

finally in the much smaller rate of mortality. Microscopical examination of the blood will exclude malarial and recurrent fevers. There are usually no symptoms which point to tuberculosis, malignant endocarditis, internal suppuration, or liver abscess. The urine and sputum are negative.

TREATMENT.—This consists principally in prophylaxis. All the sanitary arrangements of the house should be carefully gone over and put in healthy condition. Personal health should also be attended to. There is no specific medicinal treatment known for combating this fever and drugs are not of much avail. Quinine and the salicylates have been extensively used but with no beneficial influence. On the contrary, the effect has been deleterious when pushed as they have been. A careful diet and hydrotherapy are our main reliances.

Clarence Arthur McWilliams.

MALVA and MALVACEÆ.—This large family, of some thirty-three genera and nearly a thousand species, has yielded a large number of articles to the *Materia Medica*, besides *cotton* and *marshmallow*, which are elsewhere described. The most important of these substances are the leaves and flowers of the Hollyhock, *Althaea rosea* (L.) Cav., and of various species of *Malva*. All have been used chiefly as demulcents, for the mucilage with which they abound, the flowers also for their coloring matter, in coloring tinctures and other preparations. Their properties are thus of the simplest possible character and this brief mention is accorded them on historical, rather than on any practical grounds.

Henry H. Rusby.

MANACÁ.—*Mercurio Vegetal*. Preferably the root, but also the stem, of *Brunfelsia Hopeana* Benth. (fam. *Solanaceæ*).

It contains resin, gum, tannin, and probably an alkaloid, in small amount.

Manacá is a well-accredited drug throughout Brazil in the treatment of syphilis, but this repute is apparently due, for the most part, to erroneous diagnosis. It is also credited with antirheumatic properties. Several attempts have been made to develop its use in this country, but with little permanent result. There is, however, a small steady sale for it and its preparations. Certainly, when given in large quantity it has very active properties, being purgative, diaphoretic, and narcotic. Its continued use by those who have had experience with it at least justify a credence in some alterative virtues. The dose is 0.45 to 2 gm. (gr. viij.—to xxx.).

Henry H. Rusby.

MANGANESE.—I. GENERAL MEDICINAL PROPERTIES OF COMPOUNDS OF MANGANESE.—In their medicinal relations the compounds of manganese divide into two distinct groups, the one in which the metal is the basic radical of the compound, the other in which, on the contrary, it is the acid radical. The compounds of the former group, after absorption, probably affect nutrition after the general manner of the heavy metals, tending in small dosage to improve blood quality and quicken general assimilation, and, in large, to derange the nutritive processes, leading to emaciation and nerve-poisoning. Locally, the effects differ with the individual compounds according to their solubility. Therapeutically, the constitutional influence of manganese has been sought as an adjuvant to that of iron, largely upon theoretical grounds, because of the alleged presence of manganese, in small quantity, in association with iron in the composition of hemoglobin. Doubtless the influence in cachectic states is good so far as it goes, but doubtless also it is, in degree, insignificant as compared with that of iron, with which medicine manganese is, for the present purpose, almost invariably prescribed. Physicians generally have, therefore, failed to see the necessity for combining a salt of manganese with their chalybeates. Locally, the therapeutics of the compounds of manganese are individual to the compounds, and will be detailed below.

The second division of the manganese compounds, where the metal occurs in the acid radical, is represented in medicine by but a single salt, namely, *potassium permanganate*, whose virtues inhere mainly in the property of permanganates to act as oxidizing agents, as will be set forth further on.

II. THE PREPARATIONS OF MANGANESE USED IN MEDICINE.—These are, of manganese as basic radical, *manganese dioxide* and *manganous sulphate*, and of the metal as an acid radical, *potassic permanganate*.

*Manganese Dioxide*:  $MnO_2$ . This compound, commonly known as *black oxide of manganese*, is a native mineral, and of a quality representing at least sixty-six per cent. of the pure oxide, is official in the United States Pharmacopœia under the title *Manganum Dioxidum*, *Manganese Dioxide*. The mineral differs a good deal in appearance according to the source from which it is derived. It occurs sometimes in metallic-looking lumps, sometimes in fine shining crystals—the form in which it is purest—but yet is most commonly found in the condition of powder. This powder is heavy, grayish-black in color, more or less gritty and without odor or taste. It is insoluble in either water or alcohol. At a red heat it gives off oxygen gas. Manganese dioxide, as usual with the insoluble metallic oxides, is locally bland, and in the stomach tends to allay irritability of that organ. Continuously given, it is capable of absorption, with constitutional effects of manganese. Medicinally, the oxide has been applied in skin disease, in ointment (twenty-five per cent. strength), and has been given internally in gastric irritation; but its grittiness makes it an unpleasant medicine to take in form of powder. The average dose is 0.65 gm. (gr. x.) three times a day. Much more important than any medicinal application is the use of the dioxide in the laboratory, in the preparation of oxygen gas, chlorine, and also of iodine, when the latter is obtained from kelp.

*Manganous Sulphate*:  $MnSO_4 \cdot 4H_2O$ . The salt is official in the United States Pharmacopœia as *Manganum Sulphas*, *Manganese Sulphate*. This salt occurs in colorless or pale rose-colored transparent prismatic crystals, which may contain variable proportions of water of crystallization according to the temperature of the mother solution. The Pharmacopœia recognizes crystals containing four molecules of water of crystallization. The salt dissolves in less than one part of water, cold or boiling, but is insoluble in alcohol. It effloresces slightly in dry air and should be kept in well-stoppered bottles. Manganous sulphate is sharply irritant and specifically purgative, and has the reputation of being also specifically cholagogue. This latter reputation is based largely on an old assertion of C. G. Gmelin, that in experimenting with animals with the salt, a considerable outpouring of bile was determined. Rutherford's later and careful experiments, however, failed to produce a like effect. In large dose, manganous sulphate is an irritant poison. Medicinally, the purgative and alleged cholagogue action have been utilized by some prescribers, but since the salt is harsh in action and disagreeable to the taste, its use as a medicine has not found much favor. From 0.65 to 1.30 gm. (gr. x.—xx.) is a full purgative dose, not to be exceeded.

*Potassium Permanganate*:  $K_2Mn_2O_8$ . The salt is official in the United States Pharmacopœia as *Potassii Permanganas*, *Potassium Permanganate*. It occurs in deep purple-violet, or nearly black, needle-shaped, rhombic prisms, of a metallic lustre, without odor, but with a sweet, afterward disagreeable, astringent taste. It is permanent in the air; dissolves in 15 parts of cold and in 3 parts of boiling water, and is decomposed by alcohol. Weak solutions of potassium permanganate are of a delicate rose color, which should be free from tinge of green. Strong solutions are of deep purple, and have the troublesome property of staining, not only fabrics, but the skin; and even porcelain-ware will be colored a rusty purple under sufficient contact. Potassium permanganate in strong application is irritant and even caustic, but its medicinal application hinges mainly on its peculiarity

of being a powerful oxidizing agent, because of the ready disengagement, in presence of oxidizable matters, of a portion of the oxygen of the permanganic acid. By virtue of this property the salt promptly destroys fetor and fetid materials as such, and is one of the most efficient agents known for such purpose. Its disadvantages are its comparative costliness and proneness to stain. Because of its oxidizing tendency, it is necessary to keep the compound in well-stoppered bottles, and to avoid admixture with it of organic or other easily oxidizable matters. Trituration of the crystals with inflammable substances may even determine explosions. Potassium permanganate is a valuable detergent for foul surfaces, as of sloughing wounds, ulcerated cancers, etc., and is applied in aqueous solution ranging from one-fifth per cent. to four per cent. in strength. The weaker solutions are used where a mere deodorizing is sought, the stronger where a vital action also is desired, as in the case of gangrenous ulceration. To sweeten foul drinking-water a solution of the salt may be added to the water gradually, so long as the color is discharged on stirring, a circumstance that will continue as long as any organic matter remains unoxidized. So soon as the coloration persists, even in faintest shade, further addition is to be discontinued. The small percentage of permanganate then remaining in excess will neither be perceived in taste, nor will it do any harm. Solution of the permanganate is an excellent disinfectant by which to cleanse and sweeten water-closet traps, etc. For this purpose the impure salt, which is much cheaper than the pure, may be used. A drachm or so of the impure crystals may be dropped into the water of a water-closet trap and allowed to remain for a few minutes, when the trap should be flushed. Care should be taken not to leave a strong solution in contact with marble or porcelain for any length of time, lest staining occur. Potassium permanganate has been used internally in zymotic diseases, presumably with the idea of chemically assailing the virulent essence of the same; but inasmuch as any allowable dose of the salt must inevitably exhaust its oxidizing capacity while en route through the organic matters of the alimentary canal to the vascular system, the practice has not even a sound theoretical basis to justify it. The doses given are from 0.015 to 0.06 gm. (gr.  $\frac{1}{4}$  to i.) three times a day, taken in solution in distilled water. More recently, Ringer and Murrell have announced success with the internal use of potassium permanganate as an emmenagogue, giving the medicine in doses of a grain, increased to two grains, three or four times a day. Similar success has since been reported by a number of other practitioners, and success also with certain cases of menorrhagia and metrorrhagia, as well as of amenorrhœa (F. H. Martin). The medicine is best borne in pill form, but even when so taken occasionally produces a good deal of gastric distress. Because of the powerful oxidizing property of the permanganate, care must be taken in the selection of excipients for making the medicine into pills. The following has been recommended as an excipient: "Vaseline, two parts; paraffin-wax, one part; melt, stir till cold, and add kaolin, three parts; mix well." The pills, after being made, are to be dusted with kaolin.

The permanganate decomposes alkaloids, by oxidation, and has been recommended, accordingly, for internal giving in cases of alkaloidal poisoning, in order to destroy such of the poison as may still be present in the stomach. Similarly it has been recommended to inject a solution of the permanganate into the tissues of a part bitten by a venomous snake, if the application can be made soon after the infliction of the bite.

Edward Curtis.

MANGANESE SALTS, TOXICOLOGY OF.—The salts of manganese are in general feeble poisons, though some of them have decided toxic action. After subcutaneous injection, excretion occurs chiefly by the kidneys and mucous membranes of the stomach and intestines. Manganese compounds have been found in traces in the hair, urinary calculi, and gall stones.

Manganese oxid ( $MnO$ ), in doses of 6 to 8 mgm. per kilogram, administered to dogs proved fatal in two days; 13 to 24 mgm. per kilogram caused death in twenty-four hours.

Manganese dioxid ( $MnO_2$ ), used in paints, has caused paralysis of the arms and legs and of the organs of speech that either disappeared after several years or not at all.

Manganese sulfate caused vomiting in dogs, and paralysis in rabbits, and after being injected into the veins, it produced vomiting, loss of appetite, and tetanic cramps. Four grams caused death in rabbits.

Manganese-sodium basic citrate caused symptoms similar to those due to the sulfate, with paralysis of the vaso-motor centres, icterus, loss of motor power and sensibility, and coma.

Manganese carbonate, from experiments on rabbits, appears to be non-poisonous.

Potassium permanganate, in a quantity of from 15 to 20 gm., caused death in twenty-four hours in a case of suicide. After the internal medicinal use there have been observed pain in the mediastinum extending to the stomach, vomiting, and abortion. The application of a four-tenths-per-cent. solution to the mucous membranes caused inflammation, hemorrhage, and suppuration. In cases of poisoning by manganese salts, evacuation of the stomach, intestines, and kidneys by emetics, purgatives, and diuretics, and the use of heart stimulants when indicated, offer the best treatment.

To recover manganese from the tissues, these are treated as in the method of Fresenius and Babo, and after the removal of any metals whose sulfides are insoluble in acid solutions the filtrate is rendered alkaline with ammonium hydroxid and the manganese precipitated with ammonium sulfid as flesh-colored manganese sulfid. Re-solution and reprecipitation will doubtless be necessary to remove the last traces of organic matter.

Curtis C. Howard.

MANHATTAN ARTESIAN WELLS.—Riley County, Kansas.

POST-OFFICE.—Manhattan. Hotel.

These wells are located in a hilly country, eleven miles southeast of the town of Manhattan, and at an elevation of about 800 feet above the sea level. The wells are two in number, and discharge about 24,000 gallons of water daily. This is of the sulphated-saline variety, and has a uniform temperature of 55° F., summer and winter. The following analyses were made by Professor Failyer of the Kansas Agricultural College:

WELL No. 1 (MINERAL WATER).

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Calcium oxide (as bicarbonate).....	5.27
Calcium oxide (as sulphate and chloride).....	33.36
Magnesium oxide (as sulphate).....	5.65
Iron oxide (bicarbonate).....	.18
Sodium (as chloride).....	.51
Potassium.....	Trace
Sulphuric acid (anhydrous).....	61.36
Chlorine.....	1.46
Bromine.....	Trace
Silica.....	10.00
Lithium.....	Trace
Total.....	117.88

WELL No. 2.

ONE UNITED STATES GALLON CONTAINS:

Solids.	Grains.
Calcium oxide (as bicarbonate).....	6.07
Calcium oxide (as sulphate).....	14.69
Magnesium (as sulphate).....	6.58
Iron (as bicarbonate).....	.24
Sodium (as chloride).....	.86
Potassium.....	Trace
Sulphuric acid (anhydrous).....	33.11
Chloride.....	1.79
Silica*.....	10.18
Total.....	73.52

\* According to United States Geological Reports Well No. 2 contains 1.19 grains of silica per United States gallon.

The waters have been in use since 1884, and have been found beneficial in rheumatism, malaria, renal disorders, constipation, general debility, and diabetes. The waters themselves, as well as the salt remaining after evaporation, are used commercially. *James K. Crook.*

**MANILA AND THE PHILIPPINES.**—The Philippine archipelago is situated between 4° 4' and 20° 3' north latitude and 116° 4' and 126° 4' east longitude, Greenwich. On the east and northeast is the Pacific Ocean and on the west and northwest, the China Sea. In general shape the archipelago may be likened to an inverted Y, having its base, the island of Luzon, to the north, its major branch, the islands of Samar, Panay, Negros, and Mindanao, diverging to the southeastward, and its minor branch, the narrow island of Palawan, diverging to the southwestward. Between these two branches is the Sulu sea, partly enclosed to the southward by the north-east shore of the large island of Borneo and a chain of small islands stretching from Borneo to the southwest extremity of Mindanao, the Sulu archipelago. Farther south of the archipelago, about 300 miles, are the Celebes, and a little less distant on its north is the island of Formosa. The nearest point to the China coast is 890 miles from the most northern extremity of Luzon. According to the report of the United States Philippine Commission (Washington, 1901), the number of the islands comprised in the cession to the United States is believed to exceed 1,400; other authorities have variously estimated the number from 600 to 1,200 or more. By far the most of the members of the archipelago are small, and very many are insignificant both in size and economic importance. The total estimated area is, in round numbers, 130,000 square miles. The principal islands of the Philippine group are:—

	Sq. miles.		Sq. miles.
Luzon.....	40,000	Leyte.....	3,000
Mindanao.....	47,000	Negros.....	3,200
Samar.....	5,300	Cebu.....	1,600
Panay.....	4,600	Masbate.....	1,300
Palawan.....	4,200	Bohol.....	900
Mindoro.....	4,000		

The Sulu Islands, or archipelago, before referred to, are estimated as containing 1,500 square miles.

**History.**—The Philippines were discovered by Magellan, March 12th, 1521, in his memorable voyage of circumnavigation, and on April 27th of the same year he was ingloriously killed in a skirmish with the natives on the little island of Mactan, off the east coast of Cebu. Magellan took possession of the archipelago in the name of the king of Spain. In 1565 Legazpi founded in the island of Cebu the first Spanish settlement, and in 1571 fixed the capital of the islands at Manila. The archipelago was for some time known under several appellations. Its present name (*Islas Filipinas*) was suggested by Villalobos in 1543, but it first appeared in written form in 1567 in a letter of Legazpi's. The archipelago appears from the first to have been virtually turned over by Spain to the different orders of the Roman Catholic missionaries, and its conquest and civilization from thence on were practically accomplished by them. The political history of the islands, so far as relates to their foreign relations, with the exception of the capture of Manila by the English in 1762, and its subsequent restoration in 1764, is uneventful until the year 1898. The United States having declared war against Spain, April 24th, 1898, Admiral (then Commodore) Dewey, commanding the United States naval forces in Asiatic waters, entered Manila Bay, May 1st, 1898, and in the most signal engagement in naval annals completely destroyed the Spanish fleet gathered for the defence of the Philippines. The city of Manila was then closely invested by the United States naval vessels on water and by the insurgent Filipino forces on land. Upon the arrival of land troops from America, a combined land and water attack, more a demonstration to satisfy Spanish honor, was made and Manila surrendered to the United States forces

August 13th, 1898. By the treaty of Paris, December 18th, 1898, Spain ceded the Philippines to the United States. In 1899 the Filipinos, who had been in a chronic state of insurrection against Spain since 1896, becoming dissatisfied with the American policy, commenced overt hostilities February 4th, 1899. Since then engagements of more or less seriousness between the Americans and the insurgents have taken place. The latter, after their first few unsuccessful engagements in open battle, abandoned any attempt at organized warfare and resorted to that of the guerilla and bushwhacker. This kind of warfare has lingered on, much to the distraction of business in the islands, but fortunately at the present time (July, 1902) the prospects of the pacification of the archipelago appear nearing consummation. The domestic history of the islands previous to their American occupation appears to have been but a repetition of the misgovernment and official corruption so characteristic of all of Spain's colonial history.

**Population.**—The estimated population of the Philippines is 8,000,000 inhabitants. Of this number, excluding soldiers and sailors, about 25,000 are either Americans or Europeans, and about 100,000 are Chinese, and the remainder natives. The native population is represented by three distinct races, and in varying degrees of racial purity—namely, Negritos, Indonesian, and Malayan. The Negrito, the lowest race in the ethnologic scale, is now found pure only in the forests of the high mountains of Luzon, Panay, Negros, and Mindanao. From present indications the race will soon become extinct. The Negrito is small in stature, from 4.2 to 5.2 feet in height, with skin intensely black, hair short, crisp, curly and of a sooty blackness, lips thick, nose of medium size, flattened and broad at its base. Making no preparation for future wants, content to sleep where night overtakes him, armed only with a bow and arrows, the Negrito is the typical nomad and savage. The pure Indonesian is found only, as far as known, in Mindanao. The type is described by Dr. Montano as of considerable height, muscular development, high forehead, aquiline nose, wavy hair, and in the male abundant beard. The color of the skin is quite light, the individual clever and intelligent. The Malayan is difficult to characterize, because of more or less intermixture that has taken place in the race with that of the Negrito, Chinese, and Indonesian. On the whole, the Malayan is not so tall as the Indonesian, his skin is darker and his nose straighter. He has a medium to large-sized mouth, thick lips, black, straight, thick, and coarse hair, and in the male little or no beard. His intelligence is intermediate between perhaps the Negrito and the Chinese. The European mestizo is intellectually and politically the most important member of the native population, and is found everywhere throughout the archipelago, but is most numerous in the important cities and towns.

With the exception of tribes in the interior of the larger islands most of the Filipinos are civilized and in a certain sense Christianized. Human sacrifices are stated to be practised by at least two tribes in central Mindanao, and head hunting is engaged in by some of the north Luzon tribes. The primary educational advantages offered to the Filipinos under Spanish domination were limited in the extreme. The number of teachers to population averaged something like one teacher to 3,500 inhabitants. A few schools, however, of good standing existed in Manila. For an education higher than that obtainable in the primary school the facilities appear to have been a little better. The Royal and Pontifical University of Santo Tomas conferred degrees in theology, philosophy, jurisprudence, and physics and chemistry. The College of San José also gave philosophical instruction, and from 1875 it conferred degrees in both medicine and pharmacy. Other schools, such as the School of Arts and Trades, of Agriculture, of Painting and Sculpture, and the Nautical School, and several theological schools may be mentioned. The standard of these schools, however, was not that of institutions of the same apparent rank in either Europe or America.

The principal export products of the islands are hemp, sugar, copra, and tobacco. The means of transportation are limited and poor. The only railroad runs from Manila to Dagupan, a distance of 120 miles. Other railroads are much needed and will do much toward developing the latent resources of the islands. Ordinary roads can hardly be said to exist—they are but little more than trails and are impassable for traffic during wet weather. Most of the important towns and islands are in telegraphic communication, and Manila is connected by cable with Hong-Kong. Labor for any enterprise is difficult to obtain. The Filipinos are not steady workers; the most reliable laborers obtainable are the Chinese, and further immigration of these is now excluded.

Manila, the capital, as well as the chief port and largest city of the Philippines, is situated on the east shore of Manila Bay, on the west coast of the island of Luzon. The city was established by Legazpi as the capital of the archipelago in 1571. The general elevation of the land is low, being but a few feet above tide water. The immediately adjacent country is more or less flat. The Pasig River, flowing from east to west, divides the city into two parts. The Bay of Manila is too large and exposed to be a safe harbor at present. It is also shallow near the city, so that vessels of great draught cannot come to anchor nearer than from two to two and one-half miles from shore and must discharge their cargoes by lightering. However, improvements are progressing, a breakwater intended to protect shipping in all weather is under way and dredging operations are making the nearer approach of large vessels possible. The population of Manila, according to the census taken by the United States military authorities in 1901, was 244,732, exclusive of the military and naval forces. This number was divided as follows: Americans 8,461, Filipinos 101,361, Chinese 51,567, Spaniards 2,382, and other nationalities 961. Under Spanish domination the city did not present much to attract visitors. The houses, with few exceptions, were described as inferior in size and appearance, the hotel accommodations miserable, the streets narrow and unpaved, or paved only with rough cobblestones, and deep in mud for three-quarters of the year and in dust for the other quarter. In contrast, however, the shops were said to be good, equal to those of Hong-Kong or Calcutta, and the prices very reasonable. The sanitary condition of the city, with the notable exception of a fairly good water supply, was execrable,—in fact, no system at all. Much has been done since the American occupation and much yet remains to be done to make Manila a sanitary city.

**Geology.**—From a geological basis of reckoning, the archipelago is of modern formation. Evidences of existing elevation and subsidence are to be seen in many places. Prof. Dean C. Worcester states that it is not unusual to have a native assure one that he now fishes where his grandfather used to live, or lives where his grandfather used to fish. Volcanoes, active and extinct, are to be found in many localities and earthquakes are of frequent occurrence, and sometimes very destructive. In 1863 the most destructive one of recent times occurred, when it was estimated that 400 people were killed and very many more injured, and 46 public buildings and 1,100 private houses were damaged or completely wrecked. All of the islands are in general mountainous, though as far as known no elevations much in excess of 9,000 feet have been discovered. Most of the ranges apparently do not exceed 1,500 to 2,000 feet in general elevation. The usual direction of the mountains is north and south. The archipelago is well watered and many of the streams are of good size. Although the Philippines have been known to Europeans more than three centuries, very little exact knowledge is possessed with regard to either their geology or their flora and fauna. Little or nothing has been done to develop the mineral wealth of the islands. Coal of good quality has but recently been discovered in Cebu. Excellent lignite has been long known to exist in Luzon, Cebu, Masbate, and Mindanao. Copper ore and galena occur in Luzon

and some other parts of the archipelago. Gold has been crudely mined in small quantities by the natives for centuries. Modern methods of extraction will doubtless greatly increase the output of this metal. Excellent iron ore is found in Luzon, but so far it has not been developed. Marble and gypsum are found in many of the islands. Free-flowing petroleum has been discovered within a few years past in Cebu, and sulphur exists almost everywhere in inexhaustible quantities.

**Flora.**—A rich soil and favorable climatic conditions give a flora of magnificent variety and abundance. The agricultural possibilities of the islands have not been developed by the primitive methods of cultivation hitherto in vogue. So far, attention has been mainly devoted to the production of hemp, sugar, and tobacco. Rice is grown fairly successfully and forms a staple food of the natives. Coffee grows readily and its quality is excellent. Recently, however, the coffee plants have been virtually ruined by the attacks of a wood-borer. Until some means of extirpating this pest are found the industry will have to be abandoned. Cotton of an inferior quality grows wild. Long-staple cotton was at one time introduced, but it was abandoned because the authorities preferred the natives to grow tobacco, then a government monopoly. Cacao, castor oil bean, coconuts, gutta-percha, potatoes, maize, rattan, and many varieties of useful palms are grown in greater or less quantities. In fact, it appears that there is no limit to the variety of agricultural products, tropical, semi-tropical, and even many of the varieties of colder climates, that may not be profitably cultivated under intelligent supervision.

The forests abound in many valuable woods. More than two hundred kinds have been considered worthy of industrial use. Fifty or more species of hard woods are known, some four of which sink in water. Many of these woods, owing to their hardness, take beautiful polishes and are, therefore, excellently adapted for cabinet work. Others possess qualities that will suit them for general industrial use.

**Fauna.**—The mammalian fauna of the Philippines is scant in indigenous varieties compared with other islands of the great Australasian group. There are no carnivorous animals of any considerable size. A small wildcat, two civet cats, and the binturong, a related species, are the most conspicuous. One species of monkey, twenty varieties of bats, a few squirrels, a species of porcupine, and several varieties of rats may also be mentioned. Several species of deer exist. The agricultural animals are the water buffalo, or native carabao, the hog, the goat, and a small pony. Cattle of an inferior variety are also found and are extensively raised for beef. The water buffalo is the native beast of all work. The ponies are excellent for travel, but are too light for heavy loads. They are supposed to be descendants of an early Spanish stock. Birds are numerous and in great variety. Jungle fowl, hornbills, and fruit pigeons are in abundance and are hunted for and much relished as food. Snipe are plentiful in rice fields and a species of swift, whose nest is prized by the Chinese for food, is found on some of the precipitous island coasts. Alligators, or crocodiles, are common and frequently attain large size. The natives show very little fear of them, although they state that when the crocodile has once tasted human flesh it will then have no other. Snakes are numerous and venomous species are found. Cobras exist in Samar and Mindanao, and pythons, though of small size, are found generally throughout the archipelago. The python in fact is maintained by the natives about their dwellings, being much prized for its rat-catching proclivities. Fish are plentiful and in great variety. The marine fish form one of the chief sources of food supply, but the fresh-water varieties are not so important in this respect. Shellfish are likewise numerous. Extensive beds of pearl oysters are fished near the Sulu Islands. From a variety of oyster are obtained the "concha," thin squares of shell used in dwellings in place of the common window glass.

Locusts, termites, and mosquitos are much in evidence. The first two are very destructive and the third most