

Name of Projects	Planted Areas Has.	Replanted Has.	Firelines (M)	Area Under Maintenance	Living Trees
Aganan (Reopened) Iloilo			320.000	63.40	
Bessang (Reopened) Ilocos Sur			9,590.00	244.19	
Cabangan (New) Zambales			3,000.00	46.40	12,861
Callao-Cave (Reopened) Cagayan				74.00	14,370
Cauayan (New) N. Occ.	5.00				
Campo Verde (New) Aklan	22.59				
Dupax (Reopened) N. Vizcaya	40.51	12.00	5,871.00	144.29	425,280
Loboc (New) Bohol	14.17				
Mabini (New) Pangasinan	2.30				
Magallon (New) N. Occ.	2.00				
Pili (New) Sorsogon	8.40				
Mapaso (New) Abra	190.70	39.60			
Talinis (New) N. Occ.	21.00				
Mt. Tagao (New) Capiz	6.88				
Tumedtedted (New) I. Norte	10.63				
Valderama (New) Negros Or.					
Nueva Era (reopened) formerly Paraiso, I. Norte	43.43	10.00		1,173.38	751,493
<b>T O T A L</b> .....	<b>367.61</b>	<b>61.00</b>	<b>18,781.00</b>	<b>1,745.66</b>	<b>1,206,004</b>

**S e e d s**

Species	No. of liters
Benguet Pine .....	.1
Brazilian Fire Tree .....	1.0
Caña fistula .....	1.0
<b>Total</b> .....	<b>2.1</b>

If the number of seedlings per species will be any indication of popularity, then Fire Tree, Agoho, Narra, Golden Shower, *Cassia javanica*, Mahogany and Banaba must be that popular in the same order as shown in

the above table. Each of this species must have a characteristic peculiarly its own to induce the plant enthusiasts in effecting their respective decisions or choices. Some are the striking features of the individual species: the flaming red flowers of the Fire Tree must have captivated many fanciers, the Pine-like Agoho with its conical shape crown, the Narra with its beautiful foliage; the Golden Shower with its gold-like petals; *Cassia javanica* shows nothing but flowers when in bloom; the Mahogany with the popularity of the wood (belonging to Dipterocarpaceae family) known as Philippine Mahogany and Banaba with its white and purple flowers.

Compliments of

**SISTER COMPANIES**  
**ILIGAN LUMBER COMPANY, INC.**  
**KIWALAN LUMBER COMPANY, INC.**  
 &  
**B. B. ANDRADA & COMPANY**

Concessionaires, Lumber Producers  
 and Log Exporters

**REMARKS**

A plan is afoot to include wild life in the 1960 Arbor Week celebration. If this materializes the Week may be named Arbor and Wildlife Week. The plan has already been discussed during the meeting of the Committee last December 17, 1959. The corresponding report now under preparation when finished will be submitted to the National Forestry Council for final decision.



# Fiscal Years 1957-59 Cooperative Planting

By *CARLOS CUNANAN*  
*Forestry Supervisor*

Tree planting insofar as it pertains to the beautification of the home is gaining ground. The insistent demand of the public for planting materials necessitated the opening of 15 cooperative forest nurseries which are located as far as the Kolambugan forest nursery of Lanao in the South and the Tarlac forest nursery in Central Luzon. The cooperative forest nursery differs from the regular forest nursery in the sense that the latter is established to provide primarily planting materials for its reforestation project. Seedlings for cooperative planting may be given by this type of nursery, after the needs of the project are taken care of. Both nurseries are maintained and operated with Bureau of Forestry funds.

There were 15 cooperative forest nurseries opened during fiscal year 1957-58. The following year 13 cooperative forest nurseries were maintained. The Tarlac cooperative forest nursery was absorbed by the Mamot Reforestation Project in Tarlac Province while the Zamboanga del Norte cooperative forest nursery was absorbed by the Zamboanga del Norte Reforestation Project.

The tabulated statement below shows the seeds handled by these cooperative forest nurseries for the two fiscal year (1958-59) period.

Most of these seeds came from the established forest plantations of the regular reforestation projects of the Bureau of Forestry, where they were collected, sorted, cleaned, dried, measured and tagged preparatory to shipment. Some projects have endeavored to collect seeds from the flush trees. It is regretted that most projects have not as yet exerted any effort to tag their flush trees. It is regretted also that presently there is no facility for the proper storage of seeds. It is believed that this item (storage facility) is necessary in the efficient management of a gigantic reforestation task, like what we have now in the Philippines.

The seed stock table also shows that of the 6,898.09 liters of seeds of the various timber species handled during the period, 4,633.99 liters or 67 per cent were sown in seed beds, producing a total of 924,182 seedlings as shown in the following tabulated statement. There were also 348.10 liters directly seeded, while 546.40 liters of seeds on hand at the end of the period.

The statistics further show that most of these projects in Northern Luzon are located in the Ilocos Provinces — from Zambales to Ilocos Norte. Why? Because the land there is already barren in view of the tremendous soil erosion taking place. The land is so poor that it could hardly sustain the ex-

Fiscal year	Seeds handled in Liters	Sown in Seed beds	Directly Seeded	Disposed	Condemned	Balance
1957-58	3,930.95	2,750.95	158.50	345.00	24.00	652.50
1958-59	2,967.14	1,883.04	348.10	89.00	100.60	546.40
Total	6,898.09	4,633.99	506.60	434.00	124.60	1,198.90

istence of the people thereat. This explains, why you find our northern brothers almost in all nooks of the Archipelago.

lebration now-a-days. This annual celebra- tion calls for enormous amount of planting materials. Some parties take advantage of

Table showing the number of planting materials handled in the various cooperative forest nurseries during the two fiscal years (1958-59 period)

Fiscal Years	Seedlings handled during the period	Set Out	Given Free	Mortality	Balance
1957-58	252,121	54,611	56,085	41,754	372,762
1958-59	398,970	24,709	30,092	30,320	313,849
<b>Total</b>	<b>651,091</b>	<b>79,320</b>	<b>86,177</b>	<b>72,074</b>	<b>686,611</b>

The above tabulated statement shows that only about 10 per cent of the seedlings produced have been set to their permanent places in the field during the two fiscal periods, while 20 percent have been disposed and/or died. The greater bulk however have been reserved for the 1960 fiscal year planting.

**1959 Arbor Week**

Arbor Week Celebration is considered a cooperative planting project of the Bureau of Forestry. One day a year was in the past allotted for the celebration honoring the trees. The importance the trees played in our daily life has been widely recognized thereby giving birth to the so-called Arbor Week Ce-

this occasion to receive free seedlings from our forest nurseries. Some parties plant trees during the celebration as a matter of compliance. This type of people is entirely devoid of the spirit, purpose and intent of the Arbor Week Celebration. It is this kind of people that have killed so many seedlings in the name of Arbor Week Celebration.

During this year's Arbor Week the Makiling Reforestation Project at College, Laguna has distributed a total of 7,342 seedlings of the various species as shown in the table below. It has likewise disposed 2.1 liters of seeds of Benguet pine, Brazilian Fire Tree and Caña fistula.

Planting Materials Given in July, 1959 by the Makiling Reforestaion Project for this Fiscal Year's Arbor Week Celebration (Arranged Alphabetically)

African Tulip	207	Bunga de China	15	Mahogany S. L.	390
Agoho	901	Caballero	20	Mahogany L.L.	100
Anahao	279	Caña fistula		Molave	30
Araucaria	4	(Golden shower)	555	Narra	680
Asparagus	8	Congea tomentosa	4	Palosanto	203
Avocado	200	Doña Alicia	8	Papua	50
Balitbitan	18	Iresine	16	Pascuas	21
Banaba	356	Fire Tree	1208	Queensland	5
Banuyo	50	Fish tail palm	204	San Francisco	61
Bauhinia	174	Ipil	3	Selaginella	4
Baston de San Jose	20	Jade vine	110	Siar	100
Brazilian Fire Tree	200	MacArthur's	61	Star apple	200
Bougainvillea	25	Kalupueng	190	Yellow bush	50
				<b>Grand Total</b>	<b>7,342</b>

Any action to recover the land or to return it to its original state is slow, tedious and expensive. The tabulated statement below shows among others the areas planted and replanted during the three fiscal year period.

projects together with its relation to the existing projects is likely to be raised especially when a new project is opened in a region or province, where there is already a regular reforestation project.

The tabulated statement below shows the

Fiscal Yr.	Newly Planted	Replanted	Fire-lines Linear M.	Area under Maintenance	Trees Living
1956-57	6,212.07	1,468.03	9,817.349	40,179.15	15,433.308
1957-58	9,400.00	1,654.73	9,817.349	34,017.22	15,433.308
1958-59	10,685.41	3,006.64	4.373	44,703.03	6,168.513
<b>T O T A L</b>	<b>26,297.48</b>	<b>6,129.40</b>	<b>10,177.248</b>	<b>103,277.65</b>	<b>35,463.315</b>

Evidences of forming deserts, the fact that our natural resources are not inexhaustible, the shortage of the water supply for our domestic use, and for agriculture and industry, the deterioration of our wholesome climate for the benefit of this generation and the generations yet to come, the healthful environmental factors, which money alone could not buy, etc., made the people thru its Congress realize the importance and necessity of opening up new projects. Funds were properly provided, thereby making possible the opening of 17 additional reforestation projects during fiscal year 1957-1958, involving the planting of 123,603 hectares of wasteland with 60.76 hectares for nursery purposes.

These 17 additional Reforestation Projects is only 47% of the original 37 reforestation projects examined and proposed for opening. In terms of land area, these additional projects cover 52% of the total area inspected. In other words more than one-half of the area of the projects investigated have been found out not to merit immediate planting attention.

The criterion used in determining the establishment of these 17 new reforestation

relation within the region of the number of reforestation projects in operation in fiscal year 1956-57 and the number of reforestation projects opened in fiscal year 1957-58. Seventeen of the 38 old reforestation projects or 45% represented by 282,461 hectares of wasteland are located in Northern Luzon, which includes all areas North from Zambales to Nueva Vizcaya. The region with the second largest number of reforestation projects is Mindanao Island.

During the fiscal year 1957-58, the Northern Luzon Region leads with 49% of the 17 newly opened projects. This is represented by 8 projects with 95,031 hectares of badlands as shown in the following tables.

The statistics further show that most of these projects in Northern Luzon are located in the Ilocos provinces — from Zambales to Ilocos Norte. Why? Because the land there is already barren in view of the tremendous soil erosion taking place. The land is so poor that it could hardly sustain the existence of the people thereat. This explains why you find our northern brothers almost in all nooks of the Archipelago.

Table showing the number of projects by region in operation during fiscal year 1956-57

Items	Northern Luzon from Zambales to Nueva Vizcaya	Central Luzon including Bataan	Southern Luzon including Mindoro	Eastern Visayas	Western Visayas	Mindanao	Bicol region including Catanduanes and Marinduque	Total
Area	282,461	39,990	11,700	5,610	13,054	22,481	7,943	383,239
No. of Projs.	17	4	2	2	4	6	3	38

Table showing number of projects by region opened during fiscal year 1957-58

Area	95,031.00		24,086.00		1,842.00	123,603
No. of Projs.	8	2	6	1	17	

<p><i>Compliments of</i></p> <p><b>LIDDEL &amp; CO., INC.</b>  <i>General Managers</i>  Cantilan Lumber Company  Mainit Lumber &amp; Development Co., Inc.  A. J. RODRIGUEZ  <i>Operations Manager</i></p> <p>1007 Isaac Peral,  Manila  Tels. Nos. 5-37-16  5-58-32</p>	<p><i>Compliments of</i></p> <p><b>H. PORTENTO'S ENTERPRISES</b>  <i>Timber Licensee &amp; Contractor</i>  <i>Copra Dealer</i>  <i>Rice Mill Operator</i>  A. C. Operator  HERMOGENES PORTENTO  <i>Gen. Manager</i>  Tawiran, Sta. Cruz, Marinduque</p>
<p><i>Compliments of</i></p> <p><b>STA. CRUZ SAWMILL</b>    JOSELITO MOSE  <i>Owner &amp; Operator</i>    Guisguis, Sta. Cruz, Zambales</p>	<p><i>Compliments of</i></p> <p><b>LANAO EXPORTS CORPORATION</b>  <i>Log Exporter &amp; Concessionaire</i>    Office: Bubong, Marawi City    Mr. HAROLD BRADEN  <i>Incharge</i></p>
<p><i>Compliments of</i></p> <p><b>MALAYAN SAWMILL COMPANY</b>    <i>Producer of Quality Lumber</i>    Taltal, Masinloc, Zambales</p>	<p><i>Compliments of</i></p> <p><b>MR. &amp; MRS. PABLO LUNA</b>  <i>Log Contractor and Sawmill Operator</i>    Office: Kapatagan, Lanao del Norte</p>
<p><i>Compliments of</i></p> <p><b>ZAMBALES MASTER SAWMILL</b>    BENITO CHUA  <i>Sawmill Operator</i>    Palauig, Zambales</p>	<p><i>Compliments of</i></p> <p><b>BIGLANG-AWA LUMBER</b>  <i>Gen. Merchandize, Hardware &amp; Contractor</i>    Mr. ROMULO STO. DOMINGO  <i>Gen. Manager</i>    Rosario St., Boac, Marinduque</p>
<p><i>Compliments of</i></p> <p><b>STA. CRUZ UNITED SAWMILL</b>    CUA HO  <i>Owner &amp; Operator</i>    Sta. Cruz, Zambales</p>	<p><i>Compliments of</i></p> <p><b>PAULINO GO CHIO LUMBER</b>  <i>Lumber Dealer, Hardware</i>  <i>Gen. Merchandize &amp; Contractor</i>    P. GO CHIO  <i>Manager</i>    Boac, Marinduque</p>
<p><i>Compliments of</i></p> <p><b>SEASIDE LUMBER YARD</b>  <i>Lumber Dealer, Hardware</i>  <i>&amp; Copra Buyer</i>  Mrs. CATALINA REFORMA  <i>Manager</i>  Balogo, Sta. Cruz, Marinduque</p>	<p><i>Compliments of</i></p> <p><b>EMILIO DE GUZMAN</b>  <i>Lumber Dealer and Hardware</i>  <i>Gen. Merchandize &amp; Marine Motor Parts</i>    EMILIO DE GUZMAN  <i>Manager</i>    Sta. Cruz, Marinduque</p>

# *Know Your Civil Service Opinions and Rulings*

TEOFILO A. SANTOS  
Chief Training Officer

## *Implication of one's Superior through Falsification Merits Dismissal from the Service*

Does implication of his superiors through fabricated testimony constitute sufficient cause for dismissal of an employee?

### **FACTS:**

Respondent watchman appealed from BCS decision dated October 11, 1956, in Administrative Case R-14493 finding him guilty of gross negligence in connection with the loss of four office typewriters and ordering his dismissal from the service effective his last day of duty with pay. Payment of the typewriters lost was left to the discretion of the Auditor General.

It appears that four typewriters in the office were lost during his shift of duty from 4:00 p.m. to 7:00 a.m. on November 10-to-November 11, 1955.

Respondent denied responsibility for the loss claiming that he saw his two superiors personally bringing the typewriters in their jeep at 10:00 a.m. on November 11, 1955.

### **GROUND'S FOR APPEAL:**

The respondent appealed his case on the following grounds:

- (1) that due process as provided for in Executive order No. 370 was not observed;
- (2) that the investigation of the case was delegated;

- (3) that the decision was not supported by the evidence;
- (4) that the appellant's testimony was limited during the investigation; and
- (5) that the decision was unduly severe and without basis in law and in fact.

### **DECISION:**

Failure to observe strictly the requirements of said Order does not render the whole proceedings null and void, for the purpose of said Order is just to provide "uniformity" in administrative investigations.

The allegation that the investigation was merely delegated and not conducted personally by the head or chief of the bureau or office, and therefore would make the proceedings void, is without merit, because the law says: "Administrative proceedings may be *commended* x x x by the head or chief x x x" (Ex. Order No. 370, s. 1941, Sec. I). x x x It was not the intention of the law to make the head or chief the personal investigator in every case. Moreover, there is nothing in said Order prohibiting the head or chief the personal investigator in every case. Moreover, there is nothing in said Order prohibiting the head or chief from delegating said investigation.

In view of the absence of evidence to show that appellant took the typewriters

himself, he was excused from paying the same. However, because of the perversity shown by implicating his chief and assistant chief through fabrications, his dismissal was sustained. (4-57)

**Reference:**

Civil Service Rulings and Opinions —  
Volume I, Bureau of Civil Service,  
Manila, 1958

**MISCONDUCT — ACTS OF VIOLENCE  
IN OFFICE**

(Adm. Case No. 4-14969, BCS, Sept. 19,  
1956)

**FACTS:**

Respondent was charged with misconduct for having been found absent from the office on three different occasions although his time card shows that he timed in; that when he was informed that he was marked absent, he broke his pencil, threw it in front of the table of another employee, grabbed a time record from another employee and tore it.

**RESPONDENT'S DEFENSE:**

Respondent denies the charge, claiming that he was always in and about the building during the times he was marked absent; that he did not know that complainant was checking the attendance of employees; and that the actuations of complainant that morning provoked him and precipitated his acts of violence.

**DECISION:**

Respondent's explanation regarding the incident is unsatisfactory. In view thereof, he is found guilty as charged and fine his one (1) month's pay, reprimanded and warned. (12-56)

**Reference:**

Civil Service Opinions and Rulings — Vol-  
ume I, Bureau of Civil Service, Ma-  
nilla, 1958

**MAKING LOVE TO SUBORDINATE  
MERITS SEPARATION**

(Adm. Case, R-15642, April 26, 1957)

**FACTS:**

Miss S, a teacher under the supervision of respondent Mr. T. alleges that the latter, a married man, has been courting her and that he insulted her in the presence of her pupils and fellow-teachers because she rejected his suit. The complainant avers further that in the afternoon of February 2, 1956, respondent enjoined the teachers to go caroling with him during class hours, as a result of which they failed to render duty that afternoon.

**RESPONDENT'S DEFENSE:**

Respondent denies the charges. He admits having written letters to the complainant but disclaims that they are love notes. He explains that he loved her because she is his "comadre" and that his letters were all intended to improve her conduct.

**COMMENT AND DECISION:**

Respondent's letters to the complainant clearly reveal no ordinary affection of the writer for a "comadre" and show his amorous intentions towards her. The respondent's reason for writing the letters lacks merit as it appears improbable and untrue.

In view of the foregoing, respondent is found guilty of reprehensible conduct on two counts:

- (1) For writing love letters to complainant despite the fact that he is a married man; and
- (2) For enjoining his teachers to go caroling with him during class hours.

Respondent Mr. T is therefore considered resigned effective his last day of duty without prejudice to reinstatement except in the teaching service.

**REMARKS:**

Upon recommendation of the education authorities, this decision was modified in BCS Resolution dated August 4, 1958 which considered the respondent resigned

without prejudice to reinstatement as classroom teacher in another school.

**Reference:**

Civil Service Opinions and Rulings  
Civil Service Reporter, February, 1959

***INFLECTING INJURY ON CO-EMPLOYEE CONSTITUTES GRAVE MISCONDUCT***

(Administrative Case No. R-18357)

**FACTS:**

Mr. L, a clerk-messenger assigned as acting customs guard in the Bureau of Customs, was charged with grave misconduct for having struck Mr. M who suffered injuries on the lips.

**RESPONDENT'S DEFENSE:**

Mr. L denied the charge and claimed that he acted in self-defense. During the formal hearing Mr. M indicated that he was no longer interested in proceeding with the case and his witness expressed his desire not to testify in the investigation.

**DECISION:**

Although Mr. M. has shown disinterest in the case, a careful study of the evidence on record, particularly the testimony of witnesses showed that the respondent is guilty as charged. Mr. L. was fined his ten days' pay, reprimanded and warned that commission of the same offense would be dealt with more severely.

**Reference:**

Civil Service Opinions and Rulings  
The Civil Service Reporter, May, 1959

***THE TERMS "TEMPORARY EMPLOYEES" INCLUDES CASUAL EMPLOYEES***

(3rd Indorsement, CBC, November 2, 1959)

**QUERY:**

The Civil Service Commission previously ruled in the case of Fernando Jamison et al that the "x x x matter of earning vacation as well as sick leave credit is contingent, not on the direction of the head of Office, but on the services actually rendered on a full time basis by the

employee concerned, whether permanent, temporary, emergency or seasonal."

The NASSCO contends that "permanent and temporary employees are entirely distinct from casual employees, (and) to interpret Sec. 284 of the Rev. Adm. Code as amended, so as to include employees would unduly enlarge the scope and purview of the law which was never intended nor contemplated by the legislature."

**OPINION:**

Under the Civil Service Law and rules temporary employees are those appointed pursuant to the provisions of Sec. 682 of the Rev. Adm. code, as amended, (now Sec. 24 (c) of Rep. Act No. 2260) or paragraph 3 Rule VI of the Civil Service Rules (now Sec. 24 (d) of Rep. Act No. 2260). Under the provisions of Rule VI, "whenever the work to be done is in the judgement of the Commissioner (of Civil Service) ,temporary in character, he may authorize temporary employment, giving preference to eligibles if available, which employment may continue until employees in the classified service fall under this provision. A casual employee is therefore legally and actually a temporary employee.

In essence and effect there is no difference between a temporary and a casual employee because both may be separated from the service at any time with or without cause. Hence, it is believed that the word "Temporary" found in Secs. 284 and 285-A of the Rev. Adm. Code, as amended, should not be interpreted restrictively as to mean only those employees designated as "temporary" in their appointments.

**Reference:**

Civil Service Opinion and Rulings  
The Civil Service Reporter, dated  
December, 1959

***NEGLIGENCE IN THE CUSTODY OF PUBLIC FUNDS MERITS FINE AND REPRIMAND***

(BCS Decision, November 6, 1958)

**QUERY:**

Should Mr. Z be separated from the service due to negligence in the performance of his duties as a custodian of public funds?

**FACTS:**

Mr. X, a clerk-collector in the Office of the Municipal Treasurer of Y, was found short of ₱690.17 during a quarterly examination of his cash and accounts by representatives of the Provincial Auditor on April 10, 1956. The shortage was part of a ₱1,500-deposit made by the Postmaster on April 7, 1956 with the Municipal Treasurer and duly received and receipted by Mr. X in his capacity as collecting clerk.

Mr. X admitted the existence of the shortage, explaining that due to the pressing and urgent official matters on the day and the time (12:30 noon) the deposit was made by the Postmaster, he had placed the entire amount in his unlocked table drawer where it lay until 1:20 P.M. when together with other collections, he had transferred it— without counting or verification — to the safe. He also explained that he was then very hungry and wanted to get home as soon as possible.

Mr. X further claimed that there were many people crowding about his table that day and the amount of ₱690.17 may have been lost when he left his table to attend to a personal necessity. He restituted the shortage on April 11, 1956, the day following its discovery.

A formal investigation brought to light that Mr. X was a man of high moral character who lived simply and within his means. No evidence was found to show that he had put the shortage to personal use.

**OPINION:**

The Commissioner of Civil Service found Mr. X, guilty of negligence in the performance of his duties and he was consequently fined one month's pay, severely

reprimanded and warned that commission of another offense will be dealt with more severely. Although Mr. X did not put the shortage to personal use as borne out by formal investigation, he nevertheless showed laxity in the performance of his work by not taking appropriate steps to safeguard the money in his possession.

Reference: The Civil Service Reporter, June, 1959

**EMPLOYEE MAY BE FORCIBLY SEPARATED FROM THE SERVICE DUE TO ILL HEALTH**  
(1st Indorsement, BCS, September 27, 1956)

**QUERY:**

May an employee be dropped from the rolls due to ill health?

**FACTS:**

Mr. Y was granted one year's leave of absence without pay due to sickness (lung defect). After the provisions of Executive Order No. 91, series of 1955, were brought to his attention, and on the day before the expiration of his one year's leave without pay, Mr. Y returned to duty.

After rendering service for six days, however, Mr. Y asked permission to be absent for a day or two, but he did not report for duty thereafter. Instead, he filed application, five days later, for 51 days sick leave without pay on the strength of the same medical certificate used in connection with his one year sick leave previously taken.

Opinion was thereby sought by his Office as to whether M. Y may be dropped from the rolls for physical disability.

**OPINION:**

The Commissioner of Civil Service commented that there was an apparent intention on the part of Mr. Y to circumvent the provisions of Executive Order No. 91 which provides that "under no circumstance shall leave without pay be granted for more than one year", since it was obvious that Mr. Y had not fully recovered  
(Continued on page 104)



# 1959-Report of the Philippine Lumber Producers' Association, Inc.

by ANTONIO A. DE LAS ALAS

February 25, 1960

To the Members  
Philippine Lumber Producers' Association  
Dear Sirs:

I have the pleasure to submit this annual report which summarizes the activities of the Association as well as the problems that have arisen during our fiscal year.

## *FINANCIAL POSITION.*

A consolidated statement of income and expenses from July 1, 1949 to December 31, 1959, including a statement of sums transferred from assessment dues account to membership fees account, and a schedule of accounts receivable for both assessment and membership dues are herewith submitted as part of the report. There is likewise submitted a comparative statement of income and expenses for the years 1956-1959. Our cash balance as at the end of the calendar year 1959 was ₱56,910.31.

Of particular importance to our source of income is the amendment to our by-laws authorizing the collection of assessment dues on log shipments to Japan, in addition to those currently collected from exports to the United States, at the rate of ₱0.05 per M. bd. ft. for logs and ₱0.10 per M bd. for lumber. We have, however, limited the maximum assessment dues from all sources of any member to ₱15,000.00 a year. All income of the Association coming from monthly membership fees and assessment dues are now made available for such expenses as may be incurred by the Association for any

purpose authorized by its Articles of Incorporation and By-Laws. Our expenditures are now covered by assessment dues on shipments abroad irrespective of destination. I find the present arrangement to be more equitable.

The finances of the Association continue to be sound as I have consistently practiced strict economy and have insistently followed my original policy of avoiding improper, useless and ostentatious expenditures, particularly those that have absolutely no connection with the furtherance of any of our objectives.

The members are kept abreast with the financial position of the Association since the minutes of every meeting of the Board of Directors contains a statement of the cash position of the organization as of the date of each meeting.

## *ROLE OF ASSOCIATION IN ECONOMIC SETUP.*

The Philippine Lumber Producers' Association continue to receive recognition as the legitimate and most enlightened representative of the timber businessmen. It has been invited to participate and express its views by committees of Congress, the National Economic Council, the Central Bank, the Executive Departments and other entities of the government. An Executive proclamation specifically designates a representative of the Philippine Lumber Producers' Association as one of the members of the Forestry Council. Even United States government authorities

have taken notice of our Association as shown by the fact that the Special sub-Committee on Steamship Conference of the House Committee on Merchant Marine & Fisheries of the U.S. House of Representatives, conferred with us lengthily on the objectionable practice of Conference vessels and the unfair treatment accorded to log shippers of this country.

Individual members of the Association have been honored by the government. A member of our Board of Directors was made a member of the Monetary Board of the Central Bank. Just recently, another board member was appointed member of the Advisory Board of the Import-Export Committee of the Central Bank that passes upon the grant of dollar allocations.

Philippine foreign agencies have consistently referred to our Association inquiries on possibilities of supplying demands for Philippine mahogany. The Department of Commerce and Industry also transmits to our Association inquiries from all over the world concerning timber. In the United States particularly our organization enjoys high regard as requests for supply of wood products or for business connections are ordinarily addressed to our Association or directly to the members thereof.

In all matters where our opinion is sought, I have never diverted from a fair analysis of the problems presented with a view to helping or protecting the timber industries. I have expressed my views in writing and very often I personally appeared with the aid of our board members and Secretary-Treasurer, to argue or to give vital information that might help in the determination of what should be done.

#### ***THE PHILIPPINE MAHOGANY ASSOCIATION, INC.***

Our relation with the Philippine Mahogany Association has always been close and cordial. Our mutual interest to build up and protect our mahogany trade in the United States continues to be the main concern of

both organizations. We maintain our exchange of views and information on common problems affecting our timber products trade with that country.

I have been conferred the honor of being elected a member of the Board of Directors of the Philippine Mahogany Association for the current term, an indication of their desire to maintain a closer and more fruitful relationship with our Association.

There has been a reorganization of the Philippine Mahogany Association. At the last annual meeting of the Philippine Mahogany Association, attention was called to the fact that the membership of the Association had been reduced thru resignations. One of the causes pointed out was the lack of interest in the advertising program of the Association which had been rather expensive. In order to attract new members, it was decided to give up the advertisement program of the Association, and in view thereof, the collection of assessment on members was also suspended. However, in case of any expenditure of funds other than for normal operating cost the amount involved will be assessed against the members on the basis of their respective fair and equitable interest. In view of this new development, I have ordered the suspension of remittances to the Philippine Mahogany Association except the yearly membership fee of \$250.00. The actual 1959 contribution to the advertisement fund of the mahogany association amounted to only \$3,000.00.

At the same time a move was started to enlist the financial support of the Japan Timber Exporters' Association by their defraying part of the expenses for advertising Philippine mahogany in the United States. The Japanese Timber Exporters' Association rejected the proposal according to latest information received by us.

A special request has been made for me to attend the meeting of the Philippine Mahogany Association in July of this year. I shall make every effort to go as since the inauguration of our Association I have not

attended any meeting of the Philippine Mahogany Association. I should discuss with them, not only the new setup, but also the various problems pertaining to our timber products trade in the United States.

#### **MEMBERSHIP.**

During the year, Findlay Millar Timber Company resigned from the Association, alleging that they are now engaged only in the manufacture and exportation of veneer and plywood. On the other hand a new member — Rafael C. Aquino Trading — has been admitted. Our members now stand at 23. We continue to control the greater portion of the exportation of timber products.

Two new applications for membership are now being processed.

#### **RETIREMENT OF MEMBERS H. C. POPE AND MANUEL DIAZ**

Mr. H. C. Pope, 1st Vice-President of the Association, retired as active head of the Insular Lumber Company in the Philippines, and is now in the United States. Just recently, Mr. Manuel Diaz, General Manager of Sta. Clara Lumber Co. and a director of the Association, also retired.

Mr. Pope was a prominent figure in the lumber industry of the Philippines, having been Vice-President of the Philippine Lumber Producers' Association since its organization eleven years ago. Mr. Richard S. Kearns who succeeded him has not only given assurance of his cooperation with the Association, but has also shown vivid interest in and concern with the problems facing the timber industries.

Mr. Diaz has been a director of the Association since its organization. He took active part in the deliberations of the Board, contributing in no small measure to the solution of vital problems affecting the timber industries.

We have awarded the two retiring directors a plaque of appreciation for their invaluable services to the Philippine Lumber

Producers' Association and remarkable contribution to the development and progress of the timber industries in the Philippines.

#### **LIBRARY FACILITIES.**

Our library continues to receive articles, pamphlets and periodicals on the lumber industry, some dealing on such special subjects as logging and forest culture. As in previous years, our facilities have been sought by researchers and persons desiring data on certain phases of the industry.

#### **GOVERNMENT AGENCIES.**

##### *Bureau of Forestry*

*Statistics* — It is becoming increasingly difficult to obtain up-to-date information from the Bureau of Forestry. Data on export shipments are now delayed two to three months, the office concerned offering the excuse of "lack of personnel", and for this reason statistics based on them are of doubtful usefulness. However, our office continues to gather and disseminate such data when they become available.

*Inspection fee.* — On November 18, 1950, the Department of Agriculture and Natural Resources upheld the views taken by the Bureau of Forestry justifying the increase of inspection fees for grading of logs from ₱1.00 to ₱3.00 per thousand board feet notwithstanding our strong opposition to such increase mainly on the ground that the fee as increased is a form of taxation in the guise of a service fee which is of dubious legality. The ruling was handed down on our petition for reconsideration and therefore there is little likelihood that a new petition for reconsideration would prosper. The ruling may either be appealed to the President of the Philippines for review, or directly taken to a court for judicial determination on the merits. In the latter alternative, a suit has to be filed by a lumber company affected by the charge. However, the matter must be thoroughly studied before taking such step. The contention of the Director of Forestry is that the amount collected from inspection

fee is used to defray the actual expenses of servicing logs for export. On the other hand we have been contending that the collection of the fee is illegal as there has been no marked increase of the cost of the services extended by the Bureau of Forestry inspectors, and therefore, the added fees collected are being imposed for revenue purposes and not as a service charge. This contention we must prove beyond any doubt.

#### CENTRAL BANK.

On April 28, 1959, the Central Bank issued a circular requiring the submission directly to the Export Department by foreign buyers of logs of Landing Certificates and Certificates of Disposition covering shipments of logs to Japan and other countries. I suggested to the Central Bank authorities that the period of submission be lengthened from 15 to 30 days in case of shipments to Japan and a much longer period on shipments to the United States and other foreign countries. I also recommended, in view of the insistence of the Japan Lumber Importers' Association to submit such documents thru the exporters in the Philippines, that the requirement be considered complied with if the Philippine exporters submit the certificates since this procedure would give the added advantage of making log shippers equally responsible for such certificates. The Central Bank insisted in requiring the foreign buyers and importers to comply with its procedure, otherwise export licenses would not be issued. Negotiation with the Central Bank officials has been continued and there is now good prospect for a satisfactory settlement.

#### OUR FOREIGN TRADE.

*With Japan:* Our log exports are mostly sent to Japan. The total volume and value of our timber trade with Japan since 1953 up to the end of the year 1959, were as follows:

YEAR	LUMBER (Bd. Ft.)	LOGS (Bd. Ft.)
1953	845	480,788,679

1954	997	454,001,497
1955	350,433	639,121,937
1956		698,427,185
1957		674,826,931
1958		903,172,985
1959		1,125,510,568

Due to the increase of log exports to Japan, our economic planners were alarmed and focused attention to the grave consequences that may result from possible depletion of our forests. The National Economic Council recently adopted the economic policy of limiting our yearly timber production to two (2) billion board feet. The soundness of such a policy cannot be doubted. But at the same time we must adopt the policies and the measures I pointed out in discussing forest conservation and the proposed ban on log exports.

Our trade with Japan will be seriously affected in case of a ban or substantial limitation of log exports. The Japanese plywood industry is largely dependent on the supply of logs from the Philippines, and being aware of the growing movement in the Philippines to prohibit or restrict the exportation of logs, Japan has been endeavoring to open up new areas for sources of raw materials in other countries like Borneo, Malaya, Ceylon, Cambodia, New Guinea, and Indonesia. Since the tropical wood species of these countries are somewhat similar to ours, any extensive development of said countries as sources for logs needed by the Japanese wood working industries, would endanger our timber trade with Japan. It would be unfortunate for our country to lose the Japanese market and we should adopt a more realistic approach to this problem by not disturbing radically the present situation until such time as our own industries are developed and can absorb the volume of logs that may not be allowed to be exported to Japan.

Due to the imposition of the margin fee of 25%, exporters from the Philippines have been forced to increase their prices. Japanese buyers have graciously absorbed part of the increased cost caused by the fee although

they are very much concerned as they fear that the timber products made out of Philippine logs may not be sold at competitive prices at home and abroad.

*With United States:* The low level of log and lumber exports to the United States can be noted from the following figures:

YEAR	LUMBER (Bd. Ft)	LOGS (Bd. ft.)
1952	48,215,907	17,761,792
1953	42,505,361	30,444,360
1954	40,566,658	27,489,347
1955	48,527,596	34,155,894
1956	40,189,360	32,677,473
1957	40,636,747	31,076,939
1958	47,814,988	18,468,488
1959	51,835,761	21,427,587

The situation may be attributed to three causes: the high freight rates, the demand is limited to high grade products, low grade being completely excluded, and the prices of our products are not too competitive.

The Philippine mahogany enjoys quite reputation in the American market and I am sure if the government will only assist us by enabling us to reduce our cost so as to make our price competitive, we can develop a thriving market in the United States. As a form of assistance, our tax structure should be examined and revised so that export products will be freed from burdensome taxes and charges. This is the only way we can promote our foreign trade. Other countries have adopted such a policy and we should not hesitate to do the same.

As indication that we can develop foreign markets for our timber products, we have been receiving numerous requests from many foreign countries directly from private firms or thru our government agencies like the Department of Foreign Affairs and the Department of Commerce and Industry, for information or recommendation of reliable suppliers of Philippine Wood products.

#### **PLYWOOD AND VENEER.**

The production of plywood and veneer in the Philippines has increased steadily as shown by the following figures:

#### **ANNUAL PRODUCTION AND EXPORT OF VEENER AND PLYWOOD**

Fiscal Year	Production in Square Feet	
	Plywood	Veneer
1955-1956	105,301,484	197,711,557
1956-1957	135,204,320	204,891,356
1957-1958	188,901,418	244,643,820
1958-1959	298,289,958	453,774,867

The development of the plywood and veneer industry in the Philippines constitutes a vivid example of what can be done in the Philippines in so far as industrialization is concerned. The rich abundant natural resources of the Philippines can supply all kinds of raw materials for varied industries, and properly developed they surely can solve many of our present economic ills.

In the United States Congress bills continued to be filed seeking restriction of the importation of plywood in the United States. The Philippine Lumber Producers' Association has vigorously and consistently opposed any kind of restriction on Philippine plywood exports to the United States as inimical to the best interest of the Philippines and violative of the special relationship binding the two countries. Fortunately we count with the active and able assistance of Ambassador Carlos P. Romulo in combatting the proposed restriction.

#### **THE PHILIPPINE MAHOGANY CASE.**

Recently, I received disquieting news on the probable reopening of the Philippine Mahogany Case. It is reported that the Mahogany Association of the United States has initiated a move to renew its old contention that the use of the term "mahogany" for Philippine hardwoods is improper because they have no botanical relation to the real mahogany species. It will be remembered that the Federal Trade Commission, after years of hearing and study, decided the controversy in our favor and the term "Philippine mahogany" is now always used to designate our hardwood species. I have alerted the Philippine Ambassador to Washington

on this recent move, expressing our confidence that he would be able to prevent any annulment or modification of the ruling of the Federal Trade Commission. In the event the case is reopened, we of course will have to intervene to protect our interest. We have just been advised by our distinguished Ambassador that there is presently no danger that the case will be reopened and that he will always be on the alert to defend our right.

#### **FREIGHT RATES.**

There is little likelihood that shipping rates will go down unless bottoms actually exceed the requirements of the shippers. As long as we have no merchant marine of our own, we will remain at the mercy of the Associated Steamship Lines. We should be happy that the government is taking positive steps to increase the ocean vessels of the Philippines.

Recently, an investigation of the activities of "conference vessels" in the Philippines was conducted by a Special Sub-Committee on Steamship Conference of the House Committee on Merchant Marine & Fisheries of the U. S. House of Representatives. On their invitation, I appeared in person with our Secretary-Treasurer before the Sub-Committee to explain the position of the lumber industry on this important question, and I submitted a lengthy memorandum on the objectionable and harmful practice of the Association Steamship Lines. The investigation is for the purpose of obtaining, not only from the Philippines, but from other countries information on the practice and procedure adopted by conference vessels which may be a basis for remedial legislation by the United States Congress.

I have stressed the fact that the high ocean freight rates from the Philippines to the United States have affected the competitive position of our lumber in the American market, and that the absence of a Philippine merchant marine has given the Confer-

ence vessels a monopoly of ocean carriage for our commodities.

#### **DOMESTIC TRADE.**

A graph of wholesale prices of lumber in the Manila area is hereto attached to form part of this report. It will be noted that low level of prices prevailed from 1957 to 1958 but improved considerably during 1959.

#### **BAN ON LOG EXPORTS AND FOREST CONSERVATION**

These two subjects are so intimately related to each other that they should be discussed together. The Philippine Lumber Producers' Association is unqualifiedly for the conservation of our forest resources. We have so stated on many occasions, fully aware that forests are indispensable for the preservation of water supply for waterworks and irrigation and the prevention of destructive floods and harmful soil erosion. They are necessary also to insure a continuous supply of materials for shelter and raw materials for varied wood-working industries. This is the reason why we have urged the adoption of measures to combat the destruction of our forests.

We have requested the relentless prosecution of "kaingineros" who unquestionably have caused irreparable damage to our forests. Unfortunately there was a time when the government's attitude towards the activities of these despoilers of our national patrimony was not only lukewarm but even tolerant. Some were even freed from prosecution and allowed to continue their nefarious depredation. No wonder the government is now having a hard time in enforcing the law against forest destruction. Also it is now positively known that the present forest personnel of the Bureau of Forestry cannot cope with the problem as they are very few. More appropriation for forest guards will undoubtedly be an excellent investment. But in addition the assistance of the Philippine Constabulary and other members of the Armed Forces of the Philippines

as well as of the local police, should be enlisted. I understand this is being done now.

But if a thorough and impartial survey of the past is undertaken, it will be found out that the government has to assume a good portion of the blame for the reduction of our forest areas. It is no longer a secret that forest lands have been transferred to alienable agricultural lands and afterwards to land applicants. In fact even a forest project which had been tended carefully by the Bureau of Forestry was allowed to be occupied and cleared by private individuals. As a remedy we recommend strongly that forest areas be delimited clearly and once declared as such areas, they cannot be segregated and granted for any other purpose except by act of Congress.

But of course the lumber producers, the forest concessionaries, must also assume part of the responsibility. They must practice selective logging and they should take good care of their concessions. But this can hardly be expected under the present system of short, and in many cases yearly, tenure for concessionaires. The best system is to grant the lumber people long term leases in order that they may be interested in protecting and conserving their respective areas.

As a remedy for the conservation of our forests some have advocated that the exportation of logs be completely banned or restricted. I have vigorously opposed any legislation or policy which will prohibit or restrict the exportation of logs. For the purpose I have appeared personally before Committees of Congress and the National Economic Council. I maintained that such radical measure is not absolutely necessary to conserve our forest resources as there are other means some of which I have already pointed out above, to protect our forests. I called attention to the fact that the exportation of timber products like logs, lumber plywood and veneer, constitutes one of our main export business, occupying third or fourth in the ranking of our exports, and that today of our lumber companies resulting in the dismissal

of many employees and laborers which will increase unemployment, and in considerable loss of revenues which the government needs so much. I made it crystal clear however, that we are not opposing the policy of gradually restricting and reducing the exportation of logs but that this should be realized and can be attained by giving more emphasis on assistance to industries utilizing our timber products for raw materials. This assistance can be in the form of extending more liberal credit facilities, granting adequate allocations of dollar for the acquisition of processing equipment, and eliminating or reducing taxes and charges imposed upon them. My memorandum in this connection submitted to the National Economic Council is made a part of this report as it contains the views of the Association on economic policies pertaining to the lumber industry.

I cannot but express my apprehension over the recent organization of a log exporters association as it could and would be assumed that its only objective is to work for the continuance of unrestricted log exportation abroad without any formula for future gradual or partial restriction. This attitude will no doubt focus the attention of our executive and legislative authorities to the need of officially resolving this matter and there might be greater efforts towards the enactment of measures that will prohibit or at least control and regulate the production of timber and exportation of logs. My reason for this apprehension is that this question involves national interest. There is no doubt that the best policy is to retain the logs and process them here. Any other policy cannot be justified. By processing the logs here greater profits can be gained, more people can be given work thus partially solving unemployment, and bigger government revenues can be expected. We will also eliminate the shameful situation of having to compete in the United States with plywood made out of Philippine woods but coming from countries other than the Philippines.

There is no doubt that there is need of synchronizing our log export limitation with the requirements of our industries.

#### **LEGISLATION.**

Congress is again in session. We are scrutinizing the hundreds of bills filed in the two houses of the Congress of the Philippines as there may be some affecting the lumber industry. As a matter of fact two are already being considered by Congress, one restricting the exportation of logs and the other, delimiting and making forest reserve permanent or inalienable except by act of Congress. Our views on the first bill has already been expressed in this report. As to the second, we will support it with all our might as we are intensely interested in the conservation of our forests for reasons I have already given in this report.

We have always opposed and will continue to oppose strongly any measure that will increase the tax burden of the lumber industry which at present is already very heavy. Additional charges will make the price of our wood products more uncompetitive in the foreign market and they will surely be wiped out in that market. Last year, I vehemently opposed the law imposing a margin fee on purchases of foreign exchange. At present there is a move to repeal the margin fee law. The Association should strongly support the repeal for it is definitely inimical to the interest of the nation and particularly of the timber industries.

#### **GENERAL CONSIDERATIONS.**

Furor has recently been noted for the conservation of forests due undoubtedly to the menace of water shortage caused by deforestation and to rampant illegal cutting of trees and smuggling of logs into Manila and other market centers. I want to make it clear that the members of the Philippine Lumber Producers' Association are not in any way responsible or connected with such illegal cutting and smuggling. The Association and the members thereof are squarely

and strongly for and behind the conservation of our forests. This is the only attitude compatible with genuine interest in the welfare of our people. Our forest national patrimony must be conserved so that future generations will not blame and condemn the present generations. Furthermore the members of the Association are not casual or temporary operators. They have invested heavily in this business venture and they are in it permanently or as long as the business is fairly profitable. Our members pledge their unswerving cooperation with any program that will make the policy of forest conservation effective.

It must be admitted that the economic situation of the Philippines has generally improved during the year. The progress in manufacturing is especially noticeable. Without entering into the raging controversy as to whether the foreign trade had been balanced last year, I wish to state that undoubtedly it can be said that at least our export receipts have approached our import disbursements. However, it must be admitted also that this progress has been attained by reducing the effective demand thru the approval of tax bills among which are those increasing the individual and corporate taxes; increasing certain specific taxes; eliminating tax exemption from the payment of import tax of machineries and spare parts imported for industries; removing the exemption from the payment of tariff duties of certain personal and household effects; increasing the registration fees of automobiles, and authorizing the Central Bank to collect a margin fee over banks' selling rates of foreign exchange which fee was fixed at 25%; by continuing the control and restrictions on the allocations of dollars for imports, and by imposing credit restrictions. These measures taken by the government are negative and their effects will merely be temporary. They will not solve permanently or in the near future the economic problems which gave rise to the imposition of controls.

*(Continued on page 94)*



# Let Us Plant Trees And Make Them Live

By Ranger M. TANARIUS

During my fourth grade in the secondary school, I always laughed with my classmates every time the poet of the class would recite his favorite poem with a title of "What Do We Plant When We Plant A Tree". Maybe we all laughed because our own Longfellow never recited any other poem during our weekly homeroom organization except his one and only mastered piece.

In planting trees we really plant things for the continuous use of man from his cradle to the grave. But do we rightly plant our trees?

The Bureau of Forestry spends yearly a great sum of money for the cause of Cooperative Planting. This is being undertaken in order to promote civic consciousness in forestry and to make the Philippine Islands green through cooperative participation of private individuals. All planting materials for this project is provided upon request of private persons and public officials for free. It is also a way to reframe that soft and delicate organ of the human body, the heart, to make it beat with pure love and affection for trees.

There are hundreds of civic organizations, clubs and associations that dot the nation but there are only a few that will truly plant seedlings and make them grow into trees. A civic organization is not necessarily a cooperative body that does tree planting during Arbor Weeks and other important days as part of the ceremonies, but it must also be a group that will raise trees and take care of them so they will live as living memorials for a worthy cause. All living trees will be the remembrance of an association's participation and be the symbols of its undying love for trees.

A tree planting program full of propagandas and elaborate ceremonies without a long range plan for protection and care of trees is just like a day celebrated for the killing of trees. All well prepared and delivered speeches and pictorial records of tree plantings are not enough to justify the holding of an Arbor Week if the poor, delicate seedlings are left to the elements, unfed and unwanted.

This was what happened when a certain government estate was being reforested thru the participation of private parties. The yearly celebration of Arbor Weeks became weeks of tree destruction. The most improper ways of planting trees were done. A notorious example was that of schoolchildren using their slingshots and improvised base ball bats for seeds dispersal during the days of planting. Millions of planting materials died and the estate of approximately sixty hectares in area, is still almost as barren as before. Only 150,000 seedlings were enough to reforest said area but the way they were planted was disgraceful and all the efforts and money for what was intended to be a laudable work had gone to waste.

Even government officials undertake grandiose projects of roads, plaza and public grounds beautification without the proper assistance of forestry men. As usual trees are planted in an odd way. This mistake cost the City of Manila in 1934 a grand sum of money when all the rain trees planted and cared for for twenty-five long years on Dewey Boulevard, a delight to tourists, were blown down in a wink of an eye. This tragedy should point with an accusing finger to man's carelessness and thoughtlessness in selecting the right kind of shade trees for a given site. This mistake was repeated

many times, in different places of the country, and will be repeated as long as ruling officials of towns, cities and provinces will never seek help from those persons who are in the know.

The trouble revolves around too much emphasis on public relation at the sacrifice of cooperative tree planting. All forestry people must, therefore, be more active and cooperate fully at every Arbor Week, for it is

the only week allotted every year by a presidential proclamation for planting trees for future generations. Everyone should take upon himself the task and duty to see to it that every tree is cared for, protected, loved and helped to live.

A tree planted each day, even not on Arbor Week, will surely make the Filipino nation greener, stronger and richer.

## 1959-REPORT OF THE . . .

*(Continued from page 92)*

The controls were instituted about eleven years ago and at the time they were adopted and repeatedly thereafter, assurances were made that the controls could and would be lifted within a few years. Right now assurances are being given that in a period of from two to five years, controls will be eliminated. With the negative measures being taken I doubt whether controls can be eliminated within that period of time. I am afraid they will continue indefinitely or at least for many more years. If a permanent solution is desired positive remedies must be adopted and I consider as the most important such remedy the increasing of production of goods which can be sold abroad. In other words measures should be taken to promote our exports in order to be able to augment the dollar earnings of this country. This is the normal and the only effective remedy to solve the problem arising from the depletion and critical condition of our dollar reserve. This remedy is feasible for fortunately the Philippines is blessed with fabulous natural resources and especially with an abundance of products the market for which abroad can be developed. Among these products and unquestionably the most important are those coming from our forests like lumber, plywood and veneer the exportation of which

has been constantly increasing. The foreign markets for these products hold great potentiality. This is the reason why we have been pleading constantly and vehemently for recognition and effective practical assistance to the timber industries.

But to develop our export trade aggressive positive measures must be taken. The prices of our export products need be made competitive and this can only be done by reducing the cost of production of these products and such cost can be reduced by eliminating or reducing the taxes, fees and charges collectible from them. This is what other countries like Germany and Japan have done to solve their even more critical situation. The Philippines will be left behind if it does not resort to this accepted practical measure to really develop foreign trade.

I shall not tire repeating that the forest resources of the Philippines properly and effectively exploited, can contribute greatly and effectively to the solution of many of our economic problems. I believe it will not be an exaggeration to assert that they constitute the key to the realization of our fondest dream — a stable sound economy for the Philippines.

I once more wish to express my heartfelt appreciation for the confidence reposed in me by the Board of Directors and members of the Association.

## **CAMARINES STANDARD SAWMILL**

*Manufacturer and dealer in all kinds of Lumber*

*Main Office:*

Juan Luna St.,  
Pasig, Rizal

*Sawmill Office Address:*

Bayabas, Labo, Camarines Norte

# *Student Corner*

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## I CAME, I SAW....

By PENTACME CONTORTA

The proposed Forest Technology building may never leave the blueprint stage if the stumbling blocks are not removed. The university officials will not build it unless the site belongs to the College, and the College does not own the land because the Parks and Wildlife Office (PWO) refuses to relinquish ownership of the Makiling National Park which presently serves as our campus.

—oOo—

The PWO has advanced several reasons to justify its refusal to turn over the park to the College. Many of these reasons do not hold water. One thing is clear, though: the PWO refuses mainly because it will lose its most popular and one of its most profitable parks if it gives up the Makiling National Park.

—oOo—

The College has only one principal and very worthy reason for its great desire to own the park as its campus: so that it can make, without outside interference, long range plans for its expansion and improvement, and so it can have a field laboratory wherein to conduct field classes, exercises and experiments. (As a matter of fact, the history of the Makiling National Park shows that it was originally set aside for purposes of forestry education.) With a field laboratory at its disposal, the College will be more effective in carrying out its main task of training men to manage our vast forest resources.

—oOo—

Of course, it is natural for the PWO people to fight tooth and nail to retain the park in their possession. If a precedent of park-releasing is established, other government

offices may also grab other parks for other justifiable reasons, and the PWO employees will end up with no parks — and no jobs!

—oOo—

Dr. Lorch, UN expert on documentation, came to the College of Forestry twice to microfilm many of the more important but rare manuscripts on Forestry. The second time he came, his whole microfilming set was stolen from his car while he was taking a noon break. Shame on us Filipinos, doing such a sordid act to a foreigner whose only crime was coming here to help us!

—oOo—

Many of our countrymen take pains to make Filipinos well-thought of by foreigners here and abroad. They should be praised for their efforts. However, many of our less responsible people continue to treat foreign visitors shabbily and underhandedly. A hundred "Bayanihan" goodwill missions abroad will have no effect in improving our standing with the other countries unless we correct the wrongs being done at home first.

—oOo—

Our Tourist Bureau is trying hard to regain the "Pearl of the Orient" fame of the Philippines before the war. But if our people do not learn to deal correctly with visitors, we might as well close our doors to all foreigners rather than allowing them in and incurring their scorn and hatred because of the bad behaviour of some of our people.

—oOo—

Whenever a higher position in the Bureau of Forestry is vacated nowadays, there is a mad scramble among the men below aspiring for the post. And some of these men are not beyond pulling (political) strings to get the job. Oh, gone are the good old days when

a vacated position was quietly filled by a man selected by the director on the basis of meritorious service.

—oOo—

The Bureau of Forestry claims in many instances that it cannot carry out many of its assigned tasks because it is badly underfinanced, (meaning, it is given very small annual appropriations). If its claims are true, it is a wonder how it can still manage to save from one to two million pesos every year out of its annual appropriations. How do they run the Bureau then, on a shoe string?

—oOo—

With the dry season just around the corner, we should expect howls of protest from city residents regarding water shortage soon. Forests will then be in the limelights, and foresters will receive a lot of publicity that will be rather unpleasant in the sense that their failure to protect our forests in important watersheds will be pointed out. Many people will briefly realize the important relation between forests and their daily living. If the Forestry authorities will just take advantage of the situation, bad publicity and all, they will accomplish a lot in promoting forestry in this country.

—oOo—

Sometime next October, the golden anniversary of forestry education in the Philippines will be celebrated. The celebrations will center in the College of Forestry, since it is just about the only one engaged in such kind of work.

—oOo—

If we go around and ask people whether or not the College of Forestry, in its half-century of existence, has satisfactorily accomplished its main job of training men for forestry, we are likely to get a negative answer from some quarters. If we are the kind who

regard criticism, no matter how unpleasant, as constructive, we should act and find out why some believe the College has failed in its mission.

—oOo—

It is not really difficult to find the bases of our critics' skeptical attitude. Here are some of them: The College did not have any appreciable increase and improvement in its physical plant (buildings and equipment) until the last five years. The same can be said about its building up of the faculty. Surely, without sufficient and up-to-date facilities, and without a truly competent faculty, the College cannot turn out well-baked graduates.

—oOo—

Autograph seekers elsewhere seek the signatures of people they worship and admire (like the fans seeking the signatures of their movie idols). Autograph hunters on our campus seek the signatures of persons they do not particularly care for. Visit our campus before the big exams and you will see how autograph-hungry our students will be — and how they will grumble against the signers.

—oOo—

If you don't know why our students become autograph bugs, you should be told. Before the midsemester and the final exams, students should clear themselves of all accountabilities. To prove to the College authorities that they are cleared, they must present the signatures of the entities from whom they obtain clearance. Thus, the signature hunting.

—oOo—

Did you know that a student who stays here for four years clears 16 times, plus one more final time when he finally graduates and leaves the College? If there is the final clearance upon graduation, we don't see any reason for the 16 others.

# QUIET?..... NOT QUITE

## *da borer*

Where can we find quiet? This question has been raised most frequently in the College of Forestry, even long before the astronauts were conceived in mind. Why, of all places, does the college have to be the core of human activities that lead to the production of irritating sounds people have termed as NOISE?

Every forestry student is aware of the fact that he behaves quite noisily before and after classes. To satisfy an inquisitive mind, one has just to seat himself in a classroom before and after a lecture hour and he could curse at the way those loafing so and so's in the corridor are making much more noise than those who are inside the room.

But why does one person desire the other to be quiet? Has it ever occurred to him that he might be expected to put up a little racket of his own just for the heck of it? By the way, does everybody have a single sound definition of that word? Is Pedro's quiet Esperidion's noise? Is Agapito's whisper Juanchito's shout? How silence be to Torquato, as noisy as it would be to Kanuto? Could be. It just goes to prove that one's concept is the thing that counts. As the scientific name of Tangile ranges from *Imperata cylindrica* to *Shorea dapaungibonensia* does the meaning of silence resound.

Take for example me. Yes, ME, the only individual I have known personally this last twenty years. My quiet is not quite quiet at all. I get bored by silence, I mean too much of it, especially the dead ones. I can't live a day without giving vent to some inner feelings within me. I couldn't last quietness where you get deafened by smiles from across the room, or when you hear the loud noises of falling leaves of deciduous *Ipomoea*. Oh no not me, brother, I wouldn't like it to be silent that I can hear myself think and others too. If that could be, where would I be now?

But I don't approve of too much noise either. I wouldn't like some people to come a-trampling by the door just when I am giving the finishing touches to my examination paper. How could I possibly concentrate? How could I possibly hear my seatmate coaching me as to the proper answers to such easy question when those... create a racket which disturbs my mental balance? And

in a minute or two I am to submit my paper. There goes one night of cramming put to waste. Those... should know just how important one night is nowadays.

How I long to hear the racket when it is so silent. Last week, I had a grand time listening to the rhythmic sound of hammer blows during a not so interesting lecture of escapades. I wonder when they would do it again, or could they? Some other lecture hour perhaps. Then I wouldn't enjoy that disturbing noise. I find it quite an interesting game in guessing who would pass by the open door from the way he inspects how hard the cement floor really is or toy to do a one man job of scrubbing the corridors with his pair of shoes. I have found it very inducing to study in the library amidst murmurs, whispers and whatnots, almost always ubiquitously apparent. I can't help rushing to the nearest newspaper when I hear murmurs about a certain Arzala outpunching Ampon in 15 rounds or a certain Lozaga breaking another record in swimming, the nation's number one marine sport.

Without these, I find life quite drab and boring as you would find me. They be evils, to me noises are necessary evils. They give me the pause that refreshes me best. Pauses that lead to an escape from my daily peevs. True, if ever I am attracted by interest-catching noises, my concentration while studying is disturbed. But that is just what I want, a disturbance, a pause, which gives me enough excuses to know less maybe, but also provides me ample time to rejuvenate my rusting ego by a rest. Even though not always the right things, I get interested in things that happen around me, and that's not bad as a student. I hope.

But how would you react to these evils when you encounter them? Are you willing to do something or would you do something? What, join forces with those making the racket? Talk at will in the corridors, bang the class doors, drag the chairs, whistle a favorite tune (Men of the Forest U?) or just let the world hear that you have new shoes? Who cares? Others seem to get away with it, why can't you? Or can you?

Me, I don't care how you feel about it so long as you keep up with the times, But leave me some peace and quiet, will you? I NEED it.

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*Concession Area:*

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520 San Luis

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*Phone Nos.* 5-16-01  
5-16-04

# SENIOR CLASS



**PROF. DOMINGO LANTICAN,**  
Adviser



**DEAN GREGORIO ZAMUCO**



**JOSE A. ACAIN**  
Tavera St., Binalonan, Pangasinan  
**Ranger Certificate — 1958**  
PRO — Junior Class Org., 1958-59  
Bus. Mgr. Senior Class Org., 1959-60  
Member — UPSILON SIGMA PHI  
Member — Zeta Beta Rho Frat.



**ROMEO B. AGLEAM**  
Vigan, Ilocos Sur  
**Ranger Certificate — 1958**  
Vice Chair. — UPSCA, 1959-60  
Bus. Mgr. — Ilocos Sur — Abra  
Varsitarian, 1959-60



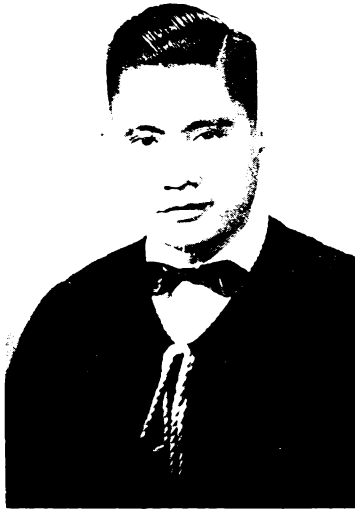
**FORTUNATO S. ARCANGEL**  
Laoag, Ilocos Norte  
**Ranger's Certificate — 1955**  
University scholar 2nd sem. 1953-54  
College scholar 1st sem. 1954-55  
B.F. scholar — 1959-60  
Pres. — FSBO — 1959-60  
Editor-In-Chief — Forestry Leaves 1959-60  
Vice Illustrious Fellow-Upsilon Sigma Phi  
Secretary — FSBO — 1954-55  
Pres — Sophomore Class — 1954-55  
Member — Zeta Beta Rho  
UPSCA, Forestry Chapter



**CRISOSTOMO V. ARENAS**  
1248 Alfredo, Sampaloc, Manila  
**Ranger Certificate —**  
Member — UPSCA



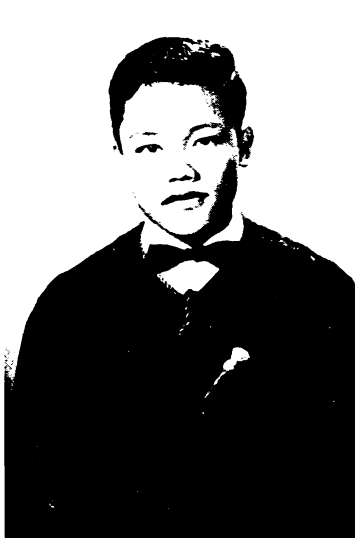
**ANTONIO T. ASUNCION**  
Aparri, Cagayan  
**Ranger Certificate — 1960**  
Member — Beta Sigma Frat.  
Member — UPSCA  
Member — "Y" Club



**WENCESLAO A. BAGUION**  
Mercedes, Camarines Norte  
**B. F. Pensionado**



**JOSE O. BANIQUED**  
San Quintin, Pangasinan  
**Ranger Certificate — 1955**  
Member — Beta Sigma Frat.



**BIENVENIDO S. BARCARSE**  
Macagatao, Allacapan, Cagayan  
**Ranger Certificate — 1958**  
Treasurer — U.P. Beta Sigma Frat.  
Treasurer — Sophomore Class  
1957-58  
Member — YMCA

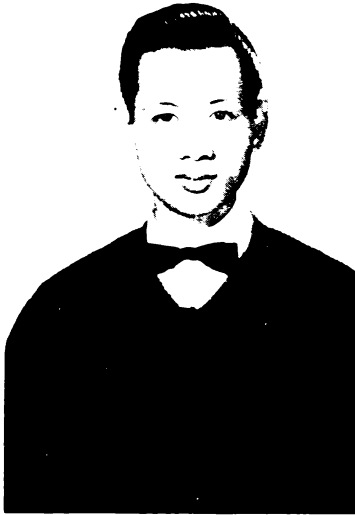


**ISIDORO K. BULACAN**  
Forestry Campus, College, Laguna  
Member:  
U.P.S.C.A.



**OSCAR B. CADELINA**  
Caba, La Union  
**Ranger Certificate — 1958**  
Managing Editor — Forestry Leaves, 1957-58  
Fellow Herald — Zeta Beta Rho Frat., 1957-58  
Delegate — YMCA-YWCA, Annual College  
Conference Baguio, '56, '58, '59  
Member — Zeta Beta Rho Frat., 1957  
Member — La Union Forester's and Aggies Club, 1957  
Member — "Y" Club, 1960  
Member — College of Forestry Basketball Team,  
'57, '58, '59, '60





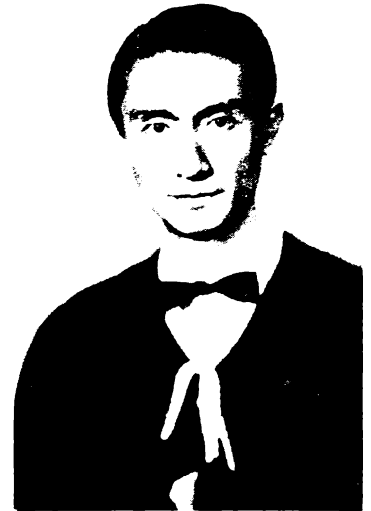
**EDILBERTO Z. CAJUCOD**

Sta. Clara, Isabela, Basilan City  
**Ranger Certificate — 1958**  
Entrance scholar — one sem 1956-57  
University scholar — one sem 1956-57  
Holder of the Sta. Clara Lumber Co. Scholarship, Four sem 1958-60  
President — Senior Class Org. 1959-60  
Vice Pres — Junior Class Org. 1958-59  
Vice Supreme Fellow — Zeta Beta Rho, 1959-60  
Chairman — UPSCA, 1957-58  
Fellow Fiscalizer — Zeta Beta Rho, 1957-58  
College Editor — 1960 Philippinians  
Business Manager — Forestry Leaves, 1958-60  
Associate Editor — Forestry Leaves 1956-58  
Captain — Forestry Softball Team, 1956-59  
Athletic Manager — SBO, 1957-59  
Member — Makiling Literary Club  
Phi Kappa Phi, Gamma Sigma Delta, Phi Sigma SAR



**ALFREDO D. CAÑETE**

No. 2, Parang, Cotabato  
**Ranger Certificate — 1958**  
Entrance Scholar — First Sem, 1956  
Univ. Scholar — First Sem, 1957  
Univ. Student Council Scholar — First Sem, 1957  
Insular Lumber Company Scholar, First & Second Sem. 1959-60  
College Scholar — First Sem, 1959  
Member — Zeta Beta Rho  
Vice Pres. — Forestry "Y" Club  
Rep. Junior Council — U.P. Junior Council, 1958-59  
Representative — Collegian Board of Management, 1958-59  
President — Makiling Literary Club, 1958 1st semester  
Managing Editor — Forestry Leaves, 1958 1st semester  
Monitor — Dormitory No. 4  
Sgt. at arms — Senior Class Org., 1959-60



**NESTOR M. CAPELLAN**

Naguilian, Isabela  
**B.S.F.S., FEU — 1950**  
DANR, BF — 1959-60  
Member — Society of Filipino Foresters  
Member — P. G. E. A.  
Member — HI XII L-82 F & AM  
Member — Forestry Leaves Staff



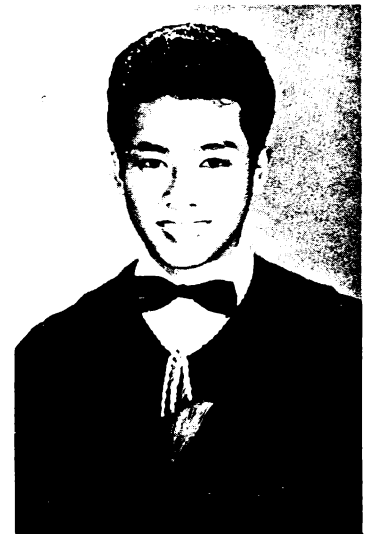
**ROBERT B. CHOY**

Tondo, Manila  
**Ranger Certificate — 1959**  
Beta Sigma (Forestry), Pres.  
Pres. Forestry UPSCA  
Most Outstanding Forestry Student leader (1959-60)  
Most outstanding UPSCA chapter President, U.P. (1959-60)



**JESUS COROTAN**

Laoag, Ilocos Norte  
Member: Beta Sigma Frat.

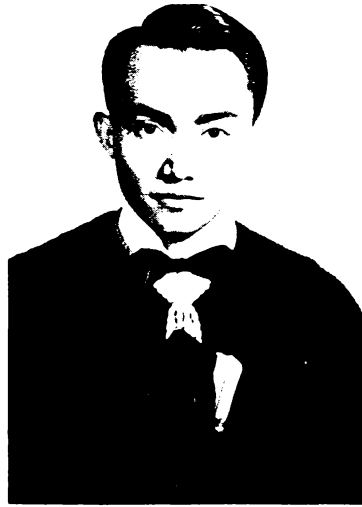


**MANUEL S. CORTES**

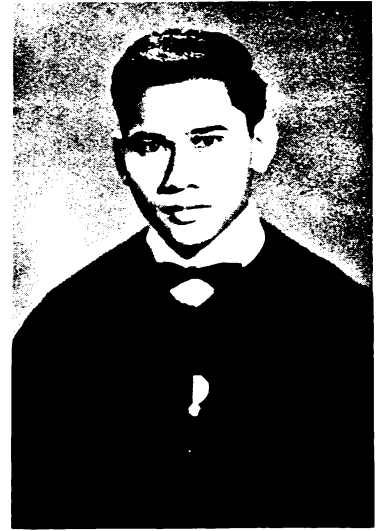
Mabini Ext. Aduas, Cabanatuan City  
**Ranger Certificate — 1959**  
Member — Forestry Soccer Football Team, 1957-60  
Member — Forestry Softball Team, 1959-60  
Member — Makiling Literary Club, 1959-60  
Member — Forestry "Y" Club



**ADOLFO DECENA**  
Iligan City  
**Ranger Certificate — 1958**  
B.F. Scholar — 1959-60  
Rep. U.P. Junior Council, 1958-59  
Member, Zeta Beta Rho



**RUFINO C. DORADO**  
Maypangdan, Borongan, Samar  
**Ranger Certificate — 1958**  
Member — Forestry Leaves Staff  
Member — UPSCA  
PRO — UPSCA, 1958-59  
Rep. to UPSCA Central Council,  
1958-59  
Cadet Lieut. — U.P. ROTC, Los  
Baños



**DOTERTY B. ENDANGAN**  
San Enrique, Negros Occidental  
**Ranger Certificate — 1958**  
Member — U.P.S.C.A.  
Member — Forestry Track and  
Field Team  
Member — Negros - Panay Org.  
Bus. Mgr. — Makiling Youth Club



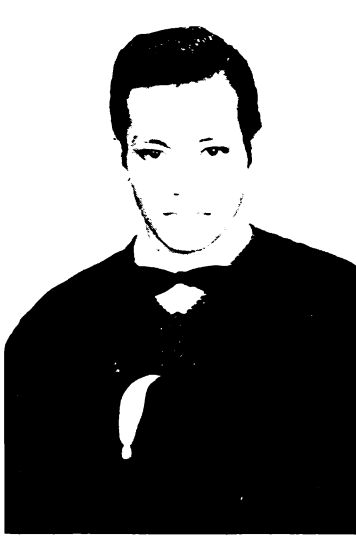
**ISIDRO D. ESTEBAN**  
Laaga, Ilocos Norte  
**Ranger Certificate — 1958**  
DANR Scholarship — 1st & 2nd Sem. 1959-60  
Associate Editor — Forestry Leaves 1959-60  
Secretary — Senior Class Org., 1959-60  
Jr. Rep. — U.P. Student Council, 1958-59  
Auditor — SBO, 1957-58  
Secretary — Sophomore Class Org. 1957-58  
Member — UPSCA  
Member — Zeta Beta Rho  
Member — Makiling Literary Club



**LORENZO M. ESTRADA**  
Santiago, Isabela  
**Ranger Certificate — 1959**  
Managing Editor — Forestry Leaves, 1959-60  
Features Editor — Forestry Leaves, 1958-59  
Circulation Manager — Forestry Leaves, 1957-58  
Vice Pres. — Makiling Literary Club, 1959-60  
Vice Chair. — UPSCA, 1957-58  
Rep. to SBO — S.B.O., 1959-60  
Member — Tobacco Growers Student Association  
Member — La Union Forester's and Aggie's Club



**CESAR R. GUTIERREZ**  
San Carlos, Pangasinan  
**Ranger Certificate — 1959**  
Member — Zeta Beta Rho Frat.



**PERFECTO F. LACUESTA**  
Buer, Aguilar, Pangasinan  
**Ranger Certificate — 1958**  
Bus. Manager — Junior Class,  
1959  
PRO. — Beta Sigma Frat.



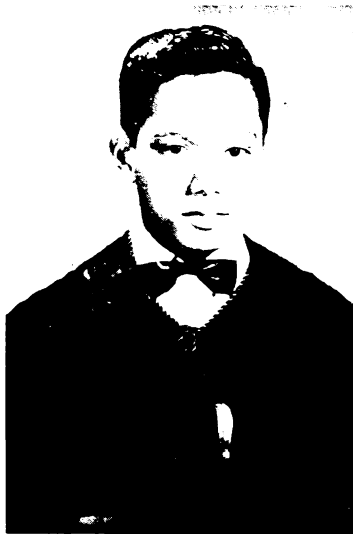
**JOSE V. LECHONCITO**  
Lambunao, Iloilo  
**Ranger Certificate — 1958**  
Member — UPSCA  
Member — Forestry Softball Team,  
1959-60  
Auditor — Makiling Youth Club  
Member — Negros — Panay Org.



**LUCIO LEE**  
Junction, Los Baños, Laguna



**ALEJO M. NECESITO**  
Burgos St., Umingan, Pangasinan  
**Ranger Certificate — 1958**  
Member — Beta Sigma Frat.  
Member — UPSCA  
Member — Makiling Youth Club



**HONORATO R. ORGANO**  
Vigan, Ilocos Sur  
**Ranger Certificate — 1958**  
Member — Zeta Beta Rho Frat.  
Member — Makiling Literary Club  
Member — "Y" Club  
Member — ISA Student Org.



**WILFRIDO S. POLLISCO**  
San Jose St., Zamboanga City  
Entrance scholar — 1st Sem., 1956  
Bureau of Forestry Scholar — 1st Sem. 1959-60  
Vice Pres — Freshman Class, 1956-57  
Vice Pres — Senior Class, 1959-60  
PRO — UPSCA, 1959 — 60  
Fellow Charge de Affair — Zeta Beta Rho Frat., 1959-60  
Member — Forestry Softball Team, 1957-58, 1958-59



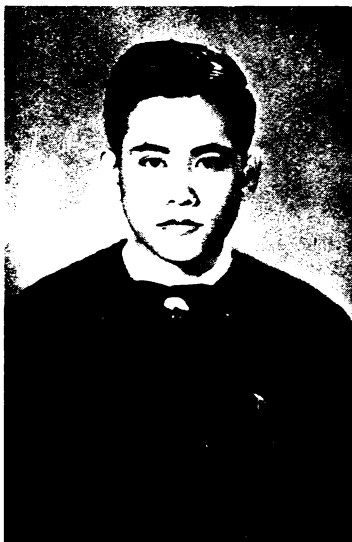
**ADELA A. RIMBON**  
Blumentritt St. Los Baños, Laguna  
**Ranger Certificate — 1958**  
Sec. — UPSCA, 1958-60  
Sec. — Makiling Literary Club,  
1958-60  
Treas. — Junior Class Org., 1959-  
60



**JUSTO P. ROJO**  
Pondol, Balamban, Cebu  
**Ranger Certificate — 1958**  
Entrance Scholar — 1st Sem., 1955  
DANR — BF Scholar — 1st & 2nd  
Sem., 1959-60  
Member — UPSCA  
Ass. Sec. — UPSCA, 1958-59  
Auditor — Junior Class Org.  
Rep. to SBO — Senior Class Org.  
Member — Zeta Beta Rho Frat.  
Fellow Whip — Zeta Beta Rho  
Frat., 1959-60



**BIENVENIDO R. ROLA**  
College, Laguna  
**Ranger Certificate — 1958**  
Bureau of Forestry Scholar — 1st  
Sem., 1959-60  
NEC-ICA Scholar — 2nd Sem.  
1959-60  
Supreme Fellow — Zeta Beta Rho  
Member — U.P. Varsity Basketball  
Pres. — Junior Class Organization  
1958-59



**ROMEO S. SALVADOR**  
San Jose Street, Zamboanga City  
**Ranger Certificate — 1959**  
College Scholar — 2nd Sem. 1956-  
57  
D.A.N.R. Pensionado — 1st Sem.  
1959-60  
Auditor — Zeta Beta Rho 1959-60  
Auditor — U.P.S.C.A., 1959-60  
Treasurer — S.B.O. 1957-58  
Auditor — Senior Class 1959-60



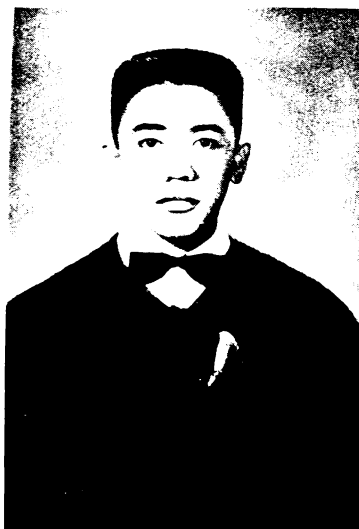
**ERNESTO V. SEGURITAN**  
Cabugao, Ilocos Sur  
**Ranger Certificate — 1958**  
Member — Forestry "Y" Club  
PRO — Ilocos Sur — Abra Org.  
1959-60  
Vice-Pres. — 1956 C. I. Alumni  
Ass., 1959-60



**CONSTANTE B. SERNA**  
Cabugao, Ilocos Sur  
**Ranger Certificate — 1959**  
Member — UPSILON SIGMA PHI  
Member — "Y" club  
Bus. Mgr. — Ilocos Sur — Abra  
Student Org.



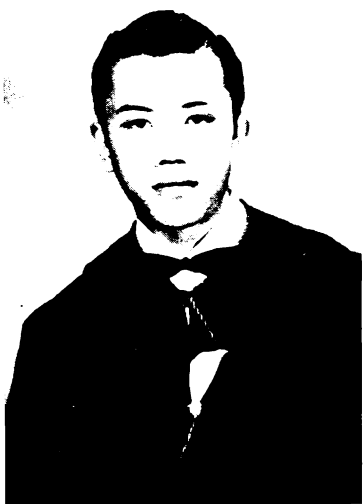
**BERNARDO C. SINUES**  
 San Juan, San Manuel, Pangasinan  
**Ranger Certificate — 1959**  
 College Scholar — 2nd Sem. 1956-57  
 University Scholar — 1st Sem. 1957-58  
 DANR — BF Scholarship — 1st &  
 2nd Sem. 1959-60  
 S.B.O. Rep. — Soph. Class, 1957-58  
 Fellowship — Zeta Beta Rho Frat., 1956-59  
 Bus. Mgr. — Pang. Varsityians  
 Club, 1958-59  
 Fellow Scribe — Zeta Beta Rho  
 Frat., 1959-60  
 Secretary — "Y" club, 1959-60  
 Auditor — SBO, 1959-60



**RUPERTO SOMERA**  
 Bayambang, Nueva Vizcaya  
**Ranger Certificate: 1958**  
 Member: Beta Sigma Fraternity (Los Baños  
 Chapter)  
 UPSCAN (Forestry Chapter)



**MARCELO P. UDARBE JR.**  
 Sandakan, British North Borneo  
**Ranger Certificate — 1958**  
 Auditor — Beta Sigma Frat.,  
 1958-59  
 Member — "Y" Club  
 Member — Aggie "Y" Club,  
 1958-59  
 Member — UPSCA, 1956-59  
 Member — Pangasinan Varsityian  
 Club  
 Rep. to SBO — Junior Class Org.



**ROMULO R. VALERIO**  
 Binalonan, Pangasinan  
**Ranger Certificate — 1958**  
 PRO — Senior Class — 1959-60  
 Secretary — Junior Class — 1958-  
 59  
 Treasurer — Makiling Literary  
 Club, 1959-60  
 Member — Zeta Beta Rho Frat.  
 Member — UPSCA



**ROBERTO G. de VERA**  
 Magtaquing, Bugallon,  
 Pangasinan  
**Ranger Certificate — 1958**  
 Ath. Mgr. — Junior Class Org.  
 Member — Beta Sigma Frat.  
 Member — "Y" Club  
 Member — Pang. Varsityian  
 Ass'n.



**AVELINO G. VERACION**  
 Sta. Cruz, Ballesteros, Cagayan  
**Ranger Certificate — 1959**  
 Member — Beta Sigma Frat.  
 Auditor — Soph. Class Org. 1957  
 Sgt.-at-arms — SBO — 1957

# RANGER CLASS



**DR. ARTEMIO V. MANZA,**  
Adviser



**TEOFILO AY-YAD**  
Home Address:  
Member: Beta Sigma Fraternity  
Forestry 'Y' Club



**AUGUSTO BLANDO**  
Member:  
Upsilon Sigma Phi  
Los Baños Varsity (Basketball)  
Chairman: Vigilance Committee  
Pres. — Sophomore Class 1959-60  
Pres. Freshman Class  
Auditor: Makiling Literary Club



**ARSENIO R. BUCSIT**  
Home Address: BCI, Bacnotan,  
La Union  
Activities:  
Member: Forestry 'Y' Club  
Forestry Volleyball team 1958-59;  
1959-60



**JONAS M. CAMAT**  
Home Address: Solano, Nueva Vizcaya



**BENJAMIN C. CARIRO**  
Home Address: Solano, Nueva Vizcaya  
Activities: Sgt. at Arms Soph. Class,  
1959-60  
Model Co. ROTC Unit  
Forestry Football Team  
President, Nueva Vizcaya Grovers  
Club



**JOSE H. CAPIO**  
Home Address: Los Baños, Laguna



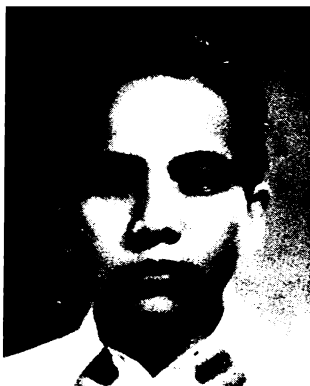
**REYNALDO P. CRISOSTOMO**  
La Torre, Bayombong Nueva Vizcaya



**JESUS M. DE LA CRUZ**  
Home Address: Bayombong, Nueva Vizcaya  
Activities: Secretary N. V. Varsity  
Org. (Forestry Chapter)  
Member: Beta Sigma Fraternity  
Forestry Soccer Team  
Forestry 'Y' Club  
Aircraft Tossers Basketball team



**LARRY B. CULILI**  
 Home Address: Fabrica, Negros Occ.  
 Activities:  
 Member: UPSCA  
 Panay-Neg. Organization  
 Visminda



**NAPOLEON B. DALANGIN**  
 Home Address: Gen. Tinio, (Papaya)  
 Nueva Ecija  
 Activities: Athletic Manager Freshman  
 Class Org., 1957-58  
 PRO: Sophomore Class Org 1958-59  
 PRO: UPSCA, — 1960  
 Member: Vigilance committee —  
 1958-59



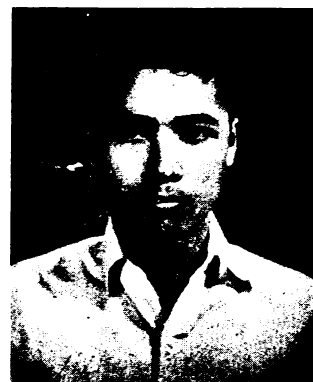
**ROGELIO DELGADO**  
 Home Address: Santa Cruz, Laguna



**SEVERO M. ENERVA JR.**  
 Home Address: 61 Corpus St. West  
 Tapinac, Olongapo, Zambales  
 Activities: Hillcock Combo Forestry



**CESAR M. GALVEZ**  
 Home Address: San Fernando, La Union  
 Activities:  
 Member: Upsilon Sigma Phi Frat.  
 4H Club  
 YMCA  
 Speech & Dramatic Club (U.P. Los  
 Baños Chap.)  
 Vigilants Committee 1959-60  
 PRO Soph. Class Org. 1959-60  
 President, La Union Aggie &  
 Foresters Club



**DOMIE O. LAGASCA**  
 Home Address: Vigan, Ilocos Sur  
 Member: UPSCA



**FRANCISCO C. LOZANO**  
 Home Address: Sn. Isidro, Sn. Nicolas,  
 Pangasinan  
 Activities: Auditor Soph. Class Org.  
 1959-60  
 B. F. Scholarship Awardee 1959-60  
 Member: Board of Directors Forestry  
 "Y" Club  
 Zeta Beta Rho Fraternity



**HERMINIO P. MAMAOG**  
 Home Address: Dupax, Nueva Vizcaya  
 Activities: (Vice Pres. N.V. Varsitarians  
 Org. (Forestry Chapter)  
 Member: Alpha Phi Omega Fraternity  
 Forestry Leaves Staff  
 Daredevil Basketball Team



**SEGUNDINO T. MARTIN**  
 Home Address: Ballesteros, Cagayan  
 Activities:  
 Member: Beta Sigma Fraternity  
 UPSCA



**VALERIO B. MENDOZA**  
 Home Address: Tayug, Pangasinana.  
 Activities: Vice Pres. Freshman Org.  
 1957-58  
 Member: Makiling Literary Club  
 1959-60.



**ISIDRO E. NALUPA**  
 Home Address: Agoon, La Union  
 Member: Beta Sigma Fraternity



**APOLINARIO M. PAEZ**  
 Home Address: Philipadeco, Butuan City  
 Member: YMCA Los Baños Branch  
 Beta Sigma Fraternity



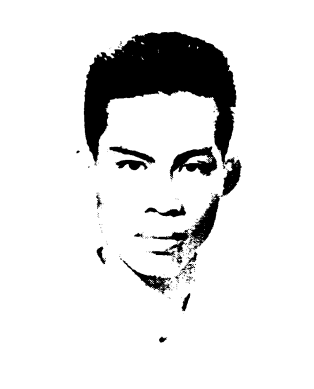
**WILFREDO I. REBOTON**  
 Home Address: Cadiz, Neg. Occ.  
 Member: Basketball team  
 Forestry 'Y' Club



**SALVADOR D. RIZANO**  
 Home Address: 1182 Singalong, Manila



**EMILIO C. SALES, II**  
 Home Address: 5-B-Salazar St. Bacarra,  
 Ilocos Norte  
 Activities:  
 Member: Beta Sigma Fraternity  
 UPSCA



**JORGE B. SEGUERRA**  
 Home Address: 14 Junction St. Los  
 Baños, Laguna  
 Bureau of Forestry Scholarship  
 Holder  
 Member: Zeta Beta Rho Fraternity  
 Vigilance Committee 1959-60  
 UPSCA  
 Forestry Basketball Team 1958-60  
 Bus. Mgr. Sophies Class 1959-60



**RAYMUNDO T. TABUNO**  
 Home Address: Sto. Domingo,  
 Ilocos Sur  
 Activities:  
 Member: Alpha Phi Omega Fraternity  
 UPSCA



**JUAN T. TAGASA**  
 Home Address: Echague, Isabela  
 Activities:  
 Member: Varsity U.P. Los Baños  
 Track and Field  
 Beta Sigma Fraternity  
 Forestry 'Y' Club  
 Forestry Football team '60  
 Forestry Volleyball team '58  
 Forestry Track & Field





**FLORENTINO F. TRINIDAD**  
Home Address: Bangued, Abra  
Activities:  
Member: UPSCA



**GIL V. URGINO**  
Home Address: Pantabangan,  
Nueva Ecija  
Activities:  
Member: Beta Sigma Fraternity  
UPSCA



**ELPIDIO A. VILLANUEVA**  
Home Address: Davao City  
Activities: Bus. Mgr. Freshman Class  
1957-58  
UPSCA Treasurer, 1959-60  
Beta Sigma Frat. Auditor-1959-60



**ISAIAS B. VILLEGAS**  
Home Address: San Fabian, Pangasinan



**CIPRIANO VINARAO JR.**  
Home Address: Echague, Isabela  
Activities:  
Member: Crusaders Basketball Team  
UPSCA



**NEPTALE Q. ZABALA**  
Home Address: Basud, Camarines Norte  
Activities:  
Member: UPSCA — 1958-60  
Vigilance Committee 1959-60  
Forestry Volleyball Team, 1959-60  
Forestry Softball Team 1959-60  
Sophomore Class Council, 1959-60  
B F Pensionado, 1959-60



**DOMINADOR DEL ROSARIO**  
Ballesteros, Cagayan  
Member: Zeta Beta Rho Frat.  
CF Volleyball Team  
B. F. Scholar — 1959-60



**Dean and Mrs. Zamuco, Dr. Manza, and friends with South American Visitors**

# Forestry Day Scenes



Mr. Jose Sanvictores Forestry Day Guest Speaker.



A portion of the audience



Forestry Upscans performing "La Jota Moncadeña"



Dean Gregorio Zamuco introduces the Guest Speaker



Professor Eugenio de la Cruz, FPRI Director, welcomes the guests



The Forest Songbirds, under the direction of Mrs. L. Palm, contribute the musical numbers.

# Moving up Day Scenes



A portion of the audience of the 19th Moving-Up Day (Graduation Day for Rangers) Exercises. L. to r. Dr. Earl Stone Jr., Regent Florencio Tamesis, Senator Gil Puyat, U.P. President Vicente G. Sinco, Director (FPRI) Eugenio de la Cruz, Dean (College of Agriculture) Dioscoro Umali, Professor Rosario Cortez and Mr. Romulo Castillo.



Senator Puyat addressing the Ranger Graduates.



The Forest Songbirds L. to r. (front): Mrs. A. B. Tamolang, Miss A. de Dios, Mrs. F. Pollisco, Mrs. N. Vergara, Mrs. Ranit.

The Picnic Lunch on the College lawn.



Lunchtime under the trees. L. to r. Mrs. Knapp, Dr. Knapp, Pres. Sinco, Senator Puyat, Regent Tamesis and Director de la Cruz.

# HERE AND THERE



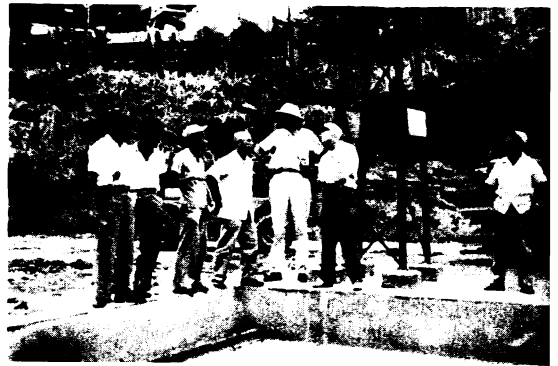
1. Laying of the Wreath on the Forestry Cenotaph "In Memory of Those Who died for the Cause of Forestry". L. to r. Dean Zamuco, Dir. dela Cruz, Mr. Glori, Mr. Castillo, (partly hidden) For. San Buenaventura, For. Sabado, Pres. Sinco, Dean Umali, For. Peñas Mr. Sanvictores.

2. Dr. Guise addressing the Forestry Students at a FSBO Convocation.

3. Atty. S. F. Cunanan driving home a point on natural resources before DANR, B.F. and B. Fisheries personnel at Dagat-dagatan, Malabon, Rizal.



The American visiting professors and ICA technical advisers, Dean Zamuco and the College Faculty mulling over possible ways of getting a site for the future Forestry Technology Building in the Makiling National Park.



1. A handful of co-eds, part of the CEU crowd that visited the Forestry Campus last Jan. 18, being shown around the nursery with Forester Esteban (back to camera) acting as guide.

2. Prof. C. Mabesa explaining to Dr. Larson (with helmet), Prof. F. Guise and other College of Forestry faculty members about kiln drying work at Nasipit Lumber Co.



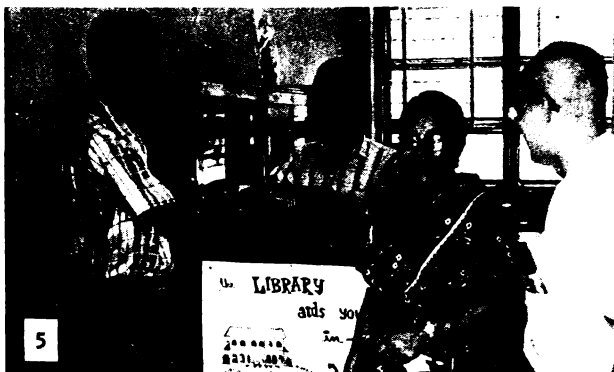
3. Provincial officials and For. Caleda planning the fire prevention campaign in Mt. Province.



4. DANR personnel having a "break" at a party tendered by For. & Mrs. Jose Viado at their residence.

5. Forester Felix O. Chinte donates books to the College of Forestry Library. In the picture are, L — R: For. Chinte, Mr. Alfaro of the College Library, Mrs. Chinte, and Prof. Recto, Secretary of the college.

6. Dr. Stone, visiting professor to the College of Forestry, answers a question propounded by a BPI personnel during the BPI Fieldmen's Convention in which Dean Zamuco of the College of Forestry was speaker.



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6

# CLASS ORGANIZATIONS



The Senior Class Organization with Dr. Manza, some faculty members and the Visiting American Professors. Professor Lantican is class adviser.

The Juniors posing with Dr. Manza and their class adviser, Miss Zenaida Portacio.

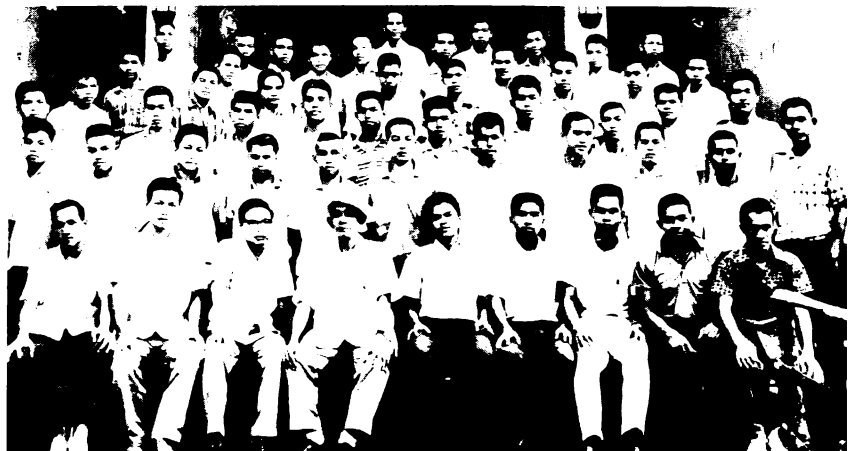


Officers of the Sr. Class together with Prof. Recto, Dr. Stone, Dr. Manza, Dr. De Zeuw, and Prof. Lantican, Class Adviser.



Officers and members of the Makiling Literary Club and their adviser, Prof. Jose B. Blando.

The Sophomore Class with their adviser, Dr. Manza.





**Stairway to the College of Forestry Building**

### **FSBO ACTIVITIES OF 1959-1960**

*By A. V. REVILLA JR.*

The Student Body Organization of the College of Forestry had the following activities for the 1959 part of this school year: July 10 — Election of SBO Officers, July 25 — Arbor Day celebration and Smoker's Rally, October 10 — Loyalty Day participation, November 30 — Forestry Day, December 19 — Lantern Parade participation, and December 21 — Christmas program. For the 1960 part, it will celebrate the Moving-Up Day which is tentatively scheduled on April 8 to 9, if the graduating students will be given their final examination one week earlier than as scheduled.

The first and probably the most important of its activities was the election of its officers, who are to lead the organization in the planning and execution of every affair they agree to undertake. The following were elected to the different positions: Fortunato Arcangel as president, Mariano Valera — Vice-President, Adolfo Revilla Jr. as Secretary, Moises Estrella as Treasurer, Bernardo Sinues as Auditor, Maximo Tandoc as Athletic Manager, Geronimo Turgo and Edilberto Unite Jr. as Sergeant-Arms, and Professor Jose B. Blando as Adviser.

On July 25, the body had two separate activities. In the morning, the whole Student Body led by the Adviser and Instructors, went to the mountains and planted mahogany seedlings to celebrate the Arbor Week. The body planted around five-thousand seedlings during the day.

That evening, the Smoker's Rally which is a tradition of the college was scheduled. This particular tradition is celebrated in honor of the Freshmen. This day is supposed to be their last chance to smoke in the presence and without the permission of an upperclassman; and from

# Campus Notes

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that day on, they are obliged to wear the prescribed skull-cap in line with a certain set of rules.

As provided in the constitution of the College, the SBO has to meet regularly every month, generally during every first Thursday. At the meeting on September 3, 1959, a proposition was made to sponsor benefit shows for the purpose of raising funds for the body's use. This was approved and during the second semester, the weekly show has been going on.

On October 10, the College of Agriculture celebrated its traditional Loyalty Day, in which the College of Forestry was again invited to participate. The FSBO in cooperation with the Forest Products Research Institute made a float which finally placed third in the contest.

The Forestry Day which is regularly celebrated on November 30, has been one of the traditions established in this college. This year, it was celebrated with a convocation, luncheon, games, and a dance in the evening. The whole day affair was taken care of by the students themselves including the preparation and serving of the food. It is regretful to say that some students did not do their part which resulted in some shortcomings during the day.

Christmas season approached, and the university again celebrated its most colorful tradition, the Lantern Parade. The FSBO sent not only a delegation but the whole student body went to participate in the big affair. And due to the efforts of Dr. Atemio Manza, the body won a pennant for having the most original lanterns in the affair.

After the University christmas celebration, we came home and two days later, we found ourselves celebrating our own Christmas program.

### **BETTER LATE THAN NEVER . . .**

The current power and water shortage brings the subject of conservation to the fore. Because of lack of water, the Ambuklao hydroelectric project is not delivering the 75,000 KW that it is expected to turn out. Caliraya, in Laguna, is probably not performing at peak capa-

city either, since the problem of water lack is not confined merely to Ambuklao. Binga, which will be finished two years from now, is expected to turn out 25,000 KW each from its two units, but is right now confronted with the doubtful prospects of the Bued river.

The subject of conservation was taken up in yesterday's conference by public works and power officials with the President. From this conference, a conservation plan will probably emerge, only to be frustrated by another lack—the shortage of funds. Yet the problem is of such magnitude that it should not be laid aside simply because of lack of funds.

For every tree cut down by concessionaires, a certain fee is paid and turned over to the bureau of forestry. This fee is presumably spent to reforest areas which have been denuded or to check on the raids of *kaingineros* on the public domain. If this money has not in turn been raided to finance some dubious project it should be used to reforest deforested lands, protect watersheds, promote sound forest management, and increase the trained personnel which can safeguard the public interest in areas where *kaingineros* abound.

In the next 20 years, there will be no forested areas to exploit if a sound conservation program is not launched right now. Instead of a department of general services, the government should have created a department of conservation.

Better late than never.

#### AUSTERITY AND OUR FORESTS . . .

The forest conservation program, such as it is, is one of the laudable projects adversely affected by austerity. As our legislators prepare their work sheets for the next Congress, attention is being focussed on the despoliation of forests and the loss in millions of pesos which is due to accidental fires, man-made fires set by *kaingineros* the failure to carry out selective logging pledges, and the limited reforestation program in which the government is only mildly interested.

The House forests committee the other day reported that the total forest reserve has been reduced by 2 million hectares. The committee claims that of 3.5 million hectares of forest administered by concession-holders, only half a million is being selectively logged.

In his Tokyo visit, the President cited forest products as one of the mainstays of Philippine exports to Japan. The bulk of these exports is in logs. Those who have enough foresight and public spirit say that in about 10 years, there will be such a critical depletion of main forest resources

that there won't be anything to ship, or anything to hold the water during the rainy season.

The bureau of forestry used to have an outlay of ₱3.5, million to finance its reforestation program. It conducts experiments in forest management, inventories of resources, and research but its funds are limited.

Congress should appropriate more funds for reforestation, research, and the enforcement of forest laws. If no funds are available in the near future, existing laws should at least be strictly enforced—both on the *kaingineros* and the concession-holder who ignores selective logging.

#### FORESTRY UPSCA 1959-1960 HIGHLIGHTS

The school year 1959-1960 marks a golden era for the Forestry Chapter of the UPSCA. It was during this year that the organization has had the greatest number of activities since its foundation in 1954.

For the month of June, the UPSCA had its despedida and at the same time a welcome party for the outgoing and the incoming advisers, Miss J. Taleon and Prof. J. Blando, respectively.

The traditional Smokers' Rally was held July 31 in the college auditorium and the UPSCA presented a choir and a combo number, both of which won first prize.

The UPSCA inter-committee Basketball League was held during the early part of September. All the committees participated in this league. The choir group stole the pennant away from the other committees.

August had two "time-outs" for the UPSCA; Aug. 15 and 23. August 15 is the anniversary of the UPSCA-sponsored Block Rosary in the Forestry campus. A mass was held followed by a procession around the campus in the evening. August 23 was the proclaimed UPSCA Day in Diliman. In spite of the rain and the distance the members had to travel, those who attended were able to make a booth which got away with the prize as the simplest booth. In addition, the combo and folk dance group participated in the program. Senator Francisco "Soc" Rodrigo was the guest speaker.

During the November 29-30 festivities in connection with the celebration of Forestry Day the Forestry UPSCAns presented folk dance numbers which won the applause and admiration of the spectators.

The month of December found the chapter engaged in three activities. The first was on December 6 during the induction rites for new members at the Lake View Resort and Restau-



rant. Its second activity was at Diliman during the Lantern Parade on December 17 and the third was when the organization participated in the FSBO sponsored Christmas Program on December 21 wherein the members captured first prizes for the group singing and lantern contests.

The election of officers for the 1960-1961 administration was held on January 21. Bob Estrella was chosen chairman. The other officers who came out during the election were: Pids Villanueva, Vice-Chairman; June Jamera, Secretary; Nephaly Zabala, Treasurer; Larry Cayayan, Auditor; Nap Dalangin, PRO; Manny Valera and Lucring Rebugio, Reps to the Central Council. Prof. Blando was re-elected Adviser.

Following the election was the formal turning over of offices to the officers-elect during the Barrio Fiesta held on February 7 at the Forestry Pavilion with Father Ortiz officiating. As can be gathered from the name of the affair all the eats prepared for the occasion were native delicacies from "buko" to "puto". Eat as much as you can — Sky is the limit — was the day's slogan.

Aside from these activities, the dance group also presented other numbers during special convocations held at the College of Forestry Auditorium such as when the college entertained the visiting Taiwan and Korean Foresters. Another instance was when the group performed before the FPRI audience in conjunction with the bienvenida party given in honor of Dr. and Mrs. George M. Hunt upon the couple's arrival from their three-month vacation in their home country.

A. A. R.

### LIBRARY

Books and more books are pouring into our college library. The latest statistics show a total volume of 4,968 books. This figure will give almost fifteen books for every student registered this semester. Around 100 more books are expected to arrive as part of the \$10,000 grant of the Rockefeller Foundation (1958-1960).

In addition to the said books are five forestry reference books donated by Drs. de Zeeuw, Stone and Larson purchased through the "Cornell Contract Fund".

The U.P. allocation for our library is expected to increase this year, as last year was increased from ₱3,000 to ₱3,500.

With the increase in the number of books goes the organization of the stockroom. Unlike before when all the books were placed inside the

shelves around the reading room, the books have been transferred to the stockroom in order to give more elbow room for the library users.

The library is also having a project of periodical self-binding with the College of Agriculture with the aid of the materials provided by the ₱200 donation of the American professors. Most of these periodicals were never bound since 1946 so that their binding facilitates and gives better and more efficient services to the readers.

A.A.R.

### YW — YMCA CONFERENCE

"Meeting the Challenge of our Present Moral and Economic Problems" was the chosen theme of the 38th annual YW-YMCA college students conference held in Baguio City December 26-31, 1959.

Some 200 delegates from 14 different colleges and universities in the Philippines took six days off from the yuletide season to give fulfillment to the gathering's noble objectives which were:

1. To stimulate and encourage student delegates to think about the moral and economic problems that will contribute to nation building.

2. To expose student delegates to the lights of democratic practices, philosophic thoughts and analysis of present day national problems closely and vitally affecting their interest.

3. To stimulate intellectual inquiry, right thinking and sound reasoning.

4. To develop among the students an awareness of the moral and cultural values in relation to character development, national economic development, political and social development.

5. To provide the delegates a healthy atmosphere for wholesome fellowship, clean outdoor fun, and well balanced community living.

6. To provide a fertile ground for better leaders for a better Philippines.

Terminating the six-day deliberations the following resolutions passed by the different commission groups were approved by the whole delegation:

1. A resolution establishing a continuing national organization to supervise the implementation of the resolutions passed during the annual conferences.

2. A resolution endorsing the move of the congress of the Philippines to revise the Laurel-Langley Trade Agreement.

3. A resolution petitioning the YWCA and YMCA to sponsor a literary contest to encourage student writings setting forth moral values.

4. A resolution requesting the delegates to undertake a self appraisal to see if his acts conform to the socially accepted standards of moral values and to serve as a dynamic force in influencing the family to take active part in community development.

5. A resolution for holding leadership seminars at least four times a year to implement and attain the proper objectives of the "Y".

The University of the Philippines sent thirty delegates three of which came from the college of Forestry: Eddie Dizon, Oscar Cadelina and Melchor Magsanoc.

Melchor L. Magsanoc

#### EX-DEAN, CONVOCATION SPEAKER

Professor Calixto Mabesa, former Dean of the College of Forestry and now a member of the staff of the Nasipit Lumber Company, was the speaker during the special convocation sponsored by the Forestry Student Body held last January 12.

Speaking before a group of foresters, FPRI personnel, and faculty of the College, he stressed the need of technically trained men in the government service and private firms using wood as their raw materials. The former dean further advised the students to take advantage of the many opportunities on hand while in College. "Take advantage with all the available facilities and equipment for learning in College. Utilize all your time wisely in learning your lessons because when you go out from this college you have to depend on what you learned here," he remarked.

The former Dean was invited by the present Dean to give guidance and enlightenment to the candidates for graduation this coming April.

*by Carlos Glori*

#### ICA-NEC AND FORESTRY

"— to expand and strengthen the over-all educational program and related operations of the University of the Philippines, in order to meet the rapidly increasing need and demand for professional foresters and trained forestry technicians, and to permit the University to provide those services which are expected of a major center of forestry education and research," were the general objectives of the assistance program between the U.P. and Cornell U as sponsored by the NEC and ICA. This assistance program which was started early 1957 will terminate on the 20th of June of this year. Ranging in the period of from 1960-'63 another contract, with the College of Forestry — State University of New York at Syracuse, was ac-

complished. Though rehabilitation of the College of Forestry is not yet in full blast, marked changes in the campus are becoming apparently noticeable. Some of these changes include the modernizing and strengthening of the curriculum, the establishment of a physical plant and the enlargement and training of the professional faculty.

The new curriculum was offered this school year with the aim of discouraging the two-year ranger course. Machinery and other equipment are now installed in the new laboratory building of the college. The injection of young blood in the faculty was initiated at the start of the school year with the appointment of 5 newly graduated foresters. The program aims to increase this number of appointees, the latest appointment being of three others.

All these developments, and much more to come, which may include the acquiring of a forest technology building and a forestry campus; are for the College of Forestry to have and retain with an able assistance from the ICA-NEC and from other persons or institutions which believe in the importance of a complete rejuvenation of the College of Forestry.

B. R. Rola

#### CEU COEDS VISITS FORESTRY

Eleven bus-loads of CEU coeds numbering about 600 made an excursion to the College of Forestry last January 18 for the purpose of supplementing their knowledge in Botany by having an actual view of the various ornamental, medicinal, and timber producing species found inside the college campus.

Led by their adviser, Dra. Isabel G. Reyes, the group composed of students in Botany and Biology of the Centro Escolar University was met by Prof. Recto, Secretary of the College of Forestry who conducted them to the Forestry tennis court where they heard lectures given to them by Dr. Manza, Mr. Quimbo and Mr. Vergara.

After the lectures the student-excursionists were then divided into groups and were shown around the campus by Messrs. Quimbo, de Guzman, Mordeno, Castillo and Villaflor, all instructors of this college.

#### JUNIOR-SENIOR'S PROM

The Junior Class Organization under the advisership of Miss Zenaida Portacio sponsored a dance last February 6 in honor of the Seniors of this college. This annual shindig, originally scheduled at the Forestry Swimming Pool, was

held instead at the Forestry Pavilion because of inclement weather.

Success of the affair is credited to Mr. Faustino, Jr., president of the sponsor-organization, to all the Juniors and their adviser who left no stone unturned to make the dance a memorable one.

Eddie Cajucom, speaking in behalf of the Senior Class of which he is the president, expressed his gratitude for the "good riddance party" feted him and his companions and in return for all of these he distributed key-chains to the members of both classes as a fitting remembrance of the occasion.

Among those who attended the prom were: Dean Zamuco, Dr. Manza, Dr. & Mrs. Larson, Dr. & Mrs. Moore, Prof. & Mrs. Rosqueta, and other members of the faculty.

#### ROYAL CRUSADERS WINS UPSCA BASKETBALL LEAGUE

The Royal Crusaders, all UPSCAn themselves, topped the basketball league that was sponsored by no other than the UPSCA, Forestry Chapter.

In a tightly contested match, the Crusaders offset the gallant bid of the Forestry Y Club to grab the league pennant, last March 13, 1960. Staving off rally after rally by the Y greenies, the goldies wrapped up the games with a heart-breaking two-point lead.

In the curtain raiser, the Aircraft Tossers upended and outdared the Daredevil combo. Brilliant outside shooting by the Tossers saved the day for them as they trounced the dareless daredevils to submission. Final score was 48-41.

The standings of the teams are as follows: first place, Royal Crusaders; second, Forestry Y Club; third, Aircraft Tossers; and fourth, Daredevils.

#### FORESTRY NINE BAGS FOURTH PLACE

The College of Forestry softball team bagged the fourth place in the current U.P. Los Baños

Softball League. Sporting a two-win three-loss card, the Forestry nine won only over the sophomores and the lowly Rural High School swatters. Rated underdogs all the way, the clouters from Maquiling lived up to the forecasts of the softball enthusiasts.

Led by team captain Pete Muñoz, the members of the team are: Dolphy Decena, Domie del Rosario, Mando Capiton, Manny Cortes, Naldo Bertuso, Will Pollisco, Bany Pilar, Joe Lechoncito, Neptale Zabala, Marcelo Mendoza, and Eddie Cajucom.

Kudos to the team that played well despite the lack of moral and financial support from the SBO and — lack of practice. —B.R.R.

#### FORESTRY GOLDIES REPULSE TAGKAWAYAN FIVE BOW TO CALAUAG QUINTET.

Incidental to the trip of the Lumbering class to Tagkawayan and Calauag last Feb. 26-28, 1960, the Forestry goldies played against the selection teams of both towns.

At Tagkawayan, heckled by a partisan crowd the goldies put up a spirited fight to defeat the Tagkawayan all-stars. Paced by playing coach Sid Zamuco, the erstwhile champions of last year's intramurals humbled the pride of Tagkawayan to submission in a foul-infested match. Employing the pass-screen-cut offense pattern, the goldies found the all-stars easy marks for free lay-ins. A series of fastbreak wrapped up the game for the ball hawking foresters, the game ending with an eight-point lead to boot.

In Calauag the next morning, the team was defeated by a strong selection combine. Playing under a scorching February sun, and the Goldies found it hard to endure the extreme heat as they folded up at the start of the second half trailing by as much as 14 points. Magnificent shooting by Blando salvaged the team's prestige as he narrowed down the opponents' lead to a scant two points before the game ended.

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### KNOW YOUR CIVIL . . .

*(Continued from page 84)*

his health when he returned to duty after the expiration of his one year sick leave.

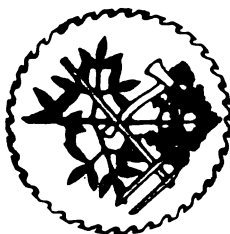
The Commissioner ruled that since Mr. Y's sickness was, by nature, contagious and may endanger the health of his co-employees, Mr. Y should be dropped from the rolls of the Office without prejudice, how-

ever, to his future application for reinstatement in the same office after he had fully recovered his health, subject to the Civil Service Law, rules and regulations governing appointments by reinstatement.

#### Reference:

Civil Service Opinions and Rulings  
The Civil Service Reporter, November, 1959

# B. F. Notes



X-WAPCO  
(Personnel Management)

September 29, 1959

MEMORANDUM for —  
Director of Forestry  
Manila

In connection with this morning's conference which was attended by division chiefs and representatives of the WAPCO and in accordance with your instruction to me, I wish to bring the following points for your consideration:

1. Realizing the sad plight of forest officers under the reorganization of the Bureau which was implemented on November 7, 1957 and after thorough analysis of the various positions, from Forest Guard to Forester III, there is a need of re-examination of these positions to solve at least the serious problem of improving personnel management for the good of the forest service.

(a) *Present Status of Technical Personnel in the Lower Bracket*

Positions	Number	Range	Salary
Forest Guard	675	21	₱1632.00
Scaler	239	24	₱1884.00
Lumber Grader	26	24	₱1884.00
Forest Station Warden	88	26	₱2088.00
Forester I	270	31	₱2676.00
Forester II	52	34	₱3108.00
Forester III	91	39	₱3984.00

(b) *Suggested Plan for Reclassification of the above:*

Forest Guard	675	24	₱1884.00
Scaler	239	26	₱2088.00
Ranger (For. Sta. Warden)	88	31	₱2676.00
Ranger (Forester I)	278	31	₱2676.00
Lumber Grader	26	31	₱2676.00
Forester (Forester II)	52	39	₱3984.00
Forester (Forester III)	91	39	₱3984.00

2. It will be noted that 52 positions of Forester II will be reclassified to Forester level which is equivalent to Forester III of the present status or a total of 143 Forester's items.

3. There are 88 positions of Forest Station Warden which are regrouped with 270 Forester I positions to the old designation of Ranger which is popular and looked upon by the public.

4. The 239 present positions of Scaler who are doing the great bulk of scaling for revenue purposes and contributing for our economy will be upgraded from range 24 to range 26.

5. The 26 positions of Lumber Graders which is a very delicate and highly skilled position doing dollar-producing tasks, will be upgraded and fully recognized from range 24 to range 31, equivalent to Ranger group. Previously, there had been a formal request for reclassification and the WAPCO has approved it in principle in giving Lumber Graders the salary range of 31.

6. The Forest Guards who are the police force of our vast forests, while still inadequate in number, will be upgraded from range 21 to 24, between the salary ranges of Clerk I (range 2)3 and Clerk II (range 25).

We pose the problem of feasibility to reconcile fiscal (money) matters for the justification of the proposed reclassification of position with the Budget Officer of the Bureau of Forestry.

(SGD.) TEOFILO A. SANTOS  
Chief Training Officer

*PARRAS PASSES AWAY*

Vicente Parras, a ranking official of the bureau of forestry, succumbed to heart attack Friday afternoon. He was 63.

Parras started his public career as ranger. He subsequently held various positions as in-charge of land classification party, forester, district forester, forestry supervisor I, chief of concessions section and forestry supervisor II.

His body lies in state at the Funeraria Nacional.

Surviving him are his wife Telesfora de Leon Parras and children Carmen, Andres, Conchita and Olivia. — fbc.

Legislation  
Supervision  
MEMORANDUM for the  
Director of Forestry  
Manila

February 23, 1960

Attached herewith is a proposed Fishery Bill, the basic or major objective of which as it affects forestry places all tidal mangrove and oth-

er swamps, ponds under water and/or foreshore areas or public forest or agricultural lands immediately upon its approval or effectivity under the exclusive jurisdiction of the Bureau of Fisheries and for other purposes. Its approval will ipso facto be detrimental to public interest particularly the administration of such forests and/or forest lands which are essentially needed to be retained for forestry purposes. In the light of such major objective of the law, it is deemed wise and necessary that the bill should be opposed to include the following grounds, to wit:

(1) The passage of the Bill requires the amendments of several statutes like the Commonwealth Act No. 141 known as the Public Land Act provided under Chapter II, Section 6, that the President upon the recommendations of the Department Head shall from time to time classify the lands into public domain;

- (a) Alienable or Disposable
- (b) Timber, and
- (c) Mineral Lands

and may at any time and in a like manner transfer such lands from one class to another, for the purposes of their administration and disposition. Heretofore, approval of the proposed bill will, thus, include (d) Fishing.

(2) Similarly, several sections of the Revised Administrative Code as amended under Chapter 27, known as the Forest Law, particularly Section 1820, 1838 (as amended by R. A. 100 & 121) and also of Republic Acts 121 & 153 amending Sec. 265 of C.A. 466) which covers a chapter of the National Revenue Code affecting forest charges on minor forest products in mangrove swamps. Section 1820 of the Revised Administrative Code, as amended, defines "Public Forest" all in reserved public land including nipa and mangrove swamps ..... "Forest products" as pointed in this section and in the National Revenue Code, includes among others like firewoods, charcoal, daluri, barks, nipa sap, mangrove species, wines, etc. which will include all other mangrove species that are of economic value. Section 1833 of the same code 153 affected by Revised Administrative Code 153 accepted by the Proposed Law provides the leasing of forest land for special use which includes timber depots, plantations for the raising of nipa and/or other plants, bacauan, medicinal plants or trees of economic value, fishpond swamps ..... Republic Act 153 amending Section 265 of Commonwealth Act 466 provides a forest charges of ₱.40 per cubic meter of firewood cut in public forests and forest reserves on bacauan, lagarai, pototan and tangal and ₱.20

per cubic meters in other woods. (This include all of the mangrove species).

(3) Aside from the amendments of these various statutes, the transfer of the administration of these areas on the proposed Fishery Bill will proved detrimental to public interests as all mangrove or tidal swamps are absolutely not fit for fishpond or fish breeding purposes. So when mangrove areas are covered with species of bacauan, nipa and other minor forest products of economic value are converted in accordance with the intention of the proposed Bill will in one way turn a liability to the economic development of the country. And if most of these mangrove swamps will remain in the administration of the Bureau of Fisheries which in turn out will be unfit for their purpose except for the supply of such other minor forest products of economic value, how may the Bureau of Fisheries protect such forest products from destructions or smuggling of firewoods, nipas etc. in view of their lack of police power?

(4) The complete clearing of all mangrove swamps including areas not fit for fishery just to satisfy the intention of the law will in no way prove better except through proper zoning of mangrove areas. If they are fit for fishery such areas should be given to the Bureau of Fisheries, and if they do fit or needed for forestry should be retained under the administration of the Bureau of Forestry.

(5) Mangrove swamps areas to some degree are playing important role through indirect services as a means to effect flood control measures, wind breaks, regulate stream flow, etc.

(6) Mangrove swamps help uplift the socio-economic condition in rural areas to some degree so much so that people now are developing forested consciousness especially in places where mangrove swamps are established as communal forests. Residents of such municipality get free of charge their minor forest products needs like fuel, timber for their family. The communal forests may served as a common fishing grounds of the residents where in their period of depredation or economic crisis, mangrove swamps is a ready source of fish like shells, shrimps, crabs, etc. to pass a meal, and,

(7) To consider as a minor argument, if we wipe out all mangrove species in this country and convert them all to fishpond or fish breeding purposes, what will our children in the future say when with their open eyes could no longer point or show how mangrove swamps look like? Will it not be beneficial to

retain areas needed for forestry purposes even merely for scientific and cultural progress?

The foregoing considered, I suggest that serious consideration will be given to this matter particularly Section 1 of said proposed bill so that proper representations be made to Congress before it is too late lest the approval of the bill without being commented by this Office.

SEGUNDO P. FERNANDEZ  
*Chief, Forest Reserves Section*

Republic of the Philippines  
Department of Agriculture and Natural  
Resources

BUREAU OF FORESTRY  
Office of the District Forester  
Iba, Zambales

D-11, Licenses (Timber Illegal)  
Olongapo, Zambales

March 3, 1960

The Director of Forestry  
Manila  
Sir:

I have the honor to report the following incident that happened to the personnel of this Forest District yesterday in connection with the blasting of the logging roads used by timber smugglers.

At about 9:00 A.M. yesterday, two teams went up to the public forest of Olongapo at the Dinalupihan side to blast the logging road used by smugglers. *The team No. 1* was headed by *Forester Fernando Gonzales*, the outgoing officer in charge of the Forest Station, Olongapo, Zambales, and who has a good knowledge of the area particularly the boundary of Olongapo as proclaimed by the President of the Philippines and the logging roads used by the smugglers. With him were Forest Guard Alfredo Nafarrete, 3 forestry laborers, 3 P. C. soldiers headed by one Sergeant named Molina, and 2 Navy Technical men. They were assigned to blast the logging roads at Sitio Panlibing which is west of the northeastern boundary of Olongapo. The team No. 2 was headed by the present Officer in Charge of Olongapo Forest Station, Scaler Adolfo L. Galam. With him were Nuresy Farm Supervisor Luis A. Quejado, Forest Guards Bernardo Montero, Lauro Tugadi and 2 forestry laborers. They were accompanied by P. C. Captain Viray and 3 soldiers; Lt. O'Brien and Sergeant Crobtee of the Navy, and Councilor Carlos Bodio, personal representative of the Municipal Mayor of Olongapo. This team was assigned to blast the logging road at Sitio Makam-

bing, also an area west of the northeastern boundary of Olongapo.

The team No. 1 approached the point that were blasted Via Sitio Bulate where a junction of the National Highway and the logging road was found, while the team no. 2 approached the points that were being blasted Via Sitio Cobogobog, also a junction of the National Highway and another logging road. Power wagons of the Navy were used as transportation.

When team No. 1 entered the logging road, they were stopped by a road block wherein a sign "No Trespassing" was posted. One of the P.C. soldiers requested the gate keeper (The wife in the absence of the husband) to let the team pass. After explaining that they were government employees and agents of the law, they were allowed. The wife opened the gate block herself with her own key.

Upon reaching Sitio Panlibing, the team overtook 2 empty logging trucks. Forester Fernando Gonzales requested them not to enter the forests as they were going to blast the road. The loggers did not insist and returned to Dinalupihan, so blasting took place in one of the branches of the logging road at Sitio Panlibing.

After blasting the first point, the team moved to the second branch and readied the holes for the dynamite. At this juncture, 3 trucks loaded with logs came out of the forest. Simultaneously, an empty truck with P. C. by the name Santos and other, also came up from Dinalupihan, Discussion about the blasting ensued. The P. C. soldier Santos questioned the team why the road was being blasted. After long discussions, the P.C. soldier and company left. To avoid trouble Forester Gonzales and his escort allowed the loaded trucks pass thru the blasted road.

In the meantime, team No.2 went up to its assignment unmolested. Upon reaching Sitio Makamping they overtook 3 trucks all loaded with logs from Olongapo forest. Scaler Galam stopped the trucks and questioned the drivers. He ordered the bringing of the trucks to Olongapo under P. C. escort. One truck, instead of following the order of Galam escaped to Dinalupihan, probably to report to Mayor Muli. Meanwhile, the blasting continued, until all the strategic points were destroyed. The team then returned to the National Highway Via the same route where upon reaching the junction, Mayor Muli, his policemen and many armed plaincloths men stopped the team. Mayor Muli lambasted the members of the team particularly the Bureau of Forestry personnel, for blasting the private road He also lambasted Councilor Bodio, the personal representative of Mayor Gerónimo of Olongapo and did not give any courtesy or respect to Captain Viray of the P.C. who was

with the group observing the blasting work. Hot discussion between Councilor Bocio and Mayor Muli ensued, but after some explanations and pacification, they cooled off. He did not arrest any member of the team, but he insisted in getting the logging trucks loaded with logs. So all members of team, No. 2 were able to go home to Olongapo safely.

After the team No. 1 was thru with the blasting, they returned to Olongapo via the same route. Upon reaching the road block, they were surrounded by Mayor Muli, his policemen and armed men. He lambasted the forestry personnel for blasting the logging road. The members of the team including the P. C. escort could not even give their reasons because Mayor Federico Muli and his men were very mad and seemed not to hear any explanation. By the order of Mayor Muli, the team was brought to Dinalupihan, lodged Forester Fernando Gonzales and Forest Guard Alfredo Nafarrete to jail without warrant of arrest and dismissed the rest.

The procedures by which Forester Gonzales and Forest Guard Nafarrete were arrested is believed very improper and unjust. In the first place they were arrested while under the protective custody of the P. C. soldiers who were requested officially by this Office as their security while performing their official duties. Secondly, they were arrested without any warrant of arrest. Thirdly, they were arrested by Mayor Muli without first ascertaining whether or not the roads blasted by them were inside Olongapo or Dinalupihan, and fourthly, that they were arrested while performing their official duties in a public forest of Olongapo where Mayor Muli of Dinalupihan has no administrative jurisdiction.

The incident that happened to Forester Gonzales and Forest Guard Nafarrete yesterday, entirely discouraged, the personnel of this Forest District. Their enthusiasm to perform their duties well in spite of the dangers and hazards of the forest protection work in the Olongapo area have wilted away because even under the protective custody of the P. C. soldiers who were supposed to give them security and protection while performing their official duties in their own administrative jurisdiction, they were arrested without any warrant of arrest by a Mayor from another Municipality and province. It is mentioned in this connection that time and again, I was assured by the P.C. of Zambales that we would be given all the securities and protection only to find out that 2 of us were ledged in jail. There seems to be no real guarantee and security of the forestry men if the present conditions prevailing are not remedied by authorities concerned.

In view of the foregoing, the following are strongly recommended:

1. That a full scale investigation be conducted by proper higher authorities why Mayor Muli arrested Forester Gonzales and Forest Guard Nafarrete without any warrant of arrest.

2. That the attention of the P.C. authorities be called regarding the incident and why our men were arrested from their protective custody.

3. That the correct boundary of the Municipality of Olongapo as per proclamation of the President of the Philippines be established in the ground preferably by licensed surveyors to prevent any future clash between Olongapo and Dinalupihan officials and men.

4. That a status of the logging road used by smugglers in the Dinalupihan side be determined and proper steps be taken to cancel same. According to my belief it is partly within the Roosevelt National Park of which this Bureau has no administrative jurisdiction and public forest.

5. That the license of Benidicto Reyes who claim to have a concession adjoining the Olongapo public forest be held pending until the question of boundary is resolved. According to our belief, there is no more timber found therein.

6. That a proper step taken to establish on the ground the boundary of the license of Cornelio Santos and if it includes any portion of the public forest within Olongapo it should be amended immediately to exclude same. Likewise, proper valuation of the area of Cornelio Santos should be taken preferably by a team from Manila Office to determine the extent of the area covered with forest. This is necessary to avoid suspicion that the license is used only as means to smuggle from adjoining forest.

Very truly yours,  
(SGD.) PRIMO P. ANDRES  
*District Forester*

#### MODEL EMPLOYEE

Disbursing officer Sinforoso Apacible was recently chosen model employee of the bureau of forestry for 1959.

Originally appointed temporary forest guard on July 14, 1919, Apacible was subsequently promoted to clerk, senior clerk and disbursing officer. His award is in recognition of his efficiency, honesty, length of service, punctuality, initiative, resourcefulness, and loyalty to the service for a continuous period of forty (40) years.

Apacible was born on February 4, 1900 in Balayan, Batangas. He is a forest guard (promotional) civil service eligible. — fbc.

EXCERPT FROM THE MINUTES OF THE SPECIAL MEETING OF THE LA UNION FEDERATION OF FARMERS' EXTENSION CLUBS HELD IN THE LA UNION PROVINCIAL NURSERY ON JANUARY 9, 1960.

PRESENT:

All Officers of the La Union Federation of Farmers' Extension Clubs.

ABSENT:

None

#### RESOLUTION NO. 6

WHEREAS, the original forest of La Union has been destroyed through the shifting method of agriculture known as kaingin making;

WHEREAS, there are many squatters inside public forest lands who have introduced permanent improvements necessary in farming;

WHEREAS, these claimants have declared for taxation purposes their improved lands;

NOW, THEREFORE, BE IT RESOLVED as it is hereby resolved, to request the Director of Forestry to assign Land Classification party to delimit the areas needed for forest purposes and to exclude areas that are improved for the production of rice, corn and other crops;

RESOLVED FURTHER, that copies of this resolution be furnished the Director of Forestry, Manila, District Forester, Baguio City, Congressmen Manuel T. Cases and Francisco I. Ortega, House of Representatives, Manila and the Office of the Provincial Governor, San Fernando, La Union.

I hereby certify to the correctness of the above proceedings of the Special Meeting of the La Union Federation of Farmers' Extension Clubs, held on January 9, 1960.

(SGD.) ALEJANDRO RAFANAN  
Secretary

APPROVED AND CONCURRED IN:

(SGD.) PIO A. TADINA

Chairman of DANREAU  
& Overall Adviser of the  
Farmers' Federation

(SGD.) APOLINARIO S. RIMANDO  
President

EXCERPT FROM THE MINUTES OF THE SPECIAL MEETING OF THE LA UNION FEDERATION OF FARMERS' EXTENSION CLUBS HELD IN THE LA UNION PROVINCIAL

IAL NURSERY ON JANUARY 9, 1960.

PRESENT:

All Officers of the Union Federation of Farmers' Extension Clubs.

ABSENT:

None

#### RESOLUTION NO. 5

WHEREAS, the province of La Union is bare of its original forests, through the shifting method of Agriculture and now there exist timber famine and critical shortage of firewood;

WHEREAS, the people now realized the real value of their lost forest because of the high price of construction materials and the critical shortage of firewood for the recently developed Virginia tobacco industry;

WHEREAS, the farmers, government officials, municipal, provincial and national, especially the Department of Agriculture and Natural Resources employees realized the tremendous reforestation work needed to promote and restore forest cover;

WHEREAS, forestry activities in this province have increased beyond routine level, thereby requiring the full administrative and technical skill of seasoned forest officers;

WHEREAS, the forest station in San Fernando has only two personnel who cannot attend to all important forestry activities, specially those related to the cooperative reforestation demonstration movement;

WHEREAS, all reports on work accomplished, program of activities, planting plans, location surveys of plantable areas, requests for allotments, requisitions, etc. are coursed thru the District Headquarters Office, Baguio City, thereby important matters are delayed;

WHEREAS, the cooperation reforestation demonstration movement is a big job, requiring the formulation of program objectives during definite periods and careful implementation of these objectives;

RESOLVED FURTHER, that copies of this resolution be furnished the Director of Forestry, Secretary of Agriculture and Natural Resources, Manila, Congressman Manuel T. Cases and Francisco I. Ortega, House of Representatives, Manila and the Provincial Governor of La Union for appropriate action.

ADOPTED AND UNANIMOUSLY approved on January 9, 1960 by the La Union Federation of Farmers' Extension Clubs and the Department of Agriculture and Natural Resources Employees Association now in special meeting.

I HEREBY CERTIFY to the correctness of



the above proceedings of the La Union Federation of Farmers' Extension Clubs special meeting held on January 9, 1960.

(SGD.) ALEJANDRO RAFANAN  
Secretary

APPROVED AND CONCURRED IN:

(SGD.) PIO A. TADINA  
Chairman

(SGD.) APOLINARIO S. RIMANDO  
President

NOW THEREFORE, BE IT RESOLVED, as it is hereby resolved, that the Federation of Farmers' Extension Clubs and the Members of the Department of Agriculture and Natural Resources Employees Association request the Director of Forestry and the Secretary of Agriculture and Natural Resources create a Forest District for the province of La Union with Headquarters in San Fernando;

#### CAMBODIAN VISITORS

Two Cambodian forestry officials who are presently on an ICA/NEC sponsored observation tour in the islands visited recently the bureau of forestry. They are Kao Nath, division chief of the forestry service of Prek Kak, and Khut.Khouem, division chief of the water and forestry service of Kompong Chen, both of Cambodia.

Their itinerary includes observation and study of management and silviculture operations and wood research and furniture manufacture in the Philippines. They will also observe our latest forest management techniques and forest methods of establishment of wood research studies to enable them to properly manage and exploit the Cambodian timber resources. --fbc.

#### PROMOTION

A veteran employee of the bureau of forestry was recently given a promotional appointment in recognition of his long and meritorious services in the government. Promoted to assistant division chief of the administrative services of the forestry bureau was Vicente Leonor, Sr. who until recently was the chief of the personnel section.

Starting as a municipal teacher of the bureau of public schools before he entered the forestry bureau in 1928 as a mere clerk, Leonor is a member of the Society of Public Administration in the Philippines and Personnel Officers' Association of the Philippines. He became records section chief, general service section chief, budget officer I budget and finance section chief and personnel officer II.

A bachelor of laws degree holder, Leonor has been a liaison officer in matters of promotions and appointments of bureau's personnel and secretary of council of personnel administration. He completed in-service training on national language at the institute of national language, personnel supervision and public personnel administration at the UP Institute of Public Administration, introductory course in modernization of accounting and auditing activities at the DANR and personnel officers course at the Civil Service Commission. —aje

#### MANAGEMENT ANALYST

Supply Officer Manuel M. Añonuevo of the bureau of forestry is the lone personnel of the bureau who passed the management analyst examination given by the bureau of civil service recently.

He completed the first Agency Management Analyst Training Course conducted by the U. P. Institute of Public Administration. A holder of the degree of bachelor of science in commerce, he also qualified in the personnel technician and second grade civil service examinations. —

Añonuevo joined the bureau as mere clerk in 1947. Through sheer merit and hard work, he rose gradually to the positions of property clerk, property custodian and supply officer II. He is now the Acting Chief of the Property & General Service Section. — fbc.

#### REPUBLIC OF THE PHILIPPINES PROVINCE OF ILOILO MUNICIPALITY OF CALINOG

Office of the Council

\* \* \*

EXCERPT FROM THE MINUTES OF THE MUNICIPAL COUNCIL OF CALINOG, ILOILO IN ITS THIRD REGULAR SESSION IN THE MUNICIPAL HALL ON FEBRUARY 14, 1960

PRESENT:

Dr. Ricardo S. Provido .....	Mayor
Mr. Rodolfo Cachuela .....	Vice Mayor
Dr. Felix O. Catoto .....	Councilor
Mrs. Monica G. Alcarde .....	"
Mr. Guillermo Castro .....	"
Mr. Ildefonso Pasaporte .....	"
Mr. Tomas Dorego .....	"
Mr. Luis G. Ortizo .....	"
Mr. Manuel Celo .....	"
Mr. Jesus Carbon .....	"

ABSENT: NONE

RESOLUTION NO. 18-S-60

TITLE: REQUESTING CONGRESSMAN RICARDO Y. LADRIDO TO PRESENT A BILL APPROPRIATING ₱50,000.00 YEARLY FOR THE JALOUR REFORESTATION PROJECT IN THE MUNICIPALITY OF CALINOG

WHEREAS, our forest has been wantonly denuded to the extent that at the rate we are ruthlessly plundering it, the time is not too far when our country will become a desolate wasteland;

WHEREAS, despite a nation-wide program of reforestation aimed at stopping a national disaster, little has been done due to limited funds;

WHEREAS, the location of the area being reforested or to be reforested in this municipality is in the site of the Jalaur Irrigation System and the proposed site of the Jalaur Hydro-Electric Power Plant, thereby making it more important that reforestation be done rapidly, not only for the purpose for which it was launched, but most specifically because we need forests to conserve water for our multi-purpose hydro-electric power plant;

WHEREAS, if we are to see the Hydro-Electric Power Plant completed at the earliest possible time, one that will give maximum of efficiency, there is, therefore, an imperative need to speedup reforesting our deforested areas as the

potential water contents of the dam that will provide the desired power depends wholly on the forest in the vicinity of the proposed projects; and

WHEREAS, this Council, recognizing the indispensability of our forests in the maintenance of our economic stability and making possible advancement in our economic life upon completion of our multi-purpose hydro-electric power plant in this municipality,

ON MOTION by Vice Mayor Rodolfo Ca-chuela, seconded by Councilor Manuel Celso,

RESOLVED a request as it does hereby request Cong. Ricardo Y. Ladrido to sponsor a bill appropriating ₱50,000.00 yearly for the Jalaur Reforestation Project in the Municipality of Calinog

RESOLVED FURTHER to furnish Cong. Ricardo Y. Ladrido and the Director of Forestry for their information and appropriate action.

UNANIMOUSLY APPROVED.

I hereby certify to the correctness of the foregoing resolution.

For. SILVESTRE ARROYO  
Municipal Secretary

ATTESTED:

RICARDO S. PROVIDO  
Mayor

*Order is the sanity of the mind, the health of the body, the peace of the city, the security of the state. As the beams to a house, as the bones to the microcosm of man, so is order to all things.*

— Robert Southey

\* \* \*

*An educated man is one on whom nothing is lost.*

— Wendell Smith

\* \* \*

*Conservation is a positive thing, a method of making the fullest use of every resource that has been bestowed on man. Conservation connotes the turning of a key. But it is not turning a lock on what has been already found; it is the turning of the key to open new possibilities for usefulness.*

— Douglas McKay

\* \* \*

*No matter what looms ahead, if you can eat today, enjoy the sunlight today, mix good cheer with friends today, enjoy it and bless God for it. Do not look back on happiness — or dream of it in the future. You are only sure of today; do not let yourself be cheated out of it.*

— Henry Ward Beecher

\* \* \*

*Education and study, and the favors of the muses, confer no greater benefit on those who seek them than these humanizing and civilizing lessons, which teach our natural qualities to submit to the limitations prescribed by reason, and to avoid the wildness of extremes.*

— Plutarch

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# FPRI Technical Notes

## MOISTURE CONTENT OF WOOD IN RELATION TO AIR HUMIDITY

Wood in the tree (green wood) contains much water, frequently more water than wood. It is very common for the water content of green wood to amount to 1/3 or 1/2 of the total weight and it can be higher. Air also contains water in varying amounts which is referred to as humidity. The "relative humidity" of the air is expressed as a percentage and refers to the degree of saturation of the air. For example, when the relative humidity of the air is reported as 80 percent, it means that the air contains 80 percent of the total amount of water it can hold at that temperature. The relative humidity of air is continually changing, not only from day to day but even from hour to hour, but most of the time it is less than 100 percent. When the relative humidity is lower than 100 percent the air absorbs water from any source that will give up water. The lower the relative humidity, the more thirsty the air becomes and the more rapidly it tries to absorb water from its surroundings.

When green wood is exposed to air at less than 100 percent relative humidity, the air absorbs moisture from the wood, rapidly or slowly according to the relative humidity. Thus the process of seasoning the wood begins and it continues as long as the air is dryer than the wood. When the moisture content of the wood comes down to about 25 per cent, (percentage based on the oven-dry weight of the wood), the wood begins to shrink. Thereafter the shrinkage will continue as long as drying continues.

But wood will not give all its water to the air because wood also has an affinity for water. Very dry wood will absorb water from air at high relative humidity just like dry air will absorb water from green wood. If the humidity of the air remains constant, the moisture content of the wood will eventually come into balance with it and, in doing so, will swell or shrink in proportion to the amount of water it absorbs from or gives off to the air. For each relative humidity there is a corresponding wood moisture content. This is called the "equilibrium moisture content" or "EMC" of the wood. The temperature of the air also has an influence on the EMC of the wood at a given humidity but this is not enough to require discussion here. Following are a few examples of the relation

between the equilibrium moisture content of wood (EMC) and the relative humidity of the air surrounding it:

Relative humidity of the air (at a temperature of 70°F) percent	Approximate mois- ture content of wood in equi- librium percent
90	20.6
80	16.1
70	13.1
60	11.0
50	9.2
40	7.7
30	6.2
20	4.5
10	2.5

The humidity of the air can change quickly as the air temperature changes but the moisture content of wood in ordinary sizes cannot change quickly. Therefore, after wood has once reached approximate equilibrium with the average humidity of the surrounding air, its moisture content does not change appreciably with the hourly or even the daily changes in relative humidity of the air. It is in a constant state of trying to accommodate to the rapid changes in humidity but because of its slowness, never is able to attain complete equilibrium until humidity changes cease — which practically never happens under normal living conditions.

Although dry wood does not respond to hourly or daily changes in the relative humidity of the air, it does respond to long-continued or seasonal changes. For example, in long periods of dry weather, the average relative humidity of the air is considerably lower than during long periods of wet weather. Wood that has reached approximate equilibrium during wet weather will therefore, lose moisture and shrink during extended periods of dryness until it reaches approximate equilibrium with the average new conditions. When the wet season comes again the wood will reabsorb water from the air and swell again as it seeks equilibrium. This constant struggle to attain equilibrium with the air continues as many years as the wood is exposed to changing humidity.

To obtain best service from articles made of wood for use in buildings, therefore, it is important that the wood be seasoned to the right moisture content before the articles are made. Failure to do so may result in much dissatisfaction.

The "right" moisture content is determined by the conditions under which the wood will be used.

For general use in the Philippines, where the buildings are open to the free circulation of air and no artificial heating is used, lumber for furniture manufacture should be seasoned to about 12 percent moisture content before the furniture is manufactured. This is close to or slightly below the average moisture content the wood will attain in normal service and no trouble should be encountered from shrinking or swelling later.

In the United States and Canada, however, it is best to season wood to about six to eight percent before making it into furniture because, in heated houses during cold weather, air humidities are very low and the moisture content of the wood may go as low as five or six percent. In the summertime in these countries, however, the windows are open, the humidities are higher and the moisture content of wood furniture may go as high as 10 percent. If the wood is between these extremes at the time of manufacture there will be less shrinking and swelling in service than if the manufacturing is done when the wood is at some other moisture content.

The seasonal changes in relative humidity of the air are very much less in the Philippines than in the United States and Canada. Much more care is required, therefore, in seasoning wood for products to be exported to these countries than products to be used in the Philippines. This is why wood products that give entirely satisfactory service in the Philippines may shrink and crack excessively when exposed to the extremely dry air of a North American house in winter.

Some species shrink or swell less than others with a given change in moisture content and, to that extent, may be preferred. The design and construction of the product, of course, also have much to do with its performance in service.

#### SOME FACTS ABOUT KILN-DRIED WOOD

Kiln-dried wood is wood that has been seasoned in a heated kiln until its moisture content has been reduced to the desired level. If the kiln is good and has been operated properly and if the drying is carefully done, well-seasoned lumber will be produced. There are, however, numerous misconceptions and false beliefs about kiln-dried lumber, some of which are touched upon in this note.

1. *How dry is kiln-dried lumber?* A skilled kiln operator with good equipment can dry lumber to any predetermined moisture content between about 20 percent and bone dry, according to what is desired. For making furniture and

similar articles for use in the Philippines, a moisture content of about 12 percent is desirable. But for the manufacture of furniture in the United States the wood should be dried to about 6 per cent because wood articles in the United States have lower average moisture content in service than similar articles in the Philippines. However, lumber to be shipped to the United States and subsequently redried in that country can be dried to the moisture content agreed upon between the buyer and the shipper.

2. *Does kiln-dried lumber remain at the moisture content to which it was dried?* No, its moisture content does not stay constant but can become higher or lower in accordance with the average humidity of the air surrounding it. For example, lumber that has been kiln dried to 6 percent and subsequently exposed to air whose relative humidity averages higher than 30 percent will absorb moisture from the air. The higher the humidity of the air, the more moisture will be absorbed. The moisture content of wood always tries to attain a balance with the humidity of the air surrounding it.

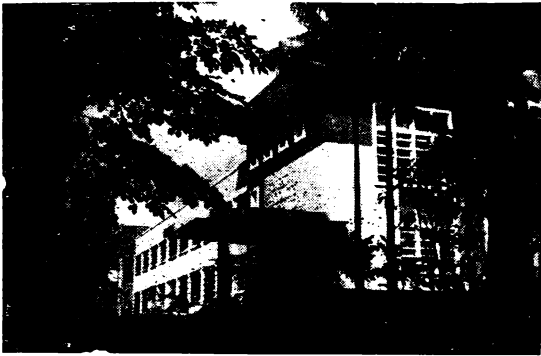
3. *Does kiln drying kill insects?* Yes, the temperatures normally employed in kiln drying will kill insects and any wood that has been properly kiln dried will contain no live insects when it comes from the kiln. As soon as the lumber is cool, however, it may be attacked by insects just like other dry lumber that has not been kiln dried.

4. *Does kiln drying make lumber weaker or stronger?* If the kiln is operated properly, kiln drying does not change the natural strength of the lumber but if excessively high temperatures are used they may reduce the strength of the wood and cause other damage.

5. *What are the essentials of good kiln drying?* Good kiln drying requires correct control of the temperature, the relative humidity and the air circulation within the kiln according to the species, thickness and condition of the lumber being dried. Incorrect control of these factors can cause many defects, such as warping, splitting, checking, collapse or case hardening and greatly reduce the value and usefulness of the lumber. Good kiln drying requires good equipment and a skilled operator. Unskilled operator can do more harm than good. Much study and practice are required to develop a good kiln operator.

6. *May all species of wood be dried together?* It is not good practice to mix species in drying. Some species are more easily damaged and require much greater care than others. When such species are mixed together in the same kiln

(Continued on page 115)



**FPRI Building**

# FPRI Highlights

*ULPIANO DE LEON*

## *THE FPRI IS COMING OF AGE*

The tangible benefits derived by wood-using industries from the technical information and advice of the Forest Products Research Institute, are an indication that this research institution is coming of age. Since the beginning of the current fiscal year over a score of wood-using industries that have presented their problems to the Institute have been supplied the information they need and we are very glad that some of them are now deriving material benefits from our recommendations.

For instance, from a Manila manufacturer of asphalt roofing, who presented his problems to the Institute a few months ago, we recently received a letter stating that following our advice and recommendations he was able to develop his own plant and methods of manufacturing from local raw materials the paper used as the base of the roofing which formerly had to be imported. Due principally to the technical guidance of the Institute, a private firm, The Industrial Fabricators, Inc., has successfully put up a charcoal kiln and a locally manufactured charcoal briquetting machine in Novaliches, Rizal. The Institute's assistance also led to a recent cabinet approval of an application for a Development Bank Loan for the establishment of a pulp and paper plant by a private company.

## *GAINING INTERNATIONAL RECOGNITION*

Barely two and a half years old in its semi-autonomous existence, the FPRI is now gaining an international recognition. This is deduced from the numerous letters from India, Indonesia, Malaya, Korea, Japan, Taiwan, South Vietnam, U.S.A., Europe, Australia and others requesting to be included in the Institute's mailing list for

publications. From South Vietnam we recently received a communication requesting the Institute to study the possibility of manufacturing plywood from the woods of that country. From different countries we receive requests for wood identification and several other related subjects.

That the Institute is gaining an international recognition may also be inferred from the fact that many high ranking foreign government officials on observation tour of the Philippine progress make it a point to visit the FPRI. Among the VIPs who made recent visits to the Institute were British Ambassador Pilcher, Australian Ambassador Alfred Stirling, Senator Fong of Hawaii, Governor Badiono of Indonesia, a group of high ranking Taiwan and Korea forestry officials, Cambodian foresters and many others. Both the Taiwan forestry officials and Cambodian foresters inquired of the possibility of sending some of their technical men for training to the Institute.

## *PROGRESS IN RESEARCH*

During the first semester of the current fiscal year, the FPRI continued to make good progress in its research activities. In his semi-annual report to the Forest Products Research Board, FPRI Director Eugenio de la Cruz stated that the Institute completed nine short projects. In addition, he said, 26 long continuing projects were completed in parts. The results of the investigation in some of the completed and partly completed projects are briefly discussed below.

*Air seasoning.* — A survey was conducted in a number of big and small sawmills in the different parts of the country. Chief Rosario T. Cortes of the FPRI Wood Preservation Division, under whose supervision the survey was conducted, reported that the methods and practices of different mills vary depending upon the end use of lumber, mill capacity, seasoning site, and others. Some practices are good, others need improvement.

*Wood Preservation.* — An investigation was conducted by Justino B. Segueria, Jr., a senior forest products technologist, on the effect of temperature and duration of pressure period on the treatability of apitong (*D. grandiflorus*) with

creosote. By means of the full-cell process, apitong specimens were treated with creosote at different temperatures and pressure-periods. In his report, Segueria pointed out that changes in temperature and pressure-periods, within the range studied, did not significantly affect the retention and penetration of the chemical because practically complete penetration of the creosote was achieved even with the least severe conditions of treatment used. This question needs further study using a species that is more resistant to penetration.

*Entomology* — Sr. Forest Products Technologist Faustino C. Francia reported recently that his section completed two short projects. One of them was a study on the effectiveness of "Sevin" in comparison with dieldrin, endrin, and lindane for protecting logs from ambrosia beetles. Francia reported that Sevin, either in the recommended dilution or in twice the recommended concentration was not found sufficiently effective. Only lindane at 4.0 and 5.0 percent concentrations in water, he pointed out, was found to give protection to newly cut logs for as long as six to eight weeks.

The other completed projects in entomology was a study on some aspects of the ambrosia beetle problem in Mt. Makiling. The report presenting the results of the study enumerates the different species of ambrosia beetles found thus far in Makiling National Park. Most of them, Francia remarked, were found causing damage to wood and wood products.

*Timber testing* — Simplicio B. Bellosillo, chief of the FPRI Timber Physics and Engineering Division, reported recently that the investigation of the strength and related properties of yakal species from Real, Infanta, Quezon has been completed. He said that five yakal trees from that region were tested and the average values of the more important strength properties of that species for the region are presented in a progress report filed in the FPRI library. It remains to be determined whether strength properties of yakal from other climatic regions of the Philippines differ significantly from the values for the Quezon region.

*Charcoal production and briquetting* — Good quality charcoal was produced from sawmill slabs of mixed hardwood species. Forest Products Technologist Pancracio Bawagan, reporting the results of his studies in a 2-cord, 3-chimney charcoal kiln, stated that an improved technique in the coaling operation, has been developed. Regarding his studies on charcoal briquetting, Bawagan remarked that in general, co-

conut shell charcoal seems easier to briquet than wood charcoal.

*Pulp and paper* — The results of the study on the bleachability of white lauan sulfate pulps was reported by Pablo M. Nicolas, Sr. forest products technologist of the FPRI Chemical Investigation Division. To produce bleachable white lauan sulfate pulps of highest strength properties and highest percentage of recovery, Nicolas tentatively recommends that the cooking chemicals to be used shall be 15 percent NaOH and 5 per cent NaS, with a liquor-to-wood ratio of 4:1. The pulping time is 150 minutes; 90 minutes for raising the temperature from room temperature to 170° and the last 60 minutes to maintain it at 170°C.

*Veneer drying* — Three progress reports presenting the results of studies on the veneer drying characteristics of three species were submitted recently by Augusto P. Bati, a junior forest products technologists of the Institute. The species covered by these reports are dagang, apitong, and mayapis. Each species was studied in three thickness. Bati investigated the effect of veneer thickness, temperature, and drying time on the quality of the dried veneer. In his reports, Bati presents data for determining the optimum drying conditions for specific thickness of each individual species.

### PHYSICAL GROWTH

Along with its continuously expanding research activities, the FPRI is also growing physically. Among the new additions to the facilities of the Institute are a new building for the storage of dangerous chemicals, a dehumidified room to prevent the corrosion of the delicate electronic parts of the timber testing machines, a roof to shelter the motor pool, and several smaller items.

Several pieces of ICA-financed technical equipment, which are a part of a group amounting to a total of \$53,000, arrived recently. These include accessories of a pulp beater and spare parts of other machines. More items are known and other publications covering chemistry, electrical cabinet to be used in certain wood gluing studies has reached Manila and should arrive at the Institute soon.

### LIBRARY

The FPRI library received another shot in the arm. This is in the form of technical books to be on the way. A temperature-humidity-conductivity, architecture, design, statistics, plywood, physics, botany, engineering, pulp and paper,

(Continued on page 116)

## FPRI Technical Notes . . .

(Continued from page 112)

charge, the drying conditions will have to conform to the requirements of the species most difficult to dry. This will be too slow for the other species. If the drying is done as rapidly as the easiest species permits, the slow-drying species will be damaged. Even when the wood is all of the same species the kiln operator must use discretion because there are differences in the rate of drying of heartwood and sapwood, quarter sawn and flat sawn, and other factors to consider.

7. *May all sizes be dried together?* Since thick lumber dries more slowly than thin lumber and must be dried with greater care, it is not good practice to dry mixed sizes in the same charge. If for any reason mixed sizes are dried together, the kiln should be operated as required by the largest size. The thinner sizes will then not be damaged but more time will be required than when they are dried alone.

8. *In what way is kiln drying better than air drying?* Air drying is dependent upon the weather but kiln drying can be under conditions controlled to give best results. Kiln drying is quicker and saves the yard space, the extra handling and the drying losses involved in air drying. It also permits drying to lower moisture contents than air drying.

9. *Should lumber be air dried before kiln drying?* Preliminary air drying is not necessary but lumber that has been air dried or partially air dried can be kiln dried more quickly and requires somewhat less care than lumber green from the saw. The kiln capacity in amount of lumber dried per month is greater and the kiln cost per thousand board feet is less when using air-dried lumber. However, the cost of air drying and extra handling must be added to the kiln costs in determining the total drying costs. These costs are avoided when drying green from the saw. Which method is more economical or preferable depends upon local conditions and requirements.

10. *How can moisture changes in kiln-dried lumber be prevented or reduced?*

(a) Storing the lumber or the article made from it in a storeroom where the relative humidity of the air is maintained at the required level will avoid moisture changes as long as the correct humidity is retained. But if the humidity changes, the moisture content will begin to change. The dried lumber should not be piled on the floor but on racks about 18 inches above the floor so that the air can circulate beneath the pile. Dried lumber should not be stored in a new building until its walls and floors have

thoroughly dried and reached equilibrium with the air.

(b) Wrapping the lumber or finished article in moisture-barrier paper or plastic can greatly reduce the rate at which the moisture content of the wood will change but will not prevent the change entirely.

(c) Coatings of varnish or paint on all surfaces of a piece of wood can reduce the rate of moisture change but not prevent the change. Finishing one side only, of course, retards moisture changes in that side only but the unfinished side is not benefited.

(d) The best way to avoid the ill effects of moisture changes in an article of wood is to have the wood dried to the proper moisture content before the article is made.

## THE FIBER-SATURATION OF WOOD

A growing tree contains large quantities of water, sometimes more water than wood. Some of this water held loosely in the wood within the fiber openings and in all other available interstices. It is called *free water*. The rest, which is called *bound water* or *hygroscopic water*, is absorbed into the walls of the cells or fibers of the wood. In green wood the bound water keeps the cells or fibers swelled to their maximum size.

When the tree is cut into lumber and the lumber begins to dry, it is the free water that evaporates first. Theoretically, all the free water should have evaporated before any of the bound water leaves the wood, but this does not occur under ordinary conditions. It is usual for the free water to have left the surface layers or the ends of a board and evaporation of bound water to have begun there before any considerable amount of the free water has escaped from the center of the board.

If we assume, however, that the drying proceeds theoretically, a point will be reached when all the free water has left the wood but all of the bound water remains. The moisture content at this theoretical point is called the *fiber-saturation point*. It is important to remember that this point marks the beginning of shrinkage and other behavior of wood as a result of further loss of moisture below this point.

As long as the moisture content<sup>1</sup> of wood is above the fiber-saturation point, changes in moisture do not cause shrinkage or swelling, nor affect the strength of the wood. But at all moisture contents below the fiber-saturation point, any further loss of moisture results in shrinkage while any increase in moisture content causes swelling. Below the fiber-saturation point also, most of the strength properties of wood increase

with further drying or decrease as the moisture content increases (up to the fiber-saturation point). When a given piece of green wood dries, the outer surfaces lose moisture first thus creating differences in moisture content in the different portions of the wood, with the surface being the driest. The exposed surface, therefore, reaches the fiber-saturation point while the inner portion is still above that point. If moisture loss proceeds further, the cells or fibers near the surface will begin to shrink but not those towards the center portion. This produces a tendency for the wood to check at the surface. Likewise, the ends of a board usually dry faster than the center so that shrinkage and checking can also begin at the ends before the center has come down to the fiber-saturation point.

To prevent the occurrence of these defects, it is important to avoid establishing too low a moisture content in the surface zones while that in the center is still high. This can be done in kiln drying by controlling the relative humidity which, of course, requires much skill. In air drying, such control is impractical because the weather is not under control.

The density of wood (weight per unit volume) decreases rapidly with the loss of water above

the fiber-saturation point, but not so rapidly below that point. Why? Shrinkage, which starts to take place as a result of further drying below the fiber-saturation point, reduces the volume of the wood and for any amount of moisture loss there is a corresponding reduction of the volume of the wood. Density, being the ratio of the weight of the wood to its volume, will be less affected by the loss of the moisture where the volume is correspondingly reduced than where the volume remains constant as with wood having a moisture content above the fiber-saturation point.

Many studies have been made in attempts to determine the exact fiber-saturation point, but the findings of different researchers are not entirely in agreement. There is much evidence to indicate that the point, for most woods, is in the neighborhood of 25 to 32 percent moisture content, although there is also evidence showing that it is lower for some species and higher for others. It is generally assumed to be about 30 percent unless known to be different. Even though the fiber-saturation point cannot be located accurately, the fact remains that it is an important concept in trying to understand and explain the behavior of wood with changes in its moisture content.

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## FPRI Highlights . . .

*(Continued from page 114)*

forestry and others. Numbering around 260, these books were donated by several international organizations including the United Nations, Rockefeller Foundation, Colombo Plan, and the ICA. Some are donation of civic-spirited individuals.

### PUBLICATIONS

A number of FPRI technical papers containing useful information on a variety of subjects were published in different local publications. One of them, "Production of Bond and Wrapping Paper from Sugar Cane Bagasse," by Jaime O. Escolano, appeared in Vol. 1, No. 2 of the *Science Quarterly Digest*.

In the 1960 Anniversary Number of *The LUMBERMAN* four papers of the Institute were published. They are "Proximate Chemical Analysis of Some Philippine Woods," by Aurora C. Reyes, "Studies on Pulp and Paper Making from Philippine Woods and Fibers," Anonymous, "Moisture Content of Wood in Relation to Air Humidity" Technical Note N. 1, and "Some Facts About Kiln Dried Wood," Technical Note No. 2. Excerpts of Technical Note No. 1, ap-

peared in the December 24, 1959 issue of the *Manila Daily Bulletin*.

The paper, "Progress Report on the Survey of Mechanical Properties of Philippine Woods," by S. B. Bellosillo and R. J. Miciano, which was mentioned in the recent issue of this publication was reprinted and has had a wide distribution. Reprints of this paper are available to any interested party by enclosing a self-addressed stamped envelope in a request addressed to the Director, Forest Products Research Institute, College, Laguna.

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*A just and reasonable modesty does not only recommend eloquence, but sets off every great talent which a man can be possessed of; it heightens all the virtues which it accompanies; like the shades in paintings, it raises and rounds every figure and makes the colors more beautiful, though not so glaring as they would be without.*

— Joseph Addison

\* \* \*

*Though reading and conversation may furnish us with many ideas of men and things, yet it is our own meditation that must form our judgment.*

— Isaac Watts



# • Sunshine Corner •

Compiled by: EDDIE Z. CAJUCOM

Professor: "You in the back of the room, what was the date of the signing of the Magna Carta?"

"I dunno."

"Yu don't, eh? Well, let's try something else. Who was bony Prince Charley?"

"I dunno."

"Well, then, can you tell me what the Tennis Court Ooath was?"

"I dunno."

"You don't! I assigned this stuff last Friday. What were you doing last night?"

"I was out drinking beer with some friends."

"You were! What audacity to stand there and tell me a thing like that! How do you ever expect to pass this course?"

"Wal, I don't, mister. Ye see, I just come in to fix the radiator."

\* \* \*

The employer, a sincere man who took a keen interest in the personal lives of the people working for him, met his shipping clerk in the hall one day.

"Tom," he said, "how are you getting on? How are things at home?"

"My wife pesters me a lot by asking for money," Tom confided.

"I come at night tired to death, nothing but work, work, work, all the time. And she says nothing but money, money, money. Give me a dollar, give me seventy five cents, give me fifty cents."

"What on earth does she do with all that money?"

"I don't know," shrugged Tom. "I never give her any."

\* \* \*

"What do you call this, tea or coffee?" demanded the angry customer. "It tastes more like gasoline."

"If it tastes like gasoline," said the waiter soothingly, "I can guarantee it's coffee, because our tea tastes like dishwater."

Mr. Gayboy— "Now, Biddie, why did you tell your mistress what time I came home last night, when I asked you not to?"

Bridget— "I didn't at all, sir. She asked me what time you got in, and I told her I was too busy cooking breakfast to look at the clock."

\* \* \*

It was a deathbed scene, but the director was not satisfied with the hero's acting.

"Come on!" he cried. "Put more life in your dying."

\* \* \*

Lady— "Can you give me a room and a bath?"

Clerk— "I can give you a room, madam, but you will have to take your own bath."

\* \* \*

Doctor (arranging patient on operating table)— "I'll be perfectly frank and tell you that four out of five patients die under this operation. Is there anything I can do for you before I begin?"

Patient— "Yes — help me on with my shoes and pants."

\* \* \*

"But, doctor," said the worried patient, "are you sure I'll pull through? I've heard of cases where the doctor has made a wrong diagnosis, and treated someone for pneumonia who has afterward died of typhoid fever."

"Nonsense," spluttered the affronted physician. "When I treat a patient for a pneumonia, he dies of pneumonia."

\* \* \*

Patient— "I'm in love with you. I don't want to get well."

Nurse— "You won't. The doctor saw you kissing me, and he's in love with me, too."

\* \* \*

"Sorry, old man, that my hen got loose and scratched up your garden."

"That's all right, my dog ate your hen."

"Fine! I just run over your dog and killed him."

\* \* \*

A passenger in an airplane was far up in the sky when the pilot began to laugh hysterically.

Passenger— "What's the joke?"

Pilot— "I'm thinking of what they'll say at the asylum when they find out I have escaped."

\* \* \*

Mrs. Pepper— "How well you are looking, Mrs. Smythe."

Mrs. Smythe— "Do you really think so?"

Mrs. Pepper— "Indeed I do. There isn't a woman of my acquaintance as old as you, who looks nearly as young."

\* \* \*

The census taker asked:

"In what state were you when you were born?"

"Well," hesitated the blushing spinster, "er-er-nude."

\* \* \*

"Waiter, we want chicken. The younger the better."

Then hadn't you better order eggs, sir?"

\* \* \*

Car owner— "How did this long blond hair get on the back seat of my limousine?"

Chauffeur— "I'll give you an explanation, sir."

Owner— "Explanation nothing! What I want is an introduction."

Boxer— "Isn't it a long distance from the dressing room to the ring?"

Opponent— "Yes, but you won't have to walk back."

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## Advice From A Famous Alumnus

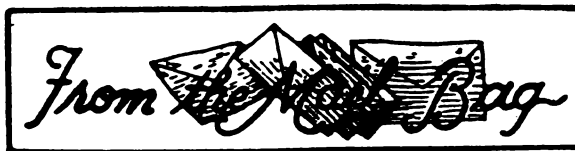
*When I was a lad I dreamed I would be  
A student in the College of Forestry.  
I passed all the subjects in my small High School  
And practiced with a bolo as my only tool,  
I swung that bolo with a hand so free  
That now I am a captain of forestry.*

*My very first year on Makiling slopes  
I concentrated on learning the ropes;  
I smiled at professors and I smiled at the dean  
And never told stories in the least obscene.  
I was so nice to the faculty  
That now I am a captain of Forestry.*

*As a new and old freshman I finally made the grade,  
But they set me to work with a dibble and a spades  
I hated the job so I loosened up the ground  
And planted all the seedlings upside down.  
Oh, I was such a whiz in the nursery  
That now I am a captain of Forestry.*

*Then with compass and transit I surveyed all the Land  
And copied my field notes from another man;  
I wrote long reports in English sad —  
But I never never made the instructors mad.  
I repeated each course till I got a three  
So now I am a captain of Forestry.*

*Now listen young man, if you want my advice,  
It's to the faculty always be nice;  
Study very hard when there's work to do;  
Pass every course with a one or two;  
Read all the books in the library;  
And you too can be a captain in Forestry!*



CHARLES LATHROP PACK  
FORESTRY FOUNDATION  
1214 Sixteenth Street, N. W.  
Washington 6, D.C.

January 27, 1960

Dean Gregorio Zamuco  
University of the Philippines,  
College of Forestry,  
College, Laguna, Philippines

Dear Dean Zamuco:

My best thanks for your kindness in sending Miss Dowling the copies of Forestry Leaves she had requested, and the photograph taken in President Garcia's office.

Professor Emeritus Cedric Guise, of Cornell, has recently written me that he expects to be in the Philippines shortly, and, if you concur, I feel sure that he could give an excellent talk to your students. Undoubtedly Paul Zehngraff will know Professor Guise's itinerary.

On looking over the provisional program for the Fifth World Forestry Congress, I was happy to see that you have been asked to contribute a paper. In this regard, I am wondering what your plans are for attending the congress. Certainly your presence there will add materially to our deliberations, especially in the tropical field. Won't you let me know what your plans are, for I am looking forward eagerly to seeing you again.

Every good wish.

Sincerely yours,  
(SGD.) TOM GILL, Executive Director

\* \* \*

REPUBLIC OF THE PHILIPPINES  
Department of Agriculture & Natural Resources  
BUREAU OF FORESTRY  
Office of the Officer in Charge  
Marawi City

D-37, Administration  
Supervision

January 13, 1960

The District Forester  
Iligan City  
Sir:

I have the honor to inform you that the Provincial Governor of Lanao del Sur invited all Heads of Offices in the Provincial Capitol for a conference in the Conference and Session Hall of the Provincial Board on January 12, 1960. The primary aim of the conference was cooperation and coordination of work among offices in

the province. And the second purpose was rather an acquaintance party. The Governor tendered a coffee party. All the heads of offices were requested to deliver a short talk to introduce our names and the names of our respective offices. I was introduced by the Governor as Gen. Mc Arthur — I shall return.

In the afternoon of January 11, this year, I received again an invitation from the elected Mayor of Saguiaran to attend and deliver a short talk in conjunction with their inaugural celebration of the newly elected Municipal Officials of the municipality of Saguiaran, Lanao del Sur. I accepted the invitation because I noticed that all the Heads of offices headed by the Provincial Governor and Board Members were going to attend the said inaugural celebration of the newly elected municipal officials. And I also believed that this is in relation with our public relation activities.

Enclosed herewith are the extracts or quotation of my short talks delivered.

Very truly yours,  
VITALIANO M. ESCALANTE  
Officer in Charge

\* \* \*

c/o Bureau of Forestry  
Manila  
January 13, 1959

Editor in Chief  
FORESTRY LEAVES  
College of Forestry  
College, Laguna

Sir:

I wish to thank you for giving me a very reasonable number of pages under Volume XI No. 4 of the FORESTRY LEAVES, organ of the student body and alumni of the College of Forestry, under "KNOW YOUR CIVIL SERVICE OPINIONS AND RULINGS".

Enclosed herewith is the second series for the coming issue. The following cases are as follows:

1. Implication of One's Superiors Through Falsification Merits Dismissal from the Service.
2. Misconduct — Acts of Violence in Office
3. Making Love to Subordinate Teacher Merits Separation
4. Inflicting Injury on Co-Employee Constitutes Grave Misconduct

5. The Terms "Temporary Employees" Includes Casual Employees
6. Negligence in the Custody of Public Funds Merits Fine and Reprimand
7. Employee may be Forcibly Separated from the Service Due to Ill Health

Also, enclosed is copy of my memorandum for the Director of Forestry, Manila, dated September 29, 1959, for your information and if found worthwhile, you may put across through the FORESTRY LEAVES.

You are rest assured of my continuing cooperation with the staff of the Forestry Leaves, I remain.

Very truly yours,  
TEOFILO A. SANTOS

\* \* \*

REPUBLIC OF THE PHILIPPINES  
HOUSE OF REPRESENTATIVE  
Manila

November 29, 1959

Mr. Gregorio L. Santos  
Gingoog, Misamis Oriental

Dear Mr. Santos:

I have been informed by Board Member Ignacio Caliñgin who is now in Manila working to get whatever assistance he can for you all, that you are one of the victims of the fire that broke in Gingoog on the 18th of this month.

Please be assured that on my part as the Representative of Misamis Oriental and as your friend I am doing my best in making strong representations with President Garcia and all the offices concerned to give you all the help we can muster.

I deeply regret what happened and I greatly sympathize with you in your plight. I know how hard is your situation but let us bear it. After all, you are not alone. We are behind you.

With my warmest personal regards.

Very cordially,  
(Sgd.) FAUSTO DUGENIO  
Congressman  
Misamis Oriental

\* \* \*

Los Baños, Laguna  
January 11, 1960

The President  
Student Body Organization  
College of Forestry U.P.  
Laguna

Sir:

The Family and Relatives of the late Forester EPIFANIO L. COLUMBRES, (who died December 16, 1959) in Butuan City, while in the performance of his official duties in the jungles of Agusan Province, wish to convey our most

profound gratitude and appreciation to all those who in one way or another helped and condoled with us in the hour of our bereavement.

For the Columbres family,

ANICETO COLUMBRES  
Brother

\* \* \*

Charles Lathrop Pack Forestry Foundation  
1214 Sixteenth Street, N.W.  
Washington 6, D.C.  
U. S. A.

Gentlemen: Attention: Ellen C. Dowling, Editor

In accordance with your letter of December 28, 1959, we are sending to you under separate cover the following:

(1) Two copies of the September, 1959 issue of *Forestry Leaves* containing Mr. Tom Gill's article, "The Forests of the Philippines"; and

(3) One copy of the 1959 Forestry Day issue of *Forestry Leaves* containing Mr. Gill's article, "Forestry Proposals for the Philippines".

Reprints of Mr. Gill's article in the 1959 Forestry Day issue of *Forestry Leaves* will be made because it is our intention to furnish persons who may be interested in improving forestry conditions in this country. It may be of interest for you to know that Mr. Gill's utterance while he was here and his articles are still the subject of favorable comments by those who are interested in forest conservation.

We are enclosing herewith a copy of the photograph mentioned in the letter referred to above and also two other photographs taken at the time Mr. Gill and his companions called on the President Carlos P. Garcia of the Republic of the Philippines.

Very truly yours  
GREGORIO ZAMUCO  
Dean

\* \* \*

Republic of the Philippines  
Department of Agriculture  
and Natural Resources  
BUREAU OF FORESTRY  
Office of the District Forester  
City of Iligan

D-37, Cooperation Mach 14, 1960  
Prof. Jose B. Blando.  
College of Forestry, U.P.  
College, Laguna

Dear Prof. Blando:

I am sending herewith postal money order Nos. 640-30755 and 639-238109 in the amount of ₱80.00 and ₱98.95 respectively representing our collection for the March issue of the *Forestry Leaves* as follows:

1. Findly Millar Timber Co. .... P80.00
2. Misamis Mahogany Inc. .... 50.00
3. Iligan Lbr. Co., Inc. ....)
- Kiwalan Lbr. Co., Inc. ....)
- B. B. Andrada & Co. .... 30.0d
4. Mr. and Mrs. Pablo Luna ..... 20.00
- Total ..... P180.00
- Minus money order and mailing fees 1.05
- Balance ..... P178.95
5. Lanao Export Corp. .... 20.00

Please send a copy of the *Forestry Leaves* to each of the above companies for their information.

With our best wishes and warm regards to your staff.

Very truly yours,  
**MARIO F. SAN LUIS**  
 District Forester

**CHARLES LATHROP PACK**  
**FORESTRY FOUNDATION**  
 1214 Sixteenth Street, N.W.  
 Washington 6, D.C.  
 December 28, 1959

Dean Gregorio Zamuco  
 College of Forestry  
 College, Laguna, Philippines  
 Dear Dean Zamuco:

The September 1959 issue of *Forestry Leaves*, containing Mr. Tom Gill's article, "The Forests of the Philippines," was received here last week, just after Mr. Gill's departure for Latin America. He is expected back here by mid-January, and I shall, of course, hold the magazine for him to see. I am sure he will be very much interested in the whole issue, and would want me to thank you on his behalf for your courtesy in arranging for him to see it.

Would it be possible for us to get two more copies? And would it also be possible for us to have a copy of the photograph that was reproduced opposite page 1 in the September *Forestry Leaves*? These materials would be very useful additions to our files, and if you will let me know the charges involved, I shall be happy to send a check to cover them.

Pending Mr. Gill's return, I am sure he would want me to wish you, on his behalf, every success and very happiness in 1960.

Very sincerely yours,  
**ELLEN C. DOWLING**  
 Editor

c/o District Office, E.F.  
 Boao, Marindusue  
 March 18, 1960

Profesor Jose B. Blando  
 College of Forestry, U. P.  
 College, Laguna  
 My dear Prof. Blando:

I received your letter of February 24, 1960. However, I delayed answering you till I would have advertisements for the *Forestry Leaves*. I did my level best and was able to solicit the amount of P100.00 from some licenses and lumber dealer and after deducting the expenses of P7.05 (for bus transportation, money order fee and stamps is herewith remitted payable to the Business Manager, *Forestry Leaves* under postal money order No. 82922.

I would have made more but our forest users have just made advertisement with the *Forestry Yearbook* last year.

This is all and I and Mrs. Soriano is wishing you and your family best regards.

Very sincerely yours,  
**EMILIO A. SORIANO**

\* \* \*

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 Manila  
 Fabrica, Occ. Negros  
 Philippines  
 5th January 1960

Dean Gregorio Zamuco  
 University of the Philippines  
 College of Forestry  
 College, Laguna  
 Dear Dean Zamuco,

Please accept my most sincere thanks for the many courtesies that you and your staff extended to me during my recent visit to Los Baños.

I was indeed impressed with the work you are trying to do in obtaining a better school of forestry. I was appreciative too of having the opportunity to see the splendid facility that you have, not the least of which was your arboretum with so many fast growing trees that show promise as alternates to trees indigenous to the Islands.

I hope that you, Dr. DE Zeeuw, Dr. Stone, Dr. Larson and other members of your staff may soon find it convenient to pay a visit here in Fabrica.

Yours very truly,  
**(SGD) R. S. KEARNS**  
 General Manager

Enc.: a/s

January 18, 1960

# Forestry Leaves

Organ of the Student Body and Alumni of the College of Forestry, College, Laguna

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## Editorials

### On this our Nineteenth Moving Up Day

*Moving-Up Day has symbolized for us growth—physical, moral and intellectual. Each graduating student, whether for the Ranger's certificate or for the Bachelor of Science of Forestry Degree, must be able to say to himself that he has grown during his stay in College. While it is hoped that he has learned and mastered those skills needed in his profession, can he say to himself in all sincerity that he has provided himself with the core of basic education, so essential for an appreciation of the values of life, and for the recognition of the true, the noble and the beautiful?*

*Has he gone through a curriculum which included those disciplines that will give a better understanding of man as a unit of civilized society and as a member of his community? Or has he acquired mere factual knowledge which by itself, according to one British writer, "is a poor test of any education and lamentably poor test of the education of boys and girls of seventeen and eighteen."*

*The proper test of education therefore is whether it teaches the pupil to think and awakens in him an interest in applying his brain to the various problems and opportunities that life presents. It is said that "the process of education is not to be compared to that of filling an empty pot, but rather to that of lighting a fire."*

*When Milton Eisenhower, President of Pennsylvania State University, was asked to define an educated man, he said,*

*"One could give a dozen valid definitions of an educated person. One would be this: he is a person of sterling character, moral and intellectual maturity and compassion. One might say that an educated person is one who has developed the foundation for a balanced growth—intellectual, spiritual and physical growth. . . . I would say we believe an educated person must achieve real depth of knowledge and understanding in some one discipline, a broad understanding in other fields of knowledge, logic and clarity in communication, the habit of critical thinking in striving at valid judgments, a commitment on the basis of deep understanding to the free way of life, and the ability to think and reason in global terms."*

While we cannot say this of our present graduates and of former ones, we have bright hopes that, with the implementation of the general basic education courses this coming school year, in all colleges of the University of the Philippines, our future graduates will have developed before future Moving-Up Days, the foundation for balanced growth—intellectual, spiritual and physical.

— L.E.

## Our Gold and Diamonds Jubilees

Just between ourselves, we in forestry are really a unique group. Outsiders have not ceased to wonder at our "togetherness." Foresters, so they say, always tend to gravitate to one another. Whether among foresters in the government service, or among those outside of it, or even between those in the service and others who have drifted to other life, work, there exists a fellowship seldom seen in other groups. Mt. Makiling, through some strange alchemy, seems to have compounded a bond of fellowship among forestry men which change of environment or fortunes, or even loss of contact over the years cannot cut or even corrode.

That this is so, we are proud to admit. We are a close, well-knit group. Even hearing someone casually mentioning Mt. Makiling or the mud springs or the "school up the hill" perks our ears, brings a soft glow in our eyes. Bring some alumni together and they hark back on the good old days. Little and big incidents long slumbering come back with startling freshness: the joys and the sorrows shared together, the lonely treks to the peaks and the sneak visits to town, the "5's" we caught and the "1's" which got away, the papayas we picked and the leeches which picked on us, how monkeys ogled on us everyday and how we made up Sundays ogling at excursionists, that glorious moment Greg hit that home-run and that inglorious night he had to run from someone's home, and the hundred other experiences which people of congenial spirits and common interests love to reminisce over and over again. Makiling and our Alma Mater have always a soft spot in our hearts. That has always been and ever will be, as time-defying as Makiling itself, as soul-inspiring as the Alma Mater herself.

Plans are underway to bring us together again. The year 1960 marks our two grand anniversaries: the diamond anniversary of the Bureau of Forestry and the golden anniversary of the College of Forestry. We are celebrating these in a manner befitting the significance of the events. Much history has passed since Captain George P. Ahern got his orders on April 14, 1900 to head the Forestry Bureau, many groups of foresters have been nurtured by our Alma Mater since the first 24 forestry students began classes in the College of Agriculture on June 13, 1910, but each year going by only strengthens our attachment to these two forestry institutions. They are our very own. Each one of us, somehow, somewhere, sometime has had a hand in building them up to what they are now. Their gold and diamond jubilees are our very own jubilees.

November 27 to 30 has tentatively been set aside for the jubilees. The Alumni Association, the Society of Filipino Foresters, the District Foresters' League, the rank and file of the forest service — and all our well wishers — are joining hands. And true to our tradition of making a happy blend of pleasure and business, the observance of the jubilees have all the ingredients of fun-filled reunions and all the trappings of a serious convention to resolve the problems of forestry.

More detailed announcement will be made of course. But as of now, everybody looks forward to seeing everyone around, come the jubilees. It will be truly worthwhile. When gold and diamond blend, something is bound to sparkle.

—N. P. Lansigan—

# Incidentally

We wish to announce with great pride that our Dean of the College of Forestry, Professor Gregorio Zamuco, was a recipient of a travel grant. He left last April 7, two days before the "Moving-Up Day." His itinerary will include all schools and colleges in the United States, where he will observe modern methods on the administration of said schools. Dean Zamuco expects to be home next June or July.

In the meantime, Dr. Artemio V. Manza, head of the Department of Botany and Dendrology, takes over the helm.

—————o0o—————

Moving-Up Day is here again with us. On this day, let us not forget the many tasks ahead of us, the conservation and the perpetuation of our great natural resources. To those who are leaving the portals of this our Alma Mater, let us not forget the many good things we learned and the spirit we have imbibed while in the College of Forestry, the college we love to see. We should always remember that the success or failure of perpetuating our forests depends on us. We should not fail our Alma Mater by doing the responsibilities that lie ahead.

—————o0o—————

The Dean, members of the faculty and Student Body of the College of Forestry wish to thank Senator Gil Puyat for putting aside other important engagements and making himself available to us as our Moving-Up Day guest speaker. Our dear friend, Mr. Puyat did not only give us his invaluable guidance, but also an assurance of his ever-helping hand in solving the many problems that beset us. He assured us also of help to work for a campus of our own.

—————o0o—————

There are 87 graduating students this year. Thirty-seven of which are candidates for the B.S.F. Degree. This year, so far, has the highest number of B.S.F. graduates.

We only hope these graduates do not fail our expectations. We wish each and every one of you good luck and Godspeed. May you succeed in all your noble undertakings.

—————o0o—————

We heard that four of our young professors and instructors will be leaving for the United States very soon. They are: Professors Domingo Jacalne and Rudy Yaptengco, Messrs. Romy Castillo and Nard Angeles. They will stay abroad for a year for their masters degree. Bon Voyage and Happy Landing!

—————o0o—————

Many of our new graduates are seeking employment in the government and private firms. Some of them have just reported for work. Four or six of the new B.S.F. graduates will join the faculty staff of the college. Well, no matter where you are, you should always remember the camaraderie we developed here on this campus, the "esprit de corps," a companionship for which foresters are noted.

—————o0o—————

Our own Eddie Cajucom has just completed two courses, the B.S.F. and "M.D." courses. He has taken before the altar his one and only best-half. Our Best Wishes.

—————o0o—————

Dr. Earl Stone, Jr. and family will be leaving us soon. We hate to see them go but we can't do anything except to wish them Bon Voyage. The faculty and students of the College of Forestry will always remember Dr. Stone for his benevolent help to the college. Dr. Stone will leave on June 15. He was one of the participants in the U.P. College of Forestry-Cornell University Contract. This contract was negotiated to help the college authorities improve the set-up of the curriculum, and the expansion of the College of Forestry.



# An Act Creating The Reforestation Administration

Fourth Congress of the Republic )  
of the Philippines )  
Third Session )

HOUSE OF REPRESENTATIVES  
H. NO. 4921

Introduced by Congressmen Sanchez, Roy, Ortega, Fortich, Gustilo, Paredes, Romualdez, Abeleda, Tan, Castañeda, Tobia and Raquiza

## EXPLANATORY NOTE

The necessity of reforesting our barren denuded grassland specially in the watershed areas of rivers, harnessed for hydro-electric power, irrigation projects, water works systems and destructive rivers and other bare areas subject to severe erosion can never be over-emphasized. During the past years we have witnessed how the reforestation fund collected by virtue of Republic Act No. 115 has been diverted for other purposes other than the intention of the Special Reforestation Act. It is therefore, imperative that in order to avoid the possibility of repeating the same and so that the reforestation fund shall be used exclusively for the purposes enumerated in said Republic Act No. 115, a separate entity or government agency be created so that there will be no doubt as to the expenditures of the reforestation fund.

A separate agency that will concern itself primarily with reforestation will go a long way towards replenishing our fast-dwindling forest areas. There is no question that the national income will suffer a serious reduction when our forest resources are not properly taken care of to assure a constant supply of valuable timber. For every tree felled, there should be another one replanted. But this can never be done unless the agency doing this work is free from the myriad problems of the Bureau of Forestry, and can concentrate on the important work of replanting. With this agency, it is hoped that better efficiency will be attained in the work of reforestation and that more areas will be reforested annually. Passage of this bill is, therefore, earnestly requested.

Fourth Congress of the Republic )  
of the Philippines )  
Third Session )

HOUSE OF REPRESENTATIVES  
H. NO. 4921

Introduced by Congressmen Sanchez, Roy, Ortega, Fortich,  
Gustilo, Paredes, Romualdez, Abeleda, Tan, Castañeda,  
Tobia and Raquiza

## AN ACT CREATING THE REFORESTATION ADMINISTRATION

*Be it enacted by the Senate and House of Representatives of the Philippines in Congress assembled:*

**SECTION 1.** A separate government agency in the Department of Agriculture and Natural Resources to be known as Reforestation Administration is hereby created to take over the functions of the existing Reclamation and Reforestation Division of the Bureau of Forestry.

**SEC. 2.** All reforestation funds collected pursuant to Republic Act Numbered One hundred fifteen shall be turned over to the Administrator of the Reforestation Administration to be spent exclusively for reforestation purposes, subject to the approval of the Sec-

retary of Agriculture and Natural Resources, and all areas reforested under this section shall be considered as permanent forest reserves.

SEC. 3. The Secretary of Agriculture and Natural Resources shall, upon recommendation of the Administrator of the Reforestation Administration declare what areas are to be reforested and placed under the management, administration and control of the Reforestation Administration and that after the area or areas have been reforested, they shall not be declared agricultural lands.

SEC. 4. All personnel now actually performing productive reforestation work, including all record, supplies, equipment, furniture, vehicles and existing buildings, improvements and other facilities and properties in the various reforestation projects now in existence as well as in the central office, Bureau of Forestry, Manila are hereby transferred to the Reforestation Administration.

SEC. 5. The Reforestation Administration shall have one Administrator to be known as the Administrator of Reforestation Administration and One Deputy Administrator with the salary range of 62 and 57, respectively, in accordance with the wage and position classification (WAPCO), and who shall be appointed by the President of the Philippines with the consent of the Commission on Appointments of the Congress of the Philippines. The Administrator of Reforestation Administration shall subject to the approval of the Secretary of Agriculture and Natural Resources, organize its personnel into such divisions or sections as will insure the simplest organization and maximum efficiency. The Administrator shall likewise organize branches in the provinces which shall coordinate their work with the Bureau of Forestry. The Administrator of Reforestation Administration shall possess the powers generally conferred upon Bureau Chiefs.

SEC. 6. For the current fiscal year, all appropriations under the current budget which pertains to the Reclamation and Reforestation Division of the Bureau of Forestry are hereby transferred to the Reforestation Administration for the proper establishment and carrying out of the purposes of this Act.

SEC. 7. All law, orders and regulations inconsistent with this Act are hereby repealed.

SEC. 8. This Act shall take effect upon its approval.

Approved,

I hereby certify that the foregoing House Bill (H. No. 4921 — 4th C.R.P.), was passed by the House of Representatives on May 19, 1960.

I. B. PAREJA

*Secretary, House of Representatives*

Railroaded during the last regular sessions of Congress was House Bill No. 4921 creating a Reforestation Administration. It was certified as URGENT by the President so that his signing it into law can be taken for granted. By the time you read this, the President would approved it.

But a more controversial bill we have yet to see. The entire work on reforestation and afforestation, together with the corresponding funds, are transferred from the Bureau of Forestry to the newly created entity. Obviously, there are as many things as could be said in favor of or against this legislation. Read it, mull over it, and see if its passage will help Philippine forestry at all or worsen the mess it is now in.

What seems most logical would have been to give the bill an airing before it was passed so that it could have been given the benefit of a thorough study. Its proponents chose to railroad it. History will either condemn its authors or make heroes of them — *N. P. Lansigan*

# The Forestry Jubilees

To take charge of preparations for the celebrations sometime this year of the 60th Anniversary of the Bureau of Forestry and the 50th Anniversary of the College of Forestry, the following committees were constituted:

## EXECUTIVE COMMITTEE

Regent Florencio Tamesis .....	<i>Chairman</i>
President, U.P. Forestry Alumni Association .....	<i>Member</i>
President, Society of Filipino Foresters .....	"
President, District Foresters' League .....	"
Director of Forestry .....	"
Dean of College of Forestry .....	"
Director of Parks and Wildlife .....	"
Forester Juan T. Utleg .....	<i>Executive Secretary</i>

## OTHER COMMITTEES

Program .....	<i>Director Tiburcio Serevo</i>
Finance .....	<i>President Nazario Peñas</i>
Publicity .....	<i>Forester Nicolas P. Lansigan</i>
Reception and Entertainment .....	<i>Dean Gregorio Zamuco</i>
Awards and Prizes .....	<i>Forester Carlos Sulit</i>
Decoration .....	<i>Forester Jose Viado</i>

## BUREAU OF FORESTRY OFFERS SCHOLARSHIP GRANTS:

The Bureau of Forestry has included in its 1961 budget a proposed appropriation for scholarships in the College of Forestry for "poor but deserving students of said College and to graduates of high schools and for advance training to deserving Bureau of Forestry personnel".

Anticipating approval of its request by Congress, the Bureau advised the principals of all city and provincial high schools in the country of these scholarship grants. Some of the conditions of the grants are:

1. The scholarship award will be annual depending on the availability of appropriation, standard of scholarship of the

awardee and his conduct in the College of Forestry;

2. The selected scholar should defray his traveling expenses from his hometown to the College of Forestry;
3. The student scholar shall receive beginning July 1, 1960 an allowance of ONE HUNDRED TWENTY PESOS (₱120.00) a month during the period of attendance in the College out of which shall be paid tuition and other fees;
4. The awardee shall agree to render not less than one and one-half (1½) years of service to the government of the Republic of the Philippines for every year of scholarship enjoyed or a proportionate period thereof. His employment, however, is subject to the availability of funds and positions and at a rate of salary that may be determined by the employing agency;
5. The awardee shall reimburse the government all expenses incurred in and incident to the scholarship award in the event that he fails to abide by the terms of the contract or in case he leaves the College or the service earlier than the period provided by the agreement except when the cause of the separation is not due to his voluntary actuations or is beyond his control;

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6. The awardee may be required to render service to the College or to the Bureau of Forestry when not engaged in actual study;
7. The scholarship may be terminated by the Director of Forestry at any time if the awardee fails to live up to the standard of scholarship, behavior and decorum required by the College of Forestry.

The application must be accompanied with an Information Sheet furnished by the Bureau, transcript of grades, and recommendation of the Principal as to the applicant's scholastic ability and moral conduct while in the high school.

In view of the limited number of scholarships, the Bureau is limiting the award to Valedictorians and Salutatorians. Anyone interested in these grants should submit his application immediately to the Director of Forestry, Manila, after graduation to afford ample time to screen and make the selection before the opening of classes in June, 1960.

The Bureau likewise asked all the District Foresters to recommend two deserving employees from each district. From those recommended, ten will be granted scholarship. The screening of applicants for scholarship is expected to be quite thorough to maintain the high academic standard of the College of Forestry.

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And from Professor Tamolang who is now finishing his F.D. (Doctor of Forestry) at Yale, and who will soon be back with us, we received the following verse. Incidentally, Professor Tamolang will be the first Filipino to obtain his doctorate in Forestry.

## Remember Always FPRI\*

By FRANCISCO N. TAMOLANG

I

*Remember always FPRI  
The Institute we love so dear  
And pledge our honor, in our work, our  
level best  
Our faithful service, we manifest*

II

*O, dear FPRI, we hold high thine  
Ideals supreme, the torch to fame;  
And always pray for strength and peace  
and guidance clear  
With "esprit de Corps" so true, sincere*

III

*On Mt. Makiling, grandly thou standeth  
Where nature's bounty lavishly abounds  
With inspiration, thy long children, every  
one  
For dear Native land labor on.*

Refrain

*We seek always for the truth  
In research and all our work  
United we stand, always alert to the call  
For FPRI's success and goal.*

*We regret that the report of Mr. de las Alas has not been printed in full for lack of space. We also regret that this issue has been delayed. Things beyond our control made it impossible for us to meet the deadline. v.c.*

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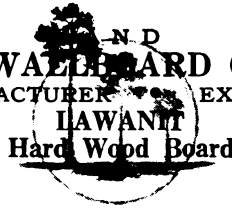
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In case of daily publication, average number of copies printed and circulated of each issue during the preceding month of NONE, 19—:

1. Sent to paid subscribers	NONE
2. Sent to others than paid subscribers	NONE
Total	NONE

In case of publication other than daily, total number of copies printed and circulated of the last issue dated March, 1959:

1. Sent to paid subscribers	520
2. Sent to others than paid subscribers	480
Total	1,000

(Sgd.) EDILBERTO Z. CAJUCOM  
Business Manager

SUBSCRIBED AND SWORN to before me this 2nd day of October, 1959, at Los Baños, Laguna, the affiant exhibiting his Residence Certificate No. A-4291956 issued at Los Baños, Laguna, on February 24, 1959.

GENARO V. CATALAN  
Mayor, Los Baños, Laguna

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