had he failed of learning the Spanish language. The place of his contact with Spaniards and Spanish-speaking friends, daily, year after year, is the *Palma de Mallorca*, a hostelry in yellow paint on calle Real, of course in old Manila. At a little round table here, among cronies of his genial kidney, Fergusson held forth daily—in an atmosphere as stimulating as that of an oldtime English coffeehouse. Among the habitues of the place, and a guest at the round table, was Fergusson's assistant, who succeeded him as executive secretary, Frank W. Carpenter, Governor Forbes's amanuensis, and real source of accurate information, in the preparation of his book on the Philippines. These reliable servants of the Philippine government owed their effectiveness to their acquisition of the language; and Carpenter did not stop with Spanish as a second mother-tongue, but mastered Tagalog too, if not several other dialects. This information is imparted for what it is worth; at least it shows that the educated American can become a versatile polyglot, when he wishes to, and make it pay.

Men of the Fergusson and Carpenter type had a chivalry of their own making. All during his service in the government, Carpenter kept *Box A*, into which he tossed a copy of every document he handled (and they were thousands, of the most important) and notes of his own on special incidents and the character and conduct of men and officials—notes showing when they wobbled, when they failed to play the game, or maybe when they did play it magnificently—the good and the bad together, all in the tell-take *Box A*. This, altogether, was a priceless record, an exhaustless treasure for the historian and the novelist alike, and for the biographer. And what, in the end, did Frank Carpenter do with *Box A?* Upon leaving Manila, or somewhere upon his route home to Boston, he opened it up and destroyed, personally, so that he would know that it was done, every paper it contained!

Some of the information was too devastating, and he concluded that the fairest way was to consign it all to limbo without discrimination. So, though there is much of history left in Manila, there is no *Box A*; and as a consequence, many a reputation, otherwise perilous, is secure of historical renown. The oldtimers were about the last of the Victorians, not the early of Albert's happy days, but the late, of the God-fearing widow—of that contemporary American period that doted upon Howells and started Teddy trust-busting. They had a certain code to which they held, a peculiar mixture of sin and saintliness that dated them with the period the internal-combustion engine put an end to.

Such were the Americans who occupied Manila and stayed to found the new community.

A toast to their pluck and their virtues. As to their vices, if such they had or have—for many are our neighbors still, and many seek nepenthe of Manila days in the homeland—overboard with *Box A!* If there are permanent American objects of history in Manila, they are mostly of their building. It is very hard to write even a little, reminiscently, without digressing to pay them deserved honor.

The above was hastily prepared, hence its discursiveness, as an address to the Manila Sojourners' Club, May 28.—*Ed.*

Manila's Bañgos—Milkfish—Industry

This article is extracted from the paper on the bangos industry of the Philippines published in the current number of *The Philippine Journal of Science*. It is the work of Herre and Mendoza, and for complete data the reader is directed to it. Obviously, an industry dating from unknown antiquity, which engages a goodly share of the capital of the islands' senate president, and altogether, only in the environs of Manila, ₱45,000,000, is something to know something about. The same industry flourishes in the Dutch East Indies. There it is wholly in the hands of the Chinese, and here Filipinos have an important if not a major share of it. The native words *garonĝin* and *hatirin* apply to the bangos, the milkfish of English, at varying stages of growth.—Ed.

Of more than sixteen hundred kinds of fishes recorded from the Philippines, bangos is the first in importance. It is by far the leading fish in Manila markets, and is the product of an industry in which over 45,000,000 pesos are invested around Manila Bay alone. Bangos is the daily staple animal diet of tens of thousands of Manilans, and in the typhoon season is the only cheap fish available. Bangos is shipped almost daily either by train or motor truck from Hagonoy, Bulacan, Navotas, and Malabon to various towns of Mountain, Pangasinan, Tarlac, Nueva Ecija, Bulacan, Pampanga, Laguna, Batangas, and Tayabas Provinces. In the interior towns of the above-named provinces bangos in all forms finds a very good market and plays an important part in the diet of all classes.

In suitable natural localities, with fairly favorable marketing facilities, the culture of bangos is one of the most profitable industries in the Philippines. Throughout a large part of the Islands one monsoon may bring a glut of fish to the shores, with a corresponding scarcity during the opposite monsoon. In every such locality bangos ponds are desirable and profitable, if the countryside is at all thickly settled, even though there is no large town close at hand.

The bangos feeds upon diatoms and other plankton organisms, the leaves of submerged flowering plants, and algæ; it consumes large quantities of the filamentous green algæ. The fry feeds upon plankton and the surface scum on the muddy bottom of quiet shallow bays and tidal creeks. When food is plentiful the bangos grows very rapidly.

The bangos is among the most prolific of fishes. One of the ovaries of a ripe female taken in Subic Bay on April 10, 1927, measured 330 millimeters in length, 89 in extreme breadth (35 at the anterior, and 24 at the posterior, extremity), 40 in extreme thickness, and weighed 450 grams. The other ovary was equally large but had been damaged in removal. Bangos eggs are very small. The ovaries of this specimen contained 3,415 eggs per gram. One ovary contained about 1,530,000 eggs; therefore, the fish had about 3,060,000 ripe eggs ready to spawn. This fish was about three-fourths of a meter in length. It is a safe assumption that fish half again as large would contain many more eggs.

In Batavia, Java, Dr. A. L. G. Seunier examined the roe of a fish 1,120 millimeters long, including the caudal fin (probably about 940 or 950 millimeters in real length). The roe weighed 1,304 grams, and one gram contained 4,370 eggs, making a total of about 5,700,000 eggs in the whole roe.

It seems probable that a bangos never contains less than a million and a half eggs, and that a very large female may have in excess of 7,000,000 eggs. Bangos average 3,000,000 eggs and can only be exceeded, if at all, by the cod, which has been known to have about 9,000,000 eggs.

The minute bangos fry swim in vast shoals near the shore line of shallow sandy coasts and enter estuaries and tidal creeks. They come in with the advancing flood tide and go out with the ebb, and therefore are always surrounded by fresh, cool, but shallow water. A knowledge of this fact is fundamental to the successful culture of bangos.

The capture of bangos fry (kawag-kawag in Tagalog) is a very important industry. The flat sandy coasts of Balayan and Batangas Bays, Batangas Province, Luzon, furnish by far the largest quantity. The annual license fees for catching bangos fry in Batangas Province during April, May, and June amount to about 100,000 pesos. The fry captured are shipped to Malabon and other points on Manila Bay, there being no bangos ponds in Batangas Province.

The fry are caught in exceedingly fine-meshed nets, made of coarse sinamay (abacá cloth). Most of them are caught from the middle of April to the latter part of June, but they can sometimes be caught during the early part of July.

When captured, the fry are about 10 millimeters long and exceedingly slender. They are so small and transparent as to be nearly invisible. As soon as possible they are placed in low, wide-mouthed, pot-bellied, unglazed, earthenware jars (palayok or palyok), some of which have a capacity of about 15 liters each, and others 30 liters. From about 1,500 to a little over 2,000 fry are placed in the 15-liter jar and 3,000 to 3,500 in the 30-liter jar. The jar is then covered with a piece of the base of a leaf stem, or petiole, from the areca, or betel-nut, palm. This is the most critical stage in the handling of bangos. A little carelessness may ruin the whole stock in the jar. The jar should be kept filled with clean water so that the fry may move about freely, and should be handled carefully to avoid injuring the tender fry.

After the dealer has sorted the fry, the purchaser counts them. Manifestly, it would be impracticable to count the fry in all the jars, which sometimes number 500, so an average is usually taken by counting the contents of ten jars. In counting the fry a wide-mouthed china bowl is dipped into a jar and filled with water and fry. Then a clam shell is dipped into the china bowl and several fry are taken up in it. The counter calls out the number of fry in the clam shell and the number is checked by two tellers. This operation is repeated until all the fry in the jar have been counted. When all

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the fry in the selected jars have been counted the total number is divided by 10 and the result thus obtained is taken as the average number of fry in each jar. The average multiplied by the total number of jars gives the total number of fry in all the jars.

Fry are bought and sold by the ten thousand, or lacsa. The price varies at present (1927) from 15 to 50 pesos per ten thousand, according to the season and place. In general the price is lower in the vicinity of Malabon, and higher in Bulacan, Pampanga, and Bataan; it is also higher early in the season as the best fry are then available. The danger of heavy rainfall during the latter part of May and in June also reduces the price, since heavy rains cool the ponds and reduce the salinity of the water, weakening or even killing the fry.

According to the belief of old men in Batangas Province, bangos fry originate in the following way: When the water is dried up and the soil exposed in swampy places in the interior, during the dry season, the ground is heated by the sun and stirred into life. Light rain falling on it then causes the fry to form, and they are washed down by the river into the sea. As proof of their story the narrators point to the abundance of bangos fry in the mouths of creeks and rivers.

In many parts of the Visayas and Luzon it is believed that bangos, and also buan-buan and bid-bid, are generated spontaneously in fishponds. This is because the minute fry, entering with the flood tide, are overlooked.

The bangos fishpond industry is really a major industry, and is a source of large revenue to the government of several provinces, even to some that have not a fishpond within the boundaries. Bulacan Province, with 3,193 hectares of land devoted to the fishpond industry, receives 118,000 pesos annually from taxes on its fishponds; while Batangas Province, with no fishpond within its boundaries, collects about 100,000 pesos from municipal licenses for catching bangos fry. These fry are sold to growers about Manila.

It is impossible to state the exact amount of land devoted to fishponds about Manila Bay, but the approximate areas in the various provinces are as follows: Rizal Province, 3,193 hectares; Bulacan, 16,700; Pampanga, 14,200; Bataan, 4,000; Cavite, 659.

The market value of bangos ponds about Manila Bay varies from 500 to 2,500 pesos per hectare. The value of a pond depends upon the distance to market; the distance to the open bay; the volume of water and its depth in the adjacent river or creek; the age of the pond; the quality of the soil in relation to the growth of lumut; the cleanliness of the pond, that is, its freedom from mud, grass, brush, etc.; and the liability to flooding by fresh water.

In general, bangos ponds are more valuable in Malabon, Navotas, Obando, Bulacan, and Hagonoy and decrease in value as the distance from Manila increases. A conservative estimate of the value of the bangos fishponds in the provinces listed above is over 45,000,000 pesos.

In Iloilo and Capiz Provinces there has been a rapid increase in the number of fishponds during the past few years and there are now about 900 hectares in operation, with an approximate value of 600,000 pesos. If the value of fishponds in Zambales, Pangasinan, La Union, Cebu, Oriental Negros, and other provinces is added, it is found that more than 46,000,000 pesos are invested in fishponds in the Philippine Islands.

The returns from bangos ponds vary greatly and depend upon the management, the distance to market, the cost of transportation, and the weather conditions.

The best fishponds, carefully managed, yield an annual income of 300 pesos per hectare. There are only a few owners, however, who get such good results. Some ponds bring in about 250 pesos per hectare; only ponds kept in very good condition do this well. Third-class ponds make a profit of 200 pesos a hectare each year. Ponds kept in good condition should do better than this, unless they are far from a good market and have poor transportation.

Salt-water fishponds in which bangos are reared are called "plaisdaan" in Tagalog, "pocóc" in Pangasinan, "pocóc," "potót," and "lapát" in Ilocano, and "ponong" in Visayan. They vary in size from one-eighth of a hectare to 68 hectares as on the estate of Carlos Palanca, near Hagonoy, Bulacan. A system of fishponds under one management may contain hundreds of hectares, as the Ayala and the Carlos Palanca estates in Bulacan and Pampanga.

Large areas of swampland or tidal flats suitable for fishponds occur along the sea coast in many localities in the Philippines. In general, four factors are of prime importance in choosing a site; namely, the soil, the vegetation, the proximity of a deep tidal stream, and the market.

The vegetation.—The ideal land for a fishpond site is peat or tule land, as there is practically no clearing to do. As soon as the dikes and the sluice gates are built everything is ready for use. The commonest type of salt-water swamp in the Philippines and next best for fishpond purposes is nipa-swamp land. The nipa palm is easily cut off. It is not necessary to remove all the plants and stumps before using the land for a fishpond; in fact, it is often advisable to leave a few trees for shade. When the leaves are kept cut off and the terminal bud is destroyed the nipa plant soon dies. The stump rots quickly and is then easily removed.

The main part of the pond may be very shallow, the water over most of it with a depth of perhaps half a meter. Around the margins where the earth was removed to form the dikes it is, of course, deeper. In large ponds two more ditches are dug, each one connecting the centers of opposite sides of the rectangle and intersecting each other at right angles. All these ditches should be made with the bottom sloped so that all the water will drain readily to the outlet of the pond. Ponds of great extent may include part of a creek or even several small creeks, in which the water may be two to several times deeper than elsewhere. Such channels are beneficial in providing cool areas for the fish to lie in when not feeding and are convenient when it is necessary to do repair work or clean a pond, as the fish can retire to them when the rest of the pond is partially or wholly bare.

A bangos pond is of necessity divided into several compartments or made up of several connecting ponds which are operated as a unit. A fishpond should be divided into not less than four smaller ponds, or compartments, and as many more may be made in large ponds as are found necessary. These ponds naturally vary in size and depth, since they must accommodate fish of different sizes and are used for different purposes. One of the ponds in the systems should be very much larger than any of the others. Where the total area is small and there are but four or five divisions in all, the largest division should be as large as all the rest taken together. In a fishpond system of any size it is necessary to have a small catching pond, into which the fish are led when they are to be caught for market.

In addition to the main sluice gate or gates, it is necessary in a good fishpond system to have small sluice gates of simple construction placed here and there to allow water and fish to pass from one pond to another.

After the dikes, cross dikes, sluice gates, and other gates have been constructed and the pond system is completed, there are expenses not yet mentioned. There must be a caretaker close at hand at all times.

The caretaker must have a house of some sort. It is usually placed near the main sluice gate. The house may be a bamboo and nipa shed costing a few pesos or a well-built, modern cottage costing several hundred pesos. In many places an artesian well is necessary to provide drinking water. The cost of drilling a well is from 150 to 200 pesos. The usual wage received by the caretaker is 40 pesos a month, and often a liter of kerosene a week in addition. Some owners pay as little as 150 pesos a year; needless to say they do not get first-class service. Large systems of fishponds, ranging from 200 to 800 hectares in extent, pay good salaries to the resident manager, up to 350 pesos a month including a good house, light, and a motor boat for inspection trips. A fair average salary for the foreman in charge of a fishpond system of moderate size, 15 to 60 hectares, is 45 pesos a month.

Laborers must be employed to inspect and repair the dikes: to destroy snakes, crabs, and

(Continued on page 12)

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Manila's Bañgos—Milkfish—Industry

(*From Page 9*)

other vermin; to kill or scare away fish-eating birds; and to assist in transfering young fish and catching those marketable, changing water in the ponds, repairing nets, and the rest of the daily routine. Wages are from 1 to 1.50 pesos a day, depending upon the locality; near Manila they are higher, and in outlying provinces they may be much lower.

Several small bancas and one or more large ones will be needed for transportation along the river and in the canals and ponds. The number will vary with the size of the establishment and the number of workmen. Large drag nets, or seines, will be needed for catching marketable fish. Small fine-meshed nets (panagap) are needed to catch hatirin; these nets are from 6 to 8 meters long and 3 or 4 meters wide. Large long-handled dip nets are used for many purposes, and several of the square dip nets (bitinan) will be needed when hatirin are caught. Small fine-meshed baklad are necessary for catching shrimps, or ulang and sugpo, and various kinds of crabs such as alimangŏ and alimasag. All told these will cost from 100 to 200 pesos.

A large fish-pond system will need a motor boat to carry the fish to market, bring supplies, and make inspections. With a motor boat the owner can market his fish without delay and in first-class condition.

The number of fish per hectare in ponds stocked for market depends upon the condition of the pond. The usual practice is to overstock. Carefull growers when making the final allotment usually put in 1,000 hatirin for each hectare of pond in good condition. A pond in excellent condition where everything is favorable, as the Ayala ponds at Macabebe, Pampanga, can carry from 1,500 to 2,000 hatirin or garonğin per hectare till ready for market.

Harvest time in bangŏs ponds varies widely according to the management and also the locality. There are two plans in general use; namely, harvesting once a year and harvesting twice a year. To say that the bangŏs are marketed but once a year is a misstatement, since under this system they are really harvested from the end of May to the close of the rainy season in September. When the fish are taken from a pond it is drained and a new growth of lumut started unless the pond already has a luxuriant growth of algæ. It is then promptly restocked with the requisite number of hatirin or garonğin, so that very little time is lost from the use of the pond. The bangŏs harvested under this method weigh from 400 to 600 grams, with an average of 500 grams, and sell at from 25 to 42 centavos each, according to the state of the market.

Occasionally a few bangŏs escape when the rest are harvested and remain uncaught for another year. By the end of the second year they will weigh between 1 and 2 kilograms. Such bangŏs are called "laón."

When the owner follows the method of harvesting bangŏs twice a year hatirin are placed in the pond during May or June and marketed from the end of September through the month of October. Then the pond is drained, the ground freshly prepared, and the pond restocked with garonğin which are harvested in April and May. The bangŏs reared under this method should reach a weight of 300 to 500 grams and sell for 20 to 35 centavos each.

The term *harvest* appears in the text: the industry is rated farming and is not taxed under the revenue law.—*Ed.*

Your Will

By Max J. Cavanaugh*

This would be a rosy world were it not for the worries some of us bequeath to the rest of us. Among worries that need not be passed on, and which cause more distress, more annoyance, more actual dollars and cents loss than any others, are those arising from the failure to make a will.

No man likes to think that after striving to build up an estate, it will be found after he has gone that he has been careless of his family's welfare. Yet, if he dies without making a will, he casts his property and the future of his dependents into the hands of the law, shackled by the inflexible, arbitrary statutes of the state in which he lives.

In most instances, men who fail to make wills also fail to inform themselves how the law will operate in the distribution of their own estates.

The court must charge someone with the burdensome and difficult task of administering an estate. If no will is left the family's welfare must depend largely upon the ability, experience and prudence of some near relative, appointed under statutory designation, who may or may not be qualified, or upon the public administrator.

These conditions and the results likely to follow are consistent neither with ordinary business judgment, nor with the love and consideration a man has for his family. No man deliberately intends them. They are, however, the certain consequences of neglect and procrastination. The right to make a will is a privilege the law gives to him who prefers to impress his own judgment and desires upon the disposition of the property his life efforts have accumulated or which has descended to him by inheritance. It assures him that his own wishes, and not the arbitrary and inflexible provisions of the law applicable to persons who die without a will, will govern the distribution of his property.

*Data derived from exchanges of the International Banking Corporation, Mr. Cavanaugh being in the Manila office.

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