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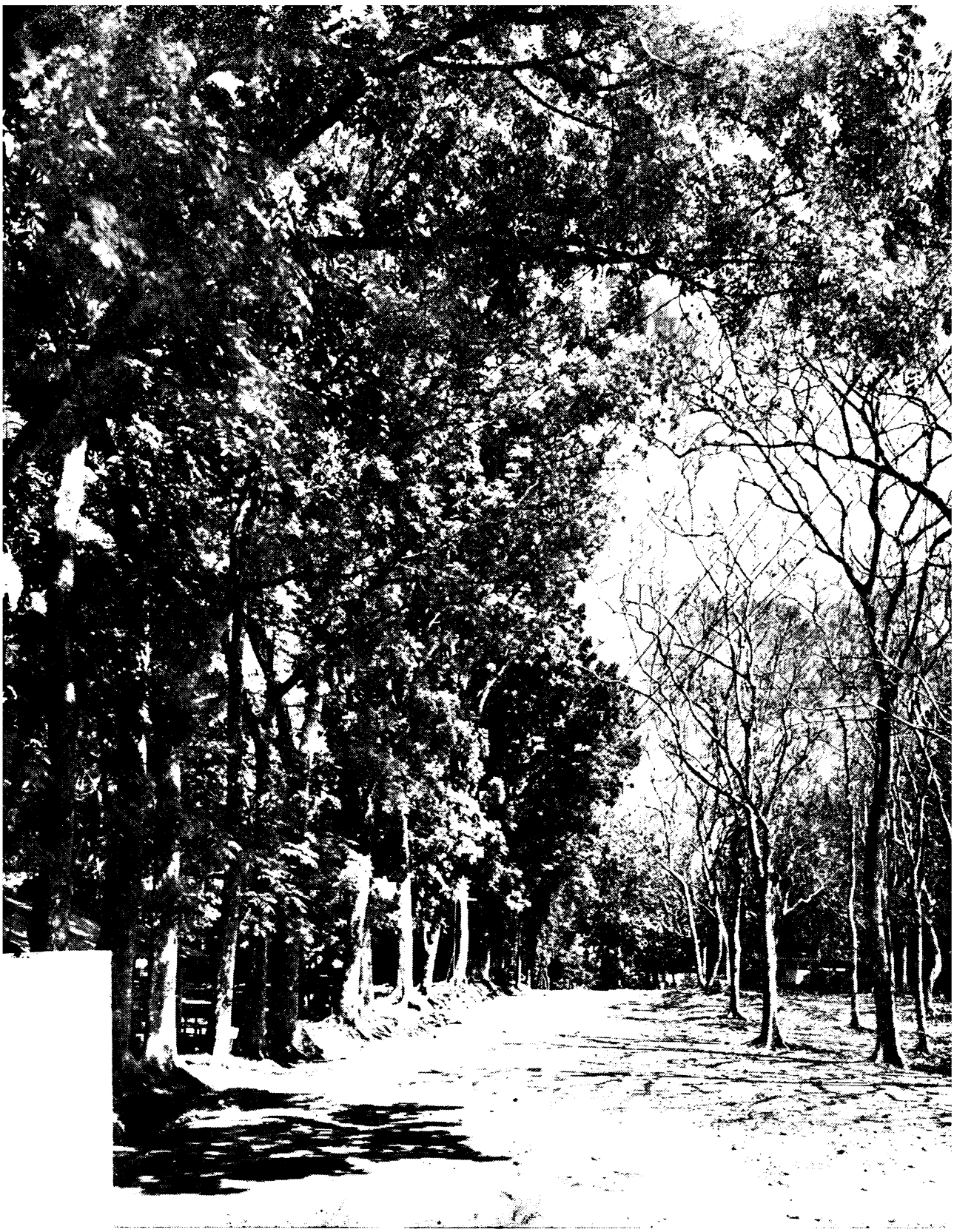

The Mahogany Grove on the Forestry Campus —
"WHEN THE MAHOGANY LEAVES BEGIN TO FALL.... IT'S GRADUATION TIME"

Forestry Education and Forest Conservation *

By PIO PEDROSA

Ten years ago, I had the privilege of attending the 40th anniversary celebration of this College. The greater is the honor you have conferred upon me now. A golden jubilee comes but once in a life-time. When today's anniversary also commemorates the diamond jubilee of the Bureau of Forestry, then the event is doubly singular. I am very grateful.

A celebration such as this is to do honor to the past, to remember the men who preceded you on this campus, the men who, during the past half-century, took up the task of wrestling with the problems of our forest service. It is to remember the glories they reaped as well as the disappointments and frustrations they bore.

This celebration is also to look into the future. It is to resolve that you who are here today, and those who will be coming after you, will be worthy of the heritage of selfless dedication to the public weal of the alumni who came before you. This College has one principal objective: to train guardians of the nation's forest patrimony. The constantly accelerating utilization of our forest resources by the timber industries flourishing today, and the thoughtless destruction of wooded areas for ephemeral farms notwithstanding, our forests still make of our country one of God's most bountifully endowed on earth. For the forest areas we still have today, we owe thanks to the zeal and devotion to duty that this school has imbued upon the men who came through it these past fifty years.

The theme of this celebration, forestry education and effective coordination of forest policies and conservation, could not, therefore, have been more aptly chosen.

The ultimate motivating objective of all governmental economic policies is to raise the standard of living of the people. Likewise, the core of all private economic efforts is to improve one's means of livelihood. The harmonious coordination of these national and individual spheres of activity propels the economic advancement of society.

Economic progress is measured by the growth of the national product. The unit yardstick of periodic gains, however, is the average per capita income. This average, as you all know, is the theoretical share of each inhabitant in the national income, which is the net increment to previous output contributed by the factors of current production in each sector of the nation's economic activity.

When the rate of increase of the national income outstrips the rate of increase of the population, we have a rising per capita income, an improving standard of living. Variations of human abilities and economic opportunities, however, distort the even and equal distribution of the national income. Wealth concentrates itself in the hands of a few. Poverty becomes the lot of the many. When the disparity of wealth distribution is so inequitable as to create utter misery in the underprivileged classes, the social organization tends to be characterized by lawlessness, by criminality, by unrest. High incidence of crimes against property and the general breakdown of moral integrity in the dis-

* Address given at the College of Forestry, University of the Philippines, November 30, 1960, Los Baños, Laguna, on the celebration of the school's fiftieth anniversary.

charge of power and public responsibility are fair indications that unwholesome conditions exist in the economy.

National production segregates itself into production for domestic consumption and production for export. Exports earn for us the foreign exchange income with which we are enabled to pay for the importation of the commodities we need but do not or can not produce. When the earnings from exports exceeds the expenditures for imports, we are said to have a favorable balance of trade.

Our total export trade of the last ten years has been increasing steadily. In 1949 our exports were valued at ₱496 millions; in 1953, ₱797 millions; in 1957, ₱862 millions; in 1959, ₱1 billion 59 millions.

The share in these total exports contributed by our log and lumber exports has outstripped the increases gained by exports of other products as well as the increases of the total annual exports. The percentages of increase of log and lumber exports to total exports has, therefore, been consistently rising. In 1949 log and lumber exports had a 1.3% share of the total exports for that year. In 1951, this rate rose to 4.3%; in 1953, to 7.4% in 1957, to 10.4%; and in 1959, to 15.2% of the total exports for that year.

We must add to the foreign exchange earnings from logs and lumber the proceeds of veneer and plywood exports. Until 1950 we were still importers of plywood. In 1949 we brought in 7 million square feet. In 1950 that importation was reduced to only 215 thousand square feet. After 1951 we have had no further imports of that product. We have been producing since then not only enough to fill our domestic needs, but we have also become the second largest supplier of plywood to the United States.

We could have improved upon the record of plywood production we have had if, instead of having sold our veneer logs to Japan, we had more plywood plants in the country. Our log exports have given Japan the premier position as plywood supplier to the United States. Of the total United States imports of 1.3 billion square feet of plywood in 1959, Japan supplied 811 million, the Philippines 214 million, and Canada 62 million.

The tragic situation, however, is that Japan has been beating us roundly in the American market with plywood made from our own logs. We have forfeited to Japan by default the greater profits that should have accrued to our log producers and veneer and plywood manufacturers. They went to the Japanese. We lost the larger number of gainful employment opportunities that should have been enjoyed by our workers. They went to the Japanese. We failed to collect the more substantial revenues that could have been derived from this industrial activity by our government. They went to the Japanese.

But that is so much spilled milk.

The brighter side of the picture shows that in 1959, of the total exports of ₱1 billion 56 millions, we sent out ₱161 millions worth of logs and lumber and ₱29 millions worth of plywood and veneer, a total of ₱190 millions of wood exports. Of all our export products, logs, lumber, plywood and veneer contribute today 18% of our foreign trade earnings. That rate is still on the increase.

With legitimate elation our governmental and monetary authorities point with pride to the favorable balance of the country's foreign trade during fiscal year 1959, the first favorable balance since liberation. When it is considered that that balance in our favor was only ₱40 millions, and remember that our logs, lumber, plywood and veneer exports of that year totalled ₱190 millions, we can legitimately say that but for the timber industry we would have been far from having such a favorable trade balance.

We are self-sufficient in our wood and lumber products domestic requirements.

The logging, saw-milling, and veneer and plywood manufacturing industries employ over 80,000 workers and give profitable returns to capital of over 20,000 investors. Therefore over half a million people derive support from these industries. These figures indicate the contribution that the timber industry is making to the general progress of the country and to the continuing improvement of the standard of living of our people.

Let us look, however, at another angle of our forest situation. Excluding brush lands, open lands and swamps, our commercial forests cover 9.3 million hectares. This is less than the area of Luzon, which measures 10.8 million hectares. In 1946 it was reported that the commercial forest area was 11.2 million hectares. There has therefore been a reduction in fifteen years of our standing commercial timber area by 1.9 million hectares. This means we have been clearing our commercial forests at the rate of 126,000 hectares per year. This must be a very conservative figure, considering the reported volume of timber being cut every year.

Our standing timber of 40 centimeters in diameter and over is said to amount to 963 million cubic meters, about 408.3 billion board feet. From 1956 to 1960, we cut for domestic consumption and for export 50.4 billion board feet, or 119 million cubic meters. Yearly, therefore, we have cut in the last five years 1 billion 9 million board feet, or 23.8 million cubic meters.

The spectacular gains we have been making in the timber industries would seem to indicate a most successful utilization of our forest resources. Quantitative logging, however, is no indication of success in forestry work. Anybody with money and bank credit and can buy logging equipment can cut timber. The vandal needs no education in forestry science.

The recorded cutting of timber shows we are denuding our commercial forest area at the rate, as stated, of 126 thousand hectares per year. And that is a conservative estimate. It is reported that we have been replanting forest trees at the very alarmingly meager rate of 6 thousand hectares per year. If since 1946, the areas from which commercial timber has been cut extend to around 1.9 million hectares, the implication is that we have denuded an area of our commercial forests almost equivalent to the provinces of Cagayan and Isabela.

It is true we also have 3 million 842 thousand hectares of non-commercial forests and grasslands. This area is equivalent to the areas of the islands of Mindoro, Negros and Samar. But the destruction going on through the kaingin is left to the imagination to estimate. No reliable figures are available on that devastation.

How long do we believe our still standing commercial timberlands of 9 million 329 thousand hectares and non-commercial forests of 3 million 842 thousand hectares can last, at the rate we have been cutting without replanting and burning through the kaingin? If we base our calculations on our own narrow criteria, we dismiss all talk of forest destruction as a lot of exaggeration. Why, a forest stand as large as the islands of Luzon, Mindoro, Negros and Samar could last forever. But if we project our calculations on the scale of history and future hopes for the well-being of generations to come after us, then at the rate we are denuding now our forests without reforestation their contribution and value to our country's welfare will be lost at a not too distant future.

Many of you attend Sunday masses at that old church in Los Baños. I am told the building is over 100 years old. Let us not talk of the really aged structures of the world. We do not have to go back to the time when the pyramids were built, or when stone upon stone the Inca temples to the sun were laboriously put up, or when the Angkor Vat was erected, or when our Igorot tribes finished hewing out their rice

terraces from the mountainsides of Ifugao. Let us just take the Los Baños church.

At the rate that our forests are being cut and burned, and at the rate we have been carrying on reforestation work, our country will have become a desolate barren grassland when your Forest Products Research Institute Building will be as old as that Los Baños church. When we add the areas ravaged by the kaingineros, the time will be shorter, much shorter still.

My friends, fortunately for us all, we have today at the helm of forest conservation work a Department Secretary who last year, while a Congressman, succeeded in pushing through a new Reforestation Law which has now fallen into his own hands to implement. We have a new Reforestation Administration Office. Its field of activity is the same as that contemplated by our old reforestation laws. But it offers new opportunities to your alumni for more effective public service. Let us hope that, through this new instrumentality, we have ushered in the period when our forests will finally be placed on a perpetual-yield basis. Let us hope we have finally put a stop to the denuding of our mountains, the destruction of our watersheds, the victimization of our national parks, the conversion into disposable agricultural areas of lands that should remain forever delimited to forest growth, and the despoliation of the exuberant fertility of our farm lands.

This year we had a fore taste of the merciless floods and the untold destruction in property, in productivity, and in lives they brought. All know that these calamities and worse will be visiting us yearly should the national apathy to deforestation continue in lethargic unconcern.

For no matter what laws we may have, they will not be worth the paper on which they are printed if their enforcement be but a mockery of their purpose. We have had a law imposing reforestation charges. Reforestation activity has been indifferent and reforestation funds have been diverted to purposes other than reforestation. We have laws defining and delimiting what areas must be conserved as forests. Political influence exerted on behalf of land grabbers has converted good forest lands into bad agricultural lands. We have laws against the cutting of timber outside of concession boundaries. Myopia has closed the sight of our authorities to the encroachments being made upon forest reservations, the squatting and destruction of the national parks, the smuggling of the timber loot taken out from them. We have laws against the kaingin. But public authorities have looked the other way and kaingineros have been allowed unrestrained destruction of the public forests.

Well-meaning foresters have complained that our people do not cooperate with them in the suppression of kaingin activities, that residents do not report the destruction of their communal forests. Our people, however, will not report kaingin activities when they see and know that the kaingineros are protected; when they see and know that persons destroying the public forests go about freely in their lawless activities not only unmolested by agents of the law but, on the contrary, aided by persons in authority or with influence in their nefarious depredations upon the national patrimony.

Perhaps we should not condemn the kainginero unduly. There is need to understand him and his plight. He is but one of the victims of the inequitable and unjust sharing of the national income under our economic system. He is not a habitual criminal. He burns and clears valuable forest land in a last-ditch struggle for his family to survive. He merely plants a patch of rice or corn in the clearing because of its initial fertility. Because of this circumstance, and because he is also a voter, he becomes the special object of solicitude of local political intrigue, which unwittingly encourages him to continue in his wanton career of forest destruction.

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Vital Role of the College of Forestry and the Bureau of Forestry in the Economic Life of the Nation *

My friends:

The double occasion we are commemorating today has special significance in that it marks the passage of a fruitful year in the existence of two allied and closely linked institutions playing a vital role in the economic life of the nation, and the entrance into another year of progress and greater achievements for both. Knowing this for a certainty, I gladly join the alumni, officials and personnel of the College of Forestry of the University of the Philippines and the Bureau of Forestry as they proudly celebrate the golden anniversary of one and the diamond jubilee of the other.

This event brings to my mind the moral imparted by the arid and barren lands in many countries resulting from the injudicious use, widespread destruction and indiscriminate waste of their forest resources. We should learn our lesson from the tragic experiences of Greece, Mexico, India, China, Arabia and Israel, among others, and act lest we find ourselves in similar straits.

Only recently, the entire country was horrified and appalled by the extraordinary flood that inundated Central Luzon and left in its wake several lives lost and untold destruction to crops, property and public works. Such was its extent that the combined resources and field services personnel of the Social Welfare Administration and the Philippine National Red Cross proved inadequate to cope with the emergency and provide relief goods promptly and in sufficient quantities to the numerous victims left hungry, cold and homeless by the calamity. Moved by their plight, Mrs. Leonila D. Garcia, on her own initiative, organized "Operations Puso" and issued a nation-wide appeal for donations and contributions for distribution later in the form of foodstuffs and other prime commodities among the people residing in remote and isolated areas not served by national relief agencies. The rest is now history. For her compassion and sincere efforts to assuage the sufferings and misery of the unfortunate victims of the flood, the memory of the First Lady and her mission of mercy will always linger in the hearts of the grateful people she helped unselfishly and at great personal risk in their hour of distress and great need.

This catastrophe brought to the fore the dire and serious consequences of the unbridled activities of an irresponsible and unscrupulous segment of our population. Knowing nothing better than the age-old practices employed by their forebears, our farmers have always resorted to the "kaiñgin" system as the quickest and least laborious way to clear the land and prepare it for planting. "What was good for our fathers is good enough for us," they tell trained government experts who want to teach them new and improved methods and techniques of agriculture. Little did they realize and much less did they care about the outcome of their ignorance, laziness and carelessness and their resultant evil effects. Aided and abetted by lax and inefficient authorities who conveniently looked the other way or closed their eyes to these malpractices, these law violators and despoilers of our forests are continuing their nefarious activities with vigor and impunity.

* Address by the Executive Secretary, Natalio Castillo at the Banquet tendered by the PLPA for the Alumni Delegates and guests on December 2, 1960 at the *Philippine Columbian Hall.*

Running a close second to the "kaiñgeros" in the mad scramble to denude our forests are the illegal or wildcat operations of unlicensed fly-by-night loggers. Spurred on by an insatiable greed for gold, they have felled young and mature trees indiscriminately and with wild abandon, in complete disregard of the law requiring the planting of a sapling or young tree for every one they cut down. Not content with working their own concessions, more often than not, acquired through questionable or dubious means, they have extended their operations to neighboring non-commercial forests and even to holdings of other legitimate concessionaires. Their activities were unearthed recently by alert agents of the presidential committee on administration performance efficiency, otherwise known as the PCAPE, acting on a request from a ranking provincial official for an investigation into the rampant illegal cutting of timber in the forests of Bataan.

The Philippines has been most singularly blessed by Divine Providence with rich and abundant forest, mineral and marine resources which, if exploited and fully developed, would assure the economic security and prosperity of our country and people for years and years to come. It is the desire of President Garcia and his administration to tap this vast natural wealth and utilize it wisely to advance and promote the best interests of 27 million Filipinos and the generations that will come after them. With keen foresight, the Chief Executive is well aware that these resources, no matter how rich and seemingly inexhaustible, will someday peter out and disappear if squandered and dissipated. Consequently, he has taken measures to conserve and protect these resources until such time as they can be exploited and developed to the advantage and benefit of all. In consonance with this policy and alarmed at the prodigious depreciation of our fast-dwindling forest reserves, the President recently signed into law Republic Act No. 2706 creating the National Reforestation Administration and charging it with the tasks of replenishing our dwindling forests and enforcing laws and regulations on reforestation.

The unusual flood in Central Luzon and the drought experienced every summer, the latter, no doubt, caused by the destruction of valuable watersheds in the mountains as a result of "kaingins" and dissipation of our timberlands, have made people take notice and realize the value and importance of our forests. The logging industry, ranks third in the Philippine export trade, next to copra and sugar. During the fiscal year 1956-1957, for example, the volume of logs exported had an aggregate value of ₱94 million. Three years later, in the fiscal year 1959-1960, this amount went up to ₱165 million, or an increase of 75%. The lumber industry is also the principal source of livelihood for approximately 80,000 persons and supports many lesser industries like saw mills, plywood and wallboard factories, wood and paper pulp mills, creosoting plants and match factories, which provide gainful employment to additional thousands. All told, an estimated one million people, including dependents, rely upon it for their living.

In the light of the above facts, it is obvious that our forests are a major factor in determining the economic future of the country. As custodians of our public forests, it is your bounden duty to see that they are not abused so that posterity may partake of the blessings and benefits we are now enjoying from them. You have performed a difficult job well and I congratulate you for your splendid record of achievements. But much more remains to be done. As you celebrate the fiftieth year of the establishment of the University of the Philippines College of Forestry and the sixtieth anniversary of the creation of the Bureau of Forestry, I call upon you, foresters and rangers, to exert more efforts, scale greater heights, to the end that our forest wealth will not vanish but will remain with us forever and ever. I am confident that this challenge will not find you wanting.

I thank you.

Trends in Forestry Education

By HARDY L. SHIRLEY
Dean State University College of Forestry
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I wish to extend to the Faculty of Forestry of the University of the Philippines my hearty congratulations on 50 years of education in forestry. I bring you the greetings of my own College of Forestry at Syracuse, New York, which next April will celebrate its 50th Anniversary.

Your college traces its beginning back to the year 1910, yet even before then the idea of a College of Forestry at Los Baños was planted in the minds of the Philippine people by Major Ahern and that greatest of all leaders in forest conservation, Gifford Pinchot. To him, the people of the Philippines and of the United States owe much; in fact, the whole world owes much. Pinchot saw in conservation of natural resources a new ethic for mankind. To Pinchot forest conservation was much more than care of land and trees. It was a religion of husbandry of nature's gifts for today and for all time to come. It was a goal to divert men's minds and hearts from avarice and waste to wise and careful use so that men of all lands might enjoy forever the blessings of abundance.

My contacts with the University of the Philippines, College of Forestry goes back to student days when I went to classes with Eugenio de la Cruz, Valentin Sajor, and Vicente Caguioa at the Yale School of Forestry. At Yale also I often sat and marvelled at the magnificent round tables made from a single piece of beautiful Philippine wood. When I came to Syracuse I found there also that our most prized piece of furniture was a table of heroic size made of Philippine mahogany. Both were gifts of Philippine foresters who had studied in America. They are a constant reminder to generations of American students of the strong ties they have with the Philippine people.

With the beginning of the Cornell University-ICA forestry contract, I was drawn into the program by Professor Cedric Guise. Professors Farnsworth, Pentoney, Stone, and later de Zeeuw and Larson came over here. Now Prof. Sammi & Carlson are here and I myself have come to serve briefly as a member of Dean Zamuco's faculty.

At Los Baños, your foresters had, before the Second World War, built up a school noted throughout tropical Asiatic countries. It was a school to attract loyalty and devotion. The tides of war swept it away completely. With peace began the ardous task of constructing anew the College of Forestry. Laboratories, classrooms and library had been destroyed. The task of rebuilding this College, when so many other pressing needs confronted the Philippine people, was necessarily slow. With the coming of ICA assistance, a new day dawned for the College. To me it has been nothing short of phenomenal to note the rapid progress made in building up faculty, completely revamping curriculums, erecting new buildings, and attracting to the school able students capable of holding their own in graduate schools across the land in the U.S.A. Great credit is due to ICA, Cornell University, and the men sent over to assist. But these could have accomplished little without the generous backing of the University of the Philippines, the National Economic Council, the Bureau

of Forestry and the hard-working and devoted faculty at Los Baños. Behind it all has been the wonderful respect and devotion of the Philippine people for education. Aristotle has said, "It is the nature of man to desire to know." No people exemplify this better than those of the Philippines. This augurs well for the future of Philippine forestry and for the future prosperity of the nation as a whole.

Forestry since 1945 has taken a new surge forward. In the United States this period has been marked by the rapid development of industrial forestry. Today some of the best forest practices to be found in my country, practices to match the best found anywhere, are on industrial land holdings. This has been paralleled by advances in forest products technology. Particle board, laminated beams and arches, and semi-chemical pulping processes—these were largely in the laboratory and pilot plant stage before 1945. So also was the power chain saw, truck and tractor equipment for handling large logs, and versatile rubber-mounted road building equipment.

What has occurred in the U.S.A. has been paralleled by similar developments in Northern Europe and the U.S.S.R. Progress has been even more notable in countries formerly having poorly-developed forestry programs. The Mediterranean Development Project is improving agriculture, grazing land and forests through better control of water in an integrated land improvement undertaking. Afforestation, torrent and avalanche control, poplar breeding and chestnut disease control are facets of the overall program.

The new nations of Africa are looking to forests as a source of wealth to improve local living and ultimately to provide products for export. Extensive planting is being done in Latin America for pulpwood and timber production. A tunnel through the Andes will enable Peru to tap its rich tropical timbers.

Nowhere is progress more promising than in the Far East — India, Pakistan, Taiwan, Ceylon, Burma, Formosa, Indonesia, Japan and the Philippines. Tree planting, timber surveys, tree breeding, control of shifting cultivation — all are a part of the program. New research institutes have been or are being established in Burma, Thailand, Pakistan, Korea and the Philippines. Everywhere there is emphasis on forest products as well as silviculture. This is healthy because it provides the common man as well as the industrialist with an incentive for good forest practice.

The College of Forestry at Los Baños is an integral part of this world-wide forestry movement. In my opinion it has a broader role to play in education than simply to prepare men for the Philippine Bureau of Forestry, important as this is. While the day may still seem distant, the hunger of Philippine youth for an education and the quality that is being built into the forestry school will ineluctably draw this college eventually into postgraduate programs and into educating people from abroad.

When I came to Syracuse in 1945, I told our faculty that a great future lay ahead of it in world forestry. Few took me seriously — though the Chancellor of Syracuse University was one who did. But today we draw our faculty from many foreign lands — Canada, England, Sweden, Holland, Denmark, Finland, Poland, Hungary, Russia, Japan, Germany, Israel China and India. We have graduate students from most countries outside the Soviet sphere and a few from inside. Some of these students return to the United States to become members of our own faculty or a faculty wife, as in the case of a very charming and gracious girl from Finland, now Mrs. Charles Larson.

I can forsee an opportunity for the College of Forestry in the Philippines to play in the future a somewhat similar role, especially with the newer nations. These can learn perhaps more easily from a coun-

try such as yours that is still developing and perfecting its forestry institutions than from the U.S.A. which has great industrial and managerial resources on which to draw.

These new developments in forestry in Latin America, Asia, Africa, and in the Pacific Islands as well as the rapid development occurring in North America, Europe, and the Soviet Union are placing new responsibilities on colleges of forestry. On the one hand, there is a rapidly-developing new technology to be appraised, mastered, and taught, on the other, there is even greater need than ever before to bring the message of forest conservation to the people in an understandable and forceful manner. Beyond technical competence, for which no substitute exists, the forestry colleges must do two tasks superbly — they must develop in their students a missionary zeal for teaching the basic facts of forestry to woods workers, farmers, workers in forest products industries, school teachers, public officials, and above all representatives of the public in government. They must also develop in their students a high sense of public responsibility and unassailable ethical standards.

Forestry has a significant role to play in providing such elemental human needs as water, food, and shelter. This fact needs to be repeatedly emphasized so that every man, woman, and child in the Philippines will understand it. One of the best expressions of the need for conservation was made by the ancient Chinese philosopher, Meng, who lived from the year 372 to 289 B.C. Meng wrote: "If the seasons of husbandry be not interferred with, the grain will be more than can be eaten. If close nets are not allowed to enter the pools and ponds, the fish and turtles will be more than can be consumed. And if the axes and bills enter the hills and the forest only at the proper time the wood will be more than can be used. When the grain and fish and turtles are more than can be eaten and there is more wood than can be used this enables the people to nourish the living and bury their dead without any feeling against any. And this condition in which the people nourish their living and bury their dead without any feeling against any is the first step in royal government."

The first step in forestry, therefore, is to impose order and gain control over forest protection and forest cutting and to teach the need for such care and control with the conviction and the fervor of a crusader. Your school is fortunate to bear the stamp of that great crusader, Gifford Pinchot. Today we need to display that same depth of conviction and fervor to save the forest.

I know of no more poignant writing than the introductory chapter to Alan Paton's book, "Cry the Beloved Country". "There is a lovely road that runs from Ixapo into the hills. These hills are grass-covered and rolling, and they are lovely beyond any singing of it. The road climbs seven miles into them, to Carisbrooke; and from there, if there is no mist, you look down on one of the finest valleys of Africa. About you there is grass and bracken and you may hear the forlorn crying of the titihoya, one of the birds of the veld. Below you is the valley of the Umzimkulu, on its journey from the Drakensberg to the sea; and beyond and behind the river, great hill after great hill; and beyond and behind them, the mountains of Ingeli and East Griqualand.

"The grass is rich and matted, you cannot see the soil. It holds the rain and the mist, and they seep into the ground, feeding the streams in every kloof. It is well-tended, and not too many cattle feed upon it; not too many fires burn it, laying bare the soil. Stand unshed upon it, for the ground is holy, being even as it came from the Creator. Keep it, guard it, care for it, for it keeps men. guards men, cares for men. Destroy it and man is destroyed.

"Where you stand the grass is rich and matted, you cannot see the soil. But the rich green hills break down. They fall to the valley below, and falling, change their nature. For they grow red and bare; they

cannot hold the rain and mist, and the streams are dry in the kloofs. Too many cattle feed upon the grass, and too many fires have burned it. Stand shed upon it, for it is coarse and sharp, and the stones cut under the feet. It is not kept, or guarded, or cared for; it no longer keeps men, guards men, cares for men. The titihoya does not cry here any more.

"The great red hills stand desolate, and the earth has torn away like flesh. The lightning flashes over them, the clouds pour down upon them, the dead stream come to life, full of the red blood of the earth. Down in the valleys women scratch the soil that is left, and the maize hardly reaches the height of a man. They are valleys of old men and old women, of mothers and children. The men are away, the young men and the girls are away. The soil cannot keep them any more."

Firm dedication to defending the forest is a necessary attribute of all foresters. Such dedication must, however, be tempered by a deep ethical sense so that the motives of foresters remain above challenge. Forestry schools must, through teaching and example, inculcate high ethical standards in their students. It must be clear to the public generally that foresters are motivated to serve the long-term public good and thereby foresters can have the support of the public against the few whose acts would abuse or destroy it.

Hugh Bennett, that world renowned evangelist for soil conservation, declared, "It takes a thousand years to build an inch of top soil but only one bad storm to carry it from an unprotected slope." Top soil is much more than finely divided mineral and organic particles surrounded by water bearing inorganic plant foods. It teems with countless living animals — earthworms, mites, millipedes, crustacea and other forms that break down leaf litter and other organic debris, carry it into the soil and make channels for water and root penetration. Destroy the forest and you destroy the life that cultivates and enriches the soil.

This past week I have had an opportunity to see Philippine land practices and forestry on Luzon, Basilan, Western, Eastern and Northern Mindanao, Cebu and Negros. Some of what I saw would gladden the heart of any lover of the soil — the deep soiled fertile hills of Basilan supporting trees of magnificent size and splendor—virgin Philippine mahoganies near Bislig Bay — logs of as high quality and value as man ever cut. I saw modern logging and sawmilling operations. But I also saw waste — waste of wood in the forest because logs were not of export grade, waste in sawmilling and veneer cutting operations because intermediate quality material commanded a poor market, waste due to poor technical control over operations. But the greatest waste of all was the waste of forests, soils, and human beings through "kaiñgin" operations. This is nothing less than a social, economic and political disease that requires cooperation of agriculturists, social scientists, and government to effect a cure. It must be dealt with promptly and courageously if the land is to be saved, if public morals are to be saved, if the nation is to avoid perpetuating a destructive, ignorant, nomadic, populace that can only continue their present wall of life at the expense of the nation as a whole.

National Resource Outlook

Neither crusading zeal nor high ethical standards of foresters will in themselves put across and sustain a permanent program of forestry in a nation. It must be backed by sound economic and technical knowledge of basic facts. It is far easier to convince the public of the necesity of forestry if we know how much forest land we have, what its potential productivity is, what our markets are, and have a clear idea of the industries that the forest land could support and what it would mean in the national economy. There is, therefore, need for strong programs in forest economics and forest resource analysis. These must be based on basic surveys of the forest potential itself, on detailed information on the existing forest products in-

dustries, and on a general knowledge of world markets and the world economy into which these forest products can flow. Forestry colleges must, therefore, be prepared to educate men in forest survey techniques, including modern statistical analysis and photogrammetry as applied to forest resource appraisal.

I am happy to learn that the Bureau of Forestry in cooperation with NEC/ICA is planning to conduct a survey of the forest resources of the Philippines using modern forest survey techniques. It was to help prepare young men to serve on this survey that we sent to the Philippines this fall Professor John Sammi from Syracuse.

Improved Worker Output

A forestry program, however desirable on the national level, is almost certain to fail unless it can bring to the people who live in forest communities, and particularly to the workers who harvest and process the timber, a good livelihood and a good way of living. A necessity, if high wages are to be paid, is high output per worker. This means the adoption of labor-saving devices but, above all, the development of proper organization and layout of work, training of workers, and adoption of appropriate incentives so that people work with efficiency and with a will. It was a pleasure to me to learn from a man long familiar with efficient West Coast lumber operations in the USA, that in his opinion Philippine workers, given comparable equipment, could match the output of US workers.

The Philippine lumber industry is to be congratulated on adopting the best modern equipment for road building, logging, lumber manufacture and veneer, plywood & hardboard manufacture. The plants I visited were modern, well laid out, and well equipped. Many were designed to utilize waste. Some of the better managed plants were producing lumber, veneer, plywood and hardboard that can compete with the best export products of any land. Such products are a must if finished Philippine wood products are to command the premium their beauty deserves in the world market.

Unfortunately the quality and efficiency of mill operations in almost every case is handicapped if not in fact jeopardized by complete lack of permanent well managed forests that can furnish a continuous supply of good logs to support the mill. Short term concesions, opening good forest land to settlement to make poor crop lands and "kaiñgin" operations are destroying the residual forests, the forest improvements, and the plans for sound long term operations. It was significant that I was able in my visit to see complete woods operations at only place. Elsewhere logging operations were almost a half days travel from the mill. Such lack of coordination between timber growing and milling cannot long keep Philippine forest products in the export field.

A second major handicap to Philippine forest industries is the lack of a well-developed local or nearby market for lumber, plywood and other products of serviceable quality yet not of the premium grade demanded by the export market. In fact even the marketing of export logs, lumber and plywood could be better organized so that top prices are obtained for all that is produced. The Philippine Lumbermen's Association itself might well give thought to how this can best be accomplished.

Developing a Strong Forest Products Industry

A forestry program, even if successfully administered on public lands, will net the people little unless the timber is harvested and the wood is processed into articles useful to local people and remunerative in export trade. It is here that many new countries tend to overemphasize export trade and to underemphasize the need for building better housing on farms, villages and in forests and for using wood in other ways to improve and build up the local economy. Ultimately, 90 to 95 percent of the timber harvested in

the Philippines should probably be used locally or at least converted into final products locally and the products themselves exported if a surplus exists beyond local needs. Rarely can a country hope to build up prosperity through the exportation of raw products. I would like to emphasize that the economic climate must be appropriate to develop prosperous wood-processing industries, for unless they are prosperous they are unable to provide steady work for their employees at good wages and are unable to maintain a good market for logs, pulpwood, and other forest products. The College of Forestry in the Philippines, along with the National Economic Council, the Bureau of Forestry, and the Forest Products Research Institute, have as one of their tasks determining the basic esential for a successful forest products industry. They also share the task of calling these to the attention of government oficials, public representatives ,and others so that appropriate steps can be taken to insure sound industry development.

Forest Improvement

Many of the measures I have mentioned thus far as appropriate trends for forestry education in the Philippines can be met largely within the framework of presently known and tested forest technology. What I shall speak of from here on, requires new knowledge to be gained through research. There is need both to develop soil surveys as a basis for estimating potential forest productivity on lands to be reforested, and the need for determining measures for improving soil. Even more important, is it desirable to improve the forest stand itself. This can be done, first, through improved cutting practices that will insure reproduction of desired species. The next step can be to select the best formed trees for the final timber crop. These are then left standing on the land where they can serve as progenitors of future stands. As our knowledge increases, we can select elite trees for seed production and ultimately use material from such trees for tree breeding to develop new, healtheir, more rapidly-growing trees with better wood quality than those we now have available. The potential of applying modern genetic science to forest tree improvement is still in its begining stages. A forestry school, however, if it is to keep pace with modern developments in the profession, must have at least one man conversant with forest genetics on its faculty. I need not dwell longer on the various means of improving the productivity of the land. These include all the techniques of silviculture, the application of knowledge of tree physiology, ecology, soils and meteorlogy, and certainly of fire, insect, and disease control if maximum use of modern forest science is to be brought to bear on improving the output from forest lands.

The discerning faculty member will, by this time, have come to the conclusion that all these new trends I have mentioned, if worked into the existing forestry college curriculum, would grossly overoad it. I agree with him.

The key to resolving this difficulty, is to concentrate instruction during the four-year college period upon fundamental sciences and basic forest principles and to defer instruction in current practices. The latter can often be given on the job more effectively than in classroom or laboratory.

How, then, you may ask are we to develop knowledge in the special fields that are needed for advancement of forestry. My only answer here is to defer such specialization to the graduate level. We are rapidly developing in the United States general practitioners and specialists in forestry just as we have general practitioners and specialists in medicine. The specialists can be developed through one — to three-years of post-graduate study. They can then serve as advisors to the practitioner in developing new standards for work in specialized fields.

Summary

No nation can develop to its full potential without a free citizenry. To accumulate the basic resources to make him free, man

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Establishing and Implementing Forestry Economic Policies*

By: GAUDENCIO E. ANTONINO
President
Chamber of Commerce of the Philippines

Mr. Chairman, Ladies and Gentlemen, My Friends:

Forests have been very kind to all of us. Out of their bounties we are sheltered and even fed and clad. They give life to streams and rivers. They water and make lush the vegetation in the plains. When abused, however, the loss of forests is paid for not only in the wanton destruction of property, but in some cases, also in the loss of life and limb itself. It is for this reason that I sincerely welcome this rare opportunity to join you in the celebration of the Diamond Anniversary of the Bureau of Forestry and the Golden Jubilee of the U.P. College of Forestry. To both the Bureau of Forestry and the U.P. College of Forestry, I extend my warmest congratulations.

For this afternoon's forum, I have been asked to speak on the subject: "Establishing and Implementing Forestry Economic Policies".

Forestry economic policies, its establishment and implementation, like all other economic policies, should have for its primary objective the greatest good for the greatest number. Regardless therefore, of the much abused so-called "Land for the landless program", the basis for our forestry economic policies, should be the maintenance, protection and conservation of sufficient forest areas that can provide a balanced forest cover for our total land area of 29.7 million hectares. With our remaining total commercial timber area of 9.33 million hectares or only 31.4 per cent of our total land area, and a forest per capita of only 0.33 hectares compared to 1.8 of United States and 0.97 of Japan, not to mention the higher forest per capita of Finland, Norway and even our neighboring countries like Indonesia, Thailand and Burma, we can no longer afford any significant reduction in our present commercial timber lands.

Director of Forestry Tiburcio Serevo, in his appeal to the public for cooperation in the conservation of our forests, said, and I quote: "In our country, destruction of public forests goes on unabated...The alarmingly rapid drain on our forests is being brought about not so much by exploitation thru the license system, but rather, by the illegal activities of many of our people, like the Kaingineros and the squatters. "End of quote. Director Serevo, as the highest official custodian of our public forests, deserves public commendation for this bold and frank admission of the helplessness of our government agencies in the adequate and effective protection of our forests under existing conditions and present policies. Any forestry economic policy, therefore, to be effective and practical, should be directed toward the adoption of fool-proof remedies that can insure a successful war against the

* Speech before the Seminar on the Diamond Anniversary of the Bureau of Forestry at the Department of Agriculture and Natural Resources Bldg., Queon City, on December 1, 1960.

illegal activities of kaingineros and squatters within our forest areas. To do this, we should analyze the causes of our failures and the reason or reasons for the victory of squatters and kaingineros in our fight for the protection and conservation of our forest lands. In the first place, why do squatters and kaingineros settle in forest lands, instead of settling or squatting in alienable and disposable areas? There are several reasons, and among them are:

1. Forest areas squatted by kaingineros are usually reclassified in the past and actual occupants who were the squatters and kaingineros themselves were given priority in the ultimate disposition of such lands. This is a tempting encouragement for landseekers to become squatters and kaingineros within forest areas in the hope that as in the past such lands squatted by them will ultimately be released for agricultural purposes. Some of them who were not able to get a piece of land from the forest areas previously released because they were not squatters, are even led to believe that illegal squatting is actually a prerequisite to the lawful ownership of a forest land being released for agricultural purposes.
2. Forest lands, especially those covered by licenses, become more accessible thru existing or proposed logging roads than most of the alienable and disposable lands, and
3. The exploitation and operation of a forest area by any licensee ultimately results in the development of a community within the area some of whose inhabitants are ultimately attracted to squat or make illegal kaingin within the nearby forest areas.

The next question that may be asked is:

What makes it difficult for our forest officers to eject squatters and kaingeneros from forest lands? The following are some of the reasons:

1. Squatters are usually protected by powerful politicians and other high government officials.
2. Lack of sufficient facilities of the Bureau of Forestry to get after all forest violators.
3. Laxity on the part of our prosecuting officials and even on some of our courts of justice in the handling of cases against squatters and kaingeneros.
4. Kaingineros convicted of illegal cutting of timber are usually allowed or tolerated to return to their houses within the cleared forest area, and
5. Thru pressures from certain influential politicians, the President of the Philippines, is usually prevailed upon to reclassify the squatted areas into alienable and disposable areas, thereby practically recognizing the right of ownership of squatters over public forests which they have destroyed in violation of our laws. This fifth and last reason is the principal incentive that has made squatting in public forests a profitable racket among many of our people.

Now, what can we do to totally discourage squatters and illegal kaingin making inside forest lands? As far back as 4 years ago, in a published article in the *Evening News,* I recommended the immediate establishment of permanent forest lines with the cooperation of forest licensees, and the enactment of legislation declaring such forest lands as permanent forests any part of which cannot be released for agricultural purposes except by an Act of Congress, and only after a public hearing is made for the purpose. This will minimize the indiscriminate release of forest lands for political expediency and will no longer make public forests an attractive place for squatters and kaingeneros.

Without the adoption of this fundamental change in the status of our public forests, the establishment of even good fores-

try economic policies would only be a cause of frustration among our forestry-loving people. Take the case of the Forest Management Plant for the City of Basilan which was the pilot project of then Director Florencio Tamesis. This was intended to be a pilot project and was a successful experiment on forest management and selective logging until squatters and kaingineros finally succeeded in destroying even the experimental plots of the Bureau of Forestry. Logged over areas, where only carefully marked trees were cut and removed, with excellent residual stand, were finally squatted, burned and cleared. And the once forested logged over areas, which were expected to yield a second harvest after some 25 to 40 years are now being gradually dotted by squatters' houses. And the Basilan City pilot project on forest management and selective logging which was once the pride of the Bureau of Forestry is now seriously threatened by the reported plan to release some of the squatted areas.

War against squatters and kaingineros is everywhere, and it is feared that the surrender of the Bureau of Forestry to them especially in such a critical area as Basilan may considerably weaken the Bureau of Forestry in its determined and continuing fight for the protection and conservation of public forests everywhere.

In the hope, however, that legislation may finally come to the rescue of our public forests, and thereby place them beyond the reach of squatters and kaingineros. I would like to suggest a Filipino First oriented forestry economic policy along the following lines:

1. In the licensing of new forest areas, absolute priority should be given to natural born Filipinos and/or corporations 100 per cent owned by natural born Filipinos. This might sound controversial because of the parity rights of Americans provided for in our Constitution and the 60 per cent Filipino ownership in corporations that may be allowed to exploit our natural resources. It is a fact, however, that in view of our very limited remaining commercial timber areas, even qualified naturai born Filipinos and 100 per cent natural born Filipino-owned corporations are being denied and therefore discriminated in the award of new forest areas. If this is so, there is no reason why all aliens and naturalized Filipinos should not first be denied the grant of forest areas before such denial is extended to qualified natural born Filipinos. Besides, I would like to believe that the parity rights given to Americans in the Philippines to exploit our natural resources, is primarily intended to allow the Americans to help us exploit the natural resources of our country that are not within our own capacity to develop ourselves. Knowing the generosity and concern of the American people to help small nations like the Philippines in their effort at self-sufficiency, it would be unkind for us to presume that the American people would insist to compete in the further exploitation of our forest resources to the extent of depriving qualified Filipinos of their prior right over their own forest resources.
2. All logging operations, whether in old or new forest areas, should be operated on a strictly selective logging basis, where only matured trees above certain minimum diameter limits are cut and removed. This will insure a natural regeneration of our timber areas and in some fairly big-sized concessions would result in operations under a sustained yield management. It has been noticed in some logged over areas operated under a selective logging system, that adequately protected, such areas regenerated themselves without the use of reforestation methods. In fact, in some cases,

thinning, instead of reforestation have been observed to be necessary.

3. Adequate forest areas should be given under renewable lease terms of 25 years to proven and reliable concessioners. This will encourage forest concessioners to set aside part of their profits for the maximum protection of their forest areas from any and all forms of forest destruction, like kaingin making, fire, etc.
4. The Bureau of Forestry should establish adequate experimental and research centers for the purpose of conducting experiments and researches on all phases of forestry that can help enhance and promote scientific forest management methods, and
5. Forest concessioners should aim to make maximum utilization of all timber cut in their forest areas. Toward this end, all efforts should be exerted in the ultimate integration of the lumber industry, whereby present wastes may be fully utilized to the manufacture of secondary products like wall boards and paper pulp.

The foregoing are some of the "musts" in the adoption of forestry economic policies. As we have noticed in many government policies, however, there is a long, long way between the adoption of a policy and the actual and truthful implementation of such a policy. In between are men called upon to implement the policy. It is therefore not enough that we should have good policies. Even more important is that we should have good men to implement such good policies. For it is just as bad to have a bad policy implemented by a good official as it is to have a good policy implemented by a bad one.

Of course the public is all aware of the unquestionable reputation of our forestry officials. With their extreme dedication and devotion to public service, there is no doubt that forestry in general and forest industry in particular, will continue to have an increasing role in the continuing development of the Philippines.

TRENDS IN FORESTRY . . .

(Continued from page 12)

must have certain basic freedom of choice in how he shall expand his energies. Still freedom must be exercised within the overall bounds of community and national well-being, else it must be restricted by government itself. In the Forestry College there must be freedom to pursue new scientific developments in fields where the investigator himself is convinced he can make the greatest contribution. New technologies can thus be developed rapidly to carry our forest practice to new heights of utility.

The forester of the future must be a broadly-educated man. He must understand the basic importance of forestry in his national economy and be able to explain it convincingly to others. He must be a man who can lead as well as follow. He must have a strong scientific background and be trained in the basic principles of modern forestry. He must have a devotion to learning and to professional improvement that makes him a student throughout life. He must have a feeling for land and for people and for that adjustment between land and people that the leads to maximum prosperity. Finally, he must have in his own character an urge and desire to improve his profession, to contribute to its knowledge and techniques, and to lead his people and the people of other lands to improved well-being through care and wise use of resources.

Our National Parks, Our Wildlife And The Farmer

By VICENTE DE LA CRUZ
Director, Parks and Wildlife

Natural resources are the nation's greatest wealth and the heritage of all the people of all times. An endowment, a priceless gift from nature that man might live. The progress and the failure of a nation is measured by how her people conserve their natural resources.

Man, in his desire for material comfort and a high place in human society, has designed ways and means whereby these natural resources will be made use of to his benefit. However, in his anxiety to achieve these material desires, he has made himself a victim of a human weakness, bound by his mundane desires, the glorification of the SELF. He has turned into a personal possession, for personal and selfish gains, with no heed for the future, the common wealth, which is inherently for all.

All these things bring to the fore the necessity of conserving our natural resources and the importance of adopting effective conservation policies.

Water, soil, minerals, forests, grasslands, and our wildlife are some of the natural resources which are in need of proper conservation. The conservation of one and the neglect of the other is faulty and does not fall under an ideal conservation program.

Among some of our most precious natural treasures of today are our National Parks. One may know the names and places of our National Parks but may not know how they come to exist and the meaning of their existence in relation to our cultural and economic way of life.

The primordial objective of setting aside a portion of the public domain as a National Park is to reserve and withdraw from settlement, occupancy or disposal under the laws of the Philippines ~~Islands~~, any portion of the property of the State, because of their panoramic, historical, scientific, aesthetic, healthful, cultural, recreational and economic values, for the benefit and enjoyment of the people of the country. Once a portion of the public domain is proclaimed as a National Park, it becomes also a Game Refuge and Bird Sanctuary, the ideal home of our Game and other Wildlife.

As of today, there are thirty-nine (39) National Parks in our country with an aggregate area of 227,329.16 hectares. Each of these National Parks possesses special features and objects of unusual interest, like natural and medicinal hot springs, peculiar rock formations, famous craters, waterfalls, gorges, numerous springs, bottomless ravines, temperate climate, natural swimming pools, wonderful canyons, beautiful streams, panoramic and aesthetic virgin forest, and many others. Our National Parks are being kept intact by the Government so that the people can have easy access and can share in the use and enjoyment of the noblest spots in our land. The establishment of National Parks is an expression of the great principle of conservation.

Our Parks, most of which are covered with virgin forests, are sources of important rivers and springs which supply our water needs for industrial, agricultural and domestic uses. National Parks, like the Mt. Apo National Park, Bicol National Park, Bataan Naitonal Park, Arayat National Park, Makiling National Park and Mt. Data National Park, etc. maintain and regulate the water supply in regions where they are located and

furnish fertility to the agricultural lands adjoining them. The Mt. Data National Park, located at the heart of Mt. Province, is the source of the Agno River which supplies water power to operate the multi-million Peso Hydro-electric Project of the Government such as the Ambuklao and the Binga Hydroelectric Projects. The Agno River was harnessed to produce low cost electricity to supply the power needs of our industry. The same river supplies water to our irrigation projects in Central Luzon to irrigate our thirsty land in order to produce more food for our people.

The benefits that we derive from our National Parks are unlimited. They serve as permanent institutions and scientific laboratories of scientist, and to lovers of nature. They provide shelter and playground to those who are fond of outdoor life and those who are tired of noise and dust of the city. Business and home industries in the rural areas will be stimulated because, throughout the year, people from near and far will flock to these parks for relaxation and physical invigoration. They go to these parks and they spend freely within the vicinity and yet they will not take home anything to make the people living in these places poorer. In other countries, like Japan, Canada and the United States their National Parks are big sources of government revenue.

Aside from the recreational and economic value that we derive from them, most of the important historical events that gave our glorious name in history took place in some of these National Parks. To mention a few we have the Biak-na-bato National Park, Bataan National Park, Bessang Pass National Park, Makiling National Park, etc., where our heroes wrote their name in blood fighting against the forces of aggression who attempted to deprive us the ıreedom and happiness that we have long enjoyed.

Our National Parks should remain unimpaired. We should guard and protect them from those who undermine the efforts and good intentions of our people. People who do not respect the usefulness and nobleness of our National Parks are saboteurs of our social, cultural and economic progress.

It is, therefore, the civic duty of every citizen to protect and preserve these priceless gifts of nature because they are rare and they are symbols of our love of nature, love of country and love for liberty and the pursuit of happiness.

Like our National Parks, the wildlife resources have very important role in the agricultural, economic and social progress of the country. The wildlife resources of the country today, however, is in such a sorry state, needless to say, there are species of animal whose very existence are threatened. This has all been due to the fact that most of our people are not aware of the importance of this natural resource — the Wildlife.

A bird feeding on harmful insects, is wildlife. The duck, the rail, the coot or the pigeon you shoot is wildlife. All the wild animals that you see in your backyard, the farm or the forest comprises the wildlife resource we are trying our best to conserve.

As our people open up more areas to be planted to rice, corn and other foodstuffs and the timber dweller hacked and sawed through the wooded wilderness of our country, birds and other animal life had to give way in proportion to the extent that its habitat and range were destroyed.

Why would a farmer, who fears that rats, harmful insects and other plant pests will destroy his crop take no regard that is destroying ideal wildlife habitat around his farm he will drive away the protectors of his crops? Animals, birds, fishes, insects even down to the lowliest worms and bugs have their part to play in developing and preserving our natural resources.

We always talk about the balance of nature without realizing that what we are talking about is vital to our own prospect of living. Our wildlife plays a great part

in keeping in order all the natural machinery of fertility and growth. The absence of a natural balance can start a chain of events which will in its outcome prove disastrous for some sections of our society. Every sort of creature is adjusted to some special way of life, some to special kinds of environment and function. If the natural habitat is changed ruthlessly, the wildlife herein is affected, its way of life is upset, and it may fail to do the part assigned to it in the scheme of nature.

In our country today where we require more agricultural produce due to the ever increasing population, we must look up to the wildlife for controls on pests that destroy our crops. Chemical control of these pests, which we are putting too much emphasis on, is not the answer, for its effects are temporary and when used indiscriminately will upset the biological complex of things. Nature, which has spent centuries to perpetuate the order of things may altogether resent such interference.

Wildlife aside from providing sports, has so many economic values. So many kinds of birds feed on harmful insects. Some birds have to up as much as 93% of their diet on harmful insects. An insect-eating bird is said to require for its support about 250,000 insects a year.

The benefits that our wildlife can give is legion, needless to say, but it is best if these benefits are pointed out to us so we may realize the need for their conservation. Without our being able to realize the importance of these things shall we be able to make the intelligent approach, a step toward conservation.

What then must we do to achieve all these?

There are many different approaches to this. We must however, first of all, accept the fact that wildlife as a natural resource play a vital role in our economy.

Our Wildlife is a product of the soil and inseparably associated with all the true products of the land itself. Increase, decrease and maintenance of wildlife, basically, is wholly dependent upon soil utilization and vegetative growth management. Good farm management is good wildlife management and this in turns results in more crops harvested, and better standard of living for the people. It is a chain reaction.

As a product of the land, conservation programs and practices must always include the conservation of wildlife.

We have always emphasized the conservation of the soil, the forests, the water and others but no mention is made about the importance and the reason why wildlife should be included in said program. Little is known about direct benefits from wildlife to agricultural crops and forests. While damage, though serious, is seldom obvious, benefits are usually still more obscure. There is a principle involved in the fact that the insect which destroy the crops is more obvious than the birds and other beneficial wildlife which prevents such destructive outbreaks.

During the past, there was much said about the value of birds for helping save the farm and the forest from the insect horde, like the locust. These statements were based on observations and the finding of large quantities of insects in bird stomachs. The modern trend is to be more careful, and in some cases to deny the bird any usefulness in this regard. Large numbers of birds and insect-eating small mammals in our farms and forests may be more valuable than suspected. The inability of birds to stop an insect horde in full spate may be akin to the fire crew helpless at a big fire pushed by wind. Both however, may be able to prevent extensive damage by early action in localized trouble areas.

We then, especially the farmers should take heed to good farming management. The leaving behind of a clump of trees or not destroying nesting sites around your farms will be of more value than a disadvantage. Proper drainage method, proper cultivation procedure to avoid soil erosion, and crop ro-

tation and range cover, are some of the methods when practiced will bring greater returns.

This is about the size of the whole situation, and toward this end — the realization of the importance of our National Parks and of our Wildlife, we are working for. *National Parks and Wildlife* "exists and they should be maintained for all the noble things and the ideals that they stand for; they exist in order to enable every citizen of our country to satisfy his craving for Nature and Nature's Beauty and that he may develop in himself the bouyancy, the joy, and the activity he sees in wild animals, that he may acquire in his mind the raw material of intelligent optimism, noble thoughts and ideals and that he may be made healthier, happier and a better citizen." We must all cooperate toward a common goal in giving our wildlife and our National Park it's due place in our conservation programs, first of all among the farmers. To them are the direct benefits given, Secondly, among our hunters. Their sports values are innumerable. Thence, among all our people. To us all, a priceless heritage. A measure of a people's programs, strivings and endeavors. A proof of its wisdom and aspirations.

FORESTRY EDUCATION . . .

(Continued from page 4)

Let me not create the impression, however, that there has been general remissness in the administration of the public forests. We all know what have been the difficulties of our foresters. Indeed I know of numbers who, because they would not bend themselves to the cajoleries and threats and briberies of the powerful and the influential and the unscrupulous, have found themselves made defendants in framed-up criminal charges for the very same violations of the forestry conservation laws they have sought to apprehend. On top of their occupational hazards, our forest administrators have also struggled unaided with the right kind of personnel, have performed their duties unsupported with anything approaching adequate funds.

There were times in the past when the Bureau of Forestry was a model for efficiency, for extraordinary dedication of its personnel to the highest traditions of a self-respected, and incorruptible forestry service. Let us hope that those times continue to distinguish this service.

Your future duties and responsibilities will not end at protecting and conserving our forest resources, fundamentally important as these may be. You have in these modern times of fast developing scientific technology to keep abreast of the myriad uses of wood being newly discovered. It used to be that not more than 30% of a tree was being utilized, while 70% went to waste. Scientific discoveries are demonstrating new uses to which practically every part of a tree, "except the cool breeze", as an enthusiast has stated, can be put. A wide range of important chemicals are being produced even from the bark. Already several grades of cellulose are being turned out for the rayon industry, the cellophane industry, the plastic industry. Wood pulp is being processed for the making not only of paper but also for the manufacture of photographic film, tire cord, industrial belting, plastic toys, telephone instruments, garments sheeting, rugs, munitions, packaging material, pharmaceuticals. Already certain forms of wood pulp are processed in cellulose and used to smoothen the finest ice-creams and to stabilize liquid ointments. Also the use of wood as a building material has gone far beyond its utilization as construction lumber and plywood. Large markets are being developed for wall board, pressed wood boards, chip boards, all made out of mill waste. These developments offer bright opportunities for your future and a brighter future yet for our country and our people.

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Cooperation in Forestry as Related to NEC-ICA Program

by: Paul Zehngraff

It is a great privilege, indeed, to be afforded the opportunity to speak today, on the occasion of the 50th anniversary of the College, and the 60th anniversary of the Bureau of Forestry.

The subject that has been asigned to me for the next 10 minutes is entitled: "Cooperation in Forestry As Related to NEC/ICA Program".

As a part of the mutual economic development program of the Philippines, the NEC/ICA and predecessor agencies have since 1951 rendered both technical and financial assistance to the various phases of forestry.

Technical assistance involves primarily the training of Filipino technicians. To date, including this year's program, 86 Philippine foresters will have received such training in U.S. and other countries under this program, and in several instances resulting in advanced academic degrees. The technical assistance also includes the stationing in the Philippines of one U.S. technical advisor. In addition it includes at present four visiting professors under the NEC/ICA financed contract between the U.P. College of Forestry and the State University of New York (SUNY).

Financial assistance involves both U.S. dollars and local currency, namely, U.S. dollars for the purchase of commodities which are not available locally, such as scientific instruments, field equipments and transportation equipment; and local currency for various other purposes such as construction and project implementation.

Among the several forestry projects that have been involved in this program, I should like to mention a few of the most important and successful ones. But first let me give you a short summary of the forest situation and the reasons for assistance: The forests of the Philippines are the Nation's most important natural resources. The Philippine forests and the term Philippine mahogany are well known throughout the world. The products that they produce are eagerly sought and demand top prices on the world market. Indeed, although forest products are export ed mostly in raw form, yet they are the third most important foreign exchange ear ner of the Nation. Forest industries provide direct livelihood to nearby 1/2 million people, and indirect livelihood to several times that number in related business. Partly, because of the former belief that the great forest wealth was inexhaustible, high-grading of the forests for export has been resorted to, and home manufacture of finished products sorely neglected, resulting in unbelievable wastes of wood and in timber lands.

Forests contain the only renewable natural resources in the world, and as populations increase and other natural resources dwindle, forest products become increasingly important. That they are not inexhaustible, however, is clearly demonstrated in the Philippines where the commercial forests have been reduced by more than 2 million hectares during the past 25 years. Yet with

* Speech at the Bureau of Forestry Diamond and College of Forestry Golden Jubilees Conference on Dec. 1, 1961 at the DANR.

adequate protection, intensified management and very much improved utilization of all that they produce, the potentialities of the remaining Philippine forests, in terms of production, home manufacture and employment, are practically unlimited. For these reasons it has been felt — and is felt to an increasing degree — that assistance to forestry is a sound investment.

(1) One of the earliest and most successful projects is the Forest Products Research Institute at Los Baños which was constructed and equipped with modern scientific equipment for the purpose of finding means of utilizing to better advantages locally the commercial woods of the Philippines, and particularly to utilize to a greater extent the tremendous volume of logging waste and tree species for which no commercial uses were formerly found. Because of this important goal, not only the NEC/ICA, but other organizations including the UN, have contributed significantly. As a result the FPRI is now not only functioning well and making significant contributions to the forest industries and the national economy, but it is the most important institution of its kind in this part of the world — and recognized as such.

(2) Another important project is forestry education. It has been fully realized that the future of forest production to a very large degree rests in the hands of those who are assigned to manage them, namely the foresters. As the available timber areas become smaller, the needs for forest products can be met only through intensified scientific management of the remaining resources. It is essential, therefore, that the young men who choose forestry as their profession receive the best possible training in preparation for their tasks ahead.

The only forestry education institution in the Philippines, the College of Forestry, was largely destroyed during the war, together with most of the teaching equipment. Consequently, one of the early projects was to reconstruct and re-equip the College. The second phase of this project, namely, the expansion of the physical plant, enlargement of teaching staff, and intensified training is now well under way, first through a recently completed 3-year contract with Cornell University, and at present through a larger scale contract with the New York State University, School of Forestry at Syracuse. Under the former contract, 6 of the young College instructors received one-year training in the U.S.A., leading to advanced degrees. Under the present 3-year contract 18 more instructors will receive similar training. The responsibility for forestry education in the Philippines to meet future demands of the Nation will rest on the shoulders of these men. With the improvements being made we firmly believe that the College of Forestry will emerge as the most outstanding forestry school in south and southeast Asia.

(3) Under the project entitled, "Forest Management" and various sub-projects, considerable assistance, both technical and financial, has been rendered to the Bureau of Forestry since 1952 in order to ease its burden and responsibilities. Under the technical assistance, including the present FY, 45 of the Bureau's personnel will have received training in the U.S. and elsewhere in various phases of forestry. Financial assistance in cludes sorely needed transportation equipment, technical field equipment and office equipment.

Under this project local currency and technical support has been given to several sub-projects, including land classification, watershed management, forest inventory, timber management, and reforestation. Since these are all long-range objective and parts of an overall program, tangible results are as yet difficult to point out, but there is at least evidence that the program is going in the right direction.

NEC/ICA assistance to the Bureau under the present so-called Forest Management project will terminate at the end of this FY, not because it is felt that assistance is no longer needed, but because the program has reached a point where assistance

effectiveness will depend on long-range management planning based on accurate resource statistics. These we do not have, and under the present system of resource inventory we will not have them for many years — too late for the intended use. Consequently, the present project will be replaced with an aerial Forest Resource Inventory project which will commence early next year and be completed, we hope, three years hence. Assistance to forestry during the next 3 years will therefore be concentrated on two major projects, namely, Forestry Education and Forest Resource Inventory. Both are fundamental projects and in line with long-range planning. After the inventory project is completed most likely assistance will be shifted back to the implementation of forest management, if it is felt then that such assistance is needed.

I should like to point out, however, that no amount of assistance nor technical know-how will accomplish their purpose unless other and rather drastic steps are taken to keep intact the remaining commercial timber areas in the Philippines. There is not as much operable area left as we should like to believe. The time has come where sufficient timber areas must be set aside for continuous timber production and kept inviolate, except for that purpose, in form of permanent National Forests, not only as remnants on the high mountain peaks, but on lands where timber may be grown and harvested economically. I believe that the present land classification should be geared toward that goal and that goal only, until sufficient high yielding National Forests have been set aside and proclaimed as such. And it is to be hoped that the "Permanent Forest Law" (introduced last year as S. 48) will be passed this year in its original form so that once proclaimed as permanent production forests, such areas may not be released for any other purpose except through an Act of Congress. This is a fundamental piece of forest legislation, and even if nothing else is done in forestry this year, the passing of that bill would be the most significant step toward forest conservation and continuous production. Unless it is passed and implemented soon, I'm afraid that most other efforts will have been in vain.

There have been several other recommendations made relating to forest protection. I shall not go into them at this time. Most of them may be found in Tom Gill's report with which I'm sure all of you are now familiar. None of these recommendations would require any cash outlay to carry out — only a certain amount of determination.

Nevertheless, it is my personal feeling that the forestry program in the Philippines is now on the right track and that if we continue to cooperate and get the public support we need, we shall eventually reach the long-range goal of foresters everywhere, namely, that of sustained yield consistent with the expected future demands on forest products.

In conclusion let me congratulate the Bureau on its 60th anniversary and wish it success during the years to come.

FORESTRY EDUCATION . . .

(*Continued from page* 20)

When this College celebrates its first centenary fifty years hence, may those who will come after us be in a position to see in retrospect a record of achievement which will proclaim you have waged the good fight. To have used the wealth God has vouchsafed to us to satisfy fully our needs, and yet be able to transmit it to those who will be coming after us, as intact in its productivity as when we inherited it from our past, is to me one of the noblest tasks of patriotism that any generation can be proud to have accomplished.

Coordination of Governmental Operations for More Responsive Services to the People

By
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Acting Undersecretary for Natural Resources

Management's task of governing, coordinating and controlling the various functions of the government is not an easy one. Its aim is to get things done in the most efficient manner. The main job would appear to consist of three major elements, namely: planning, organization, and direction.

Planning is accomplished by formulating a system of procedure and policies that reflects the basic objectives and goals of management. The system, properly planned and utilized, will aid in obtaining the desired results in the best manner with the least expenditure of both time and effort. Policies, once established, designate the aims of the office. They establish the pattern to be followed and the process whereby a top executive reduces the necessity for making decisions.

Organization consists of the act or process of defining the lines of authority and responsibility of individuals and coordinating their individual efforts for harmonious attainment of the predetermined objectives.

Direction means to command, coordinate, and control. To command is to issue definite orders, release instructions, or establish rules and regulations under which the operations are to be carried out. To coordinate is to design the structure by which the various units can best operate together for the best interests of the Office and the people. It is the process of getting all of the different work routines to move along together and smoothly, toward a common goal. To control is to evaluate, appraise, examine and investigate. It is the necessary action for ascertaining whether or not the plans and objectives are being achieved.

Difficulties will arise unless definite orders, instructions, rules and regulations are carefully predetermined and set up to guide the conduct of each and every function. For example, without established methods for carrying out repetitive activities, employees become confused and often have an inclination to use variable judgment without following any degree of consistency. The result is a lack of teamwork and coordination.

Coordinated management is necessary in order that all functions of an office may work in harmony to give better over-all management control. Without coordination, each job is likely to get out of hand.

Control by management is necessary in order to accomplish the desired goals. This concerns preplanning of work, policy formulation, predetermining objectives, the delegation of authority and responsibility for the accomplishments of results, and the comparison and evaluation of results with the predetermined objectives.

When conflict arises between the goals of bureaus or divisions and the goals of

their component branches or sections, the ability of the larger organization units to achieve their goals become heavily dependent on the success of the heads of their component units, pulled by their competing identifications in mediating the conflict. In most administrative situations it will be a foolhardy executive who will substitute his point of view for the recommendation — the crystallization of thinking — of the whole complex organization below him.

The sum total of the activities of the members of an organization must be coordinated or meshed together if the organization is to accomplish its purposes. To achieve this coordination, each member will often need to know what the others are doing so that he may dovetail his actions with theirs. A time-honored and tested method for achieving coordination is to have one person responsible for knowing what all the others in a group are doing so that he can relate the activities of each person to the activity of the others in the group. In this way, coordination is sought through the nervous system of a single individual — probably the most effective coordinating mechanism of all. Although the group supervisor is not the only coordinating device, he is one of the most important in nearly all organizations.

The use of a supervisor to coordinate the activities of a group would not in itself explain the need for a whole pyramid of such supervisors. Such a pyramid is needed because no single man can coordinate the activities of a large number of other persons — any individual's span of control has limits.

There have been many attempts to specify exactly how many persons one man can supervise effectively — the number stated by various writers ranging from three to fifteen. Because of widely varying conditions and problems as of coordination, no single number can be the right answer in all circumstances.

Certain broad generalizations can be stated about the effective span of control. The maximum size of an effective unit is limited basically by the ability of that unit to solve its problems of internal communication. No matter how the limit upon the effective span of control may vary from one organization situation to another, in any one organization unit a limit will ultimately be reached. As any group grows larger, the adequacy of the communication between supervisor and worker diminishes, the supervisor is overloaded, coordination deteriorates; and these effects become noticeable long before any ultimate "breaking point" is reached.

Consequently, when an organization has a large number of members (because of the size of its task), they may be divided into groups sufficiently small that each can be coordinated by a single supervisor. One of the principal devices used to coordinate the activities of these separate groups is to designate a second level supervisor to supervise a number of them. The pyramidal form typical of organizations is therefore a consequence of: (1) the need for coordination of individual activities, (2) the effectiveness of the individual nervous system as a coordinating mechanism, and (3) the limits upon the effective span of this mechanism.

Each supervisor and all those below him in the pyramid form a group of people that is doing something — that has some objective or goal related to the ultimate objective of the whole organization. The integration of all the functions of an enterprise into one harmonious whole is the dominant need for effective operation.

Coordination to be effective, must unify the efforts both vertically and horizontally. The vertical series of relationships from the top downward is far stronger in the typical organization than are the horizontal or crosswise relationships. Through the centuries people have been trained to respect the orders and wishes of their superiors, while the leaders are usually aware of the value of giving precise directions for securing what they want. Thus the line of authority and responsibility stretching downward from the

top has been efficient in transmitting policies, decisions and directions down that line. Even so, the usual lengthening of the line due to the growth of an organization makes difficulties in the interpretations of orders, and the increasing complexity due to technical requirements has multiplied the detail which must be correlated.

Good communications are essential to coordination. They are necessary upward, downward and sideward through all the levels of authority and advice for the transmission, interpretations, and adoption of policies, for the sharing of knowledge and information and for more subtle needs of good morale and mutual understanding. Not only most government agencies maintain a constant flow of communications among the members of their own staffs, but at least periodically they find it necessary to communicate with other agencies, with the Congress and with clientel groups, or with the general public. The amount of misunderstanding in the world caused by failure of people to communicate effectively with each other can hardly be exaggerated. Words are tenuous. The failure of human plans and aspirations are all too often bitterly recalled in terms like "if it could have been gotten across", or "if I had said it this way rather than that, he might have understood". Blockages in the communication system constitute one of the most serious problems in public administration.

In any complex society where great planning activities are being carried on by different groups, the serious problem arises out of preventing or at least minimizing the amount of inconsistent and self-defeating planning that goes on. If the immediate or the long range goals of various planning activities that contradictory, one plan will tend to undo another. Because of the many possibilities of contradiction, there is much concern with the coordination of planning. Coordination has been sought largely through organizational structure — committees and super committees. Of course if an organization has an over-all goal or dominant value as is the case with unitary organizations, conflicts between plans for that organization (or for its parts) can resolved by reference to its goal. On the other hand, if an agency does not have a dominant goal, conflict can still be avoided by killing administratively one or the other of the conflicting plans. The trouble is that there is no rational basis for deciding which to kill without reference to goals common to both plans — lacking this decision is no more rational than flipping a coin. Hence, a dominant agency goal or value is indispensable to rational coordination of planning.

When the problem of coordination is much above the level of the agency to that of the government as a whole, the same considerations apply. To coordinate all government activities rationally, there must be a dominant government goal or value. A plan that can not secure the behaviors it envisages is utopian. A practical plan — one that can be effective — is based upon a consideration of what people will do and can be induced to do.

Administrative agencies must secure public understanding of their programs, whether they are providing services to the public or regulating it. If no one knows of their services, officials will be frustrated in their attempt to supply them and they will not long receive legislative support. If the people to be regulated do not know what they are supposed to do, they can not do it; and if they do not agree with what they are supposed to do, many of them will not do it. Consequently, administrative agencies must engage in a great amount of public educational activities. They disseminate great volumes of information gathered by research; they constantly inform the public of various services available to it; and they constantly inform the public of its duties under their regulations. This kind of activity, admittedly a necessary part of administration, creates support for administrative organizations as well as understanding of their programs; it makes them

less subject to the influence or control of conflicting interests expressed through legislative or executive action.

The subject of coordination may also be grouped as follows:

1. Coordination of field offices of the same Bureau, Office or agency of equal stature in the Region;

2. Coordination of field offices of the same Department or agency of equal stature in the Region;

3. Coordination of field offices of all Departments or agencies of equal stature in the Region;

4. Coordination of national government entities with local governments in the Region;

5. Coordination of national government entities with private organizations and individuals in the Region; and

6. Tri-party coordination.

1. *Coordination of field offices of an executive bureau, office, or similar agency* is basically dependent upon the organizational structure of the agency. The "lines and blocks" affect to a high degree, the manner of coordination that can be exercised over field subdivisions.

The structure I am referring to, includes that of the central office where the initial coordination emanates and that of the regional office where further coordination occurs.

There is no uniform set-up for regional offiices of the several bureaus, offices, and similar agencies in the National government. Some bureaus in Departments like that of Labor, Health, and Agriculture and Natural Resources, have regional offices established in conformity with Reorganization Plan 53-A on Field Operations. The Plan decentralizes operations of national entities into eight regions comprising the entire archipelago, including the location of regional headquarters and the designation of the Chief of each region known as "Regional Director".

Under this set-up each Regional Office is responsible for all local offices and activities of that entity located in the region. A salient feature of this Plan is the direct reporting of the head of the region to the chief of the bureau, office or agency. In adding, permit me to quote a pertinent portion of paragraph 5, Part II of the Report on Field Operations of the Reorganization Commission of 1954, under the heading "Recommendations on Reorganization".

"Regional directors of a department or other major entity should form a Regional Committee to assist in coordinating the functions and activities of the department or other major entity in the region;

Other agencies are decentralized in different manners depending on the particular nature of their operations.

Coordination of these field offices can be achieved by simplifying the organization structure, defining clearly the methods and procedures involved in the operations, maintaining consistency in plans, programs, and policies, laying down standards for executive operations, constructing a systematic communications network, creating coordinating committees or bodies and central control sections, providing liaison men and executive assistants to reconcile differences and assisting the supervisors in their coordination function and conducting in-service trainings, seminars, workshops and other gathering that being together field men with ideas to sell or barter in the open market of collective information. By and large, these steps taken by the regional supervisors will enable him to knit the widely scattered threads of fieldwork into a durable fabric of public service.

2. *Coordination of field offices in the same Department.* — Field offices of the bureaus of agencies of a Department in a region should coordinate to attain the goal of the Department. Coordination in this level should be done through the various Regional Directors or Heads of the bureaus or agencies in the Region assisted and guided by the Central Office. Frequent consultations among the

Regional Directors or heads will result in harmonious working relationships among their respective jurisdiction.

3. *Coordination of field offices of all departments or similar agencies.* — The functions and activities of the entire national governmental machinery should be geared towards the overall administrative goal of the state. This unity of purpose should be given greater emphasis in the rural areas which thirst for essential public services. The avowed policy of "bringing the Government closer to the people" is transformed into reality when the executive departments spread to the fields and coordinate with one another into a massive operation. As a means to the realization of this end, the Reorganization Commission recommended in Paragraph 5, page 12 of its report on Field Operations, the establishment of a Regional Coordination Council, composed of chairmen of the regional committees which shall be the informal organization for assisting in the coordination of all functions and activities of the National Government in the region. I challenge the Council of Administrative Management to lead us, Executive Departments, in the implementation of this notable recommendation. When these coordination councils are created, I am positive that coordination of national entities in the regions would become an accomplished fact. The Council can count on the Department of Agriculture and Natural Resources as one of the first entities to join the coordination councils.

4. *Coordination of national and local governmental entities.* — The regional inhabitants, the barrio people, are directly served and administered by their corresponding local governments, provincial and municipal. While, the national government ordinarily participates in a supplementary capacity in local service and administration, the goals of the two types of governments are identical— public service. For this reason, there can be no denying that the national and local governments should work hand in hand, shoulder to shoulder, towards a common cause. Mutual trust, assistance, and cooperation should characterize their relationship.

5. *Coordination of national entities with private parties.* — It is satisfying to observe that there is a trend by private business enterprises, civic organizations and patriotic citizens to engage in activities the object of which is to raise the sub-standard conditions of the masses. As the object coincides with that of the government, it is therefore imperative that the two groups work in unison to attain maximum efficiency and economy.

It is our duty as leaders in the government sector, to pave the way for harmonious operations with the private sector. Let us know their leaders, meet them, talk with them, and work with them as devoted public servants. Let us extend to them all forms of assistance legally and physically possible, that they may be our faithful allies in the crusade for rural uplift.

6. *Tri-party coordination.* — The national government, the local government and the private organizations and individuals should coordinate with one another in their geographical and functional spheres where their activities conjoin. I can clearly visualize this seminar as a prelude to an enduring triangular working partnership of the three most potent elements of the nation in the betterment of the barrios and remote places. I wish it continuous success.

What I have expounded upon are propositions for synchronized action by the elements concerned with the improvement of the welfare of the people in the grass-roots level. They are indeed ideal propositions and would undoubtedly invite no criticism. But there are other factors to reckon with which influence one way or the other the translation of these propositions to concrete actions. Most glaring is the personal factor — the interplay of human emotions, idiosyncrasies, aspirations, and desires which tend to taint official actuations. The coordinators should learn to adjust their plans, programs and policies in the light of this factor, if they

desire to get results. Pure idealism has no room in practical public administration.

In closing, I can say with all humility, that field officers of our department are increasingly becoming conscious of the inestimable value of management improvement as the fruition of management seminars and in-service trainings of our own or by attending willingly and enthusiastically similar activities sponsored by the Management Service and the Bureau of Civil Service. We, in the top echelons of the Department, are pledged to lend our unconditional support for all endeavors of the Management Service and the Bureau of Civil Service destined to promote management improvement consciousness. I am happy to report that management improvement has taken a firm foothold in every bureau, office, and corporation of our Department which will last so long as there remain executives who are never contented with anything and who constantly and persistently seek ways and means to find the best.

Taken from:

1. Public Administration — by Simon, Smithberg & Thompson
2. The Essence of Management — by Mary Cushing Niles
3. Systems and Procedures — by Victor Lazzaro.

The Regeneration of Tropical Forests By Planting

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A summary of past experience and future prospects for forest planting in the tropical world, prepared without personal familiarity with Asia and Africa where nearly all of the work has been done, necessarily must be general. It may be excessively influenced by experience on an island of the West Indies where population density and forest poverty are more extreme and economic development is more rapid than in most tropical areas.

EXPERIENCE

Historically, forest planting in the tropics first appeared in south-eastern Asia. Then it was extended to Africa and generally later to America. In India research on planting of teak began in 1830. The famous teak plantations at Nilambur date from 1844. Early beginnings in Java are evident in the fact that the natural occurrence of teak there is debated. Plantation techniques were well developed by 1880. Forest planting was first undertaken in Burma in the 1840's, and in Ceylon in 1890.

Forest planting spread to Thailand and the Philippines in the first decade of the present century. Soon thereafter planting was undertaken in tropical Australia and in Trinidad. In the 1920's work started in the British, French, and Belgian colonies in Africa. Now it is probably safe to say that at least a few forest plantations have been established in every tropical country, including the American republics. More than a million acres have been planted to date.

In the western tropics extensive areas have been planted in southern Brazil, the northern Andes, and in Trinidad. Large-scale planting projects are continuing in Brazil, Trinidad, and Surinam. Species adaptability tests and smaller scale planting programs are being carried out in Mexico, British Honduras, Nicaragua, Costa Rica, Cuba, Jamaica, Haiti, the Dominican Republic, Puerto Rico, the French West Indies, Venezuela, British Guiana, Colombia, Ecuador, and Peru.

Sites and Species

Planting sites in the tropical zone span the temperature range from sea level to elevations of several thousands of feet. In rainfall they range from semidesert conditions to hundreds of inches of precipitation per year. Seasonality of rainfall, sharply defined in many areas, has greatly influenced techniques and results. Planted soils range in texture from fine clays to coarse sands and from excessively drained to swampy. For tree species tropical foresters have drawn on the world's richest flora and have traded seed without regard for distance. Certainly more than 1,000 species have been planted in the eastern tropics and nearly half that number have been tested in tropical America. Widely planted genera include *Acacia, Agathis, Albizzia, Casuarina, Cedrela,*

Cupressus, Eucalyptus, Khaya, Pinus, Swietenia, Tectona, and *Terminalia.* About a dozen indigenous timbers and some 20 exotics now are being planted extensively in tropical Africa (6). Current large-scale planting programs in the American tropics also use a variety of species, mostly exotic.

Major Techniques

At least two important forest planting techniques have had their roots in tropical experience. The taungya system, initiated in Burma in 1856, ingeniously so uses the shifting cultivator that this ultimate product, rather than ruinate land, becomes cheaply established forest plantations. Applicable wherever laborers are willing to clear forest for food crops, and where rapid growing tree species have proven adaptable, this system has given rise to hundreds of thousands of acres of excellent plantations in Asia, Africa, and on a lesser scale in tropical America, particularly in Trinidad. It has been particularly successful in the moist deciduous forest zone.

A second major tropical planting technique is enrichment. The planting of trees within cutover forests has held forth unusual promise in the tropics because (1) vast and increasing areas of cut-over forest are inadequately stocked with desirable regeneration yet deforestation preparatory to planting is very costly, (2) many of the preferred tree species have not grown well when open-planted, and (3) controlling weeds and vines in young open-grown plantations has proven very expensive. The trees may be planted beneath natural openings in the canopy, in lines cut through the forest, or in small cleared blocks. Extensively used in Africa and tested throughout much of the tropical world, the success of enrichment remains a subject of debate because of maintenance costs.

Yields

Published data on pure plantations under favorable conditions show a wide range of increment. Gymnosperms, including species of pine, *Agathis,* and *Araucaria* in tropical Australia and Indonesia at ages of 25 to 37 years range from about 200 to 400 cubic feet per acre per year (13, 19). *Eucalyptus deglupta* in tropical Australia has shown increments as high as 486 cubic feet (2). Teak in India, Java, and Trinidad at 30 years on the best sites ranges from 114 to 150 cubic feet and at 80 years from 85 to 109 cubic feet (1, 9, 17).

Financial yields from thousands of acres of 65-year-old teak plantations at Nilambur surpassed 4 percent, compound interest (17). At the other extreme, on 10-year fuelwood rotations teak and cassia plantations have proven extremely profitable in Nigeria (4).

Present Position

It is seen that in the tropics forest plantations are capable of spectacular increment, yet they cover an insignificant portion of the forested area. In only a few countries is planting being done on a scale which will make an important contribution toward meeting future timber requirements. The reasons are various.

Where large volumes of uncut forests remain, as in parts of tropical America, interest in forestry may barely support a minimum degree of control over exploitation, let alone investments in the future crop.

Where extensive forest resources and strong support for forestry both exist, foresters understandably have been more impressed by the need to market in an orderly fashion the standing mature timber while protecting for future harvests the immature trees of marketable species and the vast volume in other species for which utilities may be just around the corner than with the prospects of starting on bare land. Thus, we see girth limits, improvement fellings, shelterwood, or "clearcutting" such as has recently been developed in Malaya. The results of these practices have not always

come up to expectations, but they have generally been helpful silviculturally. Where dipterocarps or other species of high quality have regenerated abundantly, they are considered successful.

Even where no large accessible timber resource remains, the problem has generally been met by importation of timber supplies rather than reforestation. This is in part because forest planting in the tropics has been fraught with failures, usually due to inadequate knowledge of the site or the species.

A number of factors other than those already mentioned have produced in tropical foresters a degree of conservatism toward planting. Planting is considered costly at the outset and appears to involve risks of failure from unforeseen causes. These may include inferior wood quality, insect and disease attacks, and gradual site deterioration. There is evidence that these hazards may commonly be exaggerated (11, 14, 17).

On the other hand, forest planting in the tropics is on the increase. In Trinidad, for example, the annual area of planting has doubled since the second world war. In countries with extensive natural forests, such as the Philippines, Brazil, and Surinam, the planted area is rapidly expanding. Even in Malaya the prospect of extensive plantations has been under study.

PROSPECTS

The future of forest planting in the tropics is dependent upon trends in the demand for the products of tropical forests, the area and character of the land which will be available for their production, and the effectiveness of the planting practices developed for this purpose.

Demand for Forest Products

Population growth in the tropics, now at unprecedented rates, will inevitably make heavier demands upon tropical forests. Trends in the United States suggest that overall consumption of forest products per capita is increasing (18). Rising standards of living and shifts of population from rural to urban areas can be expected to increase demands particularly for the more valuable or highly processed forest products such as lumber and paper. Pulpwood consumption per capita in the United States has doubled in the past 25 years, and this product now makes up more than 25 percent of all industrial wood consumed (18). The use of fuelwood and charcoal in the tropics can be expected to decline because of substitutions, a development which may eliminate an important incentive for deforestation preparatory to taungya plantations.

Lands for Future Forestry

The area and character of the tropical lands available for future forestry will depend increasingly upon the economic relationship between forestry and alternative land uses.

Competition from Other Forms of Agriculture

For centuries the growing populations of tropical areas have been encroaching upon the forest in search of land to cultivate. The grassy wasteland which surrounds the central African forest, a heritage from generations of shifting cultivation, is in places as wide as 180 miles (3). In Nigeria alone a thousand square miles of forest are destroyed by shifting cultivation every year (5). In the western hemisphere land clearing also has been a common practice. As a result forests have largely disappeared from areas around population centers in tropical America.

The demand for field and forage crops can be expected to rise further. The yields from these crops per unit of land area are also rising. The overall effect of these developments may be to reduce the total area needed to supply a specified yield. However, since population is rising rapidly, no permanent release of lands for forest use necessarily will follow. In fact, with every

increase in yield per unit of area these crops can more forcefully compete with forestry for any lands capable of producing either crop.

Competitive Forestry

Uncontrolled forest exploitation in the tropics seldom contributes toward any other permanent economic land use. Removal of the best trees may with little apparent effect leave the forest unproductive, yet the land has not been prepared for any other use. Large areas of completely deforested lands, because they do not sustain continued cropping, become abandoned and remain unforested or gradually return to secondary brush, also of little value. In the face of growing demands for forest products the area covered with exploitable forests is declining. Future requirements will soon have to be met by production on lands now cutover, brush covered, or deforested.

Current timber productivity on most of these lands, even those under extensive management may be so low that they are vulnerable to encroachment by land uses which are temporary in nature and destructive of the soil. To prevent this the returns from forest production must rise at least to a level that is competitive with other uses for these lands. There appear to be two ways in which this can take place, in higher yields of the best timbers per unit of area and in greater uniformity of products.

Large productive potentials of lands available for tropical forestry, even where tree-covered, are largely untapped because of the presence of the following:

1. Tree species deficient in utility, of inherently slow growth, small size at maturity, or poor form.
2. Genetically inferior trees.
3. Damaged trees too poorly formed to be utilized.
4. Areas overstocked with stems, many of which can never reach merchantable size.
5. Areas understocked, possibly supporting weeds.
6. Nutrient deficiencies.
7. Losses to insects and diseases.

The removal of these limitations calls for drastic changes in existing forests, close control of growing stock, and probably also the use of some of the same techniques which are augmenting the returns from other forms of agriculture.

The lack of uniformity in the size and quality of the trees in most tropical forests, with relatively few per unit of area suitable for any one use, constitutes an obstacle to utilization which does not characterize most other crops. For this reason tropical evergreen forests are not a promising source of raw materials to supply growing paper requirements (7). Greater uniformity should foster the same efficiencies of mechanization in production, harvesting, and utilization of forest crops which are making other forms of agriculture more competitive.

Future Practices

The growing demand for forest products and the related need for financial returns from tropical forestry competitive with those of other land uses suggest that full consideration be given to those cultural practices which have been largely responsible for the increase in productivity of other forms of agriculture. These are as follows:

1. Greater concentration on the most productive lands.
2. More specialized production.
3. Development of superior plant varieties.
4. Increased use of fertilizers.
5. Chemical control of weeds, insects, and diseases.
6. Greater uniformity of production and resultant mechanization.

The nature of these developments and the growing area of unregenerated land apparently assures the establishment and management of plantations a prominent place in the future of tropical forestry. The discontinuation of natural regeneration tech-

niques is not foreseen, but if forestry is to profit by these developments a number of inherent advantages appear destined increasingly to favor plantations. The magnitude of these advantages is to be seen in the land requirement to supply a 100-ton paper mill in Malaya: 400,000 acres of mixed forest, or less than one quarter of that area of pure plantations (12). Paper companies in Surinam and Brazil, despite access to extensive mixed tropical forests, are establishing large areas of plantations.

The only rational approach to intensification of tropical forestry is through research, some of which will require years to bear fruit. This circumstance is itself the best argument for early acceleration of tests of the best available sites, species, and growing conditions.

Site Selection

The capacity of trees to grow on soils generally unsuited for other crops and man's preoccupation with the production of food on the other lands have focussed the attention of foresters on these relatively unfavorable sites. Advocates of other crops, in contrast, bid for the best lands available in anticipation of higher yields.

It must be admitted that forest crops, as a group, may never surpass in financial returns the more important food and forage crops. However, the quality of land which forestry really merits will never be known until returns from intensive forest management are determined. Results in South Africa suggest tree planting on soils now in other crops (8). Accordingly it would appear in order to test plantations on a variety of sites normally considered "too good" for trees. These should have climate and soil favorable to plant growth, proximity to markets and labor supply, and slopes suitable for the use of mechanized equipment.

Species Selection

In the selection of trees species for intensive management tropical foresters should maintain a broad and flexible outlook, embracing changes in demand, the prospect of superior exotic species and, if indicated, prompt rejection of former favorites. It is time that the forester, like the agronomist and horticulturist, ceases to dwell on the question of "exotic vs. native" species. Obviously this criterion has little or no influence on our selection of other crops. Added initial risks are involved with exotics, but with most other crops these risks have been found well worth facing, in view of the greater returns obtained. Long-term results with pines in South Africa (8) and with teak in Trinidad show that foresters may under favorable conditions expect equal rewards.

Trials of new species whatever their source, should not be made without an understanding of the environmental preferences of the species within its natural range. However, tests need not be limited to these conditions. *Pinus radiata,* for example, a species with a very limited natural range, has been found adapted to a wide variety of conditions elsewhere and the trees in their view habitats show significant genetic variations not previously evident (10, 15).

Tests of species adaptability, a task which has seemed almost endless and fraught with discouragement, is nevertheless a necessary prelude to intensive forestry. It could be greatly simplified if information on the promising species and the results of tests to date were more available. In this regard, the current series of FAO Development Papers represents a beginning. The survey of plantations now in progress by the Latin American Forestry Commission of FAO, is yielding more information of this character. A continued, world-wide search for superior species is warranted.

Among the species considered for planting in the tropics the gymnosperms are receiving much attention now, and this apparently was long overdue. A recent survey by Weck (19) shows that of some 200 tro-

pical conifers, 16 have already proven promising for planting, and in a wide range of conditions within the tropical zone. Included are the genera *Agathis, Araucaria, Callitris, Cupressus, Dacrydium, Pinus,* and *Podocarpus.*

Seed Sources

The prospects of genetic improvement of tropical trees are so great that results of many other types of tests will be materially affected thereby. The possible magnitude of greater returns through mere selection of seed sources is seen in a specimen of *Pinus radiata* in New Zealand. Growing in a 27-year-old plantation in which other dominant trees averaged 16 inches in diameter, it had attained 27 inches (16). There this species shows marked variation also in tree form, silvicultural requirements, and timber (15). Superior trees to serve as seed sources for the more promising species should be located before they are cut. Progeny and provenance trials, continued selection, and breeding should lead to better tree adaptability, form, growth rates, disease resistance, and wood properties.

Spacing

Spacing of planted trees should be such that maximum financial returns are obtained. This involves quality as well as growth rates. Traditional spacings have been found too close for maximum financial yields from pines in South Africa (8). These findings may not be equally applicable to the tropics but tests are warranted, possibly in combination with chemical control of weeds. Another consideration in initial spacings of plantations is the prospect of more efficient plantation care and harvesting where trees are planted in a strict geometrical arrangement and sufficiently separated to permit machinery to pass between them.

Nutrient Supply

Plantations using good sites, tree species of high quality from superior seed sources, and spacing favorable to high yields should grow at a rate which is limited primarily by the supply of available nutrients. This limitation is probably a major source of plant competition on soils subject to the constant leaching typical of the humid tropics. With all other factors favorable, it may prove practical to remove this limitation by the application of fertilizer, not merely to eliminate obvious nutrient deficiencies as has characterized much past work of this type, but to provide adequate levels of all nutrients. With some other crops, including forage grasses, it has proven economically advantageous to fertilize so heavily that the inherent supply of some nutrients in the soil becomes unimportant, thus minizing the limitations of infertile soils.

Control of Enemies

The control of insects and diseases in tropical forests, heretofore considered impractical under most conditions, may become more necessary in intensively managed plantations, but because of the high yields at stake it should prove correspondingly more practical. The use of low-volume mists, systemics, and ther new practices developed for other crops should warrant trial.

The Need to Combine Practices

Testing of tree species, superior varieties, spacing, and fertilizers must take into consideration their interactions. Past experience in which one or two of these factors have proven effective probably does not indicate the prospects of fully combined effects. With other crops it is the combined effect of *all* desirable practices which brings the greatest return.

Prospective Returns

How much would the intensification described increase yields? Would it pay? Only a few indications are available. As to yields, an intensively cultivated eucalyptus plantation in Nyasaland produced dominant trees of 4.4 to 5.1 inches d.b.h. and 40 to

(Continued on page 50)

ERRATA:

p. 36. — *At bottom of page*:
Continued on page 54 instead of page 50.

p. 59. — *Following lines omitted after last line.*
the exportation of logs? Of course the answer is obviously in the negative. An enlightened citizenry will cry to high heaven against this reckless waste of potential source of benefits that should accrue to our own people . . ."

Pictorial page of "Kaatoan Grows in Mt. Makiling"
Figs. 4 & 6 are interchanged.

The University of the Philippines and Educational Leadership *

Mr. Chairman, Conference Delegates, and Friends:

We in the University of the Philippines wish to thank the Secretary of Education and the Director of Public Schools for the assistance they gave us in convening this conference. We also wish to express our appreciation to each and every one of the school superintendents and other guests for their participation in this meeting. If my memory serves me well, I believe this is the first conference held in our University for the purpose of exchanging ideas on education subjects and school administration between the public school superintendents and the members of our faculty. We are certain that as superintendents of public schools you have an interest in higher education as presented, taught, developed, and advanced in the University of the Philippines. This University does not confine its education work only to the training of teachers. It also undertakes experiments affecting the nature of the curriculum and the methods of instruction for elementary and secondary schools and for colleges and universities. We believe that this University, as a state institution independent from the academic control of any other institution and any other government office, is expected to offer to the Department of Education and to all others interested in teaching and learning whatever ideas or improved methods it may discover that could be helpful to them in their educational work for the people of this country.

One definite goal that the University of the Philippines is now aiming at is that of developing itself into a genuine Filipino university, with authentic characteristics reflecting the best features of education most applicable to a progressive Filipino society, most adaptable to the growth or creation of the Filipino soul, and most helpful to him as a citizen of a Filipino democratic nation and as a creative individual in the atmosphere of his native land. This is not to say that our intention is to develop a type of person who is interested solely in the welfare of his own people, a superpatriot, and a philistine. This would cease to be a university if it should set aside the gifts and patrimony derived from modern civilization, the basic traditions of Western culture, and the universal and basic ideas beneficial to the entire human community.

What we try to avoid is the practice of adopting methods just because they are commonly accepted as desirable and good in America or in other countries without any critical balancing of their probable effects in our country or without our first carefully analysing them in the light of our customs, habits, needs, and conditions.

To transplant an institution, or a system, or a plan of education from America to the Philippines was perhaps excusable during the years when we did not have full control over our national policies and decisions. But it certainly is no longer excusable for us now that we are solely responsible for the kind of national life and educational development we should follow.

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* Address of Pres. Vicente G. Sinco, University of the Philippines, before the Joint Conference of faculty Members of the University and Public School superintendents on Dec. 21, 1960, at the Bentez Hall, Dilliman.

The practice of thoughtless imitation is often an indication of an inferiority complex. But more than that, it is a confession of intellectual irresponsibility and moral indolence. It is a submission to foreign pressures that undermine the true spirit of self-discipline and freedom. An institution has no business calling itself a *university* unless it promotes these two essential qualities of self-discipline and freedom.

Having expressed this idea on the general goal of the plan of our University which may take long years to attain, I shall mention to you very briefly a few things about some of our practices and problems which might be of interest to you. First of all, it should be known that the University of the Philippines exists and operates under a special charter. It is completely separate and independent from the Department of Education. Its highest governing authority is the Board of Regents of 12 members.

By our long-standing rules, we take in all *bona fide* high school graduates as long as there is room available for them and our resources permit. We classify all new students by a system of tests into 3 different groups. For one semester they are all placed on probation. At the end of that trial period, those who cannot make the grade are dropped.

In order that some uniformity of measurement in determining the performance of our students may be employed, we have recently organized an examining board that takes charge in the preparation of the examination questions for first and second year students and supervises the correction of their answers. In this way, we try to avoid as much as possible discrimination in grading, resulting from different causes.

This particular aspect of our system gives you a general picture of our method of selecting our students. I might state here that this practice of placing students on probation has been used in this University for many years. It is not applied only to new comers but also to those who are already in — be they sophomores, juniors, or seniors. The reason for this is that it is only through a continuous process of screening that an educational institution is able to weed out the mediocre from the serious students. Any talk of deterioration of this University because it does not select the students who apply for admission for the first time is sheer and pure non-sense. One source of that kind of talk is embittered persons who do not know or who refuse to know that there is more than one method of selecting good students. Another source are those who are eager to discredit the University, people who are interested in promoting special interests.

This University is not a one-man organization. Its success or its failure depends very much upon its body of teachers and researchers. It depends upon their academic integrity, upon their moral stamina, upon their love for learning, upon their dedication to work. They can do much in the way of educating students who come here to study and work rather than to spend much of their time in social activities or in so-called campus politics. It is true that to be a good student one has to have brains in the first place. But that alone is not enough. He should also have the work habit or should conscientiously develop that habit. To gain some mastery of any subject, there is no substitute for concentrated attention and strenuous effort. Those who talk of a so-called leisurely development really encourage the pernicious *mañana* habit. They should turn back the clock and the calendar to the days of Methuselah, if they can. They are misleading our youth.

It is not what we say or what anybody says about this University that makes it great or small, alive or dead, useful or useless. It is what the University produces that makes all the difference. "By their fruits, ye shall know them," so we have been told by Divine authority. Many of you here are, I believe, the products of this University. You are the fruits by which this University

should be rightly judged. If six or ten years from today, our graduates will turn out to be failures, racketeers, or pubic enemies, it shall be time then to pass judgment on the program, methods, and practices of this University.

About a month ago, the graduates of our College of Dentistry all passed the Board examinations. A few weeks ago, the graduates of our College of Medicine also all passed the Board examinations. These are very fresh records of our students. The records of our graduates in past years are known to all. The present showing may not convince our detractors; nevertheless, they indicate satisfactory instruction by the faculty, satisfactory performance by the students, satisfactory results of our method of selection by probation, trial, and constant screening. But these facts do not justify staying put in status quo, following the same routine.

The other evening when we had a lantern parade, an elderly American from New Hampshire, highly educated and holding a responsible position in that State, was sitting next to me to watch the participants and their floats. He asked me whether in our University some units are stronger than others, which is the case in many American universities. I replied that the same situation exists here: some of our colleges are stronger than others, depending upon the ability and character of the faculty members of each of these units and upon their *esprit de corps.*

One of the recent innovations we have introduced into our University is the Department of Extramural Studies. This unit is intended to spread as much as possible the benefits of our program for higher education over the entire country. This might be of interest to superintendents and teachers, businessmen and professionals, farmers and others who desire to improve themselves educationally but find it difficult to come to our different campuses in Diliman, Los Baños, Iloilo and Baguio for personal attendance. The instruction that the Department of Extramural Studies is at present planning to undertake will be carried out partly through home studies, by means of correspondence and the radio, and partly through personal attendance in actual classes, which will be run during the summer months and other periods of the year. They will be conducted in different parts of the country where a sufficient number of students is enrolled. At the termination of the prescribed courses, University degrees will be awarded to those who successfully pursue and finish the required studies. In this manner, we hope to extend the campus of the University of the Philippines over the entire country. Programs of this kind have been successfully carried out in the United Kingdom and in some States in the United States.

There is one thing which is quite noticeable in our country, a condition which should cause concern. Until now education has not yet really been widely and deeply felt and considered as a serious national problem by our leaders and the people as a whole in the same way and measure that they consider our economic development and national defense. The Government, it is true, has been setting aside large appropriations for our public elementary schools. But the question of finances, important as it is, is only one phase of the problem of education. The ferment of ideas on education has been spreading widely in the United States. It has captured the interest and attention of the entire nation, from the American President and Congress to the State governments, the cities, and villages, from the universities to the high schools and the elementary schools, from college professors and school teachers to businessmen and industrialists — in fact in all strata of society. But that educational ferment has yet to start in our country. Several surveys and reports on our educational system have been undertaken at various times from 1925 to this year 1960. But public discussion of

these reports has not taken place in any appreciable degree. Consequently, Dr. W. F. Dyde, Vice-President of the University of Colorado, who made a study of our private colleges and universities under a Fulbright sponsorship about 5 years ago, made this remark: "In the absence of such general discussion and debate, one must not assume that educational aims and policies in the Philippines have been brought fully into harmony with the ideals of the Filipino people."

The general discussion on educational improvement in America and other countries, the urgency of the need they feel for better educational programs, the hectic search for new methods of instruction, the adoption and experimentation of a variety of educational ideas they are making are not visible here nor experienced even by our outstanding men in public and private life. The result of this dearth of interest, this negligent spirit, is that any change we adopt or suggest in our educational methods, some of them being now obsolete, inadequate, and defective, take us by surprise and are sometimes used by persons with ulterior motives to spread alarm and disturbance in our midst. For this reason, we who are in education work must ever keep ourselves abreast of the developments going on in advanced countries, ever reminding ourselves that education is dynamic, that educational progress involves changes, and that resistance to change will spell disaster.

Here I shall close this message. I must, however, express again my sincere thanks to you all and my earnest hope of seeing you again on this campus for another conference where we can have fresh views on the ever-changing problems of education and the ever-growing challenges of new ideas in this age of stupendous advances in learning and science. For as the poet Alfred Tennyson puts it:

"The old order changeth, yielding place to new,
And God fulfills himself in many ways,
Lest one good custom should corrupt the world."

I wish you all a Merry Christmas and an enjoyable and pleasant holiday.

THE TOKYO CONFERENCE ON PULP AND PAPER

By
Manuel R. Monsalud
Assistant Director, F.P.R.I.

The last Conference on Pulp and Paper Development in Asia and the Far East was held in Tokyo, Japan, October 17-31, 1960 under the sponsorship of the Economic Commission for Asia and the Far East (ECAFE).

About 32 countries in the region, as well as outside the region, participated in the conference. The Philippines was officially represented by a delegation consisting of Dr. Mariano P. Ramiro of the National Economic Council as Chairman, Director Eugenio de la Cruz and Assistant Director Manuel R. Monsalud of the Forest Products Research Institute, members, and Drs. Amando Dalisay, Amando Clemente, and Alexander Adamson, representing the private sector of the pulp and paper industry of the Philippines, also members.

Technical problems in connection with the pulp and paper development in this region were presented and discussed in the Conference, such as availability and kind of raw materials, engineering and technology, production and consumption of pulp and paper in the region, waste paper collection and utilization, manufacture of hand-made papers, etc.

Upon its return to the Philippines, the delegation submitted its report to the Chairman, Philippine Committee on ECAFE matters, Manila.

The delegation's recommendations to the Philippine Government are as follows:

RECOMMENDATIONS

1. In order to attain efficient operation of the pulp and paper mills and help further the development of the industry particularly in the production of pulp from indigenous raw materials, the government should create and properly equip an institution for the training of qualified men in pulp and paper engineering and technology.

2. No pulp or paper mill shall be allowed to be established without any assurance of an adequate and sustained source of supply of domestic raw materials.

3. Intensified research and pilot studies on the pulp and paper making properties of indigenous fibrous raw materials including rain forest should be given generous support from the government and private sectors in order to accelerate such studies.

4. Government policy should be directed to the granting of long term leases of forest lands in lieu of annual or short term licenses. The proposed leasing system shall place on the lessee the entire responsibility of protection and reforestation of the area leased and its management on sustained yield basis.

5. In order to promote reforestation of waste public lands by private enterprise, substantially large areas of such lands should be leased under liberal terms for the raising of wood raw material to feed pulp and paper mills. The land shall be rent free but when the wood is harvested 10 to 20% of the cash value of the harvest shall be paid

the Government. This practice in Taiwan has developed forest consciousness of the people.

6. Even owners of private lands in the vicinity of pulp mills should be encouraged to raise fast growing forest tree crops for these mills.

7. Technical men should be sent to more advanced countries to study modern technology and engineering needed in fostering the efficient utilization of forest products, particularly woody materials. The trainess should learn the language of the countries in which they are to be trained, in order to be able to read, understand, and translate technical papers. Language difficulty is a common barrier in the effective use of scientific reports from Japan, Germany, Russia, and other countries noted for their engineering and technology.

8. Assistance by the Government for the further growth of the pulp and paper industry may be extended in the form of protective tariff and credit priorities through the banking system. The first is necessary in view of actual and potential competition from well-established manufacturing plants in Japan and the Western hemisphere. The second is essential in view of the availability of limited capital from the private sector and the urgent need for further research and development in pulp materials for the manufacturing of paper.

9. Further incentive should be given for the local manufacture of pulp out of indigenous raw materials, such as bamboo, bagasse, rice straw, broad leaf woods, etc., by raising the tariff duty on imported pulp from 10 per cent to 25 per cent, and by allowing the importation of pulp and paper machinery, for those firms or individuals having adequate sources of raw materials, at the preferred rate of exchange.

10. The practicability of establishing small scale pulp and paper mills in some of the population centers in the country, where raw materials are available, merits serious consideration. Small mills should be integrated with the logging and sawmilling operations of timber licensees which will utilize the waste and residues of such operations. These mills may be more responsive to the geographical feature of the country, the availability of natural and financial resources, technical know-how, the urgency of consumer demand, the extent of the area to be covered and transportation costs. The need to disperse industries and to provide increasing employment in a country consisting of several islands separated by seas is obvious. Larger gainful employment and decentralization of industries could be effected only through enterprises that could be established economically under small-scale operation.

11. The conservation and development of forest areas that are now serving or are potential sources of pulp materials for the paper industry should form part of the over-all land use and conservation programs of the government. Kaingin making must be controlled and the rigid enforcement of the selective logging systems is imperative. Moreover, the development of communication, transportation, and other social overhead facilities for these areas should be included in the national development program.

(Sgd.) MARIANO P. RAMIRO
Chairman

(Sgd.) EUGENIO DE LA CRUZ
Member

(Sgd.) MANUEL R. MONSALUD
Member

(Sgd.) AMANDO M. DALISAY
Member

(Sgd.) AMANDO CLEMENTE
Member

(Sgd.) ALEXANDER A. ADAMSON
Member

Progress Report On The Occurrence Of Silica Inclusions In Philippine Woods

I. SAPOTACEAE

By

Arsenio L. Toñgacan and Francisco N. Tamolang[1]

Silica inclusions in woods have been associated with marine borer resistance and the dulling of saws and serve as prospective diagnostic features in differentiating closely allied species or genera. This resistance to attack by teredine or marine borers was first observed in certain siliceous timbers by Gonggrijp (3)[2] who indicated that a silica content of 0.5 percent of the dry weight of the wood was sufficient to confer resistance properties upon the timber. Within one species of "Australian turpentine" specimens (*Syncarpia procera* (Salisb.) Domin.), Amos and Dadswell (2) observed that such resistance to teredine attack increased with silica content. The Hawaiian-grown turpentine, which had silica content of 0.09 percent, however, was not found to have substantial resistance. They stated that in addition to silica inclusions, perhaps the conditions favoring silica accumulation enhance the production of other toxic agents that also offer resistance to teredine attack. This makes it necessary to determine whether silica, in the absence of its accompanying metabolites found in silica-accumulating species, is a deterrent to teredine attack. Amos (1) also pointed out that siliceous timbers generally are "hard" to saw and some of them dull the teeth of saws rapidly. He mentioned further that this dulling property of these timbers might "have prompted van Iterson in 1933 to propose the theory that marine borer resistance is based upon the abrasive quality of the silica inclusions."

No tests are known to have been made in the Philippines to study the relationships between silica content and marine-borer resistance or to relate the silica content to the rate of saw dulling in lumber production. In either case, the relationship is likely to be complicated by other factors.

The occurrence of silica inclusions in wood in certain species, genera and families, has proven to be of significant diagnostic value to a certain extent. This was pointed out by Amos (1) as a promising criterion in separating closely allied genera or species because silica inclusions are readily recognizable by their characteristic properties.

For the assessment and solution of practical problems associated with silica, it is desirable to have a list of silica-bearing native species such as those prepared by Petrucci in 1903, Gonggrijp in 1932, Frison in 1942 and Amos (1). Such list of silica-bearing species is still wanting in the Philippines.

This paper presents the results to date of the investigation being conducted by the Forest Products Research Institute on the occurrence of silica inclusions in Philippine

[1] Wood Technology Division, Forest Products Research Institute, College, Laguna, Philippines.

[2] Numbers in parenthesis refer to literature cited at the end of this paper.

woods of the Sapotaceae. The objects of the study were (a) to investigate the woods of the Sapotaceae in order to determine the species that are silica-bearing; (b) to classify the types of silica inclusions in these species as possible diagnostic features for their identification; and (c) to determine the size and distribution of silica inclusions.

MATERIAL PREPARATION

From the standard working wood collection of the Forest Products Research Institute, 102 wood samples of 32 species representing nine genera of the Sapotaceae were used in this study (Table 1). The hand specimens were grouped into heartwood and sapwood and first underwent a scout test which consisted of the ordinary burning splinter test. In this test, specimens which left gray ash, indicating the presence of silica, were given priority in the study although the other specimens that did not produce gray ash were also studied later.

From each hand specimen, sections were made to provide two permanent slides or mounts. The first mount was for routine anatomical examination, the second for silica determination. This was prepared by wet digestion of the wood to isolate silica inclusions.

ANATOMICAL EXAMINATION

The form of silica as it occurs in wood has been described by different researchers as inclusions, aggregates, corpuscles, bodies, echinulate bodies, and various combinations of these terms, such as corpusculate aggregates, etc. (1). In this study, only two terms were used to describe the existence of silica in wood, namely: *silica inclusions* and *vitreous silica*. The former refers to cell inclusions smaller than the lumina of the cells in which they occur, with a wrinkled or uneven surface, and a refractive index of 1.434. The latter, which refers to silica deposited as a lining on cell walls or completely filling the lumen of the containing cell, has a vitreous microscopic appearance and a refractive index greater than 1.5 (1). Due to lack of refractive index apparatus the refractive index was not determined. However, the polarizing microscopic was used whenever there was doubt as to the recognition of silica inclusions.

In the microscopic observations, the method of preliminary analysis used by the Division of Forest Products, C.S.I.R.O. (1) was generally followed. This method indicated that silica is visible microscopically with the low power objective provided it is present in quantities in excess of 0.05 percent. In making microscopic observations, therefore, species which deposit silica as microscopically visible cell inclusions were considered *silica accumulating*, or *silica-free* if otherwise. Diameters of silica inclusions of each silica-accumulating species were measured with a micrometer eyepiece and the average diameter for the species was determined. Obviously in the silica-free wood no measurements were made but silica may be present in the ash in such small amounts that its presence can only be determined by chemical analysis which was beyond the scope of this investigation.

The occurrence and distribution of silica in the different wood elements were observed carefully, particularly some of the characteristic patterns in which they occur. In addition, an attempt was made to count the number of silica inclusions per field of the microscope.

RESULTS AND DISCUSSION

The species of the Sapotaceae studied for silica determination are listed in Table 1 with the local and scientific names of the species, number of wood samples used, and number of permanent mounts examined for each species. Tables 2 and 3 show the results of the scout test and anatomical examination of 32 local and one foreign woods. In the scout test, 14 wood samples representing six species had gray ash indicating the presence

of silica, 22 of four species had white ash indicating the presence of carbonates, two of two species had brown ash indicating the presence of manganese, 49 of 19 species had grayish-white ash, and 15 of three species had grayish-yellow ash. Species with gray ash were: *Madhuca burckiana, M. obovatifolia, Mimusops parvifolia, Palaquium bataanense, P. obovatum* and *Pouteria macrantha.* In the anatomical examination, 21 species were found silica-accumulating (Table 2), all 11 silica-free (Table 3).

As observed, silica deposits occurred as *inclusions* (Plate I, Fig. 1) and none as *vitreous.* Typical of these inclusions were dot-like barely discernible silica to distinctly large and very irregular silica occuring in the rays of the cross, radial, and tangential sections. This occurrence was found both in the procumbent and marginal ray cells and rarely in the vertical parenchyma of the radial and tangential sections.

Observations on the size and occurrence of silica inclusions in the local woods studied (Tables 2 & 3) suggested the following arbitrary classifications to permit comparing the results with that obtained from the Australian turpentine.[3] According to diameter (a) very small or dot-like silica inclusions are less than 4 microns, (b) a small inclusion is 4 to 18 microns, and (c) a large silica inclusion is more than 18 microns.

Occurrence of silica inclusions as determined by counts per field of 16 mm. objective and 8x eyepiece of a Dialux binocular microscope, is considered (a) very few when they are less than 100, (b) few when they are from 100 to 150, and (c) numerous when they are more than 150.

The specimen of *Syncarpia procera* prepared in the Forest Products Research Institute showed very few silica inclusions (60 per field) in the ray cells (Plate I, Fig. 2). The average diameter of the inclusions was 14.1 microns.

Based on the size, occurrence and distribution of their silica inclusions, the local woods that may contain as many silica inclusions as *Syncarpia procera* are *Madhuca betis* (from Rizal), *M. monticola, M. ramiflora, Planchonella firma* and *Pouteria luzoniensis.* Those that may be higher in silica inclusions than *Syncarpia procera* are *Madhuca betis* (from Cagayan and Mindoro), M. leerii, M. oblongifolia, M. obovatifolia, *Mimusops parvifolia,* (except those from Candaranon, Spiankot, Tawi-tawi and Manukmanuk islands), *Palaquium bataanense, P. obovatum* and *Pouteria macrantha.* These results suggest some appreciable indications of the usefulness of the woods as well as warning to operators who process them in the sawmills.

To the wood technologist or anatomist, the two common similar woods in the market, bansalagin (*Mimusops parvifolia*) and duyok-duyok (formerly named *Mimusops calophylloides*) are likely to be differentiated by their silica contents (Plate II, Fig. 1 and 2), i.e., bansalagin is silica-accumulating while duyok-duyok is silica-free. The recent work of Salvosa (4) points out that duyok-duyok is now named *Manilkara merrilliana*[4] and obviously these two local woods are botanically different by species as well as by genera.

Similarly, two other species, *Sideroxylon fragrans* and *Sideroxylon ahernianum* were, until recently known to belong to the same genus. The same investigator (4) mentions that the former is now named *Planchonella firma* which definitely belongs to a different genus. This species has been found to be silica-accumulating while the latter is silica-free.

In this study, the limited number of wood samples in some species imposes obvious limitations on the interpretation of the resultant observations. However, the presence or

[3] *Syncarpia procera* Salisb. = *Syncarpia laurifolia* Tenore. Index Kewensis, 1895. pp. 221-222. Boas, I.H., 1947. The Commercial Timbers of Australia, p. 240.

[4] Named by H. J. Lam. in Bull. Jard, Butenz. III 7 (1925) 240.

absence of silica inclusions may be a promising diagnostic feature useful for species identification[5] in the laboratory and may confirm to a certain extent some recent trends in plant nomenclature as mentioned in these two specific cases.

Specimens examined — Chrysophyllum roxburghii G. Don, 29161 B.F., 27860 B.F.

Diploknema ramiflora (Merr.) H.J. Lam, 10384 B.F., 17596 B.F., 12743 B.F., 8330 B.F., 10086 B.F.

Madhuca betis (Blanco) Macbr. & Merr. 7066 B.F., 2143 B.F., 238 M.P., 6547 B.F.

M. burckiana (Koord.) H.J. Lam, 14058 Elm., 26883 Elm.

M. leerii (Teijsm. & Binn.) Merr. 27903 B.F., 9342 B.F.

M. monticola (Merr.) Merr. 27903 B.F.

M. oblongifolia (Merr.) Merr. 27101 B.F.

M. obovatifolia (Merr.) Merr. 21426 B.F., 21454 B.F.

Manilkara merrilliana H.J. Lam, 22834 B.F., 23530 B.F.

Mimusops parvifolia R. Br. 5974 B.F., 27226 B.F., 7129 B.F., 21025 B.F., 22525 B.F., 13379 B.F., 20802 B.F., 21426 B.F., 7057 B.F., 21795 B.F., 26693 B.F., 29115 B.F., 2305 B.F., 18798 B.F., 502 M.P., 29116 B.F., 18695 B.F., 3070 M., 3781 B.F., 6731 B.F., 22515 B.F., 9330 B.F., 14911 B.F., 10337 B.F., 26130 B.F.

Palaquium ahernianum Merr. 20797 B.F., 20098 B.F.

P. bataanense Merr. 13040 B.F.

P. celebicum Burck 13451 B.F.

P. cuneifolium Merr. 30872 B.F., 2993M.

P. elongatum Merr. 22317 B.F.

P. lanceolatum Blanco 6782 B.F.

P. luzoniense (F.-Vill.) Vid. 1761 M., 17565 B.F., 1982 M., 23616 B.F., 5274 B.F., 22591 B.F., 7144 B.F., 30837 B.F., 5456 B.F., 5274 B.F. (a), 22591 B.F. (a), 7144 B.F. (a).

P. merrillii Dub. 253 B.F., 10476 B.F., 31210 B.F., 27732 B.F., 26496 B.F.

P. obovatum (Griff.) Engl. 27708 B.F.

P. philippense (Perr.) C.B. Rob. 17532 B.F., 168 B.F., 2 B.F., 7708 B.F., 11662 B.F., 9715 B.F., 17577 B.F., 1603 B.F., 17532 B.F. (a), 13451 B.F.

P. pinnatinervium Elm. 13896 Elm.

P. tenuipetiolatum Merr. 21938 B.F., 17930 B.F., 7498 B.F.

P. polyandrum C.B. Rob. 27825 B.F., 15411 B.F.

P. whitfordii Merr. 20470 B.F.

Planchonella firma Dub. 22499 B.F.

Pouteria luzoniensis (Merr.) Baehni, 3916 B.F.

P. macrantha (Merr.) Baehni, 23152 B.F.

P. duclitan (Blanco) Baehni, 27858 B.F., 10318 B.F., 23035 B.F., 11706 B.F., 24802 B.F.

P. oxyedra (Miq.) Baehni, 27887 B.F.

P. villamillii (Merr.) Baehni, 10317 B.F.

Sideroxylon ahernianum Merr. 174 M.P.

[5] For confirmatory and practical differentiation between the two species the color of their hot water extracts may be used. Hot water extract of duyok-duyok was found to be reddish brown in color while that of bansalagin was colorless.

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A farmer who went to a large city to see the sights engaged a room at a hotel and before retiring asked the clerk about the hours for meals.

"We have breakfast from 7 to 11, dinner from 12 to 3, and supper from 6 to 8," explained the clerk.

Look here," inquired the farmer in surprise, "what time am I goin' to see the town?"

* * * *

If he doesn't get it, he's a ne'er-do-well.

If he doesn't try to get it, he lacks ambition.

If he gets it without working, he's a parasite.

If he gets it after a life of hard labor, he's a fool who got nothing from life!

TABLE 1. Species of the Sapotaceae studied for silica determination

Scientific name	Local name	No. of wood samples	Permanent mounts prepared		No. of wood samples studied	
			Bleached	Stained	Heartwood	Sapwood
1. *CHRYSOPHYLLUM*						
C. roxburghii G. Don,	kalalang	2	2	2	1	1
2. *DIPLOKNEMA*						
D. ramiflora (Merr.) H.J. Lam,	baniti	5	5	5	4	1
3. *MADHUCA*						
M. betis (Blanco) Macbr. & Merr.	betis	4	10	8	4	—
M. burckiana (Koord.) H.J. Lam,	malobon	2	3	4	2	—
M. leerii (Teijsm. & Binn.) Merr.	edkoyan	2	3	4	2	—
M. monticola (Merr.) Merr.	betis-bundok	1	2	2	1	—
M. oblongifolia (Merr.) Merr.	malabetis	1	1	1	—	1
M. obovatifolia (Merr.) Merr.	pianga	2	5	4	1	1
M. ramiflora (Merr.) H.J. Lam,	baniti	2	2	2	2	—
4. *MANILKARA*						
M. merrilliana H. J. Lam, (*Mimusops calophylloides* Merr.)	duyok-duyok	2	2	2	2	—
5. *MIMUSOPS*						
M. parvifolia R. Br.	bansalagin	25	35	30	20	5
6. *PALAQUIUM*						
P. ahernianum Merr.	kalipaya	2	2	2	—	2
P. bataanense Merr.	bataan tagotoi	1	2	2	—	1
P. celebicum Burck	—	1	1	1	—	1
P. cuneifolium Merr. (*P. cuneatum* Vid.)	malikmik	2	2	2	1	1
P. elongatum Merr.	natong-pula	1	1	1	—	1
P. lanceolatum Blanco	palak-palak	1	2	2	—	1
P. luzoniense (F.-Vill.) Vid.	nato	12	13	13	6	6
P. merrillii Dub.	dulitan	5	5	5	3	2
P. obovatum (Griff.) Engl.	lahas	1	1	1	—	1
P. philippense (Perr.) C.B. Rob. (*P. oleiferum* Blanco)	malak-malak	10	14	13	3	7
P. pinnatinervium Elm.	tagkan	1	2	2	—	1
P. tenuipetiolatum Merr.	maniknik	3	3	3	3	—
P. polyandrum C.B. Rob.	tipurus	2	2	2	1	1
P. whitfordii Merr.	—	1	1	1	1	—
7. *PLANCHONELLA*						
P. firma Dub. (*Sideroxylon fragrans* Elm.)	bago-maho	1	1	1	1	—
8. *POUTERIA*						
P. luzoniensis (Merr.) Baehni, (*Sideroxylon luzoniense* Merr.)	banokbok	1	1	1	1	—
P. macrantha (Merr.) Baehni, (*Lucuma macrantha* (Merr.) H.J. Lam.)	white nato	1	1	1	—	1
P. duclitan (Blanco) Baehni, (*Sideroxylon duclitan* Blanco). (*Sideroxylon nitidum* Merr.)	duklitan	5	9	6	1	4
P. oxyedra (Miq.) Baehni, (*Sideroxylon pittosporifolium* Elm.)	loter	1	1	1	1	—
P. villamillii (Merr.) Baehni, (*Sideroxylon villamillii* Merr.)	Villamils-nato	1	1	1	1	—
9. *SIDEROXYLON*						
S. ahernianum Merr.	Ahern's-mangkas	1	2	1	—	1
	Total	102	137	136	62	41

TABLE 2. Summary of silica-accumulating species of sapotaceae

Species	Splinter test[1]	Silica Inclusions			Occurrence in species wood samples	Local distribution
		Abundance[2]	Size in microns	Per field[3] (average)		
A. *Species with large silica inclusions*						
Madhuca						
M. betis	GWa	VF	23.3	38-137 Ave. 90	2 in 4	Cagayan, Mindoro
M. burckiana	Ga	N	21.2	123-360 Ave. 219	2 in 2	Agusan, Cagayan
M. obovatifolia	Ga	Fw	25.0	49-228 Ave. 127	2 in 2	Camarines
M. ramiflora	GWa	Fw to N	20.3	98-253 Ave. 158	2 in 2	Palawan, Mindoro
Mimusops						
M. parvifolia	Ga	Fw to N	20.0	58-343 Ave. 168	6 in 25	Bataan, Camarines, Palawan, Cotabato
Palaquium						
P. bataanense	Ga	Fw	18.5	58-149 Ave. 117	1 in 1	Ilocos Sur
P. obovatum	Ga	Fw	22.1	90-159 Ave. 118	1 in 1	Davao
B. *Species with small silica inclusions*						
Chrysophyllum						
C. roxburghii	GWa	VF	17.0	27-79 Ave. 45	2 in 2	Palawan
Pouteria						
P. macrantha (*Lucuma macrantha*)	Ga	N	15.7	87-283 Ave. 192	2 in 2	Lanao
Madhuca						
M. betis	GWa	Fw	14.8	79-236 Ave. 127	2 in 4	Rizal
M. leerii	GWa	N	14.0	84-197 Ave. 188	2 in 2	Zamboanga
M. monticola	GWa	Fw	13.4	60-149 Ave. 104	1 in 1	Palawan
M. oblongifolia	GWa	N	14.3	309-386 Ave. 311	1 in 1	Camarines
Mimusops						
M. parvifolia	GWa to	Fw	14.0	23-225 Ave. 100	14 in 25	Mindoro, Zamboanga, Cagayan, Ilocos Sur, Masbate, Palawan, Cotabato, Quezon

TABLE 2. Summary of silica-accumulating species of sapotaceae (Cont'd)

Species	Splinter test[1]	Silica inclusions: Abundance[2]	Silica inclusions: Size in microns	Silica inclusions: field[3] Per (average)	Occurrence in species wood samples	Local distribution
Palaquium *P. celebicum*	GWa	VF	6.5	21-85 Ave. 59	1 in 1	Pangasinan
P. cuneifolium (*P. cuneatum*)	GWa to Ga	VF	10.9	32-85 Ave. 63	2 in 2	Quezon, Zambales
P. philippense (*P. olelferum*)	GWa to GYa	VF	8.2	22-109 Ave. 55	10 in 10	Bataan, Mindoro, Batangas, Laguna, Pangasinan
Planchonella *P. firma* (*Sideroxylon fragrans*)	GWa	Fw	13.8	49-164 Ave. 119	1 in 1	Capiz
Pouteria *P. luzoniensis* (*Sideroxylon luzoniense*)	GWa	N	11.3	253-323 Ave. 288	1 in 1	Tapiantana Island
C. *Species with dot-like silica inclusion*						
Mimusops *M. parvifolia*	GWa to Ga	Trace	—	—	5 in 25	Candaranon Island, Spiankot Island, Tawi-tawi, Manuk-manuk
Palaquium *P. merrillii*	Wa (4) to Ba (1)	Trace	—	—	5 in 5	Zambales, Camarines, Davao, Cagayan, Agusan
P. whitfordii	GWa	Trace	—	—	1 in 1	Cagayan
Pouteria *P. duclitan* (*Sideroxylon duclitan*) (*S. nitidum*)	GWa to GYa GYa	Trace	—	—	5 in 5	Quezon, Laguna, Cotabato, Camarines
P. oxyedra (*Sideroxylon pittosporifolium*)	Ba	Trace	—	—	1 in 1	Palawan
D. *Australian speces with silica inclusions as basis of comparison*						
Syncarpia *S. procera*	charcoal	VF	14.1	50-78 Ave. 60		Queensland and New South Wales

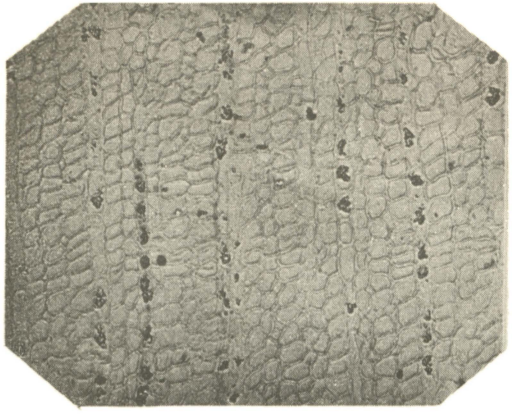
[1] Ba — Brown ash
Ga — Gray ash
Wa — White ash
GBa — Grayish brown ash
GWa — Grayish white ash
GYa — Grayish yellow ash

[2] N — numerous
Fw — few
VF — very few

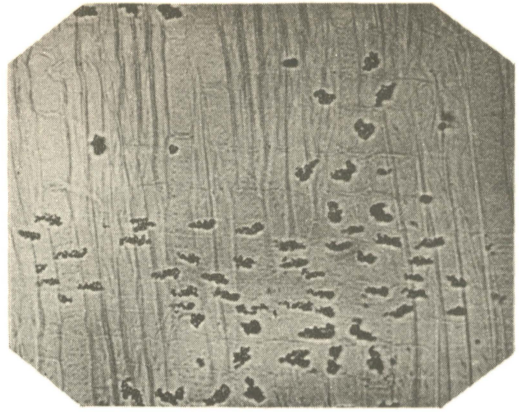
[3] Counts on the cross, radial and tangential sections with the use of 16 mm. objective & 8x eyepiece of the Dialux binocular microscope.

TABLE 3. Summary of silica-free species of the sapotaceae

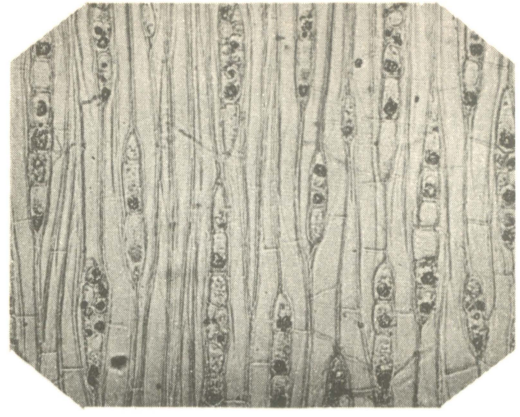
Species	Splinter test	No. of specimens silica-free	Local distribution
Diploknema			
D. ramiflora	white to grayish-white ash	5 in 5	Bataan, Leyte, Pangasinan
Manilkara			
M. merrilliana (*Mimusops calophylloides*)	grayish-white ash	2 in 2	Surigao
Palaquium			
P. ahernianum	grayish-white ash	2 in 2	Zamboanga
P. Elongatum	grayish-white ash	1 in 1	Nueva Ecija
P. lanceolatum	grayish-white ash	1 in 1	Mindoro
P. luzoniense	white to grayish-white ash	12 in 12	Mindoro, Sibuyan, Zamboanga, Bataan, Quezon, Ilocos Sur
P. pinnatinervium	grayish-white ash	1 in 1	Agusan
P. polyandrum	grayish-white ash	2 in 2	Davao
P. tenuipetiolatum	grayish-white ash	3 in 3	Bataan
Pouteria			
P. villamillii (*Sideroxylon villamillii*)	grayish-yellow ash	1 in 1	Quezon
Sideroxylon			
S. ahernianum	white ash	1 in 1	Rizal



Cross Section
L.P. X-65

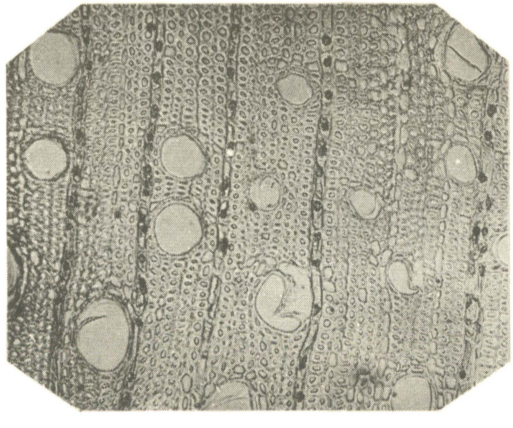


Radial Section
L.P. X-65



Tangential Section
L.P. X-65

1. Pianga (Madhuca obovatifolia **(Merr.) Merr.)**



Cross Section
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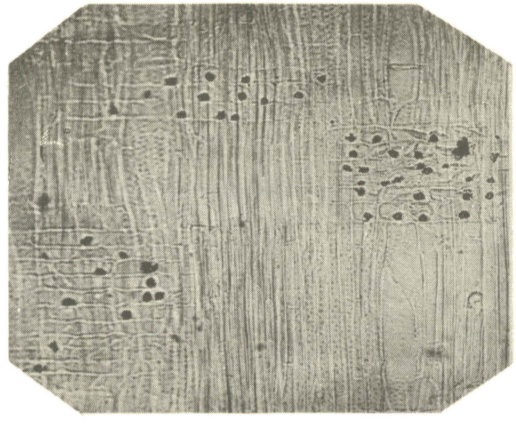
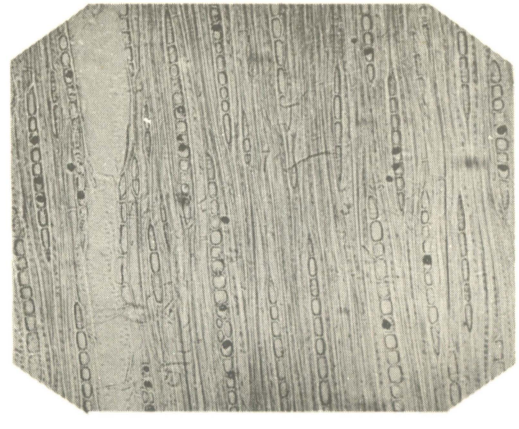


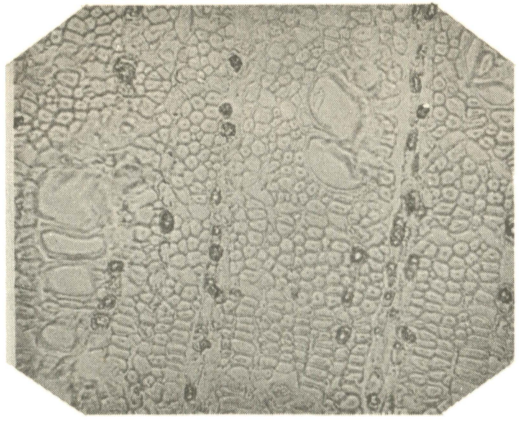
Radial Section
L.P. X-65



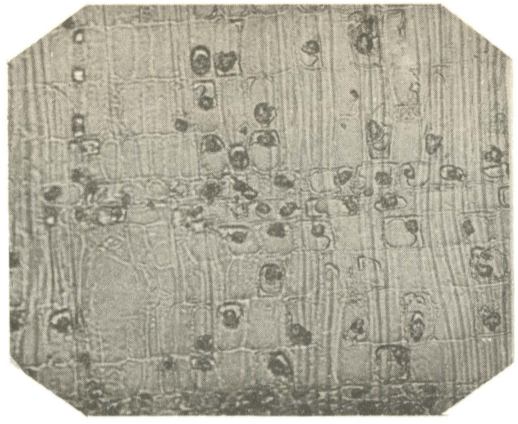
Tangential Section
L.P. X-65

2. Australian turpentine (Syncarpia procera **Selisb.)**

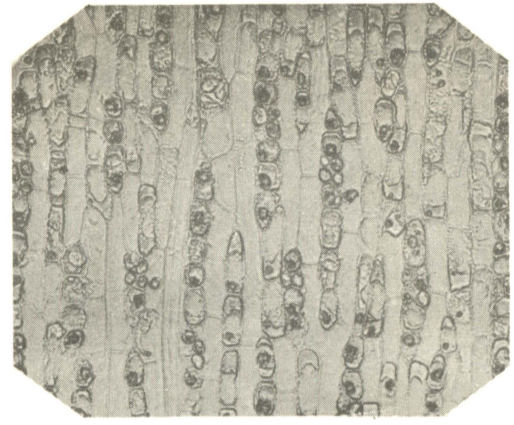
Plate I



Cross Section
L.P. X-65

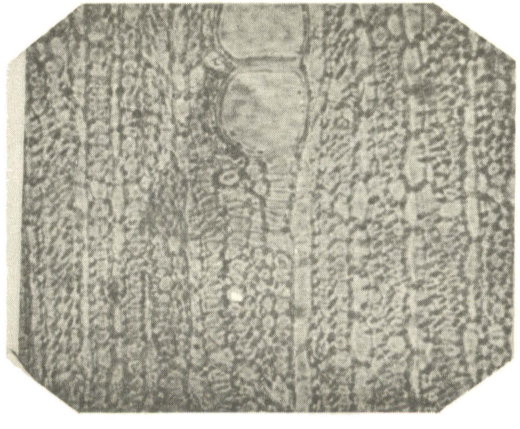


Radial Section
L.P. X-65



Tangential Section
L.P. X-65

1. Bansalagin (Mimusops parvifolia **R. Br.**)



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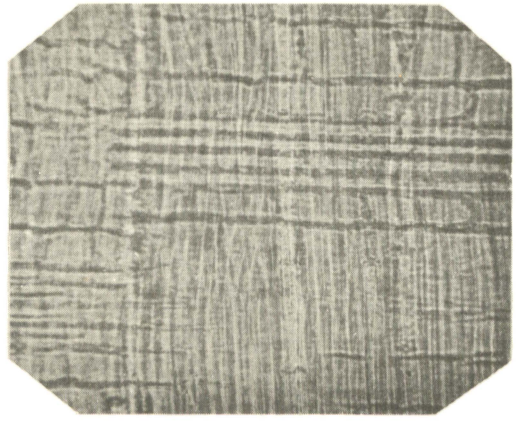
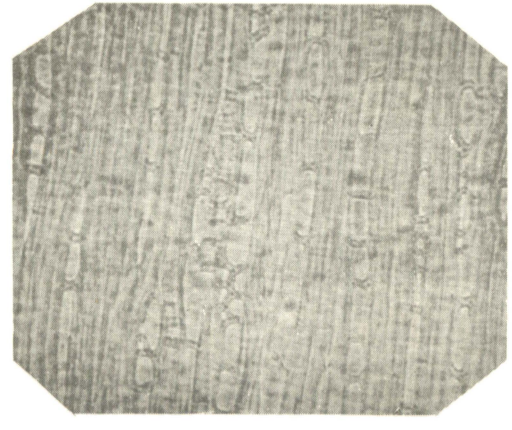


Radial Section
L.P. X-65



Tangential Section
L.P. X-65

2. Duyok-duyok (Manilkara merrilliana **H. J. Lam.**)

Plate II

Some Foods for Thought on the Local Scene

By
MANUEL R. MONSALUD
Assistant Director, F.P.R.I.

I. OUR NEED FOR LANGUAGE EXPERTS

Practically all our scientists and researchers are well versed in understanding, reading and writing English; a handful in Spanish, German, and French; and very, very few, if any, in Russian, Japanese, Chinese, Swedish, etc.

There's a lot of good scientific publications written in the last four named languages, which sometimes reach our scientific or public libraries; yet it can safely be assumed that there is at present practically no Filipino researcher capable of readily reading and understanding publications written in these languages.

It is high time that the Philippine government and private entities here should be sending promising men or women abroad to study these foreign languages. They can live with respectable families abroad that use these languages at home, in addition to studying them formally in colleges or universities. By this method, it is obvious that the Filipino trainee can, in a much shorter time, learn well how to speak, read, and write these languages.

Many promising Russian, Japanese or Chinese researchers or scientists are regularly being sent abroad to study English, German, French and other languages. When they go back to their countries, they are big assets to their respective governments in that they can readily help in the translation of technical publications written in languages other than their own.

There is no doubt that in many of our libraries in this country, especially in the University of the Philippines, in the Institute of Science and Technology, in the Library of Congress, etc., publications, written in Russian, Japanese, Chinese, and other languages can be found and many of our present researchers or scientists can not take advantage of these publications due to language difficulty.

It is urgently suggested that our government should send language trainees (not only technical trainees) abroad as soon as possible either at our own expense or thru such aids as those of the Colombo Plan, F.A.O., UNESCO, WHO, etc., so that our progress in the development here of modern science and technology will be greatly accelerated.

II. AWAY WITH COCKFIGHTING

Cockfighting is a national past time in the Philippines and a pernicious vice. It is believed that, all over the country, one out of every five male adults is a rabid cocker. On Sundays, Mr. Cocker seldom misses to go to the cockpit. Even on ordinary working days when *pintakasis* are held. Mr. Cocker invariably is never absent from the cockpit. Therefore, much valuable time on the part of Mr. Cocker is thereby lost.

Mr. Cocker devotes a large part of his time, if he raises a cock or cocks, in petting them instead of helping in the daily chores at home or showing his children wise examples. If cock fighting is held on days other than Sundays without legal sanction, it is termed *topada* or illegal cockfighting. More

often than not, Mr. Cocker loses in the game the money that would have gone into the improvement of his farm, house, fence, in the education and well-being of his children, in buying medicine for his sick wife, etc. Look at the financial and economic status of the average cocker! There is a lot of improvement to be desired.

Mr. Cocker looks with keen anticipation on the coming of Sunday, or any day for that matter, on which his favorite pastime is held. He prepares his capital for it dutifully. Sometimes, he mortgages or sells whatever property of his or that of his wife that he can lay his hands on. The needs of his children are pushed back to lower priority; he borrows from anybody who is willing to lend him at usurious interest naturally. Mr. Cocker does not leave any stone unturned in raising his capital for the occasion.

In the event he wins, which is seldom, he usually makes purchases right and left manifesting the truism of the saying, "easy come, easy go". Very often he loses. During such times, he becomes grouchy or hot tempered. He vents his anger on his children or on his poor wife for real or imaginary faults of his kins.

There are times, especially after losing heavily in the game, when Mr. Cocker thinks of evil plans such as staging a hold-up or forcing his children to become servants, or his wife to be a laundress or even worse.

Assuming that there are five million adults in the Philippines, it is estimated that one million of these are cockfight addicts. Granting that each goes to the cockpit once a week, the total of 52,000,000 man-days are lost to the country's economy annually, for cockfighting is never a constructive endeavor. Inasmuch as ₱2.50 a day is the minimum rate of daily wage for the farm hand, this economic loss amounts to the staggering amount of ₱130,000,000.00 a year. This enormous sum does not take into consideration that which pertains to the numerous women who also are addicted to this vice, nor the ₱4.00 minimum daily wage for factory workers, very many of whom are also cockfighting addicts.

Another evil connected with cockfighting, which may be considered more serious, is the spread of tuberculosis among the habitués of the cockpit.

Picture a teeming place, like the *"gallera"*, crowded with hundreds or thousands of excited, shouting and perspiring, cockfighting addicts, with gaseous substances and saliva, laden with active tuberculosis germs, being exhaled or sprayed in the atmosphere of the cockpit! This scene is an ideal set up for the rapid spread of the white plague. Every one in the cockpit can not help but inhale some air laden with the tubercular bacilli, so unless one is sure that he is immune from TB, he should pause and think many times before entering the cockpit.

It is believed that, if a medical survey is taken at random in different places or barrios, such surveys will show that the incidence of TB among the cockers is very high, perhaps it will be above 50 percent; and remember, these cockers, being germ carriers, will likely infect the immediate members of their families and, perhaps, their neighbors.

It is therefore suggested, in all earnestness, that the law legalizing cockfighting be repealed. Let cockfighting in any form, held at any time, be outlawed.

Our people, who devote much of their time in the cockpit or in petting their cocks, can put to better use such time, for example, in athletics (playing sipa, basketball, baseball, volleyball, etc.) for the building up of their physiques, or in working in their farm, backyards, and in other income-producing ventures, leading eventually to the improvement of their health and in the raising of their economic and financial status. Also, these cockers could engage in self-help projects for the betterment of their community, such as building communal irrigation projects, feeder roads, small bridges to cross creeks, etc.

As the New Year comes, let us resolve, once and for all, to do away with this pernicious evil of a pastime, this national curse, this cockfighting business. Will our legislators heed this reminder? Will the numerous civic, religious, and educational organizations join this movement? *Vamos a ver.*

III. VANISHING WILDLIFE

Most of us still remember that not so long ago there was plenty of wildlife in the Philippines — birds of different kinds, deer, wild pigs, and other animals that abound in the Philippine forests, mangrove swamps, and in the open fields. Now-a-days such wildlife has almost totally disappeared from the scene. Many of these animals, especially the birds, are beneficial to the farmers for they feed on insects that are destructive to crops.

There are several possible causes for the disappearance of wildlife, namely, (1) the extensive use of shotguns and air rifles for hunting birds and other wild animals inside and outside of the hunting season, (2) the excessive cutting of the forest by loggers or by *kaingineros* which causes the rapid drying of creeks and rivers, thus depriving wildlife of fresh water to drink, (3) the indiscriminate cutting of trees in the forests and elsewhere resulting in the destruction of many that yield edible fruits good for man, animals, and birds. Therefore, to that extent, wildlife is deprived of food.

All the farmers and orchard owners nowadays, unknowingly or unwittingly, are becoming selfish in that in harvesting the fruits of their trees they gather everything, not leaving even a few to ripen fully on the tree to feed wildlife.

Certainly it is nice and enjoyable to hear birds singing hilariously or frolicking from branch to branch. How many of us, even those living in or near the mountains, now experience such a priceless joy?

In order to remedy this unhappy situation and to prevent the total disappearance of Philippine wildlife from taking place, the following remedies are recommended:

(1) Strict enforcement of our hunting laws by our police officers, P.C., and others charged to enforce these laws. The laws must be explained to the pupils in the elementary grades as well as to those attending adult classes for them to understand and obey.

(2) Controlled logging and total elimination of the kaingin system will, in due course of time, minimize or stop the rapid denudation of our forests which in turn will revive our fresh creeks and rivers from which wildlife can draw much needed water.

(3) All fruit-tree owners are requested or reminded to leave a few fruits on their trees to mature and ripen fully as food for wildlife.

(4) The newly created Reforestation Administration Office should include in its reforestation program the planting, at strategic places all over the country, of some edible-fruit-bearing trees like guava, duhat, casoy, papaya, chico, bignay, and many others. Surely these will give food to our neglected friends.

THE REGENERATION OF . . .

(Continued from page 36)

45 feet in height 30 months after planting (20). Intensive pine plantation culture in temperate South Africa produced yields at 20 years which compare favorably with those of the tropical zone (8).

A further indication may be evident in recent results in Puerto Rico with what appears to be parallel intensification with a similar crop, coffee. The typical coffee plantation in Puerto Rico has much in common with natural tropical forests subject to extensive management. A large portion of the stand (the shade trees) does not enter into the yield. The trees which provide the harvest (the coffee trees) are not of selected strains, and they vary considerably in productivity. Both the shade and the coffee stand, as a result of growth and natural regeneration, become and are maintained overstocked, with many low yielding coffee trees. Culture consists of occasional light thinning and pruning of the shade trees and cleaning sufficiently around the coffee trees to permit harvesting. The mean yield of these plantations is from 150 to 200 pounds of market beans per acre per year.

Experiments in the intensification of coffee culture in Puerto Rico have introduced changes which are of the same order as those which should be tested for timber production, with the exception that better lands were not used. Different varieties showed similar yields under the prevailing culture, a situation which may apply equally to forest trees. Response to fertilizing old plantation was weak. More marked increases in yield followed the use of wider spacing of both coffee and shade trees and application of fertilizers. However a combination of all treatments, using selected varieties, adequate separation of coffee trees, elimination of the nonproductive shade stand, heavy and frequent applications of fertilizer, and chemical control of insects and diseases, produced the first crop in two-thirds the time otherwise required, and the average for the first five annual harvests was 1,800 pounds of beans per acre. This increase was almost tenfold. Net profit rose at about the same rate. Harvesting costs were reduced one third.

The new intensive techniques in coffee culture in Puerto Rico are not yet proven to the satisfaction of all. Skeptics still anticipate unforeseen problems. However, now that the magnitude of the advantage of intensification are known, far more can be invested than has ever been possible heretofore, if need be, toward the solution of such problems.

The intensification of forest planting and plantation management in the tropics will require much more complete knowledge of the factors of production, as well as substantial capital investment. It can only develop gradually. In large areas existing stands must be the basis for timber production for indefinite periods in the future. Nevertheless, as population and demands for land and forest products grow and as other types of agriculture progress, intensive plantation culture may prove to be the only economical source of timber in the tropics.

Establishing More Effective Coordination Of Function Among Forestry Agencies*

Mr. Chairman, Colleagues,
Ladies and Gentlmen:

On several occasions I found myself in a serious predicament whenever I was made to talk on a subject which was not of my own choice. This afternoon I find myself in the same situation, in the sense that the subject matter which I have been asked to talk on embraces the activities of several branches of the government. Whether it is the intention of the Program Committee for me to go back to my old ways of thinking during my time as the Director of Forestry or for me to throw in criticisms on the present state of affairs, I am at a loss to know. However, I do not want to go back to the past and cry over spilled milk, but I would like to look forward to the realization of the dreams of whoever were responsible for breaking up the activities of the original Bureau of Forestry into various units, which now, more than ever, call for more effective coordination. I presume that the tailor who made all these patterns have some idea of effective coordination of the different activities of the various forestry agencies. But I always ask myself: Has that tailor taken into account the different human idiosyncrasies in programming the various activities? Has the framer of this idea forgotten that there are human factors that oftentimes, or most of the time, conflict in spite of the fact that the fundamental or basic principles upon which they are based are the same? It is too early for me and for any of us here, for that matter, to make comparisons and reach a conclusion that the present arrangement is better than the old one when the forestry activities were all under one unit. The change have been due to the intense desire to foster competition and thereby produce better results. But is this objective attainable? We may ask ourselves.

As I said, it seems a little too early to predict but I feel that it is high time that we focus our attention on these different units and study the possible bad effects that might result because of the competition among them. Of course, it is natural for each unit to justify itself by claiming that its services are better than those of any of the othe units; that it has a wider field for expansion. Unfortunately this often leads to creating dissensions and intrigues, not to mention misunderstanding, among the professionals themselves. I am sure each one of them is aware of its jurisdiction limitations and capabilities, but the eyes of the public, prone to make quick judgment generally, are liable to look down at a unit whose service is delayed due to confusion in administration. Besides, we have heard of the grumbling of the various units for more power in the application of their prerogatives. This, I think, should be looked into and a workable solution that would not give rise to public indifference and distrust as to the aim and purpose of forestry and forest conservation studied.

When this idea of having a convention was mentioned and taken up in the Society of Filipino Foresters, I personally endorsed it because I felt that a closer understanding

* Speech delivered by Regent Florencio Tamesis at the Seminar held on December 1, 1960, at the DANR Building, Diliman, Quezon City, on the occasion of the Golden Anniversary of the College of Forestry and the Diamond Anniversary of the Bureau of Forestry.

among the forestry agencies, particularly the various entities and units independent of each other, could be achieved. I feel that the oftener these different units get together and iron out their differences before they are made known to the public for the purpose of publicity, the more effective coordination could be attained. We must remember that our approach to this problem is not an approach for today, or for tomorrow only. Rather, it is an approach for the years to come, and we must always project our thoughts into the distant future and consider that the ideas which we discuss today will have the ultimate desired results in the incoming years. Therefore, it is necessary that we should not lose sight of the fundamental, shall I say, edict, and that whatever differences there may be, be it personal or otherwise, should be eliminated in the programming of our work.

How to achieve a more effective coordination of functions among forestry agencies presents a very ticklish proposition. The subject of my talk itself, for which, as I told you, I was not responsible, connotes that there is a dissension within the profession on the part of some of these agencies. These agencies referred to are the Bureau of Forestry, Parks and Wildlife Office, Reforestation Administration, Forest Products Research Institute and the College of Forestry, Within these organizations, there are units which, by the nature of their functions, conflict with the other units in their operation. Those minor conflicts are inevitable, as the scopes of the activities are oftentimes overlapping. This minor overlapping or unclear interpretation of the law and its execution offers an irritating grain which, if not removed in time, would develop into something destructive and tragic not only to the personnel themselves but also to the public for which those organizations exist.

It is, therefore, essential, and I, for one, would like to see it done, that there should be more frequent gatherings of the heads of the different organizations, or units, say, at least once, or twice, a month — in the form of a working committee to pool their thinking and planning together and iron out differences before serious misunderstanding develops. In other words, I would personally like to see the same work that we used to do when these different organizations were under one head, and that was the meeting of the different division chiefs to discuss problems that confronted each one of them. And if I may be permitted to suggest, the chairmanship of the working committee should be on rotation, at least, on a three-month basis, allowing the members to elect a chairman from among themselves for this period. This period will be sufficient to clear up whatever problems would come up under one chairmanship. I personally do not see how we could effect a more effective coordination unless the heads of the different units meet together and discuss their problems as often as they can, as I am sure one agency would only be too glad to get the help of the other units which have the same aim and purpose. A similar arrangement which we used to have before the war would probably cure a bit any misunderstanding that is liable to occur. We, the directors of all the Bureaus, under the Department of Agriculture and Natural Resources met once a week and the Secretary or the Undersecretary presided. Every director of the Bureau under this department discussed the departmental problems and so the public was better served through these cooperative efforts.

So much for the cooperation among the different forestry agencies. What I think the most important of all is the cooperation and clear understanding among the different entities of the government and the public in general. The practice of forestry and all its ramifications are so broad that one cannot help but associate himself with the different human activities, particularly those of the government. Today we have one of the stringent laws which if applied properly and humanly could be a very vital instrument in implementing the program of the conservation of our natural resources. But without

the help and clear understanding of the Department of Justice and its instrumentalities down to the municipal level, there is but little hope in the application of the existing laws and regulations affecting forest conservation and wise utilization. Likewise, the help of the provincial and municipal governments as well as the Armed Forces should be enlisted for the necessary policing of these vast resources. We also have the Bureau of Lands, Bureau of Soils, Bureau of Mines, whose interests are very much involved with the activities and scope of operation of the Bureau of Forestry. Each and every one of these agencies is a potential factor in creating public acceptance and cooperation to attain the main objectives of the professional foresters.

Not very long ago, I have been jokingly confronted with the remark that when I was in the government I was advocating forest conservation, but when I left the government I was instrumental in the destruction of the forests by cutting down the trees. That remark is meaningful when one is not familiar with the aim and purpose of true forest conservation and utilization. In the recently concluded Fifth World Forestry Congress, the theme of the Congress was "Multiple Use of Forest Lands." For the first time, the world had actually realized and got alarmed at the forestry situation because of the general misconception that forest must disappear owing to pressure of civilization. This point was widely discussed from the different angles and the conclusion reached was that because of the influence of forestry in the development of community, industry, sanitation and recreation, the pressure of civilization could well be met by properly and judiciously managing the forest of a country and its natural resources by applying properly and intelligently the necessary conservation measures.

It has been discussed that the question of forest conservation and the multiple uses of forest lands is the concern of every country and every citizen of that country, that a united effort must necessarily be the objective of the government to achieve its purpose. That problem is now our problem. Its solution depends on our cooperative efforts, in order to free us from the danger of losing our precious patrimony. Taking my case, although I may utilize the timber in our operation, I can give assurance of not only the multiple uses of the forest but also its perpetuation by carrying out the most modern approach, that of making forest land yield the maximum value with the least time factor.

The Need of an Enlightened Forestry Education

By RUFINO SABADO
Bureau of Forestry, Manila

Any type of discipline, professional or otherwise, to be of lasting value must be integrated into the habits, customs and traditions of the people. This is all the more obvious if the objectives do not loom clearly manifest — if the national thinking is to be projected into the not too near future. By this token it can be said without fear of successful contradiction that forestry education in the Philippines today is a wee bit far from first base. This is not saying that our college of forestry — the only one of its kind in the Philippines and the alma mater of practically all Filipino foresters living and dead — does not measure up to the standards of a forestry college. For indeed the College of Forestry, University of the Philippines, according to unbiased authorities, can compare favorably with accredited colleges abroad. Rather it must be said that national forestry education has not reached the rank and file of a fast growing population.

The average Filipino thinks that forestry is incompatible with agriculture. The Philippines being essentially agricultural must perforce require that the former should give way to the latter. The forest is a hindrance to agricultural development. This is a fallacy. Evidence of this fallacious thinking is reflected in submarginal agricultural lands and abandoned farms. But unless and until an enlightened forestry education has reached the rural areas our people will never realize that forestry and agriculture are complementary. For a sound Philippine economy, "each is useless without the other."

The forest resources of the Philippines are not inexhaustible. As a matter of fact our forests have receded into the hinterlands at a rate faster than a safe minimum. Even the program of selective logging aimed at sustained yield management is taken by our average lumberman with a grain of salt. He is in the lumber business to make money — and fast. Selective logging is a roadblock to this inordinate ambition. His forestry education has not gone beyond the exploitation — nay, speculation—stage. The mechanics and economics of selective logging require no little amount of purposeful, intensive search for truth. Once the truth of the matter is known, selective logging should sell itself to all *bona fide* lumbermen, for truth is sufficient unto itself — *Veritas lucet ipsa per se.* Under this system of forest utilization, a lumberman, as it were, can have his cake and eat it too. But a great bulk of forestry licensed areas are not big enough to sustain an economic unit for purposes of selective logging aimed at sustained yield management. This requires a re-examination of the forestry education of policy makers, otherwise our selective logging program will become nothing more than a big joke.

The Philippine lumber industry has reached an unprecedented peak. It can very well be said that our economy has improved to some degree with the development of the lumber industry. But are we getting as much benefit as we should from our annual timber cut? Or, in other words, do we get the maximum benefit if we continue with the exportation of logs? Of course the ans-

own people. Obviously our so-called economists do not have the necessary background education, let alone enlightened forestry education, for the handling of a forest resource, a resource of manifold uses and potentialities *par excellence.*

We like to believe that the Philippines is rich in natural resources. We are blessed with a bountiful forest resource that is the envy of other nations the world over. It would seem, however, that this is pure and simple backpatting. But even assuming that our forest resource is one of the best in the world, it should be no reason for treating it in reckless abandon. Rather it should all the more spur us to greater achievement with a view to making this valuable resource have an undisputable lead in our Philippine economy. Thus integration of forest industries asserts itself. But integration calls for progressive research program that should convince officials of the higher echelons of the government, particularly the policy makers. Without a proper economic climate or investment incentives, integration of forest industries, let alone industrialization, will be long in coming, if at all.

The forest is a multiple use resource. One use does not exclude other uses. The principle of multiple use of the forest resource is premised on the time-honored primacy of the greatest good for the greatest number for all time. Thus timber production, watershed, grazing for livestock and wildlife, and recreation are uses which can be availed of to the fullest extent consistent with the perpetuation of the resource. To understand and appreciate the mechanics and economics of multiple use of forest lands must necessarily require no little amount of progressive and enlightened forestry education.

RUFINO A. SABADO
Bureau of Forestry, Manila
November 28, 1960

Forest Products Research In The Philippines

By GEORGE M. HUNT

F. A. O. Consultant and Adviser to the Philippine Forest Products Research Institute (1954-1961)

Every country that has substantial forests needs forest products research in order that its forests may be used to the greatest possible advantage. In the Philippines there is very little private forest land and the forests belong almost entirely to the government, that is, to the people of the country. Very few Filipinos, however, have a feeling of ownership in connection with the forests and yet every Filipino is a stockholder in an organization whose forest assets are worth billions of pesos. Surely this enormous value should be conserved, administered and utilized to the greatest possible advantage of its owners and not dissipated and wasted through ignorance or carelessness. And yet rapid loss and waste are going on every day and the forest assets of the Philippine people are melting away at a rapid rate. I am not here to discuss kaingineros, forest fires, reforestation, floods, erosion and the many other aspects of the problem. These things are being pointed out and discussed by people much better informed than I am about them and about what should be done. Let us, instead, direct our attention to another phase of the problem that is not generally recognized, efficient utilization.

Few people realize how much of a tree is lost as it proceeds from the forest through the various processing until it reaches the consumer in the form of a finished product. Probably not more than 25 percent of the wood growing on a hectare of land reaches the market in finished form. The logger removes from the forest only what he can sell at a profit. He leaves behind him at least half of the wood in the form of high stumps, tops, branches, broken or defective trees and species for which there is no market. He cannot be expected to operate at a loss and so he takes only what will be profitable under his conditions.

When the logs reach the sawmill or the veneer mill and the lumber or plywood reaches other factories, there is a further loss in the form of bark, sawdust, shavings, slabs, edgings, trimmings and broken and defective pieces amounting perhaps to 40 to 50 percent of what the logger brought to mill. But this is not all. When the finished product reaches the consumer, further unnecessary losses take place through preventable breakage, decay, insect attack or wear. For example, if a man builds his house in such a way that termites, powder-post beetles, or fungi destroy important parts of it in a few years, new lumber is required for replacement. This is not a necessary loss for it is possible to make a house endure for a lifetime. Similarly, when posts, poles, railway ties, bridge timbers and other outdoor structural timbers give only 3 to 4 years service instead of the 20 to 30 years that is possible, additional trees have to be cut to replace them. This

[1] Read before the Los Banos Biological Club on February 23, 1961.

again is an unnecessary waste of a national asset as well as of the owner's money.

What can be done about all these losses? Under a dictatorship, orders could be issued that all forest and factory residues must be processed into useful products and that all products should be manufactured or treated to give maximum service. I do not believe even a dictator could successfully order saws not to make sawdust but he could order thinner saws to be used that produce less sawdust and that the sawdust be put to some use instead of being burned in a waste pile or thrown out to rot. He could not order that no slabs or edgings be produced in converting round or irregular logs into square-edged lumber but he could order the conversion of the slabs into usable by-products instead of allowing them to go to waste, even though converting would have to be done at a net loss.

In a free enterprise economy such dictatorial methods cannot be used. Every industrial plant must make a profit in order to remain in business. In general, every operation in a given business must be carried on at a profit of some kind although it may be slight. In a logging operation, therefore, one cannot expect the logger to bring out of the woods material that is worth less at the mill than the cost of bringing it out. We know, however, that most of the wood left on the ground by the logger is inherently good but in a form that is too expensive to handle. This wood and the waste from the mills is potential raw material for various industrial processing and can make perfectly good products if we can find ways to do it at a profit. Here lies part of the task of forest products research — to produce useful products out of material now going to waste.

But it would be equally useful to find ways to reduce the amount of waste produced in the manufacturing processes. Much can be accomplished in this direction by finding and demonstrating ways to reduce the percentage of the log that is lost in the form of sawdust and planer shavings. Even the relatively simple job of helping the sawmills adjust their equipment to cut straight lumber with parallel sides and edges reduces the amount of waste. What happens when a board is 1 inch thick on one end and 1 1/2 inches thick at the other end? It will probably be run through the planer until it is the same thickness at both ends and all the surplus wood is converted into shavings. Thus 1/5 of the volume of that board is thrown away. On one board that is nothing to worry about but on thousands of boards mismanufactured every day similar waste is occuring that could largely be prevented. The total daily loss from this cause alone probably amounts to enough to build houses for a hundred families. There are many other ways in which preventable waste occurs in converting lumber or plywood into buildings or furniture, such as trimming long boards to shorter lengths or making wide boards narrower and throwing the trimmings away. There is much that can be done about this, partly by research but largely by the application of the results of past research and by getting better practices into general use.

Before going further in our discussion of the job of research in forest products let us give some thought to what we mean by research. It can be done by an old man with long whiskers looking into a complicated mass of chemical glassware, as the cartoonists love to picture it but very little is done that way. Most scientists nowadays do not have long whiskers. It can be done in a sawmill by men measuring logs before they are sawed and then determining the percentages of bark, lumber, slabs, edgings, and sawdust produced in sawing them. It can be done by building shipping boxes or crates and destroying them systematically in order to learn how to make them stronger or more durable or at lower cost. It can be done with dry kilns, testing machines, digesters or even with only a pencil and paper and a good head for mathematics or economics. In fact research is nothing more nor less than careful investigation and search for factual information by whatever means may be appropriate. Forest products research makes use of all met-

hods, some very simple and some very complicated.

The field to be covered by forest products research is very broad. In fact it has no limits except the limitations of funds and equipment and the number, competence and common sense of the people available to do it. I think that is equally true of the respective fields of research in which each of you is engaged. And let me emphasize that "common sense" (which is an uncommon commodity) is as important in a program of research as techniques, equipment, statistical analysis or science training. All are important.

One of the most important parts of the forest products program is collecting and tabulating in great detail the facts about the properties and characteristics of all the important Philippine woods. There are more than 3500 species of trees growing in the Philippines but they are not all important. Some are very rare, others are available in such small sizes or such small quantities that they have no commercial importance. Some 50 to 60 species now are recognized to be sufficiently available and useful to be considered commercial. Numerous others will be used eventually and sold on their individual merits but probably 95 percent of the 3,500 species will find commercial use only as they may be brought to market in mixtures with other species and not because of their individual characteristics. They may be found for example in mixtures of wood cut for fuel, charcoal and other uses where total volume or weight counts more than individual characteristics.

Many properties and characteristics influence the usefulness of wood and the selection of species for specific products or purposes. They all need to be determined for each commercially important or potentially important species. Information is needed on specific gravity, shrinking properties, seasoning characteristics, bending, hardness, compression, toughness, shearing, and nail-holding properties, color, odor, straightness of grain, figure, fine structure, fiber characteristics, porosity, treatability, natural resistance to insects and fungi, machining properties, gluing characteristics, chemical composition, pulp and papermaking properties and numerous others. We know that this information will be needed every day in many ways to help people select the best woods for each purpose, to process them most effectively into finished products, and to make them give long and satisfactory service. A weak wood should not be used for a hammer handle; that requires a high degree of toughness. A soft wood does not make good bowling pins but it is better for bulletin boards than a hard one. A wood with a strong odor like kalantas is excellent for cigar boxes but entirely unacceptable for butter boxes. And so it goes through the whole range of properties and characteristics. Obtaining this information is basic research in one sense of the word, although it can be done very largely by empirical methods. It extends the frontiers of knowledge about wood and the information is basic to the efficient utilization of wood.

In addition to studying the basic properties of wood, we need to study the details of *wood processing* so that we may know and be able to tell others how best and most efficiently to produce from it safe buildings, pulp and paper, boxes, floors, vehicles, tannins, chemical products, plywood, hardboard, insulating board, particle boards, venetian blinds, handles, ball bats, furniture, spindles, bobbins and picker sticks for textile mills, and the thousands of other products in daily use that come from the forests. Obviously all these things cannot be done at once and we must concentrate on a few of the important ones. Others can be worked upon from time to time as the need for that specific information becomes urgent to some producer or consumer.

We must study not only the natural properties of the wood but also how to change them when possible, to meet urgent need. For example apitong is a strong construction wood but it does not last very long when in contact with the ground or in damp places.

But it can be made to have long life by impregnation with preservative suitable for the specific use to be made of the wood. There are many preservatives to use, many ways to use them and many differences between the treatability of different species of wood. There is much to learn, therefore, about this subject alone. The hardness, the fire resistance, the acid resistance, the moisture absorption and the shrinkage of wood can all be improved by suitable treatment but some of the treatments are too costly for general use and some adversely affect the other properties of the wood.

Other processing that we must cover in our studies includes kiln drying, finishing with paints and varnishes, pulping, extraction with solvents, destructive distillation, resin impregnation, sawmilling and the various other types of processing required in producing the multitude of wood products and byproducts.

The work on a research project is not finished when the tests have been made and the results tabulated and neatly filed. When new and useful information is obtained, the researcher or his institution has not completed the obligation until every reasonable effort has been exerted to make the information public and put it to appropriate use by those who need it or can profit by it. Some kinds of information on basic properties and characteristics must wait for a specific instance to arise for which it is needed. It should be published of course and made readily available through all appropriate channels but no attempt needs to be made to force it into use. The fact that tuai, an otherwise useless wood, has long fibers for a hardwood and can be made into strong paper is a case in point. We should not urge someone to build a pulp mill just to use tuai but when someone begins to make pulp out of local woods the fact that tuai is especially good for this purpose could be of advantage to him. On the other hand, the knowledge that sapwood is not resistant to insects and fungi unless properly treated with preservatives, even on species of wood whose heartwood is durable, has to be constantly reiterated and taught like the multiplication table. One telling is not enough. Every effort should be made get the fact understood and get purchase and use specifications in harmony with it. The knowledge can be put to use now and save large volumes of wood from early destruction and the loss of many thousands of pesos per year. It is for this reason that we are issuing and distributing widely a series of monthly technical notes containing elementary information about wood that should be widely known but actually is known by a surprisingly small number of people.

Among the best ways for a research institution to get its information into use are close association with those who can use it, through work in committees and attendance at meetings of technical societies and trade associations, through acquaintance on a first-name basis with the managers and technical men of industry and by becoming familiar with the needs and technical problems of the specific industries concerned.

Research seldom results in wonderful discoveries and sensational "break-throughs". We read about such things of course and they do happen once in a while to some researchers. But how many times does the average researcher make the headliness in the newspapers of the world? With the very great majority of us it is a constant plugging at our problems day after day. We make progress and our work is useful to the world. We get our satisfaction out of doing our work well and knowing it is good. And thus it must be with forest products research. If the world is waiting breathlessly for wonderful new products to be made from wood it may have to wait for years. If it will be content, however, to get a constant stream of useful informulation and help to meet its current problems, it can begin collecting now.

One of the important functions of an institution like the FPRI is to develop its staff into a corps of experts of great competence who, working as a team, can focus their various skills and judgement together on any

problem. A group of people of different skills working harmoniously together can accomplish more and make fewer mistakes than the same people working independently of each other. Thus the staff of the Institute is developing into a body of general consultants available freely to industry and the general public through correspondence or personal consultation. It is not intended that they shall take the place of private engineers and consultants and shall design plants, make market studies for private companies or undertake confidential engineering studies or plans for industry. They must serve more as general practitioners pointing out what can be done or should be done or helping industry to understand its raw material better. There is still plenty of room for the services of the private consultant and, in fact, he will be coming often to the Institute for assistance on the details of his problems.

Let us not lose sight of the fact that a great deal is already known about the properties of wood and the details of processing it into useful products. Forest products laboratories in other countries have been working for many years in this field — one of them more than 50 years. Together they have accumulated and published a great fund of knowledge and have shown how to produce a great variety of products and by-products. Industry also has learned much through its own efforts. It is not necessary for a new laboratory to repeat all the work that has been done before but it must absorb the knowledge available and try to go on from there, adapting it to local conditions and opportunities. In the Philippines we must study the properties and characteristics and learn how to overcome the shortcomings of our own species because no one else has done or will do it for us. This is a big job in itself. We do not need at present, however, to set up the expensive apparatus required to produce sugars from wood and to convert them into food yeasts, ethyl alcohol, and the numerous other chemicals that can be derived from them. We know from the results of other research that about 1/2 ton of wood sugars (mostly glucose) can be made from 1 ton of sawdust (dry basis) but economic conditions in the Philippines do not seem favorable to the commercial success of such a venture at present. This is true also in America and Europe. Whenever the need arises, however, we can study the conversion of Philippine woods into these products. It is so also with the conversion of lignin into useful by-products by hydrogenation, chlorination and other chemical treatments or the manufacture of food yeasts from waste sulfite pulp liquor. Other examples can be named.

The foregoing provides a sketchy and very inadequate discussion of the field of work of the Forest Products Research Institute, its obligations and opportunities and the basic philosophy that underlies our research program and our activities. Wood is a material of extreme importance to every individual and one of the great assets of the nation. Our job is, in every way, to make it better understood and more wisely used by everyone. To the wood industries we hope to be a reliable source of information on all phases of wood utilization and an "ever present help in time of trouble."

Kaatoan Bangkal Grows In Mt. Makiling

By
F. N. Tamolang, T. M. Lindayen
J. Meniado and I. Zamuco[1]

This paper is a sequel to a previous article by Martin Reyes, "Cinchona grows, too, in Mt. Makiling," published in Forestry Leaves, Vol. 5, No. 3, April, 1952. Results of eight years' observation and investigation on the same plants, alleged to be cinchona, are presented to support the new finding of the U.S. Forest Products Laboratory and the Forest Products Research Institute that these are actually Kaatoan bangkal (*Anthocephalus cadamba* (Roxb.) Miq.), not cinchona. This answers, too, the anxiety of several foresters and the request of the late Placido Dacanay, dated Sept. 14, 1953, that the real identification of the plants be determined. Moreover, it suggests that all botanical and wood specimens, and trees grown from seeds of these plants be correctly labelled according to this identification.

Doubt on the cinchona plants came about on June 21, 1953 when Forester Rosales A. Juni, Director Eugenio de la Cruz, Dean Calixto Mabesa, Dr. Artemio Manza, Foresters Felix Franco and Francisco Tamolang, visited the plantation in Nursery No. 2. Their curiosity revealed this uncertainty when the bark was tasted and turned out to be bitterless. In his report to the Director of Forestry in August of the same year, Juni suspected that the seeds he received from Kaatoan, Bukidnon in November, 1948, might not have come from cinchona plants but from a bangkal tree growing vigorously in the cinchona plantation. This perplexing situation remained until the plants flowered and fruited in June through August and September of 1953. Botanical materials were collected and studied by Dr. Felipe M. Salvosa in 1955. The trees were suspected at first to be *Nauclea horsfieldii* (Miq.) Salv., comb. nov. based on available literature at that time. In the meantime, the Wood Technology Division had been studying its wood structure and also sent to the U.S. Forest Products Laboratory a sample of the wood (F.P.R.I. # 134) in 1957. Dr. B. Francis Kukachka and Forester Edgardo O. Mabesa studied this sample in 1959 and found it to agree in all respects with the specimen of *Anthocephalus cadamba*. Thus, arose the *Nauclea-Anthocephalus* problem which, with a wood sample of *Anthocephalus cadamba* (No. 6922), was referred to the Forest Products Research Institute. The results of botanical and wood anatomical studies agreed with the finding of Dr. Kukachka and Mabesa and since August 5, 1959, the alleged cinchona in Mt. Makiling has been called Kaatoan bangkal (*Anthocephalus cadamba* (Roxb.) Miq.).

The following nomenclature, original description, etc., of *Nauclea horsfieldii* and *N. junghuhnii*, as well as some data on *Anthocephalus* are given by Dr. Salvosa.

Anthocephalus cadamba Miq., of the Rubiaceae, is not considered by Dr. Merrill in his *An Enumeration of Philippine Flowering Plants* having available or corresponding indigenous species in the Philippines. In this work, under his "Doubtful and Excluded Genera," 3 (1923) 575, he states:

> "*Anthocephalus cadamba* Miq.; Vidal Sinopsis Atlas (1883) 28, *T.* 56, *f. c.* The drawing may or may not represent Mi-

[1] Wood Technology Division, Forest Products Research Institute, College, Laguna, Philippines.

guel's species; it was prepared from specimens formerly cultivated in the Botanic Garden, Manila."

Merrill, in the same work, l. c. 516, on the basis of the rules of priority on nomenclature, reduced *Sarcocephalus junghuhnii* Miq. Fl. Ind. Bot. 2 (1857) 133, to NAUCLEA JUNGHUHNII (Miq.) in Journ. Wash. Acad. Sci. 5 (1915) 536, and he also reduced *Sarcocephalus horsfieldii* Elm. Leaft. Philip. Bot. 3 (1911) 990, non Miq., to another synonym of that valid binomial. The botanical description of NAUCLEA JUNGHUHNII (Miq) Merr. (in *Hook f. Fl.* Brit. Ind. 3 (1889) 23, for *Sarcocephalus junghuhnii* Miq.) is really different from that of NAUCLEA HORSFIELDII (Miq.) Bremekamp. The original descriptions of the two species above are presented below for comparison as follows:

1. *Nauclea junghuhnii* (Miq.) Merr. — "*Branchlets* and peduncles puberulous. *Leaves* 4-5 by 2 — 2-½ in., rather coriaceous, nerves with minute tufts of hair in the axils; petiole ¼ — ½ in.; stipules oblong. Peduncles ½ — 1-½ in., with a small 4-lobed cup of bracts below the middle, of which 2 opposite bracts are larger than the others. *Heads* ¼—1/3 in. in diam., in fruit ⅔ in. in diam. I have seen no authentic specimen of *Junghuhnii,* but find the name attached by Maingay to his specimens. Miquel's description is most meagre."

2. *Nauclea horsfieldii* (Miq.) Bremek.— The following is given by Elmer as his fieldnote of the flowering specimens of his Todaya number 10886: "Tree, 13 m. high, 4.5 dm. thick; wood moderately soft, yellowish brown, thinly checked; branches from above the middle, forming an elongated crown, the branchlets widely spreading, lax and some even drooping. Leaves similarly green on both sides, nearly flat or only the tips recurved, submembraneous. Inflorescence upon 3 cm. long green peduncles, axillary or terminal, mostly descending; buds green; flowering heads globose, 3 cm. in diameter; pistil creamy white, the corolla creamy yellow or greenish white; calyx green. A fine tree in dense forests of moist fertile soil south of the Baruring river at 4000 ft. known to the Bagobos as "Mamulocko."

The binomial, *Sarcocephalus horsfieldii* Elm., *non* Miq., as given by Merrill, was reduced to *Sarcocephalus horsfieldii* Miq., the latter also reduced to NAUCLEA HORSFIELDII (Miq.) Bremekamp in *Blumea* 5 (1942) 248, in obs.: *Sarcocephalus horsfieldii*, whose botanical description above is the one more applicable for this tree rather than *N. junghuhnii,* as we observe it growing around the Forest Products Research Institute building.

Now to consider the reduction of *Nauclea horsfieldii* (Miq.) Brem. to ANTHOCEPHALUS CADAMBA Miq., on the basis of the above description, it is further noted that trees of the genus *Nauclea* Linnaeus, bear interpetiolar stipules, or stipules between the petioles, which are oval or oblong, but this particular tree under study bears such a pair of caducous stipules, 2-3 cm. long, which are not flat or leaf-like but pointed or acicular, quadrangular at the base, and united to one another like a sheath covering or protecting the green, terminal buds of the branches and branchlets. Authentic botanical specimen of *Anthocephalus cadamba* (Roxb.) Miq. collected from Borneo is preserved in the Philippine National Museum.

The species investigated is now called *Anthocephalus cadamba* (Roxb.) Miq. It has its range in Mindanao (Bukidnon, Davao). A number of living trees growing around the Forestry campus were introduced from Bukidnon province. Its local names are: Kaatoan bangkal (Tagalog); magalablab, manuloko (Bagobo); sapauan (Mandaya). Kaatoan bangkal is the adopted official common name, after the locality Kaatoan, Malaybalay, Bukidnon, from which the seeds were collected on or about November, 1948. It is closely allied to our bangkal tree (*Nauclea orientalis* L.) bearing oval or oblong pairs of stipules.

Following are some gross and microsco-

pic features of *Anthocephalus cadamba* and *Nauclea horsfieldii* wood as described by Valbuena and Meniado of the Wood Technology Division, F.P.R.I. (Figs, 1 & 2)

Characteristics	*Anthocephalus cadamba* No. 6922	*Nauclea horsfieldii* FPRI No. 134
Color	Buff or straw	Buff or straw
Pore size (ave. max. tangential diameter)	199.87 microns	185.25 microns
Pore No. per sq. mm. (ave.)	6.4	6.1
Ray structure	Heterogeneous; 1-4 cells wide; rays of 2 kinds, uniseriate and multiseriate; ave. max. ht. of uniseriate rays, 11 cells; ave. max. ht. of multiseriate rays, 49 cells; no. of rays per mm. 14-15 cells; sheath cells as wide as bi, tri or 4 seriate parts.	Heterogeneous; 1-4 cells wide; rays of 2 kinds, uniseriate and multiseriate; ave. max. ht. of uniseriate rays, 10 cells; ave. max. ht. of multiseriate rays, 34 cells; no. of rays per mm. 15; sheath cells as wide as bi, tri or 4 seriate parts.
Intervessel pittings	4-5 microns, alternate	4-5 microns, alternate
Fiber pittings	4-5 microns, generally arranged in uniseriate rows	4-6 microns, generally arranged in uniseriate rows

To date, Kaatoan bangkal trees in the Makiling National Park have grown luxuriantly (Figs. 4 & 5). This demonstrates that this species not only thrives well in Mindanao, particularly in the provinces of Bukidnon (altitude 1000 meters) and Cotabato, but also in Laguna (altitude 100 meters). Apparently, this is contrary to one of the ecological principles that different species grow within certain altitudinal ranges.

In September, 1948, 12 Kaatoan bangkal seedlings, 2 to 6.6 centimeters high and 2 to 11 centimeters in diameter, were transplanted in Forest Nursery No. 2. In 1952 after three years and ten months since planting (Fig. 3), their diameter and height ranged from 7 to 22 centimeters or an average of 13.8 centimeters and 5.6 to 9.9 meters or an average of 7.7 meters, respectively. Nine years after, in February, 1961, the large saplings have grown to tree size. Only nine trees remain at the site because two were blown down by typhoons and one was cut down for forest products research. Nevertheless, it is significant to note a height increment of 2 meters per year. Furthermore, the existing weather and climatic conditions in the Makiling National Park have been conducive to the growth of the stand under study. For the whole stand, tree diameter ranged from 25 to 52 centimeters or an average of 45 centimeters, and tree height ranged from 22.05 to 30.48 meters or an average of 26. 2 meters. The trees have consequently attained a volume of .91 to 1.89 cubic meters or an average of 1.59 cubic meters, based on the merchantable height of 7.4 to 12.6 meters or an average of 10.01 meters. Considering the basal area of all trees, the range is from .10 to .21 square meter or an average of .16 square meter. These figures evidently fortell, for the next ten years, an increase in the volume of the standing trees to be of some significance.

From the first flowering and fruiting in 1953, seeds were collected and planted. Thirty-one seedlings were planted at the Forest Products Research Institute premises in December, 1954. As of date, the diameters breast height range from 8.5 to 28.7 centimeters or an average of 18.5 centimeters. In height, the range is 5.52 to 18.76 meters or an average of 13.22 meters. The volume

based on the clear bole, range from .02 to .33 cubic meter or an average of .15 cubic meter. The growth of these trees in the span of 7 years is quite interesting. Besides this, there is the probability of growing Kaatoan bangkal by coppice as shown in Fig. 6.

Based on studies of plantation grown Kaatoan bangkal, the wood shows promise for artificial limbs and for pulp and papermaking. The morphological properties of the wood fibers are as follows:

Average fiber length	1.43 mm.
Average fiber width or diameter	0.035 mm.
Average lumen width	0.026 mm.
Average cell wall thickness	0.004 mm.
Runkel ratio	0.31 mm.
Coefficient of flexibility	71
Felting power	42
Prospects for papermaking	Promising

Results of sulfate pulping studies by the Chemical Investigations Division of the F.P.R.I. indicate that pulps of Kaatoan bangkal belong to group 1, very strong pulps,[2] together with almon, gubas, lanipau, malakalumpang, mayapis, red lauan, toog and tuai. Following are the pulp properties found:

	Yield %	Burst pt./lb./rm.	Tearing Resistance gm./lb./rm.	Folding Endurance d.f.	Tensile Breaking Length M.
Kaatoan bangkal	46.4	1.54[3]	1.16[3]	1,390[3]	9,900[3]
Almon	49.5	1.46	1.63	4,200	8,300
Gubas	46.5	1.46	1.23	1,100	11,000
Red lauan	44.8	1.48	1.76	1,150	8,500
Mayapis	54.7	1.40	1.54	1.100	8,500
Malakalumpang	43.0	1.48	1.50	970	10,150
Lanipau	46.4	1.55	1.60	1,150	9,100
Toog	42.1	1.50	1.96	1,060	8,100
Tuai	37.6	1.19	1.64	1,015	8,300
Albizzia falcata[4]	55.2	1.27	1.47	743	9,366
Canadian commercial kraft pulp[5]	—	1.55	1.76	1,240	9,000

Kaatoan bangkal is a "tree-guinea-pig" worthwhile watching in the Makiling plantation. It is also interesting to search for this tree and to report wherever it can be found in the Philippines.

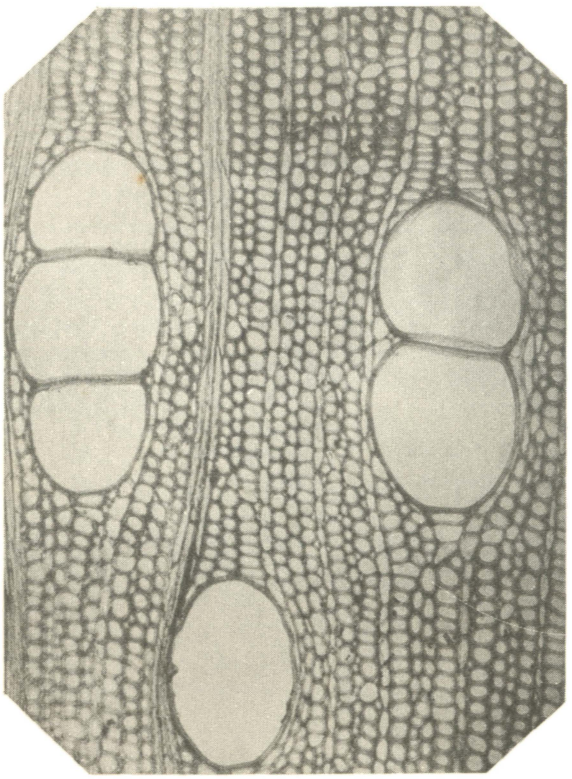
For scientific interest, the genus *Anthocephalus* and the species Kaatoan bangkal (*Anthocephalus cadamba* (Roxb.) Miq.) are new additions to our knowledge of Philippine botany.

[2] Proposed classification by Nicolas, P.M. 1959. First Progress Report on Standard Pulping Evaluation of Philippine Woods and Bamboos. F.P.L. Library (Unpublished).

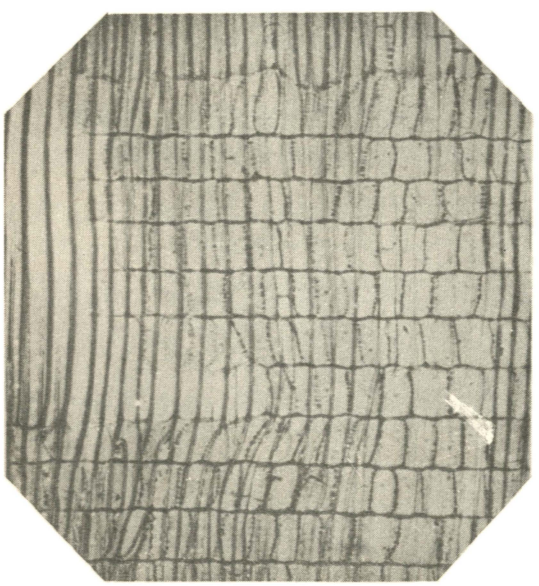
[3] Strength values were interpolated for 350 ml. freeness (C.S.) from beater curves.

[4] Data are preliminary studies of the Chemical Investigations Division. Level of freeness is 385 ml. (C.S.).

[5] Western fir and hemlock. Pulps were processed and tested at F.P.R.I. Level of freeness is 350 ml.



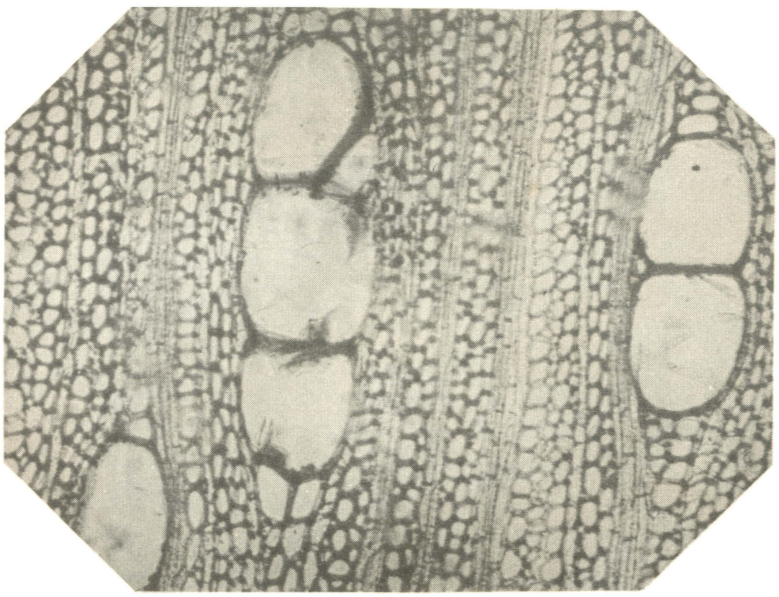
a.



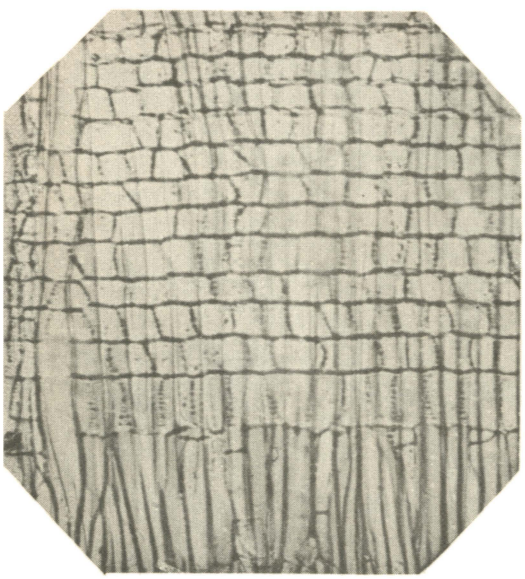
b.

c.

Fig. 1. Microscopic structure of Anthocephalus cadamba **(Roxb.) Miq., wood sample No. 6922. a. Cross section X60. b. Radial section X60. c. Tangential section X60.**



a.



b.

c.

Fig. 2. Microscopic structure of wood sample FPRI No. 134, formerly known as Nauclea horsfieldii **(Miq.) Salv. comb. nov. a. Cross section X60. b. Radial section X60. c. Tangential section X60.**

Fig. 3. Saplings of Kaatoan bangkal (Anthocephalus cadamba **(Roxb.) Miq.) grown at Forest Nursery No. 2, Makiling National Park, Laguna. As of 1952, the stand had an average diameter of 13.8 cm. and an average height of 7.7 meters.**

Fig. 4. Thirteen-year old Kaatoan bangkal at Forest Nursery No. 2, Makiling National Park, Laguna. As of February, 1961, the stand has an average diameter of 45 cm. and an average height of 26.2 meters.

Fig. 5 ▲

A 13-year old Kaatoan bangkal grown at Forest Nursery No. 2, Makiling National Park, Laguna, has a diameter of 52 centimeters. This tree was planted in 1948.

Fig. 6. ▶

A well-developed sprout of Kaatoan bangkal, producing shoots or coppices grows favorably in the Makiling National Park area.

Propagation Of Cuttings Obtained From Seedlings And Small Saplings Of Narra, Pterocarpus Indicus L. And Large-Leaf Mahogany, Swietenia Macrophylla King

By TEODORO C. DELIZO

There are a number of studies conducted on the vegetative propagation by cuttings of forest tree species. The vegetative parts used for propagation were secured from mature or near mature trees. A number of species responded favorably on this method of propagation while others did not. The species that were found to respond favorably to this method of propagation are: Karaksan, *Linociera ramiflora* (Roxb) Wall.[9]; paper mulberry, *Broussonetia papyrifera* Vent[2]; narra, *Pterocarpus indicus* L.[10]; batitinan, *Lagerstroemia periformis* Koehn[8]; para rubber, *Hevea brasiliensis* (Hbk) Muel[3]; palosanto, *Triplaris cumingiana* Fisch & Mey.[3]; banaba, *Lagerstroemia speciosa* (L.) Pers.[4]; ipil-ipil, *Leucaena glauca* L.; kakauate, *Gliricidia sepium* (Tacq.) Steud; kapok, *Ceiba pentandra* (L.) Gaert.; African tulip, *Spathodea campanulata* Bean V. and others.

The tree species that were observed not responsive to this method of vegetative propagation are: Molave, *Vitex parviflora* Juss; binuang, *Octameles sumatrana* Miq.; kalumpang, *Sterculia foetida* L.; sakat, *Terminalia nitens* Presl.[8]; panglongboien, *Syzygium simile* (Merr.) Merr.[8]; hagakhak, *Dipterocarpus warburgii* Brandis; etc.

This study is a deviation from the usual method of securing the planting materials from mature or near mature trees. Instead, the cuttings were obtained from the sections of the stems of seedlings and small saplings ranging in height from 80 to 200 centimeters. It is a common practice in our reforestation projects that over-grown seedlings in the nursery are destroyed, or, in the case of narra and mahogany, the stems are cut back leaving only a portion of about 70 centimeters long with the roots, and throwing away the parts removed. Such a practice is wasteful and actual experience with this form of transplant is not altogether favorable especially in the seasonal region of the country. The parts of the stems that are otherwise rejected and thrown away, can very well be utilized either by growing them as cuttings in the nursery or planted direct to the field. If properly handled, such planting stock may produce satisfactory results. Delizo[5] mentioned that cuttings from the stems of seedlings and small saplings of Mahogany are used in Taiwan in plant propagation. Young plantations from cuttings are found in several places in Central Taiwan. This is a common method of propagation there because of the limited supply of seeds from the Philippines. There is a place in south central part of Taiwan, where the stumps of mahogany saplings are cultivated in a nursery for the purpose of producing sprouts for cuttings.

MATERIALS AND METHODS

The narra and mahogany cuttings used in this experiment were secured from seedlings and small saplings with average height of 1½ meters that were raised in the College of Forestry nursery. They were leftovers of the recent planting season.

The stems were cut at the root collar and divided into sections or cuttings of twenty centimeters long. The portion of the stem that contained soft current year's growth was

rejected. The butts (or bottom cuts) of the cuttings were smoothened with a sharp knife. This would facilitate the formation of callus and also the basis to identify the butt of the cuttings when planting them. They were classified into diameter classes of 0.5, 1.5, 2.5, and 3.5 centimeters. In the diameter classification, no attempt was made to determine the position of the cuttings with reference to the root collar. They were grouped on purely diameter consideration.

One hundred cuttings for each diameter class were used. Each diameter class was in turn divided into two lots of fifty cuttings each. The fifty-cutting lots of narra were numbered: 0.5a-N, 0.5b-N; 1.5a-N, 1.5b-N; 2.5a-N, 2.5b-N; and 3.5a-N, 3.5b-N. The mahogany cuttings were also numbered: 0.5-aM, 0.5b-M; 1.5a-M, 1.5b-M; 2.5a-M, 2.5b-M; and 3.5a-M, 3.5b-M. The first number signifies the diameter class, the letter following to identify the lots and the capital letter indicates the species, like N for narra and M for mahogany. Lots of fifty cuttings under one diameter class were planted in seedbeds in irregular manner (Fig. 1) in order to minimize as much as possible the influence of soil, exposure and other factors.

The mahogany cuttings were prepared and planted on July 9, 1960 and narra on July 10, 1960. Three and one-half months after planting, they were all dug and the number that produced roots and sprouts were counted. It was observed that narra cuttings produced more fibrous lateral roots than mahogany. The cuttings that failed to strike roots were found to be attacked by termites.

DISCUSSION AND INTERPRETATION OF RESULTS

The result of planting after three and one-half months is shown in table 2. It could be seen that the percentage of cuttings that produced roots and sprouts in narra (Pterocarpus sp.) are: diameter class 0.5 centimeter, 72 per cent; diameter class 1.5 centimeters, 68 per cent; diameter class 2.5 centimeters, 79 per cent, and diameter class 3.5 centimeters is 82 per cent. The general trend is for the bigger sized cuttings to strike more roots and greater percentage of survival than the smaller cuttings. In the 0.5 centimeter diameter class, 72 per cent produced roots as against 82 per cent for the 3.5 centimeters diameter class. This conform with the findings of Bailey[3], Aganidad[1] and San Buenaventura[10] that the bigger the diameter of the cuttings, the greater would be the percentage of survival. There is, however a limit for this as found by San Buenaventura[10] on narra cuttings that beyond 1.5 centimeters diameter class the percentage of survival was less than the one centimeter diameter class.

The cuttings of mahogany (table 3) show slight difference from that of narra with regard to the percentage of survival. In the 0.5 centimeter diameter class, 64 per cent produced roots; 85 per cent for 1.5 centimeter class; 82 per cent for 2.5 centimeters diameter class and 85 per cent for 3.5 centimeter diameter class. It shows that a little over one-half of the 0.5 centimeter diameter class produced roots as against 85 per cent for the 3.5 centimeter class. The tendency was for a greater number of the bigger sized cuttings to strike roots. Delizo[5] was informed that the percentage of survival of the cuttings of the same species in Taiwan ranged from 75 to 85 per cent.

During the months of September and October when rainfall was slightly over three inches per month (table 1), some of the rooted cuttings died. This was due in part to insufficient rainfall, by the lack of water supply from our pipelines in the nursery and to the absence of artificial shade. The death of these few rooted cuttings did not affect the computation for survival because under normal condition these should grow. In Taiwan[6] it was observed that the cuttings were given partial shade of bamboo slats during the sunny days.

SUMMARY

Seedlings and small saplings of narra and mahogany could be propagated by cuttings.

The percentage of survival for narra ranged from 72 per cent for 0.5 centimeter diameter class to 82 per cent for 3.5-centimeter diameter class. For mahogany the percentage of survival also ranged from 64 per cent for the 0.5 centimeter diameter class to 85 per cent for the 3.5 centimeter diameter class. In order to prevent the death of the cuttings, a partial shade should be provided immediately after planting.

TABLE 1. — *Average temperature and rain fall for the months of June to December 1959*

MONTH (1959)	TEMPERATURE (°F)		RELATIVE HUMIDITY per cent		TOTAL RAINFALL IN INCHES
	Max.	Min.	Mean	Normal	
June	98.1	71.5	82.6	83.8	5.17
July	94.0	71.0	88.4	84.8	14.50
August	93.2	70.0	86.6	85.5	8.30
September	93.0	68.8	87.7	83.5	3.03
October	92.9	65.8	88.2	85.2	3.27
November	92.3	70.2	88.7	84.2	13.19
December	88.7	66.0	89.5	84.8	8.24

TABLE 2 — *Corresponding percentages of the number of cuttings of Narra, Pterocarpus indicus that produced roots*

Diameter Class (cm.)	LOT NO.	Number of Cuttings	Average Number of Sprouts	NO. OF CUTTINGS		PERCENTAGE		
				Did not produce roots	Produced roots	Did not Produced roots		Produced roots
0.5	1-aN	50	1.63	12	38	24	(28)	76 (72)
	1-bN	50	1.36	16	34	32		68
1.5	2-aN	50	2.33	14	36	28	(32)	72 (82)
	2-bN	50	1.80	18	32	36		64
2.5	3-aN	50	2.52	12	38	24	(21)	76 (68)
	3-bN	50	2.15	9	41	18		82
3.5	4-aN	50	2.24	5	45	10	(14)	90 (79)
	4-bN	50	2.36	9	41	18		82

TABLE 3 — *Number of cuttings of Mahogany, Swietenia macrophylla King that produced roots with the corresponding percentages*

Diameter Class (cm.)	LOT NO.	Number of Sprouts	Average Number of Sprouts	NO. OF CUTTINGS		PERCENTAGE	
				Did not Produced Roots	produce roots	Did not produce roots	produce roots
0.5	1-aM	50	2.33	9	41	18 (36)	82 (64)
	1-bM	50	3.00	27	23	54	46
1.5	2-aM	50	3.45	1	49	2 (15)	98 (85)
	2-bM	50	1.00	14	36	28	72
2.5	3-aM	50	2.84	7	43	14 (18)	86 (82)
	3-bM	50	3.31	11	39	22	78
3.5	4-aM	50	3.00	8	42	16 (15)	84 (85)
	4-bM	50	3.30	7	43	14	86

FIG. 1 — *Planting arrangement of each lot of the cuttings obtained from Mahogany and Narra seedlings and saplings*

	LOT 4-aM 3.5 cm. 50 cuttings	LOT 2-aM 1.5 cm. 50 cuttings	LOT 1-bM 0.5 cm. 50 cuttings	LOT 3-aM 2.5 cm. 50 cuttings
LOT 1-aM 0.5 cm. 50 cuttings	LOT 3-aM 2.5 cm. 50 cuttings	LOT 4-bM 3.5 cm. 50 cuttings	LOT 2-bN 1.5 cm 50 cuttings	
LOT 2-bM 1.5 cm. 50 cuttings	LOT 3-bN 2.5 cm. 50 cuttings		LOT 4-bN 2.5 cm. 50 cuttings	LOT 1-aN 0.5 cm. 50 cuttings

	LOT 2-aN	LOT 3-aN	LOT 1-bN	LOT 4-aN
	1.5 cm.	2.5 cm.	0.5 cm.	3.5 cm.
	50 cuttings	50 cuttings	50 cuttings	50 cuttings

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★ Literary Attempts ★

WHEN MAHOGANY LEAVES BEGIN TO FALL

By

Valerio B. Mendoza

What comes into your mind when you see the falling leaves of mahogany? Perhaps, you would be reminded of the song that describes the falling leaves. This is a sign that summer is here again, that makes everyone happy. It is not only man who feels happy, even wildlife too. As you go into the forest you can see birds chirping on the branches of trees expressing their joy that summer has come again, that by the following day they are free from the cold rain while they wander in the forest for food. It is during this time when beautiful flowers are in bloom. when the water in the creeks clear, which symbolize the clearness of summer. As you look up at the sky, high above the treetops you can see nothing except the white clouds being wafted by the summer wind. As you wake up early in the morning you will be enchanted by the sweet melodies produced by birds and insects as they welcome the advent of another clear summer day.

To the upperclass men of the College summer gives an instant glow of happiness and a feeling of comfort in their hearts for they know that there are many activities that are to be held during this time. There is the moving-up day celebration. They soon will come to realize that their years of hard labor, sleepless nights and endurance will come to an end. Their only problem is how to pass all the subjects when the final reckoning hour comes. To some students summer means a lot. There are the freshmen who have been yearning for this time to come so that they can go home to their home towns and visit their dear ones once again. They will perhaps talk about their experiences in the College, their studies, failure or success in their examinations, the kind of professors and classmates they have met from different regions of the country who gave them comfort and consolation during those lonely moments in College.

Some may even cry because of joy to see their parents once more after a long absence. To the graduating students, summer means much more. The seniors are busy with their theses and other requirements for graduation. Same is true with the ranger students. They are busy making reports about field trips, rushing requirements for graduation. But try to think for a moment and look back across the past years and recall your experiences since you were a freshman wearing skull cup and name plate, when you were forbidden to smoke, the many incidents that took place in your life during your stay in College. How do you feel that as member of the graduating class, you will soon leave the college and be missing many things which you got used to and which you have learned to love?

Ask yourselves, members of the graduating class, whether you are leaving many friends or enemies behind. Are you sure you are free from accountabilities both money and properties? Did you make an impression that the family in which you have been brought up is a good one? Are you going back to your home towns with pride and readiness to help the people get more information about the profession?

At least, within that length of time you have been in College, you can not forget the two most common problems which confronted you. First, is financial and, second, is how to pass every subject you registered in. How sad, indeed, it is to think of the beauty of the many things that happen only once in a lifetime because you can never bring them back anymore.

You are now graduating. You will soon be going somewhere. But, can you bring your friends along with you? Then, whatever the circumstances may be, patience should prevail because time passes by, and all of these are brought about by the coming of summer, and we know summer is here again because the mahogany leaves begin to fall.

DEFORESTATION: A THREAT TO THE NATION

By

Valerio B. Mendoza

Wood is as important as bread, a necessity which benefits everybody directly or indirectly. To be able to realize the importance of wood to man, there is a need of comparing the importance of agricultural crops with forest crops.

Agricultural crops are relatively produced in a very much easier manner with the proper soil conditioning and other methods of care placed together. In contrast to agricultural practices, forestry practices are more dependent on natural conditions such as topography of the ground, soil condition and rainfall. Assuming that all of these are all right, the quality of the species and the amount of timber that can be produced from a particular area depends on the silvicultural and management practices which a forester employs. Since it will take decades before the result, either success or failure, could be determined, immediate remedial action cannot be adopted.

It can be readily said that the surrounding forests give fertility to rice fields or any agricultural farms. The forests protect the fields below from floods because the trees are there to prevent the rain water from rushing down the river in great amounts. The vegetation protects the soil from erosion, from exposure, and from impacts of rain. To cite an example, the Ambuklao hydroelectric power dam was expected to generate enough electricity for industries, homes and hospitals. But is it doing or has it done its work? Maximum power expected was not attained. Maybe you will ask why deforestation has something to do with the unsatisfactory performance of the Ambuklao hydroelectric power dam. The answer is simple and obvious. The vicinity of the hydroelectric power dam used to be a virgin forest which served as a blanket to absorb the impact of rain and prevent exposure. Because of illegal cutting of timber this "blanket" is removed and the soil gets dried and pulverized. When it rains the soil is pounded into small particles and washed down to the creeks and finally to the reservoir of the dam in great amounts, hence, gradually reduce the volume of water to run the turbines.

Another bad effect brough about by deforestation is water shortage which at present is the problem of densely populated areas. Everybody knows that water is important like air and also an essential element of our economy. In most everyday household activities, water is very much needed. In industries water is also needed because in some industrial plants water is their raw material. Pulp and paper making, soft drinks plants, and distilleries are few examples of industrial plants using great amounts of water.

Deforestation is a threat to the nation. When it rains there is flood. It does not only cause destruction of roads, crops, properties, but it also causes the loss of human lives not only by the tens but even hundreds and many more are left homeless. Who are concerned with these? The government and the people as a whole. To talk on the threat of deforestation is very discouraging. There is no need to make mention of nations which at present are experiencing the evil effects brought about by deforestation. The question behind the issue of deforestation is: What are the necessary steps that should be taken to check deforestation? The answer lies on the hands of everybody concerned in the preservation and protection of our forests.

Some of the factors influencing the destruction of our forests which bother much the Bureau of Forestry and everybody concerned are the following:

1. Political interference.
2. Insufficient appropriation.
3. Lack of trained forestry personnel.
4. Indifferent attitude of the people towards forest protection and conservation.
5. Weak prosecution.
6. Poor implementation of the existing forestry laws and regulations.

Lack of understanding on the part of our people is, perhaps, the primary factor that causes the destruction of our forests.
All of these are perhaps due to the lack of understanding on the part of the people.

Forestry is concerned with the existence of vegetation, commercial, protection as well as recreation forests. It aims to produce timber in the shortest possible time, in the cheapest way possible, and to produce the best quality and greatest amount of timber from a given area. Forestry aims that a certain area should be logged so that after a given number of years that same area could be logged again. But how can the Filipino forester at present expect this with the very rampant kaingin making which is the worst agent of deforestation going on?

To achieve the goal of conserving our forests, to avoid further destruction of our forests, and to avoid further threat to the country, before it is too late, now is the right time to act on the issue of deforestation.

OUR ILLEGAL KAINGIN PROBLEM

by G. P. Principe

It is now an admitted fact that our forest, our nation's foremost heritage is fast disappearing. From the figures gathered by the U. P. College of Forestry, no less than thirty thousand hectares of forest land are cleared by *kaingineros* every year. An area more than three times as much as what the Bureau of Forestry can reforest in one year before the creation of the Reforestation Administration. It further shows that the same *kaingineros* burn down annually, timber worth ₱15 million — and this wanton destruction has been going on unchecked for years! This is a national suicide. A threat to the very life of our national economy! Something must be done, and done right and fast, if we are to save our remaining forest from the hands of thoughtless kaingineros who are flinging our country into disaster.

It is true that the Bureau of Forestry has been and still is trying its best to put a stop on illegal kaingin, to the limit afforded by its facilities and personnel. No doubt, the Parks and Wildlife Office, the Reforestation Administration and other agencies entrusted with the task of forest conservation are doing their share of checking the devastation of our forest. However, it is also true that whatever measures have been adapted to solve our illegal kaingin problm have proven to be either ineffective or inadequate as shown by the fact that illegal kaingin making is on the increase.

Prosecution of *kaingineros* in court has proven ineffective. The judge who in most cases wanted to play hero before the eyes of the poor and ignorant, most of the time freezes the case, or he imposes a very light penalty such that it losses its deterrent force to install fear into the hearts of potential violators of the Kaingin Law. However, even if the corresponding penalty of imprisonment and ejectment is given by the Court, in most cases the *kainginero* returns to his kaingin for which he was convicted, least his family die of hunger. To him it is not a question of law, but of survival. Then there is always the unscrupulous politician who does not hesitate to intervene on behalf of illegal kaingineros in order to win their loyalty, and thus be assured of their votes when election time comes. To this end, a prominent politician once remarked before this writer: "If you foresters are after forest conservation, we politicians are after our political conservation." Our kaingineros are aware of the support given them by our politicians, hence the marked rise on illegal kaingin making every approach of an election. Indeed it can be rightly said that in order to stop illegal kaingin making, we must first stop unscrupulous politicians from intervening in administrative processes relative to the conservation of our forest.

The introduction of the tree farm leases and tree farm permits designed to help the kaingineros while they in turn help the government in planting seedlings and caring for the trees had proven to be a big joke. The kaingineros help themselves while they cut down and burn the trees. Resettlement of kaingineros had proven to be inadequate. Lands to be resettled are limited while kaingineros and their families are continuously multiflying.

Indeed it will be worthwhile for the Bureau of Foresry and all other forest agencies concerned to study other possible methods of approach that can cope with the acute illegal kaingin problem we have on hand. The kainginero is a victim of a socio-economic problem, and illegal kaingin making is but an effect of this problem. It follows therefore that the socio-economic problem involving the kainginero must first be solved before illegal kaingin making can be successfully stopped. All the possible root causes of illegal kaingin making must be thoroughly studied before the most appropriate step towards its control can be carried out. This is a big problem requiring no less than a national action if it has to be solved. In our opinion, the best step that our forest agencies can do for the present is to bind all their efforts together, form a solid front, and present before our national leaders the gravity of our illegal kaingin problem so that they can turn their attention to the dangers of deforestation, which is perpetrated by the kaingineros and instigated by the politicians. In this way national action can be carried out before it is too late to avert the danger that we are facing.

B.S.F.

SENIOR CLASS 1960-1961

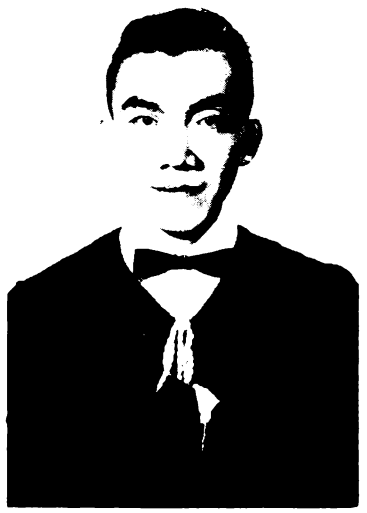
JOSE AQUINO y DAVID
132 Rizal St., Calamba,
Laguna

BACHELOR OF SCIENCE
IN FORESTRY

Ranger Certificate, School of Forestry, UP (1934)
Bachelor of Science in Business Administration, University of the East (1954)
O. M. E. C. Certificate, Army Engineering School, Fort Belvoir, Va. U.S.A. (1946)
Government Pensionado (4 semesters)
Member: Order of the Pterocarpus Fraternity
Society of Filipino Foresters
Zeta Beta Rho Fraternity

CESAR ARROYO y AMPARADO
Sta. Clara Lumber Co., Inc.
Kabasalan, Zamboanga del Sur
BACHELOR OF SCIENCE
IN FORESTRY

Ranger Certificate, UP (1959)
Recipient, Los Baños Letter (1959)
Business Manager, Junior Class Organization (1959-60)
Treasurer, Forestry Student Body Organization (1958-59)
Member: Forestry Basketball Team
Forestry Soccer Football Team
Forestry Softball Team
Los Baños Varsity Baseball Team (1959)
Y.M.C.A. (1958)
Zeta Beta Rho Fraternity



RESURECCION ASTUDILLO y VIADO
Bangued, Abra
BACHELOR OF SCIENCE
IN FORESTRY

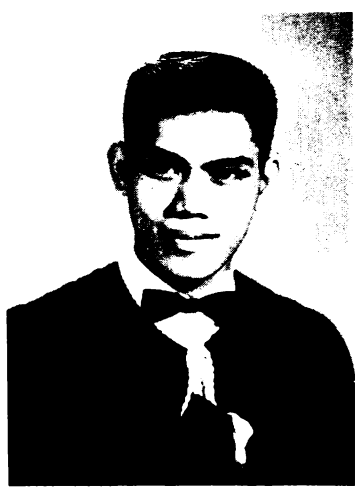
Ranger Certificate, UP (1948)
Bachelor of Science in Education (History), Far Eastern University (1950)
Bureau of Forestry Scholar (4 semesters)
Business Manager, **Forestry Leaves**
Senior Representative, Forestry Student Body) Organization (1961)
Staff Member, **Forestry Leaves**
Member: U.S.V. Organization
Y.M.C.A.

BENSON CALABIA y ARAREGO
130 Int. 1, San Francisco,
San Pablo City
BACHELOR OF SCIENCE
IN FORESTRY

Ranger Certificate, UP (1957)
Member: UPSCA

ELENO CAPILI y CALMA
Bureau of Forestry,
Baguio City
BACHELOR OF SCIENCE
IN FORESTRY

Ranger Certificate, UP (1934)
Bureau of Forestry Personnel Pensionado (4 semesters)
Vice-President, Junior Class Organization (1959-60)
Member: Zeta Beta Rho Fraternity



LARRY CAYAYAN y NATIVIDAD
Fabrica, Negros Occidental
BACHELOR OF SCIENCE
IN FORESTRY

Ranger Certificate
Business Manager, UPSCA Forestry Chapter (1960-61)
Member: Forestry Basketball Team (1957-61)
Forestry Soccer Football Team (1960-61)
UPSCA (1957-61)

DOMINGO CIMATU y PASCUA
Balanga, Bataan
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate,UP (1952)
DANR-BF Scholar (4 semesters)
Member: Zeta Beta Rho Fraternity

RICARDO CLEMENTE y AMA
Los Baños, Laguna
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Government Forestry Pensionado
(4 semesters)
Vice-President, Senior Class Organization (1960-61)
Fellow Scribe, Zeta Beta Rho
Fraternity (1960-61)
Member: Forestry Basketball Team
(1959-61)
Forestry Soccer Football
Team (1960-61)

ROBERTO DUMO y NIPA
Bontal, Bayombong,
Nueva Vizcaya
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1960)
Member: Beta Sigma Fraternity

MOISES ESTRELLA y QUIJANO
Tuburan, Cebu
BACHELOR OF SCIENCE
IN FORESTRY
Forest Ranger, UP (1959)
Vice-President, Sophomore Class
Organization (1958-59)
Chairman, UPSCA Forestry Chapter
(1960-61)
Treasurer, Freshman Class Organization (1957-58)
Treasurer, Junior Class Organization
(1959-60)
Treasurer, Forestry Student Body Organization (1959-60)
Member: Forestry Soccer Football
(1960-61)
Zeta Beta Rho Fratenity

DOMINADOR FAUSTINO JR.
y MORA
Sibul, San Miguel
Bulacan
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Government Forestry Pensionado
(4 semesters)
First place, Declamation Contest
(1959)
Second place, Oratorical Contest
(1958)
College Editor, **Philippinensian 1961**
Business Representative, **Philippinensian 1961**
President, Sophomore Class Organization (1958-59)
President, Junior Class Organization
(1959-60)
President, Forestry Student Body
Organization (1960-61)
Chairman, Vigilance Committee
(1958-59)
Captain Ball, Forestry Basketball
Team (1960-61)
Sgt.-at-Arms, Senior Class Organization (1960-61)
Member: YMCA
Zeta Beta Rho Fraternity
For Basketball Team

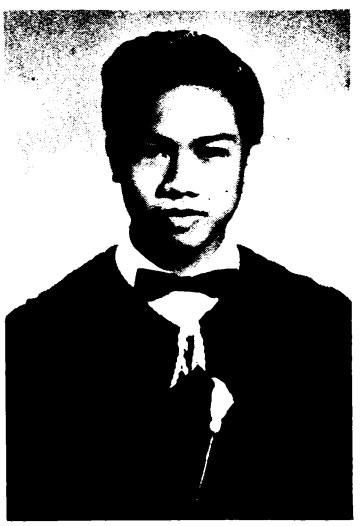
GREGORIO FRANCIA JR.
y PEÑA
Panagan, Lagonoy,
Camarines Sur
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1956)
Bureau of Forestry Pensionado
(2 semesters)
Vice Illustrious Fellow, Upsilon Sigma
Phi Fraternity (1960-61)
Staff Member, **Forestry Leaves**
Member: Forestry "Y" Club
Makiling Literary Club
YMCA

DOMINGO FURIGAY y ARAO
Peñablanca, Cagayan
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Member: YMCA

CARLOS GLORI y VILLAMOR
Bangued, Abra
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Entrance Scholar (1957)
Bureau of Forestry Scholar
(4 semesters)
First Place, Declamation Contest
(1957)
First Place, Declamation Contest
(1958)
First Place, Impromptu Speaking
Contest (1959)
President, Freshman Class Organization (1957-58)
President, Makiling Literary Club
(1958-60)
President, Forestry "Y" Club
(1959-60)
Editor-in-chief, **Forestry Leaves**
(1960)
Secretary-Treasurer, Senior Class
Organization (1960-61)
Member: Makiling Youth Club
Zeta Beta Rho Fraternity

ROGELIO GONZALES y AGUADO
Lambunao, Iloilo
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1958)
Welder of the Whip, Alpha Phi
Omega Fraternity, Theta Chapter
Member: UPSGA

TORIBIO JARAMILLO y TACTAY
Sto. Domingo, Ilocos Sur
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Member:Beta Sigma Fraternity
UPSCA



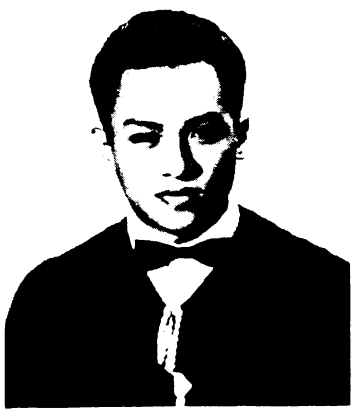
CELSO LANTICAN y BANAAG
Anos, Los Baños, Laguna
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1960)
College Scholar, (2 semesters)
Bureau of Forestry Scholar
(4 semesters)
Vice Supreme Fellow,
Zeta Beta Rho Fraternity
PRO, Senior Class Organization
(1960-61)
Auditor, Forestry Student Body
Organization (1959-60)
Member: Gamma Sigma Delta
Honor Society

CELSO LUIS y CUDAL
Alcala, Cagayan
BACHELOR OF SCIENCE
IN FORESTRY
Member: YMCA

MELCHOR MAGSANOC y LAGON
Laoag, Ilocos Norte
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Third Place, Declamation Contest (1957)
Vice Grand Princep, Beta Sigma Fraternity (1960-61)
Master of Rolls, Beta Sigma Fraternity (1959-60)
Secretary, Junior Class Organization (1959-60)
Treasurer, Forestry "Y" Club
Treasurer, Sophomore Class Organization (1958-59)
PRO, Forestry Student Body Organization (1960-61)
Representative to SBO Freshman Class Organization (1957-58)
Staff member: **Forestry Leaves**
Member: Makiling Literary Club
UPCYM

SEGUNDINO MARTIN y TABLIT
Ballesteros, Cagayan
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Member: Beta Sigma Fraternity
UPSCA

LUCRECIO REBUGIO y LAZARO
Laoac, Manaoag, Pangasinan
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Entrance Scholar (1957)
Bureau of Forestry Scholar (4 semesters)
Fellow Herald, Zeta Beta Rho Fraternity (1960-61)
Representative, UPSCA Central Council (1960-61)
Auditor, Forestry Student Body Organization (1960-61)
Auditor, Senior Class Organization (1960-61)
PRO, Junior Class Organization (1959-60)



ADOLFO REVILLA JR.
y VALENZUELA
Dingras, Ilocos Norte
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate (with honors), UP (1959)
University Scholar (1 semester)
College Scholar (3 semesters)
Bureau of Forestry Scholar (4 semesters)
President, Senior Class Organization (1960-61)
Supreme Fellow, Zeta Beta Rho Honor Fraternity (1960-61)
Secretary, Forestry Student Body Organization (1958-59; 1959-60
Staff member: **Forestry Leaves** (1958-61)
Member: Makiling Literary Club
YMCA
Gamma Sigma Delta Honor Society

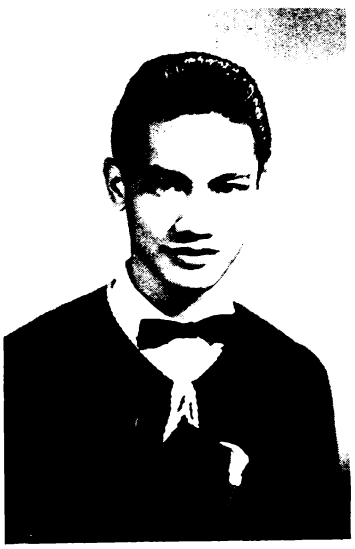
URDANITO ROMERO y MARIN
España, San Fernando, Romblon
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Member: Makiling Literary Club
YMCA

ERMELO DE LOS SANTOS
y ZARAGOZA
Kapatagan, Lanao del Norte
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Chamberlain, Beta Sigma Fraternity, Los Baños Chapter
Member: YMCA

AMADOR SIAPNO y EUSEBIO
Dagupan City, Pangasinan
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Member: Upsilon Sigma Phi
Fraternity

TRINIDAD TALARO y AGUDA
Pasuquin, Ilocos Norte
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)

GERONIMO TURGO y OROZCO
Burdeos, Quezon
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1959)
Recipient, UP Letter (1960)
Recipient, UP Los Baños Letter (1956-61)
Auditor, Freshman Class Organization (1956-57)
Sgt.-at-Arms, Junior Class Organization (1959-60)
Sgt.-at-Arms, Forestry Student Body Organization (1958-60)
Captain, Forestry Track and Field Team (1958-60)
Captain, Forestry Volleyball Team (1958-60)
Member: UP UAAP Track and Field Team (1956-60)
UP UAAP Volleyball Team (1959)
Forestry Softball Team (1956-57)



EDILBERTO UNITE JR.
y MARQUEZ
Ballesteros, Cagayan
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1960)
Second Place Oratorical Contest (1957)
Third Place, Declamation Contest (1959)
P.E. Certificate Awardee, Basketball (1961)
Letterman UP varsity Basketball and Volleyball Teams (1957-60)
Sweaterman, UP varsity Basketball Team (1960)
Representative, Junior Class Organization (1959)
Sgt.-at-Arms. Forestry Student Body Organization (1959-60)
Athletic Manager, Freshman Class Organization (1956)
Member: Forestry Basketball Team
UP Basketball Varsity UP
Los Baños Varsity
YMCA
Zeta Beta Rho Fraternity

MARIANO VALERA y ZURBITO
Masbate, Masbate
BACHELOR OF SCIENCE
IN FORESTRY
Ranger Certificate, UP (1955)
Bureau of Forestry Scholar (8 semesters)
Vice-President, Forestry Student Body Organization (1959-60)
Representative UPSCA Central Council (1960-61)
Circulation Manager, **Forestry Leaves** (1960-61)
Asst. Business Manager, **Forestry Leaves** (1959-60)
Member: Beta Sigma Fraternity
Forestry Footbal Team (1960-61)
UP Forestry Pensionado Club (1953-55)

ELPIDIO A. VILLANUEVA
315 J. Palma Gil St.
Davao City
Ranger Certificate (1959)
Vice-Chairman-UPSCA (1960-61)
Charge 'd Affaires, Beta Sigma Fraternity (1959-60)
Guardian of the coffers, Beta Sigma Fraternity (1960-61)
Business Manager, Freshman Class (1957-58)
Treasure, UPSCA (1959-60)
Member, Club Davaweño.

FELIZARDO VIRTUCIO y DIMACULANGAN
San Jose, Batangas
BACHELOR OF SCIENCE IN FORESTRY
Ranger Certificate, UP (1959)
PRO Junior Class Organization
Member: Forestry "Y" Club

RICARDO ZAPATERO y DUATIN
Coliling, Rosales, Pangasinan
BACHELOR OF SCIENCE IN FORESTRY
Ranger Certificate, UP (1958)
Member: Forestry Volleyball Team (1958-60)

The Vigilantes with their Adviser, Dr. A. Manza, Dean Zamuco, and Professors C. Larson, F. Carlson and J. Sammi.
Front row (l-r.): O. Gonzales, C. Guerrero, Prof. J. Sammi, Dean G. Zamuco, Dr. A. Manza, Prof. C. Larson, Prof. Carlson, C. Salvador, S. Reyes.
Back row (l-r): B. Sumajit, M. Madamba, O. Suguitan, E. Quintana, A. Madrid, C. B. Paet, R. Ragasa and R. Casilla.

The Philippine Lumber Producers' Association gave a luncheon in honor of the delegates of the Golden Jubilee of the College of Forestry and the Diamond Jubilee of the Bureau of Forestry at the Philippine Columbian Clubhouse last Dec. 2, 1960. Photo shows from left: Executive Secretary Natalio Castillo (Guest Speaker); Major Maximo Maceren, Vice Chairman, PCAFE; Tiburcio Serevo, Director of the Bureau of Forestry; Salvador Cunanan, Undersecretary of the Department of Agriculture and Natural Resources; Don Antonio de las Alas, president of the Philippine Lumber Producers' Association. Second row: Don Gonzalo Puyat, president of Gonzalo Puyat & Sons, Inc.; and Alfredo Montelibano, president of the Chamber of Agriculture and Natural Resources of the Philippines.

From left: 1st row, Major Maximo Maceren, Vice Chairman, PCAPE; Tiburcio Serevo, director of the Bureau of Forestry; Salvador Cunanan, Undersecretary of the Department of Agriculture and Natural Resources; Executive Secretary Natalio Castillo, Guest Speaker; Don Antonio de las Alas, president of the Philippine Lumber Producers' Association; Gregorio Zamuco, dean of the College of Forestry, U.P. Gaudencio E. Antonino, president of the Chamber of Commerce of the Philippines; and Leland Randall, Asst. Director, ICA. Second row, Don Gonzalo Puyat, president of Gonzalo Puyat & Sons, Inc.; Alfredo Montelibano, president of the Chamber of Agriculture and Natural Resources of the Philippines; George M. Hunt, former director of the U.S. Forest Products Laboratory, Madison, Wisconsin; Floyd E. Carlson, visiting Professor from Syracuse University of New York; Eugenio de la Cruz, director, Forest Products Research Institute, Los Baños, Laguna; and Dean Hardy Shirley of the College of Forestry, Syracuse University, New York.

The PHILIPPINE LUMBER PRODUCERS' ASSOCIATION gave a luncheon in honor of the delegates of the Golden Jubilee of the College of Forestry and Diamond Jubilee of the Bureau of Forestry at the Philippine Columbian Clubhouse last December 2, 1960. Photo shows from left: Don Antonio de las Alas, president of the Philippine Lumber Producers' Association (at the rostrum); Major Maximo Maceren, Vice Chairman PCAPE; Tiburcio Serevo, Director of the Bureau of Forestry; Salvador Cunanan, Undersecretary of the Department of Agriculture and Natural Resources; Natalio Castillo, Executive Secretary, Guest Speaker. Second Row: Don Gonzalo Puyat, president of Gonzalo Puyat & Sons, Inc. and Hon. Alfredo Montelibano, president of the Chamber of Agriculture and Natural Resources of the Philippines.

More than 500 Guests at the Philippine Lumber Producers' Association luncheon.

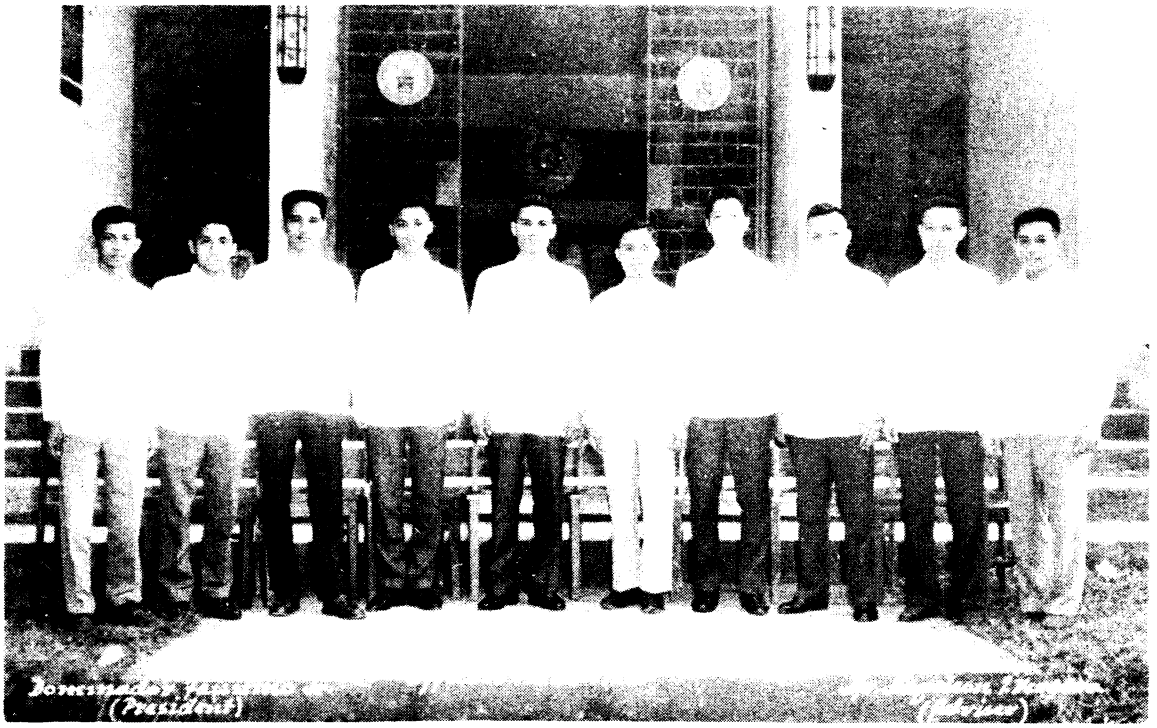
Under-Sec. Cunanan of Natural Resources taking Oath of Office as Acting Secretary of Agri. & Nat. Res. before Sec. Fortich at 4:50 p.m. on Feb. 7, 1961 in the latter's office. Sec. Fortich left at 8:00 a.m. on Feb. 8, 1961 with the Party of Pres. Garcia for Kuala Lampur.

Seattle, Wash. Philippine delegation. Kneeling George R. LaBounty, Koppel (Phils.) Inc., Manila. First row, left to right, N. P. Lansigan, T. S. Serevo, V. De La Cruz. 2nd row, F. S. Pollisco, R. A. Sebado, J. D. Lamanilao. 3rd row, F. P. Mauricio, F. B. Abraham, Jr., D. V. Antonio.

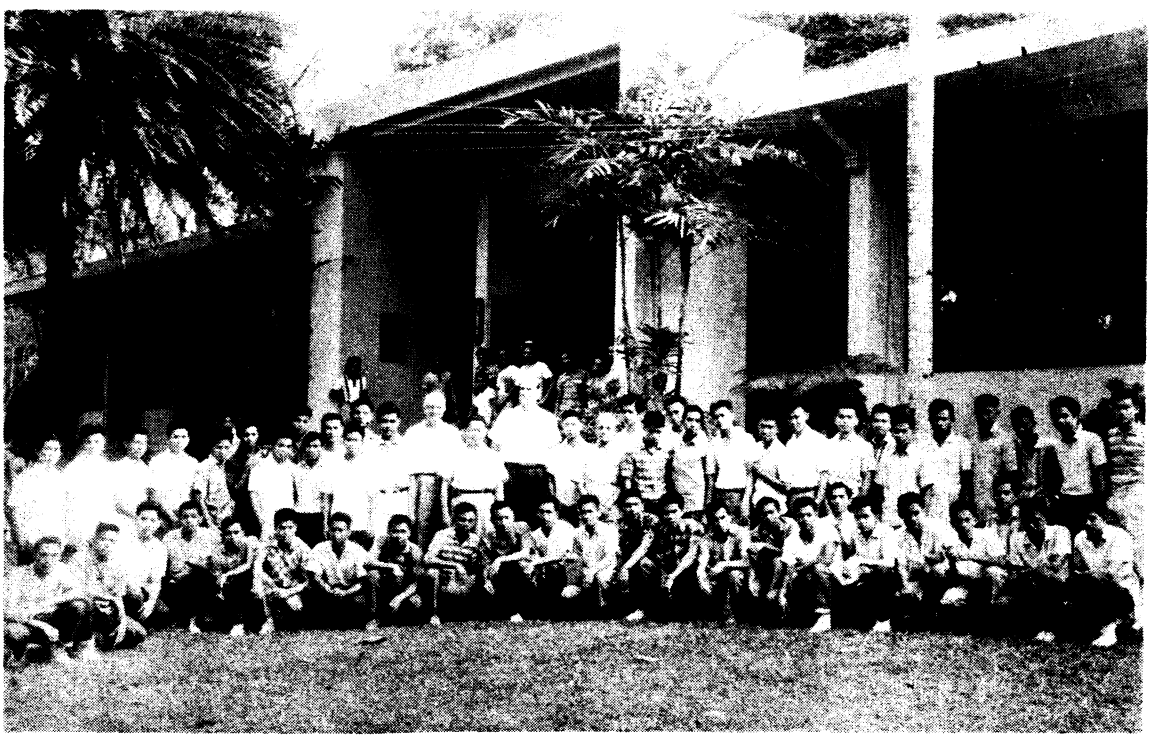
Pres. Garcia is apparently satisfied with the information being given by Acting Secretary Cunanan of DANR.

International foresters from some 23 countries with Post — (Fifth World Forestry Congress) Tour No. 5 (Rocky Mountains Tour) pose before the dormitory of "smokejumpers" of the U.S. Forest Service Fire Laboratory at Missoula Montana, USA, on September 13, 1960. The Fire Laboratory dedicated by US Forest Service Chief McArdle on September 12, 1960 is in the Aerial Fire Depot, the largest of the 8 smokejumper training centers in the U.S. Here 150 smokejumpers are trained by the Forest Service for its own protection organization, and for the National Parks Service and the Bureau of Land Management, U.S. Dept. of the Interior. Asst. Regional Forester K. A. Keeney of the Northern Region, Tour 5 Director, is at extreme left.

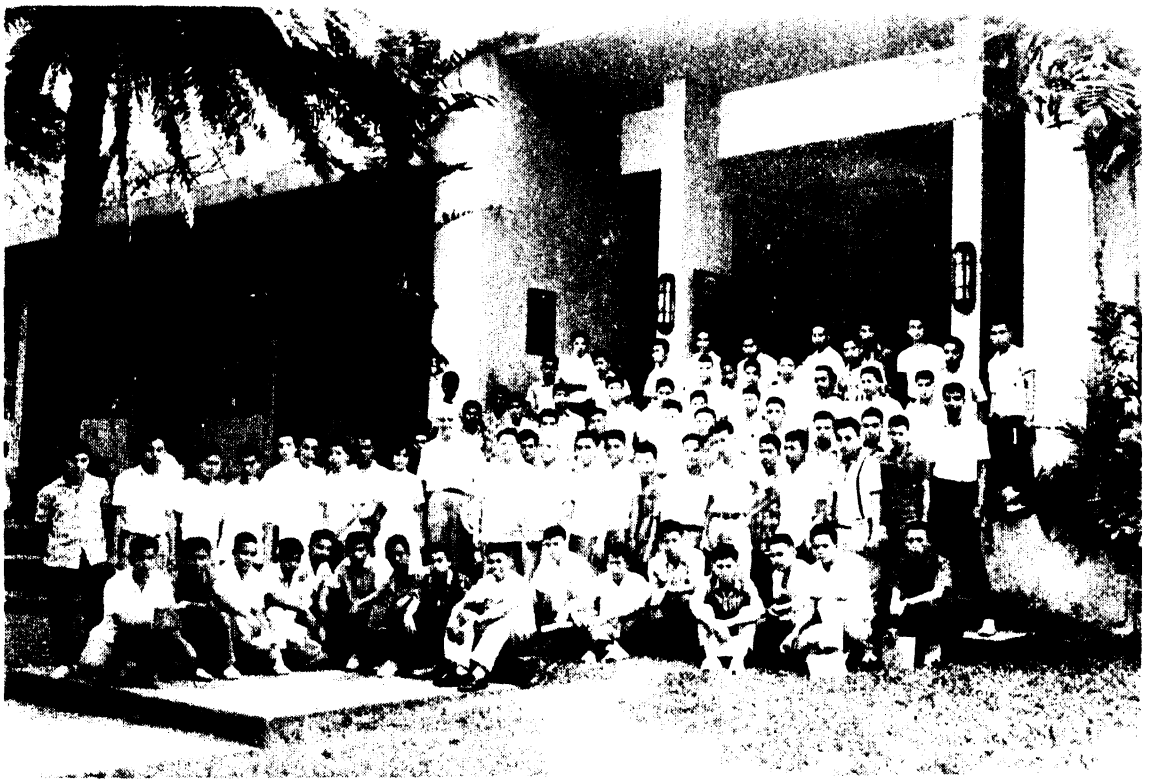
Director Serevo is planting his tree, Pinus taiwanensis **Hay (a native of Pa-Shen-Shaw, Taiwan) at the Cebu Forest Experiment Station Arboretum while Undersecretary Cunanan, Foresters Maun, Nañagas, Ballesteros and others look on.**



Officers of the U.P. College of Forestry Student Body Organization (1960-61). From left to right: Lucrecio L. Rebugio, Auditor; Melchor L. Magsanoc, PRO; Gil V. Urgino Sgt-at-arms; Honorio F. Cariño, Treasurer; Edmundo V. Cortez, Vice-president; Napoleon T. Vergara Adviser; Dominador M. Faustino; Jr., President; Gregorio P. Principe, Secretary; Francisco C. Lozano, Sgt-at-arms; and Petronilo S. Muñez, Athletic Manager.



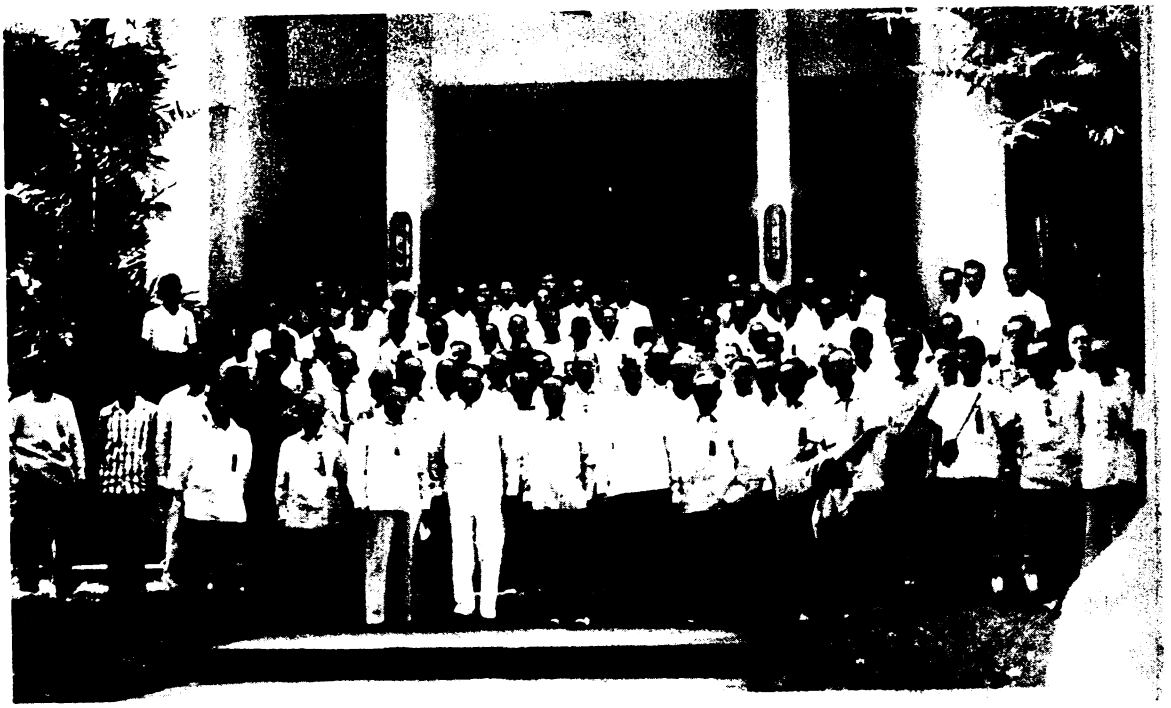
Sophomore Class, 1960-1961 with their Adviser, the Dean and some faculty members.



Freshman Class 1960-1961 with their Adviser, the Dean and some faculty members.

The Champion Intramural Basketball Team, U.P. Los Baños College, 1960-61.

(l. to r.) Ernesto Marquez, Ricardo Clemente, Larry Cayayan, Emmanuel Hilario, Dominador Faustino (Capt.), Mariano Pinson, Wilfredo Reboton, Silvestre Cruz, Cesar Arroyo, Jorge Seguerra, Ernesto Villarino, Petronilo Muñez, Bienvenido Rola (Coach). Not pictured: Augusto M. Blando and Victor Velasco, jr.



Hon. Pio Pedrosa, U.P. Vice Pres. Isidro, Dean H. Shirley, Dean Zamuco with Alumni Delegates to the Golden Jubilee of the College of Forestry.

Professor Jose Campos, members, and visitors of the first Residence Hall Seminar of U.P. residence halls.

Undersecretary Cunanan and Director Serevo with DANR Officials, Forestry Personnel of the Cebu Forest Experiment Station and Forest District No. 31 and others at Camp 7, Minglanilla, Cebu, on January 19, 1961.

1961 LOG AND LUMBER GRADING CLASS IN BUTUAN CITY

Kneeling left to right: Agpawa, H., Tosco, C., Orden, J. Jr., Gonzales, V. Sabado, J., Guadalupe, N., Mina, D., Empedrad, C.

Standing same order: Agustin, P., Molina, M., Macabata, B., Villaluna, A., Salvador, P. (Training Officer), Afalla, P., Cajucom, E., Briones, J., Decena, A., Ramos, F.

District Forester Bernabe S. Zumel and personnel of the Ilocos Norte B.F. District Office.

Ilocos Norte float B.F. (Back view) during the Agricultural, Commercial, Industrial and Educational parade that formally opened the Ilocos Norte Carnival and Fair in connection with the traditional town fiesta of Laoag held on February 5 to 12, 1961.

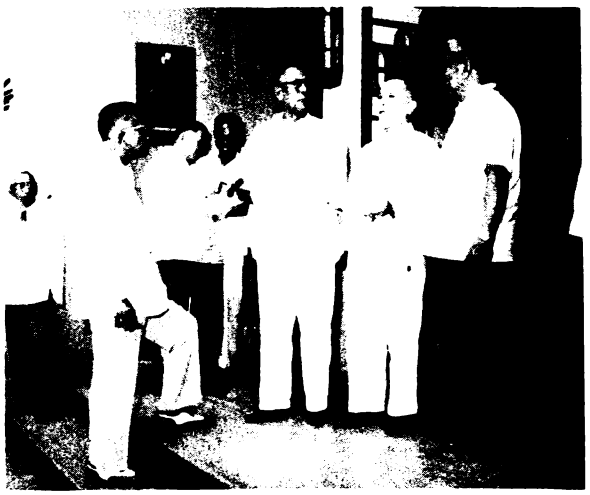
President Sinco awarding the certificates to Ranger Graduates. Dean Zamuco calls the names of the graduates as Prof. Recto, College Secretary, readies the certificates for the President to award.

Regent Ernesto Sibal addresses the Ranger graduates at the Moving Up Day Program.

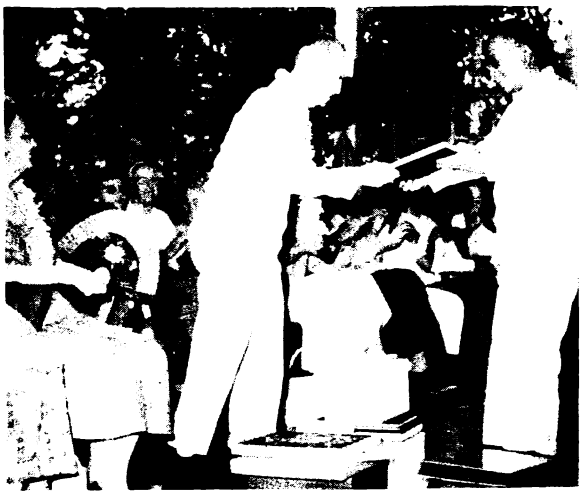
President Sinco Dr. D. Ritter and Dr. Larson breaking ground during the "ground-breaking" ceremonies of the future Forest Technology building on the College campus while the faculty, guests and student body look on.

Adolfo Revilla jr. being pinned the Ahern Medal, the highest award given to the most outstanding B.S.F. graduate. Revilla is the second College of Forestry Senior to graduate with honors (cum laude); the first one was Crisostomo Tiongson, (magna cum laude), Cl. '36.

A portion of the audience at the Moving Up Day Program.



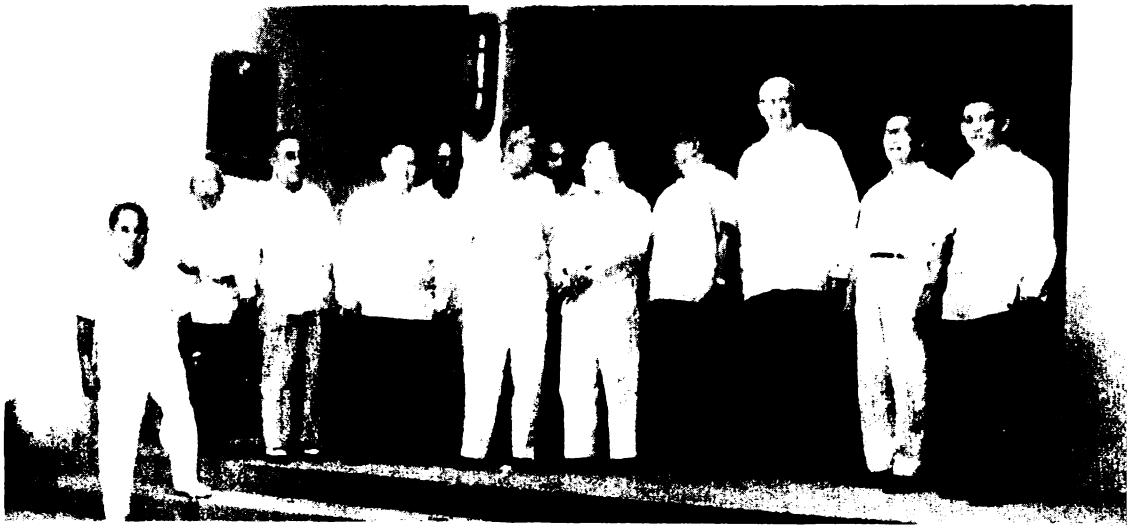
President Sinco on the front steps of the College building in a jovial conversation with Regents Sibal, Tamesis and FPRI Director Cruz.



Dr. George Hunt accepting the FPRI testimonial plaque from Director de la Cruz while Mrs. Hunt, Mrs. Ranit, and Prof. Carlson and others look on.

Assistant Director Carlos Suit, presiding at the Forestry Alumni Association Meeting. Dean Zamuco is the Secretary — Treasurer.

The F.A.A. members and their guests at the Alumni meeting.



Regent Sibal and President Sinco in an animated conversation. Others in the picture (l. to r.) Assistant Dir. Monsalud, Dr. F. Santos, Dir. de la Cruz, Dean Zamuco, Regent Sibal, Pres. Sinco, Regent Tamesis, Dr Carlson, Prof. Aglibut, Mr Uy

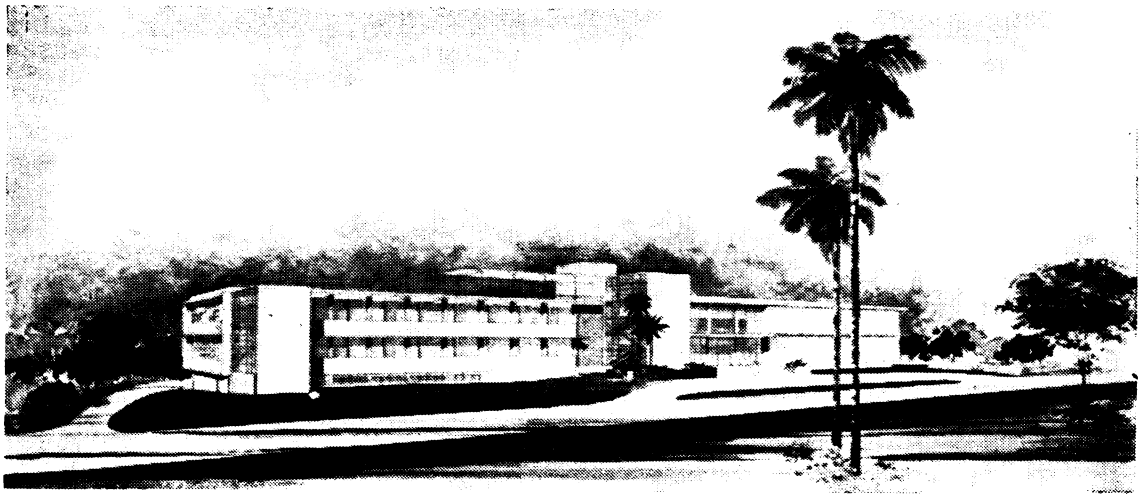
Portion of the crowd after the ground-breaking ceremonies. Mrs. Larson, President Sinco, Regent Sibal, Dean Zamuco, Dr. Larson, Prof. Blando, Regent Tamesis, Dr. Zehngraff, Mr. Mauricio, Dr. Carlson and others.

Mrs. T. Flores conducting the musical number contributed by the Forest Songbirds **to the Moving Up Day Program. Portion of the** Songbirds **group, among whom are Mrs. Zamuco, Mrs. Cortes, Mrs. Pollisco, Mrs. Mendoza, and others.**

DANR Sec. Cesar M. Fortich praising the delegates to the first reforestation conference.

Dr. Paul Zengraff of the ICA before the first reforestation conference. Others in the picture are (l to r.) Dean Gregorio Zamuco, Director Serevo, DANR Secretary Fortich, Undersecretary S. Cunanan, and Professors Larson, Sammi, and Carlson.

A portion of the mammoth crowd that attended the conference.



Forestry Technology Building

★ Campus Notes ★

THE FORESTRY TECHNOLOGY BUILDING

By Gregorio P. Principe

March 6, 1961

Construction of the much awaited Forestry Technology Building starts this April 1st. Financed by the ICA-NEC fund, this building will be erected in the site presently occupied by the boys' dormitory houses nos. 1 to 4.

The original plan of the technology building, which called for an appropriation of ₱997,000.00 was an L-shape two-story type and included an auditorium and a basement. As only ₱480,000.00 is available however, only the front wing facing Racelis Street will be constructed. The remaining wing will be constructed when additional fund from the 1961-62 budget shall be available for the purpose.

The wing to be constructed is a rectangular affair, 56½ feet by 214 feet. Among the compartments are to be housed the following:

I Basement: Drafting room; Surveying and Management Storage room; Lecture room; Storage for machineries; Comfort rooms; Photomicrography dark room; and Storage room for chemicals.

II First Floor: Two (2) Botany teaching laboratory rooms; Storage rooms for microscope and Botanical collection; Herbarium; Two (2) faculty offices; Lecture room; Comfort rooms; Information and Secretarial room;

III Second Floor: Wood collection and dry storage room for wood; Wood Technology laboratory room; Management room; Lecture room; Kitchenet; Faculty and Seminar room; Faculty office; Comfort rooms; and Calculating room.

The forestry technology building when finished will meet many of the increasing demands of forestry education and research.

* * * *

UP — PASS CONFAB

by E. V. Cortes

For the purpose of seeking out fresh approaches to the manifold problems of Philippine education, a joint conference of faculty members of the University of the Philippines and the school superintendents of the Bureau of Public Schools was held at Diliman, Q.C. December 19 — 21, 1960.

Delegates designated to represent this College were Professor Floyd E. Carlson, visiting professor of forestry information, Professors Jose B. Blando, and Domingo V. Jacalne.

Five basic problems and issues were introduced by able speakers under the following main topics: "Philosophy and Goals of Public Education," "Understanding Filipino Children", "Basic Learnings in Public Education", "Support of Public Education", and "Freedom of Education from Pressures and Influences".

These problems and issues were studied and discussed in free group sessions during the second day, and reports on the consensus of the group were submitted to the general meeting wherein resolutions, based on these reports, were adopted for transmittal to proper authorities.

Professor Carlson said this conference afforded him "an exceptional opportunity to sense the temper and outlook of both public school and U.P. leaders." He also said it revealed a surprisingly frank attitude in appraising both the weakness and the strength of Filipino education, with considerable emphasis on the need for further research, for a marked increase in financial support and for a new freedom for the educator.

The delegates to the conference were feted to a series of luncheons, first with Pres. Vicente G. Sinco as host, second, by the Central Bank, and third, by the G.S.I.S.

Held at the Benitez hall, graduate college of education, the opening ceremonies was presided by Dr. Enrique T. Virata, executive vice president. The closing day was highlighted with an address by Dr. Benigno Aldana, director of of public schools, and President Sinco of the university.

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UPSCA SPONSORED BASKETBALL INTRAMURAL

By D. DEL ROSARIO

An interfraternity basketball tournament sponsored by the UPSCA Aggie Chapter began on January 24, 1961 at Baker Hall. The participating teams were the: Upsilon Sigma Phi, Beta Sigma, Scorpion, Center, International House, Falcons, UPSCA and the Zeta Beta Rho.

The unique feature of the opening ceremonies was the presentation of muses of each of of the participating teams. Fr. Dimaano made the invocation.

In the first game, the Falcons powered by Lapeña and Talens beat the Scorpions to the tune of 55-51.

In the second game between the Zeta Beta Rho and the UPSCA, the Upscans led by a shot. In the Zeta Beta Rho line-up, Jess Rola and Eddie Unite, both U.P. varsity stars played, supported by the intramural champion forestry boys. On the opposing team was Cuyno, supported by Hilario, Reyes Pestano and Panganiban, punctured the hoop despite the Rhoans tight defense, to give his team a two-point lead.

The game on January 31st between the Zetans and the Betans was lopsided, ending in a 87-64 victory for the former. Again on February 1st, the Rhoans trounched the Center in another one-sided encounter, 77-65.

In the championship round the Rhoans subdued the Falcons in an overtime period 75-65. In their next game with the Scorpions the Rhoans trampled all over their opponents to the score of 86-53.

The championship game, the most attended, was played at the Baker Hall. Before a large, madly cheering crowd the encounter between the Upscans and the Rhoans which first promised to be a toss-up ended in a 72-69 victory for the former.

With only 1 minute and 45 seconds to go, when passion and tempers ran high the game had to be stopped with the Upscans leading by 3 points. The Upscan lead by 3 points at the cessation of hostilities, ended in a score of 72-69.

Following the unfinished game was the awarding of prizes. The handsome championship trophy was awarded to the Upscans and a pennant to the Zetans, the runner up. The members of the Zeta Beta Rho were: Jess, Rola, Playing coach, Eddie Unite, captain Ball, Cesar Arroyo, Oscar Cadeliña, Ding Clemente, Koko Clemente, Domy Faustino, Jr. Celso Lantican, Angelo Mordeno, Pete, Munez, June Revilla, Domy del Rosario, Conrado Salvador, George Seguerra, and Molly Valeña.

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THE NEW C.F. MEN'S DORMITORY

By Gregorio P. Principe

A new ₱200,000.00 men's dormitory was added to the improvements being undertaken in the College of Forestry. Started a few months ago, the construction of this building will be completed by the end of this month.

This new dormitory is a two-story, all concrete building, rectangular in shape, 51 meters long and 12 meters wide. On the first floor it has 18 student rooms, one bedroom, office and lounge for a faculty incharge, a hall, and two comfort rooms on both ends. On the second floor are 21 students rooms and two comfort rooms as in the first floor. A springbed with mattress and individual locker will be provided for each student boarder.

This new dormitory is intended to accomodate the occupants of house nos. 1 to 4 which are going to be demolished soon, and other students who intend to transfer to this new building.

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FORESTRY SENIORS DONATE BC BENCHES

by G. Francia, Jr.

The College of Forestry Graduating Class unanimously passed a resolution on a class donation consisting of four concrete and marble benches to the College of Forestry for the College Basketball Court.

(*Continued on page* 103)

★ Forestry in the News ★

compiled by GREGORIO P. FRANCIA, JR.

PI LOG INDUSTRY HAS DARK FUTURE

The Philippine log industry faces a bleak future as Japanese log importers tap other countries in Southeast Asia for supply of their wood-processing mills.

The yearly exportation of Philippine logs to Japan of about 3,000,000 cubic meters will be considerably cut this year and may in the succeeding years eventually result in the collapse of this third biggest dollar-earning industry in the Philippines unless the government takes bold and full remedial measures.

Reactions from lumbermen bear out the sad fact that there is an absence of coordinated efforts among government policy makers in solving the grave problems besetting the Philippine logging industry.

Lorenzo S. Sarmiento, president of L. S. Sarmiento & Company, Inc., who arrived from Japan Wednesday said "there is a concerted move among leading Japanese log importers, aided by their government, to develop the timberlands of Cambodia, Borneo and Indonesia."

"One of the biggest log importers," he added "has recently acquired an area of 200,000 hectares of timberland in Cambodia which they are now starting to develop."

Sarmiento further said that Borneo is now exporting to Japan 30 to 40 million board feet a month. Aside from this, there is a plan by Japanese log importers to develop Indonesia as a major supplier of logs.

Sarmiento concluded that these new developments, which affect unfavorably the foreign markets of the Philippine logging industry, would find most lumbermen losing their investments unless the logging industry is given proper government assistance.

Voicing the same problems, Ricardo Marcos, export manager of the Bueno Industrial and Development Corporation, said "that this year's foreign log market tends to be sluggish."

He added that many Japanese log importers are requesting their Philippine supplier to reduce the prices.

Marcos predicted that in the next few years many lumbermen will be caught flatfooted with their huge investments if they do not make preparation to go into the processing of their own raw materials. He further added "that we are slow in gathering strategic economic reports which are vital to the industry." — *The Manila Times Jan.* 6, 1961.

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WOOD INDUSTRY PROBLEMS CITED

Agriculture Secretary Cesar M. Fortich called for the promotion of wood processing industries as a major step in the economic development of the country.

Fortich spoke at the luncheon in his honor given by the Philippine Lumber Producers Association at the Manila Hotel last Thursday.

At the same luncheon, three leading members of the PLPA expressed the view of the forest products industry on major problems of this country.

Don Antonio de las Alas, PLPA president said while progressive countries actually encourage exports through subsidies, here in the Philippine government red tape and restrictions have made it difficult for exporters to do business. Such restrictive steps only harm the country's chances of earning more foreign exchange Alas declared.

Nick Capistrano, director of PLPA, said all efforts at reforestration would be useless unless the government set aside definite areas as permanent forest. He also said the proposed export tax would kill many marginal industries even before they could get started.

Gonzalo Puyat warned that the practice of alien interest of entering the forest industry through dummies seems to be growing in recent years. — *The Manila Times, Feb.* 6, 1961.

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ALIEN-OWNED SAWMILL FINED

An alien-owned sawmill company in Cabanatuan City was ordered yesterday by the director of forestry to pay a fine of ₱64,286.98 for allegedly having violated various forestry rules and regulations.

Ordered to pay the fine was the Central Luzon Sawmill Company which was found to have allegedly violated bureau of internal revenue regulation No. 85, Republic Act No. 460,, and Section 263 of Commonwealth Act. No. 466.

A joint team of the presidential committee on administration performance efficiency and of the bureau of forestry reported that the sawmill in question had been:

(1) Buying logs found to have been unmanifested and unsupported with auxiliary invoices

and official receipts to show that the regular forest charges and reforestation fees had been previously paid;

(2) Transporting logs without invoices;

(3) Discharging timber without the necessary permit and invoices to show that the different fees had been paid; and

(4) Failed to display in its premises the prescribed permit to operate a sawmill concern as required by regulations. — *Manila Chronicle*, 26, 1960.

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VIADO CITES FOREST DRIVE PROGRESS

Diliman Quezon City. Dec. 29 (PNS) — Administrator Jose Viado of the reforestation Administration office here disclosed yesterday that the government was gaining headway in its five-year reforestation program which started last year.

Viado said his office now maintains 13 forest nurseries and supervises 61 reforestation projects throughout the country.

He said that 1,300,000 hectares in the country need reforestation and to speed up the work, the archipelago has been divided into six regions.

The central offices of each region follows:

Region No. 1 — Baguio City for Luzon Area; Region 2 — Bayombong, Nueva Vizcaya, for northern Luzon; Region No. 3 — Manila, for Central and Southern Luzon; Region No. 4 Iloilo, for western Visayas; Region No. 5 — Cebu City, for Eastern Visayas; and Region No. 6 — Cagayan de Oro City, for Northern Mindanao.

Viado reiterated the urgent need of attorneys for his office to prosecute "kaingineros" and illegal timber cutters and loggers.

Viado explained that priorities are given for the following reforestation projects:

(1) Headwaters of waters harnessed for hydro-electric power like Binga and Ambuklao; (2) Rivers harnessed for irrigation; and rivers or headwaters for domestic use, like the National waterwork and Sewerage Authority (NWSA).

The forestry official said that for the initial year (1959-60) of the reforestation program of the government some 10,000 hectares were reforested.

For the current fiscal year (1960-61) the reforestation office will plant trees in an area of 19,000 hectares.

The rest of the planting program follows:

1961-62 — 25,000 has.; 1962-63 — 30,000 has.; 1963-64 — 40,000 has.

According to Viado, his office expects to tap other sources of income this coming year to finance the increased cost of reforestation. — *The Manila Times, Dec.* 30, 1960.

FORESTRY SCHOOL CELEBRATES TODAY

They had lured them with ₱25.00 in pocket money and reimbursement of their expenses to the school.

That was 50 years ago today when the college of forestry had just started. It was then unpopular among high school graduates.

Today, the college boasts of 1,378 graduates who compose the elite of the nation's forest riches.

Foresters all over the country today mark the golden jubilee of the college of forestry and the diamond (both) anniversary of the bureau of forestry.

A four-day convention will be held in Los Baños, Laguna, and Diliman, QC to mark the occassion.

Among the speakers are Executive Secretary Natalio P. Castillo, Education Undersecretary Jose Y. Tuazon, Agriculture Secretary Cesar M. Fortich, Guadencio E. Antonino and Pio Pedrosa, Prudential Bank and Trust Co. president.

A symposium-forum will be held today in Laguna with Dr. Hardy L. Shirley, Dean of New York State University, College of Forestry. — *The Manila Times, Nov.* 29, 1960.

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FOREST NURSERY DRAWS TOURISTS

Quezon City, Dec. 31, (PNS) — This city has a model forest nursery-thanks to the efforts of former Director Florencio Tamesis.

It came into being in 1938 when Tamesis proposed its establishment. Today, it is one of the scenic spots in the city and can compare with the tourist attractions in other parts of the country.

It is a 20-hectare show window of ornamental and shade trees nestling right in the heart of the city.

Credited with the establishment of the forest nursery aside from Tamesis, were Foresters Honorato Baja, surveyor, the late Placido Dacanay of the reforestation division his sucessor Porfirio Buenaventura, Delfin Española and Jose Rayos, officer in charge and Jose Viado, now chief of Reclamation and reforestation division.

Twenty laborers started clearing the 20-hectare site. The first variety of seedlings planted on the area came from Los Baños.

The experiment was sucessful that year after year from then on, the cogon land turned into a cool forest nursery.

The most important objective of the nursery was to provide planting materials for beautification purposes. City and provincial parks,

school yards, national highways and private entities can get seedlings from the nursery.
— *The Manila Times Jan.* 1, 1961.
NOTE: Jose Viado is now the Administrator of Reforestation Administration.

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ILLICIT LOGGING DEPLETES FORESTS

Philippine forests are being depleted faster than in any country in the world, Dr. Tom Gill, executive secretary of the Charles Lathrop Park Forestry Foundation, reported in a recent survey.

The report said over-exploitation of forests with indiscriminate cutting of trees, lack of cooperation from the public, indifference from the public, indifferent enforcement of forestry laws and inadequate information regarding the significance of forests have contributed to the national plunder of the country's natural resources.

Commercial exploitation of the forest for domestic use and export has expanded logging operations, and extended logging roads into many previously inaccessible areas.

Squatters and kaiñgineros followed the new roads to the cleared areas and hacked away the forest as soon as the logging was finished.

There are now over 5,000,000 hectares of grass and brushland. Much of it may eventually be used again for agriculture, but a huge area will require reforestation.

Timber exports to other countries contributed international exchange to the Philippines of approximately $50 million a year.

The hardwood forests are among the finest in the world. The area in accesible commercial forest is estimated 7,000,000 hectares and to contain 302 billion board feet.

In 1957 over 2,000,000 cubic meters of lauan logs were shipped to Japan alone or 85 percent of Japanese imports of lauan.

The lumber industry today furnish direct employment and livelihood to some 75,000 families, comprising nearly 400,000 people and indirect or partial employment of several times more in related business. — *The Manila Times, Nov.* 20, 1960.

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SET UP FOREST FOUNDATION

Five leading lumber associations have decided to organize the Forest Conservation Foundation of the Philippines.

At a recent meeting attended by acting Undersecretary Salvador F. Cunanan for natural resources and Jose Viado, chief reforestation administration, department of agriculture and natural resources, it was resolved to have the foundation sustained by voluntary contributions pooled by lumber associations.

The foundation will undertake the replanting of some 500,000 hectares of barren logged-over areas in the country.

Brigido R. Valencia, president of the Philippine Association of Lumber Producers and Exporters, has pledged that his organization will donate ₱40,000 out of an estimated ₱135,000 yearly fund.

The law authorizes the reforestation administration to replant only public forests concessions. However, the office will assist the foundation by providing seedlings and know-how while the latter contributes manpower, facilities and funds.

The foundation will be a private non-stock, and nonprofit organization to be guided by the department of agriculture and natural resources.

Representing the different lumber associations at the meeting were Nicolai Kosloff, president, Plywood Manufacturing Association of the Philippines; Brigido R. Valencia, president, Philippine Association of Lumber Producers and Exporters; Godofredo Garcia, Agusan Lumbermen's Association; Pacifico Ocampo, Philippine Lumber Producers Association; and Amado Munda, Davao Producers and Exporters Association.

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SENATE CONSIDER ONLY NATIONAL BILLS

The senate will consider only bills of national importance in the coming session of congress.

This was agreed upon at a bipartisan caucus of senators at the Manila hotel yesterday.

Senate President Eulogio Rodriguez warned that unless congress leaders adopt a strict rule on economic reforms, the legislative program might be disrupted this being an election year.

Senators expressed concern over the effect on the legislative program of bickerings among top administration leaders and among certain leaders of congress.

It was also feared that many congressmen running for reelecton might devote their efforts to bills of local application intended solely to enhance their political interests.

Rodriguez said attention must be devoted only to bills affecting the general welfare.

He warned that measures which fail passage this year would be deemed as rejected since there would be a new congress next year.

The senator also rallied behind a proposal by Senator Gil J. Puyat for the passage of a series of measures intended to implement a decontrol scheme.

Puyat also advocated several other bills of economic nature.

Among the other bills approved in principal at the caucus were:

S. No. 42 — An Act prohibiting the exportation of logs cut from the forest of the Philippines.

S. No. 55 — An Act authorizing insurance companies to invest in housing and real estate projects.

S. No. 137 — An Act to provide for the promotion and organization of cooperative association engaging in retail trade and to appropriate funds for the purpose.

S. No. 714 — An Act to promote the proper production of cigar filier tobacco and to establish floor prices thereof; to operate and maintain government grading stations in order to create incentives among the tobacco farmers for increased production of quality tobaccos and for other purposes.

S. No. 1252 — An Act to limit the importation of foreign raw cotton.

S. No. 158 — An Act to provide for assistance to the base metal industry of the Philippines to authorize the appropriation of funds therefor, and for other purposes.

S. No. 421 — An Act providing for the exploitation by lease of timber lands of the public domain, and for other purposes.

S. No. 523 — An Act requiring forest concessionaires, licensees, and timber cutters from public forest lands to plant five trees to replace every tree cut to insure the perpetuation of the forest.

S. No. 245 — An Act providing for the nationalization of labor in the Philippines and penalizing the violations thereof.

S. No. 46—An Act to provide for the gradual nationalization of the lumber industry.

S. No. — 535 — An Act limiting the ownership of share of stocks institutions operating within the Philippines to citizens or to individuals qualified to operate public entities in the Philippines.

S. No. 354 — An Act to regulate fee-charging employment agencies.

S. No. 333 — An Act providing for the establishment of a multipurpose antibiotic plant under the department of health and appropriating fund therefor.

— The Philippines Herald 1-18-61

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MAP PROGRAM FOR DENUDED P.I. FORESTS

Agriculture Secretary Cesar M. Fortich recently proposed an expanded reforestation program for the country's denuded forests.

Fortich was guest speaker of the Philippine Lumber Producers' Association headed by Antonio de las Alas at a luncheon at the Manila hotel.

The agriculture secretary disclosed his plan to divert some amount from the general funds to be expended for reforestation, especially of the country's denuded watersheds.

According to him, the rate of deforestation of the country's timberlands is so fast that the present Reforestation Administration, an agency purposely organized to plant trees in denuded areas, is trying its best to solve the problem within its very limited budget.

In the course of his speech, Fortich also:

(1) Ordered forestry officials to scrutinize closely new applicants for timber license to prevent infiltration of the lumber industry by dummies and fly-by-night operators.

(2) Urged the lumber groups of the country to start lumber processing projects. Fortich said the country should ship out well-graded lumber instead of logs. This, he said, will generate more dollars and provide employment for the people.

(3) Discouraged the operation of small, short-term concessions.

(4) Opposed senate bill 523, requiring concessionaires to plant five trees for every tree they cut in public forests. Fortich considered the plan impractical.

(4) That special registration of logging trucks and barges used in transporting timber should be made with the help of the Motor Vehicles Office and the Bureau of Customs:

(5) That no applicant should be issued a license unless he could show that he owns logging equipment, like trucks, bulldozers and other equipment necessary for the logging business; and

(6) That illegally cut timber should be confiscated and the person in possession of the timbers should be persecuted instead of the present practice of releasing the timbers after forest charges and other fees should had been settled. — *The Manila Times, Jan.* 1, 1961.

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CCP HEAD URGES FORESTRY POLICY

Guadencio E. Antonino, president of the Chamber of Commerce of the Philippines, yesterday lashed at the ineffective implementation" of forestry laws and came forward with suggestions for a Filipino First oriented forestry economic policy.

He was guest speaker at the seminar on the Diamond anniversary of the bureau of forestry.

He strongly bewailed the fact that through pressures from certain influential politicians, the

President in some cases, is usually prevailed upon to reclassify squatted areas into alienable and disposable areas, thereby practically recognizing the right of ownership of squatters over pubic forests which they have destroyed in violation of our laws.

"Any forestry economic policy, to be effective and practical; should be directed toward the adoption of fool-proof remedies that can insure a successful war against the illegal activities of kaingineros and squatters within our forest areas, he said. — *The Manila Times, Dec.* 3, 1960

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MAKILING PARK ADMINISTRATION

Dean Gregorio Zamuco of the College of Forestry was named executive in charge in the plan submitted by President Sinco for the Administration of Makiling Park transferred to the University recently by Presidential proclamation. Approved by the Board of Regents, it includes rules and regulations pertaining to (1) public use of certain areas as authorized by the Parks and Wildlife Office (2) the gathering or harvesting of forest products within the park (3) licensing of stationary as well as itinerant vendors or peddlers within the park (4) a schedule of fees to be chartered in connection with public use of certain areas designated as open for such and (5) deputization of security guards assigned to the park as special municipal policemen and/ or special forest of the various municipalities in which the park is situated. — *The News Report, Nov.* 19 1960.

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FORTICH DECLARES WAR ON KAINGINEROS

Agriculture Secretary Cesar M. Fortich has implemented a three-point policy to combat depredations of the country's forest resources.

He directed bureau of forestry officials to require timber license holders with more than 20,000 hectares to reforest their cut-over areas to abolish tree farm lease and to establish forest nurseries in log-over sites.

The agriculture secretary conferred with forestry officials and briefed them on his moves to conserve PI's forests.

He said timber license holders with more than 20,000 hectares be required to reforest the log-over areas by establishing forest nurseries with seedlings supplied by the reforestation administration.

Fortich announced the abolition of tree farm lease systems which he blamed for the rampant violations of forest laws.

He proposed a wood land lease whereby licensees would be required to plant trees to prevent erosion and protect watersheds.

Reduction of bonds on pasture leases which he described as "too heavy" on the applicants was also recommended by the agriculture head.

Pasture permits should not be made as collaterals for loans and warned that violations of such policy would be penalized by cancellation of their licenses. — *The Manila Times, Nov.* 20, 1960.

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ILLEGAL CUTTING OF LOGS DENOUNCED

Antonio M. Diaz, president of the Zambales League of Barrio Lieutenants, denounced the indiscriminate cutting of logs within the watershed area of Olongapo, resulting in the drying up of the water reservoir from where the town of Olongapo derives its water supply.

Diaz said he was informed that since the death of Admiral Spring 80 logging trucks making 240 trips a day have been getting no less than 120,000 board feet of logs daily from the watershed area.

He said that if this practice is continued, there will be a certain lack of potable water supply of Olongapo during the summer months.

Diaz further said that according to his informants the illegal log cutters are closely identified with certain high ranking provincial officials, giving grounds for the population of Olongapo to suspect that the Constabulary Command of Zambales has tolerated their nefarious activities to the detriment of the Olongapo population.

The attention of General Campo of the PC and Director Lukban of the NBI has been called by the Zambales League of Barrio Lieutenants.

In this statement to the Manila Times, Senator Genaro Magsaysay also denounced the indiscriminate cutting of logs in the Olongapo watershed area by unauthorized loggers since the death of Admiral Arthur Spring.

He has received a report that 80 trucks are making some 240 daily trips with total loads of 120,000 board feet of illegally cut logs. — *The Manila Times, Dec.* 9, 1960.

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TAMESIS CRITICIZES BUREAU OF FORESTRY

Regent Florencio Tamesis, former director of the bureau of forestry, has scored what he termed the "breaking of the original activities of the bureau" and assigning them to various agencies.

Tamesis pointed out that the presence of several offices performing almost the same task of forest conservation promotes more confusion rather than coordination.

The ex-forestry head was one of the symposium speakers at the seven-day foresters conven-

tion which ended last week at the department of agriculture and natural resources building at Quezon City. He said that during the prewar years, forest conservation work was performed safely by the original bureau of forestry.

He proposed that an effective coordination among the agencies be worked out immediately so as not to hamper the forest conservation work of the government. The agencies which Tamesis referred to are the Bureau of Forestry, Parks, and Wildlife office, Reforestation Administration, Forest Research Institute and the UP College of Forestry. — *Phil. Collegian Dec.* 17, 1960.

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PALPE STARTS REFORESTATION

A nation-wide forest conservation campaign was planned this week by the Philippine Association of Log Producers and Exporters.

Brigido R. Valencia, PALPE president appointed Col. Uldarico Badogan (ret) as chairman of the committee to draft the conservation program.

Valencia said the PALPE Scheme will be a year-to-year campaign to promote not only conservation but also selective logging. — *The Manila Times, Jan.* 29, 1961.

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SOLONS DENOUNCE ALIENS IN LUMBER RETAIL TRADE

Majority congressmen last night accused aliens of violating the law nationalizing the retail trade by engaging in the retail of lumber.

Reps. Augusto S. Francisco (N. Manila) and Leonardo B. Perez (N. Nueva Vizcaya) proposed a congressional probe of the alleged violation of R.A. 1180, the retail, law.

"We must break the foreign stronghold on the lumber industry, or otherwise resign ourselves to the usual role of being economic slaves of aliens in our own country," they said.

Francisco pointed out that sale of lumber directly to the consumers by alien firms or individuals is expressly prohibited by section 4 of the law.

He said alien manufacturers or processors of lumber whose capital exceeds ₱5,000 are covered by the injunction.

3. Rep. Benedicto Padilla (L. Rizal) in a privilege speech criticized President Garcia's state of the nation message, especially its economic phases. — *The Manila Times, Jan.* 28, 1961.

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DRIVE ON FORESTRY FEE COLLECTION INTENSIFIED

Baguio, Feb. 10 — Forestry officials and employes here launched a drive the other day to intensify collection of miscellaneous fees due to the Bureau of Forestry in this district.

The campaign was launched by Antonio A. Quejado, chief of the accounting division of the forestry bureau, who was directed by Director Tiburcio Serevo to go to the field for the purpose.

Quejado, who is being given full support by District Forester Rafael L. Quidilla and his staff said that the immediate target of the forestry bureau in launching the drive is to net no less than ₱8 million throughout the country from forestry miscellaneous income alone.

The forestry official said that the drive had a good start there having realized some ₱2.6 million during the first four months of the drive.

If the target mark of ₱8 million could be attained, the bureau shall have increased its collection from this source by ₱1.6 million. Incidentally, this would save the position of 350 forest guards, whose salaries were being paid under the reforestation fund.

With the creation of the Reforestation Administration, the source of funds with which to pay the salaries of the 350 forest guards has been eliminated.

Quejado said that Director Serevo is directing other bureau division chiefs to go out in the field in order to bolster bureau collections. — *The Manila Times, February* 11, 1961.

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LUMBER INFO DRIVE URGED

Education Undersecretary Jose Y. Tuazon has batted for the integration of forest conservation information in the first grade curriculum.

Tuazon spoke at the diamond anniversary of the Bureau of Forestry and golden anniversary of the UP College of Forestry in Los Banos, Laguna.

The undersecretary said the bulk of forest law violators are made up of those who never went beyond fourth grade.

There is an urgent need to integrate forestry conservation information in the early education of children to minimize if not wipe out the wanton depredations of the country's forest wealth.

Dr. Hardy L. Shirley, dean of the NY State University college of forestry, recounted efforts of the NY state legislature to combat forest exploitation through an intensive information campaign in the grades. — *The Manila Times Dec.* 4, 1960.

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1960 YEAR BOOK OF FOREST PRODUCTS STATISTICS, RECORD LEVELS REACHED IN WORLD FOREST PRODUCTS OUTPUT

Rome, 9 January — All categories of forest products — roundwood, sawnwood, plywood, particle board, woodpulp, newsprint, other paper, paperboard and fibreboard — reached new record production levels in 1959, according to statistics released today by the Food and Agriculture Organization of the United Nations.

The timber harvest from the world's forests reached 1,718 million cubic meters in 1959, an increase of 3 percent from the previous year and over 20 percent from the 1950 level. The wood destined for industrial use increased nearly 6 percent from the 1958 figure and over 37 percent from the removals recorded in 1930.

With figures from 156 countries, including estimates for mainland China, the FAO Yearbook of Forest Products Statistics*, compiled in collaboration with the U.N. Economic Commission for Europe, gives a comprehensive picture of the tremendous development that is taking place in the forest industries in all regions of the world.

One of the newest of the forest products, particle board, shows the greatest production increase, 23 percent, between the two years 1958 and 1959. Although all countries do not yet identify this product separately in their statistics, the reported world output in 1959 was 1.1 million metric tons. Over two-thirds of this tonnage was produced in Europe with the Federal Republic of Germany as the leading producer (380,000 metric tons).

The most important of the wood-based sheet materials in plywood with a 1959 world producton of 14.7 million metric tons, 13 percent above that of the previous year and nearly two and a half times greater than the output of 1950. North America accounted for 61 percent of this volume and Europe for about 16 percent.

The products of woodpulp showed about 10 percent higher production in 1959 than in 1958, with world output of newsprint at 13.1 million tons, other paper 32.7 million tons, paperboard 23.2 million tons and fibreboard 4.0 million tons.

Of all forest products, the greatest volume is in sawnwood with 1959 production of 314 milcubic metres, of which 80 percent was in coniferous species and 20 percent in the broadleaved. The 1959 volume was about 4 percent above that of 1958. The leading producers of coniferous sawnwood were the Soviet Union, the United States, Japan, Canada and Sweden. For broadleaved sawnwood the largest volume was manufactured in the United States, followed by the U.S.S.R., Japan, Australia and France.

As the production volume increased, gains were made in trade of forest products. Exports increased in all regions except South America, the increases in volumes (roundwood equivalent of all forest products) being as follows: Asia 25 percent, Pacific Area 18 percent, U.S.S.R. 15 percent, Central America 12 percent, Africa 10 percent, Europe 9 percent and North America 7 percent.

The largest gains in export volumes were recorded in the following products: particle board 64 percent, plywood 38 percent, sawlogs 24 percent, paperboard 23 percent and fibreboard 20 percent.

Export trade in forest products is particularly significant in two regions: Europe and Africa. In each of these regions the 1959 export volumes comprise over 40 percent of the harvest of industrial wood. A large proportion of the exports of Africa were in the form of roundwood, whereas, in contrast, the exports of European countries consisted mostly of manufactured wood and paper products.

According to the Yearbook estimates, the world output of wood products in 1959 can be valued at US $36,200 million, and the reported value of exports was in excess of US $5,580 million.

The comprehensive statistics of consumption in the Yearbook reveal that North America is the heaviest per capita consuming region for all categories of wood and woodpulp products. The North American consumption of industrial roundwood is now about 1,555 cubic meters per 1,000 inhabitants, whereas the lowest consuming region, Africa, uses 65 cubic meters per 1,000 capita. Sawnwood consumption in North America is 460 cubic meters per 1,000 capita, while in Africa this figure is 15 cubic meters. Other heavy consumers of sawnwood are the U.S.S.R. with 430 cubic meters, the Pacific Area with 665 cubic meters and Europe with 155 cubic meters per 1,000 population. Plywood use ranges from a low of 0.5 cubic meters in Africa to the high of 40 cubic meters per 1,000 inhabitants in North America. These same two regions report the extremes in consumption of woodpulp products (newsprint, other paper, paperboard and fibreboard) 3.5 metric tons per 1,000 inhabitants in Africa and 159.4 metric tons in North America. The other outstanding consuming regions for pulp products are the Pacific Area with 69.0 metric tons and Europe with 46.3 metric tons.

The 1960 Yearbook of Forest Products Statistics contains, in addition to production, trade and consumption statistics, figures on land and forest areas of the world, the latest monetary exchange rates, forest product definitions and conversion factors. The salient features of the production, trade and consumption developments

are described in text and summary tables in three languages — English, French and Spanish. The main features of the forest products situation are shown in two-colour charts. — (*FAO Press release*)

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FORESTRY EDUCATION URGED

The conference held during the recent celebration of the Diamond anniversary of the Bureau of Forestry and the Golden Anniversary of the U.P. College of Forestry, proved significant in more ways than one. Its selection of the theme on "Forestry Education" as the basis of their discussions, could not have been chosen at a better time than this, in view of the rapid forest destruction now spreading in the Philippines.

Prominent Filipino and Foreign Forestry experts who attended the conference agreed that education must play an urgent role in solving the problem of forest conservation.

Dr. Hardy Shirley, dean of the College of Forestry, New York State University, recounted New York's experience in solving its problem, in forest exploitation, through extensive curriculum.

Undersecretary of Education Jose Tuazon, urged the integration of forestry conservation information in the early education of children. In this connection, he said, the College of Forestry or the organization of foresters could greatly aid the movement by providing the necessary handbook easily understandable by grade students.

It is hoped that these measures be implemented soon, so as to avoid further destruction of our forests through ignorance.

BISLOG, Bislig, Surigao del Sur.

Nov. 1960.

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5 POINT PLAN TO STOP ILLICIT LOGGING STRESSED

A Filipino First-Oriented policy to stop illicit logging was underscored yesterday by Gaudencio E. Antonino, chamber of Commerce of the Philippines president.

He spoke at the seminar on the diamond (60th) anniversary of the Bureau of Forestry at Dillman, Q.C.

He suggested the following five-point policy:

(1) In the licensing of new forest areas, absolute priority should be given to natural born Filipinos or corporation 100 percent ownership of natural born Filipinos.

(2) All logging operations, whether in old or new forest areas, should be operated on a strictly selective logging basis.

(3) Adequate forest areas should be given under renewable lease terms of 25 years to proven and reliable concessioners.

(4) The Bureau of Forestry should establish adequate experimental and research centers.

(5) Forest concessioners should aim to make maximum utilization of all timber cut in their forest areas. — *The Manila Times.*

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PROGRESS REPORT OF THE PARKS AND WILDLIFE OFFICE DURING THE PERIOD FROM 1957-1960

By
Vicente de la Cruz, Director
of Parks & Wildlife

The most outstanding achievement of the Parks and Wildlife Office during the four-year span of its existence from 1957-1960 is its present organization as a permanent office under the Department of Agriculture and Natural Resources which has attained a standing at par with its sister bureaus and recognized as a distinct agency that will devote its time in the maintenance of national parks and conservation of wildlife.

From a very small office known as the Commission of Parks and Wildlife with only 22 employees quartered in a very small room and 18 fieldmen in 1956, the Parks and Wildlife Office has steadily progressed and expanded into a going concern, with 185 personnel. Its organizational structure, manning and equipping the office, training of personnel and molding them into an efficient team was accomplished in a record time such that a proficient, and fully geared machinery has soon come into existence.

Basic policies, rules, regulations and procedures were promulgated and minor details were eventually supplemented to carry out the provisions of the National Parks and Game Laws and the groundwork for National Park development. The Parks and Wildlife Office showed its capacity to administer, beautify and conserve the thirty nine national parks and five Game Refuges and Bird Sanctuaries with an area of 292,167.71 hectares.

Of the thirty nine national parks nine national parks were developed, improved, landscaped and beautified namely: Mt. Makiling National Park in Laguna, Mt. Bulusan National Park in Sorsogon, Mt. Arayat National Park in Pampanga, Hundred Islands National Park in Pangasinan, Quezon National Park in Quezon Province, Tiwi Hot Spring National Park, Mt. Mayon National Park both in Albay, Sohoton

Natural bridge, National Park in Samar and Rizal National Park in Zamboanga del Norte.

All these national parks are equipped with outdoor recreational facilities and conveniences such as dancing pavilions, swimming pools, bath houses, picnic and camping grounds and they are rendered accessible for the easy enjoyment of the public. The other national parks are under constant patrol to conserve its vegetation and protect the wildlife, natural features and other natural phenomena of unusual interest found therein from spoliation.

During the period under review, 27 parks stations and 5 regional offices were organized and established in the different sectors of the country, charged with the direct administration of national parks, enforcement of the Parks and Game Laws, conservation and protection of Wildlife, strengthening greatly the field services of the Parks and Wildlife Office— a branch of government service which never existed before.

The Parks and Wildlife Office has steadily progressed in the collection of revenues, that in the four years under review it has realized a total income in the amount of ₱1,205,855.35 broken as follows:

1956-1957	₱ 204,580.09
1957-1958	287,066.91
1958-1959	324,542.35
1959-1960	389,666.00

Exportation of Philippine wildlife and its by-products was developed and the business has considerably progressed during the period. Reptiles, reptile skins, birds and monkeys were exported in commercial quantity. The Philippine Rhesus monkeys which are a source of serum that is manufactured into salk vaccine for the prevention and cure of infantile paralysis is the greatest wildlife export. It is interesting to note that from the exportation of wildlife our government did not only derive enormous income but it also bolstered our dollar reserves by $2,228,762.45 during the last four years.

The following is the market value of our wildlife export since 1957.

1956-1957	$ 403,001.50
1957-1958	463,499.60
1958-1959	605,660.35
1959-1960	756,601.00
	$2,228,762.45

34,032 hunting licenses were issued from fiscal year 1956-57 to fiscal year 1959-60, making a yearly average of 8,508 hunting licenses. While it is evident that this figure represent a small ratio to the inhabitants of the country, it is nevertheless a healthy indication that the hunters have awakened to the importance of regulations aimed at conserving our wildlife resources.

Due to the intensive information and educational campaign conducted by this office, Parks and Wildlife conservation consciousness was considerably awakened among the people as shown by the number of people who trek to our national parks every week-end, the number of hunters who secured hunting licenses and seek technical advice from the office, by the number of letters to the office asking for informative materials in connection with their science studies and by the numerous resolutions received from different localities requesting for technical assistance in the development of local parks, and more encouragingly by the trends that timber smuggling and kaingin making inside national parks have considerably diminished.

851,755 persons have actually registered, although approximately 4,000,000 people have visited and enjoyed in our national parks during the last four years showing a yearly average of 1,000,000 parkgoers, students, employees, professionals and the general public put together.

With the assistance of the NEC, ICA and the COLOMBO PLAN, the Parks and Wildlife Office sent four of its officials abroad to study and/or observe modern methods on national park management and wildlife conservation.

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PREVENTING THE SILTING OF THE GOLDEN HORN

Stripping of Trees and Vegetative Cover Leads to Destructive Erosion of Turkish Soil

In 328 AD, Constantine the Great announced that the ancient city of Byzantium had been revealed to him in a dream as the new capital of the known world. With a fleet of Roman galleys, he sailed to the Golden Horn and, landing at Byzantium, renamed it Constantinople.

Over one thousand years later, Mohammed II, 'The Conqueror', sailed up the Bosphorus and, being stopped by defences at the mouth of the Golden Horn, transported the entire fleet overland and entered the inlet from greased runways built down the hillside. He took Constantinople by storm, bringing to an end the eastern half of the Roman empire, and incidentally changed its name to Istanbul, or Stamboul.

For hundreds of years after that the Golden

Horn, great natural harbour of Istanbul, saw the gradual emergence of the Ottoman Empire as a first-rate seapower, under such admirals as Barbarossa. War galleys exercised in the inlet, caiques plied their trade, and pleasure craft of the sultans drifted under the pine-topped hills overlooking the water. — (*FAO Pressrelease*)

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SILT THREATENS THE GOLDEN HORN

But the forests have more or less disappeared from this area for over a hundred years, and heath-covered moors are now all that are left, far advanced in erosion. Silt is being deposited at such a rate that navigation in the Golden Horn itself is threatened, and emergency measures are being carried out to curb this danger to the industrial growth of Istambul.

Such precentive work, through watershed management, is the concern of Geoffrey Chapman, a forestry officer of the Food and Agriculture Organization, who has been working with the Soil Conservation and Range Improvement Division of the Turkish Forestry Service for over two years. While at the Rome headquarters of FAO recently, he cited the melancholy history of the Golden Horn and the emergence of a Turkish spearhead project to counteract its decline.

"In the time of Mohammed, and certainly of Constantine, the area of what is now Turkey that was cultivable was certainly much larger than the present 65 million acres representing about one-third of the total area of the country," stated Mr. Chapman. "Erosion has gradually removed the topsoil, leaving vast areas which can no longer be used for growing crops.

"There is usually a reason for erosion," he said, 'and in Turkey it is too many people and too many animals trying to exist on land which can no longer adequately support them. In the last thirty years the population has gone up from 14 to 26 million, and the number of livestock has risen from 27 to 62 million.

"In an attempt to feed this expanding population, plowing has been extended far into the hills, the forests have suffered, and overgrazing is stripping the hillsides and exposing the soil to erosion."

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EVEN VILLAGES GET WASHED AWAY

"When it does rain in Turkey, it is usually quite heavy," said Mr. Chapman. "Flooding occurs easily on the bare mountain slopes, and topsoil gets washed away. In flash-floods, roads and villages are washed out, and sometimes animals and people are drowned. The slopes no longer have enough forests and grass on them to hold and absorb the rainfall, so that streams become rivers and then walls of floodwater, carrying all before them."

The long term effect is that the land surface is gradually washed away and deposited as silt in the rivers and reservoirs, navigation is threatened, and the effective life of the reservoirs for irrigation and the development of hydro-power is endangered.

'One remedy for all this is to replant trees and vegetative cover over the hills," Mr. Chapman said. "But it isn't that simple, for this implies reducing the number of goats and sheep grazing on the hills, and this in turn means offering some alternative source of livelihood to these people. The pattern of agriculture must be changed away from subsistence farming on the slopes towards intensive irrigated farming in the plains. This implies not only the development of an enormous and complex water storage and distribution system, but also vastly increased use of fertilizers and development of new kinds of crop and livestock production.

"I have been closely associated with the Golden Horn project, one of several now underway, designed to reduce the silt load entering the estuary," he explained. "Plantings of trees and grass cover have been started, and experiments are being conducted on the most efficient way of replacing the present heath by grass range."

The most advanced project is at Tokat, in the mountainous area of N.E. Turkey, where a plan for protecting the town and its fertile land from periodic floods has been started. The programme — which embrace planting forests and pastures on the uplands, constructing terracing and check-dams in the torrent beds, rotating grassland grazing and intensifying agricultural production in the most promising areas — is well underway, and by 1966 the whole catchment of 75,000 acres should be protected. — (*FAO Pressrelease*)

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FLOODS UNDERMINE BUILDINGS AND BRIDGES

Overgrazing is one of the main problems, and one village has been selected for a trial survey to find out the present grazing situation and its importance to village life, as well as the economic effect of reducing livestock population and alternative means of livelihood.

"Another project is at Aksehir, where twenty-five years ago a placid stream flowed gent-

ly between tree-lined banks through the town," Mr. Chapman said. "Now the forest has almost disappeared from the catchment area, grazing has increased enormously, gullies and landslips are appearing on the mountain slopes, and winter flooding has started to undermine buildings and bridges. We have cut contour trenches across eroded slopes and planted tree seedlings, grazing has been excluded to allow uninhibited growth of vegetation, while check dams are planned for the torrent bed."

Mr. Chapman has also been closely associated with a forthcoming $875,000 pre-investment survey project to assist the balanced economic and social development of Turkey's Antalya region. This project will last three years and will be executed by FAO for the U.N. Special Fund for Economic Development.

Mr. Chapman, a British-trained forester, has served for thirty years in the Middle East. He was formerly director of the Iraq Forestry Division, and forestry adviser to the British Middle East Office. He was at one time director of the Cyprus Forestry Service.

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UTILIZATION OF SMALL-SIZED WOOD

The utilization of small-sized wood will be the subject of a special meeting (in the form of a symposium) to be held under the auspices of the United Nations Food and Agriculture Organization and Economic Commission for Europe, in Geneva from 13 to 18 March 1961.

Demand for wood raw materials by industry, especially by the pulp and paper industry, is continually expanding. On the other hand, there are large reserves of small-sized wood in Europe, especially hardwood coppice, which technical progress in processing methods is making usable, but only on the condition that the raw material can be supplied to industry at reasonable cost; at present this is often impossible. Thus the finding of ways and means of supplying small-sized wood at an economic price could be of considerable significance to both producers and consumers of this assortment of wood. This is the aim of the special meeting, and the problems involved will be tackled by studying how to raise the efficiency of harvesting and transporting methods and hence how to lower the cost of small-sized wood to the consumer while at the same time making it an economic crop for the producer to grow and harvest. From the consumers' point of view, detailed consideration will be given to their preferences and requirements regarding the form in which small-sized wood is supplied and the methods of supplying it to them.

To introduce the various subjects to be covered at the special meeting, leading experts — university professors, members of national forest and timber research institutes and other eminent specialists in their respective fields — have been invited from many parts of Europe to present papers on the economic aspects of harvesting, transporting and utilizing small-sized wood, and to put forward their own ideas and theories on how the problem should be tackled. After each paper, the participants at the special meeting will have the opportunity of open expert-to-expert discussion.

The special meeting will be followed by a one-week study tour in France and the United Kingdom on the rationalization of harvesting and transporting small-sized wood and on its use by the pulp and paper industries.
January 1961 — Rome.

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CONSERVATION OF FOREST CAMPAIGN ON

Cunanan stressed that the biggest problem of the government is not illegal cutting of trees by private concessionaires but by farmers who practise "kaingin."

He said this "senseless and wanton destruction of the country's forest" account for about sixty per cent of the illegal deforestation.

He said he does not know of any benefit derived from this system of farming. He said that farmers get only two or three crops from "kaingin" and then move on to the next forest.

He said the patches cleared by the "Kaingineros" are left with no effort at replanting trees.

Cunanan said these clean patches are the cause of floods which have in recent years been striking the country.

At the same time, Cunanan said his office has succeeded in clearing the backlog of land titles needing his signatures. He said that he is signing deeds at an average of 300 titles a day.

He said that his office is now requesting more applications from the bureau of lands so that they could be finished.
— The Manila Chronicle — 1-31-61

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PRIVATE LOGGERS ASKED TO ASSIST GOV'T IN REFORESTATION ROGRAM

The board of directors of the Philippines Association of Log Producers and Exporters over the week-end approved the launching of the nation-wide forest conservation campaign of the PALPE.

Brigido R. Valencia, PALPE president, an-

nounced the appointment of Col. Ulldarico Baclagon (Ret.) as chairman of a committee that will go into a study of the details of the cost estimate of the campaign.

Valencia stated Baclagon will prepare the full structure of the forest conservation drive and present to the PALPE a full bodied program that will be pursued from year to year.

"The forest conservation campaign that the PALPE is sponsoring on a nationwide scale is a primary project that involves not only the interest of the industry but also, and more important, the very life of our people," Valencia said.
— The Manila Chronicle — 1-24-61

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USE OF TERM 'PI MAHAGONY' BACKED

Philippine timber has won another big round in its continuing fight to retain the trade term "Philippine mahogany" in the American market.

The US Federal Trade Commission has just ruled that certain Philippine hardwoods may be sold in the United States under that trade name.

This new victory for Philippine timber came in the form of a denial by the commission to consider a new request by a group representing competing foreign hardwoods to prohibit the use of the trade term "Philippine mahogany."

This was the gist of an advice just received by Antonio de las Alas, president of the Philippine Lumber Producers Association, from George D. Scrim, executive secretary of the Philippine Mahogany Association which is composed of American and Canadian dealers in Philippine hardwoods.

In reporting this latest victory, Scrim warned that renewed efforts by competing interests must be expected since the attempt to ban the term Philippine mahogany as applied to certain species of Philippine timber has been repeated on and off during the past 30 years.

Alas said credit for this successful bid to retain the trade term goes primarily to the Philippine Mahogany Association now headed by Harry J. Jordan of San Francisco.
— The Manila Times. Jan. 9, 1961

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FILIPINO FORESTERS PAY TRIBUTE TO HUGH CURRAN

"An indefatigable explorer and botanical collector . . . truly a dirt forester . . . a man who shunned desk work; he always wanted to be out in the field."

Such were typical of the tributes paid by veteran, Filipino foresters, many among them now holding high positions in the government, to their one-time professor in tropical forestry, Hugh M. Curran at the former School of Forestry in Los Baños, when they learned of his recent death in the United States.

Word received in Manila stated that Curran, among the earliest American pioneers in this country, passed away last October 3 at Frankfort, Indiana where he had been residing the past several years.

He died at the age of 84, having been born at New York on November 16, 1875.

Surviving him are two sons, Hugh, Jr., a former official of the Philippine Packing Corporation now residing at Malabang, Lanao, where he runs a cassava plantation; and Howard, now with Peter Paul Corporation as assistant production manager of its plant at Frankfort; and a daughter, Mrs. Polley Yankey married to Capt. W. R. Yankey who is at the U.S. naval base public work center at Norfolk, Va.

Curran first came to the Philippines shortly after the American occupation. Soon thereafter with several other Americans notably Dr. E. B. Copeland, Royal F. Nash and Gearge P. Ahern, Curran helped organize the Philippine Forest School which was later to become the U.P. College of Forestry, at Los Baños, Laguna.

As an associate professor at Los Baños, Curran taught tropical forestry.

He also had served as a forester under the Bureau of Forestry. Curran joined the U.P. in 1910 and taught there up to the outbreak of the war in 1941, except for a few years after 1930 when he left the country. He returned, however, and was caught here by the war.

He last visited the Philippines in 1955, when he had a brief reunion with his former students including Florencio Tamesis, former director of forestry and now a regent of the U.P. and an executive of the Philippine Wallboard Corporation; Marcelo Adduru, former secretary of labor and governor of Cagayan; Cecilio Maneja, former congressman from Marinduque; Nazario Penas, now general manager of the Sta. Clara Lumber Co.; Felipe R. Amos, another former director of forestry; Carlos Sulit, project coordinator of the bureau of forestry; and numerous other graduates of the forestry school at Los Baños who now hold responsible positions in the Bureau of Forestry.—*Philippines Herald October* 24, 1960.

B.F. Notes

LOG AND LUMBER GRADING TRAINING CLASS IN BUTUAN CITY

To augment the number of log and lumber graders in the country the Bureau of Forestry is conducting a training this year in this particular line with Lumber Inspector Pedro B. Salvador as training officer, assisted by Lumber Grader Eusebio Anulao.

The shortage of log and lumber graders in the country today to cope up with the voluminous grading work has spurred the Bureau of Forestry to conduct a training here in Butuan City.

The Class is composed of seventeen (17) qualified trainees recruited from the different Forest Stations all over the country. Fifteen (15) of the trainees come from the Bureau of Forestry and the U.P. College of Forestry and the Forest Products Research Institute have one representatives each. The Class was formally started last February 28, 1961 with a series of lectures concerning the rules and regulations on lumber grading.

The trainees with their respective stations are the following:

1. Prudencio S. Afalla, Basilan City
2. Herman A. Agpawa, Ipil, Zamboanga del Sur
3. Pedro S. Agustin, Cagayan de Oro City
4. Jaime C. Briones, Mamburao, Occidental Mindoro
5. Edilberto Z. Cajucom, U.P. College of Forestry
6. Adolfo B. Decena, Forest Products Research Institute
7. Carlos N. Empedrad, Cotabato City
8. Virgilio B. Gonzales, Davao City
9. Nicolas R. Guadalupe, Butuan City
10. Benjamin M. Macabata, San Jose, Occidental Mindoro
11. Dativo A. Mina, Zamboanga City
12. Marcelo M. Molina, Manila
13. Jose S. Orden, Jr., Naga City
14. Federico B. Ramos, Baganga, Davao
15. Catalino F. Tosco, Daet, Camarines Norte
16. Jose F. Sabado, Basilan City
17. Apeles S. Villaluna, Bacolod City

The class formed an organization and the followiny officers were elected:

Edilberto Z. Cajucom	President
Prudencio S. Afalla	Vice-President
Jose S. Sabado	Sec.-Treasurer
Adolfo B. Decena)	
)	Auditors
Dativo A. Mina)	
Nicolas R. Guadalupe	P R O
Forester Pedro B. Salvador	Adviser

The name of the class organization is "1961 Log and Lumber Grading Class".

The trainees undergoing this rigorous training are all forestry graduates. They are theoritically and actually trained in log and lumber grading in the different sawmill lumber yards and logponds within Butuan City and its neighboring towns. They are expected to complete this two-month under-the-heat-or-rain ordeal at the end of April.

By: Nick Guadalupe, PRO

* * * *

URGE HIKE IN FOREST FUND

A high ranking official of the department of agriculture and natural resources urged congress yesterday to implement a law increasing the allocation of the department in its reforestation program.

Stressing the importance of reforestation for the country, Acting Undersecretary Salvador F. Cunanan appealed to senators and congressmen to turn over forest inspection fees amounting to ₱4 million each year to the D.A.N.R. reforestation administration.

Cunanan said the current annual allocation of ₱2-million was insufficient.

He justified his proposal by pointing out that the job of reforesting the country's bald forest areas is a gigantic task.

The proposition will require amendment of forestry laws as well as the internal revenue code.

Cunanan pointed to the kaiñgin system as the major "culprit" in the widespread "vandalism" of public forests. He also admitted that small concessionaires are guilty of indiscriminate cutting of trees in their efforts to get the most out of their investments.

To curb this evil, the undersecretary said timber concessions should not be less than 20,000 hectares. This size will also make sustained yield practicable.

Cunanan said that timber concessions all over the country are closing ranks to form a forest conservation foundation.

—oOo—

Acting Undersecretary of Natural Resources Salvador Cunanan called yesterday on private logging association to assist the government in its reforestation program.

He said that the Philippine Association of Log Producers and Exporters has volunteered to do the spade work in this campaign. He said the members of the association have assured him that the members would follow all the rules laid out by the department of agriculture.

At the same time, Cunanan proposed an increase in the rate of fees charged on loggers for third and fourth class timber from 40 centavos to 50 centavos. He said the fees collected by the Reforestation Administration are being used to finance the government's reforestation program.

* * * *

PGEA COUNCIL ELECTION

The Philippine Government Employees' Association (PGEA) chapter of the bureau of forestry, reactivated by director Tiburcio S. Serevo, formed recently a council charged with carrying out the objectives of the local group in consultation with the basic organization.

Elected council members who chosed among themselves the officers were Juan Acogido, Manuel M. Añonuevo (secretary), Vicente Marababol (president), Segundo P. Fernandez, Severino Nablo, Juan Ravelo, Ramon Rondilla, Maximino Reyes (business manager), Remigio Rivera, Gonzalo Gutierrez, Guadencio Ferreria (auditor), Justiniano Gonzaga (treasurer), Rosales Juni (PRO), and Rufino Sabado (vice-president).

★ FPRI Highlights ★

BY ULPIANO S. DE LEON

SOMETHING ABOUT GEORGE M. HUNT

By Manuel R. Monsalud

Mr. George M. Hunt, a chemist by profession and an internationally known forest products researcher by avocation, whose picture appears on this page, was conferred an *award of appreciation* for his outstanding contribution to forest products research by the National Research Council of the Philippines on February 23, 1961.

Dr. G. M. Hunt

Mr. Hunt has been assigned as F.A.O. Consultant and Adviser to the Philippine Forest Products Research Institute at College, Laguna since April 11, 1954 to May 1, 1961. He has done an enviable job in helping make the Forest Products Research Institute what it is today.

Mr. and Mrs. Hunt will soon be leaving, with a heavy heart, the U.P. Forestry Campus, which they have come to love, and their many friends and well-wishers in the Philippines. They will return and settle down at last to a well-deserved retirement at their residence in Madison, Wisconsin, U.S.A.

Mr. Hunt is Director Emeritus (retired Director) of the world famous U.S. Forest Products Laboratory.

The following are his biodata:

Born on July 26, 1884 in Marion County, Oregon, U.S.A.; married in 1911, with 3 children; graduated from the University of California in 1911, with B.S. Chemistry degree.

Previous employments:

1. Asst. Chemist, U. S. Forest Service, California, 1911-12.
2. Asst. Chemist, U. S. Forest Service, working in cooperation with the University of Washington, 1912-13.
3. Asst. Chemist, Forest Products Laboratory, 1913-19.
4. Lecturer, University of Wisconsin, 1916-18.
5. Chief, Wood Preservation Division, F. P.L., 1919-44.
6. Asst. Director, F.P.L. in Madison, Wisconsin, 1944-46.
7. Director, F.P.L., 1946-51.
8. Retired from U.S. Government Service in 1951.
9. "Director Emeritus of the Forest Products Laboratory, Madison, Wisconsin, and a national authority on all phases of wood use and research."
10. Consultant in wood preservation in New Zealand in 1952.
11. Tech. Asst. Expert, F.A.O., U. N., in Austria in 1953.
12. Technical Consultant and Adviser, F.A.O., U. N., assigned to the Philippines from April 11, 1954 to May 1, 1961.

Membership in honor societies, technical and professional organizations:

(a) Committee, Marine Piling Investigations, National Research Council (U.S.A.) 1922-24.

(b) Building Research Advisory Board, National Research Council (U.S.A.) 1947-51.

(c) Fellow, Society of American Foresters.

(d) Life member, American Wood Preservers' Assoc. (Secretary-Treasurer, 1921-22).

(e) Charter member, Forest Products Research Society.

(f) Sigma Xi Society

(g) Philippine Association for the Advancement of Science.

(h) Gamma Sigma Delta, International Honor Society of Agriculture.

(i) Member of the panel of contributors to *"World Geography of Forest Resources"* published by the Ronald Press Co. of New York.

His special lines:

1. Preservative treatment of wood including fire-proofing, painting, moisture proofing and gluing.
2. Wood utilization.

TECHNICAL PAPERS PUBLISHED

with

George M. Hunt as author or co-author

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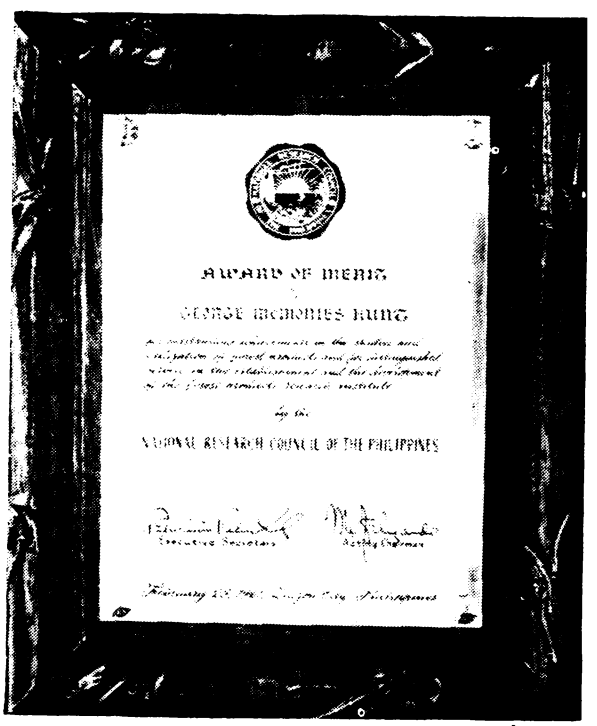
2. Effectiveness of moisture including coatings on wood, by Hunt, G. U.S.D.A. Circular No. 12. October 1930.
3. Treated wood for houses, by Hunt, G. In U.S.D.A. FPL Rept. No. 1095. September 1935.
4. Laminating structural timbers, by Hunt, G. U.S.D.A. FPL Rept. No. 1449. April 1944.
5. Protecting wood from decay and fire, by Hunt, G. M. In U.S.D.A. Miscellaneous Pub.
6. Wood as a raw material, by Hunt, G. Reprint from Wood. Sept. 1947.
7. Protection of wood in salt water from marine wood borers, by Hunt, G. In Miscellaneous Pub. June 1, 1948.
8. The Forest Products Laboratory, by Hunt, G. Yearbook-Separate No. 2151. 1949 Yearbook of Agriculture. pp. 647-651.
9. Wood preservatives in the national emergency, by Hunt, G. In Forest Products Research Society Preprint 138, 1951.
10. An international termite exposure test. Twenty-first Progress Report, by Hunt, G. American Wood Preservers' Assoc. 1952.
11. Minor Forest Products, by Hunt, G. M. In Forest Products Journal, Vol. 4, No. 2, April 1954. pp. 114.
12. Wood utilization research in the Philippines, by Hunt, G. In Unasylva 1958. pp. 164-168.
13. The preservative treatment of farm timbers, by Hunt, G. In U.S.D.A. Farmer's Bulletin No. 764. December 1958.
14. Organizing forest products research, by Hunt, G. M. In Forest Products Journal, vol. 10, no. 10. October 1960. pp. 561-562.
15. An international termite exposure test, by Hunt, G. and T. E. Snyder. 1930. In U.S.D.A. FPL Rept. No. 1078.
16. Experiments in fireproofing wood. Third Progress Report. Hunt, G. M., T. R. Truax and C. A. Harrison. American Wood Preservers' Assoc. January, 1932.
17. Hunt, G. M. Make treated wood available. Southern Lumberman 145: 30-32. October 1, 1932.
18. Hunt, G. M. and Committee. The use of creosoted wood in residues and other buildings. AWPA Proc. 31st Ann. Meeting, 283-297. 1935.
19. Hunt, G. M., T. R. Truax, and C. A. Harrison. Fire resistance of wood treated with zinc chloride and diammonium phosphate, AWPA, Proc. 26th Ann. Meeting, 130-159. 1930.
20. Hunt, G. M., T. R. Truax, and C. A. Harrison. Additional experience in fireproofing wood, AWPA, Proc. 27th Annual Meeting, 104-128. 1937.
21. Hunt, G. M., T. R. Truax, and C. A. Harrison. Experiments in fireproofing wood, Third Progress Report. AWPA Proc. 28th Ann. Meeting, 71-93. 1932.
22. Hunt, G. M. Wood and Wood Products. U.S.D.A. Madison, Wis. 1954. pp. 237-307.
23. The Philippine Forest Products Research Institute by Eugenio de la Cruz and George M. Hunt. Forest Products Journal, May, 1958.
24. Hunt, George M. The Forest Products Industries of the World. Published in "A World Geography of Forest Resources", 1956, by tse Ronald Press Company of New York.



Award of appreciation conferred on Dr. George M. Hunt for his outstanding contribution to forest products research in the National Research Council on February 23, 1961.

FPRI SPECIAL PROJECTS FOR DIFFERENT AGENCIES

Forest Products Research Institute Director Eugenio de la Cruz presented recently in a 10-page report the results of the tests conducted by the Institute on the different strength properties of kraft paper samples submitted for testing by the Tariff Commission.

This report was needed by the Tariff Commission to determine the suitability of locally made kraft paper for cement bags.

Investigation is well underway on the different strength properties of locally made plywood to determine its suitability for aircraft inside panelling. This special project is being conducted in cooperation with the Philippine Air Lines. The experimental work is expected to be completed by about the middle of February after which the data obtained will be presented in a formal report to be submitted to the cooperating agency.

Cooperating with the G. Puyat and Sons, Inc. and several bowling alley owners in Laguna, the Institute is currently making a search for native woods suitable for bowling pins. At this writing, bowling pins made from two species — magabuyo and balakat, which are believed to be suitable for the purpose — are under service test in the bowling alleys of cooperators in Calamba, Los Banos, and San Pablo City. More pins will be made from other species soon and tested like the above-mentioned species.

Similarly, search is being made by the Institute for Philippine woods suitable for the production of quills or bobbins for textile looms. This special project is being conducted for a bobbin manufacturer and certain textile mills in Manila and suburbs who are using imported woods and local species allegedly inferior in quality to the imported product. Considering the rapid expansion of the local textile industry the successful production here in adequate quantity of bobbins from native woods is of economic significance.

These are only a few of the cooperative projects of the Institute to help solve the problems of local industry. Projects of similar nature will also be conducted soon by the Institute in cooperation with other countries.

For instance, agreements have been made between the FPRI and the government of South Vietnam for the FPRI to study the veneer and plywood making properties of two South Vietnam woods, namely, *Anisoptera* sp. and *Dipterocarpus* sp. Investigation will be started upon receipt of logs from S. Vietnam which are expected to be shipped anytime now.

For similar studies on certain species from Nepal, negotiations are currently being made between the Institute and the government of Nepal.

In cooperation with the United States Operation Mission, the Institute is all set to study the strength and related properties of eight Laosian woods. Word has been received from Laos that log specimens are being prepared for shipment.

* * * *

FPRI—AN INTERNATIONAL TRAINING CENTER

Like the U. S. Forest Products Laboratory and the Division of Forest Products of the CSIRO, the two institutions after which it is patterned, the FPRI has started to serve as an international training center for specialized studies in the various fields of wood utilization.

At this writing a key official of a government owned corporation of Thailand is observing the equipment and research activities of the Institute in veneer and plywood manufacture. The observing foreigner, Mr. Thongbai Chansma, who is a mechanical engineer, is the General Superintendent of the Thai Plywood Company. He is also taken by FPRI technical men to different veneer and plywood plants in the Philippines to see the processing operations in commercial production.

Among those that have received training in veneer and plywood production at the Institute to date are Mr. Tran Trung Dinh of South Vietnam, Mr. Macario Paet of Paranaque, Rizal, Messrs. Felizardo Gubatan and Felicisimo Vieneza of the PHHC. Mr. Trung Dinh was a forestry student of the U.P., who, after finishing his course, sought to be trained in this field of work. Mr. Paet is a mechanical engineer who was hunting for a job. After training at the Institute he was reported to have accepted a key position in one of the country's biggest plywood plants. The PHHC trainees are construction supervisors in that agency. They also made studies in wood seasoning and preservation, timber physics and engineering, and wood anatomy.

In pulp and paper manufacture the following underwent training in the Institute: Mr. Sansern Charensri of Thailand, Mr. Toribio Ortega, Jr. of MLQ University, Mr. Moises T. Lucas of the ACLEM Paper Mills, Mr. Antonio Monsalud of the National Iron Works, Mr. Rodolfo Navidad and Mr. Ernesto Enriquez of Arco Pulp and Paper Co., Miss Inocensia B. Bersalona of Sampaloc, Manila, Miss Flordeliza Mendoza of Calamba, who later joined the FPRI staff, and others.

Trained in charcoal production and briquetting are Mr. Filoteo Edison of P. P. Gocheco and Co. and a technical man of the Premier Knitting Co. In wood chemistry Misses Rosalinda D. Arles, Leonisa D. Ilag, and Flor Gatchalian all of the Mapua Institute of Technology, Miss Luzviminda Santos of Adamson University and others.

* * * *

PROGRESS OF RESEARCH WORK

The Institute hit an unprecedented high in the production of progress reports during the first semester of the current fiscal year. This was learned from the semi-annual report submitted by FPRI Director Eugenio de la Cruz to the chairman of the Forest Products Research Board.

In this report, Director de la Cruz stated that some 32 progress reports were prepared by the researchers of the different research divisions of the Institute, adding that during the entire previous fiscal year, reports of similar nature totalled only 32.

These reports, Director de la Cruz explains, are technical papers presenting in details the results obtained on research projects, adding that most of the information conveyed therein bear on the immediate problems of forest products industries.

Of these 32 reports, 5 dwell on the veneer cutting of Philippine woods. In brief these reports indicate that bagtikan, red lauan, and tangile logs from the province of Agusan can be cut cold into veneer successfully but preheating improves the quality. Moluccan sau does not appear to be promising for commercial production. Almon and mayapis from Surigao province turn out high quality veneer although mayapis shows a fuzzy surface when cut to 1/8 inch veneer. Toog, apitong, and dagang can all be cut cold successfuly but there seems to be significant improvement in the quality of toog preheated to 160° F or 180° F within a certain range of nosebar compression.

A report on veneer drying studies indicates that tangile and mayapis veneers are easy to dry while toog veneer is relatively difficult to dry.

In gluing studies, two of the more important reports show that viscosity increases, while pH increases with the pot life and shelf life of the commercial brands of urea-base adhesive glues tested and that phenol-resorcinol glues seem to perform better than urea glues.

Four reports were submitted on the physical and mechanical properties of wood. One of them gives the relationship between the density and shrinkage of 63 species, another presents the data obtained in the studies on the strength and related properties of five species — bagtikan, dagang, malapanau, red lauan, and yakal-guisok. The third compares the strength of three species at 12 percent moisture content with that at equilibrium moisture content, while the fourth indicates that denser wood possess greater nail holding power than the less dense wood with respect to direct nail withdrawal.

Covering the results of investigations in wood preservation and seasoning, a total of 11 progress reports were prepared.

In entomology one report describes the structural pest problems in the government housing projects in Manila and Quezon City and indicates that about 45 percent of the units were found to be infested by termites or powder-post beetles and recommends control measures. Another report presents the approximate monthly occurrence and abundance of powder-post beetles in the Forestry compound, while still another shows that 20 percent boric acid or 0.3 percent lindane plus 0.62 percent sodium pentachlorophenate is an effective spray treatment in preventing powder-post beetle attack in sapwood lumber.

One of the two reports in pathological studies shows that staining of wood blocks was adequately prevented by Dowicide G. at 0.56%, 0.63%, 0.75% concentrations. The other indicates that none of the treatments used kept the test bolts (gubas green logs) from insect and fungus attack for 75 days, although staining was prevented for as long as 60 days.

The study on the occurrence of silica in Philippine woods was reported to have brought to light the presence of silica deposited in the ray cells and vertical parenchyma in 11 out of 71 species studied belonging to the Meliaceae family. They are under the following genera: *Aglaia, Aphanamixis, Chisecheton, Dysoyhulum, Reinwardtiondendron,* and *Walsura.*

The microscopic and macroscopic features of 17 species are described in a report on the anatomy of Philippine woods, while the report on the development of a general card-sorting key for the identification of Philippine woods presents the identifying features of some 70 species. Another progress report describes the grain formation, texture, color, and figure of 35 species, and still another report covers the occurrence of brash center or "brittle heart" in the Philippine woods.

* * * *

MONUMENTAL WORK

From authorities on dendrology in the different parts of the world, numerous favorable re-

marks have been received by the Institute on the value of the recently completed manuscript entitled, "Forestry Lexicon of Philippine Trees." This work was featured in this column on a previous issue of Forestry Leaves when the manuscript was nearing completion about a year ago.

The manuscript, which is the result of several years' hard work, was prepared by Dr. Felipe M. Salvoza, the foremost Filipino dendrologist. Having a total entry of over 3,800 tree species, the lexicon is typed single space on long bond paper totalling 194 pages. It will be printed and book bound after the comments of experts in this field from all over the world have been considered.

While Dr. Salvosa had a pretty rough time, what with arduous labor during the dead of the nights for several years, in the preparation of this manuscript, yet he feels compensated with laudable criticisms as are reproduced in parts below:

"...I have looked this impressive volume over with considerable care and interest and want to congratulate you... for an extremely useful work. I do not know where else one could find in the same compass so much information on Philippine trees — William C. Steere, Director, The New York Botanical Garden, U. S. A."

"...I consider this an excellent contribution to Philippine science and economic botany in particular... I would like to congratulate your Office and in particular Mr. Felipe Salvoza for this great contribution... Mona Lisa Steiner, Chairman, Sub-Committee of Common Names of Pacific Plants."

"...I believe what has been done is a noteworthy effort of considerable value and certainly worthy of publication — Richard A. Howard, Director, The Arnold Arboretum, Harvard University, U. S. A."

* * * *

PUBLICATIONS

Three recently published papers of the Institute are available in reprints. They are "Fiber Dimensions of Certain Philippine Woods, Bamboos, Agricultural Crops and Wastes, and Grasses III," "Wood-Destroying Termites," and "Density and Shrinkage Properties of Philippine Woods."

FPRI Technical Note No. 15, "Relative Economy of Treated and Untreated Wood," is out. Copies are available to all interested parties. This technical note dwells on the "annual charge" or yearly payment made to defray a debt on an interest compounded annually for the length of the service life of treated and untreated wood. It shows that the use of treated poles for telephone lines is more economical than the use of the untreated.

The Institute's library, which is the refuge of technical personnel when confronted with difficult problems, is continuing to grow. Recently, books over 250 volumes and magazines approximately 1,500 were added to the library reading matter. Most of the books, covering chemistry, design, engineering, entomology, pathology, forestry and other related fields, are donations of the FAO of the United Nations, Rockefeller Foundation, the ICA, civic-spirited private individuals and others.

* * *

COLOMBO PLAN DONATIONS

The Institute's studies on wood preservation got a big boost with the addition to its research facilities of a complete unit high-pressure treating plant, which was donated by the Australian government through the Colombo Plan.

The third of its kind all over the world, this wood treating plant which costs approximately $17,000.00 can be operated at a pressure up to 1000 pounds per square inch.

Justino B. Seguerra, Jr., Chief of the FPRI Wood Preservation Section, entertains that this equipment may successfully impregnate with chemical preservatives some of the native commercial species that do not treat well with the common treating equipment that delivers a maximum pressure of 200 psi only.

Seguerra says that of all native woods he has investigated with respect to treatability thus far, only apitong has been successfully impregnated with preservatives.

Another valuable equipment was also recently received through the Colombo Plan as a donation of the United Kingdom. This is an electrically heated wood-distillation retort with an approximate cost of $3,200.

FPRI Adviser George M. Hunt says that this equipment will enable the Institute to undertake new studies in the field of wood distillation.

This retort, according to Mr. Hunt, will be used to compare the yields of charcoal and by products from different species, to investigate the relation between the specific gravity of the wood and the yields, to study the relations between the distillation temperatures and the quality and yield of charcoal and to make other related studies.

Sunshine Corner

A pastor in this little parish always asked the children the same questions and in the same sequence: "What's your name? How old are you? Did you say your prayers? What will happen if you don't say your prayers?"

An overly ambitious mother rehearsed her little boy with the answers for days. When the pastor finally met the little fellow, he beat the pastor to the punch by rattling off: "Johnny Saunders, five, yes, go to hell."

* * *

The longest word in the English language is the one which follows the phrase: "And now a word from our sponsor."

* * *

The psychiatrist was advising the worried mother.

"I wouldn't be too upset about your boy making mud pies," said the doctor, "and the fact that he sometimes tries to eat them is also quite normal."

"Well, I'm still not convinced, doctor," replied the woman, "and, as a matter of fact neither is his wife."

* * *

When the chic, doe-eyed beauty asked for a good book to read, the obliging librarian said, "Do you want something light or do you prefer the heavier books?"

"It really doesn't matter," the young woman assured her. "I have my car outside.

* * *

A shipwrecked sailor who had spent three years on a deserted island was overjoyed one day to see a ship drop anchor in the bay. A small boat came ashore and an officer handed the sailor a bunch of newspapers.

Officer: "The captain suggests that you read what's going on in the world and then let us know if you want to be rescued."

* * *

An old prospector was "putting it on for some Easterners.

"There I was," he told them, "trapped in a narrow canyon with a grizzly two yards away behind a tree. The only way to hit him was to ricochet a bullet off the high canyon wall on my right. I'm a champion shot, as you know, so I gauged my windage, calculated the lead of the barrel and rate of twist, the hardness of the bullet and the angle of yaw it would have after smacking out of shape against the wall. I judged my chances of nailing the bear about 80-20. A one-rail bank shot, a controlled ricochet. So, I took aim and fired."

The prospector paused. One tenderfoot asked, "Did you hit him?"

"Nope," answered the old man. "I missed the wall."

* * *

Modern psychology tells us that it's bad to be an orphan, terrible to be an only child, damaging to be the youngest, crushing to be in the middle, and taxing to be the oldest. There seems no way out, except to be born an adult.

* * *

The wives of two prominent sales managers were talking things over in the hotel lobby.

"Does your husband confide his business troubles to you?"

"Oh, yes indeed," replied the other, "Every time I come home with a new dress."

* * *

The father entered the room just as the children were starting a free-for-all. "See here, Johnny," said the father, grabbing one of the youngsters, "who started this?"

"Well," said Johnny. "it's all Freddy's fault. He started it when he hit me back."

* * *

A Navy recruit on his first ocean trip was taking an examination for promotion. One of the questions was:

"What steps should be taken in case of a leaky tube in the boiler?"

He wrote: "The boiler-room ladder, preferably two steps at a time!"

* * *

"Some people think that bumming is a bed of roses, but they just don't know what we are up against," griped a Man of the Road. "We sleep in the open. Mostly it's cold or raining or snowing and the park benches are hard. Never know when you'll be thrown in jail, either. Often we go hungry, and . . ."

"Why don't you give it up then?" interrupted his bored listener.

"Huh? And admit I'm a failure?"

* * *

The barbers today have disproved the theory that two heads are better than one.

CAMPUS NOTES...

(*Continued from page 82*)

This will be an addition to the previous Senior Class donations among which maybe mentioned the artistic concrete benches around the date palm at the right of the concrete step Door, also a Senior Class donation, the Cenotaph, the drinking fountain, the benches under the Teak Trees and the College Tennis Court terraced seats.

*

THIS YEAR'S SCHOLARS

by Jun Rev.

During the second semester, school year 1960-1961, there were all in all forty (40) scholars registered in this College. They are as follows: Bureau of Forestry (Student Pensionados): Dominador Alonzo, Pedro Calixto, Honorio Cariño, Romulo Casilla, Ricardo Castro, Ricardo Clemente, Rogelio dela Rosa, Dominador Del Rosario, Victor Dotimas Jr., Dominador Faustino Jr., Senecio Festin, Antonio Glori, Carlos Glori, Virgilio Fernandez, Claudio Guerrero, Gerardo Ibay, Celso Lantican, Francisco Lozano, Petronilo Muñez, Gerundio Petilos, Eddie Quintana, Lucrecio Rebugio, Adolfo Revilla Jr., Jorge Seguerra, Gil Urgino, Guillermo Valeña, and Neptale Zabala; Bureau of Forestry Personnel: Jose Aquino, Resurreccion Astudillo, Elpidio Cabote, Eleno Capili, Edmundo V. Cortes, Domingo Cimatu, Julio de Luna, Gregorio Francia Jr., Geronimo Falloran, Antonio M. Lizardo, Gregorio P. Principe, Emeterio Rodulfa, and Mariano Valera.

For having obtained the highest scholastic grade during the last semester Rogelio de la Rosa (university scholar), Edmundo V. Cortes, Gregorio P. Principe and Virgilio Fernandez (college scholars) will receive certificates of merit from the President of the University during a convocation which will be given in their honor at U.P., Diliman on March 24, 1961. They also are entitled to a deduction in their tuition fees. The Bureau of Forestry scholars receive monthly allowances and in addition there are books handed by the said bureau to the College Library for the use of these scholars. On the other hand, there is a contract between the scholars and the Bureau of Forestry in which the rules and terms governing the scholarship are stipulated.

* * * *

CF LIBRARY RECEIVES MORE AIDS AND DONATIONS

By J. V. Barongan

The College of Forestry Library has additional 5,413 volumes of books as well as periodicals and pamphlets in its list of reading materials. These came from various sources through the untiring efforts of Mrs. Juanita Ranit, our college librarian.

Out of the total number of new books, 336 volumes were purchased with the U.P. Allocation Fund for the year 1960-61 and the rest are donations from the Cornell Counter Fund purchase, ICA-Syracuse Fund, USIS, Manila and from our friends, the De Zeeuws, the Raymond Moores, the Sammis and Mr. Pedro Sales.

Aside from the books, periodicals and pamphlets were also received from the public.

Also, through the ICA aid, the stack room of the library was installed with an air conditioning unit.

Mrs. Ranit has started on her project of binding all periodicals in the college library and indexing them afterwards.

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"WEST SIDE STORY" presented by Los Baños UPSILONIANS

by G. Francia, Jr.

"West Side Story", a two-act dramatic musical play by A. Lurents was presented by the Upsilon Sigma Phi and the Sigma Delta Phi, Los Baños Chapters, last December 16-18, 1960 at the Magsaysay Hall, CD. Building.

The play deals with the tragic uselessness of teenage hooliganism and of adult delinquency expressed in racial conflict, mollified by touching love scenes. The main cast was composed of Bink Besa and Tita Esguerra, both from the College of Agriculture, and Toti Blando, (Forestry) Esper Cuento and Nitay Ramirez, supported by other Upsilonians from botn Colleges among whom may be mentioned Condring Salvador and Ador Siapno. The production, directorial and choreographic work was ably handled by Tony Mabesa, son of former Dean Calixto Mabesa of the College of Forestry.

Plans to present the play in Manila and Diliman College theatres are under way.

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UPSILONIANS HOLD FRAT BALL

by G. Francia, Jr.

The 43rd. Annual Fraternity Ball was observed by the Los Baños Upsilonians at the International House last February 11, 1961. Considered as one of the most colorful and successful frat affairs in Los Baños, the success was due to the untiring efforts of this year's dignitaries composed of Ding Mora, Illustrious Fellow; Greg. Francia, Vice Illustrious Fellow; Raf Salva Cruz, Senior Noble Fellow; Benet Pablo, Fellow Orator Chaplian; Jef Demetrio, Leon Arceo, Fellow Recorder; Ador Siapno, Fellow Gate-keep-

er, and Advisers, Emilio Quintana and Pablo Javier and the Officers of the Alumni Residents Association.

* * *

SCHOLASTIC DELINQUENCY REPORT

One hundred and ninety-six out of the three hundred and seventy-eight registered students of the College of Forestry, U.P., during the first semester, 1960-61, were designated as scholastic delinquents. This group comprised fifty-two per cent of the total number of students enrolled in this college.

Academic delinquents are classified under four categories, namely: 1. WARNING — students who at the end of the semester obtain grades below "3" in 25 to 49 per cent of the total number of academic units for which they were registered are warned to improve their work. Thirty nine and three-tenths per cent (39.3%) of the delinquents or a total of 77 students fall under this category; 2. PROBATION — students who at the end of the semester obtain grades below "3" in 50 to 75 per cent of the total number of units for which they were registered are designated on probation. Consequently their academic load will be limited in the next registration period unless their designation as such is removed. Twenty-nine and six-tenths per cent (29.6%) of the delinquents or a total of 58 students are designated under this classification; 3. DISMISSAL — students who at the end of the semester obtain grades below "3" in at least 76 per cent of the total number of academic units in which they received final grades shall be designated as candidates for dismissal. Those who have grades of "4" may take removal examinations before the close of the next registration period. If after taking the removal examinations, the units for which they received passing final grades constitute less than 76 percent of the total academic units registered, their status will be lifted but if they fail to improve their grades sufficiently, their dismissal shall be final. A total of 36 students or 18.4 per cent of the delinquents were designated as candidates for dismissal; 4. PERMANENT DISQUALIFICATION — students who at the end of the semester obtain grades below "3" in 100 per cent of the total number of academic units in which they received final grades shall be designated as candidates for permanent disqualification. Those who have grades of "4" may take the removal examinations before the close of the next registration period and if they pass any of them, they shall not be permanently disqualified. A total number of 25 students or 12.7 per cent of the reported delinquents are candidates for permanent disqualification.

Meanwhile, a new ruling under the Revised University Code had been issued which provides that, starting with the fifth term for colleges under the term system and the second semester for colleges following the semestral system, the grade of "4" shall be considered a "low pass" and need not be removed. The grade should however, be made up in other subjects such that the general average shall not be lower than "3" which is the minimum grade for graduation. JunREV

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SEMINAR FOR RESIDENCE HALL SUPERVISION

A management seminar for supervisory personnel of Residence Halls operated in the university of the Philippine was held in Manila and Diliman during the months of February and March 1961. This was sponsored by the management services Office of the University the heads of dormitories in Diliman and Los Baños participated. The College of Forestry was represented by Professor Teodoro C. Delizo. The training officers were Mr. Simeon Agustin of IPA and Mr. Arsenio P. Talingdan of Management & IBM Coordinator, U.P. After the termination of the seminar, certificates were awarded by Vice President Isidro to the participants.

Lawyer—"You say you want to get a divorce on the grounds that your husband is careless about his appearance?"

Client—"Yes, he hasn't shown up in nearly two years."

* * *

Small town: A place where everybody knows whose check is good and whose husband isn't.

★ FRRI Technical Notes ★

ADHESIVES FOR WOOD, THEIR CHARACTERISTICS AND SELECTION FOR PARTICULAR USES

An adhesive, in general, is "a substance that causes bodies to adhere to each other". Adhesives for wood are compounds or mixtures of compounds for gluing wood to wood or, sometimes, to other materials. They may be of natural origin such as animal glues, fish glues, casein glues, starch glues and others, or they may be based primarily on synthetic products, such as the synthetic-resin glues. All commercial wood adhesives must be able to make joints that are at least as strong as the wood. In addition, some resistance to moisture is generally required and, in numerous cases, the glue joint must be able to resist repeated soakings in water or even boiling in water, without serious weakening. The total number of individual glues or glue formulas that may be used with wood is very large but they may be grouped into classes by origin and properties as shown in the accompanying diagram. Within each class shown in the diagram there may be wide variations in formulation or source, as well as in properties.

The starch glues, as a group, are low in cost but they are the least water resistant. They are easy to use, make strong joints and generally will set without heat, but most of these glues lose strength rapidly under continued or frequent exposure to water or to relative humidities above 80 percent. They are not suitable for use in the tropics except for very temporary or limited purposes. They are not known to be in commercial use in the wood industries in the Philippines.

Glues correctly formulated from soy-bean meal, peanut meal and other plant products of high protein content have generally higher moisture resistance than the starch glues. They are frequently used in the United States for manufacturing softwood plywood of limited moisture resistance but they will not usually last long when continuously exposed to wet conditions or high relative humidities. They are especially vulnerable to a combination of warmth and dampness and for this reason are less suitable for use in the tropics where relative humidities and temperatures are generally higher than in the temperate zone. These glues can be formulated to set cold or in hot presses.

Glues made from proteins of animal origin except blood and casein glues are generally of low moisture resistance. Ordinary hide and bone glues or fish glues lose strength completely when they absorb water. For some, the glue mixture is warmed before application while others are applied cold. They set without heat and are not suitable for use with heat. The water resistance of a hide glue can be increased substantially by the addition of formalin or certain other chemicals but hide glues are relatively high in cost and this degree of water resistance can be provided more cheaply by other glues. Water-resistant hide glues, therefore, find exceedingly limited commercial use. The casein glues, which are made from the casein produced from skimmed milk, if properly formulated, have high dry strength and good water resistance. They are used extensively in the United States and are commonly sold at retail in small packages for household use. In this form they are sometimes available in the Philippines. There is also some commercial wood gluing with casein glues in the Philippines. Casein glues can be formulated for use in hot presses or to set without heating.

Blood glues, (dry, soluble, whole-blood powder), made from animal blood, are formulated to set cold or in hot presses. They possess moderate resistance to moisture. They are not well suited for gluing solid wood but when properly used in making plywood they produce joints that remain strong after considerable soaking in water. However, blood glues have been largely replaced in commercial operations by the synthetic-resin glues. No blood glues are known to be in commercial use in the Philippines, but some dry soluble whole blood may be used with urea glue.

Synthetic-resin glues, as shown in the diagram, are of two general classes: (a) those that do not soften when heated after they have been cured (thermosetting) and (b) those that soften or become plastic when heated (thermoplastic). The thermoplastic glues are useful in certain kinds of products where convenience in use is of particular importance and where maximum strength under adverse conditions is not required. For maximum strength and durability under severe use conditions, thermosetting glues are generally more suitable and dependable.

The thermosetting resin glues, when properly formulated and used, have high resistance to moisture but some are more resistant than others. The urea-resin glues are generally cheaper than the other glues of this group and, for that reason, more extensively used. They may be formulated for use with hot presses or electronic heating or for use without heat. In the manufacture of plywood with a moderate degree of water resistance, urea glues are usually diluted or "extended" with considerable quantities of wheat flour or other similar starches, primarily to lower the cost of the glues. Also, small amounts of inert fillers such as finely powdered coconut shell or walnut shell may be incorporated in the glue to improve its spreadability or to control glue penetration into the wood. The dilution or filling of the glues adds to their attractiveness for commercial use, especially in the manufacture of plywood.

Urea glues, when formulated for cold setting, are sometimes used for gluing solid wood, as in the production of furniture and other laminated wood products. When so used, they should not be extended with any starch. The urea glues are considered on the border line of resistance to warmth and moisture for use in the tropics for these purposes. They might be used with reasonable success for such minor products where maximum safety and dependability are not required but they should not be used for producing large laminated beams or arches whose weakening or failure would entail loss of life or excessive costs for replacement. Plywood or other products glued with urea resins are not dependable for long life when used under continued or frequent exposure to the weather, to wet conditions or to high relative humidities and temperatures.

The most water-resistant glues that are readily available for commercial use at present are the thermosetting, synthetic-resin glues based on resorcinol, phenol or melamine resins or blends of phenol and resorcinol resins. The phenol resins and, possibly to some extent, melamine resins are the glues now used in the production of boil-proof, water-proof, exterior-grade or "marine" plywood. The phenol and resorcinol resins and the blends of these resins are the primary glues for producing laminated products of maximum durability but here their varying temperature requirements influence their commercial adaptability. Phenolic-resin glue is sometimes impregnated into very thin sheets of paper and used as a film glue for hot pressing. This form is especially suitable for gluing thin veneer which is difficult to spread with wet glue or which is easily penetrated and stained by wet glue. As a group, these adhesives of the waterproof class are more costly than the other resin glues which generally limits their use to products for which other glues are not acceptable.

The phenolic-resin glues require relatively high setting temperatures in the hot-plate press but this is not a serious disadvantage in plywood production where the heat is required to penetrate through thin sheets of wood. But in the production of laminated beams and arches, especially those of large size or wide curvature, the high-temperature requirements of the phenol-resin glues at the innermost glue line of the beam or arch assembly cannot be met by hot presses. The glue can be set in specially designed kilns capable of producing and maintaining the temperatures and humidities required but these are expensive and the long heating periods required can cause damage to the wood. For this reason, the resorcinol-resin glues or glues made from mixtures of resorcinol and phenol resins are preferred. These glues, particularly the resorcinols, can be set at normal indoor temperatures often found in the tropics and, at most, require only moderate heating that can be provided easily without expensive equipment. The mild temperature requirements of the resorcinol group of glues tend to offset their higher first cost.

The selection of a glue for a particular use should be based on availability, cost, convenience in use and requirements of the product to be glued. For commercial operations, all these factors are important but, for limited amounts of gluing on a small scale, convenience in using may be more important than the first cost of the glue.

Most plywood in the Philippines is now being made with urea-resin glues extended with wheat flour and, for export, must pass certain specified tests for moisture resistance. The small amount of "exterior" or "marine" plywood produced is glued with phenolic-resin glue.

Laminated timbers in the Philippines are being glued with casein glues where maximum durability is not required or with resorcinol-resin glues or phenol-resorcinol blends where such glues are specified or where maximum durability is required.

Furniture in the Philippines is manufactured almost entirely in small shops where convenience in gluing is a prime requirement. As a result, animal hide glues, urea glues, packaged casein glues or polyvinyl-resin glues are used, for the most part.

The foregoing practices may change with market demands, the relative availability and cost of the different glues or improvements in glue formulations.

In a brief statement such as this technical note, many aspects of the subject are inadequately covered and there are exceptions to some of the generalizations made. Furthemore, the whole field of glue formulation is in a state of constant change and improvement and new glues, or variations in old products may reasonably be expected. For a more adequate coverage of the subject, the reader is referred to the publications of manufacturers of the respective glues, to current technical journals and to the references listed below.

* * * *

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CLASSIFICATION OF WOOD ADHESIVES

(a) *by origin*

Natural

Plant

1. Starch base
   a) cassava
   b) other plant products of high starch content
2. Protein base
   a) soy bean
   b) other plant products of high protein content

Animal

1. hide
2. animal bones (including fish bones)
3. blood
4. casein
5. other animal products of high protein content

Synthetic

Thermosetting

1. urea resin
2. melamine resin
3. phenol resin
4. resorcinol resin
5. other thermosetting resins

Thermoplastic

1. polyvinyl resins
2. other thermoplastic resins

(b) by resistance to moisture (when properly formulated and used)

low moisture resistance
- starch glues
- animal hide and bone glues
- polyvinyl resin glues

moderate moisture resistance
- modified hide glues
- soy bean glues
- peanut-meal glues
- other glues of plant protein origin
- casein glues

blood glues high moisture resistance
- urea-resin glues

maximum moisture resistance
- phenol resin glues
- resorcinol resin glues
- melamine resin glues

RELATIVE ECONOMY OF TREATED AND UNTREATED WOOD

The economic advantage of the use of treated wood has been proven in many countries and has recently aroused the interest of wood-users in the Philippines. In semi-permanent and permanent construction, where durability is a primary consideration, the use of treated wood can usually be shown to effect substantial savings. In temporary construction, on the other hand, where cheap, untreated, non-durable species can serve the purpose satisfactorily, any extra cost of preservatives and treatments would obviously be an unnecessary loss of money. In such cases preservative treatment would not be advantageous.

The relative economy of the use of treated and untreated wood can be compared by spreading the total costs of the different materials over the number of years they are expected to serve. This gives a figure called "annual charge" which is a yearly payment made to defray a debt at an interest compounded annually for the length of the service life of the material. The total costs to be compared include the first cost of the material, installation costs, and the cost of maintenance and interest on the investment throughout the service life. In some instances, the maintenance cost of the treated and untreated material might not differ much but any difference would generally be in favor of the treated wood since it would require less maintenance than the untreated. In comparing their costs, maintenance cost should be included whenever accurate data are available.

The annual charge may be computed by the formula:

$$A = P\left[\frac{r(1+r)^n}{(1+r)^n - 1}\right] \quad - (1)$$

Where: A = Annual charge
P = First cost in place (cost of delivered material and installation cost)
r = Interest rate expressed as a decimal
n = Expected length of service

Table 1 shows the annual charge per peso of cost of a material for different interest rates computed from formula 1.

For example, for a telephone company making a choice between the use of treated and untreated apitong poles in a line requiring 1,000 poles, the first cost in place of a single untreated pole is assumed to be ₱32.00 (₱25.00 cost of poles plus ₱7.00 installation cost) and it would possibly last 5 years. A treated pole in place would probably cost ₱80.00 (₱25.00 cost of pole, ₱48.00 cost of treatment, plus ₱7.00 installation cost) and should last 30 years in service[1]. Assume also that the capital was borrowed at an interest rate of 6 percent.

Table 1 shows that, at 6 percent interest, a timber with a service life of 5 years would have an annual charge of ₱0.23740 for every peso of cost and one that lasts 30 years would have an annual charge of ₱0.07265. The annual charge for the untreated pole, which cost ₱32.00 in place, is 32 times 0.23740 or ₱7.60. The treated pole, which cost ₱80.00, has an annual charge of 80 times 0.07265 or ₱5.81. The lower annual charge of the treated pole shows that it is the more economical material to use. Using treated poles in this case would mean a total saving of ₱1,790.00 per thousand poles per year without taking into account the fact that replacement of poles in service costs more than the first installation and that there would be six replacements of the untreated poles to one replacement of the treated poles.

Some wood-users may decide to buy untreated timbers and have them treated. In this case it would be desirable to determine how much may be spent for treatment without increasing the annual charge of the structure. With the use of formula 1 and knowing the number of years the untreated wood will last and the number of years added due to treatment, the allowable cost for treatment can be estimated by equating the annual charge of the untreated wood to the annual charge of the treated wood. The first cost of the treated pole in this case is the cost of the untreated pole in place plus the allowable cost for treatment (y). The equation would be:

$$P(A_1) = (P + y)(A_2)$$

$$(P + y) = \frac{P(A_1)}{A_2}$$

$$y = \frac{P(A_1)}{A_2} - P \quad - - - \quad (2)$$

Where: A_1 = Annual charge per peso of cost of the untreated material
A_2 = Annual charge per peso of cost of the treated material
y = Allowable cost of treatment without increasing the annual charge

Using the values of the foregoing example, the maximum amount the company could spend

[1] The costs given are market prices for a 30-foot pole at the time of writing. These prices of course are subject to considerable variation.

for treatment without increasing the annual charge may be determined. Taking the values of A_1 and A_2 from the table, the allowable cost of treatment would be:

$$y = \frac{32(0.23740)}{0.07265} - 32$$

$$= ₱72.57$$

Since the cost of treatment (see first example) would amount to ₱48.00, which is less than the maximum allowable cost of treatment (₱72.57), the use of the treated pole is economically justifiable (without taking into consideration the extra costs of replacing poles in service).

Wood-users may ask how long treated wood should last to have the same annual charge as the untreated wood or how long should the treated wood serve to compensate for the additional cost of treatment. From formula 1, n, (the number of years the treated wood must last to have the same annual charge as the untreated), can be obtained by the formula:

$$n = \frac{\text{Log } A - \text{Log } (A - Pr)}{\text{Log } (1 + r)} \quad (3)$$

To avoid the tedious computation by the use of this formula, the table can again be used. Having obtained the annual charge of the untreated pole, equate this to the cost of the treated pole multiplied by the annual charge per peso of cost of the treated pole in place, represented by x.

$$7.60 = 80\ (x)$$

$$x = \frac{7.60}{80} = ₱0.09500$$

Referring to table 1, the annual charge of ₱0.09500 per peso of cost at 6 percent interest gives a figure of about 17 years. This means that if the treated pole will serve 12 years more than the untreated, the treatment will have paid for itself. The number of years each pole will serve more than is required to pay for the treatment are the savings which make its use the more economical.

A great deal of savings accrue from increasing the service life of the timber aside from the reduction of the annual charges. The use of short-lived untreated poles necessitates frequent renewals, especially when employed under conditions favorable to decay and insect attack as in power and telecommunication lines. Each replacement would usually cost considerably more than the original installation cost because the cost of renewal must include the cost of removing the old as well as the cost of erecting the new pole plus the cost of removing and re-installation of the insulators and wires. Furthermore, over a period of years, it is to be expected that the price of the untreated poles will be higher each time a new purchase is made. Therefore, the annual charge for each new group of untreated poles will be higher than that of the previous group. Added to these are the inconveniences to users and the reduction of income to the company brought about by the interruption of service. In actual practice, all these costs must enter into the computations.

The foregoing computations and values for treated and untreated poles should be understood as examples only. Conditions fluctuate from year to year and the source and availability of the materials also affect the cost. Furthermore, different localities and services have different labor and installation costs.

The usefulness of the above formulas is not limited to poles. They may be used just as readily to compare the economy of treated and untrated wood in other structures such as bridges, culverts, fences, piers, piling and other wood structures of various kinds. These formulas may also be used to compare the economy of different competitive structural materials with wood or with each other.

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TABLE — 1

ANNUAL CHARGE PER PESO OF COST OF MATERIAL IN PLACE

Years service of material before renewal (n)	Interest rate 4%	5%	6%
1	1.04000	1.05000	1.06000
2	0.53020	0.53780	0.54544
3	0.36035	0.36721	0.37411
4	0.27549	0.28201	0.28859
5	0.22463	0.23097	0.23740
6	0.19076	0.19702	0.20336
7	0.16661	0.17282	0.17914
8	0.14853	0.15472	0.16104
9	0.13449	0.14069	0.14702

10	0.12329	0.12950	0.13587
11	0.11415	0.12039	0.12679
12	0.10655	0.11283	0.11928
13	0.10014	0.10646	0.11296
14	0.09467	0.10102	0.10758
15	0.08994	0.09634	0.10296
16	0.08582	0.09227	0.09895
17	0.08220	0.08870	0.09544
18	0.07899	0.08555	0.09236
19	0.07614	0.08275	0.08962
20	0.07358	0.08024	0.08718
21	0.07128	0.07800	0.08500
22	0.06920	0.07597	0.08305
23	0.06731	0.07414	0.08128
24	0.06559	0.07247	0.07968
25	0.06401	0.07095	0.07823
26	0.06257	0.06956	0.07690
27	0.06124	0.06829	0.07570
28	0.06001	0.06712	0.07459
29	0.05888	0.06605	0.07358
30	0.05783	0.06505	0.07265

Based on the formula: $A = P \frac{r\ (1 + r)^n}{(1 + r^n - 1)}$

Where: A = Annual charge
P = First cost of materials in place
r = Interest rate expressed as a decimal
n = Expected length of service

* * * *

THE DENSITY AND SPECIFIC GRAVITY OF WOOD

The density and specific gravity of wood are valuable indices of its physical and mechanical characteristics. Generally, the denser the wood is, the higher are its strength properties, the more difficult it is to season and the harder it is to saw and nail.

The terms density and specific gravity are so frequently confused that it is worthwhile to define them specifically.

Density

Density refers to the mass or weight of a substance per unit volume and is expressed in such terms as grams per cubic centimeter, kilograms per cubic meter, or pounds per cubic foot.

Density depends heavily on the current moisture content. Green wood, for instance, has a higher density than air-dry wood of the same species. As the moisture content of the green wood decreases, the density decreases until the fiber saturation point (30 percent is the assumed moisture content) is reached. Further drying below that point causes shrinkage of the wood which tends to compensate for the weight of water lost and thus may result in increasing the density despite the loss of moisture.

Specific gravity

Specific gravity refers to the relative density of any substance in comparison with a standard density, usually that of distilled water at 4°C, which is taken as unity. Water is taken as a standard medium because one cubic centimeter at 4°C weighs exactly one gram which makes for convenience in calculation.

The specific gravity of wood is the ratio of the weight or density of a given volume of wood tc the weight of the same volume of water at a temperature of 4°C. Density referred to here is based on weight oven dry and volume at current moisture content. However, the specific gravity of wood is usually computed from the volume of the wood when green (before any shrinkage has taken place) and the weight of the wood when oven dry (moisture free). The dimensional constancy of wood under these two basic conditions assures replication, thus the calculated specific gravity is reliable and can be compared with published figures obtained under the same conditions. Sometimes, however, as in making strength tests on wood, the specific gravity is based on the volume of the wood at the time of test which may be in the green or in the air-dry condition. Whatever basis is used should be made clear in published data.

Specific gravity is expressed decimally, such as 0.37. This figure would mean that a given volume of the wood weighs 0.37 times the weight of the same volume of water.

Specific gravity is at its lowest when its computation is based on the weight when oven dry and volume when green and is at its highest when based on the weight and volume when oven dry. As wood dries or seasons below the fiber-saturation point, there is a gradual increase in specific gravity due to the shrinkage in drying.

Since most woods are lighter than water, even when green, most specific gravity values are less than unity. Thus the specific gravity of tangile averages about 0.47 based on oven-dry weight and volume when green. Some woods, however, are heavier than water even when oven dry and their specific gravity values exceed unity. Mancono, for example, has a specific gravity of about 1.41 on the basis of oven-dry weight and air-dry volume (about 15 to 17 percent moisture content).

The specific gravity of wood is a direct indication of the amount of wood substance in a given volume, but it is also an inverse indication of the amount of air the wood contains. The volume occupied by wood substance alone is considerably less than the volume occupied by

wood in the usual form in which it grows. The specific gravity of wood substance is about 1.53 as determined in water, but no wood is known to have specific gravity that high. Practically all wood contains some air space but the higher the specific gravity is, the less air space the wood contains.

The specific gravity of wood is not only different for different species but it also varies somewhat within any species and even within the cross section of a single tree. In general, the wood at the center of a tree has a lower specific gravity than the wood near the outside of the tree or in the intermediate zone. The wood near the top of the tree is also weaker and of lower specific gravity than the average wood lower down in the tree. This is not strange because the wood near the top of a growing tree is center wood and, if the tree continues to grow in height and diameter, it will eventually be covered by wood of higher specific gravity.

Specific gravity is not a reliable indication of resistance to decay, fungi or insects. Some very light woods are high in decay and insect resistance and some are low in these qualities. Similarly some woods of high specific gravity are high in resistance to decay and insects and others are not. In general, it appears that the resistance of durable woods to fungi and insects results from the presence of certain extractives in the wood which are toxic or repellent to the destructive agents. If these extractives are present in sufficient quantities they may increase the specific gravity somewhat but, in general, their quantity is limited.

For most common uses, woods of intermediate specific gravity are preferred but for limited special uses the very heavy or the very light woods may prove useful. The usefulness of wood is aso influenced by numerous other characteristics such as color, figure, texture, odor, taste, machining properties, finishing properties, durability, premeability, and others.

In surveying the mechanical and physical properties of Philippine woods, the FPRI has already made specific gravity determinations on many species. The accompanying table gives average specific gravity and density values for about 80 species that have been tested thus far, including most of the species in common commercial use.

* * * *

HOW TO DETERMINE SPECIFIC GRAVITY

Two facts about a piece of wood must be determined in order to compute its specific gravity. These are its volume (commonly in the green condition) and its weight when oven dry.

Volume of the green wood may be determined by actual measurement or by weighing the amount of water displaced when the wood specimen is submerged in a weighed container of water. This is done by placing a container of water of suitable size on one pan of a balance and placing weights on the other pan to balance it. Then the piece of wood whose volume is to be determined is impaled on a fine-pointed tool held in a clamp on a ring stand and forced below the surface of the water. The additional weights required on the other pan to bring the system again into balance are equal to the weight of the water displaced by the wood, assuming of course that no water is absorbed by the wood during the weighing. Absorption can be avoided by soaking the wood in another container of water for awhile before weighing. The weight of the displaced water in grams is equivalent to the volume of the wood in cubic centimeters. For maximum accuracy, however, the water temperature would be taken and a temperature correction applied in the calculations.

The oven-dry weight of the wood is determined by placing the specimen in a temperature-controlled oven maintained at a temperature of about 102°C. Small specimens can be dried moisture free in 24 to 48 hours under such conditions. The moisture-free or oven-dry condition is reached when successive weighings show no further loss in weight.

The specific gravity is then calculated by dividing the oven-dry weight of the wood in grams by the grams of water displaced by the wood. Or, if the volume of the wood has been determined by measurement, the oven-dry weight is divided by the volume in cubic centimeters. This is done because 1 cc. of water (at the correct temperature) weighs 1 gram. When English units of measurement and weight are used, conversion factors must be employed because, in the English system, no such simple relation exist between weight and volume of water as in the metric system.

The above method is usually employed where a more exact specific gravity value is required. A practical method of estimating the specific gravity of wood which requires less time and equipment is by the flotation method. This method is less accurate than the standard laboratory process but it is useful for producers and suppliers seeking a quick specific gravity test to guard against the use of under-weight material and at the same time, avoid the rejection of wood of acceptable specific gravity. This method is accurate enough to detect up to 90 percent of stock which should be rejectable for light weight.

The method consists of determining the submerged portion of a piece of wood with parallel sides when it is floated in water. The piece of wood to be tested is cut to 1-inch square in cross-section and 10 inches long and is marked into 10 equal divisions of 1-inch. When the test piece is floated on end in a narrow vessel of water, its specific gravity at the current moisture content can be determined by noting the length of the submerged portion of the piece, expressed as a decimal fraction of the total length.

* * * *

HOW TO DETERMINE DENSITY

Density is determined simply by weighing the specimen and determining its volume, then expressing the result in terms of weight per unit of volume and stating the condition of the wood. Thus density may be expressed in pounds per cubic foot when green or when air dry. With lumber, density is sometimes expressed as pounds per thousand board feet "shipping dry", which means at a moisture content of about 20 percent.

Density figures on U.S. woods are sometimes published as pounds per cubic foot at 12 percent moisture content. The green values may also be given in a parallel column.

The approximate density of wood at an assumed moisture content can be calculated from the specific gravity, using a formula such as

$$Dm = S\ (1 + \frac{m}{100})$$

in which D = density in grams per cc
m = moisture content assumed
S = specific gravity based on green volume and oven-dry weight

At an assumed moisture content of 20 percent, the formula would be

$$D_{20} = S\ (1 + 0.2)$$

The result, in grams per cubic centimeter, can be converted into any other units desired by using the proper conversion factors. The value obtained by this formula is only approximate because the formula does not take into consideration the shrinkage in volume in drying from the green condition to 20 percent moisture content. This could be taken care of by a more complicated formula if the volumetric shrinkage of the species is known.

Density values for moisture contents above 30 percent would be correct but, for moisture contents below 30 percent, the density values obtained by this formula will be somewhat low.

Although calculations such as the foregoing could be made for the weight of lumber per thousand board feet in the shipping dry condition, it is not safe to rely on them for that purpose. Lumber may be cut over-size or under-size and the volume of the commercial quantity called 1000 board feet may vary considerably on that account. Transportation companies and lumber shippers are accustomed to using average weights per thousand board feet obtained by weighing actual shipments.

AVERAGE DENSITY AND MEAN SPECIFIC GRAVITY OF SOME WOODS FROM THE WET REGIONS OF THE PHILIPPINES

Common and scientific name	Moisture contest at test (percent)	Mean specific gravity[1]	Density (lbs./cu.ft) based on	
			Wt. & volume at test	Wt. & volume at 12 percent M.C.
AFU (*Anisoptera brunnea* Foxw.)	106.5	0.54	69.6	41.4
AGOHO (*Casuarina equisetifolia* L.)	56.7	0.83	81.2	66.8
ALMACIGA (*Agathis philippinensis* Warb.)	97.0	0.44	54.1	33.2
ALMON (*Shorea almon* Foxw.)	106.5	0.39	50.2	29.3
ANANG (*Diospyros pyrrhocarpa* Miq.)	82.6	0.62	70.4	47.8
ANANG-GULOD (*Diospyros inclusa* Merr.)	72.1	0.68	73.0	53.4
ANILAU (*Columbia serratifolia* [Cav.] DC.)	160.2	0.37	60.1	27.4
ANONGO (*Turpinia ovalifolia* Elm.)	158.0	0.36	58.0	26.7
APANANG (*Neotrewia cumingii* [Muell.-Arg.] Pax and K. Hoffm.)	94.3	0.55	66.7	41.9
APANIT (*Mastixia philippinensis* Wang.)	115.0	0.49	65.7	37.3

[1] Based on weight when oven dry and volume when green. Data released for publication gave the specific gravity values to three decimal places, but for convenience they were rounded off to two decimal places in this Technical Note.

APITONG (*Dipterocarpus grandiflorus* Blanco)	84.0	0.63	72.3	49.0
APITONG, ROUND-LEAVED (*Dipterocarpus orbicularis* Foxw.)	95.1	0.58	70.6	44.4
ATA-ATA (*Diospyros mindanaensis* Merr.)	64.5	0.69	70.9	54.4
BAGTIKAN (*Parashorea plicata* Brandis)	106.7	0.48	61.9	36.5
BALAKAT-GUBAT (*Sapium luzonicum* [Vid.] Merr.)	153.0	0.38	60.0	28.5
BALIKBIKAN (*Drypetes bordenii* [Merr.] Pax and K. Hoffm.)	69.4	0.75	79.3	59.9
BATINO (*Alstonia macrophylla* Wall.)	106.6	0.60	77.4	46.2
BINGGAS (*Terminalia citrina* [Gaertn.] Roxb.)	66.9	0.74	77.1	58.5
BOKBOK (*Xanthophyllum excelsum* [Blume] Miq.)	92.9	0.63	75.8	48.8
BOLON (*Alphonsea arborea* [Blanco] Merr.)	66.0	0.70	72.5	55.1
DAGANG (*Anisoptera aurea* Foxw.)	121.7	0.54	74.6	41.1
DALINGDINGAN (*Hopea foxworthyi* Elm.)	73.3	0.62	67.0	47.8
DANGKALAN (*Calophyllum obliquinervium* Merr.)	78.6	0.60	66.9	46.5
DITA (*Alstonia scholaris* [L.] R. Br.)	131.0	0.38	54.8	28.0
DUKTULAN (*Syzygium luzonense* [Merr.] Merr.)	86.1	0.62	72.0	48.4
GUBAS (*Endospermum peltatum* Merr.)	191.1	0.31	56.3	22.5
GUIJO (*Shorea guiso* [Blanco] Blume)	72.8	0.70	75.4	54.8
HAGAKHAK (*Dipterocarpus warburgii* Brandis)	96.4	0.52	63.7	39.9
HIMBABA-O (*Allaeanthus luzonicus* [Blanco] F.—Vill.)	132.8	0.43	62.5	31.9
IPIL (*Intsia bijuga* [Colebr.] O. Ktze.)	95.9	0.68	83.2	53.1
IPIL-IPIL (*Leucaena glauca* [L.] Benth.)	79.1	0.73	81.6	58.2
KALANTAS (*Toona calantas* Merr. and Rolfe)	92.1	0.56	67.1	43.0
KAMATOG (*Erythrophloeum densiflorum* [Elm.] Merr.)	74.8	0.69	75.2	54.6
KATILMA (*Diospyros nitida* Merr.)	67.8	0.70	73.3	55.5
KATONG-MATSIN (*Chisocheton pentandrus* [Blanco] Merr.)	127.0	0.52	73.7	39.5
KATURAI (*Sesbania grandiflora* [L.] Pers.)	180.1	0.40	69.9	29.6
KUBILI (*Cubilia cubili* [Blanco] Adelb.)	116.5	0.49	66.2	36.9
KUPANG (*Parkia roxburghii* G. Don)	223.6	0.34	68.7	25.5
LAMOG (*Planchonia spectabilis* Merr.)	103.6	0.55	69.8	42.3
LANIPAU (*Terminalia copelandii* Elm.)	106.3	0.47	60.5	35.5
LANUTAN BAGYO (*Gonystylus macrophyllus* [Miq.] Airy-Shaw)	109.5	0.50	65.4	38.0
LANUTAN, VIDAL (*Bombycidendron vidalianum* [Naves] Merr. and Rolfe)	93.2	0.53	63.9	40.8
LANUTAN, YELLOW (*Polyalthia flava* Merr.)	111.4	0.51	67.4	38.9
LAUAN, RED (*Shorea negrosensis* Foxw.)	97.7	0.46	56.8	34.7
LAUAN, WHITE (*Pentacme contorta* [Vid.] Merr. and Rolfe)	122.0	0.42	58.2	31.2
LIUSIN (*Parinari corymbosa* [Blume] Miq.)	63.5	0.74	75.5	58.5
MAHOGANY BIG-LEAVED (*Swietenia macrophylla* King)	138.0	0.45	66.8	33.5
MALABAYABAS (*Tristania decorticata* Merr.)	46.8	0.94	86.1	77.5
MALABULAK (*Samalia malabarica* [DC.] Schatt Endl.)	252.0	0.27	59.3	19.4
MALAPANAU (*Dipterocarpus kerrii* King)	88.2	0.58	68.1	45.1
MALATAPAI (*Alangium longiflorum* Merr.)	89.3	0.64	75.2	49.5
MALIBAYO (*Berrya cordifolia* [Willd.] Burr.)	118.4	0.57	77.8	43.8
MALUGAI (*Pometia pinnata* Forst.)	100.3	0.56	70.0	43.1
MANARING (*Lithocarpus soleriana* [Vid.] Rehd.)	81.8	0.63	71.4	48.8
MANGGACHAPUI (*Hopea acuminata* Merr.)	82.7	0.63	71.9	48.8
MANGGASINORO (*Shorea philippinensis* Brandis)	133.5	0.39	56.8	29.0
MAYAPIS (*Shorea squamata* [Turcz.] Dyer)	139.6	0.37	55.3	27.7

MIAO (*Dysoxylum euphlebium* Merr.)	71.8	0.66	70.7	51.5
MOLAVE (*Vitex parviflora* Juss.) Merr.)	68.8	0.71	74.8	56.0
NARIG, THICK-LEAVED (*Vatica pachyphylla* Merr.)	86.6	0.62	72.1	48.5
NARRA (*Pterocarpus indicus* Willd.)	119.1	0.50	68.4	37.8
PAHUTAN (*Mangifera altissima* Blanco)	104.7	0.55	70.2	42.5
PANAU (*Dipterocarpus gracilis* Blume)	83.2	0.63	72.0	48.8
PANGLONBOIEN (*Syzygium simile* [Merr.] Merr.)	105.1	0.56	71.6	43.0
PIANGA (*Madhuca obovatifolia* [Merr.] Merr.)	96.0	0.60	73.3	46.4
PINE, BENGUET (*Pinus insularis* Endl.)	65.9	0.59	61.1	46.0
RAINTREE (ACACIA) (*Samanea saman* [Jacq.] Merr.)	154.8	0.49	77.8	36.9
SAKAT (*Terminalia nitens* Presl)	97.1	0.57	70.2	43.5
SANTOL (*Sandoricum koetjape* [Burm.f.] Merr.)	107.3	0.46	59.6	34.8
SPANISH CEDAR (*Cedrela odorata* L.)	169.0	0.38	63.8	28.6
TAINGANG-BABUI (*Gonocaryum calleryanum* [Baill.] Becc.)	81.9	0.63	71.5	49.0
TANGILE (*Shorea polysperma* [Blanco] Merr.)	92.8	0.47	56.5	35.9
TEAK (*Tectona grandis* L.f.)	118.2	0.49	66.7	37.4
TOOG (*Combretodendron quadrialatum* [Merr.] Merr.)	94.0	0.57	69.0	43.8
TUAI (*Bischofia javanica* Blume)	124.4	0.53	74.2	40.3
TULO (*Alphitonia philippinensis* Braid)	139.9	0.40	59.8	29.6
YAKAL-GISOK (*Shorea gisok* Foxw.)	54.6	0.81	78.2	64.7

* * * *

SAPWOOD AND HEARTWOOD

When a cross section of a tree is viewed, such as the end of a log, an outer zone of light-colored wood will usually be seen next to the bark as indicated in Fig. 1. This light-colored wood is called the "sapwood" of the tree. It is composed partially of living tissues whose main function is to carry food and water to the different parts of the tree to serve as a reservoir of stored food.

Surrounded by the sapwood zone, as shown in Fig. 1, there is a central zone called "heartwood". This is usually, but not always, darker in color than the sapwood. In some species, the borderline between the two zones is difficult or even impossible to locate. These are sometimes called "sapwood species", meaning that they have no noticeable heartwood. The heartwood consist of dead tissues and does not participate in the life activities of the tree but it continues to serve as a support of the standing tree.

In the beginning, when the tree is very small, it consists entirely of sapwood but as the tree grows larger and puts on new layers of sapwood beneath the bark, "as the result of the activity of a growing layer, the cambium", life gradually ceases in the central portion and the central sapwood becomes heartwood. The pith of the tree (see Fig. 1) generally disappears. Year after year, as the tree grows older and increases in size, the heartwood zone also increases in size but always is surrounded by the sapwood zone. The thickness of the sapwood zone depends mainly upon the wood species. In some species the sapwood may be less than an inch thick while in others, the "sapwood species", it may occupy all or most of the cross section.

As the age of the tree increases there is a tendency for resins, gums, tannins, coloring matter and other so-called "extraneous materials" to accumulate in the heartwood but very little in the sapwood. The nature of these "extraneous materials" or "extractives" varies greatly among different wood species. The heartwood of some species contains materials that are toxic or repellent to fungi and insects, which account for the resistance of the heartwood to these destructive organisms. In other species the extractives of the heartwood do not contain protective chemicals. In such species the heartwood has little greater resistance, if any to decay fungi than the sapwood.

As mentioned above, the sapwood of the tree contains very little of the extractive materials that characterize the heartwood but it contains the sugars, starches and other nutrients of the tree, some of which are foods for fungi and insects. The sapwood, therefore, has low resistance to decay fungi under damp conditions of use, is easily discolored by staining fungi and readily attacked by several kinds of insects. Starch appears to be particularly attractive to powder-post beetles (bukbok). Sapwood that is kept thoroughly dry does not stain or decay but may be attacked by "bukbok". The absence of these nutrient

chemicals, particularly starch, from heartwood makes it unattractive to bukbok and, therefore, generally free from their attack even in species that do not contain toxic chemicals in the heartwood. Staining fungi find nothing of value in heartwood and, therefore, do not discolor it. Wood-decaying fungi, however, depend on the wood substance itself and, under conditions favorable to their growth, attack both sapwood and heartwood in all species that do not contain toxic or repellent extractives in the heartwood.

The general characteristics and properties of sapwood and heartwood are compared in the accompanying table.

While the foregoing statements and those in the table are generally correct, there are occasional exceptions. For example, sometimes trees contain rings or irregular areas within the heartwood that did not change from sapwood to heartwood. These areas are sometimes called "included sapwood" or "inner sapwood" and they appear to retain the general properties of sapwood even though surrounded by heartwood. Whether they continue to function in the life processes of the tree is not apparent.

There is also false heartwood which is sometimes found within the sapwood zone. This is dead wood caused by a wound or a diseased condition. It is usually too small to be significant in the utilization of the wood but may be excluded as defective because of its color.

When the log is cut into lumber, some of the boards may be all sapwood, some may be partly sapwood and partly heartwood, and some may be all heartwood as indicated in Fig. 2. Boards containing sapwood are perfectly acceptable for many purposes and sapwood is usually preferable to heartwood if the wood is to be impregnated with preservatives. When lumber is selected for high natural resistance to decay and insect attack, however, it should be remembered that this property exists only in the heartwood. The sapwood of even the most durable species is low in decay and insect resistance. When thoroughly impregnated with suitable preservatives, however, sapwood can be made as durable as heartwood and, in most species, even more durable.

It is sometimes assumed that heartwood is stronger than sapwood but this is not correct and frequently the reverse is true. The wood very near the pith of the tree, in the heartwood zone, is frequently less dense and more defective and therefore weaker than the wood in the outer heartwood zone or in the sapwood. The strength of wood depends to a large degree on its density or specific gravity, moisture content, straightness of grain and freedom from defects, and not upon the change from sapwood to heartwood. The relationship between density and strength is particularly close, so much so that density is considered to be a good indication of strength, the denser woods being the harder and stronger.

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TABLE

SAPWOOD AND HEARTWOOD COMPARED

Sapwood
The outer zone of the tree
Light colored
"Living" wood
Contains sugars, starches and other nutrients of the tree
Does not contain toxic or repellent chemicals
Easily discolored by staining fungi
Attractive to bukbok
Not durable under adverse conditions
Strength at least as great as in heartwood
Usually penetrable by preservatives
Extraneous materials mostly absent
Heartwood
The inner zone of the tree
Usually darker in color than sapwood but not always
No longer living
Does not contain nutrient chemicals

Many species contain toxic or repellent chemicals in varying amounts but they are lacking in other species

Not discolored by staining fungi

Resistant to bukbok

Highly durable in some species, intermediate in some species, not durable in others

Outer heartwood as strong as sapwood, inner heartwood often weaker

Penetrable on some species, highly resistant to penetration in others

Extraneous materials generally present

Technical Notes are brief summaries of the different subjects on the properties, processing, and uses of wood and other forest products, issued monthly by the Forest Products Research Institute for public information. The information in the Notes is derived from the accumulated world knowledge of each subject discussed as well as from the work of the Institute. For more comprehensive discussion, the reader is referred to the many books and other publications available.

Republic of the Philippines
Department of Public Works and Communications
BUREAU OF POSTS
Manila

SWORN STATEMENT
(Required by Act 2580)

The undersigned, RESURECCION ASTUDILLO, business manager, of Forestry Leaves, published quarterly, in english, at College of Forestry, Laguna, after having been duly sworn in accordance with law, hereby submits the following statement of ownership, management, circulation, etc., which is required by Act 2580, as amended by Commonwealth Act No. 201:

Name	*Address*
Editor GREGORIO P. PRINCIPE	College, Laguna
Managing Editor EDMUNDO DIZON	College, Laguna
Business Manager Resureccion Astudillo	College, Laguna
Owner U.P. College of Forestry	College, Laguna
Publisher Student Body & Alumni College of Forestry	Laguna
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Office of Publication	College, Laguna

If publication is owned by a corporation, stockholders owing one per cent or more of the total amount of stocks: NONE

Bondholders, mortgages, or other security holders owning one per cent or more of total amount of security: NONE

In case of daily publication, average number of copies printed and circulated of each issue during the preceding month of September, 1960;

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 July, 1960;

1. Sent to paid subscribers	520
2. Sent to others than paid subscribers	480
Total	1,000

RESURECCION ASTUDILLO
Business Manager

SUBSCRIBED AND SWORN to before me this 11th day of November, 1960, at Los Baños, Laguna, the affiant exhibiting his Residence Certificate No. R-3413056 issued at Los Baños, on January 29, 1960.

CIRIACO LAWAS
Acting Mayor, Los Baños, Laguna

NOTE: This form is exempt from the payment of documentary stamp tax.
ACT 2580 REQUIRES THAT THIS SWORN STATEMENT BE FILED WITH THE BUREAU OF POSTS ON *APRIL* 1 *AND OCTOBER* 1 *OF EACH YEAR.*

Republic of the Philippines
Department of Agriculture and Natural Resources
OFFICE OF THE SECRETARY
Diliman, Quezon City

November 28, 1960

SPECIAL ORDER)
No. 98 :
Series of 1960)

SUBJECT: *Designating Forestry Supervisor I Paciano R. Rimando as Acting Chief, Reforestation Management Division.*

1. Forestry Supervisor I Paciano R. Rimando is hereby designated Acting Chief of Reforestation Management Division of the Reforestation Administration in the absence of a duly appointed Chief of Reforestation Management Division.

2. As Acting Chief of Reforestation Management Division, he is authorized to direct, supervise and carry out functions relating to the formulation of policies, programs and plans and the setting of standards, criteria and practices, for the management of reforestation projects; technically supervise and coordinate the execution of such policies, programs and plans and insure compliance with such standards, criteria and practices in the field; and cooperate with other government agencies city, provincial and municipal governments, private organizations and individuals in planting trees.

3. In connection with the above, Forestry Supervisor I Rimando is authorized to sign all correspondence pertaining to the duties of the position and when acting in such capacity shall sign as follows:

For the Administrator:

PACIANO R. RIMANDO
Acting Chief, Reforestation Management Division

4. This Special Order shall take effect immediately and shall remain in force unless otherwise revoked or until a Chief of Reforestation Management Division shall have been duly appointed.

(SGD.) CESAR M. FORTICH
Secretary of Agriculture and Natural Resources

RECOMMENDED BY:
(SGD.) JOSE VIADO
Administrator
Reforestation Administration

Republic of the Philippines
Department of Agriculture and Natural Resources
OFFICE OF THE SECRETARY
Diliman, Quezon City

November 28, 1960

SPECIAL ORDER)
No. 99 :
Series of 1960)

SUBJECT: *Designating Sr. Research Forester Roman B. Valera as Acting Chief, Technical Services Division.*

1. Sr. Research Forester Roman B. Valera is hereby designated Acting Chief of Technical Services Division of the Reforestation Administration in the absence of a dully appointed Chief of Technical Services Division.

2. As Acting Chief of Technical Services Division, he is authorized to direct, supervise and carry out the planning and programming functions relating to technical services such as the demarcation and delimitation of the classified areas under the management, administration and control of the Administration; the control and supervision of all field surveys through the setting and maintenance of technical survey standards, techniques and methods and the preparation of reforestation maps, formulating and coordinating the exectution of, in cooperation with the Bureau of Forestry, research programs, policies and procedures, and the procurement, propagation storage and distribution of seeds, seedlings and other planting materials needed for reforestation and public and private cooperative projects.

3. In connection with the above, Sr. Research Forester Valera is authorized to sign all correspondence pertaining to the duties of the position and when acting in such capacity shall sign as follows:

For the Administrator:

ROMAN B. VALERA
Acting Chief, Technical Services Division

4. This Special Order shall take effect immediately and shall remain in force unless otherwise revoked or until a Chief of Technical Services Division shall have been duly appointed.

(SGD) CESAR M. FORTICH
Secretary of Agriculture and Natural Resources

RECOMMENDED BY:
(SGD) JOSE VIADO
Administrator
Reforestation Administration

Republic of the Philippines
Department of Agriculture and Natural Resources
OFFICE OF THE SECRETARY
Diliman, Quezon City

November 29, 1960

SPECIAL ORDER)
No. 100 :
Series of 1960)

SUBJECT: *Designating Forestry Supervisor II Carlos Cunanan as Acting Chief, Statistics and Extension Division.*

1. Forestry Supervisor II Carlos Cunanan, in addition to his other duties, is hereby designated Acting Chief of Statistics and Extension Division of the Reforestation Administration in the absence of a duly appointed Chief of Statistics and Extension Division.

2. As Acting Chief of Statistics and Extension Division, he is authorized to direct, supervise and carry out functions relating to the evaluation of statistics concerning reforestation and afforestation; compilation of data and information from other agencies and foreign countries useful to the administration, preparation of informative materials for extension purposes; participation in community programs and activities; and handling of other public relations work of the administration.

3. In connection with the above, Forestry Supervisor II Carlos Cunanan is authorized to sign all correspondence pertaining to the duties of the position and when acting in such capacity shall sign as follows:

For the Administrator:

CARLOS CUNANAN
Acting Chief, Statistics and Extension Division

4. This Special Order shall take effect immediately and shall remain in force unless otherwise revoked or until a Chief of Statistics and Extension Division shall have been duly appointed.

(SGD) CESAR M. FORTICH
Secretary of Agriculture and Natural Resources

RECOMMENDED BY:
(SGD) JOSE VIADO
Administrator
Reforestation Administration

* * *

Republic of the Philippines
Department of Agriculture and Natural Resources
OFFICE OF THE SECRETARY
Diliman, Quezon City

November 29, 1960

SPECIAL ORDER)
No. 101 :
Series of 1960)

SUBJECT: *Designating Mr. Honorato A. Baja as Acting Chief, Administrative Services Division of the Reforestation Administration.*

1. Mr. Honorato A. Baja is hereby designated Acting Chief, Administrative Services Division of the Reforestation Administration in the absence of a duly appointed Chief of Administrative Services Division.

2. As Acting Chief of the Administrative Services Division, he is authorized to direct and supervice clerical services, property control, building maintenance, central records, payroll keeping, personnel records, budget and fiscal activities security and discipline.

3. In connection with the above, he is authorized to sign all routinary correspondence which are not policy making and to perform other administrative duties as directed and when acting in such capacity, he shall sign as follows:

For the Administrator:

HONORATO A. BAJA
Acting Chief, Administrative Services Division

4. This Special Order shall take effect immediately and shall remain in force until the Chief, Administrative Services Division of the Reforestation Administration is appointed or until revoked.

(SGD) CESAR M. FORTICH
Secretary of Agriculture and Natural Resources

RECOMMENDED BY:
(SGD) JOSE VIADO
Administrator
Reforestation Administration

* * * *

January 3, 1961

MEMORANDUM

TO : Dean Gregorio Zamuco
FROM : Floyd E. Carlson

A joint conference of faculty members of the University of the Philippines and the school superintendents of the Bureau of Public Schools was held at the Diliman Campus December 19 to 21, 1960. Delegates designated to attend from the College of Forestry were Professors Blando, Jacalne and Carlson. The conference took up the subject "Public Education: Problems and Issues".

Termed a "peace conference" by some, it proved to be a highly successful meeting for several reasons: The program was expertly put together by the Co-Chairmen Dr. Antonio Isidro and Fructuoso R. Yanson, President of the Philippine Association of Schools Superintendents. Their committee courageously brought to the surface issues presented by able speakers under the five main topics: "Philoso-

phy and Goals of Public Education", "Understanding Filipino Children", "Basic Learnings in Public Education", "Freedom of Education from Pressures and Influences" and "Support of Public Education". Delegates were free to attend group discussions on these subjects, bring forth the consensus of opinions of the group, and report these to the general meeting. Resolutions were forthrightly debated and better acquainted as did the morning and afternoon

The program was further augmented by a series of luncheons tendered the delegates, the first with President Sinco as host, the second by the Central Bank and the third by the G.S.I.S. (Government Service Insurance System). These luncheons provided excellent opportunities for delegates to get better acquainted as did the morning and afternoon coffee breaks.

Throughout the conference there was a remarkably free approach to problems under discussion.

As Visiting Professor of Forestry Information this conference provided an exceptional opportunity to sense the temper and outlook of both public school and U.P. leaders. It revealed a surprisingly frank attitude in appraising both the weakness and the strength of Filipino education, with considerable emphasis on the need for further research, for a marked increase in financial support and for a new freedom for the educator. The conference provided association with school superintendents from every part of the Republic. It provided insight into the leadership of U.P. officials and several informal contacts with them.

Since the delegates enthusiastically endorsed the idea of making the Conference an annual affair, it would seem desirable to have the College of Forestry and especially those concerned with student recruitment and public education in forestry, to attend such Conferences in the future.

FLOYD E. CARLSON

cc—Dr. Larson
Prof. Jacalne
Prof. Blando

* * *

DUKE UNIVERSITY LIBRARY
DURHAM, NORTH CAROLINA
U.S.A.

2.17.61

Mrs. Juanita C. Ranit, Librarian

College of Forestry
University of the Philippines
College, Laguna
Philippines

Dear Mrs. Ranit:

Since all formal exchange agreements are handled by the University Library your 14 July 1960 letter addressed to the Librarian of the School of Forestry has been directed to me.

We are happy to accept your proposal and in exchange for FORESTRY LEAVES have placed your name on the permanent exchange mailing list for the DUKE UNIVERSITY SCHOOL OF FORESTRY BULLETIN. A copy of the most recent bulletin, Number 15, is being sent to you under separate cover and future numbers will follow as they appear. You might note on your records, however, that this series is pubished very irregularly, sometimes two issues in one year, one in one year or none for several years. Unfortunately, we do not have a publication exactly comparable to FORESTRY LEAVES to offer you but trust that the bulletin will be satisfactory.

For some time the Director of Forestry, Manila, Philippines has been sending a complimentary copy of FORESTRY LEAVES directly to our School of Forestry Library. May we ask that whatever arrangements are made between you and the Director for the distribution of this series, the following address now be used for our copy:

Chief of the Processing Division
Duke University Library
Durham, North Carolina, U.S.A.

We should much prefer that your publication be mailed directly to our main library so that we may process it here and send it on the the School of Forestry Library rather than having it sent from them to us. We will be most appreciative if you can make this adjustment.

We have asked the President's Office to send you the available campus brochures and trust that they will reach you shortly.

Very truly yours,

Gertrude Merritt
Chief of the Processing Division

/jj

* * * *

THE UNIVERSITY OF MICHIGAN
Ann Arbor
University Library

January 12, 1961

College of Forestry Library
University of the Philippines
College
Laguna, Philippines

Dear Mrs. Ranit:

Your letters of July 14 addressed to the School of Forestry has just been referred to this Section. Thank you for sending us Volume 12, Number 1, 1960, of FORESTRY LEAVES. We would like to receive a copy of each issue still in print and future issues if you agree to our exchange proposal below.

On October 6, 1960, we requested your FPRI TECHNICAL NOTES and you very kindly sent us Numbers 1-12. At that time we offered to send you MICHIGAN FORESTRY and MICHIGAN WOOD TECHNOLOGY. Under separate cover we are sending you these two series and also MICHIGAN WILDLIFE. Future issues will be sent unless we hear that you no longer care to receive them.

We are also sending you "History of Activities in the Field of Natural Resources, University of Michigan" which we hope you will find useful in your own celebrations of your anniversaries.

We hope our exchange proposals meet with your approval.

Very truly yours,

Dan Graves, Head
Exchange and Gift Section

DG:jc

* * * *

IN AGRICULTURE AND HOME ECONOMICS
STATE OF MASSACHUSETTS

August 24, 1960

Mrs. Juanita C. Ranit
Librarian
College of Forestry
University of the Philippines
College, Laguna
Philippines

Dear Mrs. Ranit:

I am enclosing back issues of bulletins and circulars of the Department of Forestry and Wildlife Management here and will include you on our mailing list for future issues.

Very truly yours,

John H. Noyes
Extension Forester

JHN:me
Encl.

* * * *

KANAPANAN
Lanao

Oct. 31, 1960

Mr. Florencio Tamesis
Philippine Wallboard Corp.
Manila

Dear Mr. Tamesis:

The family wishes to thank you for the tributes paid our father as reported in the newspapers recently. We are happy to hear that his former students, of whom you were one, hold him in such high regard.

Our letter from home carried the news that his passing was peaceful. We were afraid that with cancer he would have a difficult time at the end and are most thankful he was spared.

Had he lived longer, I am sure that he would be most pleased to hear that an all out campaign is being planned to save and restore the forests of the country. I know that during his last visit he was most concerned with the all too apparent devastation of the forest resources of the country.

With best regards to you and yours,

Sincerely,
HUGH M. CURRAN, JR.

* * * *

P.O. Box 226, Sandakan, N. Borneo
25th December, 1960

The College of Forestry,
College, Laguna, Philippines
Sirs:

(Through the Dean, College of Forestry, College, Laguna.)

BEST WISHES FOR A MERRY CHRISTMAS AND A HAPPY PROSPEROUS NEW YEAR.

May I inform you with happiness, and if you please to all my classmates and friends, that my son, Marcelo P. Udarbe, Jr. who graduated (B.Sc.) in April, 1960, is now working (administrration) with the government Forest Service of North Borneo where I worked as Timber Officer for over 25 years before my retirement due to old age (I am now coming to 61 years old) in March, 1957. Marcelo was born in North Borneo and is considered by the government as a 'local boy', so was qualified to have the job.

May I take this opportunity to thank all concerned for your fruitful assistance in the past and good school training for me and for my son, I beg to remain.

Yours faithfully,

(SGD.) MARCELO L. UDARBE
Class 1922 of P.I.
Forest School

N.B.

Please convey my best regards to the Forestry Leaves.

(Initialed)
MU.

A young man had just met the father of his favorite girl friend. "The young man who marries my daughter will get a prize," boasted the proud parent.

There was a pause, and then the young man said: "May I see it?"

ABSTRACTS

"THE NATIONAL PARKS OF THE PHILIPPINES"
(Abstract)

by
Dr. Vicente de la Cruz
Director, Parks and Wildlife
Manila, Philippines

The National Parks of the Philippines are established under the world-wide concept of setting aside areas primarily to protect and preserve superlative scenery, flora and fauna of national significance for the benefit of the general public.

The growth of the National Park movement in the Philippines, started in the early 30's but did not reach its legitimate beginning until the middle part of 1952 when the Commission on Parks and Wildlife was created under the Office of the President of the Republic. Later under the Reorganization Act of 1956 the Commission was abolished to give way to the Parks and Wildlife Office under the Department of Agriculture and Natural Resources. From that time the progress made had been substantial.

There are at present thirty-nine (39) national parks established throughout the archipelago and each of these contain distinctive flora and fauna. We have as one of our National Parks, Mayon Volcano, acclaimed as the volcano with the "World's Most Perfect Cone". Of these there are seven which may be considered as National Historic Sites. They are the areas set aside as national parks which have pre-eminent historical significance.

All is not well with our system however. Our national parks are the object of speculation. Many would wish to exploit and utilize the natural resources therein for commercial profits under the guise of national or local needs. The beautiful scenery, the fauna, the natural wonders found within these areas demands our protection.

There are also other things we have to resolve; that of making our national parks available to the general public and the idea of keeping our parks in their "original unspoiled state". Many problems will arise from this, but let us keep the impairment at the lowest possible level consistent with our program to keep our parks accessible in the practical sense of the word.

* * * *

GROWTH OF YOUNG NARRA (*PTEROCARPUS* SPP.) TREES IN PLANTATION, CAMP 7, MINGLANILLA, CEBU

A study of the growth of narra planted in 1924, 1928, 1936 and 1939 was conducted on a .75 hectare plot. In 1949, the average diameter and height of the trees were as follows:

Date Planted	Age	Diameter (cm.)	Clear Ht. (m.)	Total Ht. (m.)
1924	25	29.31	6.94	11.46
1928	21	14.63	4.64	9.73
1936	13	6.78	—	6.47
1939	10	3.20	—	3.45

The percentages of growth in diameter and height follow the same trend, i.e. smaller trees give higher values than bigger ones. Based on diameter, the growth for the stand is 2.74 percent and based on total height, it is 3.58 percent.

B.F. Research Division

* * * *

RANGE MANAGEMENT IN THE PHILIPPINES

Abstract. — The Philippine Archipelago is situated between 4° 30' and 21° 20' north latitude and between 116° 55' and 126° East longitude. It lies off the southeast coast of Asia and consists of chain of 7,100 islands and islets stretching almost a thousand miles north to south. The total land area is 29,740,972 hectares or approximately 116,000 square miles.

B.F. Research Division

Forestry Leaves

Organ of the Student Body and Alumni of the College of Forestry, College, Laguna

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BREAK-UP NOT BREAK-DOWN

The break-up of the Bureau of Forestry is a fact. From the solid, cohesive and most prestigious government agency that the pioneer foresters succeeded building it up, the Bureau has been dismembered, according to some, beyond recognition. First to be lopped from it is what is now the Parks and Wildlife Office. Then followed the College of Forestry and the Forest Products Research Institute. The most recent is the Reforestation Administration.

Sometime the dismemberment came after long, deliberate study wherein the pros *and* cons *of the matter were weighed carefully. Sometimes, it has been precipitate and hasty. And as any horticulturist will tell us, a good marcot must be allowed a sufficient time to develop its root system before it could be cut off from the mother tree. Most fortunately, some marcots from the Mother Bureau of Forestry seem to be doing well. It's to be hoped that all will be so in time.*

But what of the Mother Bureau? How well has it withstood the dismemberment? Even the most healthy tree can withstand only so much! Thus, horticulturists are most careful where and how many marcots they try on any tree. Of course it is a different matter altogether if we do not care what becomes of the mother plant at all.

But it happens that we do care! For after all is said and done, the Bureau of Forestry is still the basic government agency when it comes to forestry. Dismembered and emasculated as it is, it still retains responsibilities and functions far more encompassing than any of the other units so far torn off from it.

The break-up is a fact! But the break-up must not necessarily mean a break-down! Not if those still in the Bureau will take the present situation as a challenge to build up and make good with whatever still remains with them; not if the energies spent in recriminations between those who left and those who were left are put to better use.

And if there is any lesson at all to be learned from all these dismemberments, it is this: the agitation for separation of any one unit has always come when there is build-

up of disatisfaction over the set-up or a gross failure in carrying out functions. This is a lesson well worth remembering — the Mother Bureau and even by the new units now leading an independent existence.

— N. P. Lansigan

MOVING-UP DAY AND THE GOLDEN JUBILEE

Moving Up Day has always symbolized for us growth: physical, intellectual and moral. It is but fitting and proper, then, on this year's Moving Up Day, that we ponder on the progress made by the College during its fifty years of existence.

It cannot be denied that fifty years ago, the school began as a department of the College of Agriculture, and from this humble beginning with a small faculty, handful of students, limited facilities and equipment, it has grown and developed in physical plant, faculty, student body, facilities and equipment. Through the ICA-NEC and with more aid from the UP, it can now boast of a bigger faculty, with postgraduate training abroad, a library of 5,220 volumes and 14,466 periodicals, forest photogrammetry equipment, a forest products teaching laboratory with wood working and testing machinery, the research facilities of the Forest Products Research Institute and Forest Experiment Station of the Bureau of Forestry, a new Dormitory, and soon the Forest Technology Building, believed to be the biggest and most modern in South East Asia.

In the past, the College was proud of its strong and dedicated faculty, welded into a compact body of seasoned and self-sacrificing teachers, by camaraderie, *brought on by years of happy companionship in a small community, high sense of devotion to duty and of responsibility, respect for one another, and unquestioned integrity. Despite their low salaries, and lack of facilities, they turned out graduates, rangers and foresters, the like of whom has not yet been matched and who, with their splendid esprit de corps, honesty and efficiency, made the bureau one of the oustanding bureaus of the government.*

On this Moving Up Day, could we venture to say the same thing of the present faculty?

Comparisons are at times invidious, but could we say without fear of successful contradiction that the present faculty is as cohesive, as solid and as strong as in prewar years?

We feel the crying need for more men and women of tested competence, broad sympathies, depth *and vision who will imbue our students with breadth, fortitude and foresight* — quintessential qualities *that a leader must possess.*

G.P.P.

Incidentally...

Hon. Pio Pedrosa

The Hon. Pio Pedrosa was the unanimous choice of the Executive Committee, the Faculty and Student Body, as the Speaker of the 40th Anniversary Program. Again, at this year's Golden Jubilee, he was selected to address the Alumni, their friends and their guests. Some one made the remark, that it would be interesting to hear from him on the progress that the College had made after a passage of ten years. Said he among other things, "When this College celebrates its first centenary fifty years hence, may those who will come after us be in a position to see in retrospect a record of achievement which will proclaim you have waged the good fight. To have used the wealth God has vouchsafed to us to satisfy fully our needs, and yet be able to transmit it to those who will be coming after us, as intact in its productivity as when we inherited it from our past, is to me one of the noblest tasks of patriotism that any generation can be proud to have accomplished."

— oOo —

"The Three Workers," L-r, Prof. C. Larson, Dr. D. Ritter, and Pres. Sinco during the ground-breaking ceremonies.

In connection with this year's Moving-Up Day Celebration, the ground-breaking ceremonies for the Forest Technology site was held before the traditional graduation program. After making the opening remarks, the Dean facetiously remarked that he would ask the three gentlemen, President Sinco, Dr. Donald Ritter, and Prof. Larson, to work. Given shovels, the three gentlemen set to work. Above one notes how President Sinco after finishing his job well ahead of his "fellow workers" bursts into a big hearty laugh.

— oOo —

The Forestry Songbirds

To the Forestry Songbirds, the College of Forestry is very grateful. Before every College program, one can hear them at practice every evening. It is a very cohesive and active group despite the fact that a good many of them are very busy housewives, with big families and so many household chores to take care of. To Mrs. Flores goes the honor of having continued the splendid work started by Mrs. Palm, Mrs. Moore, Mrs. de Zheeuw and Mrs. Stone, three years ago. More Power to YOU!

— oOo —

This year's Faculty-Senior "Roasting" supper in the words of one of the old members of the Faculty, has been characterized by bitterness and resentment. Most of the Seniors trained their guns on two of the younger members of the Faculty, some even going to the extent of saying bluntly that one of them should be asked to resign. Reason: the freshman mortality in the subjects that they are teaching is over 50% and in one subject, in a class composed of the brighter group of students, only ONE passed the course with a grade of 3. And it happened that this student graduated *cum laude*, the second (BSF) senior, to graduate with honors in the history of the College. Unfortunately, the faculty members concerned were absent at the affair. And so their side was not heard.

One can not deny that the '60 Freshman group, belonging as it does to the group that has not been screened by Freshman Entrance Examinations, is composed of *not very bright* (euphemistically speaking) students. We still remember the Spanish saying: "Si la Naturaleza no da, tampoco Salamanca." (The University of Salamanca cannot give the student what Nature has failed to provide him). This means that one cannot just pass any Tom, Dick, and Harry without sacrificing U.P. Standards.

And then has any one asked if the College has provided the students with references for the course or courses offered. Before the prescription of the course, the College should have seen to it that there were enough books in the library to go around for the students' reference.

And then again perhaps the recruitment of the younger members of the faculty must be faulty. An applicant with a dazzling record of "1's" or has made a name in the literary field does not necessarily mean that he would make a "good teacher." We know of a good many scholars in their college days who miserably failed in their teaching jobs. It was either faulty communication or lack of understanding.

And what is more, in previous years, the Seniors paid for the supper and there was a pleasant give and take of *barbs* (dulled by jokes and banter). This year, the Faculty paid for their "meal" in order to hear their colleagues attacked. What a whale of a difference.

— oOo —

"Destructive criticism may be of great value," said Dr. Halsey B. Knapp at the convocation program given in his honor before he left Los Baños for the States." Criticism which indicts without proposing a remedy is often termed 'destructive'. 'He tears down, he does not build' it is said."

"But if one mind can detect a flaw or weakness and make it known, then a thousand minds may seek the solution," he added.

When the Graduating Seniors bitterly criticized some of the faculty members, it was high time for those in charge of the Faculty to have begun seeking the best and quickest solution.

It has been said that the majority of professors are not actually bad men; they do not want to do evil. But the whole university community fails, as a rule, to see that the obligation of good teaching is essentially a moral obligation. When any one sees another human being in need of help, and can help him, and does not help him, but passes by on the other side, that man is *immoral.* This is even more acutely true if the passerby is an adult, and the human being in need of help is a young person. Even elephants, wild cattle, and baboons band together to protect their collective young. It does seem as if college professors (and university administrators) do not practice that much morality. A very large percentage of them make no special effort to help their fellowmen in ways that are almost more important than matters of life and death, for though to save a man's life is more important, to give him a life worth saving is almost equally important. When generations of young people come to university professors asking to be shown how to have life worth saving, and are turned away because professors are willing accessories to the formalisms of examinations — grades — credits systems, or because the professors think that" upholding the standards of the university" by *giving bad grades is more virtuous than good teaching* or insist that learning be unpleasant, or are selfishly busy or negligent or indifferent or are dominated by certain character traits that are harmful to young people but that can be altered, these professors are being immoral. The only way they could be more immoral would be to commit murder.

It seems that what is needed is not so much a change in the curriculum as a change in the methods of presenting the curriculum. A good scholar and a good teacher could make a far more meaningful, instructive and inspiring course out of teaching the history of the ABC's than a good scholar and a poor teacher would make out of the whole Greek philosophy. *What is taught matters far less than WHO TEACHES IT.*

It has been said, too, that a professor whose heart is right will not wish to make the university a place where the only young people who are welcome are the "intellectual elite." He will regard the university a place where almost every young person in the nation should have the opportunity to discover something of value that young person individually. The professor will not regard most people as mere chaff, and only a handful of solid grain; rather, he will take exactly the reverse attitude. *If the students do not learn much in his classes, he will not blame them, but himself; and he'll try to improve himself as teacher. He will feel a profound moral obligation to these young people in his classes; he will no more leave them to sink or swim, as best as they may, in the ocean of knowledge than he would walk off and leave a child drowning on the surf.*

Our College is really the only one of its kind in the whole Philippines. In this College, more honor and encouragement is given a student who excels in basketball and other fields of athletics, than to a student who excels in the academic field. Proof of this, is the awarding of a gold medal to the outstanding athlete of the year during this year's Moving-Up Day Celebration, while not even a one-centavo ribbon was awarded by the College to any of the outstanding scholars of the year. Is this in keeping with the avowed program of the College to attract bright and promising young men from various parts of the country to take up Forestry? Is this in line with the policy of the mother University of encouraging scholarships among her colleges?

— oOo —

On day, during the last semester, the whole college population was taken by surprise when the members of the "Young Faculty Association of the College" entered their offices and classrooms, sporting the most colorful ties that ever blazed this corner of Makiling.

When one of them was asked, "How come the innovation?" The proud answer was "It would add dignity to the profession." It would serve, in the mind of their prexy as a badge of distinction.

This reminds us of the tonsorial artists in Manila or the DRB agents. Their ties are so loud that they could be heard miles away.

Before the war, a certain member of the Faculty, whose name calls to mind a very precious metal, and who was considered "funny", was in the habit of wearing a tie, whether he was in the classroom or in the field, to distinguish himself from the other members of the faculty. His reason was the same, "It gives dignity to the forestry profession."

Another forester, assigned to teach in the College (then School), teasingly quoted to him a Spanish proverb," Aunque la mona se vista de seda, mona se queda".

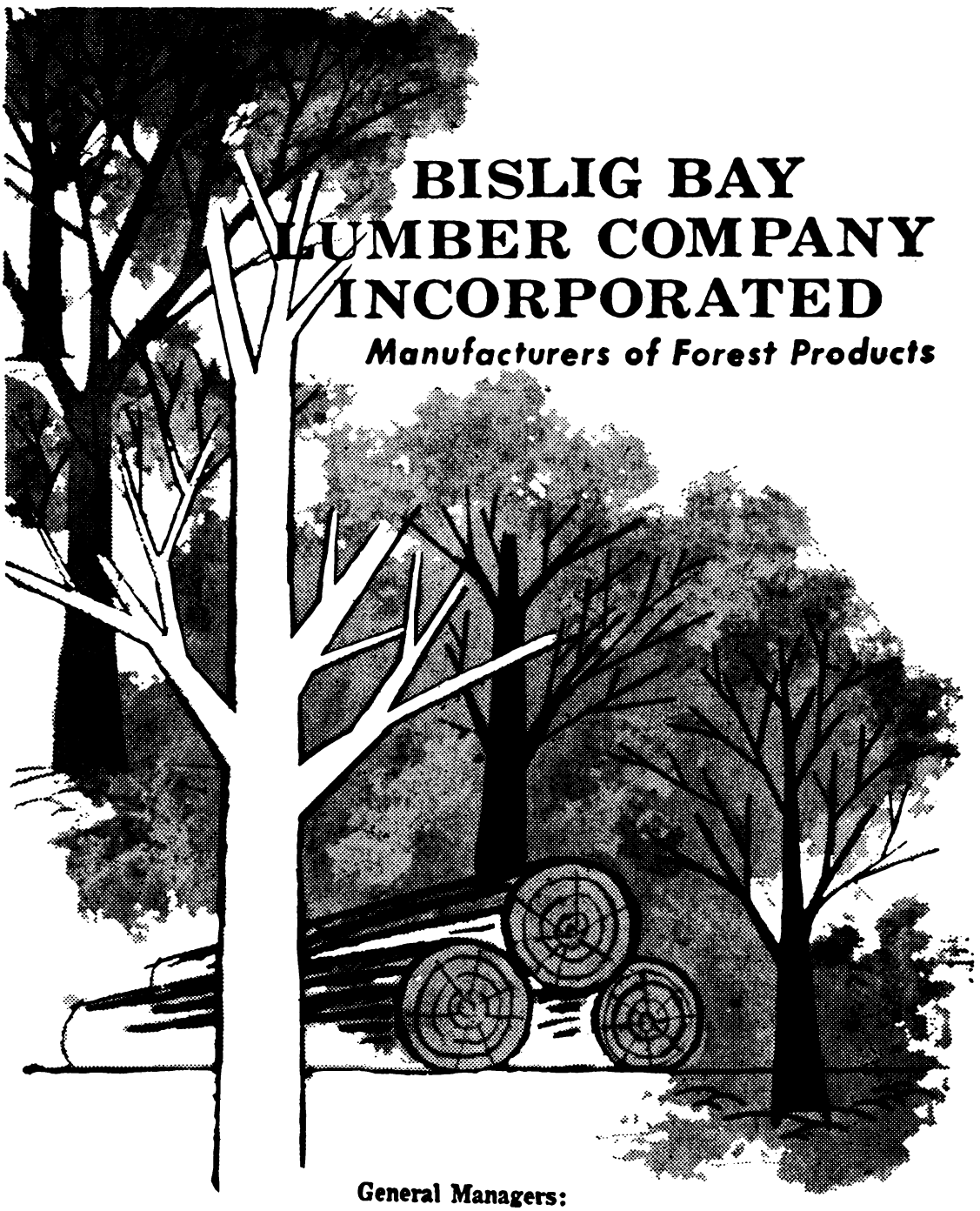
We do not see the *ties* anymore around us. What has happened? Was it just another fad that has lost its glamor?

After this year's literary-musical program at the pavillion, the bonfire that was built at the edge of the forest, across the road, opposite the Swimming Pool, became one smoldering fire hazard. On their way home, Professors Sammi and Carlson, called the attention of "Bert" Pollisco one of the active young members of the faculty, to the danger of one of those still blazing logs' falling over the edge of the road into the adjacent forest area. Bert after changing clothes, summoned every student in the dormitories and took charge of the fire-fighting squad. "N ap" Vergara, this year's FSBO Adviser, summoned the fire-fighting unit at Los Baños, but just a few kilometers from the town, the fire-engine broke down. In the meantime the fire had already spread and had threatened to reach to the bottom of the slope to the Molawin creek. Thanks to the timely arrival of the Dean and other members of the Faculty and additional groups of students and campus residents, water scooped from the swimming pool, in kerosene cans and all kinds of containers, was passed from hand to hand and dashed into the spreading fire. Others with shovels and rakes did their best to keep the fire under control. Three hours later, the fire engine came and with everyone lending a hand, the fire was completely put out between one and two o'clock in the morning. The Dean tired but still smiling said, "Let us charge this to experience."

— oOo —

Very Lively, Colorful, and Impressive, was the farewell party given on April 22, 1961 at the Forestry Pavilion by the officials and employees of the Forest Products Research Institute headed by Director Eugenio de la Cruz in honor of Dr. and Mrs. George M. Hunt, leaving for their homeland, after serving as Adviser of the Institut for more than seven years.

—oOo—



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MEMBER - PHILIPPINE LUMBER PRODUCERS ASSOCIATION