Philippine Geographical JOURNAL

Vol. VI April-June, 1958 No. 2

Watch Australia Produce
RICE AT ₱0.30 A GANTA
Read "Humpty Doo"
by PROFESSOR MIKE MCINTYRE

Know Something About **NIDO SOUP**
in an Article "Palawan's Edible Bird's Nest"
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Learn More About Our
POPULATION AND FOOD SUPPLY
in "Consumption of Basic Food Items in the Philippines"
by MESSRS. A. P. VARONA and J. V. CASTILLO

PHILIPPINE GEOGRAPHICAL SOCIETY

Soil Conservation Building, Florida St.
Manila, Philippines

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THE AUTHORS

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Barrera has written several scientific papers dealing with Philippine soils. Before he became chief of the Soil Survey Division, he, for many years, headed many soil survey parties that conducted soil reconnaisance survey, land classification survey, and land-use survey for government and private interests.

His researches in Philippine soils, particularly on morphology and genesis and soil geography with particular reference to the relationship of soils as the latter affect the behaviour of man, animal, and plants earned for him the distinction of being one of the foremost Philippine soil scientists today.

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LATITUDE AND LONGITUDE

"*Latitude* of a place is its angular distance from the equator and is measured by an arc of the meridian between the zenith and the equator.

"*Longitude* of a place is measured by the arc of the equator, intercepted between the prime meridian and the meridian passing through the place, or by the angle at the pole between these two meridians."

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Philippine Geographical JOURNAL

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EDITORIAL

GEOGRAPHY AND TOURISM IN THE PHILIPPINES

While the Philippines offers a great variety of natural and man-made wonders and traces of its past which have survived the ages, an extensive tourist industry has not been fully developed and exploited. This may be due perhaps to the lack of a thorough understanding and knowledge of the geography of the country which is essential in promoting such an industry.

The Philippines is located off the Southeast Asia coast just a little above the equator. It consists of more than 7,000 islands and islets sprawling in a triangular pattern measuring 1,152 miles from north to south and 688 miles from east to west at its base. It has a typical tropical climate — moderately warm but the days are generally pleasant and the nights are cool on account of constant sea breezes. It is a land of colors and light of the rainbow, sparkling waters in its rivers and rivulets, lush greenery and a variety of flowering plants growing throughout the year. The remnants of its glorious past, from the time when Magellan planted the cross and the flag of Spain in Cebu to the present age when man seems already capable of defying the forces of nature, could be felt in cities and towns, and in every nook and corner of its countrysides. Truly, it is a land of tropical splendor incomparable in almost every aspect to its neighboring lands and peoples.

Its people, though Oriental in origin and in appearance, culturally belongs to the West. It is here where the East meets the West; where Oriental culture blends with the West and the happy link between the New World and the Old joins. This is a result of the more than three centuries of Spanish colonization and fifty years of American rule. It was during this period where this cultural link is little by little forged by the voluntary submission of the conquered to the conqueror.

Today, the Philippines is an Oriental "melting pot" with all races and nationalities mingling with the original Malay race. More than 7,000,000 inhabitants speak the English language. About 16,000,000 of the population are Catholics while the rest are distributed among the

Aglipayan Church, Mohammedan, Protestant, Iglesia ni Kristo, and other religions.

The country, its cities and towns, mountains and valleys are filled with natural and man-made wonders which could only be found in this part of the world. There is the ancient Ifugao rice terraces in Banaue, Mountain Province which for more than two thousand years remains unchanged; Mayon Volcano in its silent magnificence; the scenic beauty of Taal Lake and the Taal Volcano which for only a few years back became a boiling inferno spewing havoc to its vicinity; the relics and ruins of churches, domes and buildings as the priceless heritage under the Spanish flag; the legacy of nature as the shimmering and sparkling waterfalls of Pagsanjan and Maria Cristina; the calm of Manila Bay at sunset, where color becomes the theme; the Hundred Islands of Pangasinan; the countryside with brown men eking their living from the bounty of nature; the pageantry of town fiestas and festivals; the mineral springs which have been a haven for excursionists during week-ends and many others will satisfy the desire for adventure and entertainment. All these have their own peculiar way of individuality, entirely different from one another yet in the same background and setting.

With all these, the Philippines has all the potentials to develop an extensive tourist trade which could easily compete with Japan and the Crown Colony of Hongkong, not to say with Switzerland, Italy or Monaco. The government of these countries have used this trade as the major and veritable source for their national coffers. There is no reason why the Philippines could not do the same with such an array of gorgeous wonders to attract foreign visitors. There are now 17 organized travel and tourist service agencies to promote the exploitation of this untapped resource. It is only necessary that Filipinos give moral and financial support and to exert more effort in attracting the attention of foreigners to visit the country. This could only be done if there is a complete knowledge of its geography — the country, its land, and its people. S.A.B.

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Exploring the Universe: Control of Weather... "there is little doubt that one could carry out analyses needed to predict results, intervene on any desired scale, and ultimately achieve rather fantastic effects... Extensive human intervention would deeply affect the atmosphere's general circulation, which depends on the earth's rotation and intensive solar heating of the tropics.

"Measures in the arctic may control the weather in temperate regions, or measures in one temperate region critically affect another, one-quarter around the globe... There is no need to detail what such things would mean to agriculture, or, indeed, to all phases of human, animal, and plant ecology... All this will merge each nation's affairs with those of every other nation more thoroughly than the threat of a nuclear or any other war..." John von Neumann.

HUMPTY DOO

MIKE MCINTYRE[1]

Last year marked the entrance of a major new rice producer into the Far Eastern scene. Australia, which had scarcely produced a pound of rice in its entire history, began in 1956 a project which may prove to be far-reaching in its effects, not only on the Australian economy, but on those of Oriental nations as well. For this new scheme envisions the ultimate production within the next few years of something in excess of 750,000 tons per year of high quality rice (500,000 acres at more than 3,000 lbs. per acre), all to be marketed within the southeast Asiatic sphere at a lower price than any rice available today. If the plan develops as is expected in Australia, it may well wreck a three-ply revolution: (1) the traditional producers of surplus rice will be facing in the international market-place a competitor whose product is more efficiently produced and thus both cheaper and of higher quality than their own, (2) the chronically rice deficit nations will be able to afford more and better rice than before, (3) not only will Australia tap a major new source of income, but will achieve the final realization of an old dream — the effective utilization and occupation by Australian nationals of the tropical Northern Territory.

The entire Australian rice project is, at the moment, somewhat within the realm of speculation. It has by no means been conclusively proved that this newly conceived plan is economically feasible, or that the high optimism of its Australian and American backers is fully justified. But, the project is well underway and over a million dollars has been committed. Certainly every effort will be made by those involved to achieve the announced aims. It will bear watching over the next few years by all Far Eastern nations, for every one of them will be affected in some degree if the Australian rice program does prove successful.

In April of 1956, an agreement was reached between the Australian government and Territory Rice Ltd. (a 2/3 American, 1/3 Australian concern), formalizing the long-term lease of 500,000 acres of land in the Northern Territory. The Company was given until 1961 to choose their site and an additional 15 years to place it under cultivation. Actually, considerable exploratory work had already been accomplished, and the Company had decided on a series of tracts in alluvial river bottoms at Humpty Doo, forty miles south of Darwin. Pilot plots, experimenting with 27 different varieties of rice, had narrowed the choice to four that promised to be well received in Asiatic markets. Further development was immediately begun with canal work and surveying of 20,000 acres being carried out by the Utah Construction Company and dams and water control units being constructed by the Australian engineering firm of Gutteridge, Haskins, and Davey. By the end of the 1957 crop year, 300 acres had actually produced the first commercial rice at Humpty Doo. The results of this initial crop were encouraging. Yields were up to expectations and the rice, sold through Hongkong, was appraised there as "best in market." This year, 1,600 acres have been planted. Also, experimentation is being carried out in relation to the

[1] Professor, Department of Geography, San Jose State College, San Jose 14, California, U.S.A.

growing of short grain rice and other commercial supplementary crops during the winter dry season. At the present rate of operation it now appears that the entire project will be in full production in about seven years with total development costs running in the neighborhood of $37,500,000 ($75 per acre).

The Australian rice project borrows much from American experience in Arkansas and California where, in the face of high U.S. labor cost, the traditional Oriental "garden type" agriculture, involving the lavish use of hand labor, could scarcely be economical. Large scale volume production is the key to this American "factory in the field" concept, economy being achieved by the maximum utilization of machinery and modern farm technology. Mechanical seed drilling and broadcast sowing by airplane, and machine cultivation and harvesting are coupled with the most scientific methods of water control, fertilization, and seed selection. All of these applied to virgin land that has never known the plow will, in the opinion of the Company planners, produce positive effect on yields that the resulting "quality" rice can be delivered for as little as 3¢ per pound (₱0.30 per ganta) as compared with the current competitive price of 5¢-8¢ per pound (₱0.49-₱0.79 per ganta) in the Far Eastern market.

The Australian government is particularly concerned with another phase of the Company agreement, that is, a provision that areas taken on lease by the Company must be subdivided into smaller single farm units to be sold to individual settlers within ten years after the first crop. They will operate semi-independently under the supervision of the Company which will continue as the management and marketing authority. The Company is also empowered to provide housing, shopping services, community buildings, and other facilities for settlers on a profit-making basis. It is hoped that such an arrangement will eventually put the land in the hands of a large number of permanent Australian farmers without sacrificing the basic advantages of efficient volume production. This should be at least a partial answer to the long-festering national problem of how to effectively occupy the tropical north with permanent settlers of European origin.

Australians have been notoriously thin-skinned regarding criticism of their so-called "White Australian" immigration policy ever since Prime Minister Billy Hughes (the Little Digger) proclaimed his unrestrained views on race and immigration from the international forum at Versailles following World War I. It is universally acknowledged that despite its size, a very large part of Australia can never support much in the way of permanent population because of the restrictions of extreme aridity. But in the tropical north where climatic conditions are essentially identical to coastal Southeast Asia, the productive potential is high; and yet, Australians have failed to develop and occupy this area, even on a token basis. It is this fact that has led to the long-standing Asiatic contention that it is morally wrong for a nation to deliberately deny the utilization of this land to those who are willing, able, and starving in Asia. It is entirely possible that a successful rice program will provide the impetus for further agricultural development of the Northern Territory and this long-neglected region will, in the not too distant future, become an important contributor to the total Australian economy.

To Burma, Thailand, and South Vietnam whose single important export is bulk rice for Oriental consumption, the arrival of large quantities of 3¢ rice on the market may well mean national bankruptcy. Even the Philippines, self-sufficient in rice at one time or another in the past, will be forced to re-examine its stated long range plans of producing rice for export. For Philippine rice is a relatively high-cost product, a result of expensive labor and acre yields which rank with those of the other three Far Eastern commercial producers as the lowest in the Orient.

The impact of cheap Australian rice will be quite a different matter for such nations as Malaya, Ceylon, Japan, and India whose concern with commercial rice have been as consumers. With rice at half the price, they will be able to purchase twice as much, and this could mean at least partial emancipation from chronic food shortages which have sometimes resulted (as in India) in widespread famine. China too, although giving the appearance of food surpluses by trading rice for Ceylonese rubber, is in actuality a rice deficit nation. And, since rice does not appear on the list of restricted trade items with the free world, China could become one of Australia's best customers.

Certainly a major market exists in southeast Asia for low cost food, and Australia's productive potential is high. If these two mutually complementary regions can find in rice a common ground for a prosperous trade, the results will be generally beneficial for the majority despite the inevitable minor dislocations.

PALAWAN'S EDIBLE BIRD'S NEST [1]

ALFREDO BARRERA [2]

In 1949, the writer, as one of the members of a soil survey party classifying the soils of the province of Palawan, passed by the towns of Bacuit and Taytay. There are two interesting facts known to the writer about these towns, namely, the rich fishing ground around Malampaya Sound, Taytay, and the edible bird's nest industry in Bacuit. The latter is quite unique in that it is the only place in the Philippines where such product is well exploited.

Found in the menus of popular restaurants in Manila is "Nido Soup" — soft, almost watery in consistency and providing very excellent entree for dinner. The soup is very popular not only for its taste but also for what people think of it as possessing some nutritive value. It is more relished by Chinese more than any other people. As a matter of fact they also control the supply of this delicacy. The gathering of edible birds's nest is an important industry by the people of Bacuit and, to some extent, by the inhabitants of Taytay, both municipalities lying in the northern section of Palawan's mainland.

The Bird

In Palawan, the bird that makes this nest is locally called "Balinsasayao." This bird belongs to the Swift family (Cypselidae). According to Dr. Canuto Manuel of the National Museum, the bird that makes the true edible nest is scientifically known as *Collocalia francica germani* Oustalet. There are several other species of swiftlets that make edible nest. The "Kula" is similar to the Balinsasayao with respect to its nest-building habit, although the former mixes some foreign materials thereby making the nest unfit for human consumption.

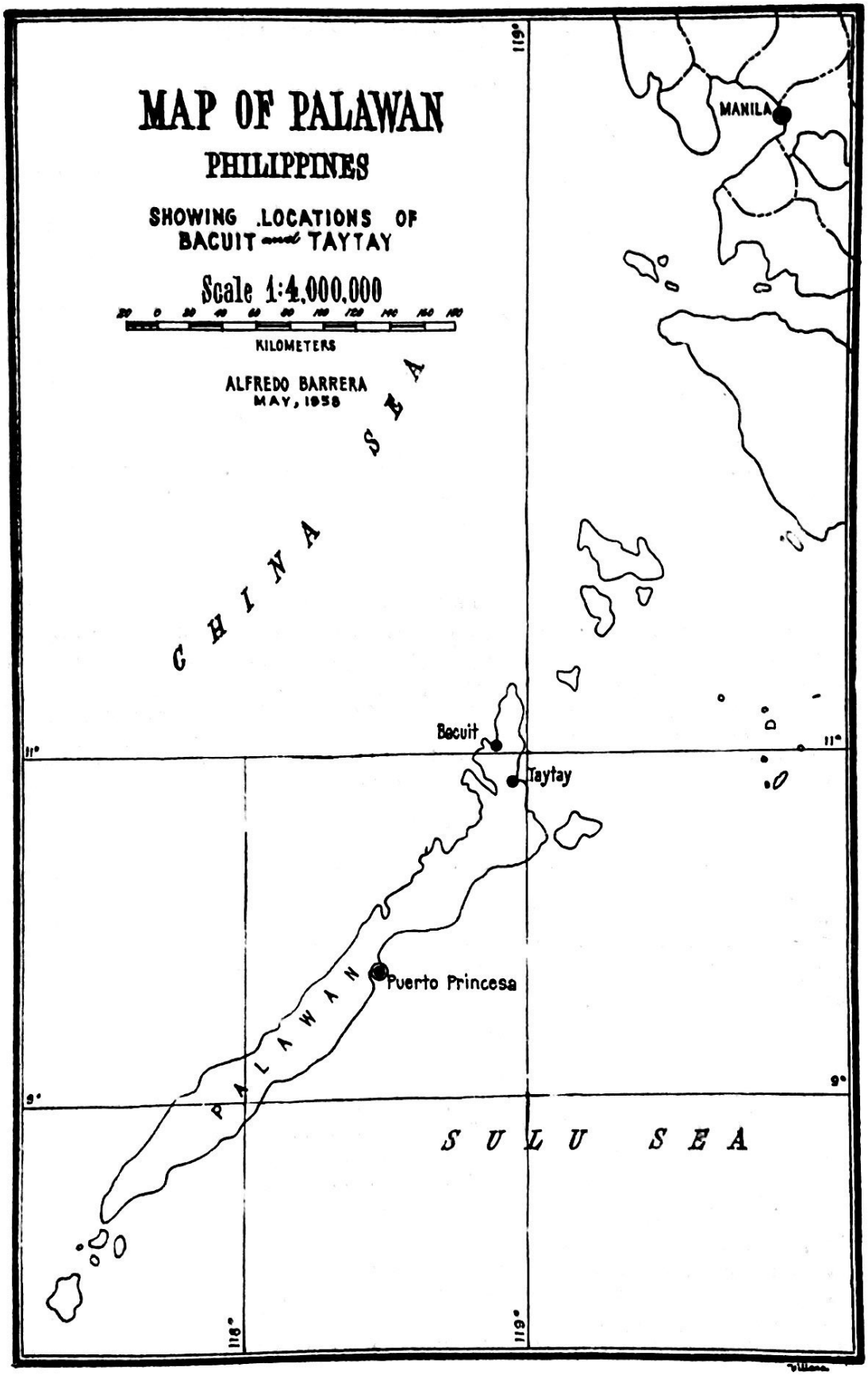
The Nest

The bird's nest is made from the saliva of the bird. When newly formed, the nest is white, semi-translucent, and shaped like a small hammock. The material of the nest appears like the fine cast network of fibers not interwoven. The structure is very similar to the so-called Venus basket although the fibers of the latter are much finer. Chemical analysis of the nest as reported in Handbook I, of the Institute of Nutrition under Food Composition Tables, shows it to be very rich in protein. Its composition for every 100 grams weight of nests is as follows:

Edible portion	100%	Ash	5.3%
Moisture	24.8%	Calcium	.48%
Calories	281.0	Phosphorus	.018%
Protein	37.5%	Iron	.003%
Fat	.3%	Sodium	—
Carbohydrate	32.1%	Potassium	—

The same source reported it to contain traces of thiamine, 0.02 mg. of riboflavin, 0.2 mg. of niacin and none of ascorbic acid. From these data, it could be seen that the nest is very rich not only in protein but

[1] Published with the permission of the Director of Soils.
[2] Chief, Soil Survey Division, Bureau of Soils.



also in carbohydrates. It is low in fats. This is probably an adaptation to prevent rapid deterioration of the nest.

The nest measures from 7 to 10 centimeters long and about 3 to 4 centimeters wide at its widest part which happens to be at the middle of the nest. A nest may weigh from 5 to 10 grams. There seems to be no season for nest-making as nests may be collected throughout the year.

There are two kinds of nests with respect to color, namely, the white and the brown. The authenticity of this classification seems to be rather doubtful because some people believe that nests are produced by two different kinds of birds and others think that age of the nest has something to do with the change in color. It is the practice of collectors at the beginning of every year, to clean the caves and remove all old nests so that the subsequent new nest shall be white. When new, the nest is pliable; and gradually becomes reddish and brittle as it reaches the age of 6 months before it is gathered.

After gathering, the nests are bundled together with a No. 20 cotton thread. Four of these bundles weigh one kilogram. The nests are sold mostly to Chinese from 15 to 20 centavos a gram. The nests are classified according to size and color. A ten-gram-white nest is considered first class.

The Cave

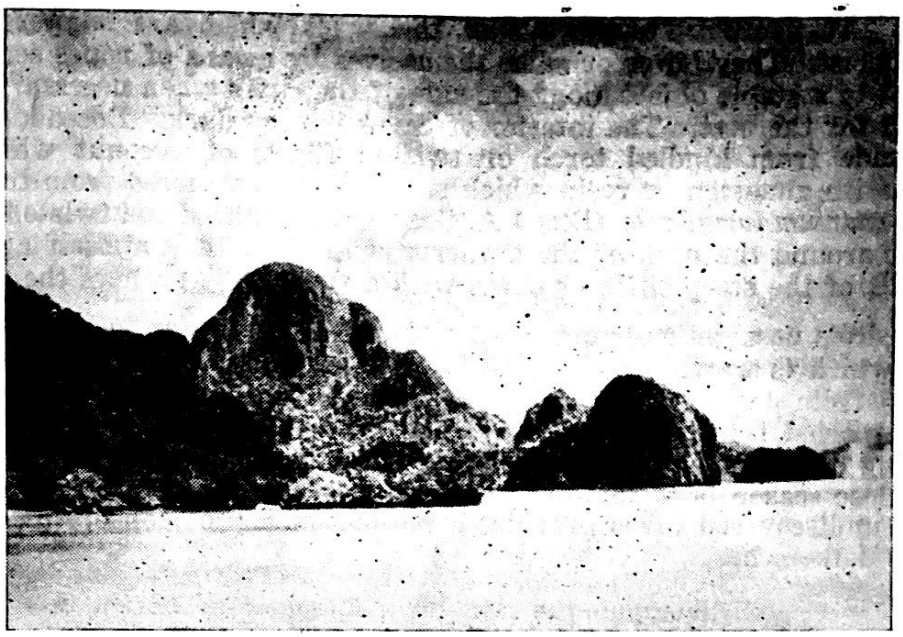
Surrounding the vicinities of Bacuit and Taytay are hills and mountains of limestone, a kind of formation wherein caves are expected to develop. As a matter of fact, there are hundreds of them. The caves in these areas are unique in that most of the inside walls are steep and many rise perpendicularly from the floor. Some of the caves have their entrance out to the sea with the openings barely above sea level. These conditions make these parts of Palawan good habitat for the swiflets. Some of the caves are so formed that they are hardly accessible to man.

"Boceadors" as collectors of birds are called, are in a constant search for caves. The caves thus located are registered in the municipality and only the registered licensee can collect the bird's nests therein. Many of the caves are known only to the "boceador" himself and the members of his family. The idea is to keep them secret and away from poachers.

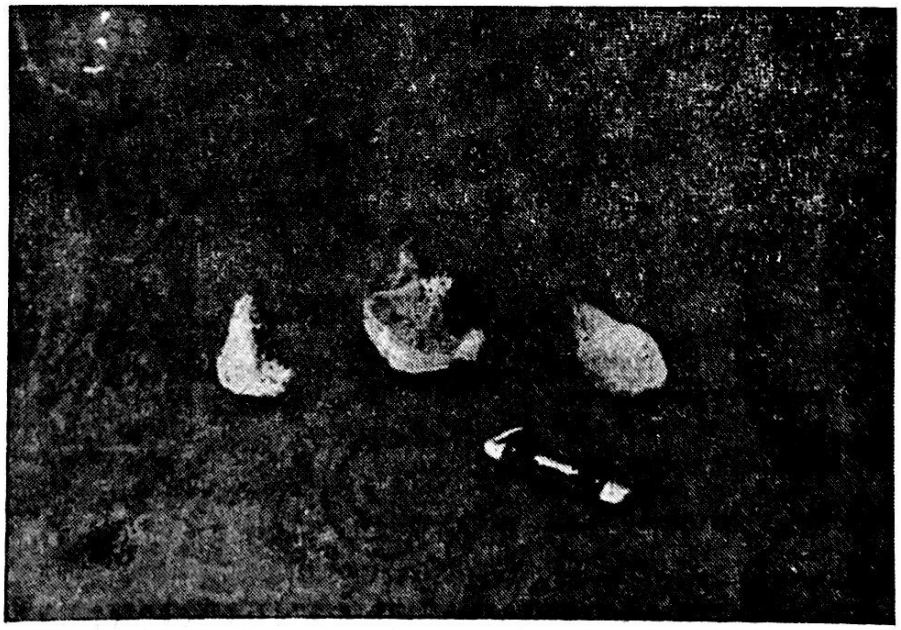
The municipality gets part of its income from the registration fees depending upon the number of caves:

Class D-	1 to 5 caves	₱10.00
Class C-	6 to 10 caves	₱20.00
Class B-	11 to 20 caves	₱30.00
Class A-	21 up caves	₱40.00

Since the location of most caves is known only to the licensee there is a likelihood that some boceadors may have several unregistered caves. A cave may yield from 10 to 30 nests at a time. Nests are collected every 30 days and at most every 15 days to avoid losses from poachers. In 1950 there were about 50 collectors of bird's nest in Bacuit alone. The gathering of nest is not an easy task. Boceadors risk their lives in the



Around the vicinities of Bacuit and Taytay are limestone hills and mountains with very steep slopes. Gatherers of bird's nest risk their lives in scaling the walls of such cliffs.



Three samples of edible bird's nest. They are white and pliable when freshly made. Note the sizes by comparing them with a boy scout knife.

process. They climb steep walls of the caves which are slippery and almost moist. They lower or raise themselves by means of ropes securely fastened to a stable object along the side of the cliffs when necessary just to reach for the nest. The interior of caves is very dark. Boceadors use light made from kindled torch or twisted fibers of coconut which is soaked with almaciga or resin which substance is extracted from the pili tree (*Canarium luzonicum* (Blm.) A. Gray.) The lighted and twisted fiber is hung around the neck of the gatherer while he clings himself against the walls of the steep cliffs or caves with a rope as he gathers the nest.

A bird's nest gatherer can collect from 5 to 10 kilograms during the season which is worth from 200 to 2000 pesos annually. The nests are collected from January to March and from July to December. The law sets the period from April to June of each year as a "close season" for gathering of bird's nest. Quite discouraging, however, is that this period of close season is seldom observed. Nevertheless, the probable existence of undiscovered caves provides a natural means of conserving these birds and their nests.

CONSUMPTION OF BASIC FOOD ITEMS IN THE PHILIPPINES

A. P. VARONA AND J. V. CASTILLO [1]

This paper shall deal briefly with the growth of population as a factor influencing demand trend and the annual consumption of the basic food items consisting of rice, corn, and root crops, during the last twelve years from 1946 to 1957 and also for 1940.

The annual consumption consists of the domestic production plus the importation on one hand, less the exportation and re-exportation combined, on the other. The consumption data discussed herein include all kinds or classes of products derived from each commodity. For instance, rice consumption refers to all kinds of rice regardless of variety, quality, volume consumed by different consumers, season of harvesting, origin, and such other factors affecting a wide range of demand elasticities of the commodity. The same situations also prevail in the consumption of corn and root crops. Studies have yet to be made in order to be able to present a better picture of the variations and changes in consumption pattern both within a commodity or between commodities.

Population

The trend of population, besides the amount and variety of goods consumed, is an important factor when considering the trend of consumption of food items in a country (Table 1 and Fig. 1). In 1940, the population of the country was 16,459,900. In 1946, it went up to 18,434,400 after five years, resulting in an increase of about two millions in spite of the sad effects of World War II. Since 1946, there was a gradual yearly increase so that in 1957 the country's population reached 22,689,700. This positive trend in the population likewise resulted in a proportionate increase in the consumption of the basic food items of the country, from 1946 to 1957.

Rice Consumption

The annual rice consumption, based on rice disappearance, in 1940 and from 1946 to 1957, consisted predominantly of domestic production plus importation on the one hand minus exportation and re-exportation on the other (Table 2 and Fig. 2). Ninety-three per cent of total domestic production are available for human food and seven per cent as allowance for seeds, animal feeds, industrial uses, etc.

In 1940, the rice consumption was 1,574,000 metric tons. In 1946 and 1947, in spite of the increase in population, the consumption dropped to 1,200,400 and 1,341,400 metric tons, respectively. These years rice supply were partly covered when relief and army surpluses were made available to the population in addition to importations and domestic productions. The consumption picked up to almost its prewar level in 1948 when it amounted to 1,553,200 metric tons. However, an importation of 120,100 metric tons was necessary in 1948. But from 1949 to 1957, the annual consumption increased gradually and each year all exceeded the 1940 level.

[1] The authors are from the Agricultural Economics Division, Department of Agriculture and Natural Resources, Manila. Mr. A. P. Varona is a Supervising Economist and Assistant Chief of the Division, and Mr. J. V. Castillo is a Senior Statistician and Chief of the Statistics Section. The tables and graphs were prepared by Mr. R. B. Galvez.

TABLE 1

Population of the Philippines, 1940 and 1946-57 [a]

YEAR	POPULATION (AS OF JULY 1ST)
	Number
1940	16,459,900
1946	18,434,400
1947	18,785,700
1948	19,143,800
1949	19,508,700
1950	19,880,500
1951	20,259,500
1952	20,645,600
1953	21,039,200
1954	21,440,200
1955	21,848,800
1956	22,265,300
1957	22,689,700

[a] Bureau of the Census and Statistics.

The trend of consumption from 1946 to 1947 had been significantly positive. This was also true in the case of production. However, production began to exceed annually the prewar level in 1949 up to last year.

The importation had been somewhat irregular. Importations were over 100,000 metric tons in 1946, 1948, 1949, 1951, and 1957. Except in 1953, where there was no importation at all, importations during the other years were below 50,000 metric tons. During the eleven years out of the twelve-year period, there was always importation although it was quite insignificant in 1950. The general trend in importation was negative. However, in 1957, a sudden increase very much like that of 1948, had been noted.

Exportation and re-exportation were all below 30,000 metric tons during the years when such were made.

Corn Consumption

The annual consumption of milled corn in 1940 and 1946 to 1957, consisted principally of domestic production and importation from 1946 to 1951. There was also importation in 1940. It should be noted, in this connection, that in pre-war years up to 1954 about 88 per cent of total production are for human food and 12 per cent allowance for seeds, animal feeds, industrial uses, etc. At present, about 70 per cent of total production is only available for human consumption and 30 per cent for industrial uses, seeds etc.

In 1940 the consumption was 491,100 metric tons (Table 3). The consumption dropped in 1946 to 282,200 metric tons, but in 1947 it went up to 583,100 metric tons which was slightly higher than the prewar level. With the exception of 1946 to 1949 where the consumption were below the pre-war, the consumption for all the other years up to 1957 increased and were higher than the pre-war. The consumption in 1957 amounted to 761,100 metric tons. It will be noted that importation was highest in 1947 which amounted to 181,700 metric tons. From 1947 to 1951 importation decreased and that by 1952 importation was practically

TABLE 2

Rice (milled): Production and apparent consumption of the Philippines, 1940 and 1946—1957, in metric tons [a]

YEAR	PRODUCTION[b]	IMPORTATION[c]	EXPORTATION AND RE-EXPORTATION[c]	TOTAL SUPPLY
1940	1,535,800	38,300	100	1,574,000
1946	1,055,100	145,300	—	1,200,400
1947	1,357,300	12,500	28,400	1,341,400
1948	1,456,500	120,100	23,400	1,553,200
1949	1,619,300	145,600	6,600	1,758,300
1950	1,694,000	4,900	13,200	1,685,700
1951	1,700,700	109,100	[d]	1,809,800
1952	1,840,000	62,900	[d]	1,902,900
1953	2,043,700	—	5,300	2,038,400
1954	2,068,600	42,500	7,400	2,103,700
1955	2,081,900	68,000	[d]	2,149,900
1956	2,127,700	39,500	—	2,167,200
1957	2,174,800	120,800 [e]	—	2,295,600

[a] Agricultural Economics Division, Department of Agriculture and Natural Resources, Manila, Philippines.
[b] Milled rice. Milling percentage based on 65 per cent of total palay production.
[c] Taken from the Foreign Trade and Navigation of the Philippines, Bureau of the Census and Statistics, Department of Commerce and Industry, and NARIC.
[d] Less than 100 metric tons.
[e] January to December 31, 1957 imports, NARIC.

negligible. In fact some exportation and re-exportation were made from 1954 to 1956. It will also be seen that from 1952 to 1956, the Philippines produced enough to meet its consumption requirements.

As may be seen in Figure, 3, the consumption trend for corn was positive while the importation, negative. The exportation and re-exportation indicate a very slightly negative trend.

TABLE 3

Corn (milled): Production and apparent consumption of the Philippines, 1940 and 1946—1957, in metric tons [a]

YEAR	PRODUCTION[b]	IMPORTATION[c]	EXPORTATION AND RE-EXPORTATION[c]	TOTAL SUPPLY
1940	486,400	4,700	[d]	491,100
1946	281,600	600	—	282,200
1947	401,400	181,700	—	583,100
1948	441,200	67,200	900	507,500
1949	454,000	8,000	[d]	462,000
1950	487,600	6,600	—	494,200
1951	512,700	500	—	513,200
1952	647,600	[d]	—	647,600
1953	603,100	[d]	—	603,100
1954	663,800	[d]	2,000	661,800
1955	654,600	[d]	1,200	653,400
1956	771,300	[d]	100	771,200
1957	761,100	[e]	[a]	761,100

[a] Agricultural Economics Division, Department of Agriculture and Natural Resources, Manila, Philippines.
[b] Computed on the basis of 85 per cent of total corn (shelled) production.
[c] Taken from the Foreign Trade and Navigation of the Philippines, Bureau of the Census and Statistics, Department of Commerce and Industry.
[d] Less than 100 metric tons.
[e] Data not available.

Root Crop Consumption

The annual root crop consumption in 1940 and 1946 to 1957 consisted principally of production and small importation (Table 4). This consumption has been divided into 93.23 per cent for human food and 6.77 per cent allowance for seeds, animal feeds, industrial uses, etc.

In 1940, the root crops consumption amounted to 534,600 metric tons. From 1946 to 1949, yearly consumption was below that of the 1940 level. But from 1950 to 1957, the yearly consumption all exceeded the 1940 level. Not only this, it also gradually increased so that in 1957 it amounted to 1,204,500 metric tons. During the twelve-year period, there has been a positive trend in root crop consumption (Figure 4).

With respect to foreign trade, the highest importation amounted to 1,000 metric tons, was in 1950. In general the importation showing a negative trend was practically negligible.

TABLE 4

Root crops (edible portion): Production and apparent consumption of the Philippines, 1940 and 1946, in metric tons[a]

YEAR	PRODUCTION[b]	IMPORTATION[c]	TOTAL SUPPLY
1940	533,700	900	534,600
1946	376,700	100	376,800
1947	399,400	[d]	399,400
1948	455,000	100	455,100
1949	458,400	100	458,500
1950	576,500	1,000	577,500
1951	606,200	300	606,500
1952	635,200	800	636,000
1953	985,300	500	985,800
1954	1,024,000	400	1,024,400
1955	1,041,400	200	1,041,600
1956	1,175,400	[d]	1,175,400
1957	1,204,500	[e]	1,204,500

[a] Agricultural Economics Division, Department of Agriculture and Natural Resources, Manila, Philippines.

[b] Includes camote (sweet potato), cassava, gabi, pao (galiang), tugue, and ubi. Computed on the basis of 93.23 per cent of total root crop production.

[c] Composed of sweet potato and cassava starch. Taken from the Foreign Trade and Navigation of the Philippines, Bureau of the Census and Statistics, Department of Commerce and Industry.

[d] Less than 100 metric tons.

[e] No data available.

Summary

During the twelve-year period, from 1946 to 1957, there was a positive trend in population and annual consumption of the basic food items consisting of rice, corn, and root crops. The importation on the one hand and the combined exportation and re-exportation on the other, which were in many instances negligible towards 1957, showed a negative trend.

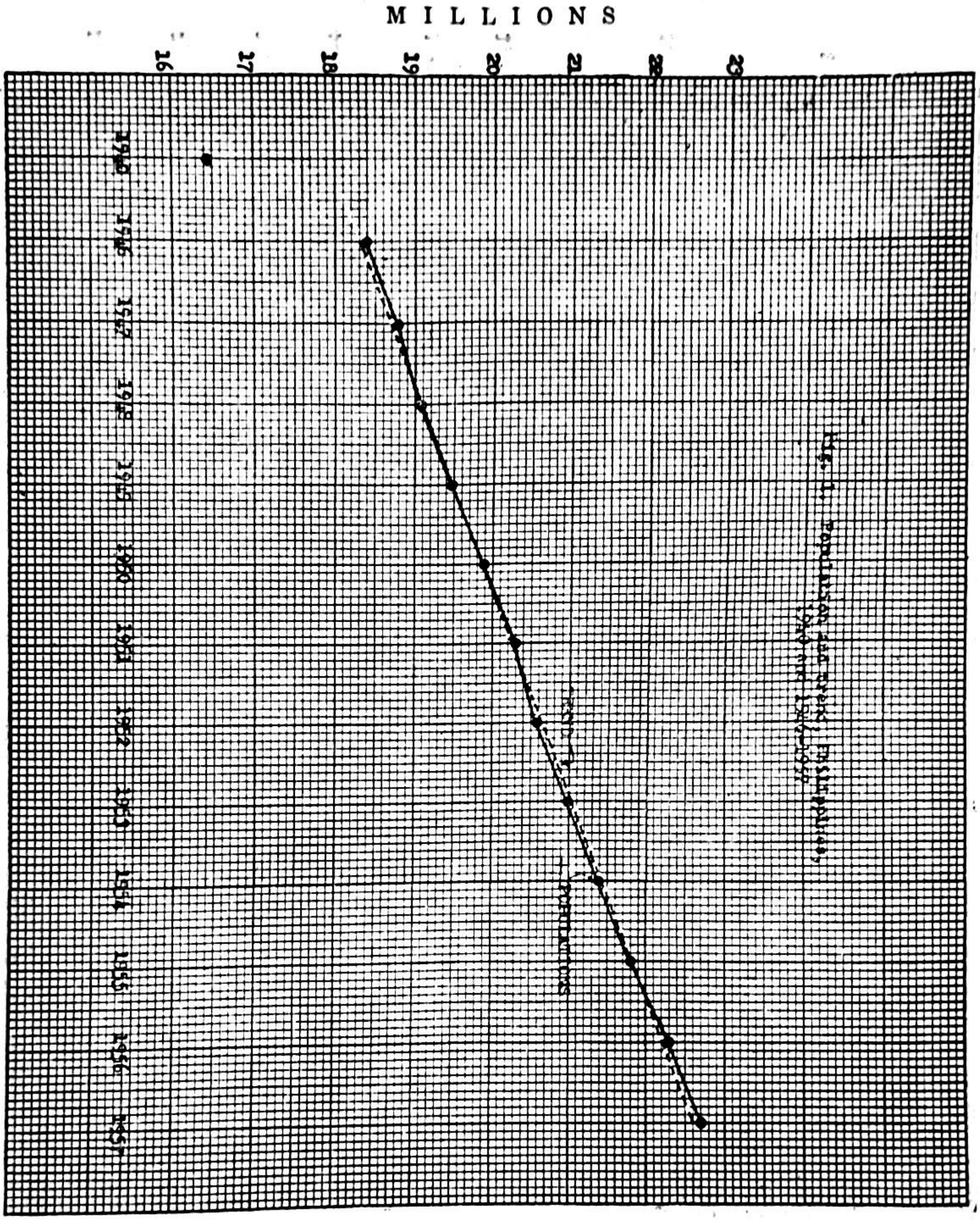
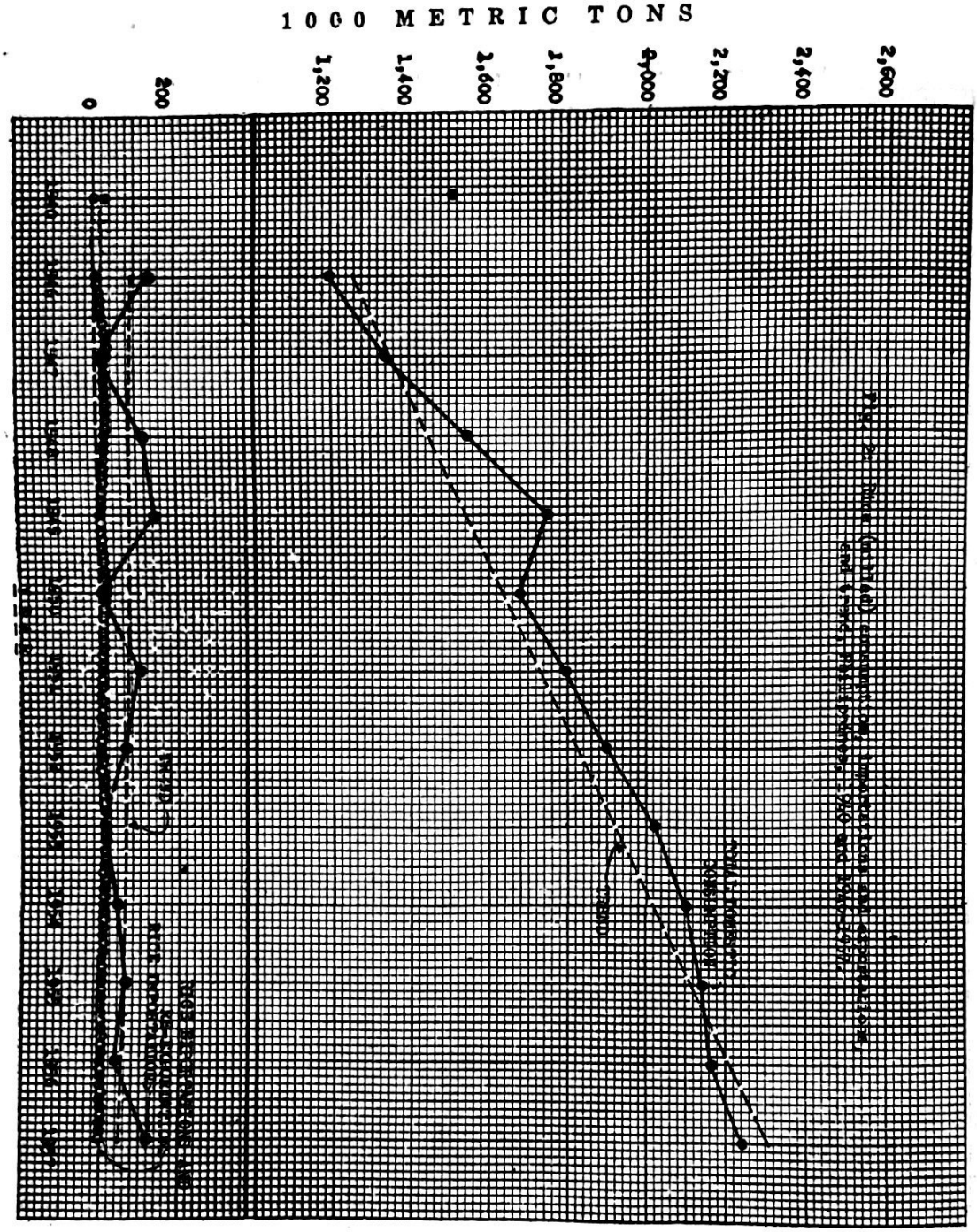
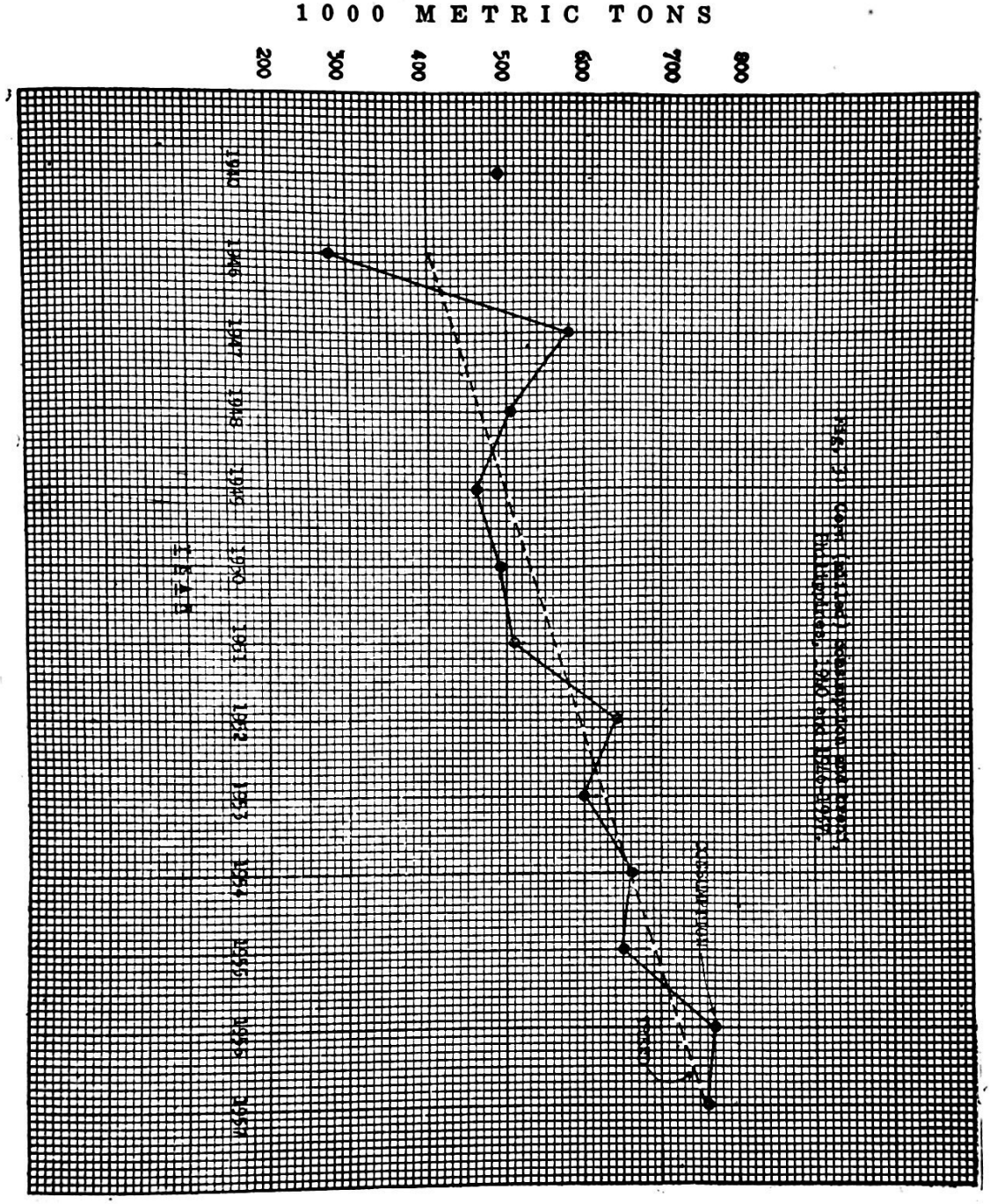
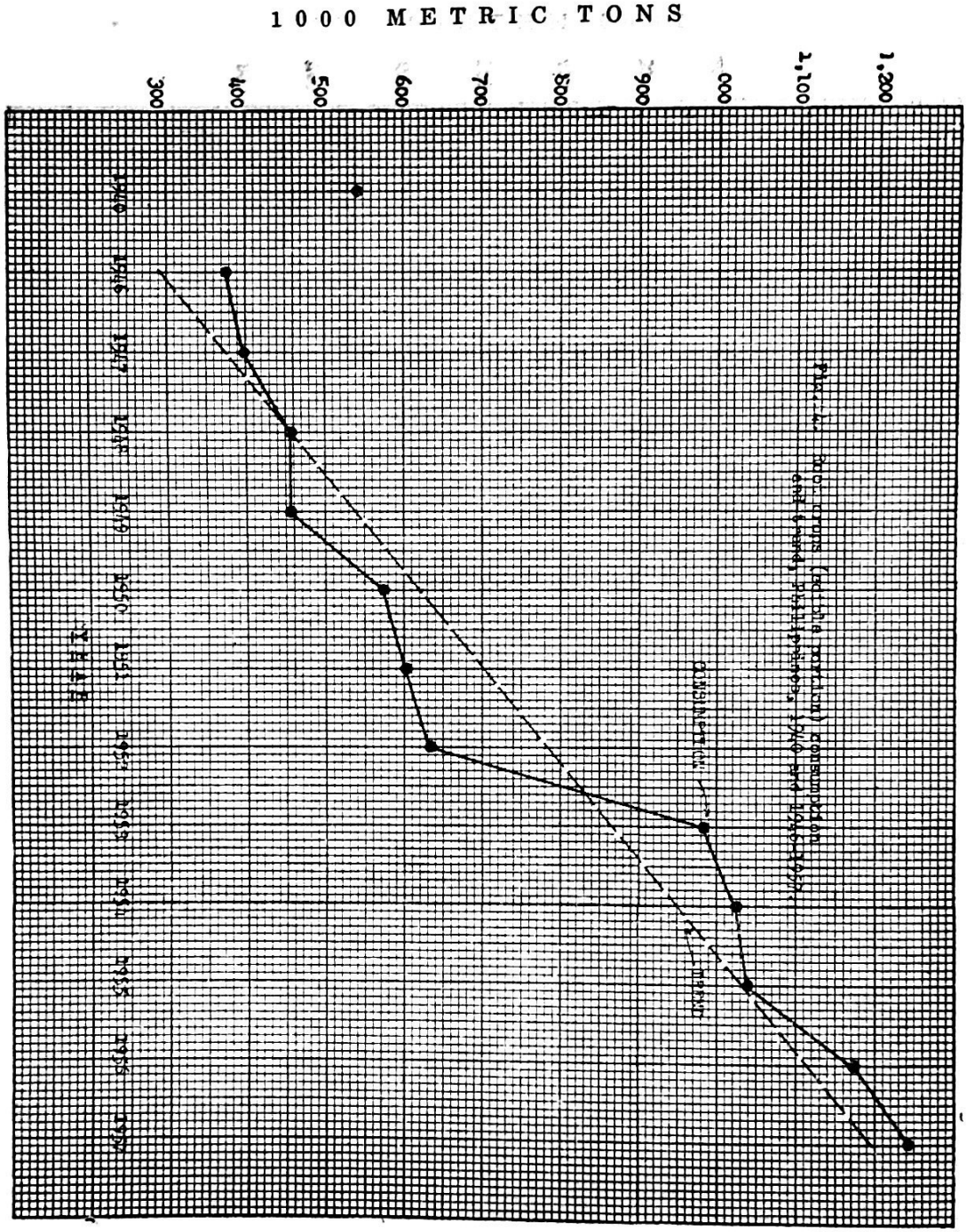


Fig. 1. Population and Trend, Philippines, 1940 and 1946-1957






1000 METRIC TONS
300
400
500
600
700
800
900
1,000
1,100
1,200
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
YEARS
CONSUMPTION
PRODUCTION

GEOGRAPHICAL DIVERSITY IN SOUTHEAST ASIA[1]

SAMITHA DE FONSEKA

Definition of the Term Southeast Asia

The unit under review includes the old colonial world comprising Burma, Thailand, Cambodia, Laos, North Vietnam, South Vietnam, Malaya, the Republics of Indonesia and the Philippines. Geographically speaking, Southeast Asia includes the above-mentioned countries but in terms of political geography it goes further than this limited region to include India, Pakistan, and Ceylon. The reason for this extension is that India, Pakistan, and Ceylon too have been colonies of western imperial powers. Furthermore, the flow of their emigration is in the direction of Southeast Asia.

Colonial Rule to National Independence

At the beginning of this century, all the countries were under the direct control of Western nations with the exception of Thailand which remained a buffer state. Colonialism came to an end in part, as a result of the strains of the second world war and was further aggravated by the dynamic local freedom movements. It is now thirteen years since World War II ended. To Asia these years have been eventful and the new nations have established themselves firmly on the world map. Not all countries obtained their independence with the same degree of ease. The transfer of sovereignty in the Philippines was done in a peaceful way. In contrast, France and the Netherlands clung to their overseas possessions. It took, therefore, 4 years of hard struggle (from 1945-1949) for the Indonesian Republic to be born. The French withdrew from Indo-China very reluctantly leaving the peninsula partitioned into a non-communist and a communist part. Today, four independent states, North Vietnam, South Vietnam, Cambodia, and Laos make up the former Indo-China. Indo-China is an obsolete name but in this paper, Cambodia, Laos, and Vietnam will be referred to as Indo-China for convenience. Indo-China was oriented towards France just as the Philippines was oriented towards the United States; Indonesia towards the Dutch and Burma towards the British. The dominant motives of western imperialism varied. Here was seen the proselytising zeal of the Portuguese and Spanish, the mercantilist preoccupation of the Dutch, French, and English, and the United States' attitude of trusteeship during the period of preparation for self-government. The United States promised ultimate independence to the Philippines at the time of acquisition. Independence came to the Philippines in 1946 as a part of a pre-conceived plan. Hence, the Philippines could be cited as the "show-window of western imperialism" in Southeast Asia. Connections of the colonial countries with the imperial powers established divergent trade streams, and emphasized currency, educational and political differences.

[1] The author wishes to express her appreciation to Dr. Alden Cutshall, Fulbright Professor of Geography at the University of the Philippines for constructive suggestions and editorial assistance in the preparation of this paper for publication.

General Geography

Southeast Asia, covering 1,500,000 square miles or about 3% of the land surface of the earth, has approximately 160,000,000 people. The area of the nine political units that composes Southeast Asia is equal to half that of the United States. Even at its youthful stage the population of Southeast Asia is as dense as that of some of the highly industrialized countries of the world. Southeast Asia is both land and water. The northernmost portion, in Burma, is about 28° north latitude and the southernmost portion of Indonesia extends to about 10° south of the equator. Strategically, the position of Southeast Asia is far more than of local importance, primarily because the great trade routes lie within that area. The various straits provide the only natural waterways through which ships of foreign countries reach the Pacific from the Indian Ocean. Relief and climate continue to render it a region of favorable response and increase. This region produces a greater variety of tropical products for the consumption of temperate countries than is found in tropical South America or Equatorial Africa. In spite of such conditions the unit is largely underdeveloped if not undeveloped. The situation is aggravated by a rapidly increasing population depending primarily upon farming for its livelihood. Agriculture in this region is characterized by low yields, a low per capita output and excessive pressure on the land. This situation is partly offset by the returns of the plantation products and mining which provide the region with moderate purchasing power. Southeast Asia produces almost all the world's natural rubber, abaca, kapok, teak, and cinchona, at least 3/4 of the coconut production, 1/3 of the sisal, 3/5 of tea, 2/3 of tin and a considerable amount of petroleum. The importance of this area was indicated during World War II. When the Japanese captured Malaya, tin cans disappeared from the groceries of many countries. Outside of Southeast Asia, tin is mined in great abundance only in Bolivia and central Africa. A foreign market beyond the control of the producer introduces a degree of price fluctuation which may result in an unstable economy. The industrial section is untouched. Southeast Asia enters industrial society in the age of atomic energy. This demonstrates the lead of the dominant West. Southeast Asia is certainly becoming industrially minded. There is a strong desire for industrialization more or less for its own sake and regardless of whether new factories are likely to be successful.

Physiography

The national environment of Southeast Asia shows a variety of conditions; and landforms are not as simple as they appear to be. The contrasts are more pronounced than the similarities. The two main regions — the Mainland Region of Burma, Thailand, Malaya, and Indo-China and the island arcs of Indonesia, the Philippines, and New Guinea, cover an area which has a 1500 mile radius from the mouth of the Mekong. Indonesia and the Philippines lie within the fire-girdle of the Pacific while the Mainland is non-volcanic. The island arcs are arranged asymmetrically around the equator. The fragmentation of the lowland by either seas or mountains brings extremes of relief. Hence, isolation is seen not only in distances but in physical obstruction as well. Complexity is brought about by high mountains, plateaux, and deltaic

plains. The north-south range of mountains of Malaya and nearby islands are the denuded remnants of the Sunda platform. The Sahul Shelf which is an old stable land like the Sunda platform embraces easternmost Indonesia, Northern Australia, and New Guinea. The curving and recurving arcs bring much diversity. In some places the greater parts of the mountains are below sea level while in other areas, as in Borneo, they rise to an altitude of over 13,000 feet. The major north-south mountains are the central mountains of Thailand between the Salween and Menam, the Annamitic Cordillera in Indo-China and the Sierra Madre in Luzon. In Celebes is found the east-west trends continued from Java and the north-south trends continued from the Philippines. The elevations vary within individual countries rising to 3,700 feet in Kra Isthmus, 7,300 feet in Tenasserim, 8,800 feet in the Yunnan border, 9,610 feet at Mount Apo of Mindanao, 12,000 feet in Sumatra, and 13,451 feet at Mount Kinabalu in North Borneo. Intricate relief and highly developed drainage has made the Arakan Yomas one of the most inaccessible areas in Southeast Asia. The central mountains of Thailand are made up of elongated blocks. The Korat and Shan plateaux and the Cambodian saucer are similar in that all of them are the result of peneplanation, but these plateaux are quite unlike in minor details. The Korat plateau is more dissected than the Shan. In total area it is only 1/3 that of the Shan Plateau, and 1/2 that of the Cambodian saucer. The large fresh water lake of Tonle Sap in Cambodia is unique in Southeast Asia and in areal extent it is second only to that of Lake Tobas in north Sumatra. The dimensions of Lake Tonle Sap vary with fluctuations in precipitation. Lake Tobas is unique in having a large island in the middle of the lake.

Like the mountain ranges, most of the rivers trend north to south. The present plains beyond the coastal swamps are comparatively small. Distinct isolation of river valleys is brought about by a double ring of mountains. No two river valleys of Southeast Asia are alike. Only the Menam, Irrawaddy and the Lower Mekong are important for navigation.

The Irrawaddy which is longer than the Ohio or the Columbia drains a lowland area of 40,000 square miles, equivalent to the total area of the island of Luzon. This lowland is more extensive than that of either the Salween or the Mekong even though the length of the river is comparatively shorter. The Irrawaddy which is 800 miles long is about the same length as the Dniester and is longer than the Rhine. The Menam, which is 300 miles long, has a river basin of 26,000 square miles which is approximately equal to the total area of Ceylon. The Salween is different from the above mentioned rivers in that it does not have an appreciable delta at its mouth. It has very few tributaries and the volume of water does not change markedly as in the Irrawaddy or Menam. Longer than the Mississippi, it is the least useful of the major rivers of Southeast Asia and one of the least useful in the world. The Kapaus River in Borneo, and the Cagayan and Agusan in the Philippines are some of the other long rivers. No single river in the Philippines has an extensive delta. The rivers of Malaya, Sumatra, and Java are different from those mentioned above in that each of them drains a limited area normally to the east or the south.

These relief features, mountains, and river valleys, have led to geographical isolation rather than unification of the area. With the possible exception of Malaya, the physiography of Burma is less complex

than that of any other country in Southeast Asia. Burma has a single core area surrounded by mountains, in contrast to the situation in Indo-China where people and products gravitate from the Central area.

Climate, Vegetation, and Pedology

Southeast Asia extends through a latitudinal distance from 28° N latitude to 10° S latitude. Hence, it is no surprise that the climate merges from tropical to monsoon type, and in high latitudes to mid-latitude temperate type. Temperate climate (humid subtropical) is found in northerly latitudes like northern Burma and Indo-China. "Winter" temperatures here are lower because of higher latitude and continental location.

Temperatures are generally uniform throughout the area but a certain degree of diversity is brought about by rainfall. On the basis of rainfall the region can be divided into two main areas. In Burma, Thailand, Indo-China, and the Philippines is seen the seasonal division of the year into three periods. In contrast, Indonesia has only two. Within the first group is found the dryer belts of Upper Burma and north and central Thailand. These regions are shielded by relief barriers and they have a prolonged dry season with a rainfall as low as 20 inches in Burma. There are rainshadow areas in the Philippines, Indo-China, and Sumatra, but they are less severe than that of Burma. In Burma, the rainshadow area is sheltered by double ranges and not by a single range as in the above-mentioned areas. Because of this feature Burma has a fairly constant rainshadow and this situation is worsened by *foehn* winds. Here the drought season is long with an average rainfall of 20-40 inches. In contrast, Singapore has an average rainfall of almost 100 inches with only 10 inches during the wettest months and as much as 6 inches in the driest month. Jakarta, on the other hand, receives an average rainfall of 72 inches and experiences greater seasonality since it varies from an average of 13 inches in January to less than 2 inches in August. In the Philippines all precipitation zones have a distributional trend which is essentially north-south. Typhoons though common within Southeast Asia, are more important as a precipitation producer in Indo-China and the Philippines than elsewhere within the region, and they are of more painful frequency in the Philippines than in Indo-China.

The diversity in natural vegetation is a result of a combination of factors — temperature, rainfall, altitude and to a lesser extent, soil. Based on altitude there are three main vegetation types — the coastal, lowland, and mountain vegetation. Tropical rain forests occur in regions that have no significant dry season and are found in the western Arakan Yomas, southern Pegu Yomas, Shan Highlands, Malaya, and parts of Indonesia and the Philippines. The vegetation is profuse. In parts of Sumatra there is a semi-arid savanna vegetation in regions of equatorial climate. This rare phenomenon is not a result of climate but is related to the fact that the soils are of volcanic material. These equatorial forests are tall, leafy, congested, and evergreen with lianas and epiphytes. It is different from the tropical savanna forests of Central Burma, western Thailand, Indo-China, western Philippines, eastern Java, Sunda Island, and New Guinea where the dry season is long, but trees can live. The teak forests of Burma and Thailand belong to this savanna forest type. Above 5,000 feet is found mountain vegetation. Only in New Guinea and Yunnan are heights great enough to prevent tree

growth entirely and produce an alpine vegetation. Because of diminishing temperatures at these high altitudes rhododendrons, magnolias, maples, and Formosan pines occur. The coastal vegetation could be further divided into two types — the mangrove and related swamp vegetation, and the fresh water swamp forest. The former type is found in Malaya from Kedah to Singapore, E. Sumatra, Menam Delta, and the Irrawaddy delta. Vegetation is generally salt-tolerant and takes the form of mangrove, nipa, or bamboo. Even within this region the vegetation pattern may differ from place to place as a result of tides. The vegetation on the seaward edge is more salt-tolerant than the inland portion. Fresh water swamp forests are found in the valleys of the Korat in Thailand, in Malaya near Kuala Selangat and in Sumatra. Here the lowlands away from the river valleys become inundated during the rainy season, and foster a vigorous growth resulting in inaccessible forest. Unlike in the mangrove and swamp vegetation the trees are of commercial value.

In no other part in the world of comparable size and in similar latitudes is the soil so fertile. The best soils in Southeast Asia are those derived from basaltic (basic) volcanic deposits and are found in certain areas along the inner curve of the island arc from Sumatra to the Philippines and South to Northern Celebes. The volcanic soils of Java are exceptionally fertile. The rocks are of basic character and weather into a soil of high fertility. Further ejecta from the volcanoes provide fresh layers of unweathered soil material and hence, there is a reshuffling of soil layers. The volcanic soil in Batangas and Cavite near Taal volcano is fertile though not to the same degree as the Javanese soils, Much of the Philippine soils, although volcanic, are acidic in character resulting in low fertility. Volcanic areas of fertile soils are interspersed with laterites as in North Borneo and New Guinea. Within Southeast Asia as a whole, there has been much leaching because of the equatorial rains, resulting in low yields in cultivated crops. Burma, Thailand, and Indo-China have no active volcanoes and their alluvial deposits are midway between the first and second groups in fertility. These areas are the flood plains and deltas of the Irrawaddy, Menam, the Mekong, Cagayan and the longer rivers of Borneo and Sumatra. These soils are less rich than those in Java but fortunately they have been less subject to leaching than those in the other equatorial zones. Here the rich alluvial soil is annually watered by the inundations of the river and refertilized by the deposits of silt. In northwest Malaya limestone has developed into karst topography of low fertility, but in the Philippines the limestone soils in the Bais and San Carlos areas of Negros are moderately fertile.

Population

The population pattern is one of extreme diversity in densities, ethnic types, and languages. Hence, no apology is made for analyzing population on a more comprehensive scale than some of the other aspects. According to the 1951 census figures, Malaya with an area of 50,000 square miles has 5-1/2 million people, Burma with 260,000 square miles has 18-1/2 million, Thailand with 200,000 square miles has 19 million, and Indo-China with 290,000 square miles has 28 million. Indonesia has a population of 80 million. Java which occupies less than 5% of the total land area of Indonesia has a population of 53 million. With a total area approximately the same as Malaya, Java has more

than 9 times as many people as the former. Java's population is equal to that of Brazil which is 50 times as large in area compared to the former.

These figures show the uneven distribution of population. Within these countries settlement is largely determined by the search for workable lands and this reflects the diversity in physical environment. Population is highly concentrated in the alluvial plains except those of New Guinea, Borneo, Sumatra, Mindanao, and Malaya where swamps or leached soils are common. The Irrawaddy delta near Rangoon has a density of 200 per square mile. The Menam delta has a density of 800 per square mile and Central Luzon has over 700. These are the most densely populated regions of the respective countries. The island of Java on the whole has a density equal to that of the Menam delta. Djakarta, the capital of Indonesia, has a density of over 3000 per square mile. Djakarta is different from Quezon City, the capital of the Philippines, in that it did not come into existence all of a sudden. Djakarta which was known as Batavia by the Dutch is a result of several distinguishable periods all of which have left their particular memories of that city. The densities of Southeast Asia can be compared to that of some of the western European countries. Madoera sustains an average density of over 1,300 per square mile which is higher than the average for Java. Cebu has a density of 750 per square mile which is higher than that of the Central Plain of Luzon. In population as well as in many other geographic aspects, the island of Cebu can be compared to that of Lombok in Indonesia. In most of these regions, the dense population is nucleated for commercial activities.

In the Philippines, Indonesia, and Thailand, the population has doubled since the beginning of the century; in Burma it has increased 40% and in Malaya 400%. In the Red River Delta, Java, and Central Luzon population pressures appear to have reached saturation point. On the other hand, the sparse settlement of the plains of Celebes, Borneo, and New Guinea is no mere accident. In these areas the carrying capacity is low. Therefore, the area available for resettling the surplus population is more restricted in these areas than would appear at first glance. The highlands in Southeast Asia are sparsely populated and stand out on population distribution maps in distinct contrast to that of the most densely populated lowlands.

The eastward migration of racial groups have all left their mark in Southeast Asia. There are three main groups today, the Austronesians, the Negritoes, and the Austroloids. The Austronesians form the basic population of Malaya and insular Southeast Asia. They are essentially of the same human type as the basic population of the rest of the Indo-Chinese Peninsula and South China. This group may be further divided into the Proto-Malay and the Deutero-Malay groups. The Proto-Malay which has Mongoloid characteristics is said to have formed the first basic Indonesian population of Southeast Asia. It remains for the most part in mainland Southeast Asia, but the Bataks of Sumatra, the Islanders of Nias, the Torajas of Celebes, and most of the Dayaks of Borneo are Proto-Malay. The Peninsular-Malays, the Coastal Malays of Sumatra, the Javanese, Sundanese, and Balinese belong to the Deutero-Malay group. The Negritos, one of the earlies racial groups, are found as the Senang people of Kedak and Perak, Pangan in Kelankan and as the Aetas in the Philippines. The Papuans of New Guinea and

the nearby islands are the survivals of mixed Negroid strains. The Sakai hill tribes of Malaya belong to the last group, the Austroloid group.

The diversity in natural environment has its repercussions on local racial tribes. Rugged and heavily forested uplands act as barriers between the lowlands and this is particularly true in Burma, Thailand, and Indo-China, where the north-south ranges have imposed a linear pattern on the migrations. In Burma are several hill tribes like the Karens who inhabit the Pegu Yoma, the Shans who occupy the Shan Plateau and the upper part of the Chindwin Valley, the Kachins in the north, Chins in the western mountains and the Palanungs and Was on the Chinese border. In Indo-China the situation is different in that there is a vertical stratification of people and occupations, as for example, the Laos who occupy valley floors and grow wet paddy and the Mau groups who live at slightly higher elevation and practise shifting cultivation. The Mau who practise mixed hill farming or dry paddy are found at a higher elevation of over 3,000 feet. The hill tribes of Southeast Asia as in most other areas of the world are considered more militant than the lowlanders. Various types of people live along the coast, showing that the sea has acted as a link rather than as a barrier.

The presence of large alien minorities in Southeast Asia is generally attributed to colonialism as the imperial powers imported large numbers of alien workers. The Chinese form the largest group of aliens. There is diversity within this group as they come largely from three different provinces of China: Kwantung, Fukien, and Kwangsi. The emigrants of Fukien who speak the Fukien dialect are the most numerous of the Chinese in Southeast Asia. The Chinese are scattered throughout the larger towns, villages, peasant farms, plantations, and mining communities. These are the Chinese middlemen and retail traders of the Philippines, the rice exporters of Thailand, the rubber tappers and tin miners of Malaya and the subsistence farmers of western Borneo. In non-colonial Thailand, the 3 million Chinese live in close association with the Thai people and hence, there has been considerable assimilation of some Chinese elements into Thai culture. This is also partly true in Indo-China, where culturally they grade from a distinctly Chinese character in Laos into a more alien culture of Cambodia. In British Malaya, where 43% of the population is Chinese, they are separate from both the Indian immigrants and the indegenous Malays. The Indian and Chinese laborers in Malaya constitute a problem because of their numerical superiority and control of the national economy. Any degree of variation between the two may be found wherever the Chinese are settled in Southeast Asia. The second alien group, the Indians, is smaller in number and predominate in Burma, Malaya, Java, and Bali. Their main occupation is in the retail trade in Java and Bali and as middlemen in Burma. British, Spanish, Americans, French, and Dutch form the Western minorities in Southeast Asia. In Indonesia, the Dutch elite kept apart from the natives and hence, the Dutch community has been a foreign enclave.

In contrast with the mainland, the archipelago is rather simple in the basic linguistic characteristics and this may be a result of the unifying influence of the sea. Over the entire area from the Philippines to Indonesia (with the exception of New Guinea) the language is of one common stock — the Austronesian group. Within this division, diversity is brought about by a great variety of languages; in the Philip-

pines there are over 70 dialects, and Indonesia has 114 different dialects. Indonesia is making all efforts to merge this multitude of languages into a new "unity in diversity."

Three of the world's greatest religions, Christianity, Islam, and Buddhism are found in Southeast Asia. Islam spread to the east in the 14th century and today it is dominant in Indonesia, and has pushed north as far as Mindanao. Spanish colonial policy, which placed much stress on Christianity, was very successful among the animist population of the Philippines (except for the remote mountain tribes) but was never able to convert the Moslem Moros of Mindanao, Palawan, and Sulu. These muslims were called Moros by the Spaniards after the Moors of southern Spain. Today approximately 80 per cent of the total population of the Philippines is Catholic. Buddhism reached Burma, Thailand, and Indo-China by way of Bengal and Ceylon. Hinduism spread to this region on a minor scale and is most dominant in Burma and Bali. Bali is the last remnant of the Hindu Period in Indonesia.

Economy

Agriculture. — The diversity of the natural landscape has its effects on the human utilization of the land and the nature of crops; but the diversity in farming types is more related to different rates of agricultural development than to major environmental differences. The people still cling to the traditional practices that have been handed to them over centuries. Hence, agricultural practices for the most part depend on the muscle of man and beasts of burden. A major contrast can be seen between the almost exclusive concentration of rice production on the river plains and basins of mainland Southeast Asia and the distinctly plantation agriculture, the latter transferred to this region within the last two centuries. The latter type is more typical of Malaya, Indonesia, and the Philippines. Shifting cultivation is adapted to large empty areas where soils are poor and the rate of soil erosion is high. This system is of little commercial significance and is found in the hilly areas of Malaya, northern Burma, northern Thailand, the mountains and some hilly areas of the Philippines, Borneo, Celebes, and parts of eastern Sumatra. The third type, which is subsistence farming, has evolved from shifting cultivation and is found in somewhat better areas. The main crops are generally rice and corn with spices, coconuts, pulses, and fruits grown in small proportions. The fourth and most important type is small scale commercial farming which is practised in practically every country in Southeast Asia and occupies about 35 million acres. It is in the form of food crops as rice, sugarcane, tobacco, and tea, and non-food crops like rubber and abaca. Rice covers approximately 95% of the cultivated land in Thailand, 85% in Indo-China, 65% in Burma, 35% in the Philippines and about 30% in Indonesia.[1] Here rice cultivation is an extension of subsistence agriculture, on a commercial scale. The main rice areas are the Menam, Irrawaddy, Mekong lowlands, the Central Plain of Luzon, and Java. Though rice culture appears to be the same in most areas there is a difference in intensity depending on the difference in land utilization. For example, almost all the rice in Thailand, Burma, the Menam Valley

[1] Original statistics from Spencer's *Asia, East by South.* Percentages calculated by the author.

and the Central Luzon Plain is paddy rice whereas that of Celebes, Borneo, and northern Indo-China is upland rice. The Philippines as a whole has more hectares of upland rice than most other countries. Floating rice is more peculiar of Thailand and Indo-China than other Southeast Asian countries. Commercial rice farming is less common in the Philippines than in the rest of Southeast Asia. Indonesian agriculture is more diversified than that of any other country in Southeast Asia, but the Philippines has all the major Southeast Asian crops except tea.

Some of the important crops are sugar, coffee, cinchona, coconut, oil, palms, rubber, and abaca. Rubber is mainly a plantation crop in Malaya, a crop of small landowners in Sumatra, and both in Java. The peasant landholders in Sumatra are different from most of the small rubber growers in Malaya because they are primarily interested in food crops. Rubber is only a sideline though important in Sumatra. Coconut is a plantation crop in Indonesia and the Philippines, but not in mainland Southeast Asia. There are contrasts in sugar cultivation and ownership between Java and the Philippines, the two leading sugar producers of Southeast Asia. In Java no ratooning is practised since, by government restriction, only one crop of sugarcane can be grown before food crops are planted, but this is not the case in the Philippines. More tobacco is grown in Indonesia and the Philippines than on the mainland, but the Thai tobacco industry has become very important in the postwar years. The Philippines has a monopoly for abaca. Root agriculture seems to be more confined to the islands than in the mainland. The rice producing countries specialize in mono-culture while the Philippines and Indonesia have a variety of crops. The great intensity and variety of cultivation in Java is unequalled in any other country of comparable size in Southeast Asia.

The word *estate* is synonymous with *plantation* in Malaya, and with *hacienda* in the Philippines. In Malaya most of the plantations are British-owned. In the Philippines some of the sugar land is Spanish-owned. In Indonesia, with the recession of Dutch influence, the Dutch have been practically driven from the plantations. The abaca plantations and most of the large sugar *hacienda* of the Philippines contradict the general statement that the plantations in Southeast Asia are foreign-owned. Tenancy is highest in the Philippines among southeast Asian countries, and this is a remnant of the Spanish agrarian policy.[1] Absence in the Philippines of a good rubber industry, as in Malaya or Indonesia, is due primarily to the legal restriction placed on the acquisition of large tracts of land.

Minerals.—The distribution of a variety of minerals is no surprise because of the complex physiographic and geologic structure of Southeast Asia. Though there is a wide variety, no one major mineral except tin is important enough to be really significant in world production. Indonesia leads in petroleum production with Burma a poor second. Indonesia is the leading producer of petroleum for the entire area between the petroleum fields of the Middle East and those of California. Anthracite coal is found only in north Vietnam. Iron ore is found in commercially workable quantities in the Philippines and in eastern Malaya. Both

[1] Editor's Note: Tenancy is also very high on the Bangkok Plain of Thailand and possibly in other areas of high land values.

iron ore and bauxite, though widespread, are without convenient location to the power needed to develop them. The Indo-Malayan mountain system contains the world's greatest deposits of tin and it is important in Malaya, Bangka, and Billiton. Malaya has illmenite and tungsten. Manganese and chromite ores are scattered throughout the region with Zambales in the Philippines holding the reputation as the biggest producer of chromite in the Far East. More hydro-electric power has been developed in the Philippines than any other Southeast Asian country. Very little has been developed in Burma and Indo-China. The above analysis of minerals in Southeast Asia shows that the Philippines has the biggest variety of minerals for any individual country of comparable size in Southeast Asia.

Out of all geographic aspects the least amount of diversity seems to be in manufacturing. Light manufactures are common within the whole of Southeast Asia and all activities connected with processing are widespread. Rice mills seem to be omnipresent. Rubber factories, oil presses, and sugar mills have been established on modern lines. Other industries are textiles, fertilizer, glass, cement, paper, and chemicals. Unavailability of some raw materials, fuel, and technical know-how are factors that inhibit industrialization. If there is a diversity in industrialization it is between the Philippines and the rest of Southeast Asia. The Philippines is not only more industrialized but its industry is more diversified than in any other Southeast Asian country.[1]

Trade. — There is very little intra-regional trade within Southeast Asia as all countries produce approximately the same goods and commodities. Most of the products of the region are agricultural raw materials purchased by western powers. The following figures for 1956 show the extremely narrow base of the export trade of Southeast Asian countries. Rice made up 42% of Thailand's export value; it provided 50% of Burma's export by value; and 60% of Cambodia's export by value. Rubber and tin provided 65% of Malaya's export value; rubber, tin, and petroleum provided 70% of Indonesia's export value; and copra, sugar, logs, and lumber provided 60% of the Philippine export value.[2] The tendency in most countries today is towards a greater diversification of exports. Rice occupied 66% of the value of the exports of Thailand in 1953, 56% in 1954, 44% in 1955, and 42% in 1956.

During colonial days, all Southeast Asian countries were closely interrelated with imperial powers. Hence, Philippine trade is oriented towards the United States market, Indo-China has been oriented towards the French market, but Burma, curiously enough, to the British rather than the Indian market. Much of Cambodia's export trade is directed towards Laos and Vietnam. In 1956, 38% of the exports of Cambodia went to Vietnam, 22% to Laos, 22% to France, 19% to the Sterling area, and only 16% to the United States. In 1955, the Netherlands took only 20% of Indonesia's exports and provided only 10% of her imports. Philippine production has been completely oriented towards the United

[1] Editor's Note: For a more detailed treatment of Philippine manufacturing, see Alden Cutshall's "Industrialization in the Philippines," published in the *Philippine Geographical Journal*, Vol. VI, No. 1, 1958.

[2] Original export statistics from the *Economic Survey of Asia and the Far East 1956* and the *Yearbook of International Trade Statistics, 1956*. Percentages of total export by value calculated by the author.

States market. The United States absorbed the Philippine trade with Spain and established a tariff that inhibited the acquisition of other markets for Philippine products. In no single country in Southeast Asia has prosperity been based so much on free access to a single market. Philippine trade with the United States exceeded that with all other countries in 1916. Two years after the Free Trade Act was passed, exports to the United States, which was 32% in 1909, increased to 42% in 1910, 82% in 1940, 59% in 1955, and 53% in 1956. Imports from the United States too have decreased from 72% in 1954 to 64% in 1955 and 59% in 1956. However, the tendency today is towards a greater diversification of trade partners and the most important feature in the present trade scene of the Philippines is the rise of Japan as the second ranking market as well as importer of Philippine commodities.

Intra-regional commerce takes the form of transhipment at Singapore and shipment of the rice surplus from Thailand, Burma, and Indo-China to countries that specialize more on non-food crops like Malaya, and secondly the Philippines. Trade statistics in Southeast Asia must be treated with skepticism as they include a considerable amount of entrepot trade as in rubber and tin through Singapore.

Cultural Heritage and Politics

Although all Southeast Asian countries changed under colonialism, not all of them have been uniformly westernized. The Philippines is a country with great western cultural assimilation. There are Chinese mestizos, Spanish mestizos, American mestizos, Japanese mestizos and a handful of French, German, and Swiss mestizos. Islam in Indonesia and Malaya, and Buddhism in Ceylon, Burma, Thailand, and Indo-China were against Christianity and hence, they shunned an important medium of westernization. Various Southeast Asian countries are oriented towards the metropolitan countries that conquered and ruled them and hence there has been a disintegration of the traditional social structures. In the Philippines there is a veneer of American culture superimposed upon a Spanish cultural pattern which in turn had been superimposed on a Malayan cultural base. Western ideas of socialism dominate all Southeast Asian countries except in the Philippines where free enterprise and private property are dominant. In the Philippines alone the mestizo class occupies a position of social prestige. The language of the mother country became the language of the colony. Therefore, the local languages were replaced by English, French, Dutch, and Spanish in Burma, Indo-China, Indonesia, and the Philippines respectively. Today all Southeast Asian countries except Malaya and the Philippines have reverted to their respective national language, at least in part, as the medium of instruction in the educational system as well as in the medium of communication in the administrative courts. In Thailand, alone, as a result of its perennial non-colonial status, the Thai language was always used as the official language in schools, government, and courts. Emphasis on the Thai language was made along with its conscious effort at westernization.

Though in the past, Southeast Asia consisted of colonies to satisfy the political prestige of their masters, today it is the subject of international forums. All except North Borneo, Timor, and the much disputed West Irian have passed their colonial stage. All except the Philippines have a parliamentary type of government. Only in Thailand and Cam-

bodia is found a monarchy; and the peculiar feature of Thai politics is characterized by the dominant position of the Thai military oligarchy which governs the country. This type of government is unique in Southeast Asia. No Southeast Asian country after it gained independence from the mother country has yet reverted to the type of government of pre-colonial days. Cambodia was an exception in that it became a limited and constitutional monarchy even when under French rule.

All Southeast Asian countries are different; they are politically similar only to the extent that they all deplore colonialism. All except non-colonial Thailand and the Philippines have a tendency to view western policy with suspicion and as a possible threat to the newly acquired and much cherished independence. Special privileges with regard to exports to the United States, with regard to the rights of the Americans in the Philippines, and the 99-year lease of the military bases, connect the Philippines very closely to the United States.

Thailand is indifferent to Asian aspirations and is often accused of conducting her foreign policy as if she were a non-Asian power. Thailand used to attend the Delhi conference on Indonesian independence. North Vietnam is under the sphere of Soviet colonialism and is the only area of this type in Southeast Asia. Malaya, the youngest independent state in Southeast Asia, is socialist in outlook. Burma too is socialist and the core of her foreign policy is neutrality and non-alignment. Indonesia is aggressively neutralist. Indonesia today is unable to stabilize her present territory either politically or economically. Indonesia's internal problems of economic development, political control, and national unity, are probably more acute than those of any other country in Southeast Asia. Indonesia's economic future is anybody's guess. Cambodia, Laos, and South Vietnam are neutralized areas and they cannot join any power block due to the Geneva Summit agreement. The neutralists are not concerned about security treaties as there is a tendency to be pulled either to the East or to the West. Countries to which neutralism is unpalatable such as the Philippines and Thailand have joined the Southeast Asian Treaty Organization. Thailand is a very willing recipient of American economic and military assistance. These divergent foreign policies show that Asian unity is a myth. There is unity, — but it is unity only in so far as antagonism and resentment towards colonialism is concerned. Whatever the geography, whatever the language, whatever the political structure, whatever the race, the countries of Southeast Asia have only one thing in common — they are underdeveloped if not undeveloped and they are all poor.

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GEOGRAPHY, GEOGRAPHERS, AND THE PACIFIC SCIENCE CONGRESS

ALDEN CUTSHALL

The Ninth Pacific Science Congress, held in Bangkok, from November 18 to December 9, was attended by more than 20 geographers. About one-half of them represented the continental United States; others came from Germany, the United Kingdom, Japan, Malaya, Taiwan, Burma, the Philippines, and Hawaii. Many of them attended, in part, because the Congress was held in Bangkok. Probably there has never been a previous meeting that was attended by as many geographers with a demonstrated special interest in Southeast Asia.

The Pacific Science Congress does not yet have a Division of Geography. Papers by geographers were read in the Divisions of Anthropology, Botany, Conservation, Crop Improvement, Geology and Geophysics, Meteorology, and Soil and Land Classification; and the geographers participated in at least four post-conference excursions (Anthropology, Botany, Geology, and Soil and Land Classification). Joseph E. Spencer (UCLA) was responsible for arranging a section on Effects of Shifting Cultivation on Natural Resources with Special Reference to Problems in Southeast Asia (Division of Conservation). Karl Pelzer (Yale) was designated chairman of a section on Problems of Land Use and Land Tenure and Albert Kolb (Hamburg) was chairman of a section on Demography; both were in the Division of Anthropology. L. Dudley Stamp was one of the busiest men at the conference. He gave one of the six public lectures, "Land and People; The Scientific Background of National Land Planning"; was chairman of a section on Contribution of Geographers to Conservation with Special Reference to the Pacific Area; and besides presenting a paper, gave the general summation and conclusions of the UNESCO symposium on the humid tropics.

The UNESCO-sponsored symposium entitled Climate, Vegetation, and Rational Land Utilization in the Humid Tropics was held in two four-hour sessions. Of the nineteen papers, six were prepared by geographers. The participants were carefully chosen and all papers were reproduced and distributed in advance. The discussion was lively and fruitful. This symposium proved to be one of the highlights of the Congress.

There was an expressed desire by both the geographers, and by many individuals in other disciplines, that the Congress create a Division of Geography. The Division of Anthropology, and possibly other divisions, presented a formal resolution requesting this action. The Pacific Science Council which is the continuing organization of the Pacific Science Association chose not to create a new division at this time, but instead set up a Standing Committee on Geography. This is considered the first step necessary in the creation of a new division.

The next meeting of the Pacific Science Congress will be held in Honolulu in 1961.

INTRODUCTORY ECONOMIC GEOGRAPHY, THIRD EDITION — by Lester E. Klimm, Otis P. Starkey, Joseph A. Russell, and Van H. English. Harcourt, Brace, and Company, New York, 730 pp. ($7.50).

This edition of Introductory Economic Geography is a complete rewriting of the Second edition. Most of the maps and graphs have been redrawn and many of the other illustrations are new.

The authors believe that the function of economic geography is to describe and analyze the distribution of man's economic activities. Where do people live? Why do they make a living in a particular way in each place? What is possible under a given set of environmental conditions? What is profitable? What changes in possibility and profitability are likely to occur? These and other similar questions are the problems to study in considering man's use of the earth. This is the material of economic geography.

This book is divided into five unequal parts. There are two unnumbered introductory chapters that introduce the reader to certain basic concepts of the subject and to the use of maps in geographic work. Part I contains nine chapters on the physical environment and human activities portrayed from the standpoint of world patterns. Part II, five chapters, treats economic organization and the use of resources. Part III, Representative World Industries, has 14 chapters, most of them in the field of agricultural geography. Part IV, Major Economic Regions, contains 15 chapters. This last section is regional economic geography with emphasis upon trading areas rather than upon regional description. An 8-page statistical appendix is quite valuable.

Introductory Economic Geography differs from other textbooks on the subject in both organization and content. The material on climate and landforms in Part I is not ordinarily included in an economic geography text. Secondly, it is unusual to have both a pattern of industry organization and a regional treatment within the same cover. To do all of this the authors have been, of necessity, quite brief. This book is an acceptable text, probably the best text, in a course whose students are freshmen or sophomores with no previous work in geography and as a result need some description and explanation of physical phenomena in order to understand the patterns of production. It is not adequate for an upper division economic geography course.

ALDEN CUTSHALL

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Map Standardization for a Loose-Leaf National Atlas is an excellent map showing distribution of resources, commodity production, transportation features, climate, geology, types of terrain, types of farming, and many other kinds of economic, cultural, and physical information. Maps are also issued to show the status, or coverage to-date, of such activities as geologic mapping, topographic mapping, aerial photography, and soil surveys.

The committee on a National Atlas of the United States, established by the Division of Earth Sciences of the National Academy of Sciences — National Research Council, recommends that Federal agencies issuing maps standardize the size of sheet and related map features so as to build up a Loose-Leaf National Atlas of the United States. It is evident from examination of other countries, as well as the United States' National Atlas that the loose-leaf type has many advantages. New maps can be added as they are published and the Atlas is therefore not limited to a fixed number of maps as would be the case in a bound volume. Out-dated editions of maps can be readily replaced with new editions. Maps or sheets of text containing supplementary information can be added and placed in proximity to the material they supplement. Persons who could not afford a large bound Atlas and those who might have no need for all the maps in such an Atlas, could provide themselves with Loose-Leaf Atlas containing only such maps as they especially wanted. Great flexibility is possible in the manner of binding or assembling the loose-leaf Atlas. This can, in fact, be left largely for the individual user to determine, according to his personal preference. The same set of maps can be assembled in various types of loose-leaf binders, boxes or other kinds of containers, provided standardization of sheet size could be achieved in place of the present diversity.

CONSUELO A. GONZALES

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No. 58 Catalog. Denoyer-Geppert, 1958. Denoyer-Geppert Company, 5235 Ravenswood Avenue, Chicago 40, Illinois, U.S.A.

The Denoyer-Geppert 1958 Catalog #58 is a new catalog of teaching aids. This catalog is the latest guide in the sustained use of visual aids for classroom teaching. It includes maps, charts, atlases, globes, models, and study guides. The catalog is divided into fourteen parts.

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CONSUELO A. GONZALES

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GROUNDWATER, ITS OCCURRENCE AND IRRIGATION USE. Epifanio J. de la Fuente. Mimeograph Report on studies in the U.S.A. for six months ending January 28, 1958. NEC-ICA Training Grant. Irrigation Service Unit, Department of Public Works and Communications. April 7, 1958.

Mr. Epifanio de la Fuente is Chief Engineer of the Irrigation Service Unit, Department of Public Works and Communications who spent six months' study on underground water and deepwell irrigation installation.

1. *Cycle leading to the formation of Underground Water.*

Unlike the debatable origin of the *Homo sapiens*, the beginning of underground water is quite visible to man's view as evaporated water from the oceans, rivers, creeks, other surface sources, transpiration of plants and animals that are formed as clouds carried by the wind. Due to the natural change of temperature, these clouds precipitate as rain or snow on recharge surface land area. Rain water or melting snow seeks its own level and in the course of its movement as run off water, part of this returns to its original river or ocean sources, a portion dissipates from man's view and finds its way by filtration downward thru permeable and porous strata of the earth mass. This water fills the cavity pores of sand and gravel stratum to stay from a few feet to several hundred feet below the ground surface to provide tremendous benefits to industry in giving domestic water supply and to agriculture, giving forth irrigation water that can transform arid regions into agricultural lands that bloom with green plant life.

2. *The Role of Geologist in the Investigation of Earth Strata.*

For one to understand and follow the travel of streams thru underground passages, it is necessary to understand the sequences of the earth formations, their porosity and permeability, with the aid of the science of geology. No longer a problem to the geologist, he can now determine, with the aid of an electric detective gadget from a 4-inch test hole dug into the ground, the earth mass stratifications and their depth of formation; and for specific utilization of underground water; water bearing aquifers, their depth and water quality. The extent of underground water and amount of water stored can now be predicted after careful observations of several hundred test wells strategically located.

3. *Scientific Prediction of Hydraulic Characteristics of Wells.*

Hydraulic engineers play an important role in the study and evaluation of hydraulic formula for the determination of the hydraulic characteristics of the well, such as coefficients of storage and transmissibility, amount of drawdown and discharge. They can now predict water level, interference, discharge at any place, their amount and extent.

4. *Industrial Contributions for Tapping Underground Water.*

Of course, almost all underground water except springs, does not come out of the earth surface by itself. Drilling equipment and the services of expert drillers are necessary. With the experience of such well known drill rig manufacturers such as George Failings, Speedstar and Keystone, and Franks employing the percussion and rotary types of drill rig, it is now possible to tap underground water anywhere it is located. The driller has his problems to solve — the breakdown of equipment and its replacement, fishing of tools that get lost in the well — which are ordinary for well-equipped contractors.

5. *Needed Laws for Protection and Safeguard of Underground Water Resources of the Country.*

A deepwell owner needs protection in the operation of his well just like any other property right. Conservation laws on underground water in the Philippines have yet to be formulated and legalized by Congress and action on this phase of the work should be initiated by the underground water resources division of the Bureau of Public Works. This will control or minimize indiscriminate tapping and wastage of ground water resources.

6. *Irrigation Use and Application of Underground Water.*

Perhaps the best use for underground water is to support plant life which is mankind's fundamental source of life. An irrigation well would not be complete without its water distribution system. Without land leveling, Philippine topography is generally reached by irrigation thru the construction of as many laterals and farm ditches, the layout of which is always done to water the field evenly and prevent distribution losses and seepages. The fact that deep well water is expensive calls for highly efficient distribution system and high-priced crop specialization.

FELIPE L. MEMPIN

GEOGRAPHICAL NEWS

Messrs. PABLO SALAMAT and PEDRO ARCEGA, both members of the Philippine Geographical Society, have been very busy during the quarter in connection with their duties as Field Supervisors of the Irrigation Service Unit. Mr. Salamat concentrated his field activities in the Central Luzon areas where farmers needed his services most. On the other hand, Mr. Arcega, a sparring partner of the former, conscious of his avowed duties and responsibilities, performed a similar job by contacting progressive farmers in southern Luzon provinces in preparation for the coming farming season. Congratulations are in order for their meritorious services.

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The M.S. MOLAVE arrived recently from Japan with a substantial cargo of processed copper for the American Wire & Cable Company, Inc., manufacturers of the famous "Duraflex" wire and cable products.

The copper concentrate was mined at Marinduque and shipped to Japan for processing, then returned to the American Wire & Cable Company, the largest wire drawing mill in the Philippines.

The American Wire & Cable Company (AWICO) manufactures a complete line of plastic-coated electrical wires and cables. In addition, AWICO is the only manufacturer in the Philippines of rubber-insulated, weather-proof triple braid, and steel-armored wires and cables.

A substantial cargo of processed copper for American Wire & Cable Co., Inc. (AWICO) is shown being unloaded from the M.S. MOLAVE which has just arrived from Japan. The copper concentrate was originally mined at Marinduque and the processed product will now be used by AWICO, the first and the largest wire drawing mill in the Philippines.

Bearing the responsibility of being the largest factory of its kind in the Philippines, AWICO maintains rigid inspection and high quality control procedures on all wires and cables manufactured. In this manner, all "Duraflex" products are made to conform with the manufacturing and quality standards of the National Electrical Code of the United States.

At present, AWICO is satisfying the total Philippine requirements for all types of wires and cables needed by industry, communication systems, public utilities, government hydro-electric projects and home building.

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Mr. ALEJANDRO R. APACIBLE, 1958 president of the Philippine Geographical Society, was recently elected to the following positions: vice-president of the Philippine Association for the Advancement of Science (Geography and Geology); member of the board of directors of the Philippine Association of Agriculturists; and executive board member of the College of Agriculture Alumni Association.

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TEOFILO M. MENDOZA, secretary of the Philippine Geographical Society and Chief, Project Investigation Division, Irrigation Service Unit, D.P.W.C., had been away for sometime conducting field investigation for feasible pump sites in the Bicol region. The result of his investigation

showed that water source is the limiting factor for the extension of irrigable areas. Besides his work along this line, Mendoza averred that thousands of rice lands lay idle in view of the fact that drought did not spare the Bicol region.

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Mr. MANUEL R. ARGUELLES, an active member of the Philippine Geographical Society and Regional Construction Engineer of the Irrigation Service Unit, returned on April 1, 1958, after staying in Tokyo and Osaka, Japan for almost one-half month studying and observing the adaptability of Japanese pumps under Philippine conditions in the culture of rice and other crops.

While in Japan, Arguelles visited the different pump factories most important of which is the Kubota Iron and Machinery Works, Ltd., considered one of the leading pump and diesel engine manufacturers. He made a first hand observation on the step by step process of pump manufacture.

He also made some studies on the operation of the big pumping stations by testing and checking pump and engine performances; gathered pertinent data for ready reference and use by the ISU in the selection of pumping units which the government will install for the farmers if the latter agree to the terms and conditions relative to the installation and construction of pump units.

The PGS and ISU profited very much from Mr. Arguelles' travel abroad.

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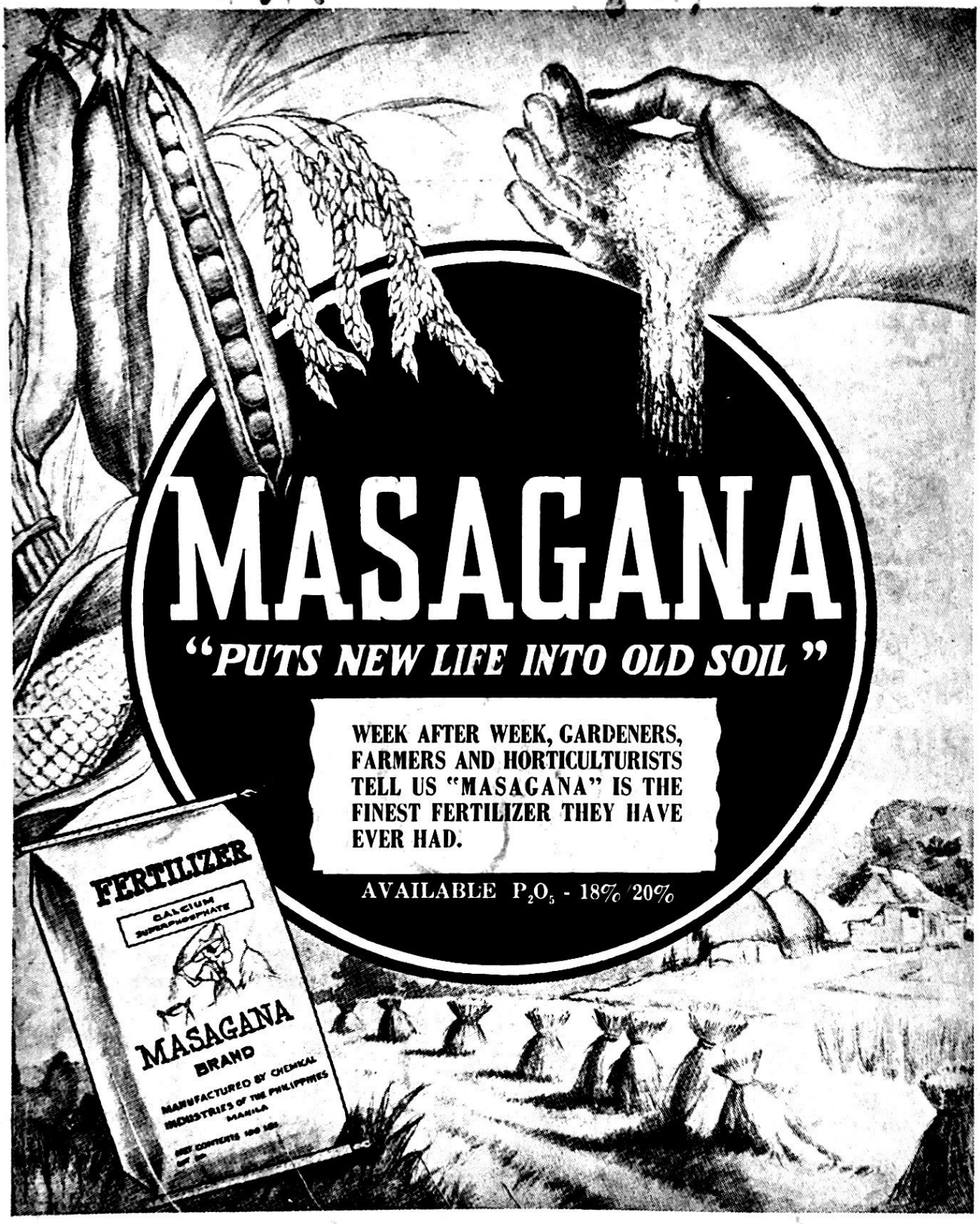

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