

SOME RECENT LAUNCHINGS IN THE UNITED STATES NAVY.

The stimulus given to the private shipbuilding yards by the improved conditions under which contracts for government ships are let, the plans being in more complete condition and less subject to alteration subsequent to the commencement of work than formerly, is showing its good effect in the large number of ships that is now being launched and pushed to completion. Moreover, there is no doubt that the building of the "Connecticut" in a government yard has stirred up the private builders. The rapidity with which the "Louisiana" was built at Newport News is representative of a general quickening of work on government contracts. As immediate evidence of this, it may be noted that, following close upon the launch of the "Connecticut," as recorded in our issue of October 1, another battleship of scarcely less importance, the "Nebraska," was launched the

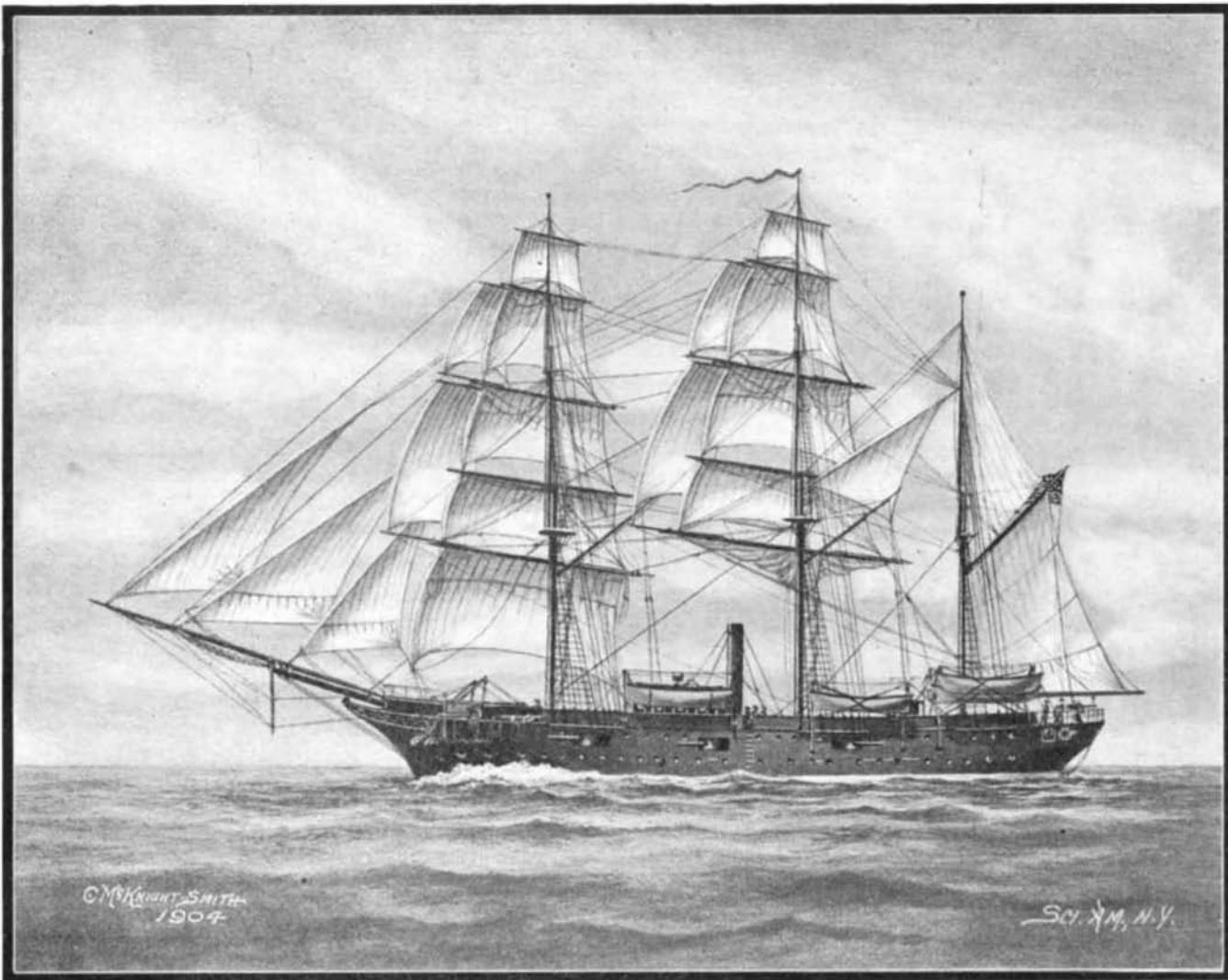
following week at the yard of Moran Brothers, Seattle, Wash., and that on October 11 three United States vessels took the water, namely, the "Georgia," a sister ship to the "Nebraska," which was launched at the Bath Iron Works, Maine; the gunboat "Paducah," a

sister ship of the "Dubuque" (whose launch was recorded in our illustrated issue of September 10) launched at Morris Heights, New York; and the wooden training brig "Boxer," which was launched at the United States navy yard, Portsmouth. The Boston navy yard

United States warship. The "Georgia" and "Nebraska" represent a class of five ships, four of which, the "Virginia," "Rhode Island," "Nebraska," and "Georgia," are now afloat, while the "New Jersey" will take the water early in November. The description of the

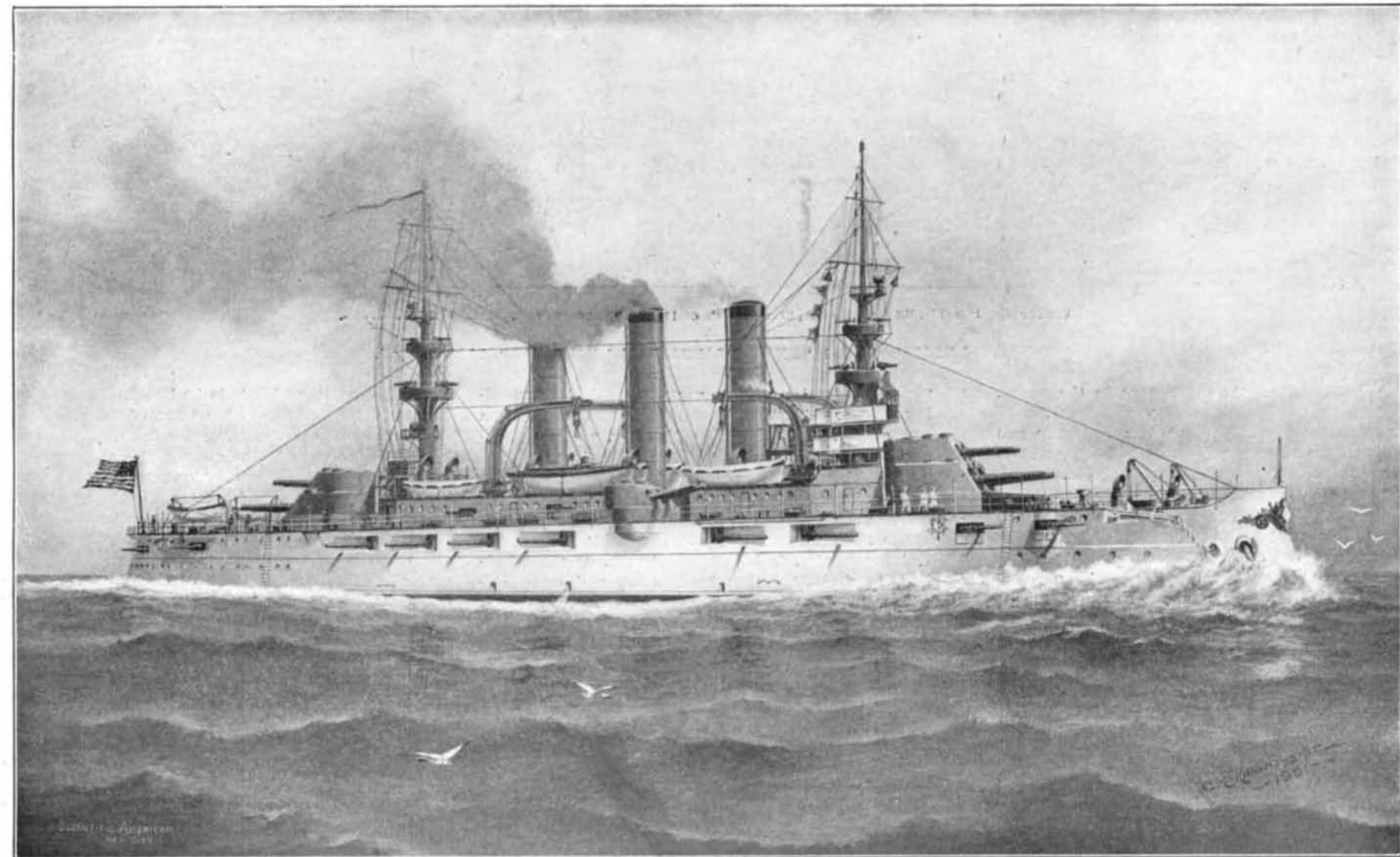
"Georgia," therefore, will answer for any one of the class, the differences being of a minor character, and chiefly affecting the displacement, which, in the case of the "Georgia," is estimated at 14,948 tons when she has all stores on board and a normal coal supply of 900 tons. As will be seen from our illustration, this fine ship, which is only about 1,000 tons less in displacement than the "Connecticut," and 15 feet less in length, is a vessel with a flush main deck, a high freeboard, and a lofty command for the guns on her main and intermediate batteries. She is protected by a continuous belt of Krupp armor at the waterline, which varies from a maximum thickness of 11 inches amidships to a minimum thickness of 4 inches at the bow and stern. She has

also a wall of side armor, which extends from the forward to the after barbette and reaches from the top of the waterline belt to the level of the main deck. This armor is 6 inches in thickness, and at the ends of the armor 6-inch bulkheads are carried athwartship



Waterline Length, 176 feet, 5 inches. Beam, 45 feet, 7 3/4 inches. Draft, 16 feet, 5 3/4 inches. Displacement, 1,800 tons.

STEEL TRAINING SHIP "CUMBERLAND," RECENTLY LAUNCHED AT BOSTON NAVY YARD.



Displacement, 14,948 tons. Speed, 19 knots. Bunker Capacity, 1,704 tons. Armor: Belt, 11 inches to 4 inches; turrets, 12 to 8 inches and 6 1/4 to 6 inches; barbets, 10 inches and 6 inches; deck, flat, 1 1/4 inch, slope, 3 inches. Armament: Four 12-inch 40-caliber B. L.; eight 8-inch 45-caliber B. L.; twelve 6-inch 50-caliber R. F.; twelve 3-inch R. F.; twelve 3-pounders; eight 1-pounders; two 3-inch field guns; six automatic guns; two machine guns. Torpedo Tubes, 2 submerged. Complement, 812.

BATTLESHIP "GEORGIA," RECENTLY LAUNCHED AT BATH, MAINE. ALSO SISTER SHIP "NEBRASKA," LAUNCHED RECENTLY AT SEATTLE.

to the barbets, to afford protection against end-on fire. The protective deck is 3 inches in thickness on the slopes, and 1½ inches on the flat, and at the sides it is curved down to a junction with the lower edge of the waterline belt. A heavy shell from the enemy, therefore, would have to penetrate the main belt and the sloping 3-inch deck, and pass through the mass of coal in the coal bunkers, before it could reach the engine or boiler rooms or the ammunition supplies.

The central broadside battery, formed by the 6-inch walls of armor and their associated bulkheads, contains twelve 6-inch, 50-caliber, rapid-fire guns of the latest pattern, arranged six on each broadside. These fire through recessed casemates, and they are provided with semicircular shields, which are adjusted to close the casemate opening, sufficient space only being left between the semicircular shield and the casemate to give clearance when the gun is being traversed. Upon the same deck, forward in the bows, are four 3-inch, rapid-fire guns, firing through casemates that are protected by 2 inches of armor. Four guns of the same caliber are mounted near the stern on the same deck, and behind similar protection. Forward and aft of the central battery are the two barbets for the main turrets. These are protected by 10 inches of Krupp armor in front and 7½ inches in that portion that lies within the bulkheads of the central battery. The turrets that are mounted above these barbets are of the superposed or double-deck type, carrying a pair of 12-inch 40-caliber guns on the lower deck, and a pair of 8-inch 45-caliber guns on the upper deck; the lower portion of the turret being protected by 12 inches of Krupp armor, and the upper portion by 8 inches of armor.

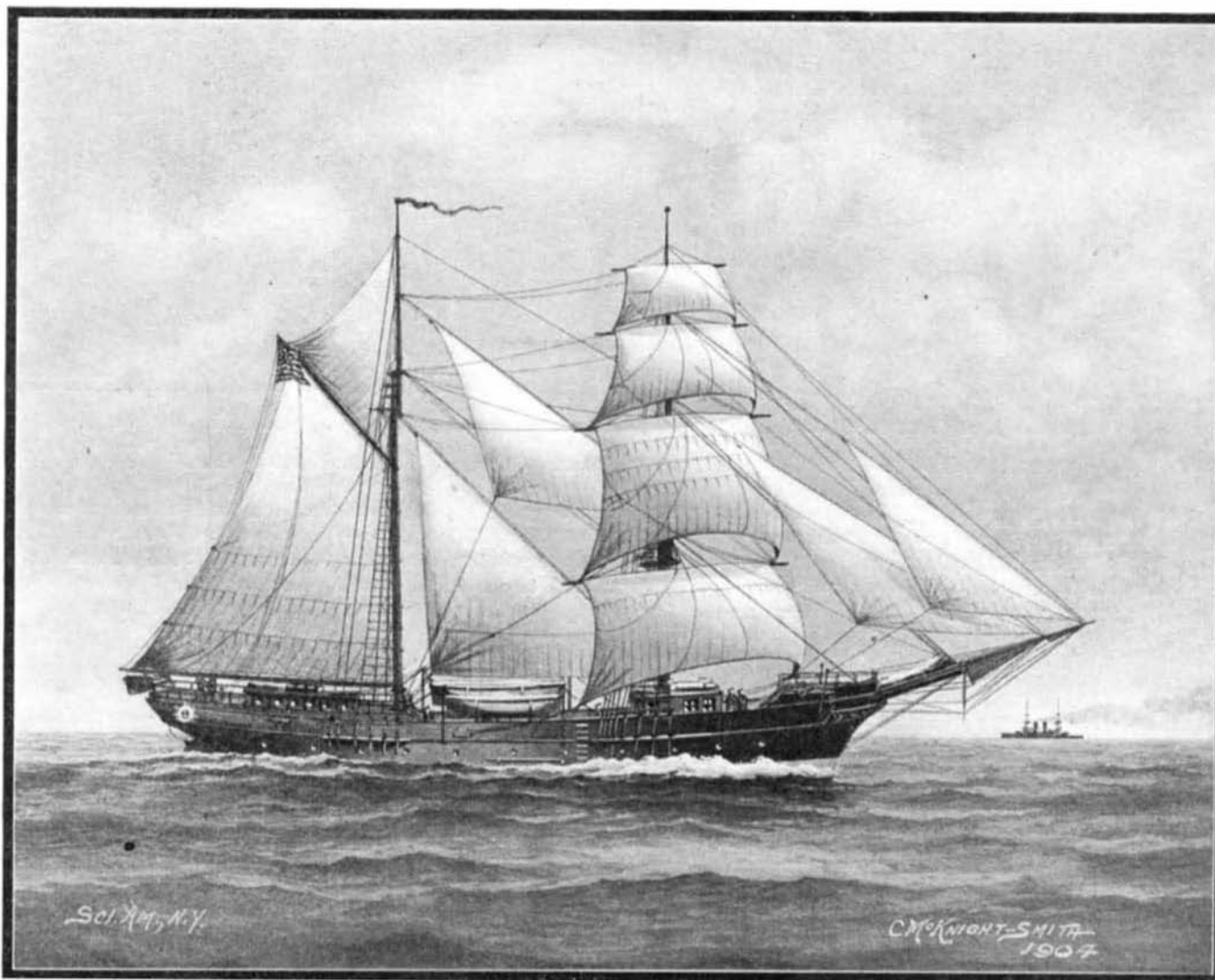
The "Georgia" class are the ships regarding whose armament there was so much discussion in our Naval Board on Construction; the present design was adopted as a compromise, and it is probable that these are the last ships on which the double turret will be mounted. The chief objection to the type is that four guns might be put out of action by a single shot; moreover, the firing of any one gun of the four has a disturbing effect upon

the sighting of the other guns in the turret. In addition to the four 8-inch guns carried in the double-deck turrets, there are four others carried in pairs in two barbettes, protected by 8 inches of armor and placed on either broadside. These 8-inch guns are sponsoned out sufficiently to give them a line of fire dead ahead and dead astern. Within the superstructure on the main deck are mounted four 3-inch rapid-fire guns, protected, like those on the main deck, by 2 inches of casemate armor. There are 9 inches of Krupp steel on the forward conning tower, and 5 inches on the after conning tower, generally known as the signal tower.

It will be seen from a glance at the ship and from this description that the concentration of fire is very heavy, consisting of two 12-inch, six 8-inch, and four 3-inch ahead and astern, while the broadside consists of four 12-inch, six 8-inch, six 6-inch, and six 3-inch guns. There is no ship afloat that can compare with this in intensity of fire, even the "Connecticut" and "Louisiana" having less by a pair of 8-inch. The arc of fire is also very satisfactory, the 12-inch guns having 270 degrees, the 8-inch superposed guns 270 degrees, the 8-inch guns amidships 180 degrees, and the 6-inch 110 degrees. The ammunition hoists are electrically operated, and they are designed to supply the various guns at a slightly faster rate than the maximum rate of fire. The ammunition supply consists of 240 rounds for the

12-inch; 1,000 rounds, or 125 per gun, for the 8-inch; 2,400 rounds, or 200 per gun, for the 6-inch; and 3,000, or 250 per gun, for the 3-inch pieces. The battery of smaller guns consists of twelve 3-pounders, four 1-pounders, four 1-pounder automatics, two Gatlings, and six Colts. There are two submerged torpedo tubes carried in the forward part of the ship. The motive power consists of two sets of four-cylinder triple-expansion engines of a designed indicated horse-power of 19,000, under which the vessel is designed to make on trial 19 knots an hour. The maximum supply of coal is 1,704 tons, and the complement of officers and men is 812.

Of the two gunboats illustrated, the more important is the steel training ship "Cumberland," which has a length of 176 feet 5 inches, a beam of 45 feet 7¾ inches, and a draft on a displacement of 1,800 tons of 16 feet 5¼ inches. The sister ship "Intrepid" is being built at the navy yard, Mare Island, Cal. The vessel is propelled by sail only and, as will be seen, she is bark-rigged. She carries a battery of six 4-inch, 40-caliber rapid-fire guns, four 6-pounders, two 1-pounders, and two Colts. The 4-inch guns are carried in broadside on the gun deck, the 6-pounders forward and aft on the main deck, and the 1-pounder guns amidship on the same deck. At first sight the "Cumberland" would appear to be a steam auxiliary; but as a matter of fact the smokestack shown is merely to serve the boilers



Waterline length, 108 feet. Beam, 29 feet 11 inches. Draft, 9 feet 6 inches. Displacement, 345 tons.

WOODEN TRAINING BRIG "BOXER," LAUNCHED AT NAVY YARD, PORTSMOUTH.

which supply steam to the various auxiliaries, consisting of two 24-kilowatt generators, two 4,070-gallon evaporators, two 3,000-gallon distillers, a steam winch, an electric winch, and fire and drainage pumps. The vessel has accommodations for a complement consisting of a commanding officer, nine wardroom officers, six warrant officers, and 320 men.

The little wooden brig "Boxer," built also for the training service, is 108 feet in length on the waterline, 29 feet 11 inches in breadth, and on a displacement of 345 tons will draw 9 feet 6 inches. The hull is built of yellow pine planking and white oak timbers, and is copper-sheathed below the waterline. She is built with berth, main, forecabin, and poop decks. She carries a 24-foot cutter, 20-foot whale boat, and an 18-foot dinghy. Accommodations are provided for a commanding officer, two other commissioned officers, and a crew of sixty landsmen and apprentices.

Owing to satisfactory experiments which have been carried out, the officials of the Pennsylvania Railway Company have decided to do away as much as possible with manual work and have the work done by machinery. At points where compressed air or electricity can be employed it has been decided to employ new methods of handling material.

Detection of Radio-active Substances.

BY E. WALLMAN.

The methods generally used for testing the radio-activity of substances are those employing the electro-scope and the dry plate. Both of these methods require a great deal of time, and relatively a large amount of material to be tested. These disadvantages can be avoided by using a method which depends on the principle of the spintharoscope, that is, this test for radio-activity consists of observing the scintillations produced by a mixture of phosphorescent zinc sulphide and the radio-active substance under investigation.

The apparatus needed is very simple, merely a quantity of phosphorescent zinc sulphide and a magnifying lens of about one-half inch focus. The phosphorescent zinc sulphide can be bought or made as follows: Add NH_4OH in excess to a clear solution of ZnCl_2 until the precipitate first formed is completely redissolved. Then pass H_2S into above solution until all ZnS is precipitated. Filter, but do not wash. Scrape precipitate into an evaporating dish and, stirring, heat until dry. Powder the mass, and heat in partly-covered porcelain crucible with blast-lamp until all fumes are driven off, then close and raise heat to highest point for ten or fifteen minutes. Let cool with cover on. The phosphorescent sulphide feels gritty under a stirring rod, and after exposure to sun-

light, shines with greenish-yellow light, which can be seen in a darkened room. The microscope used to observe the scintillations is composed of two simple one-inch focus lenses placed close together and mounted on a stand so that it can be focused on any object placed underneath. The aperture of the lens combination should be about one-half inch.

With this simple apparatus in a dark room, it is possible to test the radio-activity of a substance even lower than that of uranium oxide. The testing can be done best at night, because the eyes are much more sensitive to light. Before entirely darkening the room, mix as much phosphorescent zinc sulphide as will go on the point of a knife with an equal volume of the powdered substance, as Wels-

bach gas mantle, which is to be tested. Place this in a small flattened heap in the focus of the microscope and then darken the room. After five or ten minutes bring the eye close to the glass, and small flashes of light can be distinctly seen. The zinc sulphide should be kept in the dark, until it loses its phosphorescence, before mixing with the substance to be tested.

In this manner one can judge roughly the relative radio-activity of such ores as carnotite, pitch-blende, monazite sand, etc. It is also useful in testing residues and precipitates, which are obtained in extracting radium from the ores containing it.

Aluminium-tin alloys have been experimented with by E. S. Shepherd. (Journ. Phys. Chem.) Between 10 and 50 per cent aluminium, the author found that an increase of aluminium was always accompanied by a rise of freezing-point. By pipetting samples off from top and bottom of the molten alloy containing 18 per cent aluminium, in some cases with a small percentage of lead added, it is shown that there is no tendency to separation into two liquid layers. From analyses of alloys of aluminium and tin with silver the author believes that a solid solution does exist. From the curve of specific volumes, from the microstructure, and from the thermal measurements, the author concludes that 20 per cent tin is the limiting concentration of tin in aluminium.

A PECULIAR LILY.

BY HERBERT I. PRIESTLEY.

Two American teachers in the Philippines, while walking some time since in the fields in the vicinity of Nueva Cáceres, in Southern Luzon, came across a peculiar specimen of the lily family of plants which has not yet apparently been noticed by scientists.

It was while passing through a dense cluster of underbrush that the gentlemen noticed a remarkably strong odor of decaying flesh which seemed to emanate from the ground close by. Suspecting the presence of some gruesome thing concealed in the bushes, they commenced to search. They were assisted in this by the presence of numerous "blue-bottle" flies, which seemed to be buzzing about some object half concealed under the dense vegetation. This object proved to be the plant shown in the accompanying illustration. The strong smell of rotteness given off by the plant attracted all manner of insects, which was not surprising, as the odor was so strong as almost to repel all investigation.

The plant is called by the native Bicolos "borac sa Mayo," that is, May flower. It blooms only during the month of May. It is no doubt a member of the order *Lilacei*, better commonly known as the lily or tulip family. It has the large bulb, the inconspicuous calyx, the pronounced stigma, and the characteristic structure of lilies in general. The remarkable features of this particular variety of lilies are that it has such a pungent odor and that it has absolutely no leaves at the time of blossoming. These appear later, when the flower has died. The blossom rests immediately on the ground, and is not more than eight or nine inches high. The calyx often measures a foot in diameter.

After the blossom has disappeared the leaves begin to sprout from the bulb. These often grow to the height of three or four feet. Their general shape is similar to that of the leaves of the calla lily, but they are divided into an irregular number of lobes or fronds.

The corolla and the remarkably exaggerated stigma exude a clear viscous fluid which seems to be the cause of the offensive odor. This fluid attracts the flies, thus insuring the transmission of the pollen from plant to plant.

The large bulb, in fact all parts of the plant, have the peculiar acrid juice which is so poisonous, a trait common to the lilaceous order. The acrid taste and the poisonous effect of the juice are lost upon cooking for several hours. During the period of frondescence there is no odor present. This plant is not used for food by the natives where it is found, though there are several other species of the same order which are highly esteemed by them as food.

AN ANIMAL NEW TO SCIENCE AT THE NEW YORK ZOOLOGICAL PARK.

Among a collection of some twenty living animals received some time since by the New York Zoological Society from Capt. Thomas Golding, of the ship "Alfrida," was a small, white creature that proved to be a puzzle to all natural history experts who saw it. It is 21 inches long—a little more than 27, counting in the tail—and stands rather more than 10 inches high at the shoulders.

It rather resembles a small Spitz dog, but it is not a dog any more than it is a raccoon, although the shape of the head and the face marking that seem to belong so peculiarly to the family of *Procyonidae*, are marvelously imitated in this little beast. Perhaps it resembles a white Arctic fox more than it does any other creature. It had been called a white fox in the country, northern Japan, from which Capt. Golding obtained it, but it is evidently no more a fox than it is a dog or a raccoon.

"An examination of its external characters," says the director of the New York Zoological Park, Mr. W. T. Hornaday, "reveals an unmistakable resemblance to *Nyctereutes procyonoides*, the so-called raccoon dog of Japan and of north China. Inasmuch as the animal seemed to be immature, and it appeared possible that its pelage might undergo seasonal changes of some importance, it was decided to defer bringing it into notice, and keep it under observation for at least a year.

"During the fifteen months which this strange animal has passed at the Zoological Park it has not undergone any noteworthy change in pelage, nor has it perceptibly increased in size. It therefore seems fairly conclusive that the creature is adult and that its colors are constant throughout the year. As it is certainly not an albino individual of the well-known rac-

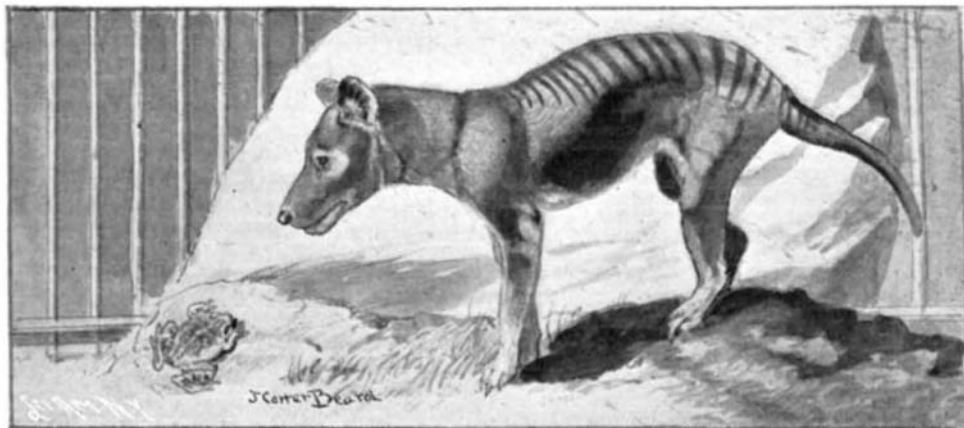


BLACK LILY.

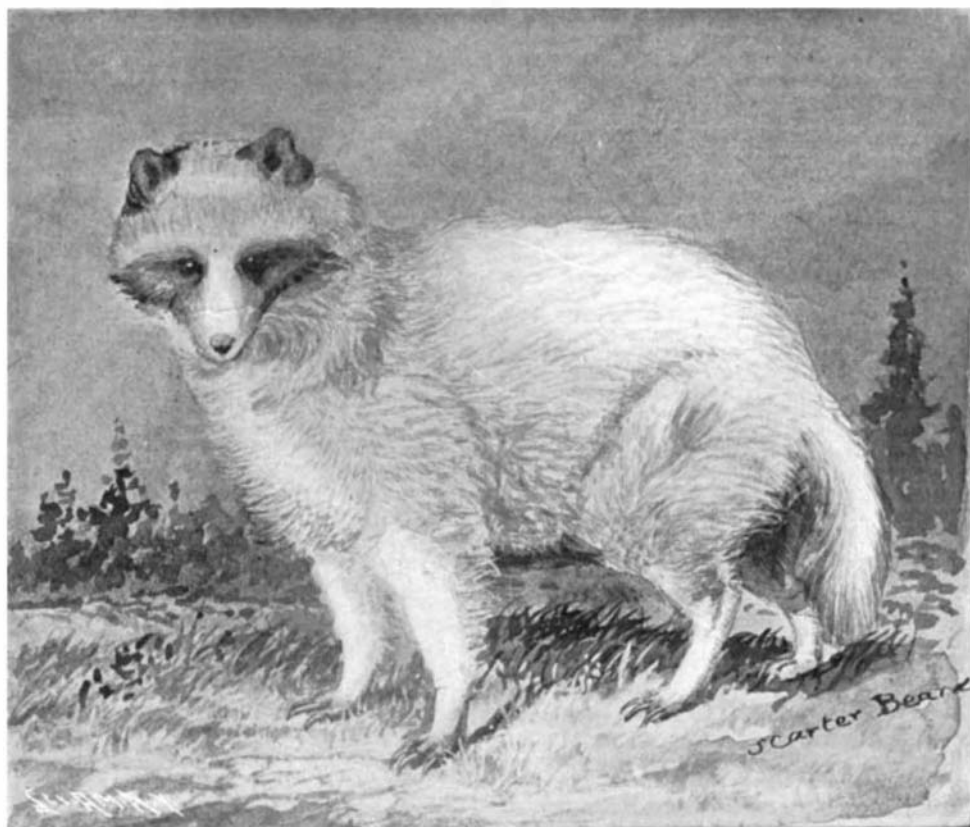
coon dog, referred to above, with living specimens of which it has lived in constant comparison, there appears to be no escape from the conclusion that we have here the living representative of a species of animals hitherto unknown."

It has now been admitted to the great assembly of classified animals under the name of *Nyctereutes albus* or the white raccoon dog.

It is a pretty little creature, gentle in disposition, and is well worth a visit to the park to see. It is not often one gets an opportunity of gazing upon a brand-new animal never before known to scientific zoologists.



DOG-LIKE DASURE, AN ANIMAL WITH A POUCH, RELATED TO THE KANGAROO.



THE WHITE RACCOON DOG—AN ANIMAL NEW TO SCIENCE.

The allied species *Nyctereutes procyon* or *Canis procyonoides*, according to Mivart, who makes only one genus of dogs, wolves, foxes, and raccoon dogs, is said to hibernate in the winter. If this is true it forms a most remarkable exception to any other known animal of the dog kind. We are told that those of the tribe that do this (for according to all accounts some of the raccoon dogs hibernate while others do not) look up old, deserted fox burrows or those of some other animal if they can, for their bedrooms, but are quite capable, should they not be able to save themselves work in this way, of digging their own burrows. As for the little animal at the park, she certainly evinced no disposition, severe as was the weather at times last winter, of remaining asleep in the comfortable sleeping quarters assigned her, when feeding time came around. Nor are the feet of the creature—short, small, and weak, with claws of little strength—well calculated for digging burrows. As Mr. Hornaday says: "As a whole the animal is not physically robust, nor is it at all vicious in temper. On the contrary it has taken kindly to its keepers and to captivity. Its teeth are small and weak, and taken altogether it is poorly equipped for self-preservation. It requires a home not overrun by bears, wolves, foxes, or the larger members of the family *Mustelidae*. It very probably inhabits moist lowlands rather than dry and rugged highlands."

Another very rare animal—so far as the writer knows, the first animal of its kind ever seen on this side of the Atlantic—the so-called Tasmanian wolf, zebra wolf, or pouched dog, *Thylacinus cynocephalus* is to be seen at the New York Zoological Park. Although not new to science it is in some respects a more interesting animal than the white raccoon dog. The "Tasmanian wolf," so far from being a wolf, does not belong to the dog family. It is, in fact, a marsupial, and is more nearly akin to certain of the kangaroos than it is to the *Canidae*. The female, indeed, has a well developed pouch, though the marsupial bones are wanting, being replaced by cartilages. The animal walks upon its toes and partly upon half its soles or palms, as may be seen more evidently in the hind feet; this causes the body to be brought much nearer the ground in running than is the case with a wolf or dog, and constitutes the Tasmanian wolf a semi-plantigrade. The lower canine teeth in dogs pass on the outer sides of the upper ones when the mouth is closed, while the larger recurved canines of the Tasmanian wolf in the upper jaw are separated from the incisors by a space into which the points of the lower canines fit when the jaw is shut. The animal has the peculiar lower jaw of the marsupials—the angle is inflected; it is, in fact, a marsupial with structural parts foreshadowing those of the more highly developed dog. Such an animal as this transports us back to those primeval times when animals far more generalized than those that now exist united in themselves diverse characteristics and specific features never, in our day (save in a few such instances as the Tasmanian wolf), found in any one individual or any one species.—J. C. Beard.

The Supply of Ivory.

During a recent visit to the London Docks, says Knowledge and Scientific News, Her Majesty the Queen was informed that the stock of ivory then shown represented, on an average, the annual slaughter of some 20,000 African elephants. This statement has been contradicted in two letters in the daily papers. In one of these Messrs. Hale, of 10 Fenchurch Avenue, state that at least 85 per cent of the supply is "dead ivory," mainly obtained from hoarded stores of African chiefs, who are shrewd enough to put their commodities on the market only in dribbles. The most interesting part of the letter is, however, the statement that the great bulk of this hoarded ivory is obtained from "elephant cemeteries"—spots met with here and there in the jungle, where elephants have resorted for centuries to die. Much of the ivory that comes to the market may, therefore, according to this letter, be several hundred years old. The marvel is why it is not devoured in the jungles by porcupines, as certainly happens with tusks of the Indian elephant which are left in the jungle.