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THE NATIONAL GEOGRAPHIC MAGAZINE

WILD LIFE OF THE ATLANTIC AND GULF COASTS

A Field Naturalist's Photographic Record of Nearly Half a Century of Fruitful Exploration

By GEORGE SHIRAS, 3D

AUTHOR OF "PHOTOGRAPHING WILD GAME WITH FLASH LIGHT AND CAMERA," "WILD ANIMALS THAT TOOK THEIR OWN PICTURES," "ONE SEASON'S GAME BAG WITH THE CAMERA," "WILD LIFE OF LAKE SUPERIOR, PAST AND PRESENT," ETC., ETC., IN THE NATIONAL GEOGRAPHIC MAGAZINE

FROM 1876 to the present time the author has passed a part of each year in pursuit of wild life in some section of the Atlantic and Gulf seaboard. Many of his most interesting and fruitful expeditions have been made within these limits, first as a sportsman with a gun, and later as a field naturalist enthralled with the joy of photographing wild things in their haunts.

The coastal area considered here extends from Newfoundland to northern Vera Cruz, Mexico—a distance of more than 6,000 miles following the sinuosities of the shore line. Its middle part has become by far the most densely populated section of the New World. Here are located numerous great cities and a well occupied countryside, but a study of the results of occupation of the region by civilized man for centuries will show surprisingly small effect on the face of Nature as a whole.

BISON AND ELK ONCE ROAMED OUR EASTERN FORESTS

From the time of the arrival of the early colonists, whether on the shores of Canada, the United States, or Mexico, to the present day, the chronicles of this region contain numerous references to the abounding wild life of many kinds.

It is true that the newcomers have cut vast areas of forest, and a number of large or otherwise noteworthy species originally here have disappeared, but these were of kinds apparently unfitted to survive in a populous country. Among them may be mentioned the bison and the elk, which once roamed the eastern forests, and the wolves and cougars which preyed upon them and other wild things. In addition, the great auk, the Labrador duck, the heath hen, passenger pigeon, and the parrakeet have vanished.

As against this we have a marked renewal of forests in progress and large numbers of species of wild creatures have adapted themselves to share their world with civilized man. Moose and caribou hold their own in some of the wilder places, and the white-tailed deer is probably more numerous than at any previous time in its history. Each yearly hunting season, within a radius of 300 miles of New York City, with its approximately 7,000,000 inhabitants, sportsmen take more than 40,000 of these deer. In Pennsylvania their increase has been so great that the entire stock of deer has been threatened with starvation, owing to lack of sufficient forage.

Probably the total number of small birds now is vastly greater than existed in the

Photographs by George Shiras, 3d

MIGRATING CARIBOU SWIM SANDY LAKE, NEWFOUNDLAND

Because of their heavy coat of long, tubular hairs, caribou ride high in the water, but are not as rapid swimmers as either moose or white-tailed deer. They carry the white tail erect when swimming, as shown here. The animals in the lower photograph are a stag, a doe, and a fawn. About one in two or three female caribou in Newfoundland have antlers. These caribou were so strictly diurnal in habits that they did not give any opportunity to secure flash-light pictures of them (see, also, text, page 265).

day of the Pilgrim Fathers, owing to the increase of food available on farms and in second-growth forests. Millions of migratory wild fowl continue to troop southward every fall to winter in the coastal waterways and marshes.

Many small creatures of field and forest have developed such an insight into man and his ways that they outwit him at times when their interests conflict. Cottontail, swamp, and snowshoe rabbits, squirrels, muskrats, beaver, mink, otter, raccoons, bobcats, and other small mammals, and even the black bear, are common in many places. Doves, wild turkeys, ruffed grouse, and bobwhites continue to lead the hunter afield.

So far we have had to do only with the creatures of more northern latitudes, but within our southern limits come such tropical beasts as the jaguar, ocelot, jaguarundi cat, coati-mundi, peccary, and prehensile-tailed porcupine, with parrots and other strange birds and a very different plant life, that make a new world to the northern visitor.

Photograph by George Shiras, 3d

A CANADA JAY, OR WHISKEY JACK, NEWFOUNDLAND

In the north country the "whiskey jack," or Canada jay, makes himself free in almost every woodland camp. He is an arrant freebooter, but his confident and tricky ways afford amusement and sometimes exasperation to the campers. In the photograph above one has taken possession of a haunch of venison hung at the end of the tent.

VALUE OF WILD LIFE IS NOW APPRECIATED

With so much of the original capital in wild life to go on, it is specially pleasing to note the great awakening that has taken place among the people of the United States during the last twenty years in their recognition of the value of wild life as a great national asset that must be maintained and perpetuated. This change from comparative indifference has come as the direct result of an educational campaign conducted for years by many organizations, among the most effective of which has been the part taken by the National Geographic Society.

The survival of so much wild life along the eastern coast and its bordering hinterland is due largely to this region's physical characteristics. To the north, in Newfoundland, Nova Scotia, New Brunswick, and Maine, are vast, thinly peopled, forested areas abounding in streams and lakes. There travel is still so largely by rough roads and small boats that conditions re-

Photograph by George Shiras, 3d

A BULL MOOSE AT NIGHT

After being "flashlighted" in the deep water of a small lake in New Brunswick, this second photograph was taken near shore. Unlike deer, the moose is not alarmed by the brilliant flash light and its loud report, apparently regarding them as natural occurrences, like the sound and flashes of a thunderstorm.

main favorable to wild life. The rock-bound coast and outlying islets also provide homes for countless sea birds, just as do similar conditions on the shores of the North Pacific.

Beginning near the mouth of the Hudson, a great coastal plain extends southward to eastern Mexico. To the north it begins with a width of only a few miles, broadening to from 100 to 250 miles in places, until it narrows again near Tampico. In this entire distance there are no outcroppings of metamorphic rocks and apparently none of sedimentary formation except the coquinas of Florida. Long stretches of this plain are fronted by sand beaches penetrated here and there by bays, sounds, inlets, and the mouths of rivers. Back of the exposed beaches lie many great marsh areas and shallow bays, with numberless sand bars, low islands, and mud flats.

In such places thrive aquatic plants with myriads of fish, crustaceans, and other food which in winter sustain millions of swans, geese, ducks, gulls, waders, and other wild fowl.

Fortunately for these birds, the broken shore line and submerged lands have prevented the opening of highways and limited agricultural development. Large areas are occupied only by fishing villages and by hunting clubs in Maryland, Virginia, North and South Carolina, Louisiana, and Texas.

SOME BIG GAME OF EASTERN CANADA

At the time of my first visits to eastern Canada, in 1906 and 1907, the amazing numbers of caribou in Newfoundland and their annual migration across the island each fall were recognized as one of the marvels of American wild life. At the same time the moose of New Brunswick were extraordinarily abundant.

Although this region had long been accessible with comparative ease, yet its unsuitability to agricultural development had left vast areas so sparsely occupied that they remained true wildernesses, in which the native animal life thrived. There the sportsman and photographer of wild things could make his camps in ideal surroundings and feel himself in the midst of

Photograph by George Shiras, 3d

ALMOST GOOD-LOOKING

Rusty brown, long-legged, and short-necked, with a huge nose and mulelike ears, the cow moose is regarded as the homeliest of animals. Becoming suspicious, the one shown above has assumed such an attitude of alertness as to command attention, if not admiration. This lady moose, moreover, had just quaffed the tonic waters of a New Brunswick salt lick, and this may account for her sprightliness.

conditions almost as they were in primitive days.

The coming of the World War brought a period of intensive pursuit of big game in all this region for its meat value. This slaughter of moose, and especially caribou, dangerously lowered their numbers. Probably the migratory herds of caribou will never again troop across the barrens of Newfoundland in anything like their former numbers.

With well-enforced protection, however, caribou in Newfoundland and moose in New Brunswick and Maine may be maintained in fair abundance. Caribou appear to be going forever from Maine, New Brunswick, and Nova Scotia, the white-tailed deer having taken their place in many districts. The deer continue to extend their range.

In a previous article in the NATIONAL GEOGRAPHIC MAGAZINE* I have given some of my experiences with the moose in the wild, forested parts of New Brunswick, and with caribou on the lakes and barrens of Newfoundland. My second trip to this great island was for the special purpose of photographing migrating caribou as they swam across the large Sandy and Little Deer lakes, which lie across their regular route.

* See "One Season's Game-Bag with the Camera," by George Shiras, 3d, in the NATIONAL GEOGRAPHIC MAGAZINE for June, 1908.

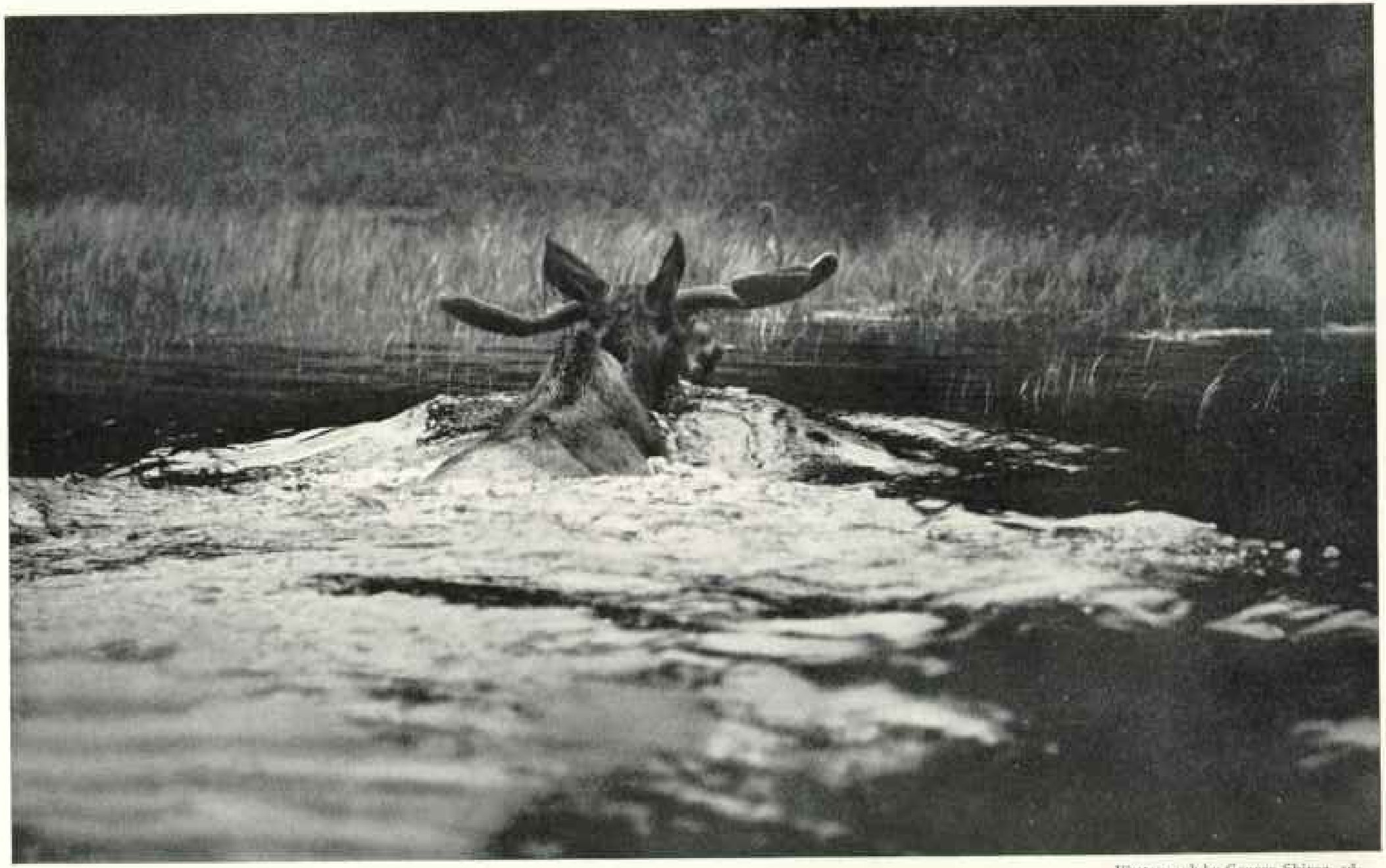
PHOTOGRAPHING CARIBOU DURING MIGRATION

Accompanied by a guide, I arrived at Little Deer Lake late in October, near the close of the migration of doe and fawn caribou, which begins the middle of August, and just before the beginning of the migration of old stags. Our camp was within 25 yards of the lake where my guide and I alternated in watching for caribou entering the water on the opposite shore, between about 9 a. m. and 3 p. m., which covered the daily period of the migratory movement. Migrating caribou entered the lake at a rapid trot, quite unlike the slow,

Photograph by George Shiras, 3d

COW AND CALF MOOSE, UPPER TOBIQUE RIVER, SALT LICK, NEW BRUNSWICK

Mother and offspring were photographed as they wandered unsuspectingly before a flash-light camera in the sheltering darkness of midnight. The calf was not noticed until the plate was developed, two weeks later.



Photograph by George Shiras, 3d

ALL POWER ON!

This New Brunswick moose was surging across Nictor Lake at a rate which required the best efforts of two strong paddlers in a canoe to bring the camera within range. This animal was feeding in eight feet of water because the plants in the shallow bays had been eaten. Moose can remain submerged for nearly a minute, and some observers report that the ears are lowered so as to exclude the water from the eardrums.

Photograph by George Shiras, 3d

WILSON PLOVER, WITH ITS NEST AND EGGS

This small coastwise plover is a common bird on sandy beaches at Revels Island, Virginia, which is near its northern breeding limit.

cautious movement of other deer taking to the water.

In our canoe we met the swimming animals in midlake and were repeatedly surprised that we could not force them to turn back. During the fall migration they habitually moved against a south wind, in order to detect danger ahead. These animals have a well-known habit of crossing in this way any stream or lake which they come to.

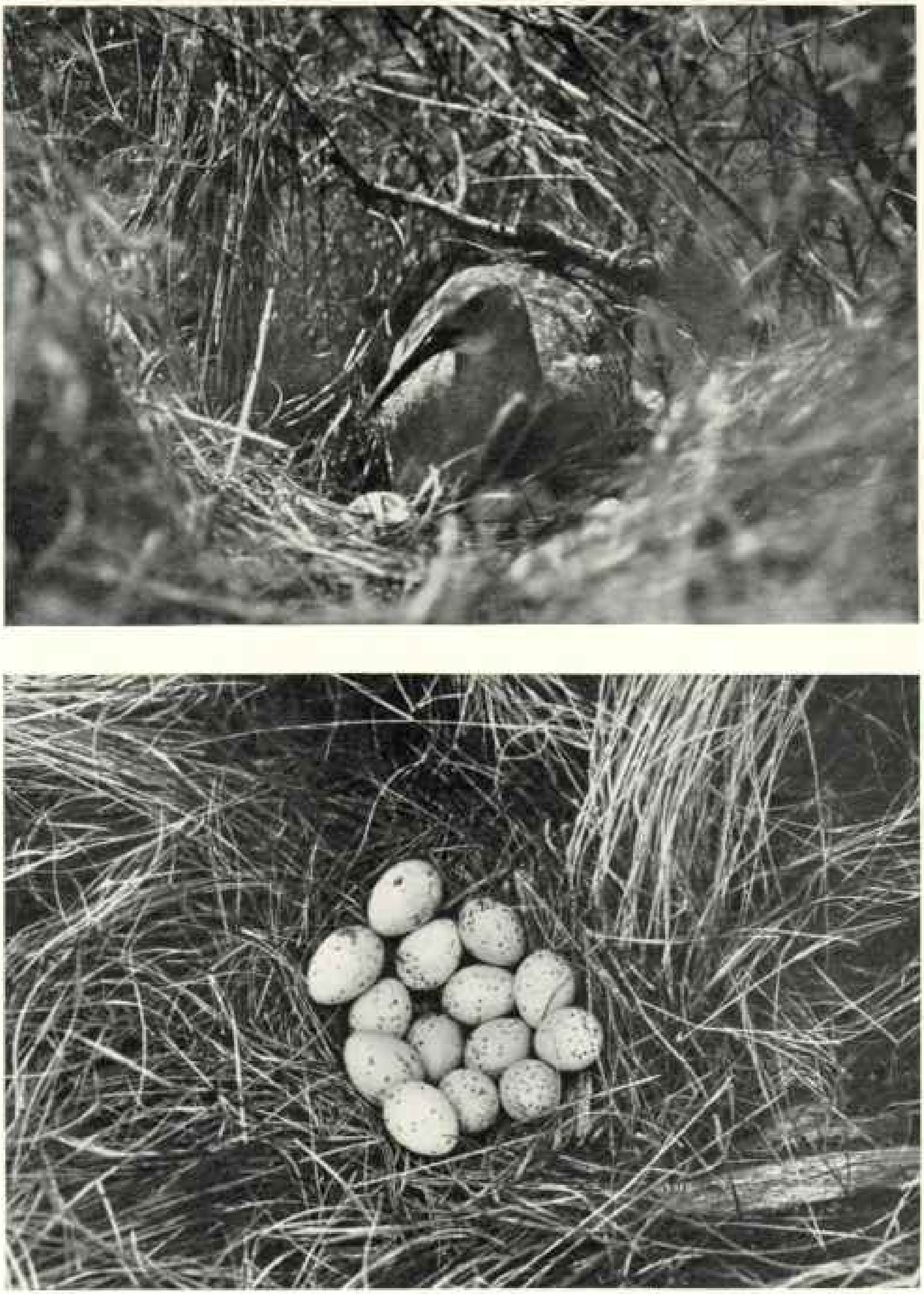
Owing to their heavy coat of long, tubular hair, caribou float high in the water, but, strangely enough, they are slower swimmers than the moose or white-tailed deer. As a result of this, it was easy to keep abreast of or close to a swimming caribou in a canoe by the use of a single paddle, although in pursuing the other animals named, sometimes two or even three paddlers may be needed. A considerable series of pictures was obtained on the lakes (see page 262).

On one occasion in Newfoundland we saw a bear working in and out of the bushes along the shore of Sandy Lake, heading toward the trail from our tent to the water's edge. Leaving the guide to watch, with instructions to whistle whenever the bear came near, I retired for concealment in the tent.

In a short time a low whistle was heard, and I hurried out only to find that I had been deceived by the call of a Canada jay, so I again retired from view. Within a few minutes the whistle sounded several times, but was attributed to the bird and ignored. Then, peeping out of the tent, I saw the guide crawling along the trail, waving excitedly.

Running down to the shore, I came upon the bear as it was sniffing at the canoe, but so close that he dashed into the bushes and escaped a shot from the camera, evidently believing that the usual bullet was in store for him. It appeared that the bear had come out of the brush only about 100 feet away from me, and the guide had whistled repeatedly, as instructed, without any response on my part.

Every wild-life photographer sooner or later has such keen disappointments; but



Photographs by George Shiras, 3d

CLAPPER RAIL, WITH NEST AND EGGS, AT REVELS ISLAND

When sitting on its eggs under cover of the canopy of marsh grasses, the clapper rail is almost invisible. Even when the bird is gone, the eggs are not seen readily except when the overhanging grass is pushed aside, as in this photograph.

A FEMALE STARLING FEEDING ITS YOUNG

Starlings, introduced near New York City a comparatively few years ago, have spread over the eastern United States to beyond the Mississippi River. They are useful insect-eaters, but aggressively oust natives, such as bluebirds and others, from their nesting places.

Photographs by George Shiras, 3d

AT THE CAPITAL OF THE NATION

About the author's suburban home at Wesley Heights, Washington, D. C., come birds of varied colors, sizes, and habits. The District of Columbia has a greater variety of land birds than almost any other area of similar size in the country. This shows an American purple grackle.

if success were always assured, the sport of hunting with the camera would lose much of its attraction.

TWENTY-FIVE SEASONS ON REVELS ISLAND, EASTERN SHORE OF VIRGINIA

In 1894 I became a member of the Revels Island Club, which is the owner of a partly wooded island surrounded by extensive marshes and shallow bays, lying inside the ocean beach. These marshes are in Accomac County, one of the two counties constituting the Eastern Shore of Virginia and terminating the peninsula bordering the eastern side of Chesapeake Bay.

The wild-fowl shooting in these tidal waters never equaled that in the sounds farther south, owing to the absence of fresh-water ducks, the black duck being the only one found in abundance.

When I first went to Revels Island there were many geese, brant, and broadbills, with occasional flocks of redheads, a fair number of golden-eyes and butterballs. This club was the first, I think, to introduce a floating blind, made of green cedar boughs stuck in a frame that would admit a ducking boat, and where sometimes a narrow, flat-bottomed scow thus disguised was left during the shooting season for the use of the sportsmen.

Such a contrivance, being anchored, always headed up wind, so that the decoys could be placed to advantage and the shooter need only watch for the approaching birds coming against the wind, as was their custom. Moreover, these floating blinds rose and fell with the tide, whereas in the case of stuck blinds it was hard to shoot over them at low tide, while an exceptionally high one exposed the boat and hunter. Floating blinds were set out in advance of the coming of the birds, which thus regarded the clump of cedars as a part of the landscape.

In those days no baiting was done, so it was essential to have the blinds located on good feeding grounds or narrow flyways. The shooting was originally satisfactory, but gradually became poor, when the shallow bays were leased for oyster planting and the near-by guardhouses became nuisances.

With the coming of naphtha launches, and later those propelled by gasoline, the sailboats gave way to a means of

transportation that kept these bays in continual disturbance, for the lack of wind made no difference, but rather increased activities. Moreover, the oyster guards were always alert to take a pot-shot when geese or brant began feeding near the oyster grounds and soon routed them.

WHERE THE SHORE BIRDS ASSEMBLED

The marshes and mud flats about Revels Island were always famous for the number and variety of shore birds which visited them during the migrations. Even when there was a dangerous decrease of these birds along most of the Atlantic coast, these marshes were apparently the stopping place of all the survivors. It caused no wonder that the time finally came when the migration showed a tremendous decrease, for in the spring, at the time the local shore birds were either nesting or mated, every clubhouse from Virginia to New Jersey was filled with members intent on a vacation to shoot migrant shore birds at a time when all other shooting was prohibited.

In early years I have seen supposedly reputable members bring in two or three hundred birds, and when the weather was warm it was a question how to save them. In later years I gave up spring shooting as a matter of principle, but having the camera as a substitute I was doubtless less tempted than the others.

There were days in the spring when the migrating shore birds were not in flight, and then I turned to photographing nesting gulls, skimmers, herons, and oyster catchers, or to land birds like the osprey, the fish crow, and the flicker, and to smaller birds, such as the brown thrasher, tree swallow, the grackles, and the bluebird. Seldom in this season of the year need the camera be laid aside for want of subjects, thus filling a great but necessary void for a lover of the out-of-doors when spring shooting was prohibited throughout the country.

The next to my last trip to the island was for the purpose of photographing the robin snipe and the Hudsonian curlew, for it seemed as if they were going the way of the passenger pigeon and would soon be exterminated. It was this feeling, after many years of observation, that led me in 1904, when representing the 29th Pennsylvania district in the U. S. House of Representatives, to prepare and introduce in Congress the original Migratory Bird Bill.*

Photograph by George Shiras, 3d

YOUNG TURKEY BUZZARD IN ITS WHITE BIB AND TUCKER

The cottony white down is worn early in life. This photograph was taken in a rocky niche in the gorge of the Potomac River above Washington.

A FEW YEARS OF PROTECTION SAVED A VANISHING SPECIES

Another visit was made in May, 1923, when I was accompanied by Dr. E. W. Nelson, then Chief of the Biological Survey, to check up on the reputed increase of the shore birds. The launch had no sooner put out from the little town of Wachapreague than Hudsonian curlews began springing up on all sides, and nearly a thousand must have been seen on the six-mile trip to the island. And yet this bird had been nearly extinct ten years before.

In the several days spent on the marshes and mud flats we found that protection had brought an increase in most kinds of shore birds, including the willet, the black-bellied and smaller plovers, the knot or

* This measure subsequently became a law and later on was merged in the bird treaty with Canada. This Federal jurisdiction has proved most timely and effective.—Editor.

Photograph by George Shiras, 3d

ON FEEDING GROUNDS IN CURRITUCK SOUND

Mallards and black ducks gather on common feeding places in shallow water, where they are often joined by pintails and coots.

robin snipe, dowitcher, calico-backs, and many varieties of sandpipers. The yellowlegs, however, were scarce, since an open season still allowed shooting of this species, and the result was apparent to us.

Subsequently the Advisory Board, of which I was a member, recommended that the season be closed on yellowlegs, and this suggestion was adopted by the Department of Agriculture in 1927. Sportsmen are to be commended for the fine spirit they have shown during the long period that no shooting of shore birds has been allowed, but these birds are so helpless before modern gunners that even a short open season might be disastrous to them.

A rather unusual custom that prevailed along the Eastern Shore, under local laws, was the gathering of the eggs of marsh birds the first two weeks of the nesting season. The principal victims were the black-headed gull and clapper rail, usually called marsh hen, the well-concealed nest of which is often located by the use of trained dogs. Thousands of these eggs were collected each spring and, the natives assert, without any diminution of the young reared, because the birds robbed have time enough to lay another set.

The fish crow naturally pays no attention to the law, but continuously robs the nests, and although the marsh hen and the willet cover up their eggs with more or less success, the open and exposed eggs of the gulls, terns, and skimmers invite a raid.

Under one big pine tree I counted more than five hundred eggshells dropped by crows, and am of the opinion that this depredation along the coast accounts largely for the decrease in many species of water birds, for which an explanation is now being sought. This crow, on Revels Island at least, does not nest until well into May, evidently figuring that domestic responsibilities will be more easily met when food is abundant.

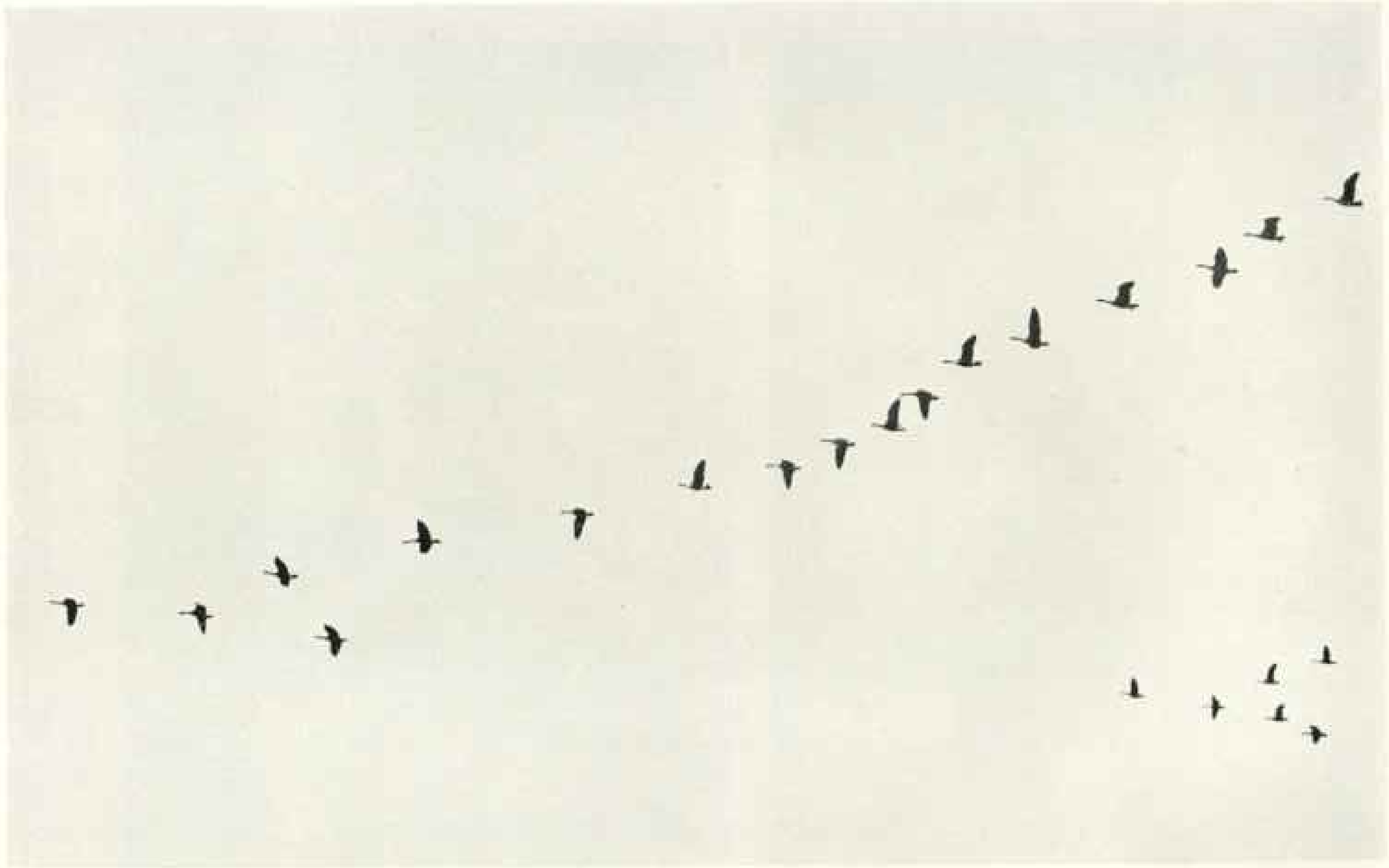
OUR EMBLEMATIC BIRD MAKES A STIR

At the present time it would seem that the shore birds have returned in large numbers along the Eastern coast since the Migratory Bird Treaty became effective, and while many of the species go into Mexico, and even South America, to winter,

Photographs by George Shiras, 3d

A WILLET ON THE WING (UPPER) AND ITS NEST (LOWER)

This large and handsome wader breeds commonly in dry, grassy places about Revels Island. The nests are hidden by overhanging grass that must be bent away to expose the eggs. The bird shown here is flying from its nest in a clumsy, grotesque manner to draw attention away from its treasures.



Photograph by George Shiras, 3d

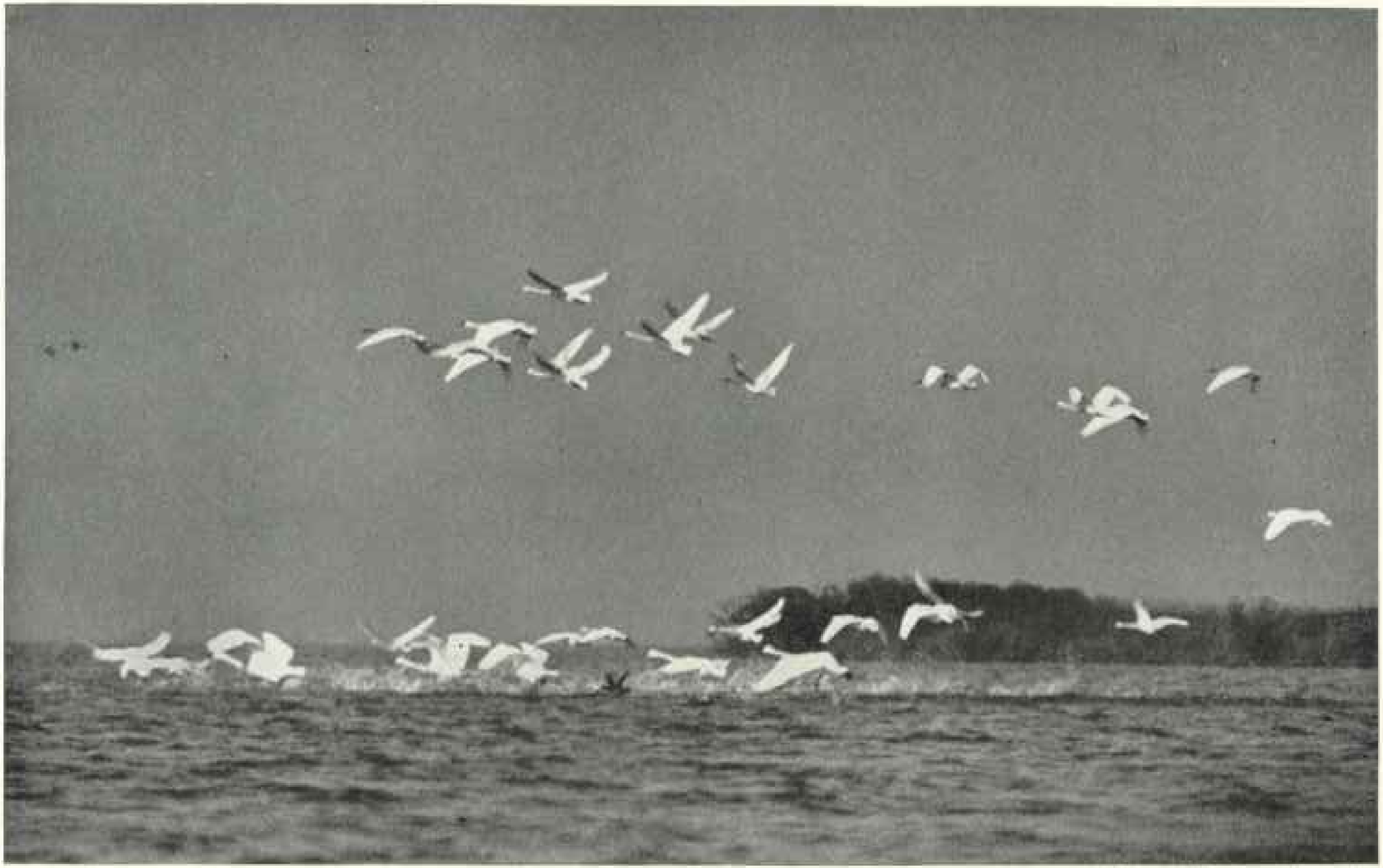
THE ARRIVAL OF A FLOCK OF CANADA GEESE AT CURRITUCK SOUND

There is no more inspiring sight for a lover of wild creatures than the arrival of wild geese from their far-northern breeding grounds. The ordered ranks of the flying birds and their clanging cries of greeting to their winter home stir one's pulse in sympathetic response (see, also, pages 277-8). When migrating, far overhead, these geese usually travel in a wedge-shaped formation, with a leader at the head.

Photograph by George Shiras, 3d

BLACK DUCKS TAKE WING

When marsh ducks spring from the water in alarm, their movements are too rapid to register in the human eye. The camera, however, requiring only a very small fraction of a second to make its record, shows the extraordinary attitudes taken as the birds spring into the air.



Photograph by George Shiras, 3d

WHISTLING SWANS ON CURRITUCK SOUND

Tens of thousands of these noble birds winter in the region from Chesapeake Bay to Currituck and Albemarle sounds. Since they have been protected under the Migratory Bird Treaty Act they have greatly increased in numbers. As they rise against the wind, they aid the launching into the air by vigorous use of their broadly webbed feet, as indicated by the spray shown in the photograph (see, also, text, page 281).

Photographs by George Shiras, 3d

CANADA GEESE ON CURRITUCK SOUND

When these wary birds are preening themselves and resting in quiet places, one or another of the flock will raise its head and look about sharply for possible approaching danger. When no shooting is permitted near the clubhouses, geese and ducks soon take advantage of these safety zones. When on feeding places, a flock of geese presents an animated sight as the individuals continually up-end to gather food well below the surface. The first flock is opposite the Swan's Club, and the second, to the south, near Narrows Island.

Photograph by George Shiras, 3d

A PAIR OF CANADA GEESE, CORE SOUND

On a good day many of these fine birds may be seen searching for coarse sand and bits of shell to aid digestion.

most of them are too small to attract the pot-hunters of those regions.

Bald eagles were rather common about Revels Island, where they seldom harmed other birds, but one once caused great excitement at the clubhouse. Captain Wickes, then superintendent, was returning to the club through the "swash" channel in a small ducking boat when he saw one of these handsome birds flying overhead within easy gunshot. Thinking it was a good specimen to mount as a trophy, he fired and dropped it within a few feet of the boat.

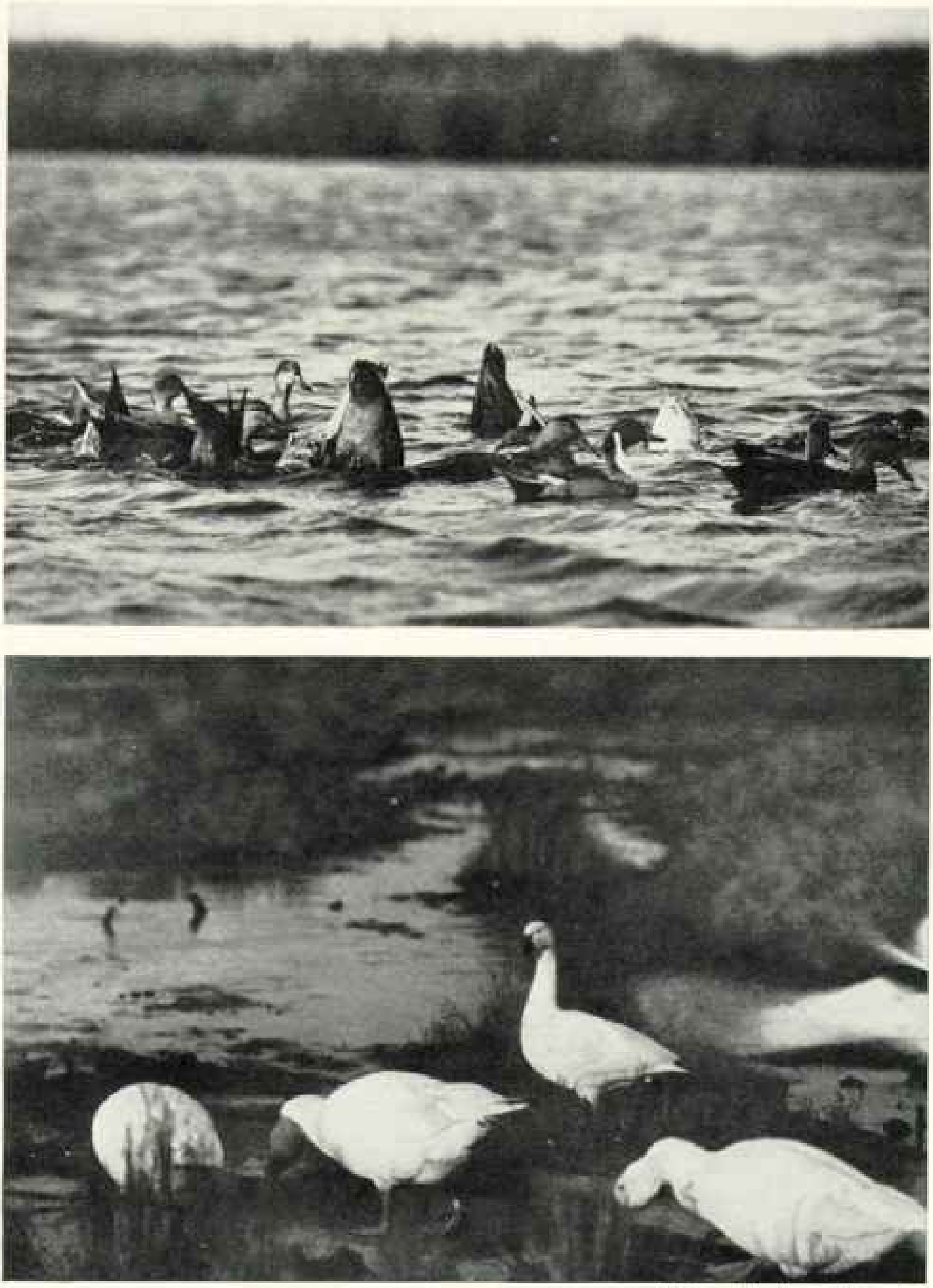
Picking up the apparently lifeless form, he stowed it between his legs and continued rowing toward the clubhouse. Suddenly one of his legs was gripped by the long talons of the bird, which sank into the flesh, causing great pain. At such close quarters he could neither shoot it nor hit it with an oar; so he did what appeared to be the best thing, leaped overboard, hoping to force his assailant by drowning to release a grip that would only enlarge his wounds if he tried to pull the bird away while alive. As he came to the surface, he found the eagle had let go and was standing erect on the bow seat of the boat, in apparent command of the craft.

No wind was blowing at the time, so the boat continued to drift with the tide toward the clubhouse. The captain thereupon swam ashore and limped along after the drifting boat for a quarter of a mile, expressing his feelings meanwhile in violent language.

The boat finally touched the bank at a bend, giving a chance for the ousted skipper to get on board. Seizing one of the small oars, he gave the defiant bird a knock-out blow, and it sank to the bottom of the boat, apparently with a broken neck.

On reaching his destination, the captain carried his trophy ashore, throwing it on the porch back of the kitchen. He then went into the gun room to look for a bandage, kept there in case of accidents.

While binding his bleeding wounds, for a small artery had been opened, he heard loud shrieks from the rear of the kitchen. Hastily tying on a temporary bandage, he hurried back to learn the cause of the uproar. There it appeared that a colored



Photographs by George Shiras, 3d

MALLARDS, BLACK DUCKS, AND PINTAIL DUCKS (ABOVE) AND WHITE GEESE (BELOW)

The ducks are feeding in Currituck Sound. In the background (lower picture) is a snow goose which two winters in succession fed with the three tame geese (in foreground) on Monkey Island, Currituck marshes. These geese breed on Canadian Arctic islands and winter largely in Chesapeake Bay and the Currituck Sound region.

Photograph by George Shiras, 3d

A LARGE WHITE EGRET

This bird, nearly extinct in North America, was photographed in a brackish pond on Cumberland Island, Georgia. In this little pond the author had an exciting encounter with an alligator that had appropriated a jacksnipe dropped in the water by the gunner (see, also, text, page 290).

maid, with bare feet, while examining the bird had given it a kick to turn it over for further inspection. Thereupon the apparently lifeless bird, resenting this liberty, sank his talons deep into the calf of her leg. At this she began to shriek and to jump about on one foot until she fell down the back steps to the ground.

When the captain appeared he saw a confusion of waving wings, arms, and legs, accompanied by the piercing cries that had at first so startled him. Picking up a piece of stove wood, he finished the eagle on the third and final round.

The great flights of geese, swans, and ducks that annually sweep south and southeasterly in the fall through the Eastern States and along the Atlantic coast mainly congregate in and about Chesapeake Bay and Currituck Sound. Many of these birds, however, remain about Long Island Sound and Barnegat Bay until the coming of severe weather, when most of them also move down the coast.

Another great migratory flyway is down the Mississippi Valley. Most of the birds taking this course winter along the Gulf coast. Many of them linger along the Mississippi and adjacent waters, however, until severe weather sends them south.

Georgia and Florida, having few shallow fresh-water bays and little wild-fowl food along the Atlantic coast, form a rather marked area of almost complete separation between these two groups of migrants which winter along the Atlantic coast and those of the Gulf; the Atlantic geese and swans in particular not usually being found farther south than the Carolinas.

CURRITUCK SOUND AN IDEAL WINTER HOME FOR WILD FOWL

Currituck Sound is an ideal home for wild fowl during the winter months. It is shallow, surrounded by marshes, bays, and ponds of almost entirely fresh water in which various kinds of excellent wild-fowl food plants abound. Fish, shellfish, and crustaceans are also plentiful.

On its deeper and more open waters are thousands of canvasbacks, numerous redheads, scaups, and golden-eyes, while in the shallow bays and connecting ponds are to be found great numbers of marsh ducks, such as black duck, mallard, widgeon, pintails, and teal, which usually assemble in smaller flocks than species frequenting deep water; yet on one occasion I saw a flight of pintails that probably contained more than five thousand birds. Here the geese are extraordinarily abundant, and I have seen more of them in a single season than during a dozen years' visits to Revels Island, where geese are not considered scarce.

THE WHISTLING SWAN

To me, at least, the most interesting bird on the Currituck is the whistling swan. The local estimates of these birds vary from a total of fifty thousand to nearly one hundred thousand birds. Although the swans are undoubtedly very numerous, yet these estimates are no doubt far too high. As a matter of fact, they probably do not reach the lowest number given. Fifteen or twenty years ago, in this region, through overshooting, the swans were becoming dangerously reduced in numbers.

While this swan is found on the Chesapeake and other neighboring waters, the main concentration is in Currituck Sound. On one trip Dr. F. M. Chapman went with me to see the swans, and although he ranks among the leaders in American ornithology and has traveled extensively over this continent, he had never seen a whistling swan alive, which is a very good indication of how limited are its winter quarters.

The increasing number of swans under rigid protection presents a difficult problem, for if the local minimum figure of fifty thousand is accepted, this means approximately twenty thousand breeding pairs. As each breeding couple produces from two to four young, it seems certain that, figuring on nonbreeding birds and every form of casualty, the young swans, known as cygnets, would probably amount to more than ten thousand yearly.

The concentration of these birds on the waters occupied by great numbers of geese and ducks decreases the food supply for all. A swan weighs from twelve to sixteen pounds and has the habit of pulling up the water plants in order to eat not only stems, but some of the roots, and temporarily destroys the available food crop on considerable areas. This effect is purely temporary, however, for each summer sees a renewal of the growth in these feeding

Photograph by George Shiras, 3d

WHISTLING SWANS

The typical swan family spends the winter in friendly companionship on Currituck Sound. The two pure-white parents and the grayer young may be readily distinguished. One of the young in this group is sleeping in a characteristic pose, its neck folded back against the body and the head lying on the middle of the back, between the bases of the wings.

places. Few sportsmen would care about shooting more than one swan, but the natives are very fond of them, especially the young ones.

Illegal night shooting no doubt keeps the increase of swans somewhat in check, but those who go forth to kill swans at night are tempted also to shoot into flocks of geese and ducks, if they happen to come across them.

Under Federal regulations, the perpetuation of the whistling swan appears assured. Any one who has seen the great white bands flying up and down the sound every day, or has seen them in large flocks in the quiet bays and heard their clear, flutelike notes, often during the darkness of the night, will be ever ready to defend them (see pages 276 and 283).

Swans apparently mate for life and are accompanied by their young during the first winter; so that, big as a flock may be, the family is the unit, and when on the water it is not hard to pick out the small divisions based on kinship.

These birds feed in the morning and late afternoon and often at night, if the weather is favorable. From 10 o'clock in the morning until 3 in the afternoon they can be seen drifting about in family groups, most of them sound asleep, with the head and long neck folded on the back (see above).

AN EAGLE CATCHES A COOT

On the occasion of Doctor Chapman's visit we took lunch at Monkey Island and witnessed an incident worth recalling. In a bay close to the island was a large flock of coots, locally called "blue peters."

Suddenly from out the sky appeared a bald-headed eagle heading for the coots, which showed great consternation. Hovering over one end of the flock, the eagle dropped down to within a few feet of the water. Thereupon the coots dived out of sight, although they are not skilled in submerging. Mounting aloft, the eagle again made a descent as the birds came to the surface, driving them down again.

Photograph by George Shiras, 3d

WHISTLING SWAN AND DECOYS

A young swan comes in to visit some wooden decoys. The dark-gray head and dull white of the rest of the plumage indicate that it is a bird hatched the previous summer. At the time this swan inspected these decoys it appeared to resent such clumsy images of its kind and swam up close to each one, pecking vigorously at its head.

These maneuvers were repeated for five minutes by the watch, but the eagle made no attempt to capture any of the birds. At this juncture we were called to lunch, and a guide agreed to watch the eagle while we were away. Another five minutes passed, when the eagle descended and succeeded in seizing one of the exhausted birds. When we returned it was seated on a channel post eating its victim. Apparently the eagle had deliberately harried the coots until they were so exhausted by being kept under water that it became a simple matter to capture one of them.

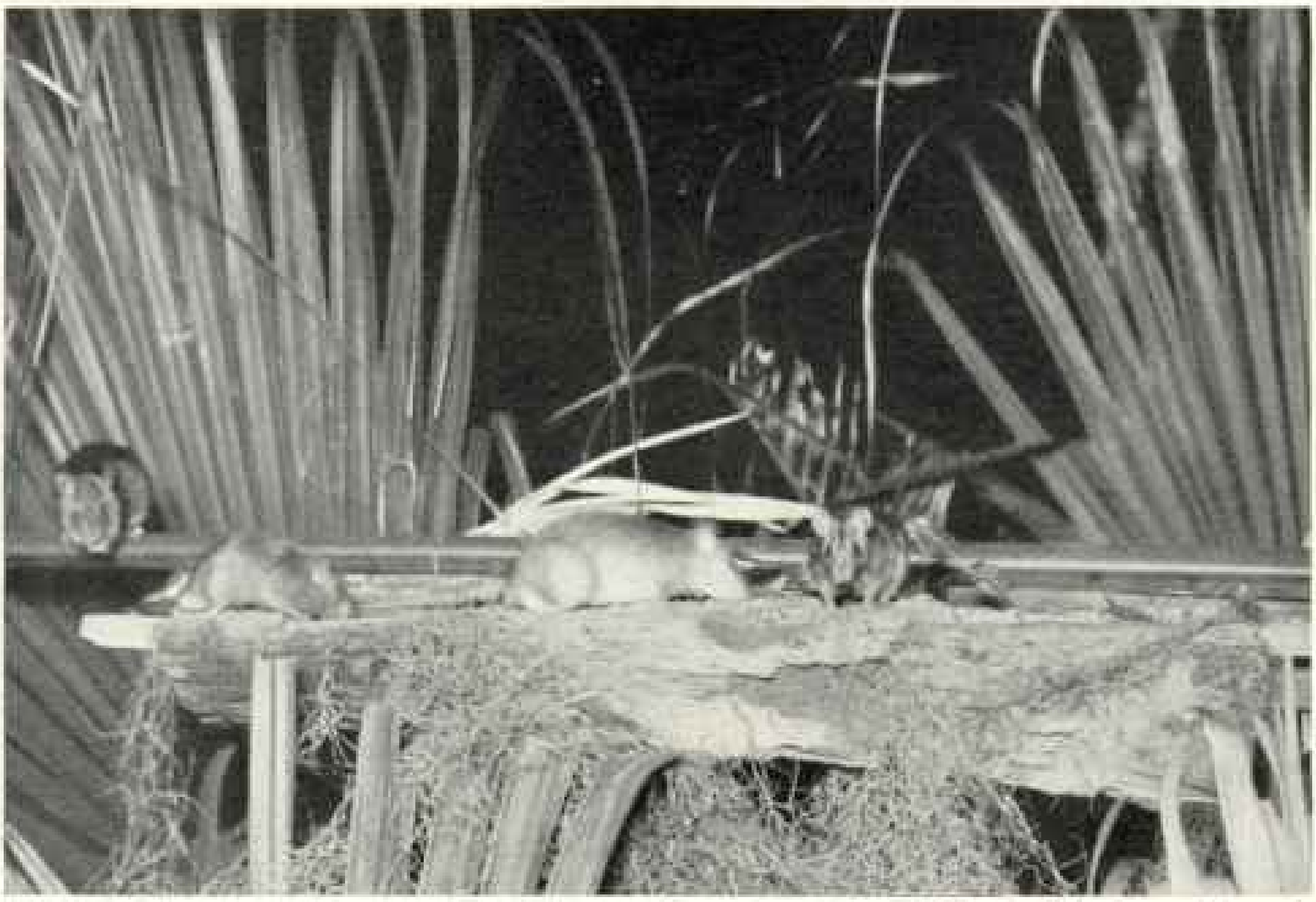
A fish crow flying behind the busy eagle saw a chance for a meal and audaciously pulled away some of the remains beneath the eagle's tail. This would seem to indicate that eagles won't "eat crow," for these slowly flying birds might be easily captured when crossing over the wide waters of a bay.

Currituck Sound is approximately 30 miles long and varies up to five miles in width. It is an important connecting link of the "inside passage" used by yachts and houseboats on their way to and from southern Florida.

THREE HUNDRED MILES OF DUCKING WATER

Currituck Sound enters the eastern end of Albemarle Sound, which extends west for 60 miles, and then these combined waters flow into Pamlico Sound, which, with a width of 30 miles, borders the coast for some 75 miles, to join Core Sound, the southern limit of the best ducking waters on the Atlantic coast.

The depth and width of Pamlico Sound afford congenial wintering haunts for large numbers of redheads, ringnecks, scaups, scoters, golden-eyes, bufflehead, and old squaws. From Back Bay, in Virginia, through Currituck and the other waters mentioned, the inner shore line totals some 300 miles, and is somewhat longer than the outer coast, for Albemarle Sound is computed as a part of the inner lines.



Photograph by George Shiras, 3d

NIGHT CUSTOMERS

Roof rats, usually house frequenters, occur wild in great numbers throughout most of Florida. At Ormond Beach these agile climbers, old and young, nightly make free use of the food placed for birds. A flash-light camera gave the accompanying view of them at work. This Old World rat is abundant in warm parts of America. This view shows the young and the old feeding on grain put out for the birds.

No place on the American continent affords such a winter home for our wild fowl, and here some day should be established large wild-fowl refuges, affording havens of security when shooting becomes excessive.

I have photographed many ducks, geese, and swans on Currituck Sound. In the region I visited there are three weekly rest days — Wednesday, Saturday, and Sunday—when no shooting is allowed, thus giving the waterfowl a chance to feed and rest. This wise provision of the law naturally invites the use of the camera, and many sportsmen now occupy these otherwise idle days by getting pictures of wild fowl swimming about. Then, again, they may endeavor to have the negative record birds speeding over the decoys, perhaps at 50 miles an hour.

In this sport the customary hardships of wild-fowl shooting are largely avoided; for, instead of arising at daybreak, the camera hunter goes forth after the sun is well up and returns early in the afternoon, before the fading light prevents rapid exposures. If it is raining or blowing a gale, he may stay under a roof, awaiting better weather.

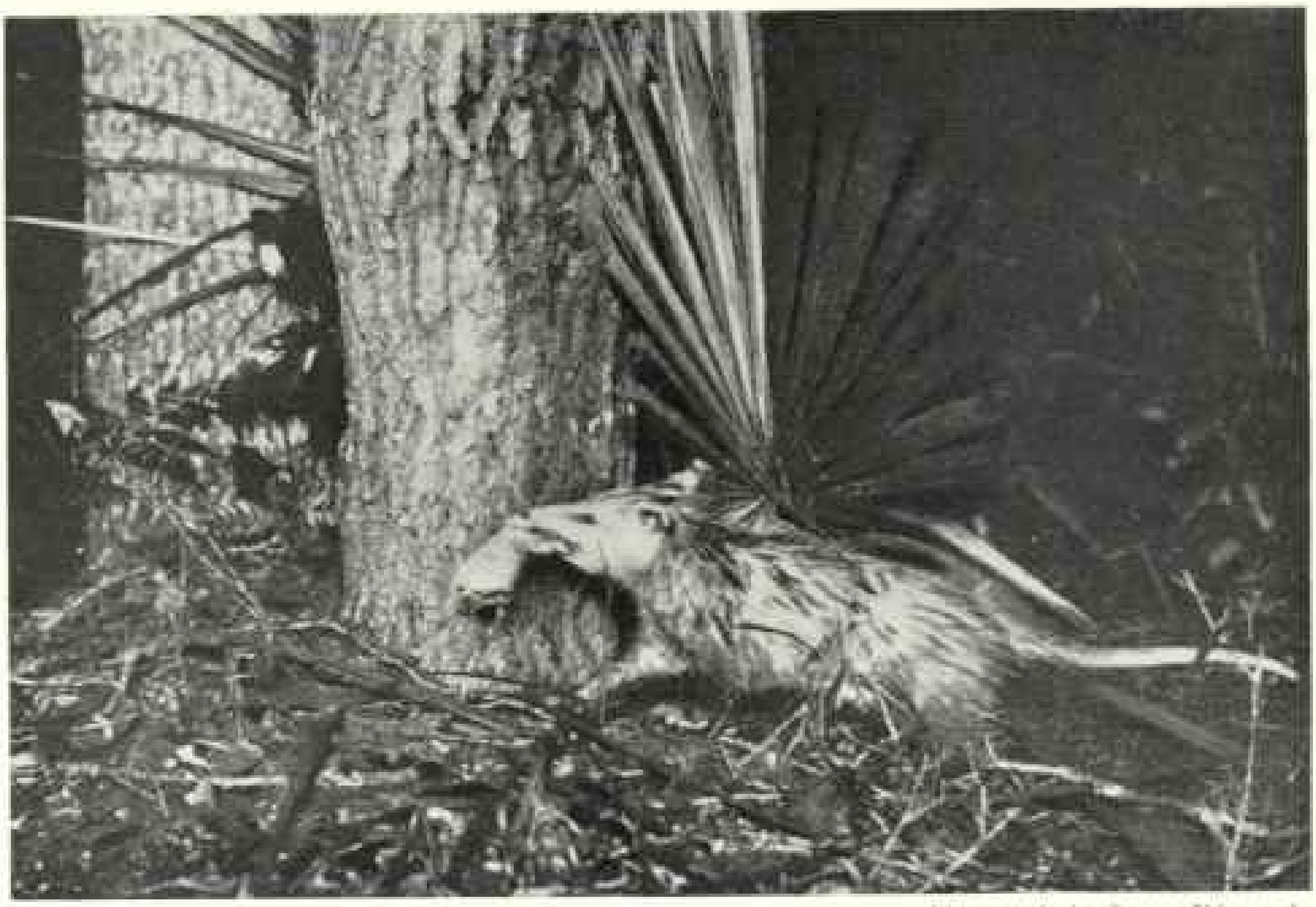
HOW TO OPERATE THE CAMERA

Satisfactory wing pictures depend upon careful preparation and the accurate handling of the camera. At first it may seem more difficult than shooting, but in a short time practice overcomes the principal troubles, and then one can depict more wild fowl on his plates in an hour than a crack shot could kill in several days.

The location of the blind and the setting out of decoys are the same as when shooting, except that there must be a small, low opening in the front part of the blind, where reeds or other obstructions should not be permitted to interfere with a semicircular swing of the camera. Of course, the greatest difficulty in taking wing pictures arises in getting the birds not only on the negative, but in sharp focus. A badly focused bird is on a par

A FLORIDA COTTON RAT

The little cotton rat (*Sigmodon hispidus littoralis*) is common in the damp, grass-grown stretches along the Halifax River. By careful work, several daylight photographs were taken.



Photographs by George Shiras, 3d

OPOSSUMS TAKE THEIR OWN PICTURES NEAR THE AUTHOR'S WINTER HOME

Opossums are the only American marsupial. They range from the United States to Argentina, and the species vary from the size of a house mouse to that of a large house cat. The young are born in an embryonic state and are carried, attached to teats, for many weeks in a pocketlike pouch on the mother's abdomen.

Photographs by George Shiras, 3d

FLORIDA SWAMP RABBITS

Swamp rabbits took their own pictures freely by flash light, when baited, on the river bank near the author's winter home, at Ormond Beach. When pursued, these rabbits take to the water and swim as freely as muskrats (see, also, text, page 300). The Florida form is dark reddish-brown. Seldom seen in daylight, the automatic flash light was needed to picture such an animal.

with the escape of a wounded one.

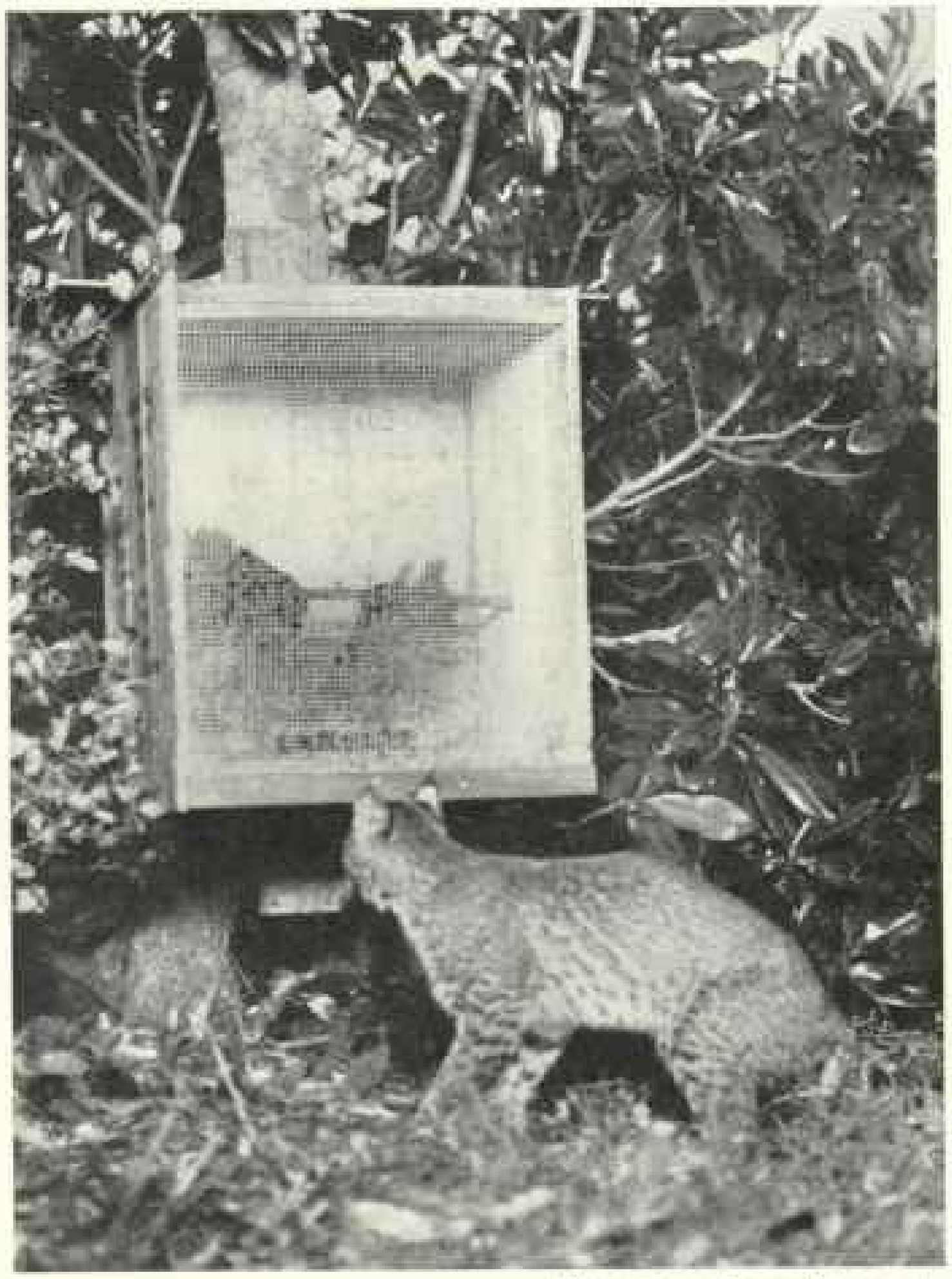
In a lane, between two sets of decoys, I place five specially marked ones 10 feet apart, the nearest being 30 feet from the blind. These fixed distances should appear on a temporary camera scale. By setting the exposure at time, the mirror can be released and the focal plane shutter operated successfully by a quick pressure on the upper catch.

The shutter should be set at from 1/500 to 1/1000 of a second, depending upon the quality of the light and the speed of the birds. When a flock is seen approaching, a long lever on the side of the camera connected with the focusing disk is thrown to a point bringing the birds in focus according to which one of the five decoys they are nearest.

If the ducks come straight in, circle, drop down, or rise, it requires quick thinking and an equally quick manipulation of the focusing apparatus and the shutter; yet exactly the same quickness of mind and body is required in successful wing-shooting, with the advantage, however, on the side of the camera hunter, for if he misses or bungles, these birds are very apt to return to the silent blind.

Most of my swan pictures were taken from a launch coming down wind on feeding or resting birds, and when they arose quartering toward the boat I could get satisfactory pictures, even at a hundred yards, through the use of a long-focus lens. Several times I put out goose decoys painted white, but the older swans eyed them in contempt, although several cygnets (young of the year) would swim in and sometimes attack these poor counterfeits, as though resenting their appearance.

The Canada geese rarely came to baited blinds until after sunset, when shooting is prohibited. Apparently they soon learned this and kept an eye on the declining orb. In 1927 shooting was prohibited after 4 o'clock in the afternoon, and the geese promptly advanced their feeding schedule. Then I could enter the blind with enough light left to get many pictures, much to the envy of my fellow hunters, when they heard me tell how large flocks swam up



Photograph by George Shiras, 3d

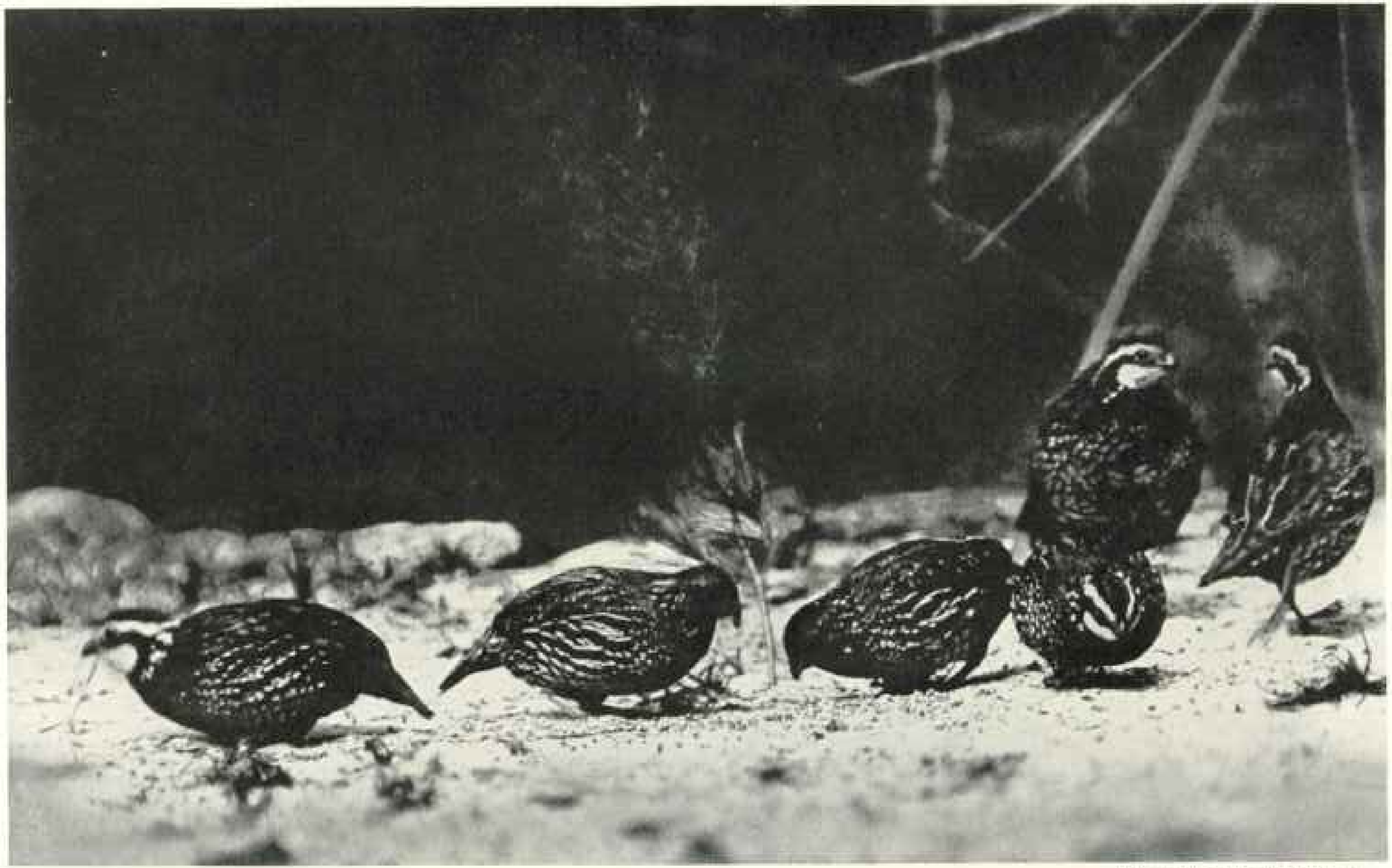
A FLORIDA WILD CAT

The only wild cat picture the author ever secured was by an odd combination of an automatic flash light, in broad daylight, at a plantation up the Halifax River from Ormond. The lure used to attract the animal was a live chicken in a screened box (see, also, text, page 299).

Photograph by George Shiras, 3d

THE FLORIDA RACCOON IS AT HOME AMONG THE PALMETTOS AND TRAILING SPANISH MOSS

Near the author's winter home, at Ormond Beach, a number of raccoons have taken their own pictures by the automatic flash-light camera. When young it makes an interesting but inquisitive pet. This animal is practically omnivorous, eating frogs, fish, small mammals, birds, eggs, insects, fruit, young corn, etc.



Photograph by George Shiras, 3d

FLORIDA QUAIL AT HOME AMONG THE PALMETTOS

The Florida bobwhite is a little darker-colored than the familiar northern bird, but its habits and cheerful call-notes are practically the same.

Photograph by George Shiras, 3d

HAVING FUN WITH A LOGGERHEAD

Every spring when the nesting time arrives both the loggerhead turtle and the green turtle come ashore on the sand beaches along the east coast of Florida and, scooping holes in the sand above high tide, deposit large clutches of eggs, which are buried by scooping back the sand with their front flippers. Then the mothers depart. In due course the little turtles appear, and promptly enter the sea and swim away on their voyage of life.

and down in front of the blind, paying no attention to the clicking camera.

CUMBERLAND ISLAND, GEORGIA

In the winter of 1885 I made my first visit to Cumberland Island, near the southern border of Georgia and just north of Fernandina, Florida. This property had been acquired by Thomas M. Carnegie, a brother of Andrew Carnegie, and his family has occupied it ever since.

No more attractive island for a winter residence is to be found on the Atlantic coast. It is some twenty miles long and several miles wide, with fine, hard beaches. It is well forested, and contains fresh-water ponds and numerous lagoons where ducks and many varieties of water birds are to be found.

The alligators are large and numerous, causing havoc with the swamp-breeding birds, besides devouring young pigs, deer, and hunting dogs when they cross the lagoons. In the woods are many deer and wild turkeys, but these are sparingly shot, so that the island is really a refuge for animals and birds. By a coincidence my maternal grandfather had an option on this property in 1866, so I viewed the attractive surroundings with additional interest.

THE WATER MOCCASIN

Among my pictures is one of a cotton-mouthed moccasin which recalls a rather amusing adventure. Close to a cabin on the beach which I occupied during a week's photographic trip in 1901 was a small fresh-water pond, where I flushed a number of jacksnipe every time I passed by; so a gun was borrowed to provide game for the table. One snipe flew over the pond and fell in the middle of it when shot.

Taking off my shoes and stockings, I waded in after it. On reaching the place where the bird fell, it could not be found; so I started to mount a sunken log to look carefully about. Suddenly the head of an alligator appeared between my legs and water was splashed over me. I had tried to mount a partly submerged 'gator,

which resented such familiarity! Deciding that the snipe had disappeared down the capacious throat of this reptile, I went ashore in some haste.

When narrating this incident to one of my hosts, he declared I had taken a great risk in wading about this pond. I scoffed at the idea, saying that the alligator was too small to be feared. To this he replied that it was not the alligators, but the water moccasins he meant, for the pond was filled with them, and I should always wear something on my feet. Thereupon I suggested that his wishes that I be shod when in the water were easily complied with, "for I could enter the water barefooted and come out with a 'gator' on one foot and a 'moccasin' on the other!"

Another year I went to the Big Green Swamp, south of Mohawk, Florida, for pictures of the rapidly decreasing Florida sandhill crane. A local trapper took me to a marsh where he said these birds were breeding. On arriving, we found all the nests empty, which the guide said might be due to his having taken the eggs to send north at the rate of a dollar apiece to adorn egg collections. This threw some light on the rapid disappearance of these birds.

Desiring to mollify me, he told of a little pond near by where I could get a picture of "the biggest alligator in Florida." Approaching the place cautiously, I saw what seemed to be a small alligator wriggling its way through the tall grass to the pond. Reaching down, I seized it in the middle and held it aloft, when, to the horror of the guide and myself, it proved to be an extraordinarily large water moccasin. Meanwhile this snake was trying to swing its head up, so that it could strike my wrist, the nearest part of my body and a place where the poison would be particularly dangerous. Of course, I dropped it at once, and was glad that this reptile had lived up to its reputation for sluggishness, for few persons are killed or injured by the many thousands of moccasins occupying the southern swamps.

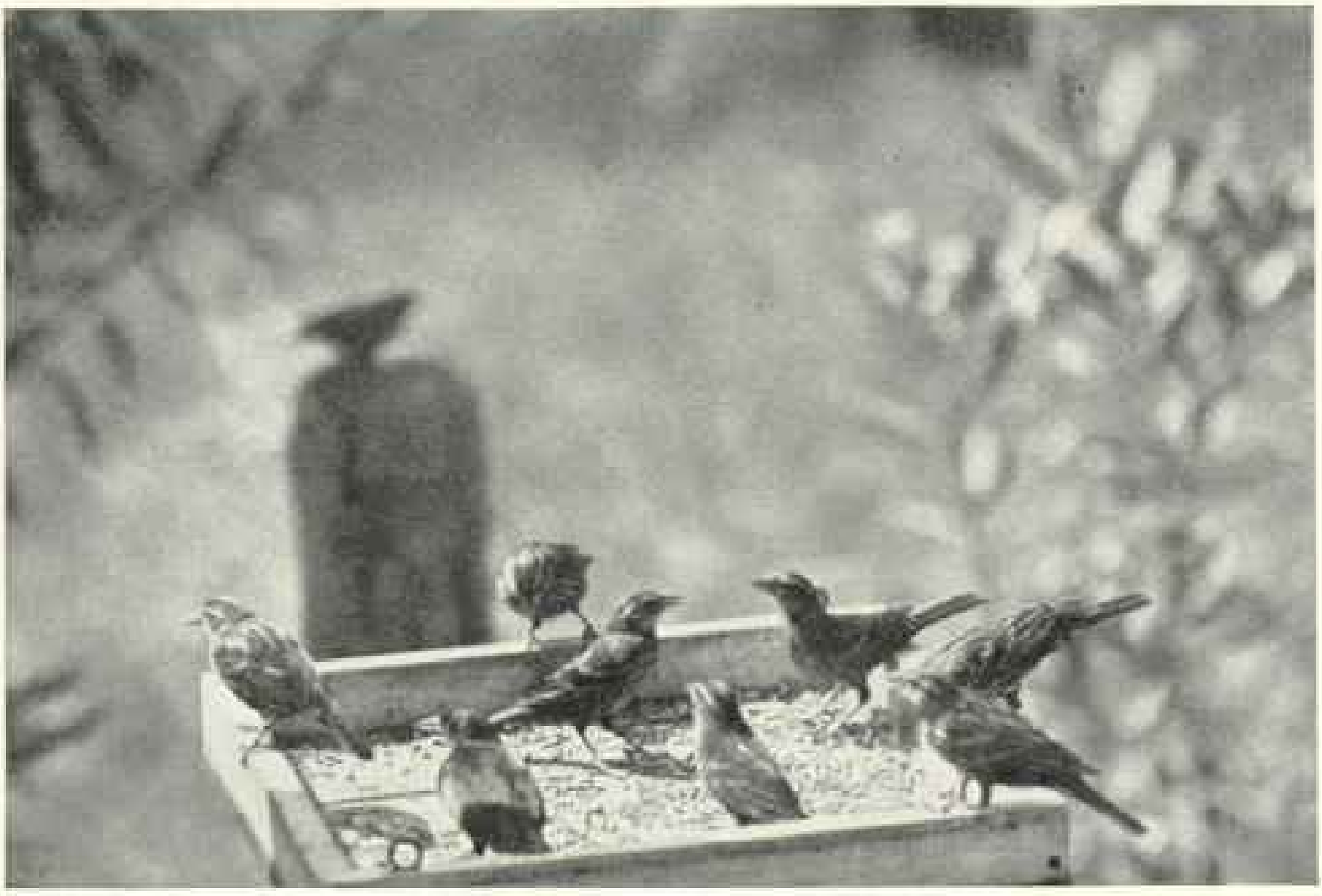
Photograph by George Shiras, 3d

A RED-BELLIED WOODPECKER EATING SUET ON A CABBAGE-PALM TRUNK

This, one of our common birds, heralds the approach of the mating season by hammering loud tattoos on tin roofs, metal tanks, wooden copings, and other sonorous objects. Photographed at Ormond Beach.

A NATURE LOVER'S PARADISE

With its southern end resting on the border of the Tropics, Florida has a gen-



Photograph by George Shiras, 3d

RED-WINGED BLACKBIRDS

In winter they come daily in flocks to enjoy the contents of a feeding tray under a large palm tree about 25 feet from a veranda where people are usually gathered, at Ormond Beach, Florida.

erally mild and equable climate. This favors the production within its borders of a great variety of fruits, flowers, and other vegetation. Its long stretches of beautiful coral sand beaches, its thousands of fresh-water lakes and placid rivers in picturesque setting, accessible by water, rail, and modern highways, have made it one of the most famous winter resorts of the world.

Its great north and south extent of land projecting into the sea has made it a highway for migrant birds of many kinds. At the same time the extraordinary richness of the State in lakes, marshes, and coastal lagoons makes it the favored home of a vast multitude of herons, ibises, cormorants, pelicans, snakebirds, gulls, terns, and other water-loving bird life without parallel on this continent. Quail and wild turkeys also abound.

With its wealth of bird life, Florida also once possessed a great abundance of other animals, conspicuous among which were white-tailed deer, black bear, puma, wild cat, gray wolf, otter, and other fur bearers. Along the coastal salt lagoons were many manatees.

Within comparatively recent years the rapidly increasing occupation and development of the State has had the usual effect on wild life produced by such conditions. Conservationists have been active trying to save the wild things of the State from the extermination within its borders which has overtaken the flamingo and parrakeet and threatens others. At present, what with improved game laws and a greater appreciation of the value of its wild life developing among the residents, the future appears more hopeful for the wild creatures that add so much to the attractiveness of this region.

TWENTY-FIVE WINTERS IN EASTERN FLORIDA

In the winter of 1906 I went again to Florida and with my family occupied a cottage at Ormond Beach, on the eastern side of the Halifax River, where I have returned every winter since. The sandy peninsula formed between this river, which is really a long salt lagoon, and the ocean had few occupants then, the visitors stopping at the two hotels—one on the river and the other on the ocean.

Photograph by George Shiras, 3d

THE FLORIDA JAY

This plain, grayish-blue jay is peculiar to Florida, where it occurs mainly in the Ormond Beach district, along the palmetto and brushy belt covering the sand-dune area. In the Halifax River country they are in the shore belt and do not frequent the more wooded vicinity of the river, where the Florida blue jay occurs. The Florida jay has something of the same confidence in mankind shown by the Canada jay, as indicated by the readiness with which it may be taught to come to hand for pieces of bread or other food, as in this photograph, made at Ormond Beach.

Along the river and for three hundred yards back were forests of yellow pine and oak, growing on sand-dune ridges formed long ago by the ocean, while beyond the trees was a dense thicket of bushes covering other sand dunes to the beach, three-quarters of a mile away. This stretch of wild country extended up and down the coast for fifty miles and contained few habitations back from the water.

It was not long before I discovered that in the woods in the rear of my cottage were large numbers of small animals, such as the wild cat, raccoon, opossum, skunk, cottontail rabbit, and wood rats, and occasionally tracks of deer and bear were seen farther up the river. In the growth along the low shore of the river were marsh rabbits and cotton rats (see page 285).

With my guide, John Hammer, I set out a number of cameras connected with a flash light. The first glare of light and heavy boom of the explosion astonished the neighbors, but finally they became accustomed to it, and I would be asked what luck I had the night before.*

About the house were placed feeding boxes, and during the season we were able to see nearly every species of land bird living or wintering there, the principal exception being the Florida jay, which was to be found only a quarter of a mile away, in the scrub bushes nearer the ocean. Unusual visitors at the feeding boxes were red-winged blackbirds, which, owing to the proximity of the river, came daily. Quail, too, found grain on the ground and offered excellent chances for pictures. A special feeding box for fish crows near the reeds by the river made it possible to photograph this marauding creature.

Eighteen miles south, the Halifax River enters the ocean through a mouth called Mosquito Inlet, recently renamed Ponce

* In 1890 and later the author invented the apparatus for taking photographs of wild life at night, by hand and by set cameras, which forms the basis of the instruments now so generally in use for this purpose.—Editor.

Photograph by George Shiras, 3d, March, 1932

SCAUP DUCKS, HALIFAX RIVER, FLORIDA

These ducks rise gradually from the surface.

Photograph by George Shiras, 3d

SANDERLINGS ON DAYTONA BEACH

These nimble little sandpipers are common all winter along the sand beaches of Florida. They nest in the far north.

Photograph by George Shiras, 3d

A DOVE OF PEACE BECOMES BELLIGERENT

A male Florida ground dove assumes a threatening attitude to drive an approaching blue jay (not in the picture) from the feeding place it occupies.

de Leon Inlet at the request of the business interests. This inlet and the waters and sand bars back of it are wonderful places for sea birds. At low tide hundreds of brown pelicans and black skimmers may be seen resting on the sand bars and mud flats, together with gulls, terns, herons, and shore birds. This area was long a Federal game preserve and did much toward interesting the winter visitor in the conservation of bird life. The many pictures I have taken here and along the eastern coast tell the story of camera hunts in this region (see pages 296-7).

BROWN PELICANS, OFFENDED, CHANGE THEIR CENTURY-OLD HOME

From time immemorial the brown pelicans of eastern Florida occupied a small island in the Indian River near Sebastian.

Twenty-nine years ago President Roosevelt set this island aside as a Federal Bird Reserve.* Since then it was visited by many hundreds of naturalists and bird lovers accompanied by a warden to see that the birds were not unduly disturbed. At first the island was covered by a dense growth of mangroves, but continued use by the nesting birds completely destroyed them. The pelicans then continued to build their nests on the bare ground rather than seek a new home.

About eight years ago two small houses were built on the east side of the river close to Pelican Island. Thereupon these birds, outraged at the intrusion and the motor-boat traffic incident to it, took wing for new quarters. Instead of choosing one of the near-by islands, they continued north until Mosquito Lagoon was reached, a large body of nearly fresh water lying close to the ocean at the southern end of Halifax River and paralleling the headwaters of Indian River.

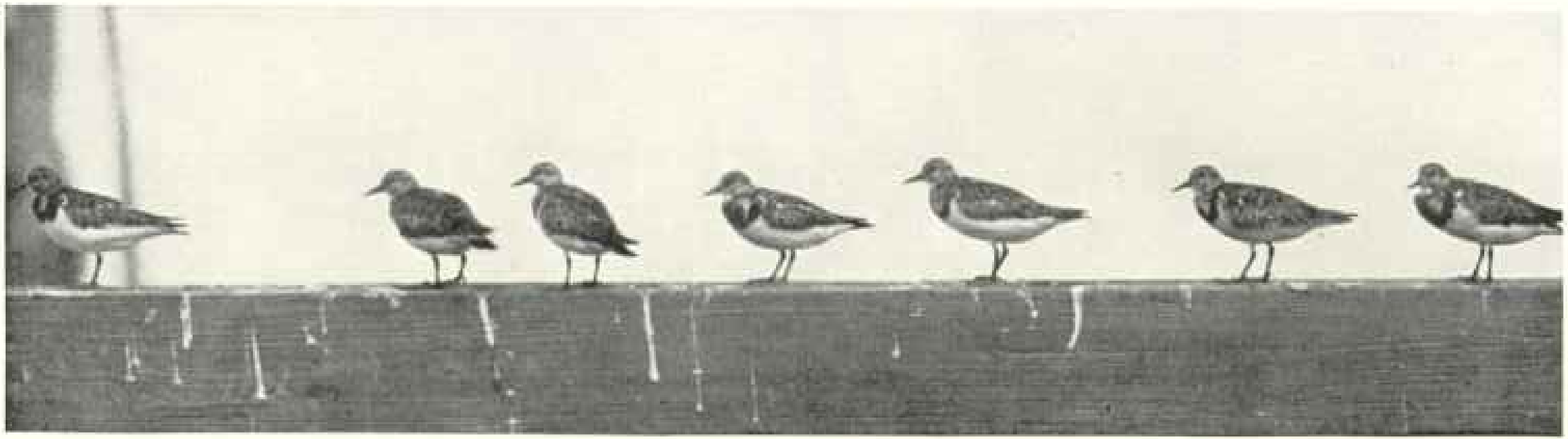
Here, at the south end of the lagoon, they took possession of a larger, partly wooded island and without hesitation built their nests in the mangrove tops, as was their custom many years before. Sharing these new quarters with the pelican was a large colony of Ward's herons, a pale-colored Florida phase of the great blue heron (see page 298). The year after

* The first of nearly 90 now in existence.

Photographs by George Shiras, 3d.

BLACK SKIMMERS AT PONCE DE LEON INLET, FLORIDA

These strange birds gather in large numbers on the bare sand at the inlet during each low tide. When alarmed, they take wing in a compact flock, as they have been standing on the sand. Their appearance is so different from that of the gulls and terns, with which they are neighbors, that they may be readily distinguished at a long distance.



RUDDY TURNSTONES, OR CALICO-BACKS, ON RAILING OF APPROACH TO PORT ORANGE BRIDGE, FLORIDA

They are waiting near an oyster-shucking house for the dumping of empty shells, among which they search for food. These little waders are more ornate than members of the snipe family, to which they are related.

Photographs by George Shiras, 3d

GULLS AND TERNS ON THE BEACH NEAR PONCE DE LEON INLET, FLORIDA

At low tide many waterfowl gather on the bare sand near the mouth of this inlet. In this photograph are herring, ring-billed, black-headed, or laughing gulls, and royal terns.

Photographs by George Shiras, 3d

WARD'S HERON AT BREVARD ISLAND, MOSQUITO LAGOON

The Florida form of the great blue heron is a much paler bird than its relative of the Northern States in summer. The bottom photograph was taken as the heron was leaving its perch on top of a mangrove.

their arrival the pelicans aroused the ire of some local fishermen, who mistakenly feared their effect on the local fish supply; so a general massacre of more than 1,000 birds, old and young, took place. Careful investigations before this had proved that the pelicans feed almost exclusively on menhaden taken along the coastal waters and rarely on any fish of commercial food value.

When the Bureau of Biological Survey learned the pelicans had deserted their former reserve on the Indian River, the new island home was surveyed and set aside as a reservation under Federal supervision (see page 306). This location, being much nearer the large town of Daytona Beach, will become a new mecca for the bird lovers of Florida.

It is worthy of mention that in the early spring of 1927 Dr. E. W. Nelson, on his second trip to the new pelican home in Mosquito Lagoon, found about 80 white pelicans temporarily consorting with their brown relatives, having come from the Gulf, where they winter every season. Some of them now breed on an island off the Texas coast.

In catching fish, the brown pelicans dive heavily from a height of some twenty to seventy-five feet, with a loud splash, sometimes disappearing below the surface, capturing fish in the distended pouch as in a dip net, while the white species swims about in a dignified way and scoops up fish near the surface, also as in a dip net. Both on Yellowstone Lake and on Henrys Lake, Idaho, I have seen the white pelican capture a fish as agile as the trout. The white species might prove harmful in the fresh-water lagoons along the coast of Florida, but they are rare visitors there.

During more recent years the natural development of Florida, together with the late lamented land boom, have affected many of the wilderness tracts, but some of these are returning again to their former condition.

The wonderful ocean front along the Ormond-Daytona Beach has once more become the world center for breaking automobile speed records and others are populous bathing resorts. The crowds at such places have naturally disturbed the feathered occupants of the shore; but otherwise those who are interested in bird life hope that this State will long continue

Photograph by George Shiras, 3d

THE LOUISIANA HERON IS A COMMON RESIDENT THROUGHOUT THE YEAR IN EASTERN FLORIDA, WHERE IT HAUNTS RETIRED SHALLOW WATERS

to maintain its marvelous assemblage of winter and resident birds.

GETTING A PICTURE OF A WILD CAT

Besides the bears, there was another animal that foiled me for years; this was the wild cat, a southern cousin of the Canada lynx. I once succeeded in getting a flash-light picture of the latter in western Ontario, but the wild cat had eluded every effort.

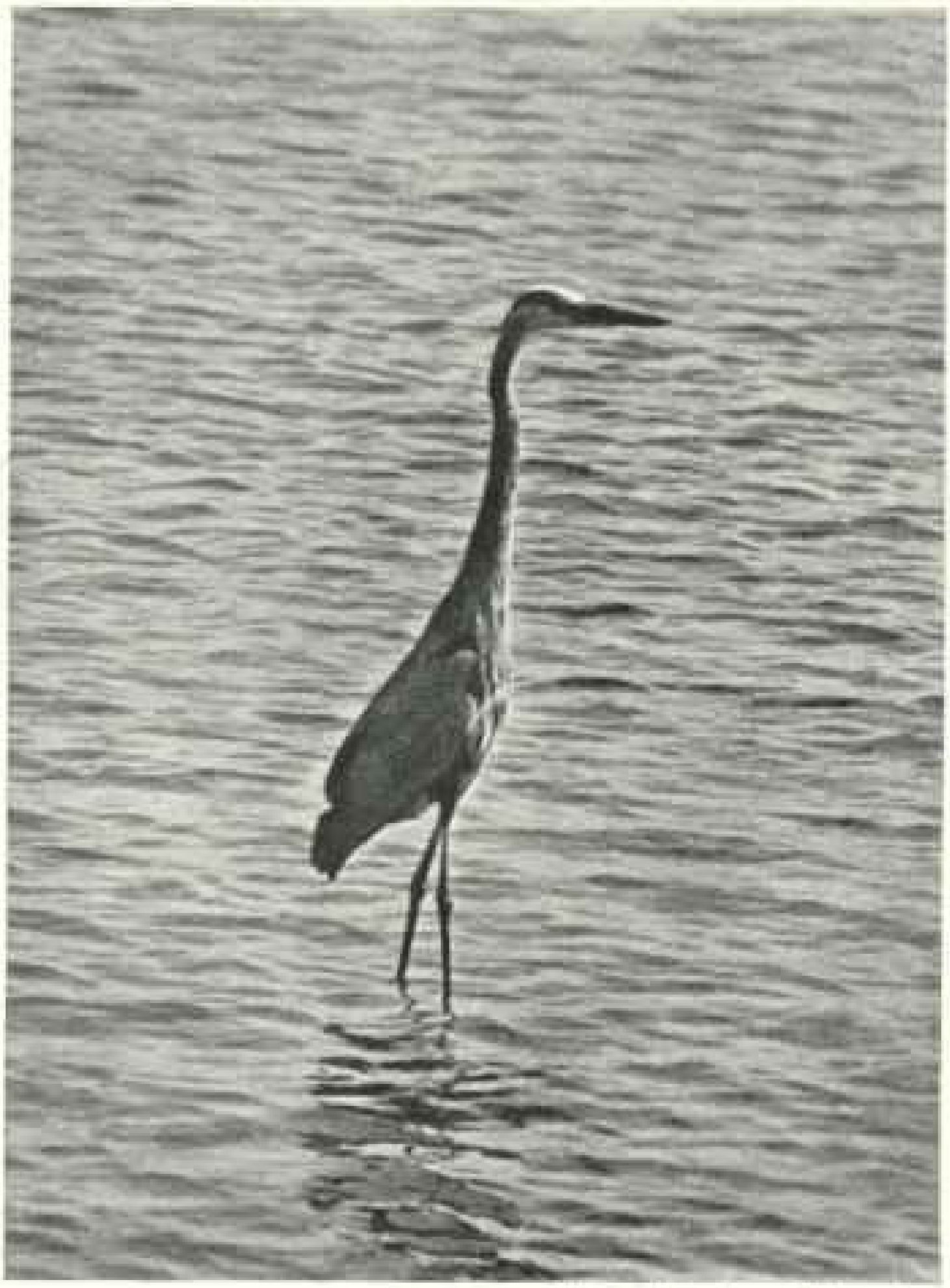
The only reward for a long time obtained by setting baited cameras around the edges of swamps and thickets where wild cats were abundant, near the Florida coast, was pictures of raccoons, skunks, opossums, and wood rats. Finally, I heard of a raid made by a wild cat on a chicken coop at a plantation up the Halifax River, where forty out of forty-five chickens had been killed.

Visiting this place, I borrowed one of the surviving fowls and placed it in a box, well guarded on the open side by a strong wire mesh, with food and water that would last several days. The box was then nailed to the base of a magnolia tree in an abandoned orange grove near the thicket where the slaughtered chickens had been dragged.

Every few days I visited the place to care for the chicken and to see whether the flash had been fired. Ten days passed, and it was time for me to go north, so I went to the plantation for my outfit.

The owner of the place met me with an apology, saying that the day before, which was Sunday, he had let his big boar out of the pen for an airing, for it had been shut up while I had been trying for a picture. He said the boar had gone unseen to the rear grove and evidently fired the flash, because there was a loud explosion, and in looking up the trail he saw it returning at full speed, head and tail up. It entered its pen, looking as if it had had all the fresh air it wanted. I said that I had come up to get the camera and would be glad to develop the plate in order to see his inquisitive swine.

On returning north it was some time before I developed the plate, and thereon, instead of the big hog, was the crouching form of a wild cat! Most amazing was the fact that it was taken in bright daylight, so that the picture represents a com-



Photograph by George Shiras, 3d

"OLD BILL" AT PORT ORANGE BRIDGE, FLORIDA

The great blue heron spends the winter in northeastern Florida while its summer home in the north is closed by ice and snow.

bination of daylight and flashlight (see page 287).

SWAMP RABBITS

The swamp rabbit of Florida and the coastal swamps and marshes of adjacent States is almost as amphibious as a muskrat. While similar in general appearance to the cottontail of the North, it is a heavier-bodied and shorter-legged animal, with a darker brown color. It lives in grassy marshes or in wooded and brush-grown swamps. When small vegetation such as grass or reeds make a dense growth, these curious rabbits make well-worn runways which they use constantly. They leave these roads and often take to the water voluntarily, or when frightened, and swim with all the facility of a mink or muskrat. In order that they may swim more readily, the toes on their hind feet are partly webbed.

Along the bank of the Halifax River, in front of my winter home, grew a border of reeds, water brush, and small palmettos. The water rabbits frequented this cover and when stray dogs pursued them they swam out among the reeds, where they remained safely hidden until the enemy had gone.

Having noticed their presence, I placed conveniently for them samples of celery, carrot, and cabbage, which they promptly ate. Then I set up a flash light with a pulling-string properly baited. Early the first night following these preparations on shore, before the house, the living room was suddenly illumined by the explosion of the flash-light powder, followed by a loud report, which caused much excitement among the people in the neighboring cottages. In a short time a series of flash-light pictures of these rabbits was secured by set cameras located almost in my front yard (p. 286).

THE AMERICAN CROCODILE AND THE ALLIGATOR

Among the numerous interesting animals found in Florida is the American crocodile. It was first captured in the State, years ago, in Biscayne Bay. Later it was found to inhabit the salt lagoons and marshes of extreme southern Florida, to which it is restricted, owing to its sensitiveness to cold. This is the largest of the lizards in North America, some-

Photograph by George Shiras, 3d, and McClintock

LITTLE GREEN HERON ON ITS NEST NEAR VERMILION BAY, LOUISIANA

times exceeding 14 feet in length. It also occurs in the Tropics of the West Indies and Mexico. During recent years its numbers have greatly decreased in Florida, where it appears to be harmless so far as human beings are concerned. This relative of the dreaded Old World crocodile is readily distinguished by its long, narrow snout from the well-known alligator, which has a broad, shovel-shaped head.

When I first went to Florida the alligator was very abundant in most parts of the State, where it frequented the fresh-water streams, shallow lakes and marshes. The increasing demand for its hide, from which ornamental leather goods are made, has greatly reduced its numbers. This decrease has been hastened by the ready sale of the eggs and very young ones to tourists. The man with a gun also has helped lessen their numbers by thoughtlessly killing them because they served as large living targets.

The mouth of the Tomoka Creek, a tributary of the Halifax, is located about six miles above my winter home. The Tomoka is navigable for large power boats to about ten miles above its mouth. It is a narrow, winding, sluggish stream, and is a favorite resort for picnic parties in launches and other excursion boats. Its mouth is in the midst of broad, grass-grown marshes, with stately groups of tree palmettos here and there along the adjacent higher ground. Farther up, the marshes are more broken by wooded areas in which palmettos, pines, and live-oaks are intermingled in picturesque array. The upper reaches of the stream are narrow and heavily fringed with trees, the live-oaks being beautifully draped with Spanish moss, some of the hanging strands being 12 to 15 feet long.

The marshy borders of this river have long been a favored haunt of alligators. By common consent, owing to their interest to visitors, they have had a certain protection.

During my first excursion up the Tomoka, in a boat with many others, we saw numerous large and small alligators lying in the sun near the water's edge. Whenever an unusually large one was seen the boat would swing over and pass close to the sleeping animal without causing any sign of alarm, even when the excited passengers made loud cries and rushed about on the boat (see page 309).

Photograph by George Shiras, 3d

AN ANIMATED SIGHT ON THE LOUISIANA DUCK MARSHES

Unlike the deep-water ducks, those of the marshes, such as the mallard, black duck, and pintail, rise perpendicularly from the surface when alarmed, whereas the diving ducks ascend gradually. In the Gulf region the wild fowl escape the rigors of the northern winter, and many find a safe retreat on the Rockefeller, Sage, and Rainey refuges.

CAN DUCKS SMELL THE HUNTER?

The photograph shows a part of a flock of ring-necked and scaup ducks at Avery Island, Louisiana, coming in to feed on corn near a blind occupied by the author.

Photographs by George Shiras, 3d

RING-NECKED DUCKS TAKING TO THE AIR IN FRIGHT

This flock was photographed at Avery Island as it turned and flew away in alarm, just as the birds came to the point where the slight offshore breeze carried the human scent to them. This occurred repeatedly, and no other cause for the alarm could be noted. The day before, when the wind blew inshore, the birds came within a few feet of the blind. Were they alarmed by the scent?

Photograph by George Shiras, 3d

FLOCK OF BLUE GEESE LEAVING THEIR FEEDING GROUND ON THE RAINEY REFUGE, LOUISIANA

Usually about one in eight or ten birds in these flocks is a lesser snow goose, some of which appear in this picture. During the summer of 1929 the nesting place of the blue geese was definitely located in southern Baffin Island (see, also, text, page 308).

A BLUE GOOSE ATTRACTED BY CORN BAIT IN THE LOUISIANA MARSHLAND

The author spent long hours in a blind waiting for blue geese to come to scattered corn bait. Boat-tailed grackles promptly came to the feast and their presence may have caused the solitary blue goose that came in to investigate this strange food.

Photographs by George Shiras, 3d

CANVASBACK DUCKS, RAINEY REFUGE, LOUISIANA

Before the author visited this refuge, in February, 1927, a fresh-water lake adjoining the clubhouse was entirely covered with the banana waterlily, which attracted more than 50,000 canvasback and scaups. But when the author arrived, these plants had all been eaten, and only a single flock of canvasback remained to be pictured.

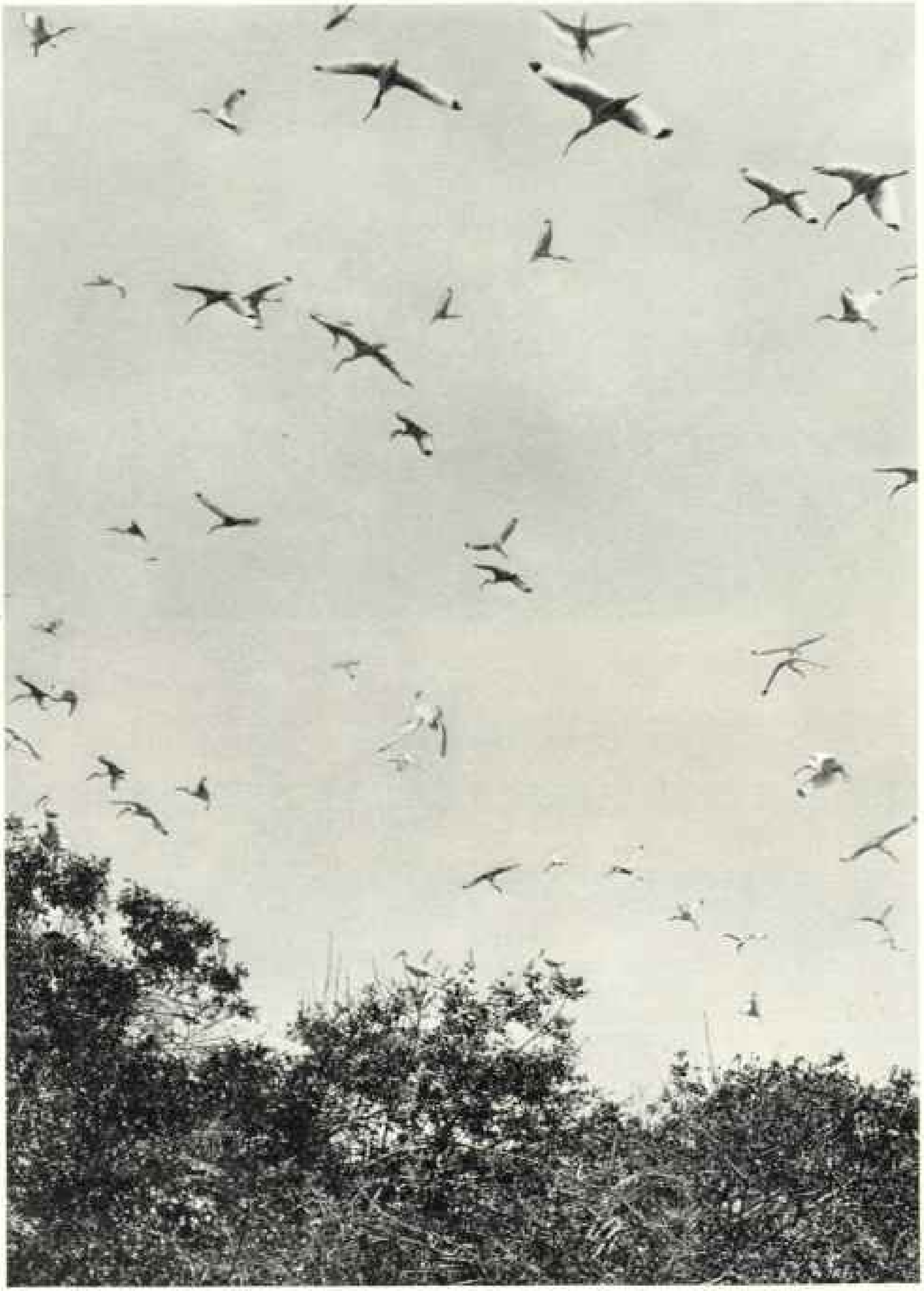
Photograph by George Shiras, 3d

A PELICAN NESTING ALOFT IN ITS NEW HOME

When the brown pelican colony deserted a century-old home near Sebastian, Florida, its members selected the large and partly wooded Brevard Island in the Mosquito Lagoon, east of the northern end of Indian River. There they built their nests in large mangroves, thus reverting to the normal habit of this bird in Florida (see, also, text, page 295).

This indifference to passing people made me feel assured that a brief trip up the river in a rowboat would afford many opportunities to take fine photographs of them. With John at the oars, we made a round trip of about twenty miles in a small boat, which recalled our long hunting and fishing trips along the shore of Lake Superior. As we carefully rounded the first point in the marsh, about half a dozen alligators were seen lying on the muddy shore. They saw us at once, and as the small boat came into the line of their vision they all promptly slid into the water, some making a small splash. This unexpected wariness continued among these animals all the way up the river, and we were unable to secure any photographs of them.

It was plain that the passage of the large boats with many passengers caused no concern, but the appearance of small boats or canoes meant possible danger. As a result, I invited a party to accompany me up the river on a large boat, and from its deck had no difficulty in obtaining a good series of pictures. In a few cases the boat was backed to try for a second



Photograph by George Shiras, 3d

A FLIGHT OF WHITE IBISES

When the author approached the closely occupied nesting place of the white ibises, they would rise in a cloud of white flecked with their jet-black wing tips. They soared about in a beautiful maze of moving figures, almost dazzling the eyes in the brilliant sunlight. Photographed at Tamiahua Lagoon, south of Tampico, Mexico.

Photograph by George Shiras, 3d, and McClintock

A SNOWY EGRET ON ITS NEST, CONTAINING YOUNG, NEAR VERMILION BAY, LOUISIANA

Like its larger relative, this bird was much reduced by plume-hunters, but is now less persecuted and is common in some places.

picture, but each time this was done the alligator recognized that something was wrong and disappeared.

THE RAINEY WILD-FOWL SANCTUARY OF LOUISIANA

Considering its brevity, one of my most informative and interesting camera trips, in 1927, was to a 26,000-acre tract of marshland on the western side of Vermilion Bay, on the southern coast of Louisiana. This property was the former hunting grounds of Paul Rainey, whose sister, Mrs. Rogers, generously presented it to the National Association of Audubon Societies as a perpetual memorial bird refuge in his honor. It is located in the center of the winter home of many varieties of ducks, and is one of the principal winter homes of the blue goose, the mystery as to whose breeding place has been solved during the last few seasons by its discovery in Baffin Island, part of which is within the Arctic Circle.

The blue goose is also found in many of the neighboring marshes. Local observers have recently estimated their total numbers at more than 400,000.

Mr. J. P. Holman, an official of the Association, with whom I visited the reservation, recorded the incidents of the first afternoon of our stay as follows:

"Before supper we sped down the main canal, in the speedboat *Whistler*, to Belle Isle Ridge. Shutting off the engine as we neared the bank, a loud cackling greeted our ears, and in a moment we were surrounded by thousands of blue and lesser snow geese, rising like a pillar of light against a blue-gray sky (see page 304).

"It was truly a wonderful sight. As we gazed, new groups of birds rose and added to the sweeping tide of life and din of voice, until the whole heavens seemed to be filled with beating wings and soaring bodies, weaving in and out, etching a pattern of silver on a background of blue canvas."

This goose seems to spend most of each day on parts of marshes covered with only a few inches of water and at night returns to sleep on the open water of ponds and

Photograph by George Shiras, 3d

AN ALLIGATOR ON THE BANKS OF TOMOKA CREEK, FLORIDA (SEE TEXT, PAGE 300)

small lakes. They feed largely on the roots of scirpus and other marsh plants, which grow luxuriantly in water supplied by frequent rains. It is a stirring sight to witness a flock, sometimes exceeding 5,000, feeding on the marsh. In a solid phalanx they uproot all in front and trample down the rejected portions, so that the areas cleared each day become shallow, open water.

I spent several days in a blind baited with corn to get photographs of blue geese, but they evidently knew nothing about grain and numerous grackles were the main beneficiaries. However, one lone goose was encouraged to try the corn by the eagerness of the small birds (see page 305).

After using my last plate on it, for I had taken many wing pictures of passing flocks, I noticed a regiment of blue geese containing a few white ones, which looked like officers in their light uniforms, marching toward the blind. Rather than have the exasperation of this parade take place in front of me when I was out of photographic plates, I arose and frightened them away.

These geese come south in November from their island home near the Arctic Circle and depart mainly from the end of March to the first of May. Considering the great size of the present flocks, it is remarkable how few are killed on the way, in this extensive flight. It bears out the idea that they have little interest in the rest of the country when traveling between their two secluded homes, although since spring shooting has been prohibited these geese, both east and west, have been seen on some northerly waters awaiting the opening of the Arctic.

A notable feature in the development of the Louisiana marshes is the numerous canals, costing millions of dollars and extending hundreds of miles, many of them through sections heretofore inaccessible to the hunter or trapper. This construction has been largely brought about by the muskrat industry and to a lesser extent by ducking clubs. Naturally such development endangers the wild fowl in marshes where they have never been disturbed before.

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A GLIMPSE OF SHANGHAI'S RIVER TRAFFIC

Thousands of Chinese with bags and babies and bundles move in and out of the city daily; 866 vessels of steam navigation for inland waters are registered in this great trade mart. Save for the eye, added after the manner of Chinese junks, this antique side-wheeler, lying at dock in the native Nantao district, is reminiscent of the old boats steaming down the Mississippi or riding the Potomac to Mount Vernon.

COSMOPOLITAN SHANGHAI, KEY SEAPORT OF CHINA

By W. Robert Moore

Author of "Coronation Days in Addis Ababa," "Along the Old Mandarin Road in Indo-China," etc., in the National Geographic Magazine

GREATEST seaport in the Far East and emporium to one-eighth of the human race is Shanghai! A bold skyline of steel and concrete now rises where reeds once waved over marshy flats. The wide Bund, which throbs with the kaleidoscopic march of motors, electric trams, and other traffic, extends along the water front where boat trackers once beat a narrow footpath. Paper lanterns change to neon lights for advertising display signs; beside ubiquitous Chinese cabbage now are supplies of caviar; from fishing to high finance has been the city's growth.

At the end of the first year after it was formally opened as a treaty port, 1843, Shanghai could marshal for statistical evidence of foreign enterprise and industry only "23 foreign residences, one consular flag, 11 business firms, and two missionaries." To-day it domiciles nearly 60,000 foreigners; 17 consular flags wave in the Shanghai breezes and others have representation; business firms are legion, and the city is headquarters for countless phases and branches of missionary and other activity.

FROM HAMLET TO KEY PORT IN NINETY YEARS

For a small fishing village, hiding behind fortifying walls for protection against the inroads of Japanese pirates (aided frequently by Chinese of the same calling), and doing only a limited amount of trade with coastal junks, to expand and become the fifth largest seaport of the world in less than 90 years is no mean accomplishment in any land; but in China this transition is an even greater marvel.

To find the reason for this remarkable transformation, one need not search far. A glance at the geography of its position reveals why Shanghai should logically take rank as China's key seaport.

Its situation, approximately midway along the China coast, makes it at once the most natural distributing center for extensive trade with coastal ports; but of far greater importance is the fact that Shanghai commands the vital position for commerce at the very outlet of the whole Yangtze River system.

In all the world it is doubtful whether there is another equally extensive region of wealth where the people depend as solely upon a single artery of traffic and upon one entrepôt as do the inhabitants of the Yangtze Basin. Approximately 200,000,000 people, half of the population of entire China, live in this fertile area, utilizing the river, its tributaries, and its network of canals as their chief means of communication. Their needs, beyond those supplied directly or indirectly by the products of their own hands, make business for Shanghai.

MAIN ARTERY OF THE HEART OF CHINA

Wealthiest portion of all China is this Yangtze Kiang Basin. The temperature and climatic conditions are most favorable for the development of its agricultural resources; many sections have valuable mineral deposits which are being worked or are awaiting scientific exploitation; and extensive manufacturing is carried on up and down the reaches of this mightiest river of Asia.

The territory stands without a rival in any other spot on earth in its potentiality for future growth. It is the heart of China proper, which now absorbs more than 60 per cent of the foreign trade of the whole country; and Shanghai stands at the natural gateway of this great hinterland to act as its vast clearing house.

Trade sheets of Shanghai's business are, therefore, of necessity a barometer of the status of the valley. Floods, droughts, famines, wars—all make zigzags across the pages of the trade graph which tells the story of the port's prosperity.

Though living and growing by the commerce of the Yangtze, Shanghai is not actually on that great waterway. It is located, instead, some 13 miles up the Whangpoo (or, as purists spell it, the Huangpu), a

Photograph by W. Robert Moore

WHERE SPORT, RELIGION, AND COMMERCE MEET

Formerly at the western edge of Shanghai, the Race Course and Recreation Center now form an island in the midst of the stately edifices that have risen during the rapid expansion of China's mighty emporium (see text, page 347).

Photograph by Alfred Chial

LIVE CHINESE PIGS GO TO MARKET IN BASKETS

Porkers transported thus are often seen corded up in piles like firelogs. These will eventually be roasted and varnished to provide sacrificial offerings for funerals, or the meat will be retailed in this open market stall.

UNLOADING CABBAGES ALONG SOOCHOW CREEK

The Hongkew section of the city, once known as the "American Settlement" (see text, page 325). In the background rises the tower of the Chinese Central Post Office, which has been handling all of the Shanghai mail since various foreign post offices were closed, in 1922.

Photographs by W. Robert Moore

WILL YOU HAVE ANYTHING ON THE HAIR OR FACE?

Although they use no soap and only an occasional bit of water for shaving the faces and heads of their patrons, these outdoor barbers along Shanghai's side streets seem always to have waiting lines.

Photograph by W. Robert Moore

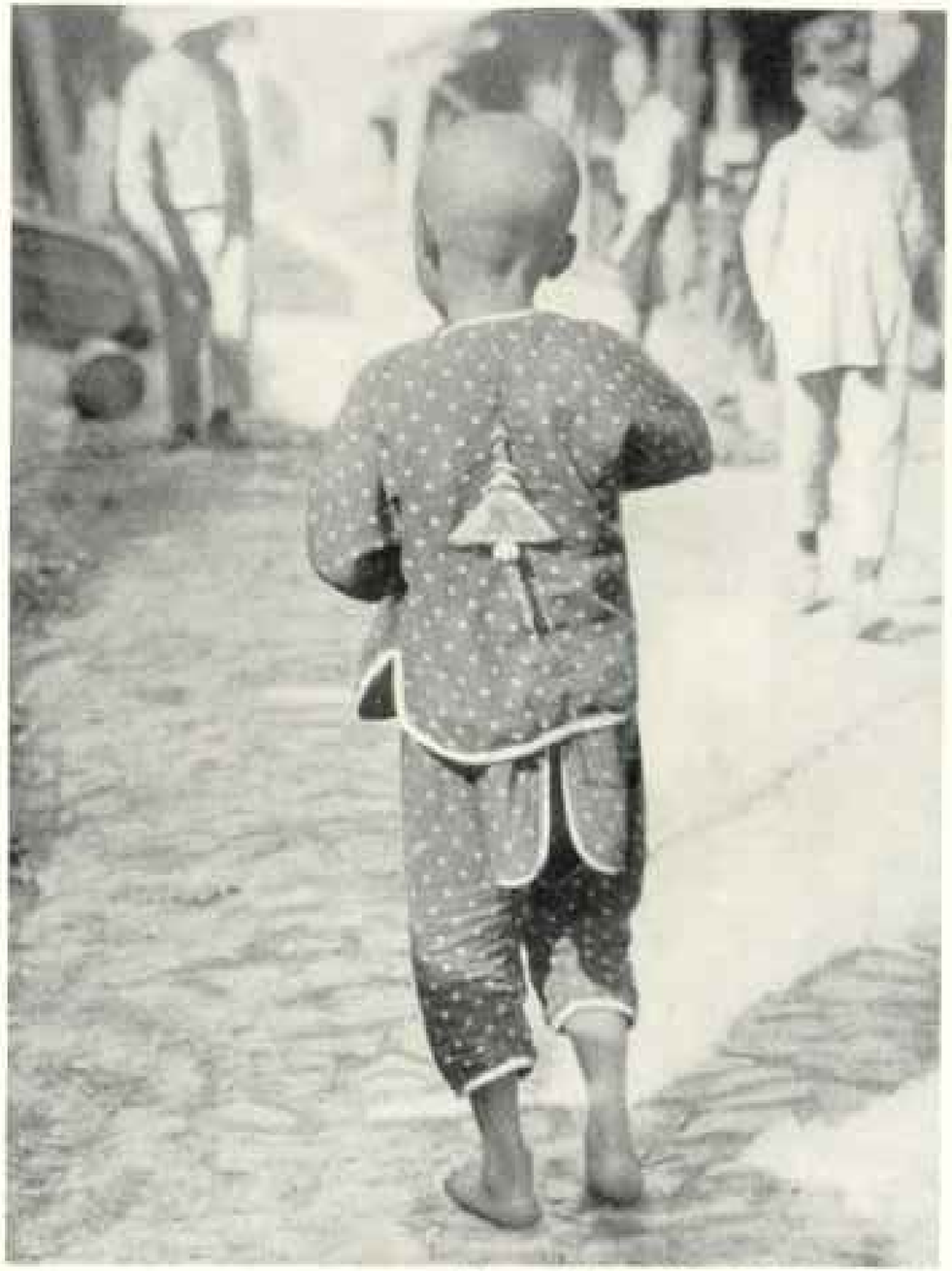
NINETY YEARS AGO THE INTERNATIONAL SETTLEMENT BUND WAS A BOAT TRACKERS' FOOTPATH

Bank buildings, the Chinese Customs Building (with clock tower), hotels, newspaper offices, and other commercial houses make up this imposing skyline of cosmopolitan Shanghai (see, also, Color Plate III). The monument at the right is in memory of those residents of the foreign settlements who left Shanghai for the Allies' cause in the World War, never to return.

Photograph by W. Robert Moore

"EXTRAS" COME OUT IN SHANGHAI, TOO

Four widely read daily newspapers, more than half a dozen weeklies, and several monthly journals are published in English. A French daily and countless Chinese newspapers also come from the city's many presses.



Photograph from Richard M. Vanderburgh

EVIL SPIRITS, BE WARNED!

The fetish of cloth that a superstitious Chinese mother has fastened to the back of the child's jacket will supposedly ward off any harmful unseen forces lurking near.

tributary of the Yangtze which empties at Woosung into the southern channel of the river.

Of China, too, is Shanghai, but it still is not China; foreign commerce has had too much of a hand in shaping the city's growth. There is a great commingling of foreign and Chinese elements, but the ratio is ever changing, as one will observe in visiting different portions of the expansive city.

As one's steamer cleaves the muddy Yangtze waters and enters the Whangpoo on the approach to Shanghai, there is little to indicate that one is entering China unless a fleet of native fishing junks happens to be moving out to sea at the time. The river banks are lined on both sides with oil supply depots, smoking factory chimneys, warehouses, silk filatures, repair docks, and strange things of foreign import.

SKYSCRAPERS RISE ABOVE THE BAZAARS

To-day the skyline that marks Shanghai's water front is decidedly occidental in appearance and most strikingly impressive—an effect due in part, perhaps, to its contrast with the flat alluvial plain rather than to the actual heights of the buildings. Until the present century, low, commodious Chinese buildings or two- and three-story structures served a majority of the business concerns; but the introduction of excellently equipped modern offices has initiated a period of extensive building.

The tendency of Shanghai's building program has been distinctly skyward in the last few years because of the congestion in the business areas occasioned by its meteoric expansion in trade.

Construction of tall buildings, however, even those of eight and ten stories, presents considerable difficulty to the architects because of the nature of the footing upon which the foundations must be laid. The soil is entirely alluvial deposit of the Yangtze; but, in spite of the obvious handicaps, architects are now exploring new heights for Shanghai with 10- and 15-story structures.

The Chinese, quick to appreciate this upward direction of city-building, have begun erecting tall department stores, tea houses, guild halls, and other structures which bring them financial advantage and modernize the appearance of Shanghai.

Radical indeed are the changes that have taken place in architectural expansion since I first came to Shanghai, only eleven years ago, and the last five years have seen vast alterations in the skyline of the metropolis.

In a few minutes' walk from the most up-to-the-moment districts of Shanghai, however, one can be in surroundings that are little altered since the day when the first foreign firm marked out its business site in the muddy concession.

Within the Nantao district, at the southern side of the city, lies the old Chinese settlement, or Native City. Modernization has been slow to move in this locality, and native life takes much the same course that it followed before steamship screws began stirring up the muddy Whangpoo around the fishing junks and sampans.

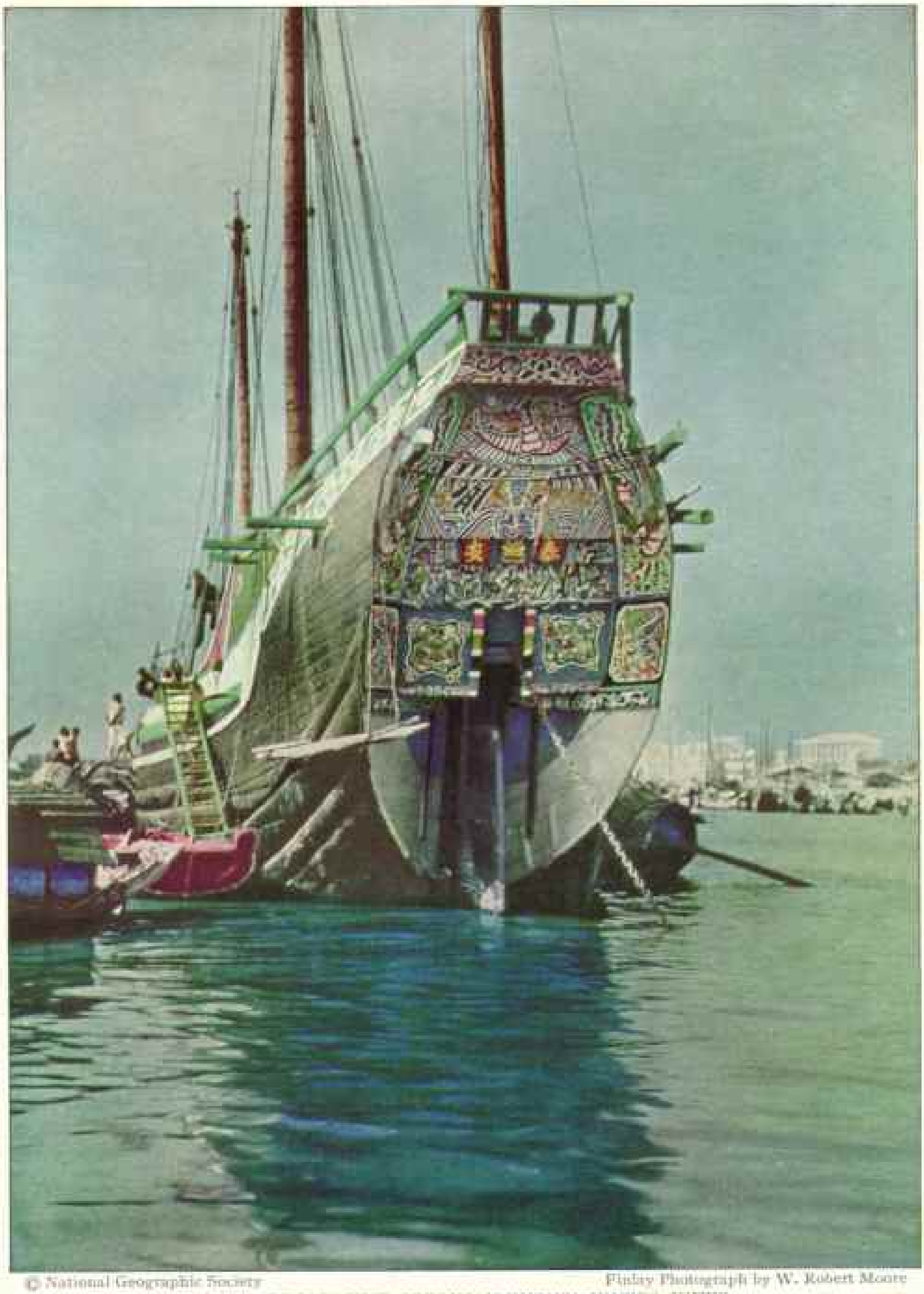
Even here, however, there have been changes. Since the Republic has come into existence, the old wall that surrounded the city has been demolished. I have seen narrow cobbled streets with open sewers running down their centers gradually give way to more cleanly concrete passages. Loathsome beggars have somehow been reduced in numbers, although there are still more than enough of the pitiable wretches wandering about the streets. A few timely fires have been a godsend in clearing out several disease traps and pestholes, which have since been rebuilt with somewhat better structures.

MODERNITY SPOILS THE "WILLOW-PATTERN" HOUSE

On the other hand, some fine things, such as the "willow-pattern" tea house and pool, spots of real beauty, have fallen from their high estate. Coarse matting blinds, rough, wooden kitchen extensions, and unsightly advertisements have been the recent contributions to the building that once found such popularity pictured on tea services for foreign homes.

Transition is slowly leavening the closely packed lump, but it will be long before those of the native district give up their narrow streets and twisting alleys, which are flanked with one- and two-story combination open-front shops and family residences. The Native City takes little cognizance of modernism which towers near by.

North of the International Settlement lies the thickly populated Chinese district of



 Finlay Photograph by W. Robert Moore

HIGH DECORATIVE STERNS IDENTIFY NINGPO JUNKS

The Phœnix, emblem of immortality, provides for superstitious Chinese sailors sea insurance on these heavily built junks, whose principal cargo consists of poles for building purposes.

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THREE YOUNG FUEL GATHERERS OF FOOCHOW

Throughout China women and children are ever busy gathering grass and twigs, thereby contributing further to the denudation of the already nearly barren country.

Finlay Direct Color Photographs by W. Robert Moore

KEEPERS OF THE SACRED FISH POOL AT KUSHAN

There are many other Buddhist monasteries secluded in the hills of China besides this famous one near Foochow. The pool contains many large, overfed golden carp.

Finlay Direct Color Photograph by W. Robert Moore

THE SHANGHAI WATER FRONT TEEMS WITH A MULTIFARIOUS TRAFFIC

Behind these steamers, launches, sampans, and junks that crowd the Whangpoo River rise the modern towers of commerce on the Bund. The domed building is the headquarters of the Hong Kong and Shanghai Banking Corporation, the next houses the Chinese Customs, and the third tall tower is the Sassoon Building, or Cathay Hotel.

MAH JONGG IN ITS NATIVE LAND

Ningpo sailors, who man the junks in the timber trade between Foochow and Shanghai (see Color Plate I), have a hand at their favorite "deck game" during a few moments off duty.

 Finlay Photographs by W. Robert Moore

FIGURES OF LEGEND FRESH FROM THE PORCELAIN KILNS

Centuries ago the Chinese achieved a high degree of perfection in producing porcelains and potteries. From their excellent products has come the general term "chinaware."

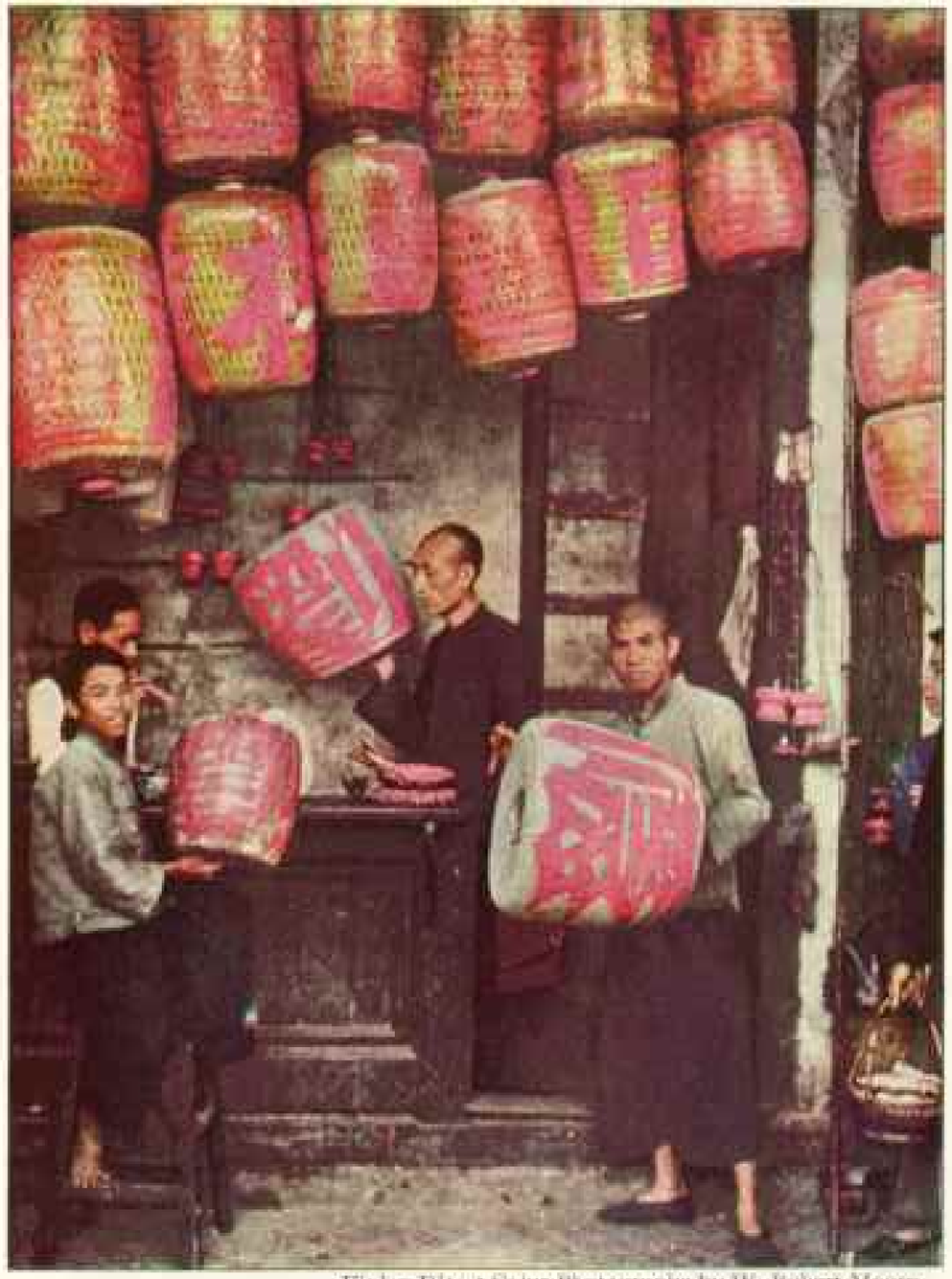
WHEN THE HANGCHOW BORE COMES THUNDERING IN

As the tide rushes up the great funnel-shaped mouth of the Tsientang River, the waters pile up to the height of several feet. Here the wave front is six or eight feet high.

 Finlay Photographs by W. Robert Moore

PREPARING FRAGRANT INCENSE FOR THE GODS

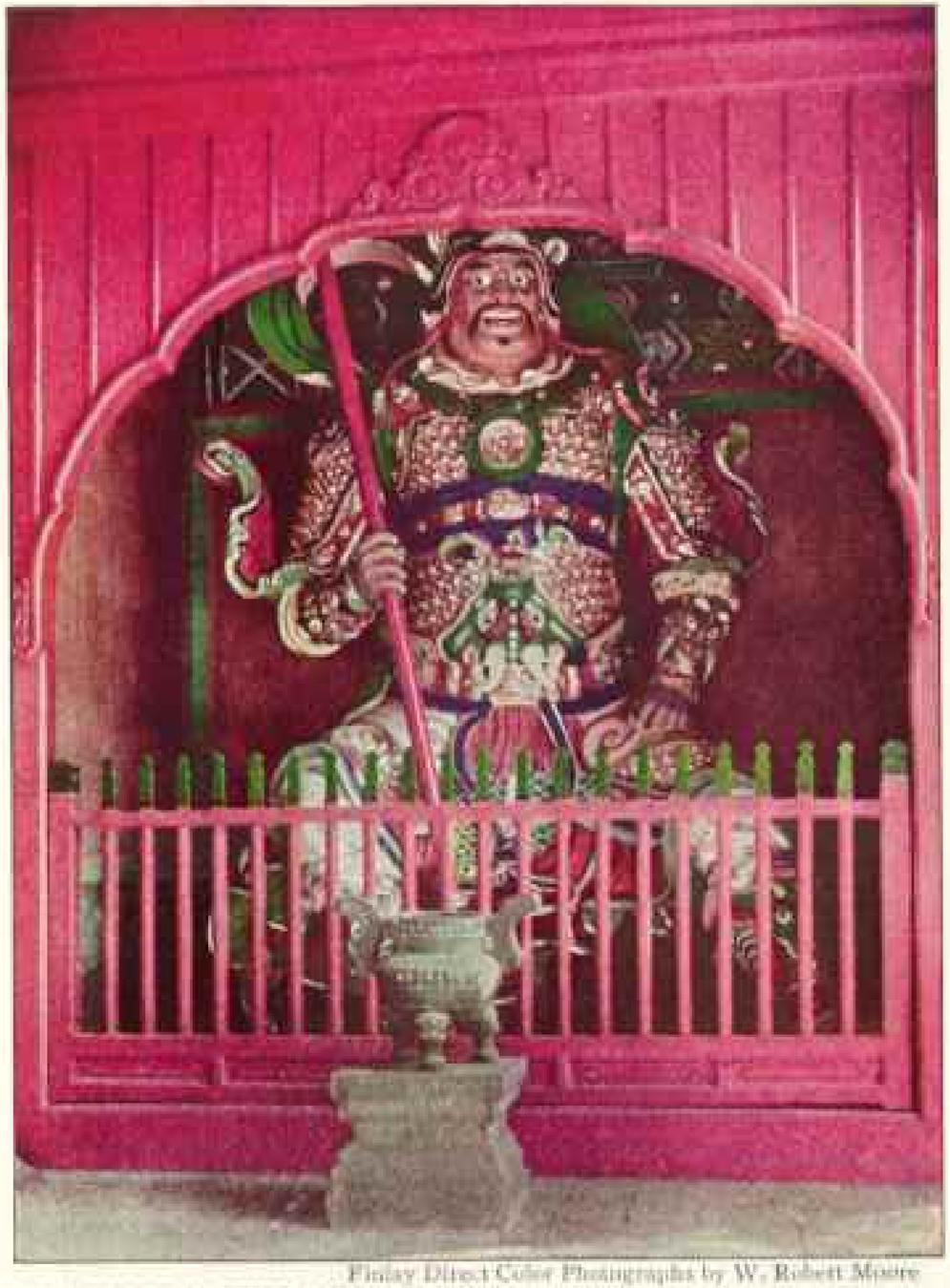
Incense and firecrackers are manufactured in large quantities throughout China and burned to appease the evil spirits. Freshly made sticks drying in a Chaochow courtyard.



Finlay Direct Color Photographs by W. Robert Moore

STREET VENDING AND OPEN-FRONT SHOPS ARE THE MODE IN CHINA

In coastal cities prepared soda waters are replacing the brews and fruit juices such as the man is having difficulty in keeping the flies from sampling. Electric lights and neon display signs are also rapidly making the paper-lantern industry (right) less profitable.



Finlay Direct Color Photographs by W. Robert Moore

BOTH THEATRICAL PERFORMERS AND TEMPLE GUARDIANS PORTRAY THE FANTASTIC AND UNREAL

At the well-patronized theaters in China the plays are usually mythical or historical in nature, and every emotion of the player has its formalized interpretation. Men play the feminine roles, as at the left. At Taoist and Confucian temple doorways ferocious chromatic figures stand guard.

FISHING BOATS ANCHOR IN THE SHADOW OF THE SIX HARMONIES PAGODA

This 13-story structure above Hangchow city was built originally 970 A. D. to control the influences that were supposed to affect the tidal wave in the Tsientang River (see Color Plate V). The outer structure was rebuilt in 1893-1901.

 Finlay Photographs by W. Robert Moore

TRADE AND RELIGION THRIVE UNDER THE SAME SPREADING BRANCHES

Itinerant venders of sweetmeats and paper toys apparently find this a convenient place for carrying on an active business, for many people pass or stop to worship at this tree shrine which stands by the roadside in Foochow.

Chapei. Chapei borders upon the Soochow Creek boundary and is just back of the foreign district of Hongkew. This district, before the recent bombardments, was somewhat more modern and progressive than the Native City region. Here, in Chapei, were located large Chinese business concerns devoted to exporting and importing. Here had sprung up offices, factories, and printing establishments, among the last named the *Commercial Press*, largest publishing concern in China, valued at one and a quarter million dollars. In this locality, too, is the Shanghai railway station for the Shanghai-Nanking line, used also for the Shanghai-Hangchow-Ningpo road and the short branch that extends to Woosung.

MODERN SHANGHAI BEGINS WITH THE INTERNATIONAL SETTLEMENT

But the focus of all Shanghai is the foreign settlements, for in them have been the remarkable incentive and expanding force that have built this modern seaport. First allotted a portion of land on the south side of Soochow Creek, following the Treaty of Nanking, in 1842, when Shanghai was indicated as one of the five treaty ports, British business established itself and expanded, digging drains and filling canals to make the concession habitable.

Six years later France was conceded the territory between the British concession and the Native City, and only a few years afterward Americans leased land in the Hongkew district, which extends along the Whangpoo water front north of Soochow Creek, where the river makes a sharp curve to the right (see page 313).

This so-called American Settlement was never organized as such, but was incorporated with the British district in 1863. Thus came into being the International Settlement, premier nucleus of modern Shanghai. Other portions of land have been added on the west, where old-timers used to bag snipe in off days from their offices.

The French chose to remain apart and to-day continue to administer their own concession as a separate unit.

The years have seen a fast-moving panorama since the early days when the International territorial fusion came into being, received nourishment, and became what has often been termed "The Model Settlement." The administration of the International Settlement has been in many ways a unique experiment, perhaps without parallel in any other place; and results make it evident that the Shanghai Municipal Council has served the Settlement well.

The Council is composed of a group of members elected by the taxpayers of British, American, Japanese, and, more recently, Chinese nationality. The number has been increased from time to time until 15 members are now included in the group that directs the affairs of the Settlement of 1,008,000 people.

Paving, policing, planning—a multitude of tasks face the paternal body which, gratis, guards the interests of International Shanghai. A similar, but smaller, task confronts the 17 other men who handle the affairs of the French territory with its nearly 435,000 inhabitants.

Because Shanghai has not always had a peaceful career, troops of the four chief foreign nationalities have been maintained to give necessary protection to the residents of the city. Shanghai has also had a volunteer corps with a personnel of more than 2,000, which was organized at the time of the stress of the Taiping Rebellion, in 1854, and has been mobilized at various intervals of necessity during strikes and when the pot of Chinese political affairs has been boiling over.

Big, bustling Shanghai, this titan of commerce in Far Asia, lives beyond the boundaries of any one settlement or nationality; it commands all of them together for its life and trade. Well beyond three million people are numbered in the districts that form the whole of greater Shanghai.

SHANGHAI HAS FIFTY FOREIGN NATIONALITIES

Cosmopolitan, too, as only one of the world's largest seaports can be, it records in its census 50 foreign nationalities. The commercial capital can also call from its midst representatives speaking practically all the numerous dialects in China, if one should ask for further confusion in the linguistic babel.

Ningpo, which in earlier days of foreign shipping trade was a fairly important port, has declined to slight importance because it has given its most progressive minds to Shanghai's opportunities. Men from all other localities have likewise been attracted.

Photograph by W. Robert Moore

BRITISH-TRAINED SIKHS HELP TO POLICE THE INTERNATIONAL SETTLEMENT

A rush moment in cross-traffic of rickshas and pedestrians at an intersection on Nanking Road, one of the chief thoroughfares in Shanghai (see text, opposite page).

The facets of life and activity of the metropolis are as multiple as the peoples that compose it.

Stand any day along the Bund and watch the variety of traffic that passes under the signals of a tall, bearded Sikh traffic policeman. Electric tramcars, loaded buses, and trackless trams, filled to all available standing room; motor cars and trucks of every kind and size, although American makes are in the majority; wheelbarrows that trundle along with tremendous loads; coolies, turned beasts of burden, bearing bales and baskets of incredible weight; great two-wheeled trucking carts, with as many as six or eight perspiring coolies straining at the pull ropes; rickshas, well past the period of their best usefulness in these days of increasing taxi service, trying by their very importunity to gain a stinted living; bicycles, carriages, pedestrians—the whole contrasting procession passes.

On another street a Chinese wedding palanquin or a long funeral cortège moves along with all the red and tinsel glitter that China assembles around these two events. At the corner the procession waits for a traffic jam to clear before it can proceed.

In fact, the traffic has reached such a stage of congestion that means for its solution is causing much serious thought to the planners of Shanghai's future. New roads are being made wide enough to take care of the increasing traffic for years to

Photograph courtesy U. S. Navy Recruiting Bureau

"STRIKE UP THE BAND!"

The young bluejacket needs no tall shako to rise above the Chinese band over which he has assumed impromptu leadership in a march down Bubbling Well Road. Chinese brass bands are much in demand for funerals, and it is not unusual to hear them playing "Dixie," "Marching through Georgia," and other surprising airs at the head of the cortège.

come, but many of the busiest old roads constitute a knotty problem indeed.

Famous Nanking Road, that leads westward from the Bund, later to become Bubbling Well Road, near the point where the Race Course puts a big kink in the thoroughfare, is packed to overflowing with homeward-bound traffic when the offices close in the afternoon. Only a score or so years ago Bubbling Well Road was a favorite place for leisurely driving at the cooling end of the day. The wealthy then rode in handsome carriages behind trotting horses in charge of finely appareled coachmen and grooms.

But the city, too, has grown up along this street that was once largely residential and a country drive. Large department stores, clubs, recreation halls, towering apartment houses, churches, a Y. M. C. A., and commercial houses of all sorts have risen on every side. At night the road looks like a well-lighted Broadway, with its profusion of neon lamps and moving electric signs.

BUSINESS INVADES A FAMOUS COUNTRY DRIVE

In this westward movement and growth, business and religious structures have halted their march only to preserve space

Photograph courtesy U. S. Navy Recruiting Bureau

THE WHANGPOO, RIVER OF CONTRASTING TRAFFIC

Fishing craft, sampans, shallow-draft river boats, tankers, battle cruisers, and sleek ocean liners stir up the silt-laden waters that flow past the Shanghai Bund; thirty-five million tons of foreign shipping clear here annually (see text, page 332). While in common parlance one speaks of Shanghai as on the Yangtze, it is actually thirteen miles from that great waterway, on its tributary, the Whangpoo. A time-old junk lifts wide matting sails and drifts past one of the greyhounds of Uncle Sam's Asiatic fleet.

for the Race Course and public recreation grounds, and have left this small green island of sport and relaxation in their midst. At the time the club was established it marked the outward fringe of the city (see page 312).

Wherever the Englishman has come to the East, he has brought his sport with him, and he could hardly suffer to see the Race Course and the other places of recreation disturbed by business.

The Shanghai races claim a great deal of attention. About the Far Eastern coasts the Shanghai Sweepstakes have always been an important topic of conversation in the spring and autumn, especially among British ship officers. Each is always sure that his ten-dollar ticket is the one that is going to win the grand sweep of more than $200,000 Mex. Even the banks and offices declare half holidays when the semiannual race meets are being held.

"YULOWING" A BOAT ON THE WHANGPOO

The girls are sculling in a fairly swift current and under conditions where it would be impossible for them to make progress were they to use Western means of propulsion.

Photographs by Robert F. Finch

THE BOATMAN'S PROFESSION IS REGULATED BY A GUILD

Those who own boats and who deal in foreign commerce make local regulations applying to trade and transportation, and woe to the boatman who disregards them! Their patroness and protectress is Kwan Yin, Goddess of Mercy, especially in her manifestation as Goddess of the Sea.

Photograph by Charles A. Jones

CHINA'S CHEAPEST MEANS OF TRANSPORTATION, COOLIE POWER

On any street one can see workmen laboring with incredible loads on two-wheeled carts, on wheelbarrows, and on bronzed shoulders. American motor trucks, however, are finding ever wider use in Shanghai and comprise nearly one-seventh of the more than 13,000 motor vehicles registered in the French and the International settlements (see text, page 326).

Shanghai has also provided parks and gardens where people may loiter and parents may take their youngsters for a happy outing and toy-boat sailing. Motorists may enjoy a spin over an excellent short circuit of fine road into the countryside known as the Rubicon Road.

To the new visitor to Shanghai the street contrasts are vivid. On the wide streets are window displays worthy of any Fifth Avenue store; on cross-streets shops are hung with bright-colored flags, covered with Chinese ideographs, telling of bargains, sales, and the nature of the goods supplied. Near by a street vender shouts the wares contained in the packs or portable kitchens that swing from the ends of his shoulder pole.

Modern talking cinemas, presenting the latest films, and some high-class Chinese theaters debouch their gay night throngs; tenements close their board fronts, darken, and are still, except for a few who try to snatch a little longer working time away from the night.

Bright limousines unload a group of people at some large hotel along the Bund to attend a formal dinner; other people are frequenting wealthy Chinese restaurants. A mission is giving soup and religious teaching to a queue of hungry souls.

THE OLD GOES ON IN THE LIGHT OF THE NEW

Chromatic signboards proclaim the world's most advertised articles of trade. What matters it if two Chinese women are brawling loudly beneath a radio sign, or that outdoor Chinese barbers are scraping their patient victims in the shadow of a wall that bears advertisements of the most highly recommended shaving preparations?

Large, efficient schools and colleges rise in stately edifices; in a single room off an alley youngsters are shouting over and over, at the tops of their voices, the lists of characters they are learning.

Jazz bands wail at modern night clubs and cabarets, while a lone hawker pipes a few wavering notes on a flageolet and hopes for one more customer for his pickled fruits before he goes wearily to bed.

A woman beggar, carrying a poorly dressed babe, holds her hand out toward an ermine-wrapped lady who is carrying a Pekingese dog.

Day or night, summer or winter, life glimpses on the street are as diverse and

A HUMBLE UNIT IN THE THROBBING LIFE OF CHINA'S PREMIER SHIPPING CENTER, SHANGHAI

Photographs by Robert F. Fitch

POLING A HEAVY CARGO THROUGH SHANGHAI HARBOR

This world emporium of commerce serves not only the outside world, but also the dense population living in a radius of 150 miles of the port and the teeming millions of the Yangtze and its tributary rivers.

Photograph courtesy U. S. Navy Recruiting Bureau

THE U. S. NAVY MAKES FRIENDS WITH LITTLE MISS SHANGHAI

She is apparently much more interested in the cameraman's activities, however, than in the small coin that the bluejacket is offering her.

fragmentary as these words I use in trying to suggest them. But all summarize Shanghai.

Turning from streets to waterways, one can also observe ceaseless activity on the Soochow, Siccawei, and other creeks, as well as on the Whangpoo River.

At one time Soochow Creek was a stream of much greater size than it is now, but through the years it has become silted and much canalized. Thousands of Chinese craft and houseboats animate this creek, which cuts a sinuous path down through the city and joins the Whangpoo at the northern end of the Bund.

Vegetables, rice, and other products that supply Shanghai's heavy demand for food supplies and goods for transshipment are brought in from the country districts and from Soochow way, where the creek connects with China's historic Grand Canal. Some of the goods that are discharged from steamers at Woosung are also brought down to Soochow Creek on smaller boats and unloaded into warehouses along the waterway. Thus a constant stream of traffic flows under the several bridges that span the creek and its banks always present a busy appearance (see page 313).

SHIPS OF THE WORLD MOVE AMONG WHANGPOO JUNKS

And the Whangpoo. More than thirty-five million tons of foreign shipping cut muddy furrows up the Whangpoo in a year, according to Shanghai's clearance papers. Hundreds of junks move up and down the river with the tides and winds. Some of them are heavy Ningpo junks, high sterns colorfully painted with the Phœnix and other symbols, transporting poles and timber from Foochow (see Color Plate I). Other junks are engaged in coastal trading, but many of them form the

Photograph courtesy U. S. Navy Recruiting Bureau

FOOCHOW ROAD IS EVER THRONGED WITH SHOPPERS

A group of sailors on shore leave from one of the ships of the U. S. Asiatic fleet hold a street conference in the midst of their souvenir hunt. Perhaps they are doubting the veracity of the "Big Sale," "Cheap Sale," and "Bankruptcy Sale" banners after receiving a quotation of prices on some desired curio.

Photograph by W. Robert Moore

BARGAIN DAYS ARE COLORFUL EVENTS

It is evident that this cloth merchant believes in the motto, "It Pays to Advertise," as he announces his reduction sale. Openings, bargain weeks, and bankruptcies are heralded thus with banners, such as the large one, which reads: "Second Memorial Formal Great Sale; Cheap Price, with Special Souvenirs."

large fishing fleet, or do lighterage work between Shanghai and the mouth of the river at Woosung (see page 328).

Large ocean liners and freighters lie at dock along the water front. The Japanese shipping companies have considerable berthing capacity along the Hongkew settlement front, and American and other shipping concerns haveestablished wharvesand godowns farther up the river, on the Pootung side, across the Whangpoo, above the city. Lumber ships, tankers, tramp steamers, and warships lie in midstream. Ships of many flags look to Shanghai's trade.

Launches, lighters, and sampans maneuver about, along with ferries and large flat-bottom river boats that transport numbers of Chinese up the Yangtze. Even women beggars comb the waters and hover around ships to salvage in nets food scraps or anything else of use thrown overboard. There could hardly be a more diversified grouping of ships in any waters.

Statistics show that the harbor has accommodated as many as 156 merchant vessels and 22 warships at the same time, besides, of course, large numbers of miscellaneous smaller craft.

Shanghai's shipping has seen high ascendancy since Sir Robert Hart industriously set about organizing the Chinese Maritime Customs. More than a half billion gold dollars in export and import values are cleared, even in a year of depression; and were Sir Robert able to stand to-day on the Bund where his statue now is, he could look toward a much more pretentious Customs Building than the one which existed in Shanghai when he was inspector general.

Despite the figures on ship movement, there is much to be desired of the Whangpoo Harbor, as Shanghai looks toward her future.

DREDGING KEEPS THE WHANGPOO OPEN

The mouth of the river has a tendency to silt up and also to form shallows along its channel, and thus to make it difficult for ships of deep draft to pass even at high tide. Extensive labor on the part of the

Whangpoo Conservancy Board has made improvements in the harbor, so that pace has been kept with the growing need; but the project necessitates the dredging of two million cubic yards of mud annually to maintain the required depth of the channel for present shipping requirements.

It is not the Whangpoo, however, which causes the greatest concern in planning for the deeper-draft vessels of the future, but rather the sand bars in the Yangtze mouth. The fact that five billion cubic feet of sediment debouch into the sea each year to pile up at the river mouth presents no small problem.

As one comes up the river from Woosung, a branch of the Shanghai-Nanking Railway may be seen on the right. Here is the route of the first railway to be built in China. A British concern established the short line between Shanghai and Kiangwan in 1873. The present road is not the original one, however, because strong superstition caused the Chinese Government to buy the first strange contraption that disturbed the sphere of spirits and dump it down on the shores of Formosa.

To-day there is a railway between Shanghai and Hangchow, extending on to Ningpo. The Shanghai-Nanking line taps northern territory, and after one crosses the Yangtze River at Pukow, on the opposite bank from Nanking, one connects with the railroad to Peiping, or goes through Tientsin, and on up into Manchuria, to catch the Trans-Siberian to Europe.

MAIL GOES TO PARIS IN 16 DAYS

Until the recent disturbances in Shanghai and Manchuria, it was possible to reach Moscow or Paris in 15 or 16 days from Shanghai. The introduction of wagon-lit cars has recently made travel to Peiping a matter of comfort; and through branch lines the whole territory tapped by the Peiping-Hankow and Changsha railways, as well as the Shantung branch, is brought into close contact with the metropolis of Shanghai.

Mail service to European capitals in 16 days, as contrasted with a full month or more by sea, means much to industrial Shanghai.

Until a few years ago, Shanghai's foreign mails were handled in post offices under the control of the several nationalities represented in the foreign settlements of the city, but since 1922 these separate post offices have been closed and the Chinese postal authorities have been satisfactorily dispatching and receiving all mails.

Air service between Shanghai and Peiping, and also up the Yangtze to Nanking and Hankow, has already become an established fact, and plans are in hand for further development of sky routes to the interior.

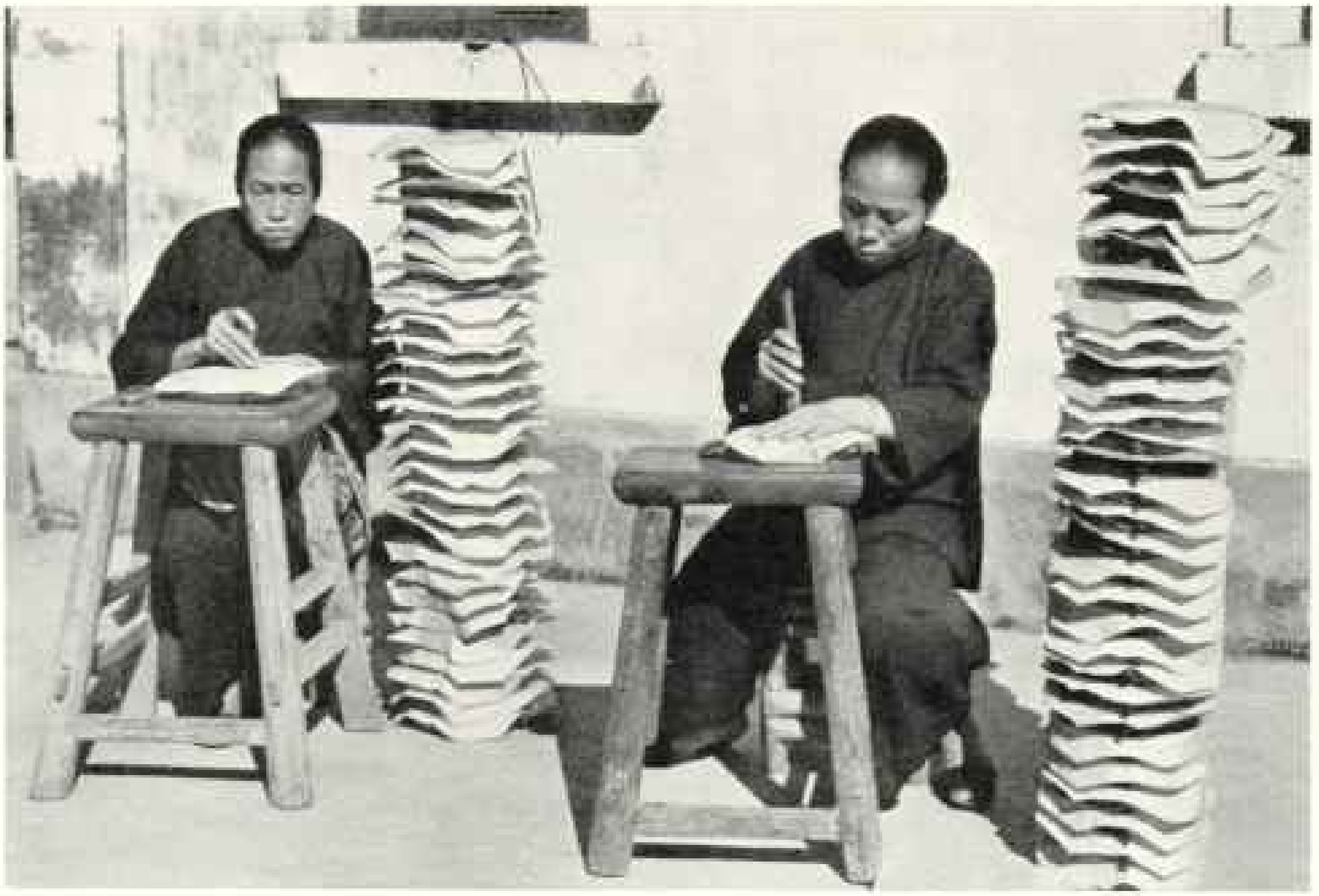
Bigger buildings, greater trade, better communications, and wider industrialization for the employment of more people—by such means Shanghai grows and expands its horizons. It has already gone far since boisterous clipper days brought stirring events to the new port and made "shanghai-ing" a new word in the English language, but left many crumbling tombstones as reminders.

Yes, the pulse-beat of this mighty emporium has been greatly quickened, and, given peace to pursue its plans, it will go even further in its phenomenal expansion as key seaport and clearing house for the increasing needs of awakening China.

Notice of change of address of your NATIONAL GEOGRAPHIC MAGAZINE *should be received in the office of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your November number, The Society should be notified of your new address not later than October first.*

SORTING FISH ON THE MACAO WATER FRONT

A large proportion of the Chinese population of Macao devotes its time to this chief industry of the little colony.



Photograph by W. Robert Moore

FIRECRACKERS IN THE MAKING

Paper is pasted over both ends of a double handful of the empty tubes, and then the top paper is perforated by means of the bamboo pinches which these women are using. The tubes are then ready for filling with clay and powder (see text, page 355, and Color Plates III and IV).

MACAO, "LAND OF SWEET SADNESS"

The Oldest European Settlement in the Far East, Long the Only Haven for Distressed Mariners in the China Sea

By Edgar Allen Forbes

WITH all due respect to the dignity of the great port of Hong Kong and the rarefied atmosphere of its Victoria Peak, let it be frankly said that South China is no place for a poet. For six months of the year its breath is that of the drying room of a Chinese laundry, and its atmosphere is then so humid that you may almost squeeze water out of it. The traveler's shoes accumulate overnight a vegetation of luxuriant green mold, and he awakes in the morning with the feeling that a cross-section of his lungs would resemble a slice of Roquefort cheese.

Under such conditions, temperamental persons like poets and artists do not burst into poesy and song. Nor can it be claimed that the neighboring districts of Canton and the Si Kiang, or West River, give rise to swelling emotions that can only be expressed in sonnets, odes, and lyrics.

Yet within forty miles of Victoria Peak is a little wooded knoll where a broken man with an inextinguishable soul responded nobly to the impulse of the gods and produced an immortal epic. Though three centuries and a half have passed, the atmosphere of Olympus still clings to the memorable garden, and scores of poets and near-poets from many lands are in the habit of here giving vent to their ecstasy or agony in elegiac verse. Some of them have wrought so well that their stanzas have been chiseled into white marble and grouped about the entrance to the grotto where sang the great master in whose memory they were written.

"A LITTLE PLACE WITH A LARGE HISTORY"

The place is Macao (Macau); the Virgilian singer was Luis de Camoëns, whose "Os Lusiadas" will forever remind a forgetful world that the Portuguese (Vasco da Gama in particular) were a race of daring navigators in the great era of discovery.* In lonely exile here, in a wild garden overlooking a beautiful inlet from the China Sea, Camoëns rendered both himself and his native land immortal. When Nadir Shah carried away to Persia the Peacock Throne of Delhi, he took not back from the Orient so priceless a gem as "the deathless song" with which the aged Camoëns returned to the land of the Tagus.

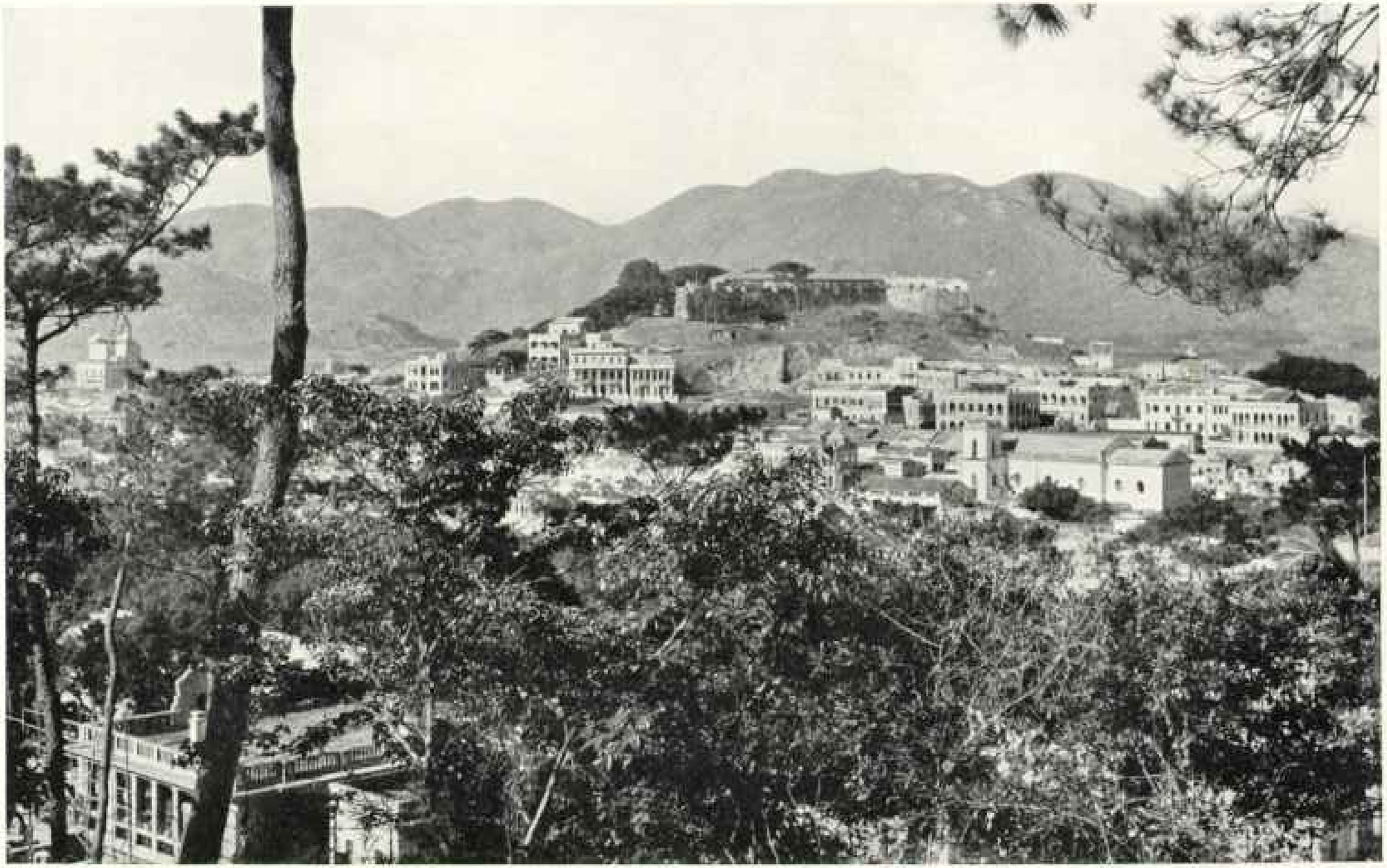
Now Macao is but the tip end of the unimportant island of Heungshan (also known as Macao Island), belonging to China. The Portuguese area, which includes two small adjacent islands, embraces less than a dozen square miles; but there are few places in the Orient where a dozen square miles contain so much of interest. It is the oldest European settlement in the Far East and was for long the only haven of refuge for distressed mariners in the China Sea. Its modest lighthouse there, on Fort Guia, was the first that ever flashed a beacon from the coast of the Chinese Empire, and its little cemetery was then the only spot where a European might find an unmolested grave.

Furthermore, Macao is "the Monte Carlo of the Orient," the only place in the world where fan-tan houses, opium factories, and lottery tickets finance a colonial government; and it is, beyond question, one of the most beautiful cities of the extreme East.

> The very clouds that top each mountain crest
> Seem to repose there, lingering lovingly.

But if you mention Macao to the average resident of Hong Kong he will tell you that it is a place of little interest, certainly not enough to justify your remaining overnight. The schedules of the Hong Kong, Canton, and Macao steamers are, therefore, so arranged that the traveler who insists upon going to Macao may arrive

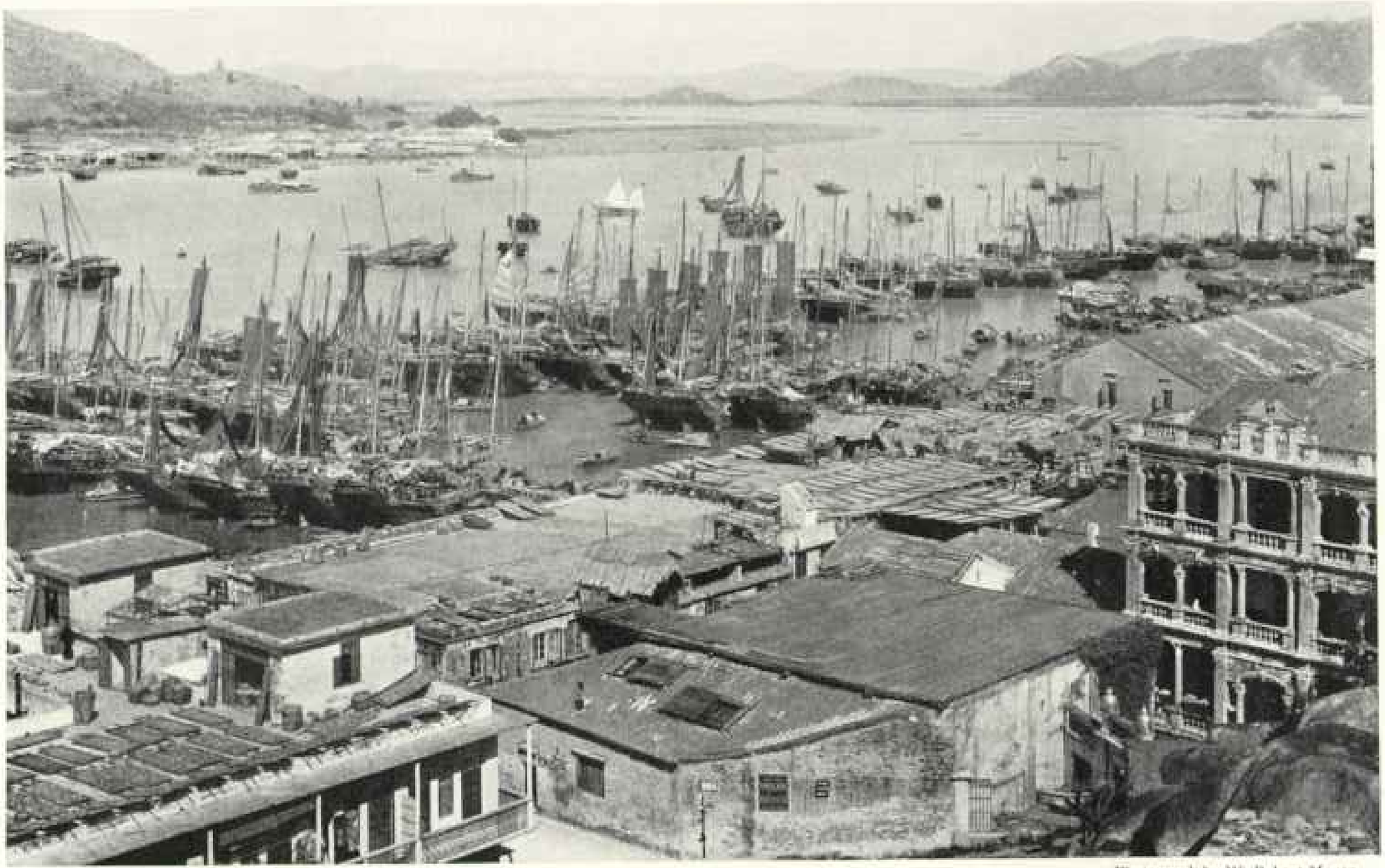
* See, also, "The Pathfinder of the East," by J. R. Hildebrand, in the National Geographic Magazine for November, 1927.



Photograph by W. Robert Moore

MONTE FORT CROWNS THE HILL WHICH RISES IN THE CENTER OF THE MACAO PENINSULA

From this stronghold, built in 1675, was fired the shot that killed the leader of the Dutch forces who marched against the city in the thrilling days when the Netherlands was competing with Portugal for supremacy in the East. Its guns, too, voiced protest against the control of the Chinese. The fort is still in use to-day.



Photograph by W. Robert Moore

STEAMERS VISITING MACAO TIE UP IN THIS HARBOR

Gray surrounding hills under a hazy-blue China sky, quiet waters bristling with masts of junks holding folds of drying nets, and fish spread in the sun on the roofs that line the quay—such is the inner harbor viewed from Penha Hill.

there about noon and leave about 2 o'clock. For the man who has eight or ten days in Hong Kong, therefore, two hours is considered an ample allotment of time for Macao.

Possibly the judgment of Hong Kong is influenced by its famous mist rather than by any selfish wish to see the traveler spend his money under the Peak. At any rate, Hong Kong's idea of a gorgeous time for the traveler seems to be a tram ride up to the flagstaff on the Peak, a stroll through the Botanical Gardens on the way down, a motor trip around by the Reservoir, and a grand finish at Happy Valley, which is both a cemetery and a race course.

The result of Hong Kong's advice is that many travelers never go to Macao at all, not even for the standardized two-hour visit. In a little while, perhaps, the excursion may be made by airplane without landing. Camoëns's Garden could readily be seen from the air and the national game of fan-tan might be viewed through glass roofs while flying over the gaming houses.

A CRUISE ON THE "SUI AN"

The atrophy of sentiment and imagination in the vicinity of Victoria Peak is further reflected in the name of the morning steamer that plies between Hong Kong and Macao. You would naturally expect it to be the *Luis de Camoëns*, or the *Lusiad*, or possibly the *Druid*, in memory of the stout little vessel commanded by Capt. Lord Henry Churchill, who sleeps in the old Protestant cemetery at Macao. But no; the steamer is the *Sui An*. Of course, *Sui An* may be Cantonese for "Perfumed Garden of the Unforgotten," but its intonation is more suggestive of a pigsty.

But it is a nice little picnic boat, and the American traveler may sit out on the top deck and easily imagine himself on the way to Coney Island. One of its distinctive features is common to all excursion boats out of Hong Kong—a military guard. Armed cap-a-pie, he grandly paces the deck under the mistaken impression that he is conveying a sense of confidence and security to the quaking soul of the traveler. "Fear not; papa is here!" seems to be the idea (see page 355).

As for being a real help in the event of a pirate raid, the guard is of doubtful utility; but he is certainly picturesque and amusing. My preference in the matter of Macao steamboat guards runs to marines, who mask a warlike front with a thick screen of Portuguese whiskers.

When you tire of the magnificent marine landscape (which recalls that of the Inland Sea), you can always shift your eyes back to the brave soul who is prepared to defend you with his life, here on a sea highway which, although piracy hazards may exist, seems about as perilous as the sidewalk leading to the Presbyterian Church in Terre Haute on a Sunday.

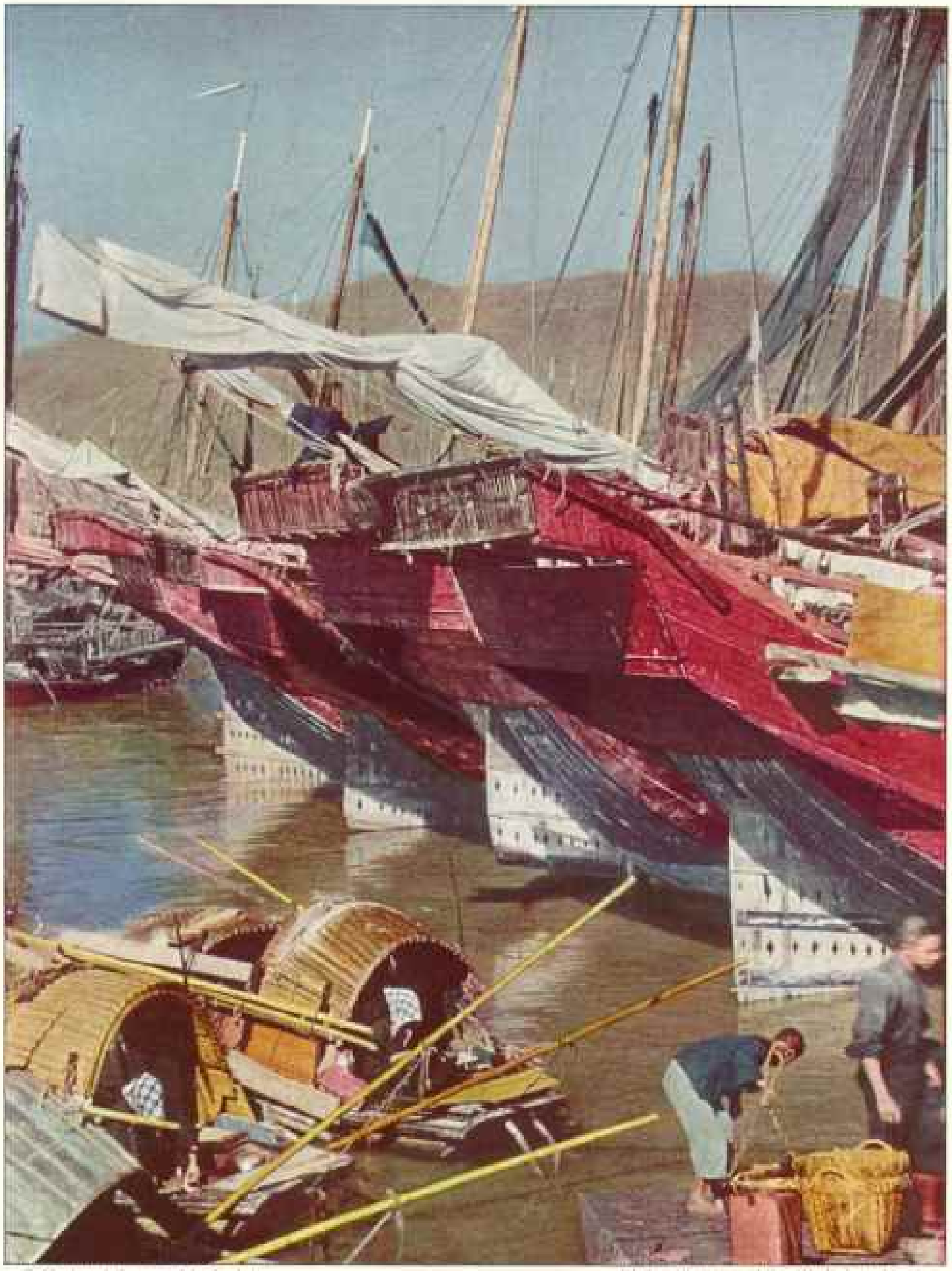
Now the *Sui An* is a staunch little steamer that began its maritime career in the bracing air of the Scottish Highlands, but a long sojourn in the Orient has induced a lassitude that is by no means uncommon in that part of the world. It therefore twirls its little twin screws nonchalantly and gives you an opportunity to take in every detail of the horizon on the three-hour voyage to Macao.

At last you see the little white lighthouse, and the *Sui An* swings gracefully into the shallow waters of one of the prettiest little bays in the Orient.

Around the curving beach and beyond you see the unmistakable architecture of southern Europe—terraced houses of light blue and pink and yellow—scrambled all over a beautiful wooded headland. The general aspect of the island as seen from the steamer is suggestive of the sunlit shores of the Mediterranean along the Riviera. The tints of the Portuguese houses led Frederic Courtland Penfield to call Macao "a stranded Eastern rainbow." Then the *Sui An* sidles up to the ramshackle dock and gives you a whole two hours to spend before rushing back to Victoria Peak.

PORTUGAL, INDIA, WEST AFRICA IN CHINA

For a generation, nearly everybody who knows about Honolulu has known also about Ah Fong, the millionaire sugar planter whose Eurasian daughters of beauty and refinement became the wives of American naval officers. When Ah Fong waxed old and found Diamond Head and Waikiki monotonous, he set out to find a more seductive location for the home of his decrepitude. He found it here in Macao, here on the Praia Grande—the ocean



 Finlay Photograph by W. Robert Moore

FISHING IS MACAO'S CHIEF INDUSTRY

In both the large fishing junks and the numerous small sampans many people spend practically their entire lives, seldom setting foot on land except when they are discharging their cargoes of fish or other wares.

Finlay Direct Color Photograph by W. Robert Moore

MATTING SAILS GLEAM IN THE MORNING SUNLIGHT AS JUNKS RETURN TO MACAO FROM THE FISHING GROUNDS

MANY FOURTH OF JULY FIRECRACKERS COME FROM MACAO

Following the old Chinese custom a few of the crackers are yellow, representing high royalty, some green for princes, and the rest red for the masses.

Finlay Direct Color Photographs by W. Robert Moore

PHOTOGRAPHY INTERRUPTS THE WEAVING OF A FISH NET

This old man earns a livelihood by ferrying people about the harbor, and by weaving fish nets which are always in demand among the craft along the water front.

NEWLY MADE SPIRALS OF INCENSE ARE DRIED IN THE SUN

Incense ranks third in Macao's industrial life; some 1,300,000 Macanese dollars' worth is produced annually.

 Finlay Photographs by W. Robert Moore

FIRECRACKERS ENOUGH TO MAKE MANY AN AMERICAN BOY HAPPY

The paper tubes are filled with powder and a layer of clay at each end; they are then soaked in water and put in the sun to dry and allow the clay to harden. The yearly output is valued at about 1,500,000 Macanese dollars.

PUBLIC WATER FOUNTAINS SHOW PORTUGUESE INFLUENCE

Like so many other things in Macao, time has left this street watering place in considerable disrepair.

 Finlay Photographs by W. Robert Moore

A DULL MORNING IN THE FERRY TRADE

During the interim when there are no passengers to be ferried across the harbor or out to boats in midstream, one of the women is catching up on the family wash while the other relaxes in the sunshine.

Finlay Direct Color Photograph by W. Robert Moore

FISH NETS DRYING IN THE EARLY SUNLIGHT MAKE A SCENE WORTHY OF TRANSFER TO AN ARTIST'S CANVAS

From the 16th to the 18th century, this outer harbor, now badly silted, saw many caravels from the West, because Macao was the leading port of trade for European commerce in China at that time.

Finlay Direct Color Photograph by W. Robert Moore

INDUSTRY AWAKES ALONG THE MACAO WATER FRONT WHEN THE FISHING BOATS RETURN TO HARBOR

 Finlay Photograph *by* W. Robert Moore

QUAINT SHOP FRONTS LINE THE AVENIDA ALMEIDA RIBEIRO

Although Macao is a Portuguese colony, the greater portion of its business is in the hands of the Chinese, who comprise more than 97 per cent of its 157,175 population.

boulevard which is to Macao what Bubbling Well Road is to Shanghai, or Connaught Drive to Singapore, or Unter den Linden to Berlin. For a mile and a half it winds along the sea wall, shaded by banyan trees and with an arcade of solidly built houses on one side. Among the proudest of these is that of the genial Ah Fong.

Other wealthy Chinese are also here, not merely because they find the climate more salubrious than that of Kwangtung Province, but because their heads rest more securely on their shoulders here, under the Portuguese flag. The Praia Grande is a cool and restful avenue and leads appropriately to a plaza which is the vestibule of the grotto and garden of Camoëns.

This plaza is unique in China. The only place in the Far East to which it may be likened is the Luneta in Manila. But the plaza of Macao is only a tiny park, a miniature public square fronting on a crescent-shaped bay. Nevertheless, one may here become romantic with little effort.

The plaza is to be seen at its best on Sundays and holidays, when the band from the Portuguese garrison plays classical selections with the same ease and perfection that endear the Constabulary Band to the Filipinos. On such occasions the plaza is adorned with the élite of Macao, with Chinese and Eurasian children of the "cunning" type, and with dark-eyed Portuguese girls, who flirt discreetly (but none the less effectively) with the young officers from the garrison.

This romantic plaza in Macao serves the traveler like a page torn from a school geography.

Here, stalking grandly across the square, we see a swarthy oriental noncommissioned officer with his head draped in a striped turban, and we wonder what the Hindu is doing here. Somebody tells us that he belongs here, that he belongs to the battalion sent here from Goa, which reduces us to the humiliating necessity of asking what and where is Goa. (I crossed India twice without ever discovering that both Portugal and France still have colonial possessions in ancient Hindustan.)

Then another apparition catches the eye, the silhouette of a row of ivory-black soldiers, topped off with red fezzes, festooned over the rail fence in front of the barracks. Plainly they are not Portuguese, nor Hindu, nor Chinese. Amid all the ethnographic display of the Orient, we have seen nothing like this before.

Suddenly one of the dusky soldiers lays his head back and laughs—laughs loudly and long. The identification is instantaneous and complete; there is no mistaking that laugh: it is the same that you hear on the levees of the Ohio and the Mississippi. It was made in Africa, and these are native troops from a Portuguese colony somewhere along the hot, steaming coast of the Dark Continent.

To those who have sojourned among the frontier forces of the French in the Senegal, of the British in Sierra Leone, of the Liberians at Monrovia, or of the Sudanese on the upper Nile, the spectacle brings back old memories.

THE "HALL OF CLASSICS" AT MACAO

And so, as one draws near to the famous garden of Camoëns, he passes through an atmosphere that is reminiscent of the widely separated lands of the poet's exile, the lands where

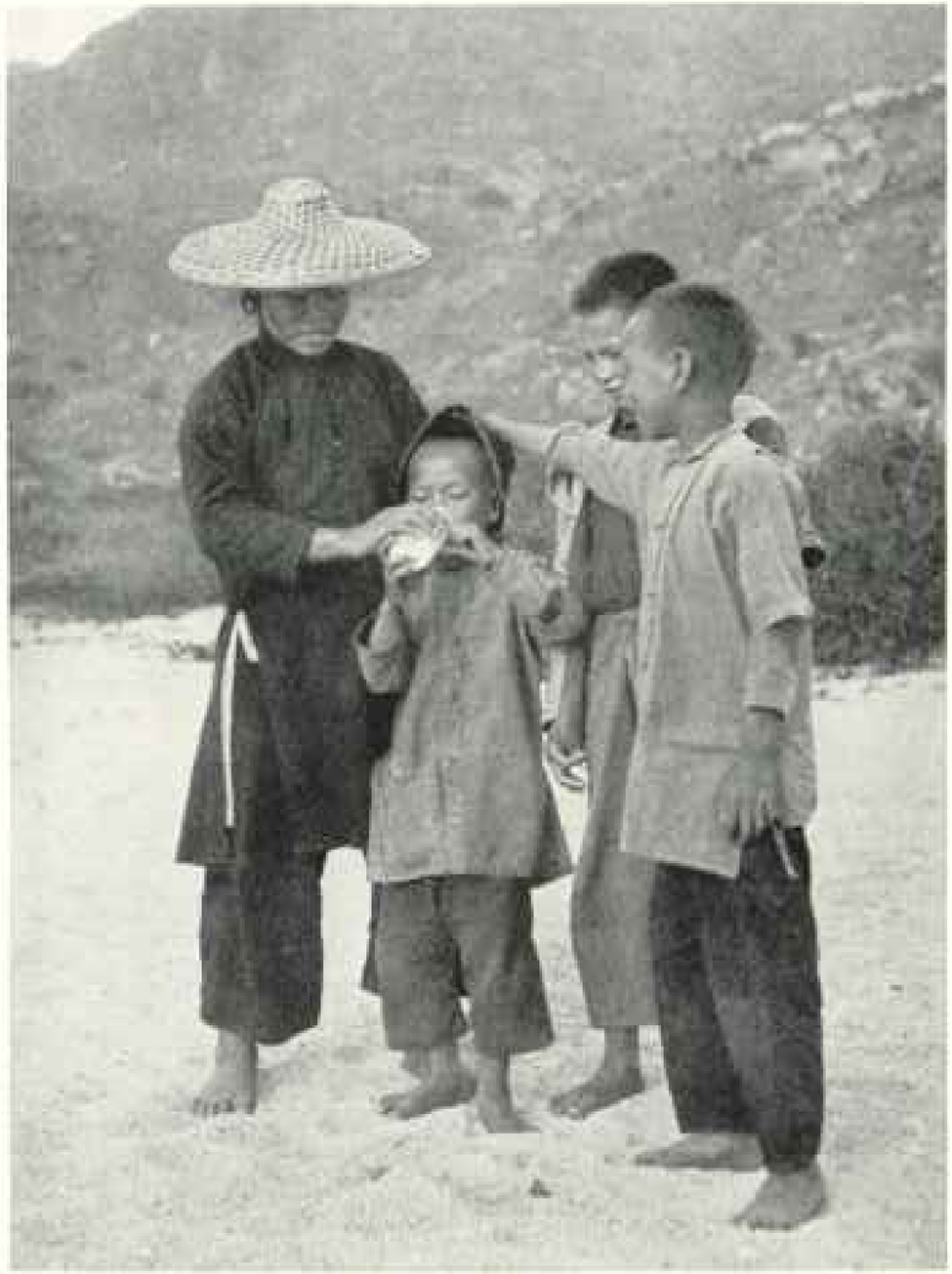
> One hand the pen and one the sword employed.

A gentle mist was falling as I made my first pilgrimage to the shrine—a mist poetically suggestive of an exile's memories. It was a temptation to ask the bandmaster to make the scene idealistic with the plaintive overture to "Poet and Peasant."

Slightly elevated above the plaza and shaded by the spreading branches of a venerable tree is a little retreat inclosed by a marble railing, where the thoughtful may sit in meditation. This is, perhaps, one of the spots consecrated by the master singer, for above it is a tablet inscribed with a stanza from an elegy penned by Camoëns in a saddened hour. It is so plaintive in its melancholy that one may close his eyes and hear the rain dropping upon the tomb of buried hopes:

> . . . N'esse paiso
> De suave tristesa me acudiam
> A memoria as lembranças do passado.

"In this land of sweet sadness." Surely no exile has ever spoken more gently of his place of banishment. The stanza continues in the same strain; it seems to drip with unforgotten memories, with unfulfilled aspirations, and with nameless fears.

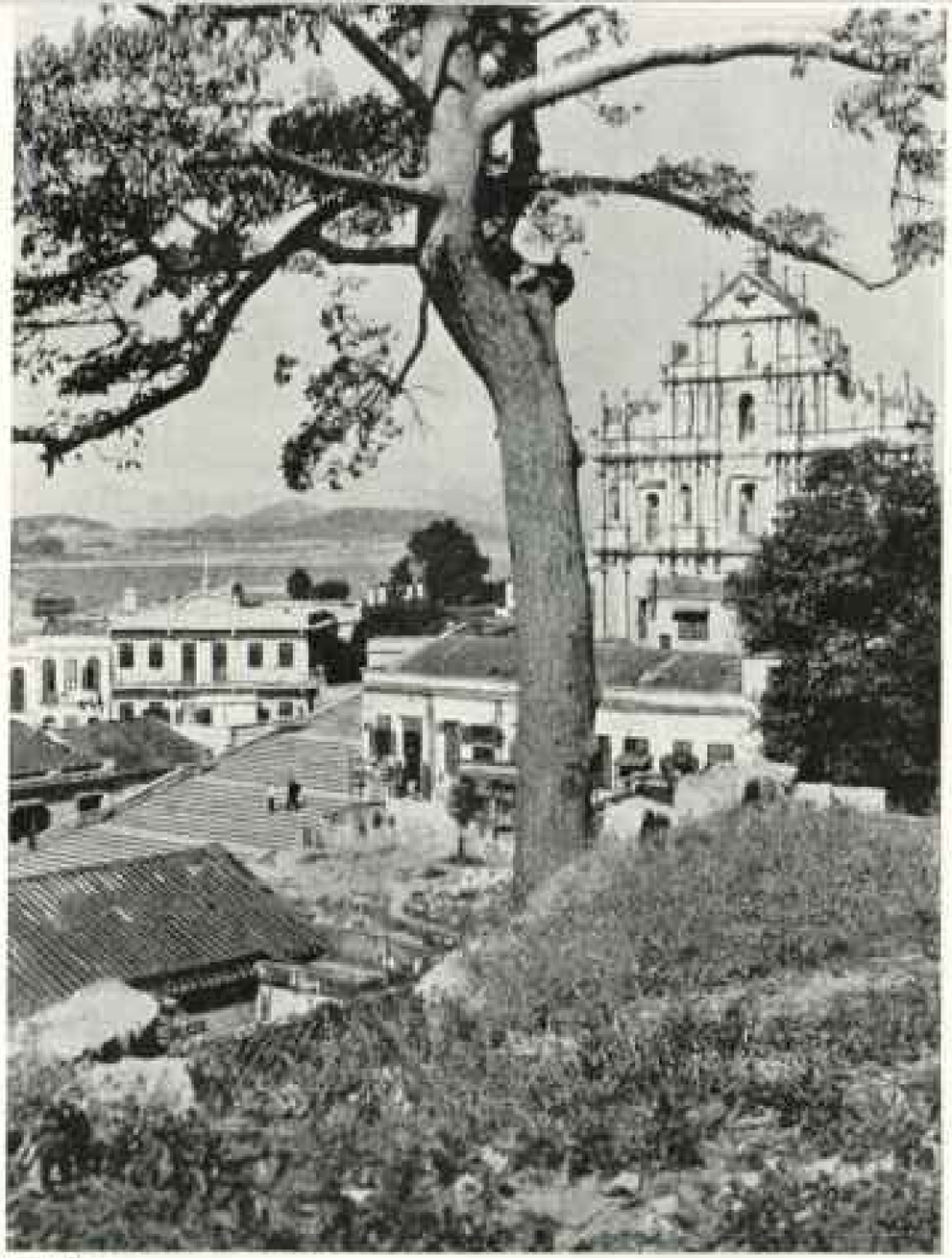


Photograph by Wilfred Tuska

A REFRESHING MOMENT FOR AT LEAST ONE OF THE MANY CHINESE YOUNGSTERS IN MACAO

Photograph by W. Robert Moore

THE GUIA BEACONS IN 1864 FLASHED THE FIRST LIGHT TO MARINERS IN THE CHINA SEA



Photographs by W. Robert Moore

BARRIER GATE, OR PORTO DO CERCO, RECALLS THE CONFLICT OF AUGUST 22, 1849

At that time Governor João Ferreira do Amaral, at the cost of his life, caused the expulsion of the Chinese customs officials from Macao and established free trade. The Chinese fort near this boundary gate, after ineffective bombardment from Monte Fort and gunboats, was taken by a young artillery lieutenant, Mesquita, and 36 men (see, also, text, page 354).

ONLY A CRUMBLING FAÇADE TELLS THE GLORY THAT WAS SÃO PAULO'S

Built in 1638 by Japanese Christian artisans, on a site of an earlier cathedral, dating from 1602, this church was the finest in all Macao. Although commonly called St. Paul's, the name above its door indicates that it was built to "Mater Dei." It was destroyed by fire in the 30's of the 19th century.

Photograph by W. Robert Moore

FINE HOMES AND PICTURESQUE GOVERNMENT OFFICES LINE THE PRAIA GRANDE
This splendid boulevard extends along the crescent-shaped bay that forms the old outer harbor, where early vessels from Europe rode at anchor (see Color Plate VI).

Between this retreat and the entrance to the grotto are grouped the tall marble slabs on which are engraved, in their several languages, the noblest of the requiems that exalt the genius of the author of "The Lusiads" (see page 350).

Though not so lofty as the granite tablets in the courtyard of the Temple of Confucius at Peiping, these marble pages recall those enduring records of the honor men among the scholars of China for generation after generation. The Government of Macao, inspired by the beneficence of the wealthy Lourenço Marques (whose name in turn has been perpetuated by the city of Lourenço Marques, in Moçambique, Portugal's colony in eastern Africa), has beautified the memorial garden and caused these tablets to be erected.

After reading these praises of Camoëns, sung in many tongues, you are fittingly prepared to enter the grotto itself and stand reverently before a statue of heroic size mounted on a lofty pedestal. But there is no such memorial of Camoëns in Macao. As you enter the dim recess of the tunneled gateway, you see only a modest bronze bust of the great singer, with a marble slab beneath it and some of the choicest lines of his "deathless song."

This is the pathetic singer of Portugal's vanished glory and heroism. Instead of standing majestically on a lofty pedestal in the bright Macao sunlight, he has shrunk back into the shadow, leaving Tasso and the others to remind you that the place whereon you stand is holy ground.

CRUCIFIX AND LINE-O'-TYPE

Near the Grotto of Camoëns is another hallowed garden, one seldom visited save by the few who seek it. It is the little "God's Acre" of the English chapel, the lonely burial ground of the pioneers who died in the China Sea in those early years when there was no "Happy Valley" at Hong Kong.

Here lie the men of Salem and of Boston who came out in sailing ships to seek the riches of the East and found lonely graves instead. But they sleep in the goodly company of "hearts of oak" from the British Empire, found in many a pioneer graveyard in the remote corners of the earth.

Photograph by W. Robert Moore

THE MA KOK MIU TEMPLE IS DEDICATED TO THE GODDESS A-MA

From this deity, patroness of the Chinese seamen, Macao (formerly Amagan) is supposed to have derived its name. Fishermen who frequent the water front find this ancient courtyard a convenient place to lunch or to have a friendly gambling game, such as is in progress at the right.

The greatest name decipherable on the disintegrating slabs of this obscure oriental burying ground is that of Robert Morrison, pioneer Protestant missionary to China, one of the men who first set in motion the influences that only two decades ago dethroned the Manchu dynasty. His talents, of a high order, had been consecrated to the awakening of China, and the mastery of its language was his life's work.

The New Testament in Chinese and a six-volume Chinese-English dictionary are his enduring memorials. His dictionary has been called the key which unlocked the Chinese classics to Western scholarship. Perhaps it would be more fitting to call it the passageway, tunneled through the ancient wall of Chinese exclusiveness, through which the East and the West might pass and come to know each other.

Camoëns, with all his brilliant genius, influenced the millions of China not at all; the man who sleeps neglected here linked his name with that of Confucius as a regenerating influence in one of the greatest of earth's empires. On the final day, when the empire became the first republic in the Orient, let us hope that some one with a long memory bethought himself of a wreath for the unobtrusive grave here in the corner of the garden.

Though not buried in this consecrated soil, the names of two other great men like-minded to himself are historically associated with Macao. One was Wells Williams (author of "The Middle Kingdom"), equally distinguished in Chinese scholarship. Here, under the Portuguese flag, he found a convenient place for setting up his Chinese printing press. The other was the zealous Francis Xavier, who, frustrated in his attempts to carry the Cross into China, died on an island some 30 or 40 miles from Macao.

"SEEING MACAO"

But these details are not for the speeding traveler. He gleans the essential facts from a guidebook *en route;* his all-comprehending eye sweeps the landscape while the *Sui An* is leisurely making its way up to the dock, where the jinrikisha coolie is

Photograph by W. Robert Moore

TURBANED EAST INDIAN POLICE DIRECT THE TRAFFIC IN MACAO (SEE, ALSO, TEXT, PAGE 349)

Portugal has three colonial possessions in India: Goa, Damão, and Diu.

waiting to whirl him around the circuit and back to the gangplank. A stroll past the grotto of the poet, a snapshot of the imposing façade of ruined São Paulo's (see, also, page 351), a brief glance at a fan-tan game, a two-minute detour at the opium factory, ten minutes at the firecracker works, a whirlwind finish at the Barrier Gate, and Macao has been "seen"—at least on the average tourist schedule.

The Barrier Gate, designed like an arch of triumph and now wreathed by the branches of venerable trees, makes an arresting silhouette, especially when you pause to consider that this is the only place in the world where Portugal is bounded by China (see page 351).

The spot is more historic than the average visitor realizes. This little neck of the island is the place where, in 1537, the Western World secured its first foothold in the Far East. It is true that Magellan had landed in the Philippines earlier, but it was not until 1567 that Legaspi established a permanent settlement at Cebu.

In 1557 the unwelcome Portuguese invaders were officially given permission to remain in Macao, and in 1573 the Chinese Government built a barrier wall across the neck of the island to fence them out. Six times a month the gate was opened to permit supplies to be imported by the isolated foreigners, who held tenure by virtue of the payment of an annual rental.

This arrangement was abruptly terminated in 1849, when the Portuguese Governor General refused to pay rent any longer and ejected through the gate the Chinese officials sent to collect it. The present Barrier Gate was then erected to commemorate the event, but it was not until 1887 that Portuguese sovereignty was finally recognized by China.

With a guard of Portuguese soldiers on one side of the gate and representatives of the Chinese Republic on the other, the Barrier Gate reminds you of the Neutral Strip at Gibraltar, with Britain and Spain on guard at each end.

Returning along the beautiful driveway, you find it convenient to stop at the outskirts of the city and take a few lessons in the craftsmanship of firecrackers. The process of manufacture is so simple that even the two-hour tourist may learn to "roll his own" (see Color Plates III and IV, and illustration, page 336).

First, you make the tiny paper tubes and paste red paper around them. It is like the traditional method of making doughnuts—first make the hole and then mold the dough around it. Next, you take a double handful of the little tubes, stand them on end, and tie a string around the bundle. Then you paste white paper firmly across the top and the bottom, so that the openings of the tubes are covered.

With a crude instrument that looks like a nail punch you perforate the top paper rapidly to admit to each tube first a layer of clay, then the powder and the fuse and another layer of clay. Finally you string together the required number, wrap them in a neat package, affix your fancy label, and the work is done.

The Chinese have been making firecrackers after this fashion for many centuries and have acquired amazing dexterity. But a visit to the factory spoils the enjoyment of firecrackers ever afterward, if you happen to have both a memory and a conscience. It seems like a sacrilege to set off an entire bunch with one match when you remember the time and patience that entered into its manufacture here in Macao.

THE CELESTIAL'S NATIONAL GAME

Fan-tan is another monument to the patience of the Chinese people. It is one form of gambling with which the Western World is not likely to become infected; it

Photograph by Edgar Allen Forbes

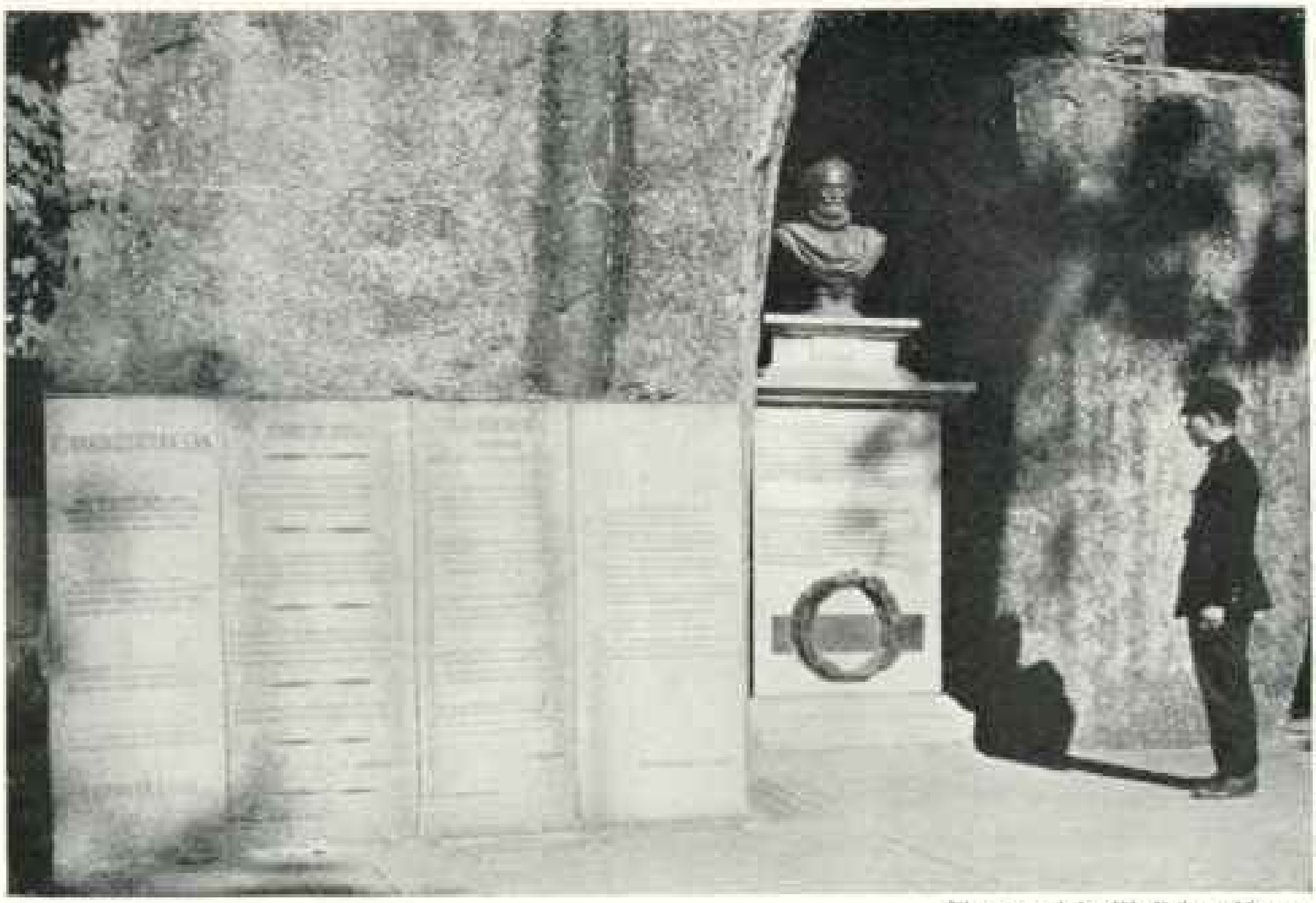
PREPARED FOR PIRATES

Equipped with both rifle and revolver, heavily armed East Indians stand guard on the deck of a Hong Kong-Macao steamer. Because of the frequent piratical attacks, passageways on many of the ships on the China coast are barred to prevent anyone reaching the control bridge.

is too slow for the occidental, who knows many ways of arriving at the same results more speedily.

The preëminence of Macao in the matter of fan-tan is not due to the Portuguese fondness for the game itself, but for the ensuing revenue. There are many places in the world where fan-tan is a diversion or a vice, but Macao is the only place where it is one of the foundations of a colonial government.

When you consider that Macao is at one end of a triangle that has Hong Kong and



Photograph by W. Robert Moore

IN THIS GARDEN GROTTO PART OF "THE LUSIADS" WAS WRITTEN

Upon the pedestal, on which a few stanzas of "Os Lusiadas" are chiseled, stands the bust of the soldier bard, Luis de Camoëns (Camões), who in 1553 came to the Portuguese colony of Góa, in India, and later took part in the occupation of Macao. Of the four tributary tablets, the second from the left is Sir John Bowring's "Sonnet to Macao" (see also text, page 349).

Canton at the other angles, it is easy to understand how a Portuguese city "with the lid off" and with good steamboat connections can acquire a large and profitable clientele. The Chinese make their money in China; they spend it in the fan-tan houses and lottery shops of Macao, for the gaming instinct abides with the oriental from the cradle to the grave. Even sweet charity is under its heaviest obligations to this impulse, for Macao squares itself with its conscience by holding drawings for the poor.

Those who are familiar with the gilded vice of Monaco will not see much that is familiar in the tinsel of Macao. Instead of a superb Palace of Chance, there are a number of famous fan-tan houses, monotonously alike. You are politely escorted up a stairway into a large room furnished with a few European chairs. Chinese tea and toasted watermelon seeds are hospitably placed before you as a sort of hors-d'œuvre, the watermelon seed being to a Chinese function all that peanuts are to an American circus. Gracefully to extract the kernel from its hiding place requires considerable practice; even more practice is necessary before you learn to like the titbit.

The paraphernalia of the game is all downstairs, but the aristocratic gambler prefers this second floor. In the center of the large room is a sort of light well surrounded by a railing, over which a motley crowd is always leaning. Since the gaming table is directly beneath, every movement can be seen to advantage.

On the long table are charts bearing the numerals 1, 2, 3, and 4, and the game is simplicity itself. You may bet on any one or all the numerals and you may wager any amount you choose. Your stake is lowered to the table in a little basket and placed on the numeral you designate.

When all of the participants have deposited their bewilderingly varied funds, coins and currency of many lands being heaped about the numerals in apparent confusion, you wonder how the cashier can keep his accounts straight. But the Chinese mind seems to work like a cash register, and there are no complaints afterward.

When the crucial moment has arrived the master of ceremonies, who sits at the head of the table, pours out a gallon or two of *cash*, the familiar Chinese coins with square holes in the center. Then, with a little rake, he begins rapidly to draw them in, four at a time. The spectators on the mezzanine floor stop cracking watermelon seeds and eagerly wait for the last motion of the rake. It takes about five or ten minutes to reach the fateful termination, and the issue depends upon the number of cash left for the last move.

If you have placed your bet on number 3 and there are three cash left, you have won twice the amount of your wager, less 10 per cent commission. If there are 1 or 2 to 4 cash remaining, you have lost. With a wheel or a top marked with the four numerals, you could have the answer instantaneously; but that would not be fan-tan.

Fan-tan in full swing seems nothing like so wicked as it sounds, and as a gambling hell the fan-tan house is remarkably sedate. The game lacks the picturesque accompaniments of a "crap game." It has none of the "bluff" of poker, none of the repartee of a lively game of bridge, and none of the suicides of Monte Carlo. Just what happens when a desperate loser has staked his return ticket to Canton, I had no opportunity to learn.

CALDRONS OF ORIENTAL DREAMS

Perhaps the strangest sight in Macao, when you remember that the official name of the place is "City of the Name of God, Most Loyal of the Colonies," is the opium factory.

If you have taken the pains to inform yourself in advance with respect to Macao, you know that the Portuguese obtained a permanent foothold here as the result of helping China to suppress wholesale piracy in the Canton River, and that their sovereignty was finally confirmed in exchange for a promise to aid in stopping the smuggling of opium into China.

Historical facts, therefore, seem to be standing on their head when you view them from the shore instead of from a book, for the opium factory is one of the institutions of Macao and its annual revenue has been reckoned at several millions. Of late years it has been decreasing.

You are not asked to crawl surreptitiously through a cellarway to view it, but it is, nevertheless, a dingy, dirty place, as becomes so vile an industry. Crude opium worth perhaps half a million dollars is to be seen bubbling in large pots all over the place. Were it not for the distinctive odor, one might mistake the establishment for a chocolate works.

When sufficiently cooked, the black, viscid mass is scooped into little tins.

Where grow the poppies which furnish the raw juice and by what devious paths the finished product reaches the poor wretches who are willing to barter their very souls for it are details not explained to the traveler.

All in all, this Portuguese outpost in China is a most curious mixture of the poetic, the romantic, the historic, and the vile. The "sweet sadness" of Camoëns's Garden is disturbed by the popping of handmade firecrackers. The bells of time-hallowed churches mingle with the clank of the cash on the fan-tan table. The requiem of the branches above Morrison's grave is broken by the bubbling of black opium in huge caldrons.

White, fleecy clouds float across a sky of infinite blue, while out yonder in the black, slimy ooze a half-naked Chinese boy joyously lifts toward his peasant mother a mud-covered arm within whose tiny fist is clutched a clam.

The *Sui An* quickens its pace as it heads for Hong Kong.

THE SOCIETY'S SPECIAL MEDAL AWARDED TO AMELIA EARHART

First Woman to Receive Geographic Distinction at Brilliant Ceremony in the National Capital

BEFORE one of the most distinguished audiences ever assembled in the National Capital, President Hoover presented Mrs. Amelia Earhart Putnam with the National Geographic Society's Special Gold Medal for her solo airplane flight across the Atlantic.

Presentation of the first of The Society's historic medals to be bestowed upon a woman took place on the evening of June 21, in Constitution Hall, national auditorium of a woman's organization, the Daughters of the American Revolution.

Highest officials of the three branches of the Federal Government participated in the ceremony. On the platform with the President of the United States and Mrs. Hoover were the Chief Justice of the United States, who is a Trustee of The Society, and Mrs. Hughes, and in the audience were enough Senators and Representatives to make a quorum in either House of Congress.

Also attending were diplomatic representatives of 22 countries, including those from European nations which had honored the flyer after her dramatic landing at Londonderry, Ireland; high officers of the Army, Navy, and Marine Corps, and noted scientists, men of letters, and other members of The Society.

A VIVID RECITAL OF HER EXPERIENCES

Dr. Gilbert Grosvenor, President of the National Geographic Society, presided and presented President Hoover. Following her acknowledgment of the medal, highest American reward for geographic achievement, Miss Earhart—Amelia Earhart, she explained, is her "flying name"—gave the first complete narrative of her eventful voyage.

Miss Earhart's vivid account of her epochal flight thus becomes available to the world membership of The Society, as were other noteworthy reports on explorations, such as those of Colonel Roosevelt when he returned from South America and Africa; of Colonel Lindbergh, after his pioneer Atlantic crossing, and of Admiral Byrd, following his flights across the Atlantic and to the North Pole and South Pole.

Thus another first narrative of geographic high adventure is added to the long list of "first-edition" accounts of exploration contained in bound volumes of THE GEOGRAPHIC, which are found in member libraries in every civilized country of the world.

The only added decorations in Constitution Hall on this occasion were the flag of the United States and the flag of the National Geographic Society, which has been carried by The Society's expeditions on sea and land, across burning sands and icy wastes, on every continent and over every ocean, during the numerous explorations sponsored by the organization.

The U. S. Marine Band played as the President and Mrs. Hoover entered, accompanied by Mr. and Mrs. Putnam, who had been guests at the White House for dinner.

Trustees and officers of The Society tendered Miss Earhart a luncheon at The Society's headquarters on the day of the medal presentation.

More than 10,000 requests were received for tickets of admission to the auditorium, whose seating capacity is limited to 3,800. Arrangements were made, therefore, not only for Washington members of The Society to "listen in" over the radio, but for the more than one million member families throughout the country, as well as the general public, to hear the addresses of President Hoover, Dr. Grosvenor, President of The Society, and Mrs. Putnam, the medalist, through a network of 38 stations of the National Broadcasting Company.

OFFICIALS ON THE PLATFORM

On the platform seated with the President, Mrs. Hoover, Dr. and Mrs. Grosvenor, and Mrs. Putnam were Dr. John Oliver La Gorce, Vice-President of the National Geographic Society, and Mrs. La Gorce; the Chief Justice of the United States and Mrs. Hughes, the Minister of the Irish Free State and Mrs. MacWhite,

Photograph by Paramount from Keystone

OFF ALONE TO CROSS THE ATLANTIC

Just at dusk Miss Earhart's plane left the ground at Harbour Grace, Newfoundland, and journeyed through the night. She landed safely in Ireland the next morning.

Mr. and Mrs. William P. MacCracken, Jr., Hon. and Mrs. Theodore G. Joslin, Captain Joel T. Boone, U. S. N., and Mrs. Boone, Hon. John Barton Payne, Dr. George Otis Smith, Hon. Walter H. Newton and Mrs. Newton, Hon. French Strother and Mrs. Strother, Director and Mrs. Raymond S. Patton, Dr. George R. Putnam and Miss Putnam, Colonel U. S. Grant, 3d, and Mrs. Grant, Lieutenant Colonel Campbell B. Hodges, Hon. Charles D. Millard and Mrs. Millard, Captain Charles Russell Train and Mrs. Train, Mrs. Stark McMullin, Hon. Clarence M. Young, Mr. George Palmer Putnam, Miss Mildred Hall, Miss Doris Goss, Lieutenant F. B. Butler and Mrs. Butler, Lieutenant F. V. H. Kimble, Mr. and Mrs. Mark Requa, and Mr. and Mrs. Warren D. Robbins.

Among those in the audience were the Secretary of State and Mrs. Stimson, the Secretary of the Treasury and Mrs. Mills, the Attorney General and Mrs. Mitchell, the Postmaster General and Mrs. Brown, the Secretary of Commerce and Mrs. Lamont.

Only 12 men have received The Society's medal since the first presentation to Peary, in 1906. Thus Amelia Earhart's name is enrolled on the roster of geographic fame which includes Admiral Byrd, Colonel Lindbergh, Captain Amundsen, Sir Ernest Shackleton, and Dr. Hugo Eckener.

The medal bore the inscription, "Awarded by the National Geographic Society to Amelia Earhart, First Woman to Achieve a Solo Transatlantic Flight, May 20-21, 1932."

INTRODUCING THE PRESIDENT

Dr. Grosvenor, the first speaker of the evening, said:

"Mr. President, Mrs. Hoover, members and friends of the National Geographic Society:

"We are assembled to honor a member of our Society who has made another milestone in the swift progress of the youthful science of aëronautics. Amelia Earhart is the first woman to fly alone across the Atlantic and the only person who has twice crossed the ocean in an airplane.

"She has also achieved the speed record for crossing the Atlantic—16 hours, 12 minutes; and the distance record—2,026.5 miles—for a flight by a woman.

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RESIDENTS OF LONDONDERRY CHEER THE SUCCESSFUL TRANSATLANTIC FLYER AS SHE LANDS NEAR THEIR CITY AFTER HER LONG AND DANGEROUS SOLO FLIGHT

© Harris and Ewing

A TRIBUTE FROM MRS. HOOVER

The "First Lady of the Air" was presented with an exquisite basket of flowers by the First Lady of the Land.

Photograph from Keystone View Company

READY FOR A FLIGHT

That rare quality of courage, together with skill and a sureness of spirit, is reflected in Miss Earhart's flying smile.

"Following her first transatlantic flight four years ago, she addressed our Society. During that crossing, though she was then a skillful pilot, she made no plea to take the controls. She placed success ahead of personal fame.

"Her restraint then, her self-discipline, training, long observation, and thorough preparation for the feat she has just accomplished, remove it from the category of happy accident and stamp it as one of the enduring achievements of aviation.

A PIONEER SPONSOR OF AVIATION

"Your Society has long been a pioneer and sponsor of aviation. Since 1903, when the National Geographic Society printed in its Magazine an article by Alexander Graham Bell, which foreshadowed the practical application of aëronautics to travel, exploration, and shipment of goods, many explorers of the air—Byrd, Lindbergh, Eckener, Ross Smith, Kingsford-Smith, Cobham, Macready, Dargue, De Pinedo, Mittelholzer, Stevens—have recounted for it and your GEOGRAPHIC MAGAZINE their trails through the skies, as have the noted explorers of land and sea.

"Amelia Earhart is the eighth person and the first woman to receive one of THE GEOGRAPHIC's medals from the hands of the President of the United States since the presentation of our first award to Admiral Peary by President Roosevelt.

"The presentation to Sir Ernest Shackleton, for Antarctic discoveries, was made by President Taft, who was for many years a member of The Society's Board of Trustees. The presentation to Colonel Goethals, as builder of the Panama Canal, was made by President Wilson. Presentations were made to Admiral Byrd, to Floyd Bennett, and to Colonel Lindbergh by President Coolidge, who now is a member of our Board of Trustees.

"A second medal to Admiral Byrd, in recognition of his Antarctic explorations, was presented by President Hoover.

"To-night President Hoover again honors our Society. It is fitting that a medal for aviation achievement should be tendered, on behalf of our Society, by one who, as Secretary of Commerce for eight years and as Chief Executive, has vitally aided development of aviation in the United States.

"Daily many thousands of men, women, and children are traveling by air in complete safety because of the wise policies governing air travel in the United States, many of which Mr. Hoover initiated.

"It is a source of deep gratification to our members to realize that their Society, in its encouragement of science, in its broad educational work, and in its promotion of understanding among people of the world, represents those constructive ideals cherished by President Hoover.

"In the library of the National Geographic Society is a prized volume, which is the first English translation of a Latin treatise of 1556 on mining methods. The translation bears the date of 1912 and the names of the translators, Herbert Hoover and Lou Henry Hoover, who then inscribed herself as 'A. B., Stanford University, Member American Association for the Advancement of Science, the National Geographic Society, and the Royal Scottish Geographical Society.'

APPRECIATION OF MRS. HOOVER'S SUPPORT OF THE SOCIETY

"Mrs. Hoover has been a member of our Society for thirty years, joining it when it was a small group of some 2,500 members. Her encouragement and consistent support have greatly aided The Society.

"In behalf of a present membership of 1,200,000 persons, representing every county and community in our Nation and every civilized country in the world, we thank you, Mr. President, and Mrs. Hoover for your kindness in coming to this meeting and adding to those precious traditions which give strength and permanence to our Society.

"Ladies and gentlemen, the President of the United States."

ADDRESS BY PRESIDENT HOOVER

President Hoover, in presenting the Special Medal of The Society, said:

"It is a great pleasure to come here and share in your honoring of Mrs. Amelia Earhart Putnam. She has shown a splendid courage and skill in flying alone across the Atlantic Ocean. She has often before demonstrated her ability to accomplish the most difficult tasks that she set herself to do. She has been modest and good-humored.

"All these things combine to place her in spirit with the great pioneering women to whom every generation of Americans has looked up, with admiration for their firmness of will, their strength of character, and their cheerful spirit of comradeship in the work of the world. It is significant that she found the first outlet for her energies in social settlement work, and that through all her succession of triumphs in aviation, her transcontinental and transoceanic flights, she has continued active in this warmly human labor.

"Her success has not been won by the selfish pursuit of a purely personal ambition, but as part of a career generously animated by a wish to help others to share in the rich opportunities of life, and by a wish also to enlarge those opportunities by expanding the powers of women as well as men to their ever-widening limits.

"Mrs. Putnam has made all mankind her debtor by her demonstration of new possibilities of the human spirit and the human will in overcoming the barriers of space and the restrictions of Nature upon the radius of human activity. The Nation is proud that an American woman should be the first woman in history to fly an airplane alone across the Atlantic Ocean. As their spokesman, I take pride and pleasure in conferring this rarely bestowed medal of the National Geographic Society upon Mrs. Amelia Earhart Putnam."

THE ADDRESS OF ACCEPTANCE

In accepting The Society's Special Medal, Amelia Putnam said:

"Mr. President, Dr. Grosvenor, Dr. La Gorce, members of the National Geographic Society, ladies and gentlemen:

"I am deeply grateful for the medal you have bestowed upon me. I have no words in which to express my appreciation to you and to the National Geographic Society. I can but feel it is too great an honor for my exploit.

"I am going to tell you something about the trip, which was simply a personal gesture on my part. Four years ago I went on the *Friendship* and, as has been said, was simply a passenger. In fact, in England I was referred to as 'a sack of potatoes.' That all too-appropriate appellation, probably as much as any other single factor, inspired me to try going alone.

"Some features of the flight I fear have been exaggerated. It made a much better story to say I landed with but one gallon of gasoline left. As a matter of fact, I had more than a hundred. The exact quantity I remember because I had to pay a tax for every gallon imported into Ireland!

HAZARDS NOT QUITE SO MANIFEST AS DESCRIBED

"I did *not* land within six feet of a hedge of trees. I taxied to the upper end of a sloping pasture and turned my plane into the shelter of some trees, as a matter of course. It made a much better story the other way, I admit.

"No flames were threatening to burn my plane in the air. I did have some trouble with my exhaust manifold, of which I shall tell you later. There was no extreme hazard from that cause, however.

"I did not kill a cow in landing—unless one died of fright. Of course, I came down in a pasture and I had to circle many other pastures to find the best one. The horses, sheep, and cows in Londonderry were not used to airplanes, and so, as I flew low, they jumped up and down and displayed certain disquiet. I really was afraid that an Irishman would shoot me as I stepped out of the plane, thinking that I was just a 'smart Alec' from some big town come down to scare the cattle.

"To begin at the beginning, I left Harbour Grace at dusk. I preferred to fly all night and land on the other side in daylight rather than leave during the day and run the risk of landing, when daylight was failing, on an unknown shore. I had at least two hours of daylight or two hours when I could still see the glow of the setting sun if I looked back.

"I started to keep a log, but it didn't continue very long. On that log I jotted down '8:30—two icebergs,' and a little later I recorded the fact that I had seen a small boat a couple of hours out of Harbour Grace. I was flying at 12,000 feet and I blinked my navigation lights, hoping that the vessel would sight me. However, I do not think I was seen because I received no answering signal and probably was too high to be noticed, anyway.

"Two hours after I left the moon came up over a field of little, scattered, woolly

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ARRIVING AT THE WASHINGTON AIRPORT

Appropriately enough, Miss Earhart came to the capital by plane. Officers of the National Geographic Society extended her an official welcome as she landed, while a crowd of interested onlookers accorded her an enthusiastic greeting.

clouds. Those little woolly clouds grew compact and finally covered the ocean with their soft whiteness. I flew along with nothing happening until 11:00, when an enormous dark cloud loomed before me, stretching as far as I could see. Behind it I watched the moon finally disappear. It was entirely too high for me to climb over. I could not waste the gasoline, and flying for any length of time at 20,000 feet, which was approximately the height of the cloud, is too hard on the pilot without special apparatus.

"Two things happened before I struck the storm. One was that my altimeter, the instrument which shows height above a level, had failed me for the first time in 12 years of flying; so that I could not know how high I was above the sea. The other, a weld in my exhaust began to burn through. I knew after several hours the sections would become loosened and tend to vibrate. It was a heavy manifold and very rigidly attached to the cylinders, so that excessive vibration might have been more or less serious.

"I plunged at 11:30 into the storm cloud and met the roughest air I have ever encountered while flying completely blind. By blind I mean I could not see out of my cockpit at all. I had light there which, of course, did not cast much illumination beyond the windowpane, any more than a lamp in a house throws its glow far outside. For about an hour I could not keep my course absolutely. I was tossed about to such an extent that accuracy was impossible.

"I had been told by the Weather Bureau that there were storms south of my course; possibly these storms would come on my course about midnight, but after that I should probably have moonlight and stars.

MENACED BY THE DREAD ICE HAZARD

"I did not get out of the storm area. In fact, I continued in it until daylight came. When I tried to climb out, I picked up considerable ice, and ice is a hazard which all flyers dread.

"In order to get out of the ice area, I came down. Aviators have no other protection, except to get out of the particular temperature zone where ice forms. I went down until I could see the white caps breaking in the darkness. If it had been a smooth sea, I might have gone too far.

"As my altimeter was out of commission, I could not tell whether I was 50 feet off the water or 150. I only knew I was too close; so I tried to climb through again, and again picked up ice, and concluded that I must fly under the altitude, whatever it was, where I collected ice, and over the locality where I thought the water waited.

"When daylight came I could see on my wings traces of the ice which had gathered—droplets of water and very small frozen particles. Probably, if I had been able to see what was happening on the outside during the night, I would have had heart failure then and there; but, as I could not see, I carried on.

THREE TYPES OF COMPASSES SHOWED THE WAY

"Instrument flying is easier sometimes than trying to see an obscure horizon. By instrument flying I mean that type of flying in which the pilot cannot see a horizon—cannot see outside his cockpit, probably. It is a curious fact that our sense of position in space sometimes depends on our being aware of the horizon. A flyer in a fog is just as blind as if he had a bandage tied over his eyes, and his unaided senses may give him the incorrect impressions. Modern instruments have been invented to help our faulty senses under such conditions.

"The instruments I had for flying were three different types of compasses—one a simple magnetic compass, the other an aperiodic, and a third a directional gyro, which has to be set about every 20 minutes with one of the others as checks. It is, by the way, one of the best blind-flying instruments I know.

"I think that instrument flying will be a significant step in aviation. With it developed, I think the weather will not hinder flying any more than it does any other means of transportation. After all, trains are stalled by washouts and ships by fogs; so their performance isn't perfect either. Probably more weather information, possibly through mid-ocean stations, will add further to aviation's reliability.

"In my opinion, any expedition owes 60 per cent of its success to the preparation beforehand. I was fortunate in having Bernt Balchen, the great Norwegian flyer, who was with Admiral Byrd at the South

Photograph by Acme

AT THE WHITE HOUSE

In the group from left to right are: Dr. Gilbert Grosvenor, President Hoover, Amelia Earhart Putnam, and Mrs. Hoover. In the back row: George Palmer Putnam and Dr. John Oliver La Gorce, Vice-President of The Society.

The medal presented to Amelia Earhart Putnam on behalf of the National Geographic Society by President Herbert Hoover, June 21, 1932. She is the first woman to receive The Society's award.

Pole, to help me with my preparations. In fact, he flew me to Harbour Grace to save me fatigue before the actual take-off.

"The motor I had was a super-charged Pratt and Whitney 'Wasp,' developing about 500 horsepower. I carried 420 gallons of gasoline. I had flown my plane for three years; so I really ought to know it and it ought to know me. Of course, I had the advantage of having crossed once before and of knowing something of the conditions which were inevitable—that no one can expect good weather over the Atlantic for 2,000 miles.

"For food I carried a very simple ration—tomato juice. I think that serves as food and drink, and I used just a few swallows of it. I had no sandwiches or anything of that sort with me. The fact is, one doesn't think much about food on such a journey.

NOT TROUBLED BY DROWSINESS

"I have been asked many times whether I was sleepy, and I can say, 'No, indeed,' emphatically. With very concentrated flying, one becomes wider and wider awake. Then, after all, one night is not any particular strain. One can do almost anything for one night; so that I did not have any great fatigue. Possibly, if the night had been a beautiful, clear one, with the moon and stars shining and with nothing for me to do, I might have got somewhat drowsy. Flying in the kind of weather I met, however, made even winking an eye impossible.

"When daylight came I found myself between two layers of clouds. One I should estimate at 20,000 feet and the other a thousand feet over the water. With a glimpse of the water that I had then, which was the first in many hours, I noted that I had a strong northwest wind. I thought then that I must be south of my course, inasmuch as I had run into storms predicted south of my course, and I found myself in a northwest wind. Therefore, instead of following implicitly the course which I had laid out, I tried to allow for what I considered my southward drift. Consequently I hit Ireland farther north than I had expected (see, also, illustration, page 360).

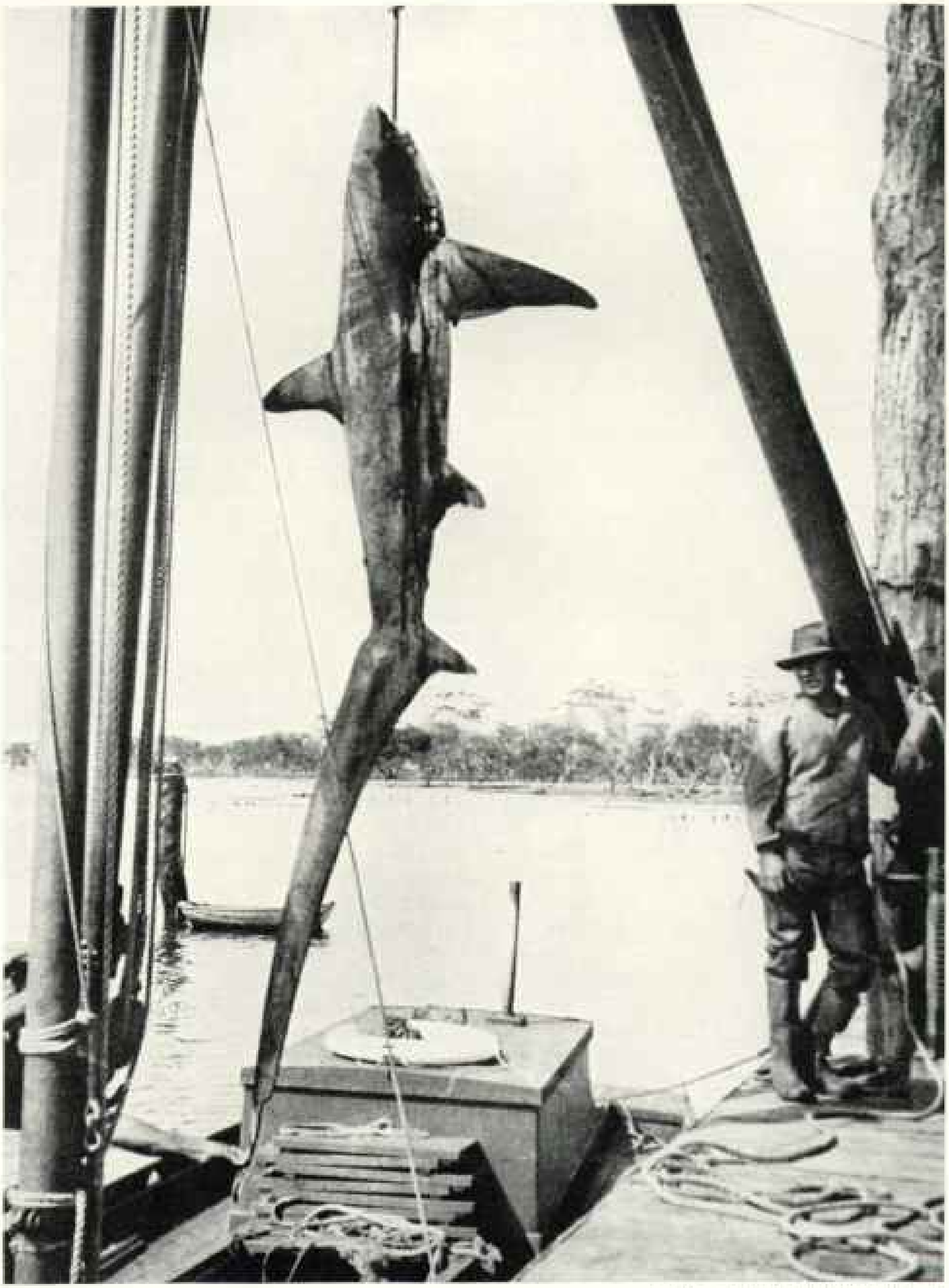
"With my exhaust burned out, as it was by that time, I thought it was common sense to check over the first land available, and I did not want to miss the tip of Ireland. So I corrected too much. After sighting land, I started down toward the southern coast, found thunderstorms in the mountains, and, not knowing the topography of the region, thought it was not very sensible to try to fly through. I then turned north into clearer weather.

"Using United States reasoning in Ireland was not quite effective. I thought if I followed a railroad I should come to a large town, and a large town would have an airport, as they usually do here. I found the railroad, followed it, came to a fair-sized city, but found no port. Consequently I selected the best pasture I could find and settled down in it. I pulled up at the front door of a farmhouse and asked the surprised farmer for a drink of water—an unusual request in Ireland, I found!

"Probably more exciting than actually sighting land was seeing a small fishing vessel about 100 miles off the coast. I was going by, as I wanted to reach land, but then decided to circle, that all might know I had got so far, anyway. I circled and received an answering signal. A whistle and some kind of bomb was sent off. Of course, I could not hear them, but I could see the smoke and the steam from the whistle. It was the first human contact since Newfoundland.

"My flight has added nothing to aviation. After all, literally hundreds have crossed the Atlantic by air, if those who have gone in heavier-than-air and lighter-than-air craft are counted and those who have crossed the North and the South Atlantic. However, I hope that the flight has meant something to women in aviation. If it has, I shall feel it was justified; but I can't claim anything else.

"I am grateful to have had the privilege of coming here to-night, and for the honor which the National Geographic Society has paid me."



Photograph by Norman W. Caldwell

A THRASHER, SCOURGE OF THE WHALES

Equipped with a disproportionately long tail which gives it wonderful pace and extraordinary maneuverability, the thrasher plays havoc with the mammoth of the deep. Whalers regard the thrasher as a special friend, for it frequently locates their prey for them. This shark invades schools of smaller fish, and uses its long tail to splash the surface of the water as it swims about them in ever-decreasing circles. This seems to terrorize the victims and keep them crowded together where they may be more easily attacked.

SHARK FISHING—AN AUSTRALIAN INDUSTRY

By Norman Ellison

SHARKS are a grave and constant menace along the New South Wales bathing beaches.

Every summer these wolves of the deep take a toll of bathers. Shark-proof fences and other defensive methods are not always effective; and so, at every popular beach, keen-eyed watchers scan the water from high towers and sound a bell to warn the crowds of bathers of the marauders' approach. Indeed, the menace is sometimes so serious that it is proposed to supplement the present shark lookouts with either airplanes or captive balloons.

However, at Pindimar "shark" is good news, for here is the headquarters of a shark-fishing industry. Pindimar is a sleepy little village on the shores of Port Stephens, a natural port where vessels of deep draught can find anchorage. Overshadowed by the industrial success of Newcastle, New South Wales, its nearest port neighbor, it is sparsely populated by fishers, lobsterers, and oystermen (see also, illustration, page 372).

Founded several years ago, the shark industry of New South Wales has at last reached the commercial stage. Like the rabbit, the snake, the lizard, the crocodile, and the alligator, the shark has attained this status mainly through the whims of Milady Fashion the world over. She demanded something new in footwear and bags, and she has it in sharkskin.

Several years ago a trading company in England sent four experts out to Australia to specialize in sharks—shark catching and shark treatment. They were the specialist nucleus of Marine Industries, Ltd., the Australian offshoot of the English company. After investigation, the quartet chose Pindimar as the scene of their operations. It had and has the first essential—sharks, thousands of them; all kinds and varieties; all sorts and sizes; and all within a few miles of the shore.

The *Devil* and the *Demon*, specially built motor boats, 30 feet long, 8-foot beam, drawing 3 feet of water, and powered with 12-horsepower Diesel engines which gave them a speed of 7 knots, were put into service. Staunch little craft they were, proving themselves so with the heaviest of freights and in the dirtiest weather.

The first attack was launched at the entrance to the Port, a stretch of water three-quarters of a mile wide. The nets were unlike any used before in New South Wales. They were approximately 1,000 feet long, about 16 feet deep, of an 8-inch mesh, and they were leaded and anchored to the bottom with glass buoys to hold them upright. On the surface, marking the anchors that helped secure the net to the bottom and at the same time holding it steady, were large drums. Usually the nets are set in the afternoon and raised the next morning.

A FISH STORY WHICH PROVED ENTIRELY TRUE

When the first net set was raised, the shark fishers discovered that, for once at least, the local fishermen had told the truth. There were sharks there in abundance—all sorts and sizes—"gray nurses," "whalers," "tigers," "school sharks," "blue pointers," "hammerheads," "carpets," "wobbegongs," "shovel noses," "gummies," "angels," and "Port Jacksons."

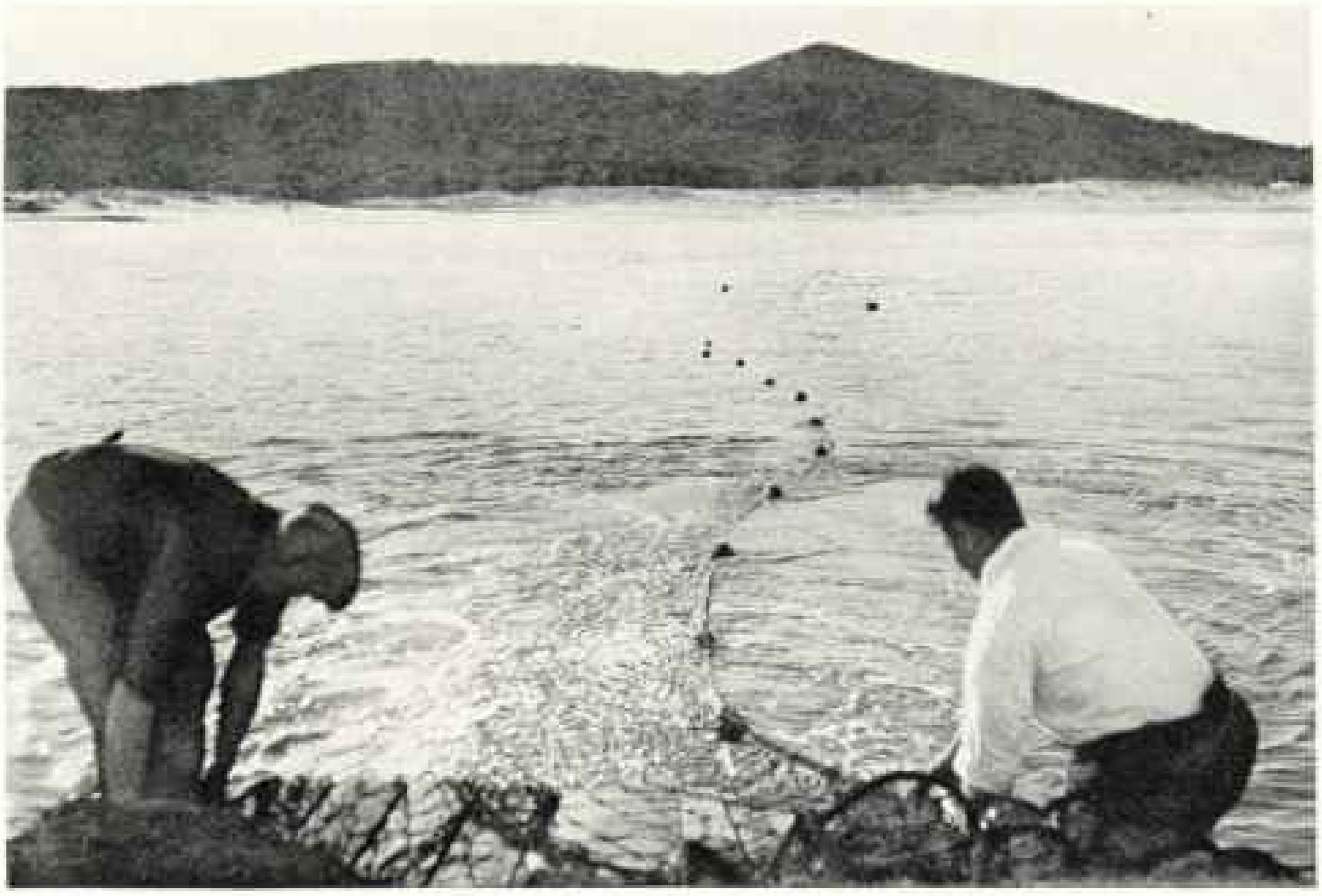
The shark fishers learned, too, that sharks were really stupid. An egg-cup would have covered the brain of the biggest shark I have ever seen, an 18-footer, and in my opinion a sheep is quite a brainy creature compared with some sharks.

This lack of intelligence is demonstrated by the fact that once a shark runs into the mesh of the net, once he even touches it, his doom is more or less sealed. Though he may sense its dangerous potentialities, he will not retreat; he presses ahead. And as he does so, those thin brown cords get tangled more and more securely around his gills. Then, unless he is a very Samson among sharks, he is there to stay—perhaps not intact, but that aspect of shark fishing will be dealt with later.

The *Devil* and the *Demon* are each manned by a crew of two and a "half" men—two very strong men and a lad. On the job of raising the net, the skipper is at the tiller; right up "forrard" one chap, his legs braced against a little footrail, hauls,

HAULING IN THE NET IS HEAVY WORK

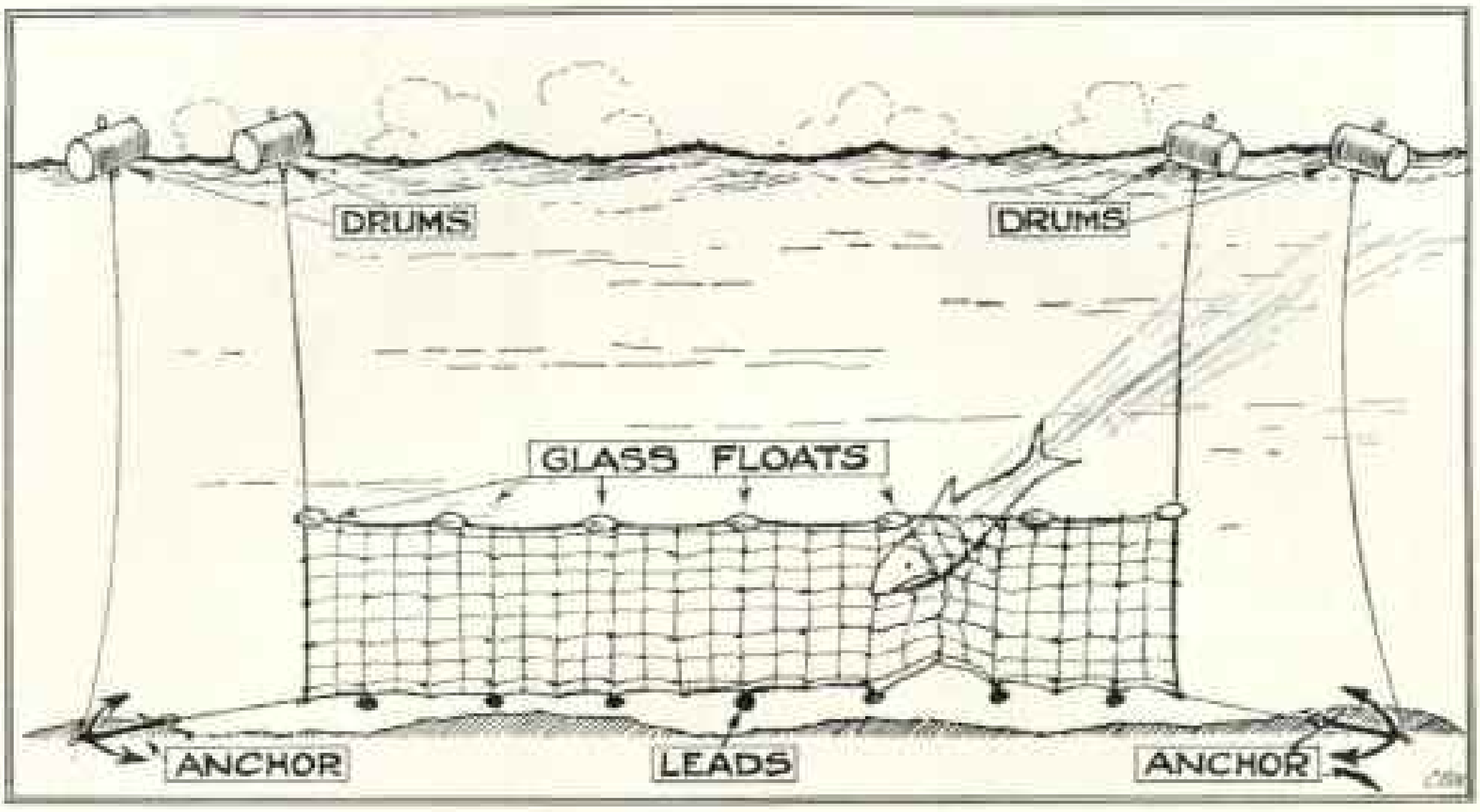
Staunch little craft, the shark boats work out at sea in all weathers and their crews are able sailormen. On this occasion the *Demon*, one of the shark boats, had two more than the usual crew aboard.



Photographs by Norman W. Caldwell

SETTING THE SHARK NET

The preferred place for this operation is where salmon are numerous, for then the sharks come to catch the salmon and the net snares the sharks. That portion of the net nearest the boat has not yet sunk, but eventually all of it goes to the bottom, where it rests straight up and down (see illustration, opposite page).



HOW A SHARK NET WORKS

It is usually about 1,000 feet long and has an 8-inch mesh. There is no bag. The sharks are meshed about the head when they strike the net, as big fish are caught in our Midwest with the trammel net.

and a little farther along the deck, taking the strain, is the lad.

Hand over hand they heave and pull, until at last the "forrard man" calls a halt. "Here comes one," he says, and, below, a mass can be seen tangled in the net, thrashing and writhing. Then the skipper leaves the tiller and lends his weight.

It is a man's job. For even without the catch to increase its weight, a shark net, when wet, tips the beam at half a ton. And even when the sea is smooth as glass, there is always some underwater pressure to make the net heavier.

At last that part of the net which holds the shark is pulled to the surface. Then for daring, speed of hand, and sureness of foot, there is little to equal a trained shark fisher. The forward hand leans over and grasps the tail of the struggling monster. No matter what the shark's size, weight, and temper, that tail must be hitched. And when the shark boat is shipping green seas, and a savage 15-footer is venting his rage on the net, with the forward hand having only a tiny footrail to give him stance and grip, then the ordinary angler comes to a realization of the difference between fishing for sport and netting for sharks.

But to return to our shark: his head is tangled in the net; his tail securely noosed. While the forward hand is fixing the noose, the lad has swung out the derrick arm. The tail loop is linked up, the lad works the windlass, and shark and net are simultaneously hoisted into the air.

Follows another hazardous operation—extricating the shark from the net. The mesh is wound round and round and fastened about his gills, and quite possibly, too, his fins and tail are entangled. With infinite patience and the speed of long experience, the fishers pull the net clear—pull it clear from razor-edged teeth, thrashing tail and madly squirming body—until at last the shark is clear of the net and hanging by its tail.

SHARKS CAN TAKE A LOT OF PUNISHMENT

In each shark boat is an outsize in baseball bats, or at least what looks like a baseball bat, only it is rougher and very much heavier. There is also a revolver of large caliber. With one of these weapons an "anaesthetic" is administered to the captive. Either the baseball bat thuds with every ounce of the wielder's weight on the nose of the shark, the nose being the sharkish equivalent of the point of the human jaw, or the revolver does the job another way.

It would be natural to expect that such treatment would mean instant demise. But

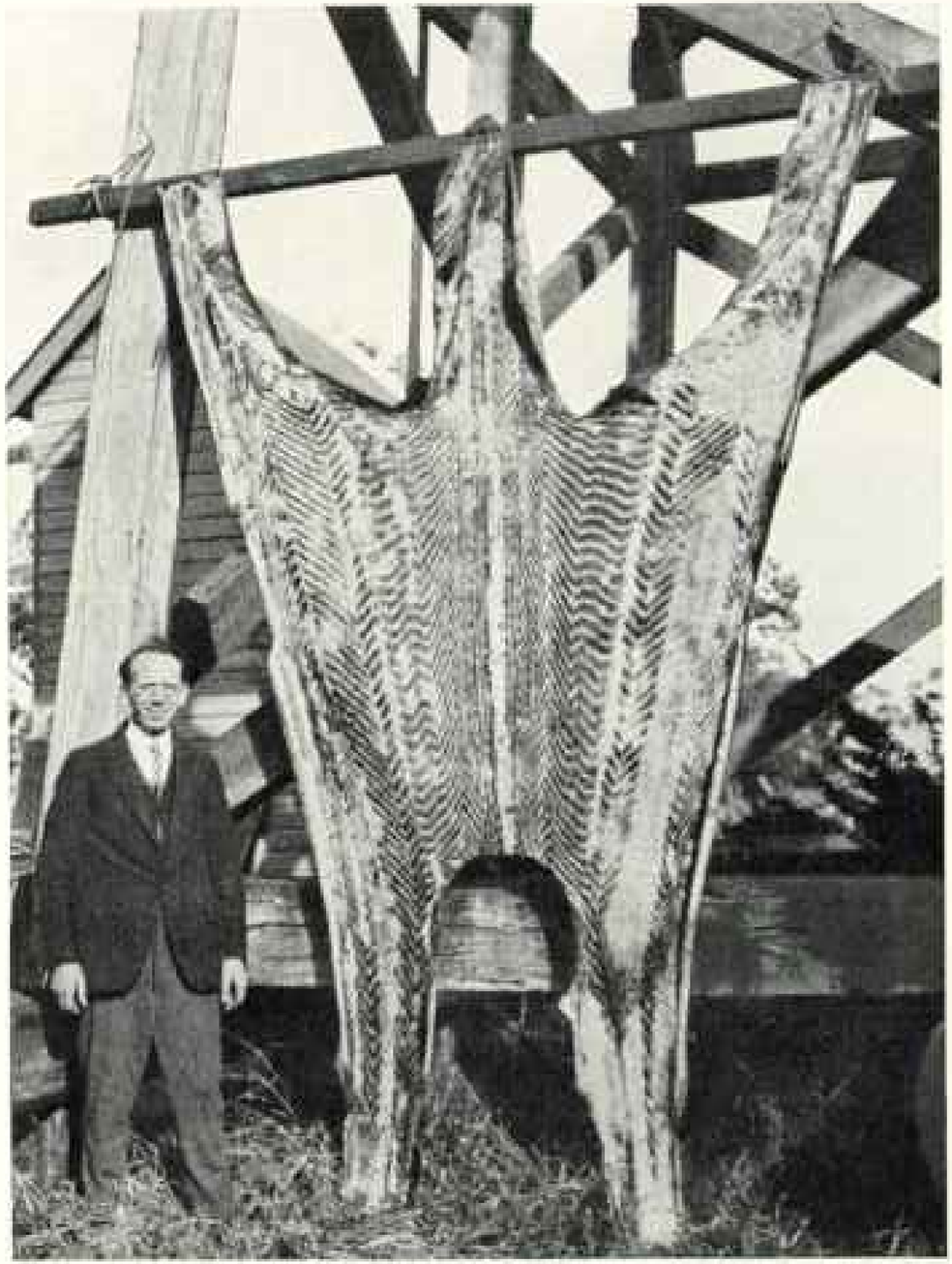
FISHING PROVED EXCELLENT IN THE WATERS OFF PORT STEPHENS HEADS

In the foreground is a mooring drum, marking the position of one end of a shark net (see illustration, page 371).

Photographs by Norman W. Caldwell

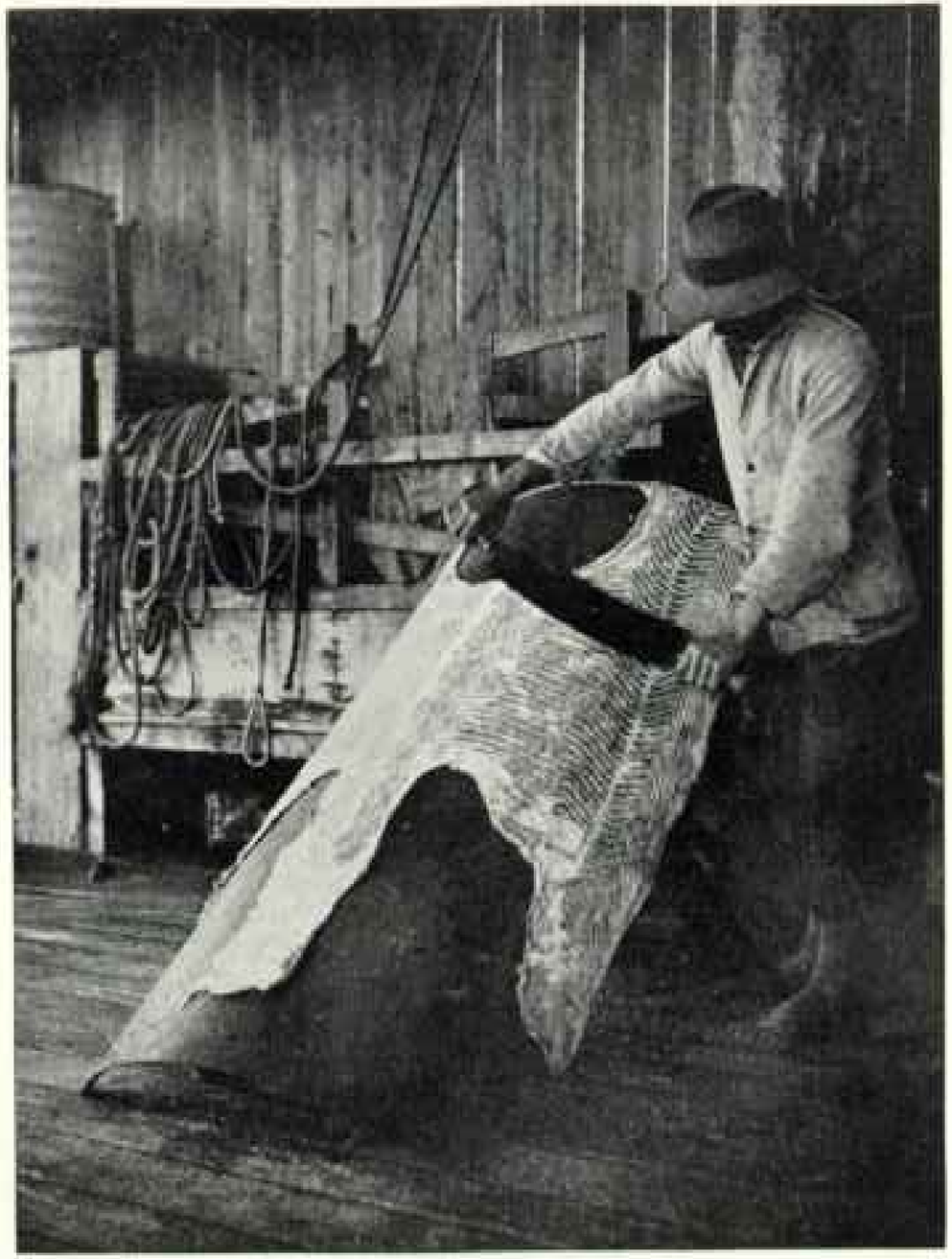
HEADQUARTERS OF THE SHARK FISHERS AT PINDIMAR

Under the roof in the foreground are the curing, drying, and packing departments, while jutting out from the jetty can be seen the shark dock, where the catch is skinned and the livers boiled down.



THE "SUIT" OF A 16-FOOT TIGER SHARK STRETCHED FOR DRYING

Sharkskin is extremely tough, some varieties having a tensile strength from six to ten times that of oxhide.



"BEAMING" A HIDE BEFORE THE CURING PROCESS

It is stretched over a convex board and scraped clean with a cleaverlike instrument (see text, page 375).

Photographs by Norman W. Caldwell

Photograph by Norman W. Caldwell

THE BUSINESS END OF A GRAY NURSE

In Australian waters this variety of shark seldom attains a length greater than 10 feet, but it makes up in meanness and general bad temper anything it may lack in size (see text, page 381).

the shark, like the snake, is not so easily disposed of. Temporarily out of action, at least, he is swung into the hold. To get him there from the water may take ten minutes or two hours, and then there is the next chap to be hauled aboard! With a big catch, say 50 sharks, it is a long and patience-testing job, since each and every one must be untangled from the net.

Mark especially the "untangled." For nets are costly things; and though, of course, it would be easier to cut them clear, what is cut must be mended again. Besides, your shark fisherman has his professional pride, just like any other disciple of Izaak Walton. To use a knife on line or net is "bad fishing." It just isn't done.

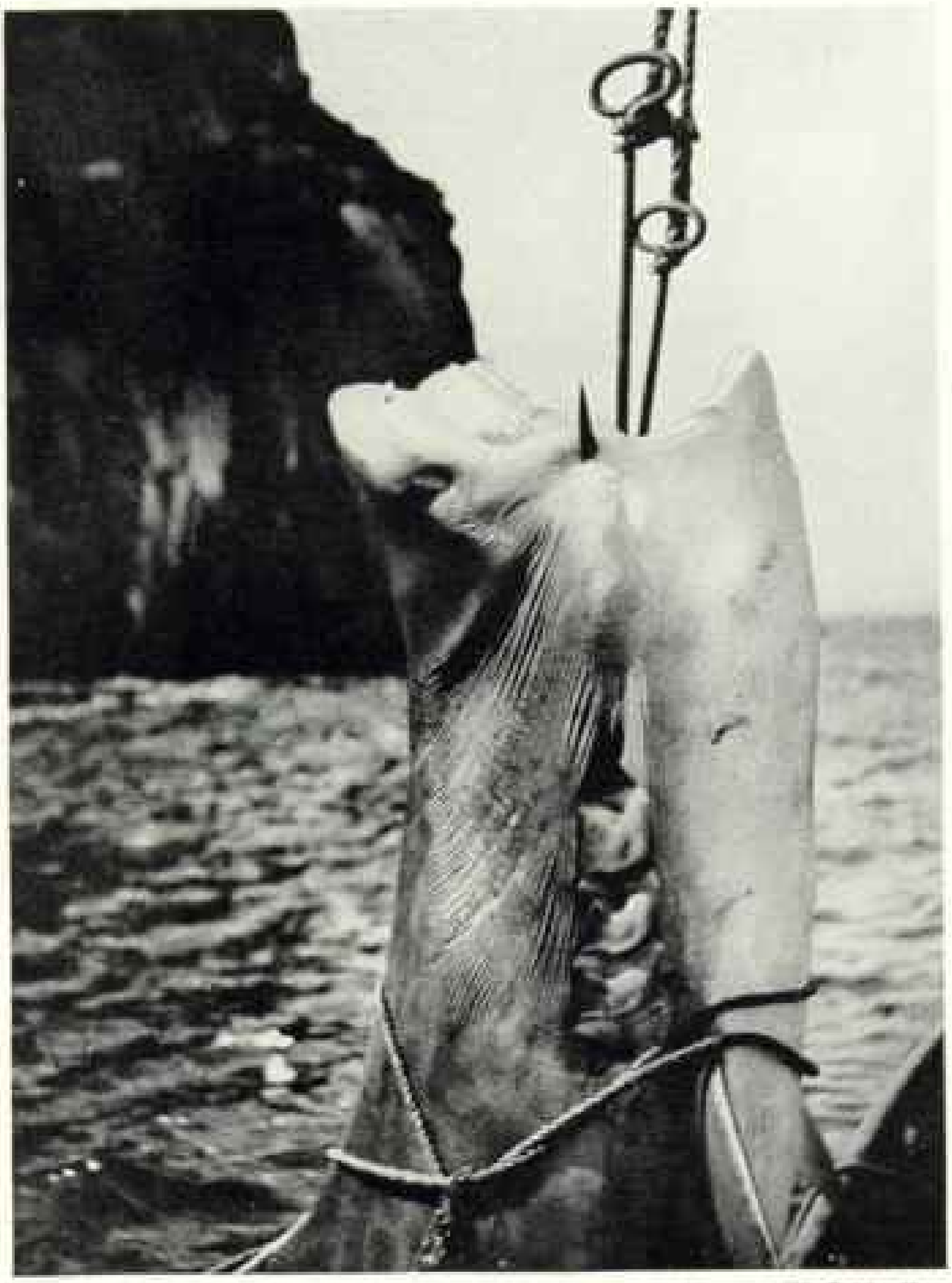
Hazardous is the actual landing of the catch; likewise the trip back is no pleasure jaunt. Of course, everything depends on the size and extent of the haul and the condition of the weather. But let your imagination picture for you a run of 25 miles, from Seal Rocks to the entrance of the Port, in the teeth of a howling "southerly buster," with three and a half tons of shark aboard and two nets each weighing half a ton. Picture the hatchcombings being washed away and 10- to 14-foot sharks swishing about the tiny deck! Picture a cargo like this on a 30-footer carrying green seas two feet deep on her deck and only a cockpit of a cabin to house the crew!

On one particular job, when all these conditions prevailed, the *Devil* was carrying too much and floating too low in the water. Skipper Frank Winser did his best, but eventually it was a case of lighten her load or founder. So the *Devil* was lightened. But even then she had to put about and run before the storm. However, boat and sharks eventually found their way home, as they always do. Some of the latter were still very much alive despite the buffeting, and ready for their final phase of commercialization.

On the dock Charlie Ping is waiting, and Charlie is rather an extraordinary person, even for an extraordinary industry. There are three different strains packed into that husky little frame — Australian aborigine, Jap, and Malay. He has queer greeny-gray eyes set in a most expressive

face. And when he dons his blood-stained apron, bares his muscular arms, and delicately tests the keenness of his big collection of knives, then the great fish is headed for a shark's equivalent of the Hereafter.

First, however, Charlie must have his hand-rolled smoke, an irregular bulgy affair that never leaves his mouth until it is the veriest wisp of a fag. Once this is alight, he proceeds to translate the shark into hard cash—to separate the wheat from the chaff, as it were.



Photograph by Norman W. Caldwell

A "BAD MAN" OF THE DEEP NEARS THE END OF HIS TETHER

A tiger shark being hauled aboard the *Devil* near a rocky shore. Some of the strands of net may be seen below his gills. The great hooks are not used to catch the fish, but merely to haul them aboard.

SOUTH SEA ISLANDERS DO NOT USE SHARKS' TEETH AS MONEY

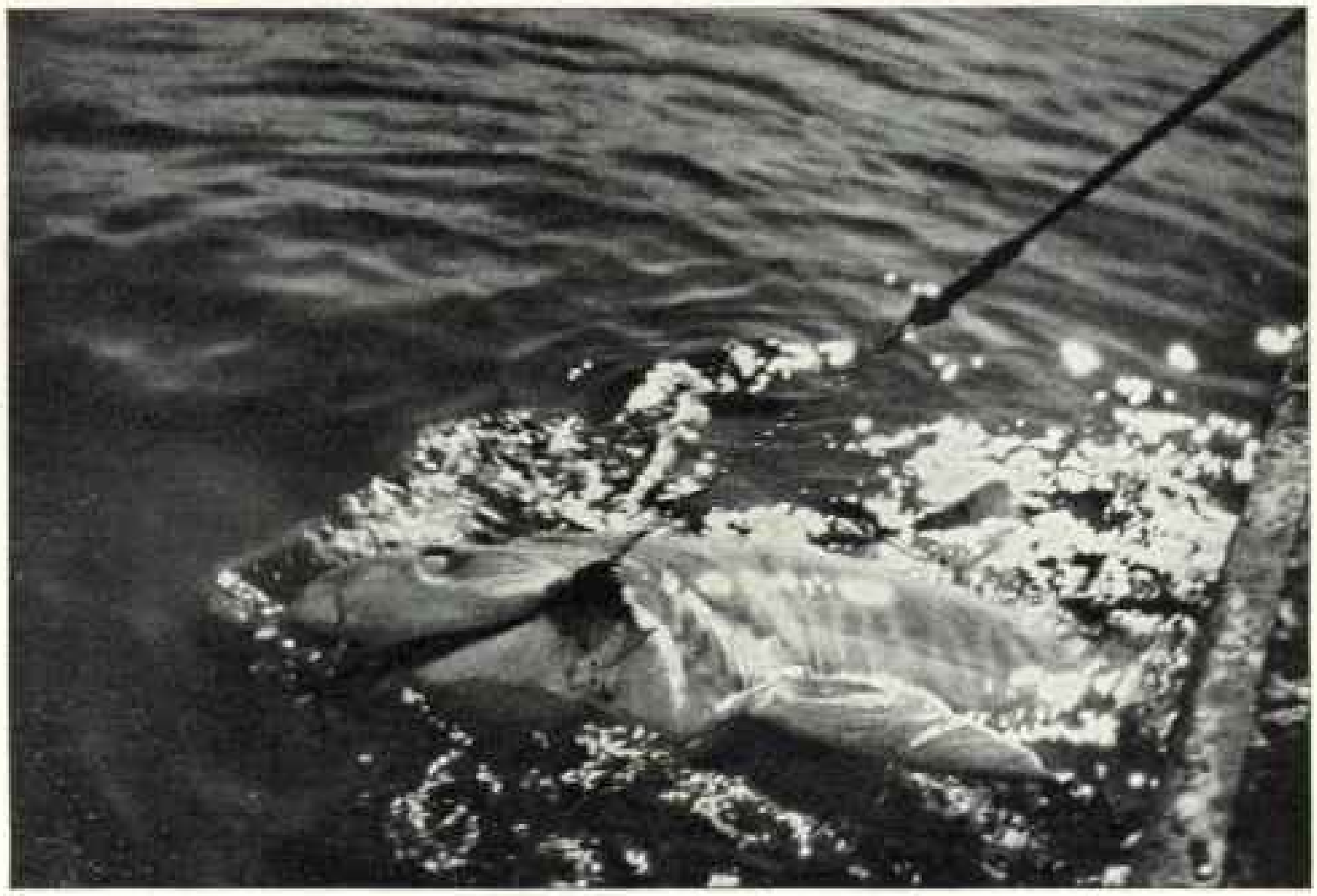
The salvaged portions, in order of value, are the hide, the liver, the fins, and the stomach bag. Contrary to prevailing opinion, the teeth are valueless. It is generally believed that sharks' teeth pass as currency in many of the South Sea Islands; but although teeth, ranging from the razor-edged fangs of the tiger to the ivory stilettos of the gray nurse, have been hawked throughout the islands, they have never found a market.

To revert to the commercialization. First the shark is killed. No stunning or near-killing this time. Charlie's most wicked-looking knife performs some hara-kiri-ish evolutions, and when they are completed the shark is dead, extremely dead. Next the carcass is washed and Charlie sets about cutting away the fins and begins skinning. This is a most delicate job, for one false cut and the value of the hide is materially lessened.

What makes the cutting so difficult is the toughness of the hide. It is rough and thick and stubborn, a veritable piscatorial coat of mail, and each cut plays havoc with the skinning knife. So much so, that after six incisions hone or oilstone must be brought into play.

However, in a few minutes the shark's clothes look like a cubist cross-word puzzle. Then it is tug and pull until the hide is off.

After shark and hide have parted company, the latter is "beamed"—the flesh is cleared away from the inner side. This is done by Ping. He stretches the hide over what looks like a big convex washing board, minus the "wrinkles," and scrapes away with a cleaverlike instrument (373).



Photograph by Norman W. Caldwell

FISHING FOR SHARKS WITH ROD AND LINE

Port Stephens is a favorite resort for game fishermen, and the waters thereabout afford them great sport with sharks, tunny, and kingfish. The hook has to be attached to the line with a chain, for nothing else could withstand the attacks of a tiger's terrible teeth.

Beaming completed, the hide is closely inspected. If any parts are faulty, they are cut away; and then it goes to the shed for its first coat of brine. A week later it is given another coat, and two weeks later a third. It is then ready for the tanner.

THE TANNER MUST RETAIN DISTINCTIVE MARKINGS

The tanner, as a matter of fact, is the man who has made shark fishing a feasible and profitable proposition. Until recent years, although it had been proved that sharkskin was among the most durable of leathers, it was not found possible to treat it commercially with any great degree of success.

But new methods have developed. It is now practicable so to soften the toughest hide that it may be put to practically every purpose for which the best bullock leather is used. It is also possible now to retain not only the markings that make sharkskin so distinctive, but also its remarkable qualities of durability.

At present, the most important articles manufactured from sharkskin are footwear, handbags, attaché cases, and luggage. The hide of the carpet shark, with its distinctively mottled shagreen, is used for exclusive feminine footwear and pocketbooks. This particular hide realizes up to 15 shillings a square foot in good markets.

Once you have seen sharks' liver you can understand why the shark is such a bad-tempered fellow. He is probably the liver champion of the world—that is, in point of size. Seemingly he specializes in big livers, for they put his other organs to shame. Pindimar's record in this respect is that of a 15-foot tiger who had a liver 13 feet long weighing 200 pounds. And other sharks are proportionately equipped.

Once Charlie Ping has operated, this dreadful-looking organ soon loses its entity, or whatever is the anatomical equivalent. It is dumped into a big container and cooked. Heat breaks down the oil cells and the resulting product is shark-liver oil, the nearest blood relation to cod-liver oil. If anything, it smells worse, but physicians say that its medicinal qualities are the same. The liver referred to, in its liquid medicinal state, yielded sixteen gallons.

Photograph by Norman W. Caldwell

THE SKINNER CASTS AN APPRAISING EYE ON THE CATCH

The bulky 16-foot tiger shark being hoisted onto the dock will soon lose his skin, liver, and fins at the expert hands of Charlie Ping (see text, page 374).

Photograph from Norman Ellison

A WHITE SHARK THAT WILL NEVER ATTACK BATHERS AGAIN

He has succeeded in thoroughly entangling himself in one of the Pindimar fisher's nets. The white shark is one of the man-eating varieties.

A visit to Pindimar convinces one that, as an indiscriminate eater, the shark outshines even the ostrich.

THERE IS NOTHING SQUEAMISH ABOUT A SHARK'S APPETITE

Pindimar fisher folk will tell you that a shark stops at absolutely nothing; he will eat anything that he can get his hideous mouth around—fish, tins, bags, barbed wire—in short, any refuse that comes his way. On not a few occasions he has tried to sample the boats of the lobster potters. But they, knowing something of his dental equipment, have judged discretion the better part of valor and taken their departure hurriedly.

Post-mortems show that the shark's favorite diet is porpoise, or dolphin. This explodes another popular belief, that a shark will not touch porpoise. But judging by the thousands of deceased porpoises, mangled and most thoroughly ill-treated, that have seen the light of day for the last time on Pindimar's dock, sharks not only do touch porpoises, but they touch them with their whole razor-like armament!

QUEER CATCHES FREQUENTLY CONFOUND THE FISHERS

All kinds of weird and unexpected catches are made in the shark nets. In point of size, the most unlooked-for visitor was a 40-foot whale. Luckily for the crew of the *Devil*, they saw him first. The net was set in comparatively shallow water at that time, and the water was clear. Before a start was made to haul in, the monster, apparently asleep, was seen stretched along the net. It takes a lot to scare shark fishers, but they were frightened that day. They knew the only way of saving at least some of their net was to scare that whale off. This they did by giving him a couple of rounds from the Colt. That the *Devil* is still afloat to-day is due to the fact that when the whale heard the call of this rather unusual alarm clock, he did not head straight to the surface, but came up at a slant, and then did his "yawning" over water. Before it beat a precipitate retreat, however, the *Devil* was nearly swamped.

Another catch that came under the heading of "unexpected" was a 15-foot leopard seal and what he did not do to that net! As seals are protected in these waters, he was speedily released.

Often big fish are caught in the net—snapper, huge jewfish, salmon—but rarely do they reach the surface intact. Apparently sharks appreciate hors d'oeuvre.

Then one day two turtles, each of which weighed not less than 200 pounds, heeded the "stop!" sign of the shark net and never more flapped their way through marine or beach traffic. "No, we did not eat 'em," said Skipper Winser. "I've heard of turtle soup, but I didn't like the look of the green flesh. Ugh! . . ." And he shook his head as if at an unpleasant memory. Imagine a chap who can't discover anything offensive in shark smells; who stoutly declares that shark-fin soup is fine, and who likes his fried shark steak, saying "Ugh!" to turtle soup and cutlets!

Photograph by Norman W. Caldwell

A DREADED FOE OF THE SHARK FISHERS

When the nets become too heavily encumbered with kelp, they have to be abandoned. One net, raised by herculean effort, contained over four tons of this marine growth.

Anything entangled in the net is fair game for the sea wolf who is still at large. Judging by the underwater treatment meted out to hundreds of sharks, there are no Marquis of Queensberry rules on the ocean floor.

Once a shark is at a disadvantage, and the net certainly provides this disability, others quickly declare war. Many a shark has been hauled out of the net tailless, headless, or with huge pieces of body missing. Often the free attack the netted just as the latter are hauled out of the water, and at such times one can best record the sulphuric richness of a shark fisherman's vocabulary.

Apropos of marine meals, there is a little story that verges on an epic of pluck. One night, outside Port Stephens, a Port Jackson shark was caught. Port Jacksons are probably the smallest and certainly the least offensive of any shark in Australian waters. They seldom exceed four feet in length and live on shellfish. To masticate this food, instead of teeth or fangs the Port Jackson has bony plates running across his mouth.

The hero of this story, a three-footer, was caught in the net. The shark fishermen visualized what happened. While he

Photograph by Harry Tonier

THEY FEEL SAFE WITH A HEAVY METAL MESH BETWEEN THEM AND THE SHARKS
(SEE, ALSO, TEXT, PAGES 369, 384, AND ILLUSTRATION, PAGE 382)

was struggling to free himself, along came a 12-foot tiger, who should not have been hungry, since it later developed he already had two Port Jacksons inside! But to a tiger, a Port Jackson is a savory titbit, second only to porpoise; so this one lost no time in attacking. As he swooped out of the green waters, the little Port Jackson saw him coming, and shrank farther into the net. Apparently this was an educated tiger who knew nets and the danger thereof, so as the Port Jackson sidestepped the tiger swerved away.

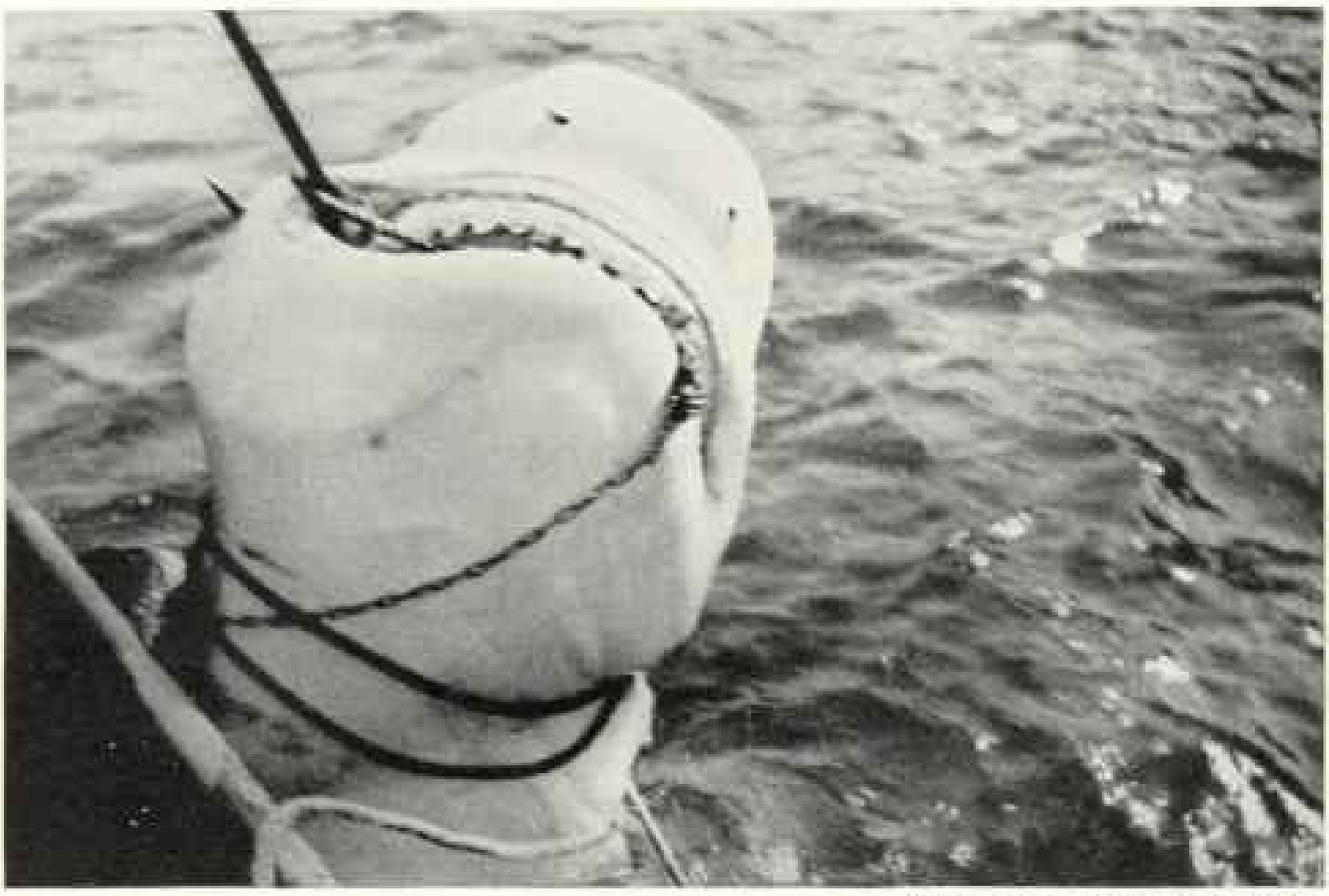
How long and how often attack and retreat went on, no one knows. But apparently the Port Jackson became desperate. Perhaps he realized that the net meant death, and certainly he knew that the tiger spelled the same fate. So, as the tiger attacked and swerved past again, the Port Jackson went into action. Just as the tiger's gills flashed by, the Port Jackson, still caught fast in the net, thrust out his head and fastened his bony plates on the soft flesh of the gills of his enemy—fastened and hung on.

In the morning out came the *Demon* to take aboard the catch, and the fishermen saw the extraordinary result of this duel. There was the Port Jackson, hopelessly enmeshed in the net, still hanging on to the tiger. The tiger was quite clear of the net, but the bulldog grip held him fast. As the captive and the captive-captor were hauled to the surface, the tiger made a last desperate effort to free himself. He thrashed and squirmed, but to no effect. Only when the noose was placed about the tiger's tail did the Port Jackson release his grip, to fall exhausted back into the net.

Yes, your guess was right. The tiger made the acquaintance of the baseball bat, the hold, the shark dock and Charlie Ping's knife, and the Port Jackson probably is still hunting shellfish. Never was shark put more tenderly back into the water, but told not to return.

Such occurrences as these, however, are rare; for, after all, your shark fisherman wants sharks. Underwater epics are all very well, but the main thing is to bring in a man-sized lot of fish. For the Pindimar sharkers are paid on results, at so much a ton.

When Frank Winser put down his first two nets at Seal Rocks, and, notwithstanding tremendous rents, caught four and a half tons, there was jubilation at the Pindi-



Photograph by Norman W. Caldwell

THIS TIGER SHARK WAS A FIGHTER

Before he could be hauled aboard he had received a heavy blow and a revolver bullet. Even then a gaff with nooses and hitches "fore and after" were necessary to quiet him. The eyelike openings in the front of the head are the shark's nostrils.

mar shark dock. One shark of this catch established a record. It was a tiger, 18 feet long, weighing about half a ton, and with a vicious mouth measuring 38 inches across.

One catch, made a few miles off Port Stephens, yielded 63 sharks, a total weight of more than eight tons.

SEAWEED SOMETIMES FOULS THE NETS

Sometimes when the net is tremendously heavy, the fishermen are not so pleased, for the weight is caused by kelp. Not so long ago two expensive nets had to be abandoned for this reason, since the crew could not shift them (page 379).

The real "bad old men" of the shark family are two scavengers—the blue pointer and the gray nurse. These chaps simply spoil for fight; they will tackle anything in fish, and when they make the acquaintance of the shark net, it is in for rough treatment. Often they get away. When they don't, and when the brawny arms on the *Demon* have pulled them to the surface, they snap at everything within reach, and are unusually hard to dispatch.

The tiger, too, is a fighter, but only when he is cornered. His fighting is usually done in his own backyard, so to speak. Once he is hauled to the surface he is just a limp, more or less inert mass. This chap, by the way, is misunderstood by most Australians. They think he is a terror, the marine counterpart of the land tiger, and named after him. That is not so in these waters. The tiger shark gets his name from the striped suit he wears when he is a youngster (page 384). But in his adult stage the tiger sports but one color, an ugly dark gray.

A DAVID AND GOLIATH EPISODE

On the eastern seaboard of Australia, the thrasher is probably the most famous of all sharks. He is the fellow who makes the whales wish they had never left home.

To use a very mixed metaphor, he knows that the Achilles heel of the whale is its tongue, and, therefore, against this he directs his attack. It must be most annoying to have a fast-moving, fearless fish making slashing attacks on one's tongue. At any rate, it makes the whale very, very

Photograph by Harry Turner

WORKING ON THE SHARK-PROOF FENCE AT COOGEE, POPULAR SYDNEY BATHING RESORT

A heavy toll of life has been taken among Australian bathers by sharks, and drastic protective measures have become necessary at the more crowded beaches. Man-eaters have been found in the first line of breakers (see text, page 384).

Photograph by Harry Turner

SHARK-PROOF FENCES BOOMED BUSINESS ON THE BEACHES

Part of the beach crowd of 50,000 on the first day the fence was installed at Coogee (see, also, illustration, opposite page). So successful has the net proved and so vastly has it increased the number of bathers that other popular beaches are being similarly equipped.

Photograph by Norman W. Caldwell

A LARGE FAMILY THAT HAD A BRIEF EXISTENCE

Some of the 42 young which were found in a 13-foot tiger shark after it had been "operated on" at Pindimar. No one seemed to want to make pets of the babies and they met the same fate as their mother. The body stripes which give the species its name disappear with maturity.

cross. He flails at the shark, generally losing his temper completely, and usually his tongue, as well. For this reason the thrasher is greatly esteemed by whalers (folk who chase whales, this time). The David versus Goliath affair usually creates a commotion. Once the lookout sights this upheaval, the whaling crew knows there is spoil about.

To see a thrasher spring out of water is to marvel at his extraordinary speed and flashing acceleration, for half his length is taken up by tail. And, as it appears when tail and shark are together on the shark dock, a badly fitting tail it is. But you can take it for granted that the thrasher has perfect control over both his steering gear and his throttle.

But after all, the public is most interested in sharks. Not so much as a commercial proposition, as so many boots or shoes or bags, but as a deadly menace on the bathing beaches (see, also, illustrations, pages 380, 382, 383).

For some years, no season has passed without at least two persons being fatally attacked by sharks on the New South Wales coast. Sydney's beaches, in particular, come in for more than a fair share of this dreaded attention. In one three-week period alone, three men were fatally mauled by these sea wolves.

An idea of the seriousness of the menace is furnished by the fact that in all three cases the victims were taken in not more than four feet of water.

A day after the last attack at Bondi, one of Sydney's most popular beaches, Marine Industries, Ltd., sent the *Devil* down to attempt to convince Sydney sea bathers that sharks abounded in the surf. They made only one haul and netted 29 sharks! Most of these were man-eaters, and a fact which gave the bathers

AWAITING THE SKINNER'S KNIFE

This haul weighed more than three tons, but its value was lessened because it did not contain any carpet or wobbegong sharks. Because of their fancy patterns the skins of these species are much prized by users of sharkskin leather (see, also, text, pages 369, 376).

Photographs by Norman W. Caldwell

ALL CLEAR, SKIPPER!

The catch cleared and stowed in the hold, the net is stacked forward ready for relaying. Ground anchors and marking drums can be seen.

Photograph from U. S. Bureau of Standards

ARTICLES MADE FROM SHARKSKIN LEATHER WHICH SHOW NO APPRECIABLE WEAR AFTER A YEAR IN SERVICE

something very serious to think about was that the four biggest sharks, including a bloated 14-foot tiger, were caught in the first line of breakers!

Thousands of times during this period the warning bell has called bathers out of the water, and on scores of occasions the retreat has been just in time. The sharks sighted were there for no good purpose.

Experts say that sharks abound in the waters of eastern Australia in almost inexhaustible numbers. However, commercial fishermen have already cleared up the waters around Port Stephens, and with the *Devil* and the *Demon* reinforced by bigger boats and the scope of operations extended, three-quarters of a million surf bathers in New South Wales may go into the breakers with not only greater enthusiasm but an added sense of security, and Australia's unique industry will pass into the commonplace.

NATIONAL GEOGRAPHIC SOCIETY

GEOGRAPHIC ADMINISTRATION BUILDINGS

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ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

TO carry out the purposes for which it was founded forty-four years ago the National Geographic Society publishes this Magazine monthly. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole, and contributed $50,000 to Admiral Byrd's Antarctic Expedition.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society's notable expeditions to New Mexico have pushed back the historic horizons of the Southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region The Society's researches have solved secrets that have puzzled historians for three hundred years. The Society is sponsoring an ornithological survey of Venezuela.

TO further the study of solar radiation in relation to long range weather forecastings, The Society has appropriated $65,000 to enable the Smithsonian Institution to establish a station for six years on Mt. Brukkaros, in South West Africa.

Now the WATCH *of* RAILROAD ACCURACY TRAVELS *the* BUSIEST SKYWAYS

How Hamilton Watch helps Ludington Air Lines keep 31 schedules per day on time

THE Ludington Air Lines, operating between New York and Washington, have carried over 100,000 passengers in a period of 18 months. With 31 schedules to make *on time* every day—Ludington must have accurate timekeeping.

Ludington's senior pilot, George Pomeroy (at extreme right in picture) carries a Hamilton Watch.

*

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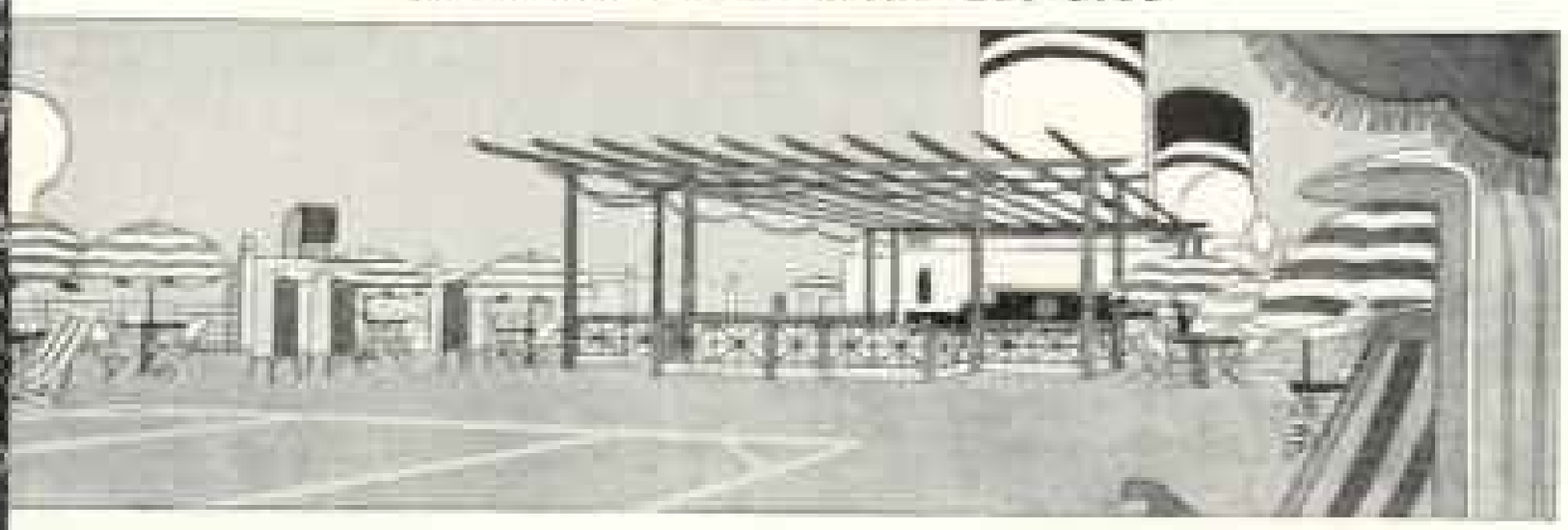
JANUARY 14—MAY 23, 1933



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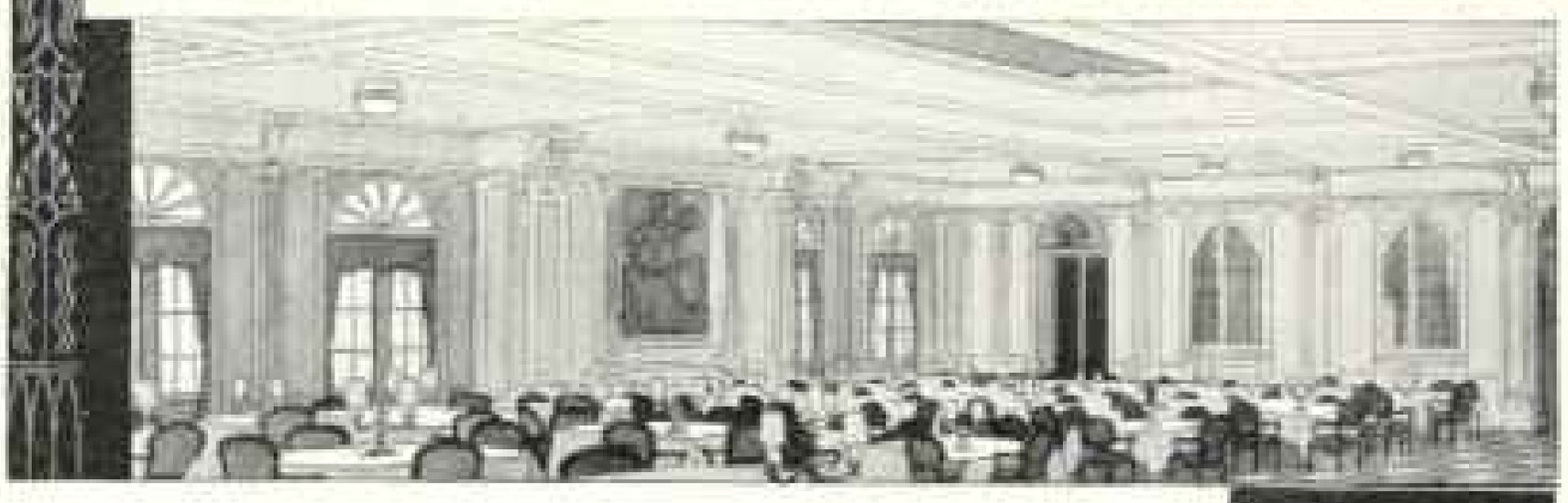

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The Old Singin' Master and his singers—mellow old hymns and ballads the way you like them. Tune in every Sunday night at 10:15, Eastern Daylight Saving Time on the N. B. C. (WJZ) Blue Network, coast to coast.

Ray Perkins, Barbasoloist with Peter Van Steeden's Barbasolians, WEAF—N.B.C. Red Network, Tuesdays and Thursdays, 7:30 P. M. Eastern Daylight Saving Time.

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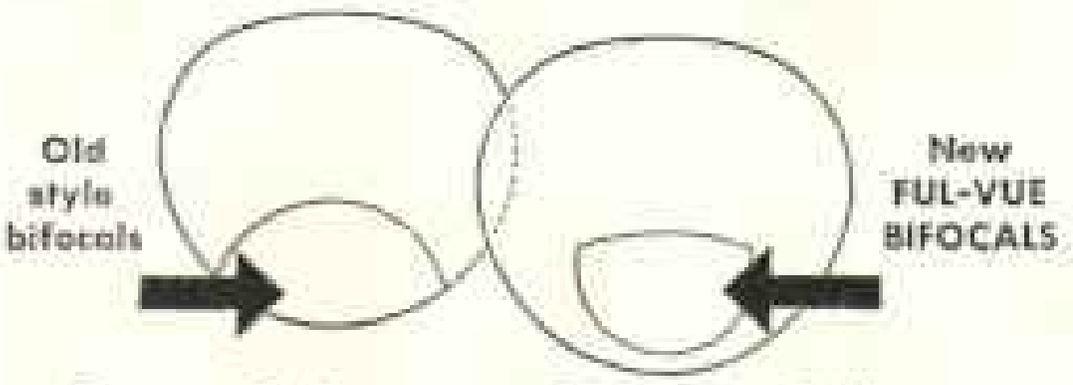
You can identify the perfected Ful-Vue Bifocal by the shape of the small inset lens, shown below.



Because of the greater width at top of this near vision segment, the eye finds the fullest width of reading vision instantly, without head movement.

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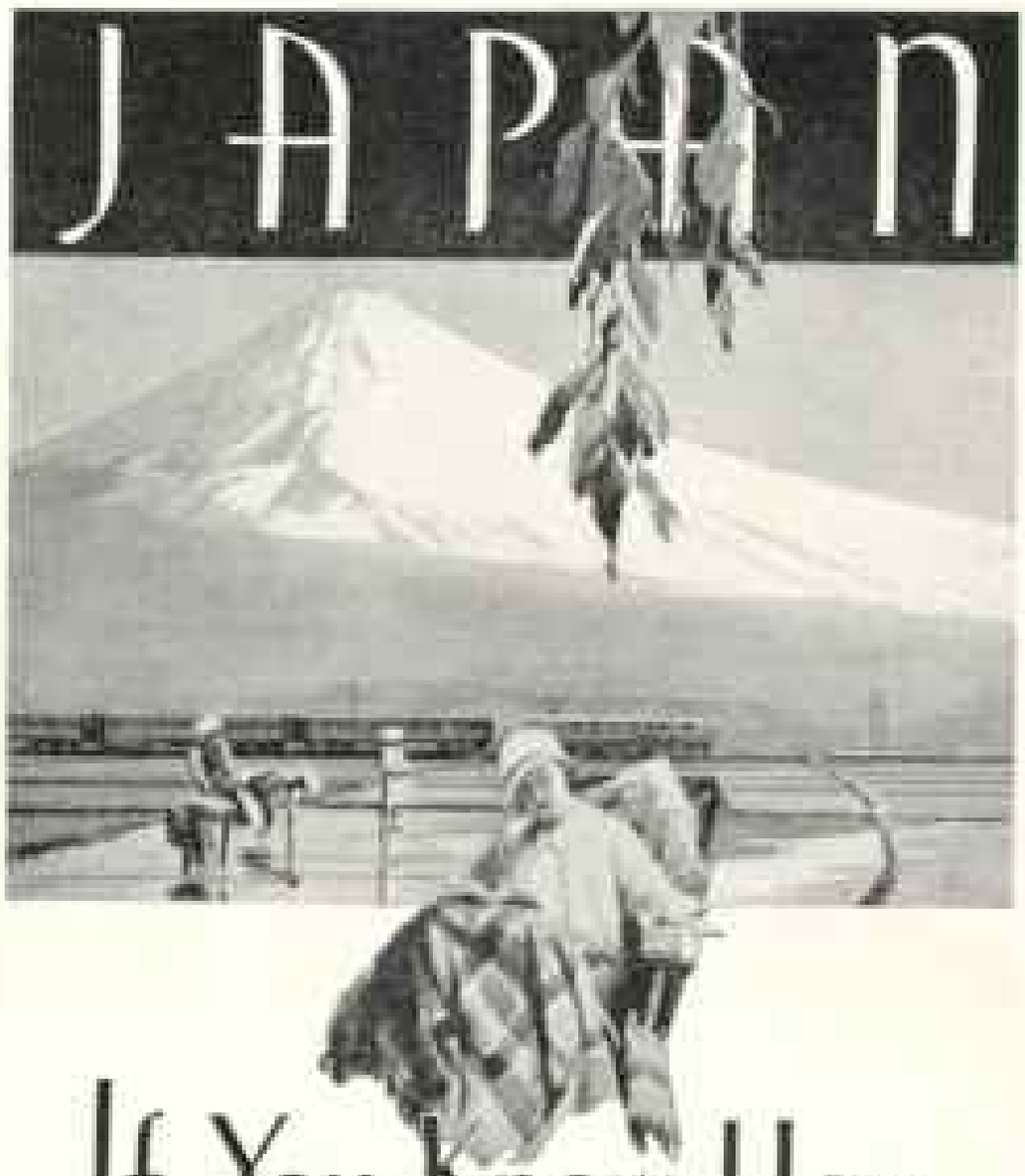

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JAPAN
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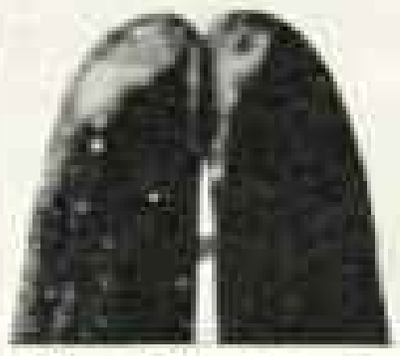
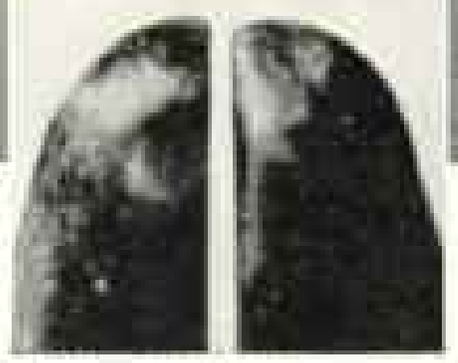
Waterman's

shows what happens to Pen Points after a 38-mile Writing Test

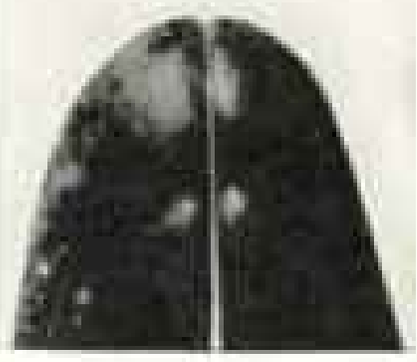


Other Make No. 1— *Both point tips worn flat. Ink channel obstructed by metal.*

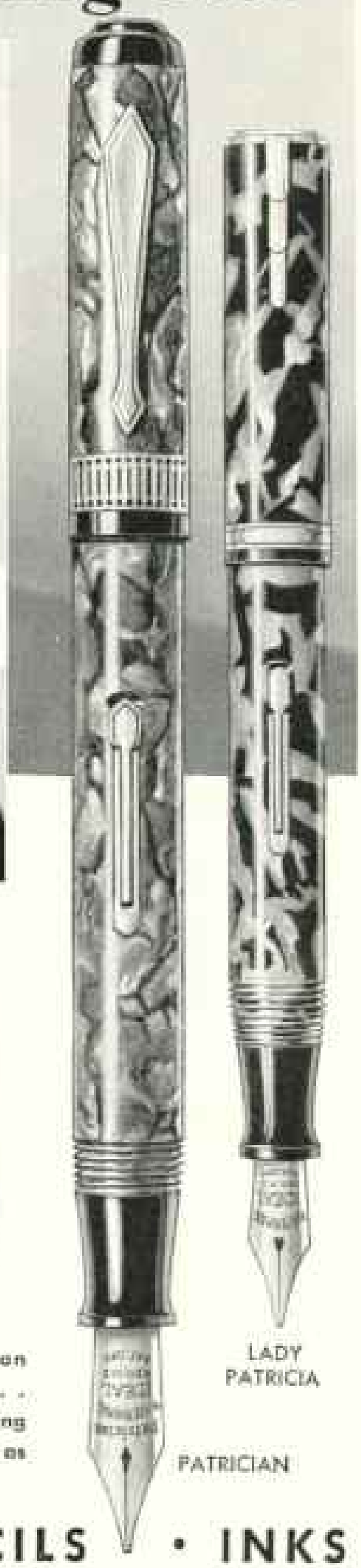
Other Make No. 2— *Right hand point worn shorter than left. Tip roughened.*



Other Make No. 3— *Ridges worn into entire writing surface. Tips flat and pitted.*



Waterman's—*Perfect roundness and smoothness unaffected by 38-mile test.*



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Even in ancient Rome the candidates for public office went around soliciting votes. This activity was denoted by the word *ambitio* "a going around" especially applied to candidates for office in Rome who went around to solicit votes. *Ambitio* was derived from *ambire* "to go about," which in turn was formed from *ambi*, in the sense of "about" and *ire* "to go." Since this activity indicated a desire for honor or power, the word *ambitio*, came to mean the desire for official honors. This word and its meaning were taken into French and then English as *ambition*, but its meaning later broadened to denote the earnest desire for achievement of any kind. There are thousands of such stories about the origins of English words in

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Now she enjoys the drink she loves

THERE are a lot of things you have to give up when you get to be a grandmother. But when you love good coffee, the way I do, you won't give it up till the last minute. Of course, I'd heard that caffeine wreaks greater harm when you get older, but it wasn't till I began losing half a night's sleep that I finally gave in. And I never missed anything so much.

But now I drink all the coffee I want, because I learned about Kellogg's Kaffee Hag Coffee. I've never felt better or slept better in my life. And the really big surprise to me is its wonderful flavor.

• • •

Kaffee Hag Coffee is guaranteed to be pure coffee, 97% free of caffeine and with the indigestible wax removed. You can drink it at any hour and feel safe from a sleepless night or overwrought nerves. Yet it brings you all of coffee's magic cheer and aroma.

Roasted by Kellogg in Battle Creek. Money refunded if it doesn't entirely satisfy you. Reduced in price. Quality guaranteed.

Get Readjusted

THE MEN who made the United States the richest country in the world did not go about wringing their hands and quaking in their boots. They worked—whether the going was easy or whether it was hard.

For nearly three years too many men, who themselves have had plenty to eat and to drink, good beds to sleep in and comfortable homes, have spent hours and hours predicting hard luck and disaster.

Last spring such men were saying that the United States appeared to be headed for bankruptcy. Since then the Government has begun to cut its expenses and increase its income. It is resolutely facing its difficulties. There is no reason for anyone to fear that the nation may fail in its obligations, or collapse.

The man who is saturated with gloom spreads it. When he loses his sane, clear-eyed viewpoint he may seek sympathy, but what he really needs is to be shaken out of an unhealthy frame of mind.

And the man who hoards not only robs his family but fails to do his share in promoting normal business and employment of workers. He aggravates the condition which he deplores.

Some men need jobs—need them badly. They must be helped. But more men need to get readjusted to conditions as they exist. These men may need to readjust their mode of living or their way of thinking.

Worries fester and grow in the dark. They shrivel and vanish in the light. There are times in every man's life—whether he be strong or weak, brave or cowardly—when he needs the counsel of someone who is unafraid. And there are many who know that our country has battled through difficult periods and has always emerged stronger than before.

Get readjusted.

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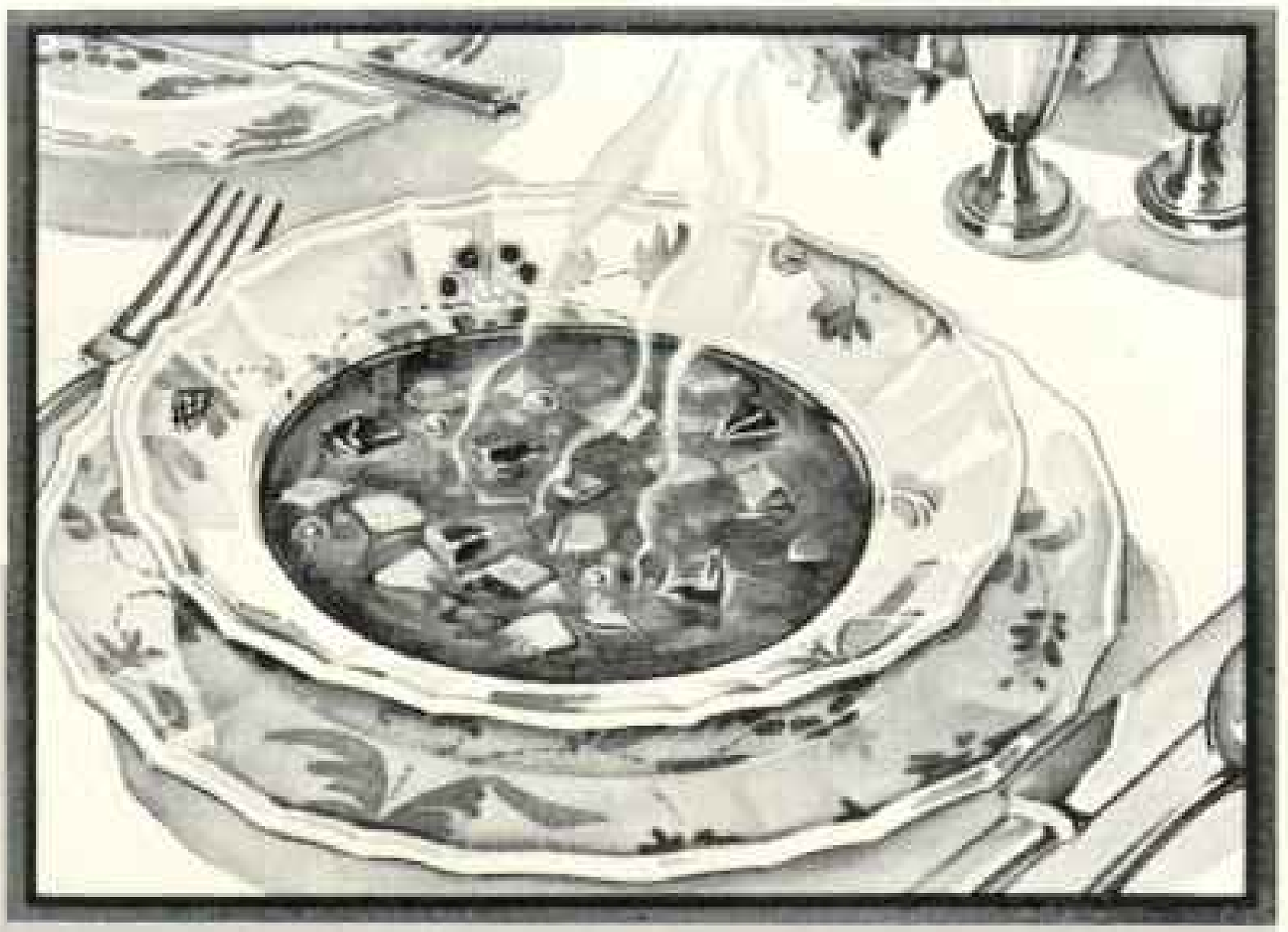

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A Message to the Membership of the National Geographic Society about the Distribution of Their Magazine

EACH month twenty mail cars loaded with cargoes of Geographics start their journeys from Washington. Over a million copies are delivered direct to members in the United States.

California leads the States in ratio of membership to population—1 member to every 57 inhabitants. On this same basis Ohio is first among the Central States, while New Jersey leads the Eastern States.

In New York State 137,000 copies are read; in Illinois, 65,000. Texas has 26,000 Geographic subscribers; Massachusetts, 55,000.

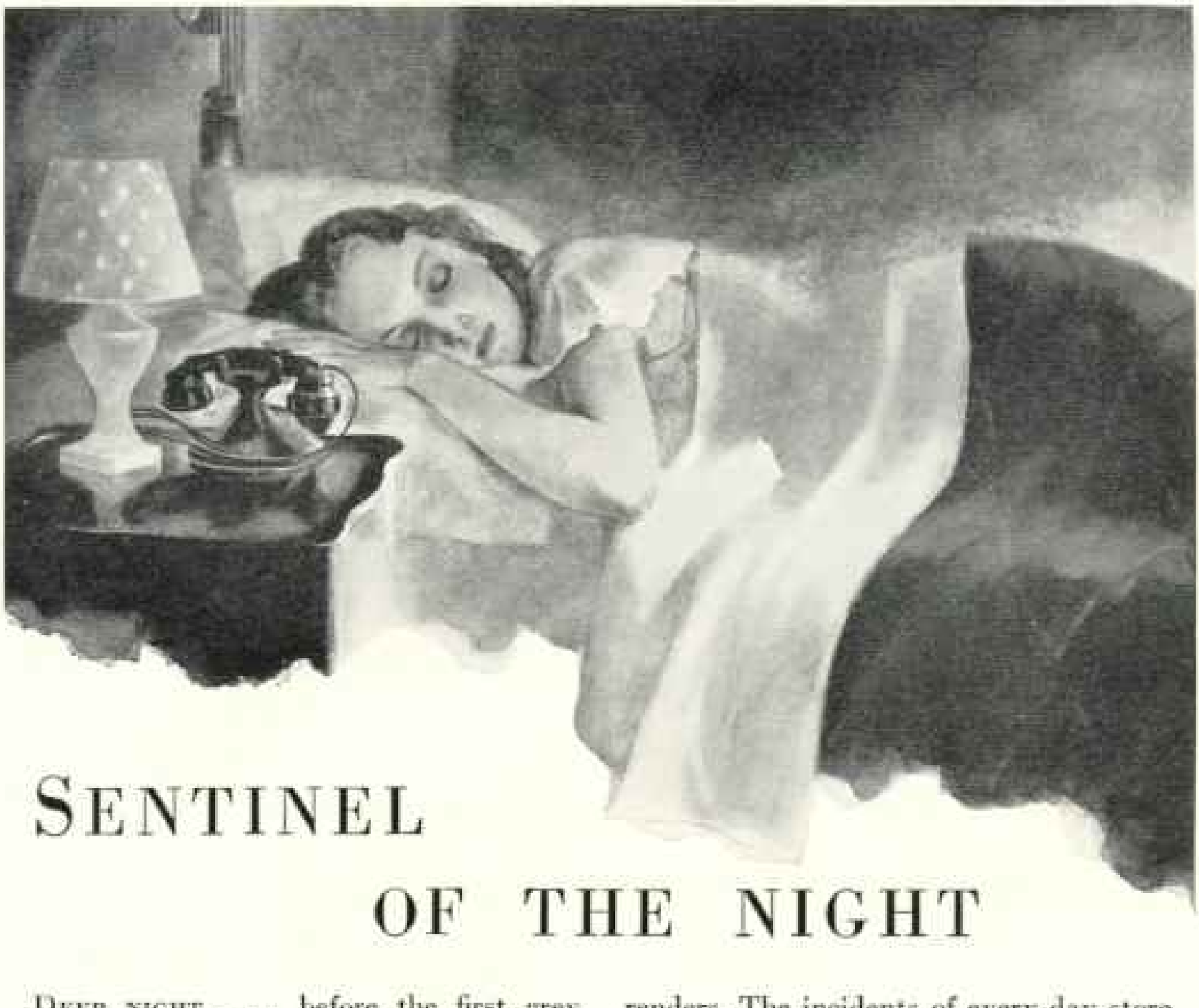
There are 8 Geographic families in Tuscumbia, Alabama; 904 in Scarsdale, New York; 1,003 in Bethlehem, Pennsylvania; 12,349 in Detroit, Michigan.

The Magazine quite naturally is concentrated most heavily in those areas and neighborhoods where incomes are highest and where standards of living are above the average. Wherever humanized geographic knowledge is a requisite in today's changing world The Geographic is welcomed.

Sincerely yours,

Geo. W. Hutchison

Associate Secretary



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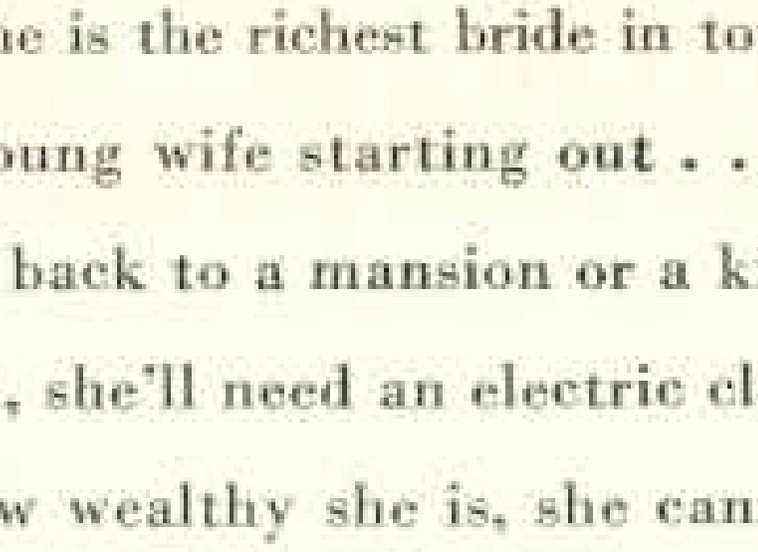

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