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GREAT BRITAIN ON PARADE

By MAYNARD OWEN WILLIAMS

AUTHOR OF "CARNIVAL DAYS ON THE RIVIERA," "TURKEY GOES TO SCHOOL," "SEEING 3,000 YEARS OF HISTORY IN FOUR HOURS," ETC., IN THE NATIONAL GEOGRAPHIC MAGAZINE

ENGLAND'S Silver Jubilee of 1935 is but a more elaborate form of the traditional pageantry which marks each changing year in Britain.

Attending Maharajas, more numerous, add sparkle; more Mayors, on both banks of the Thames, are presented to Their Majesties; floodlights, piercing the velvet night, transform historic buildings; more trees are planted and bird sanctuaries set aside; the famous Three Choirs of Hereford, Gloucester, and Worcester sing better because their 215th meeting comes in Jubilee Year; Army, Navy, and Air Force put more snap and precision into their evolutions before their King.

However, it is the same old England, putting on the same old spectacle—today's colorful link with the mighty past and the confident future.

A more unassuming people than our English cousins would be hard to find. Understatement is their style of humor, underemphasis the mark of their cordiality. But when they put on a pageant—to use the expression of one admiring American—it struts! Especially does Jubilee Year recall the "days of old when knights were bold and barons held their sway" over petulant King John.

THE STATE COACH SURVIVES

All British pageantry is a bright ornament, and the people like it. Only the threat of pneumonia excuses the King for going to Parliament in an automobile instead of in the ornate equipage which has borne four Kings and a Queen to their coronations. The State Coach was built when 30-year-old George Washington, back from the Indian Wars, was a gentleman planter of Mount Vernon and English vestryman. It is drawn by stallions harnessed in red morocco and gilt. It was painted by Cipriani, who decorated Somerset House, collaborated with the Adam brothers of Adelphi Terrace fame, and designed the Royal Academy diploma (pages 144, 150, 169).

Only after long training are the King's horses allowed to pull the four-ton carriage of pomp and circumstance from Palace to Parliament. Pageantry is a part of their equine education—they are exercised amid blaring bugles, fluttering flags, and beating drums.

When spring comes to London, pageantry is not far behind.

A month before, the south coast has retained the winter's health seekers and a generous sprinkling of visitors from "The Colonies." To watch the opening of the mail in a drawing room of Penzance or Torquay is like leafing the pages of an imperial atlas or a stamp album.

The season's northward passage from Kent and Sussex changes the country's outlook. Then the visiting expatriates move north, and the Cornish Riviera emerges from its plate-glass windbreaks. The daffodils have begun to show themselves in London's parks.

How many hundreds of springs have worked their magic around Ludgate Hill? Yet the story is never old.

Photograph from Wide World

THE KING LENDS A HELPING HAND TO A CHARMING PRINCESS

On the balcony of Buckingham Palace, following the wedding of the Duke of Kent and Princess Marina of Greece, His Majesty lifts up the four-year-old Princess Margaret Rose to see the packed crowds outside the palace gates (see illustration, page 140). His left epaulet and sleeve insignia appear to the right of the little Princess. Queen Mary steadies the child, while the Princess Royal and one of her sons smile down.

In St. James's Park the pelicans plume themselves for another round of admirers. Testy old Colonials, amid youngsters with the same straight backs, ride splendid horses along that mid-city strip of tanbark known as Rotten Row (151). Before St. Paul's and under the haughty noses of the Landseer Lions in Trafalgar Square children minister to the vernal voracity of the London pigeons.

In Whitehall, where the Horse Guards sit their coal-black mounts, warm red winter capes are removed to display white buckskin breeches. In front of the Old Admiralty, whence Nelson hurried off toward the Strait of Gibraltar and the battle commemorated by the name of Trafalgar Square, a flower seller thrusts out a sixpenny bunch of daffodils.

As if the bright lights around Leicester Square had helped coax them forth, early blossoms circle the base of a statue to England's immortal poet and playwright. Leaning on a pile of his works, his legs crossed more carelessly than a sculptor allows in the case of a general or a statesman, Shakespeare broods in the center of a theaterland whose craft he glorified.

A GIBRALTAR OF CONSTITUTIONAL GOVERNMENT

Another spot gilded by daffodils is the garden outside the Houses of Parliament, a site where monarchs ruled from Edward the Confessor to Henry VIII. Since the days of Bluff King Hal, the House of Commons has turned this Thames-side meeting place into the democratic heart of a far-flung Empire.

The World War Tommy sang to Piccadilly and Leicester Square, but the nerve center of the British Commonwealth is this fortress of constitutional government beside Britain's historic river.

Three centuries ago, under the Palace of Westminster, a tall fellow with auburn hair sat amid barrels of gunpowder. In a few hours King, Lords, and Commons were to meet in the hall overhead. A watch provided by Thomas Percy ticked all England closer to chaos.

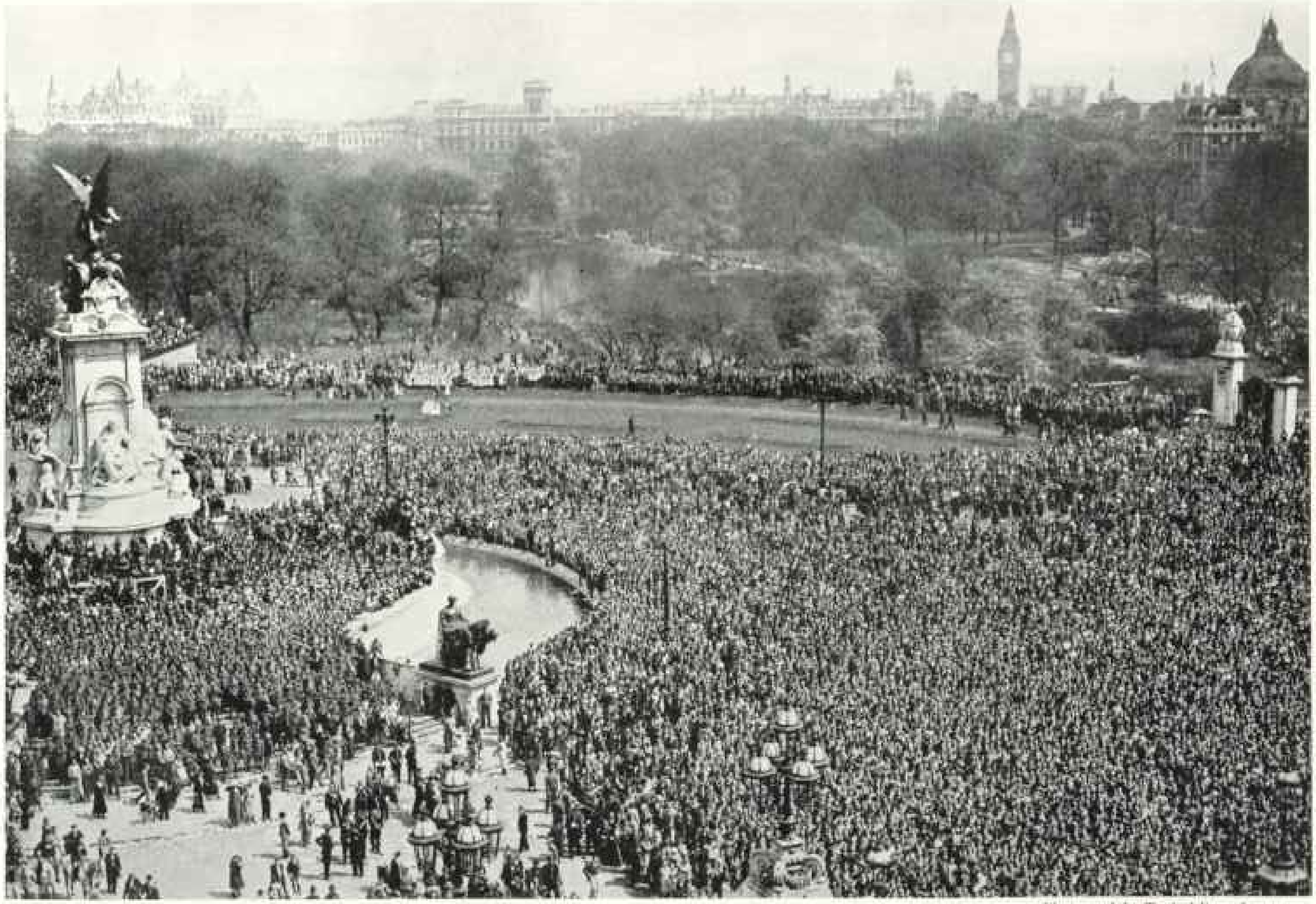
STEADY AS STATUES, THE HORSE GUARDS THRILL ENGLAND'S YOUTH

Giant Guardsmen add color to gray-stoned Whitehall, London's avenue of Government offices (page 152). Of the Guardsman the poet Henley wrote: "He wears his inches weightily, as he wears his old-world armour . . . a triumph of British blood and bone and beef and beer." Every hour, when the two mounted sentries are changed, a crowd gathers to see them come to life.

Photographs by Maynard Owen Williams

LONDON SCHOOL CHILDREN INSPECT THE DOCKS WHICH FEED THEM

England imports much of its foodstuffs, and vessels aggregating a million tons a week enter the Port of London. On excursions arranged by the Port of London Authority, thousands of English youngsters tour the busy harbor. The King George V Dock is used by vessels up to 30,000 tons.



Photograph by Topical Press Agency

THE PEOPLE, MASSED BEFORE BUCKINGHAM PALACE, JOIN IN THE KING'S THANKSGIVING, ON MAY 6, 1935

On the return of Their Majesties from the Silver Jubilee Service in St. Paul's, this huge throng gathered in the Mall near Queen Victoria Memorial (left).

The Gunpowder Plot was discovered. Intervening centuries have healed the grim memory of his execution, and Guy Fawkes Day has become a children's festival, with fireworks shooting from grotesque effigies to amuse the crowd. But even yet, before the King leaves Buckingham Palace to open Parliament, red-coated Beefeaters search the cellars beneath this mighty pile.

KITEFLYING ON HAMPSTEAD HEATH

On Hampstead Heath coveys of kites, their strings coiled on reels strong enough for tunny fishing, shake their tails across the heavens, while Punchinello wags his long-beaked face before those still too young to read *Punch*. On a hundred lakes and streams the swans stretch their long necks in begging. Down the hidden lanes of Devon, Kent, and Sussex cyclists and motorists push their explorations.

The wide expanse of Dartmoor, the coves of Cornwall, the gossamer haze of English lakes, the pilgrim places of art and architecture, of religion and literature, all have their devotees.

Yet even these alluring places, so fondly dreamed of around tea tables in paneled rooms, are hard put to keep admirers from rushing off to some display of uniforms, banners, horseflesh, or costumes—perhaps a lady of quality wearing the same gown and the same title as did a famous ancestor in the age of Queen Anne or Nell Gwyn.

At a pageant the King may sit his horse while colors that have faced enemy fire are dipped in salute, or the tale of Runnymede, built up by Roman and Dane, Plantagenet and Tudor, may be retold in one stirring afternoon beside the Thames.

DRAMA OF THE GRAND NATIONAL

In the Midlands, smoke and haze often thwart the sun, but spring arrives with the pounding of hoofs and the cries of the crowd at the Grand National Steeplechase, which determines the winners of the Irish Sweepstakes, now duplicated on Derby Day.

The course is 4¼ miles, with 30 jumps. Beyond any of them, all but the lead horse may land on his rivals' sky-turned hoofs instead of on billiard-cloth turf, or trample a bright-clad jockey. An Aintree steeplechaser will swerve in the middle of a leap to avoid a fallen rider, but when a dozen leapers cross Becher's Brook together, like a pony ballet pawing the footlights, there is danger aplenty and drama for all.

A few days after the race half the men who slap reins on workaday horseflesh will be clucking to their steeds in the name of the year's Grand National winner. Even on the remote Isles of Scilly I found that a fuzzy-faced donkey had suddenly been christened "Golden Miller."

After this dramatic attack, spring consolidates its hold. Small parties hie away to rustic spots beloved because they are known to few. How one island can contain so many favorite picnic sites is a mystery. "Gated roads," "private" signs, and turnstiles are designed not so much to keep out beauty seekers as to keep in an air of seclusion and quiet.

Everywhere citizens move out to greet the bursting bud, the new-born lamb, the soft spring breeze along white cliffs, or welcome warmth at the foot of red-rock sun traps near the sea.

THE RIVER OF "LIQUID HISTORY"

England can be grim. There is the cruel Tower where Anne Boleyn's slender throat was severed by a sword and those of Catherine Howard, Lady Jane Grey, and the Earl of Essex by an ax; but London River calls us. London Tower is a scene of the Nation's tragic deaths; the Thames of its birth and growth and power (see page 147). Who has not heard the aphorism: "The St. Lawrence is water; the Missouri is muddy water; the Thames is liquid history"?

Today a well-managed excursion cruises down London River under the auspices of the Port of London Authority. Shiploads of school children and adults are carried amid the busiest portions of London's 70-mile port. They are shown through the docks that feed and furnish a nation and link this tiny island to the Empire its restless mariners won, and to the world (139).

Leaflets are distributed which map the course, epitomize the river's history, and list the day's portion of a thousand ships a week converging from the far corners of the earth. Through loudspeakers, intelligent guides point out where Raleigh spread his cloak for Queen Elizabeth, where the timeball of a modest observatory marks the stride of our sphere, where Francis Drake, expecting punishment, was knighted on the *Golden Hind* (see page 171).

Once there were more boats upon the Thames than there were hackney coaches in the streets, and magistrates from the City were rowed to Westminster. Today many

Photograph from Wide World

AN INSTRUMENT OF WAR IS PUT TO FRIENDLY USE WHEN BRITAIN IS ON PARADE

So dense are crowds along the royal routes that periscopes are used, as here in the Mall during the procession of guests on the way to the wedding of the Duke of Kent and Princess Marina.

Photograph by Topical Press Agency

THIS RIVERINE ROUND-UP ON THE THAMES IS CALLED SWAN-UPPING

Only the liveried Vintners' and Dyers' Companies share with the King the right to keep swans on the Thames. In July the year's cygnets are caught and their bills are marked with two nicks for the Vintners, one for the Dyers, and none for those of the Seigneur of the Swans, the King.

Photograph by Topical Press Agency

KING GEORGE V, IN FIELD MARSHAL'S UNIFORM, ON HIS CHARGER "ANZAC"

His Majesty is on his way to present new standards to the Household Cavalry. The Royal Horse Guards, or "The Blues," who once also convoyed treasure, escorted prisoners, and burned forbidden tobacco crops, now act as bodyguard for the King.

travelers ignore the "most significant waterway in the world," extended by the Grand Union Canal, which makes the industrial Midlands shipping suburbs of the London docks.

Near the upper reaches of tidewater is Kew, a vast open-air nursery for plants and "a convalescent home for all sore souls." Through the Royal Botanic Gardens at Kew the rubber plantations of Malaya passed on their way from the native forests in Brazil. India's post offices could not sell Asiatic quinine to relieve the tropical fevers of countless millions until South America's cinchona tree was bequeathed to Ceylon and the Himalayas through the propagating gardens of Kew.

THE CYCLE OF FLOWER SHOWS

Kew is one of London's best-loved playgrounds, especially when young spring has ringed its little lake with fuzzy foliage and touched the widespread green with masses of gay blossoms. Bluebell, lilac, magnolia, and azalea, all have their devotees, but the rhododendron display especially interests us

Photograph by Topical Press Agency

FOUR KINGS AND A QUEEN HAVE RIDDEN TO THEIR CORONATION IN THIS ORNATE COACH

Designed in 1762 by Sir William Chambers, who also built the pagoda in Kew Gardens, and painted by Cipriani, decorator of ceilings in Somerset House and Buckingham Palace, the gilded State Coach still carries the King to open Parliament. In 1934, because of illness, King George used a motor car (see text, page 157, and illustrations, pages 150 and 169).

Photograph by Maynard Owen Williams

"NUMBER 534" SLIDES DOWN THE WAYS AT CLYDEBANK TO BECOME THE "QUEEN MARY"

In the presence of Their Majesties, at a moving ceremony attended by a vast multitude on both banks of the Clyde, the 1,018-foot Cunard-White Star liner was launched on September 26, 1934. At this point the river is little wider than the ship is long, so that 2,000 tons of drag chains were used to slacken its speed. The hull, which alone weighs 40,000 tons, and is held together by ten million rivets, moved from land to water in 54 seconds (page 175).

Photograph by Topical Press Agency

A ROYAL BARGE STILL FLOATS ON THE KING'S RIVER

To water-borne royalty, London was once a Venice, the Thames its Grand Canal. State barges and riverside water gates were commonplace. This resplendent craft was built by William III ten years before he gave his name to Middle Plantation, now Williamsburg, Virginia. Flying the Royal Standard and rowed by scarlet-coated oarsmen, it here bears members of the British royal family beneath its red canopy.

Photograph by Maynard Owen Williams

THE NATIONAL GEOGRAPHIC SOCIETY'S YUNNAN PROVINCE EXPEDITION ADDED TO THE MATCHLESS RHODODENDRON COLLECTIONS OF KEW GARDENS

Hundreds of varieties of rhododendrons, brought back from China by Dr. Joseph F. Rock, were sent as gifts to these world-famous botanic gardens.

A FORTRESS THAT CLOSES AT NIGHT AND A BRIDGE THAT OPENS

To this day the gates of the Tower of London, which has been a prison, a palace, a mint, a museum, and a jewel house, are locked every night and the King and the Lord Mayor know the daily password. The square White Tower within the walls was built by William the Conqueror to close the river approach. The Tower Bridge opens to allow shipping to enter the Upper Pool (right) and carries a footway, now little used, so high above the Thames that tall-masted steamers can pass beneath (see page 141).

because a National Geographic Society expedition to Yunnan bequeathed to Kew 493 varieties of this spectacular plant.

Kew allures its lovers out of doors throughout the year. But the formal opening of the London season is a flowery one—the famous Chelsea Show, held in the gardens of that hospital for red-coated veterans which tradition says Nell Gwyn wheedled out of Charles II. Only humble workmen and a privileged few see it before the annual inspection by the King and Queen.

Watching a duchess "talk shop" with a gardener is one of life's rare pleasures. Their Majesties do the same, but during that important hour only England's and Nature's Royalty are present.

From Bournemouth's Spring Show in mid-March until the chrysanthemum shows of November, England has a procession of floral displays.

It is the bright poster of the Royal Tournament at Olympia that gives Englishmen the feeling that summer is on its way. To stirring music and the swift drumming of hoofs the Royal Horse Guards, Royal Horse Artillery, and the Queen's Own Hussars gallop around the arena. Historical displays turn back the clock to birthdays of famous regiments.

The Royal Marines change from the feathered hats and yellow uniforms of 1664, through the red and white of Trafalgar, to sun helmet and "King's Badge," the Royal Marines of today.

The Black Watch, whose list of battle honors stirs martial music in the memory and makes one picture its far-flung flags at "Mangalore," "Waterloo," "Sevastopol," "Lucknow," the "Hindenburg Line," and "Megiddo," reenacts four phases of its history.

CLIMBING TO THE BALL ATOP ST. PAUL'S, STURDY VISITORS MAY VIEW MANY LONDONS SPRAWLING BELOW

Sixteen hundred years ago a 20-foot wall enclosed "The City." Sewer contractors today are allowed by law to charge extra if their excavations are blocked by the buried masonry. Areas presided over by Water and Drainage Boards, Post Office, and telephone service differ in extent, yet are called London.

Photograph by Central Press

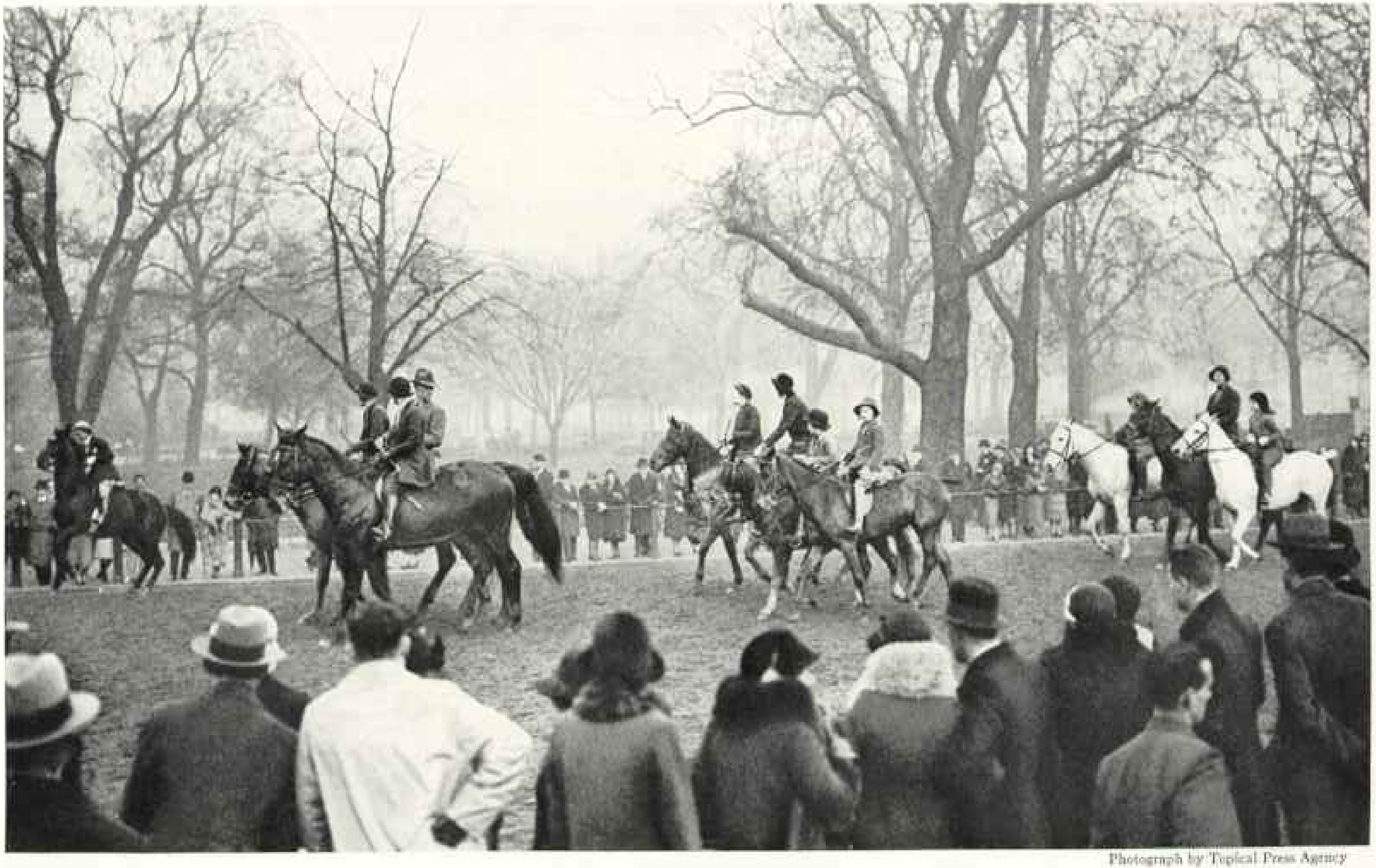
THOUSANDS PACK WHITEHALL FOR THE EMPIRE'S DAY OF REMEMBRANCE—NOVEMBER 11

On Armistice Day, amid impressive quiet, the King lays a wreath at the foot of the Cenotaph to England's Unknown Warrior, whose body rests in Westminster Abbey among the great well-known. These two minutes of silence, held in sunshine or in fog, bespeak a nation's gratitude.

Photograph by Topical Press Agency

COLORS ARE DIPPED AS EIGHT SPIRITED BAYS DRAW HIS MAJESTY THE KING TO PARLIAMENT

Escorted by the Royal Horse Guards, the ornate State Coach approaches the Royal Entrance at the base of Victoria Tower, while far away in Hyde Park artillery booms the Royal Salute of 21 guns. From his pedestal beyond, Oliver Cromwell, who displaced royalty, looks down on the perfect pageantry of this State Opening in 1932 (see illustration, page 144, and text, page 137).



Photograph by Topical Press Agency

A BRIGHT DECEMBER DAY BRINGS MANY RIDERS TO ROTTEN ROW

When bare branches slash the mist in Hyde Park, a bit of sun on a Sunday morning brings out the riders to this mid-city bridle path. The jingle of harness blends with the honk of motors, and muffled hoofs beat their broken rhythm against the rumble of rolling tires beyond Albert Gate. The King rides here on occasion.

Formed in the Highlands and given a special tartan, since its members came from different clans, the "Gallant Forty-twa" is the oldest of Highland regiments, and in its bonnets wears the Red Hackle because the Black Watch regained an enemy position which its former wearers, the Dragoons, had lost.

As they march through the arena at Olympia, their bagpipes sing the story of their progress down the years. The "Black Highland Laddie" carries one back before the American Revolution, "My Love is Like a Red, Red Rose" dates from the Egyptian wars half a century ago, and "Keep the Home Fires Burning" needs no dating among those who remember "Over There." Pipes and drums play other tunes to stir Scottish blood—"The Banks of Allan Water," "The Hills o' Perth," "Highland Harry," and "The Kilt Is My Delight."

Navy and Marine teams race each other in breaking field guns into pieces, swinging them across an imaginary river, and bringing them home in good order; and members of the Army Physical Training Staff give a splendid display of agility in the great hall where trim cavalry officers will soon take their fine horses over the hurdles during the International Horse Show.

THE GUARD MOUNT

London's daily pageantry centers in two giant Guardsmen, mounted on statuelike horses, about halfway between Trafalgar Square and the Cenotaph.

Every hour the two human statues come to life and give place to two others, and at 11 every morning guard mount is held in the courtyard of the Horse Guards building (p. 139). An even more colorful display, if the King is in residence, takes place every morning in front of Buckingham Palace.

"Trooping the Colour," an elaborate extension of the daily guard mount, is the birthday tribute paid by the Household Brigade to its Colonel-in-Chief, George V, by the Grace of God, of Great Britain, Ireland and the British Dominions Beyond the Seas King, Defender of the Faith, Emperor of India (see page 170).

When the King's Birthday, Speech Day at Eton, and the Derby all come within a week, June begins with a bang.

As the King's birthday fell on Sunday last year, Trooping the Colour was held on Monday, June 4, which is Founder's Day at Eton. Several days before the annual birthday party, when 1,800 officers and men parade their allegiance to their King, there was a dress rehearsal, complete in every detail except for the presence of the King, the Princes, and the foreign military attachés. The day of the rehearsal was fine, that of Trooping the Colour so gray and dreary that the brilliant costumes were softened and mellowed as in an old masterpiece.

Skirling pipes and the muffled beat of saddle drums carried by the towering piebald (p. 166) stood out amid the music of six massed bands and four fife and drum corps. Music, color, precision, and patriotism added to the majesty of the spectacle on Horse Guards Parade, and splendid soldiery slowly marched past in honor of their flag and their Sovereign. Women turned their vanity mirrors into periscopes, and even aliens joined in the prayer "God Save the King."

FOUNDER'S DAY AT ETON

The royal party had scarcely returned to Buckingham Palace before my cameras and I were off for Eton. On its playing fields "Waterloo was won," and on that stretch of the Thames many of England's finest oarsmen have been trained.

On Founder's Day parental pride centers in the pink-cheeked, silk-hatted students of Eton College, which will soon be 500 years old. Fathers in baggy tweeds and sons in toppers chat together ("Sorrell and Son" to the life), while mothers and sisters invade this man's world (see page 164).

Years ago, roaming through Eton, I came upon the name "Oates," carved on a bench. A thrill ran through me, for my mind pictured that night in the Antarctic when a "very gallant gentleman" plodded painfully into immortality through a blinding blizzard. "I am just going outside and may be some time," he said. Today on your GEOGRAPHIC map of Antarctica the words "Oates Land" symbolize that brave "bit of England," once a student at Eton.

Founder's Day is also Speech Day, with Sophocles, Racine, and our own Herman Melville sharing with Shakespeare, Dickens, and Lewis Carroll the honor of having their works declaimed.

Eton's distinctive "wall game," played in November, recalls that in this school of 1,000 pupils there are 70 "Collegers," or "Foundation Scholars," who win their place through scholarship, and form a group apart from the 930 or so "Oppidans" whose tuition and board are paid for by their parents.

 Photograph by Maynard Owen Williams

THE KING'S PRIVATE PIPER SURVEYS THE KING'S MEN

Pipe Major Henry Forsyth, wearing the Royal Stuart tartan, looks down on the Highland Gathering in Princess Royal Park, Braemar. For 45 years after the defeat of Bonnie Prince Charlie at Culloden Moor, the tartan of the Stuarts was proscribed and all Scotch Highland dress was forbidden in an effort to destroy the clan system. Now the clansmen proudly parade their bonnets and hose, flashy kilts and plaidies, *piob-mhòrs* (bagpipes) and *sgean-dhus* (daggers) before their Sovereign, who, while on vacation at Balmoral, becomes a true Scottish laird.

Photograph by Maynard Owen Williams

THE MARQUIS OF ABERDEEN WELCOMES QUEEN MARY TO THE 1934 BRAEMAR GATHERING ON HER ARRIVAL FROM BALMORAL

The Duke of York, in kilts, is assisting his daughter, Princess Elizabeth, from the royal coach, in which the Duchess of York and Princess Margaret Rose are still seated. So numerous are distinguished visitors that one writer calls them the "Clan New York, Clan Chicago, and Clan Washington."

TWO MUST HOIST FOR ONE TO TOSS

When the caber is upright, the competing Samson picks it up, balances it during a short run, then heaves it end-over-end for a record. Tossing the caber has long been the most distinctive of Highland sports.

Photographs by Maynard Owen Williams

TO STEADY HIMSELF, HE SPIKES HIS FEET TO THE EARTH

When throwing the hammer, this sturdy Scot whirls it around his head by the wooden handle, then hurls it as far as he can. He does not spin on his feet, as do college boys just before they release the wire-cabled hammer.

Photograph by Maynard Owen Williams

IN THE HEART OF THE HIGHLANDS, LOYAL SCOTTISH PIPES SURROUND THE ROYAL STANDARD

The personal flag of the House of Windsor, indicating the Queen's presence at the Braemar Gathering, is paraded on the spot where, 219 years before, Scottish rebels proclaimed the Stuart Pretender, James VIII, as King. British Royalty now lends color and prestige to the march of the clansmen, piping and dancing contests, Highland fashion show, and athletic events which make up the Braemar Games.

Photograph by Maynard Owen Williams

TO THE SONG OF SKIRLING PIPES SCOTTISH LADDIES DANCE THE HIGHLAND FLING

Not originality or mere agility but exact form and grace mark a competition dance at Braemar. Variations of the Highland Fling, Reel, and Sword Dance are common. But the keen-eyed judges at Braemar reward skill in the traditional measures that are linked with the long ago.

Photograph by Maynard Owen Williams

WHAT BUT A BAND OF PIPERS CAN SILENCE 2,000 AUTO HORNS?

Among the most popular features of the Highland Games is the music of the bagpipe. Individual pipers attain wide fame. Stirring marches, meaningless to strangers, cause Scottish ears to tingle. Massed pipe bands weave a descriptive musical fabric of attack, conflict, and death, ending with a lament such as "Flowers o' the Forest," in memory of Flodden Field. The Highland bagpipe is an epitome of geography, for Australian sheepskin, African blackwood and ivory, Spanish reeds, Swiss ribbons, and Scottish tartans compose a single instrument.

CHOSEN BRAEMAR PRESIDENT AFTER 63 YEARS

Mr. Charles Mackintosh wears the Scotch thistle and oak leaf of the Balmoral Highlanders and the cairngorm brooch presented to him by the King. Widely known for its annual gathering, the century-old society was organized to raise a fund for widows and orphans, the sick and the aged.

Photographs by Maynard Owen Williams

PIPING TAKES LEATHER LUNGS AND NIMBLE FINGERS

Air forced into the bag through the blowpipe constantly escapes through the fixed-toned bass and tenor drones at the top and the many-toned melody pipe below, which carries the tune. Dexterous "warbles" facilitate the change from one tone to another.

CLANSMEN AND CINEMAS PASS ON THE HIGHLAND TRADITION

For a day, nondescript Scotsmen don their splendid Highland raiment while cameras grind out the picture of customs and costumes long banned, but now regaining favor amid the slopes of The Grampians.

 Photographs by Maynard Owen Williams

ATHLETES AND JUDGES WEAR TARTANS FOR THEIR COLORS

The farthest white peg marks a 16-pound shot-put of 45 feet 7 inches, far beyond the landing place of lesser heaves. The 28-pound weight, swung from a handle, was thrown for a Braemar record of 74 feet 6 inches. Each clan has its own tartan, or plaid design.

The Eton wall game antedates wide playing fields. The goals consist of a small door and an elm tree at opposite ends of the wall. Since not one goal has been scored in more than 30 years it is no wonder that commentators find funmaking easier than fact-finding about this annual contest between eleven King's scholars and an eleven chosen from the Oppidans. Not nose guards, but ear muffs, are worn. They save aristocratic auricles from being scraped off against the wall.

The aquatic festival attracts large crowds. The ten boats parade rather than race, but there is always a good chance that at least one straw-hatted crew and its "cox," togged out like a Tom Thumb admiral, will overturn while rising in their seats in mid-Thames. Last year the spectators and press photographers had no luck. Every bright-ribboned and beflowered straw hat finished the day without a wetting (see page 169).

Beside the Thames the Brocas was long considered as an Eton, and hence a male, preserve. But times have changed. Every Sunday in summer this green meadow along the 140-mile Thames-side towpath is a rendezvous for women cyclists in shorts, and scores of swans stretch long necks to beg food of stenographers from the city.

Once a year there is an aquatic round-up, called "swan-hopping," or "swan-upping," when the year's cygnets are caught by crews representing the King, the Vintners, and the Dyers. The beaks of the birds are nicked—no marks for the royal swans, two for those of the Vintners, and one for the Dyers. This branding of the mavericks of the swan world is a splashy and turbulent occasion (see page 142).

THE HENLEY REGATTA

But the choice event of the Thames year is the Henley Regatta, "that garden party in a punt" (see page 172).

Over a course a trifle more than a mile and a quarter long sweep speedy waterbugs propelled by the finest of amateur oarsmen. Strict interpretation of what constitutes an amateur has caused individual disappointment, but the name of the Royal Regatta remains unsullied, and the water-borne picnic surrounding a rowing race is the Thames' fairest spectacle, celebrated on a day when Anglo-American gatherings are conspicuously cordial—the Fourth of July.

When first I knew England, the summer King George was crowned, the Thames afforded the most aristocratic popular river spectacle I have ever seen. Erect, broad-shouldered men stood proudly in their punts, while lovely ladies in chiffons and droopy broad-brimmed hats arranged the tea things or dipped lazy fingers in the cool stream. Not a Thames steamer or noisy motor boat do I remember from those days. Pearls dripped from the punt poles, gay parasols were twirled behind dark eyes.

But times have changed. Today the figure tossing the punt pole may be that of a young girl as splendidly alive in her backless bathing suit as was Fayaway in Melville's "Typee." If woman has gained independence, man has achieved no added dignity. Cranking a phonograph in the bottom of one of these punts, a young man let loose upon that romantic river near Cliveden the strains of "Parlez-moi d'Amour."

THE DERBY A "COUNTY FAIR"

The Grand National is pure horse racing; the Derby is a county fair. For days before the race, gypsies move in with testimonials brightly painted on their motor coaches, and the various catchpenny devices of carnival time are set up on the bare heath which on Derby Day will be hidden beneath a million feet. The course, shaped like a horseshoe, inspires an atmosphere of good luck (see page 168).

I left London immediately after an early breakfast, but thousands of people were already crossing the racecourse on strips of matting, laid there to protect the pathway of the three-year-olds that were to run in the 151st renewal of the Derby stakes. Hundreds of motorbusses, from whose roofs the passengers would later view the races, already lined the rails. "Pearlies" wandered about, gathering funds for hospitals in London's East End, fortune tellers with borrowed babies graciously accepted the trifling sums which would bring fortune to the givers, and tipsters, clad in parti-colored shirts, with racing saddles on the turf beside them as visual evidence that they were "in the know," dealt out envelopes containing the names of different horses, each bound to win.

Few are allowed to visit the weighing and dressing rooms at such a time, but a photographer manifestly lacks the wherewithal to "fix" a race, and the General Manager, Mr. E. E. Dorling, whose royal day it was, took the time to show me the private dining rooms of the Jockey Club and the royal guests.

Photograph by Maynard Owen Williams

TO THE MEADOW WHERE THE MAGNA CARTA WAS SEALED FOUR MEDIEVAL KNIGHTS IN ARMOR RETURN

One episode in the 1934 Pageant of Runnymede represented the St. George's Day Tournament of 1358, to which Edward III invited the royalty of Europe (see text, opposite page). During the jousting, four knights like mounted chessmen marked the tournament boundaries and served as referees under the Black Prince, Marshal of the Lists.

In the dressing rooms I handled featherweight costumes, boots, and saddles that would not hamper a jack rabbit, much less a horse. In some saddlecloths were pockets for lead disks of varying weights. There also were saddles so designed that the same jockey might ride an untried mount carrying only 98 pounds, or a favorite colt carrying 126. As a special privilege, I was introduced to the Clerk of the Scales, who, among the racing gentry, has all the standing of a Justice of the Supreme Court.

Eating and drinking go on without let-up, bookies dangle the hope of fortune before many to whom this is the day of days, and staid bank officials are "taking a chance."

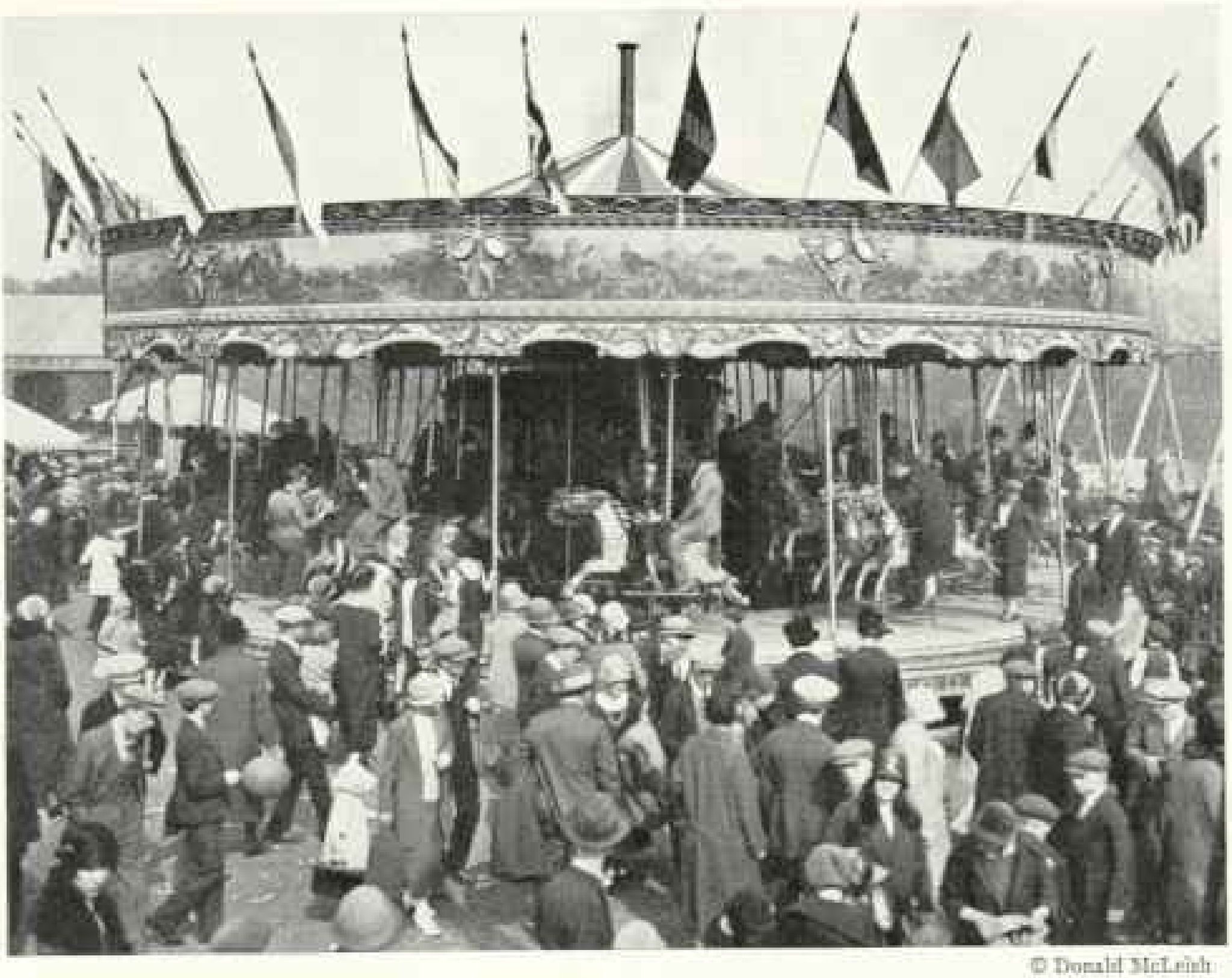
Long before the first event, trains, busses, and private cars have done their work. On a high tower of steel tubing and on every conceivable corner of the grandstand the movie men stand ready to grind, and with the arrival of the King and Queen this greatest of popular holidays attains full stride.

Of the five races only one—a mile and a half for proven three-year-olds—really counts. Up the far course, a tangle of hoofs around slippery Tattenham Corner, and down the home stretch to a thunderous finish before the stands. "They're off!" changes to "'Windsor Lad' wins!"

The smiling Maharaja of Rajpipla leads "No. 14" into the circle of gray toppers, and the life of London can begin again. Tomorrow will come the Coronation Cup and the day after that the "Oaks," but those are mere horse races—Derby Day trots out even that overworked adjective, unique.

THE "TATTOO" AT ALDERSHOT

At Aldershot the Army puts on its greatest show, the "Tattoo." Staged at night within a semicircle of searchlights, Cavalry, Artillery, Engineers, Signal and Tank Corps



WHAT CHANCE HAS A CHILD TO GET A SEAT WHEN THIS ROUNDABOUT PLAYS A ROUNDELAY?

Adults on vacation have commandeered the merry-go-round from the children here on Hampstead Heath, London's hillside recreation park. Whether it be returning to work after Easter, Whitsunday, or Christmas, or time for paying a debt, bank holidays in England add an extra day of grace.

are massed in a rallying of Empire, whose central figure, as in the hearts of the onlookers, is Britannia (see pages 165, 173).

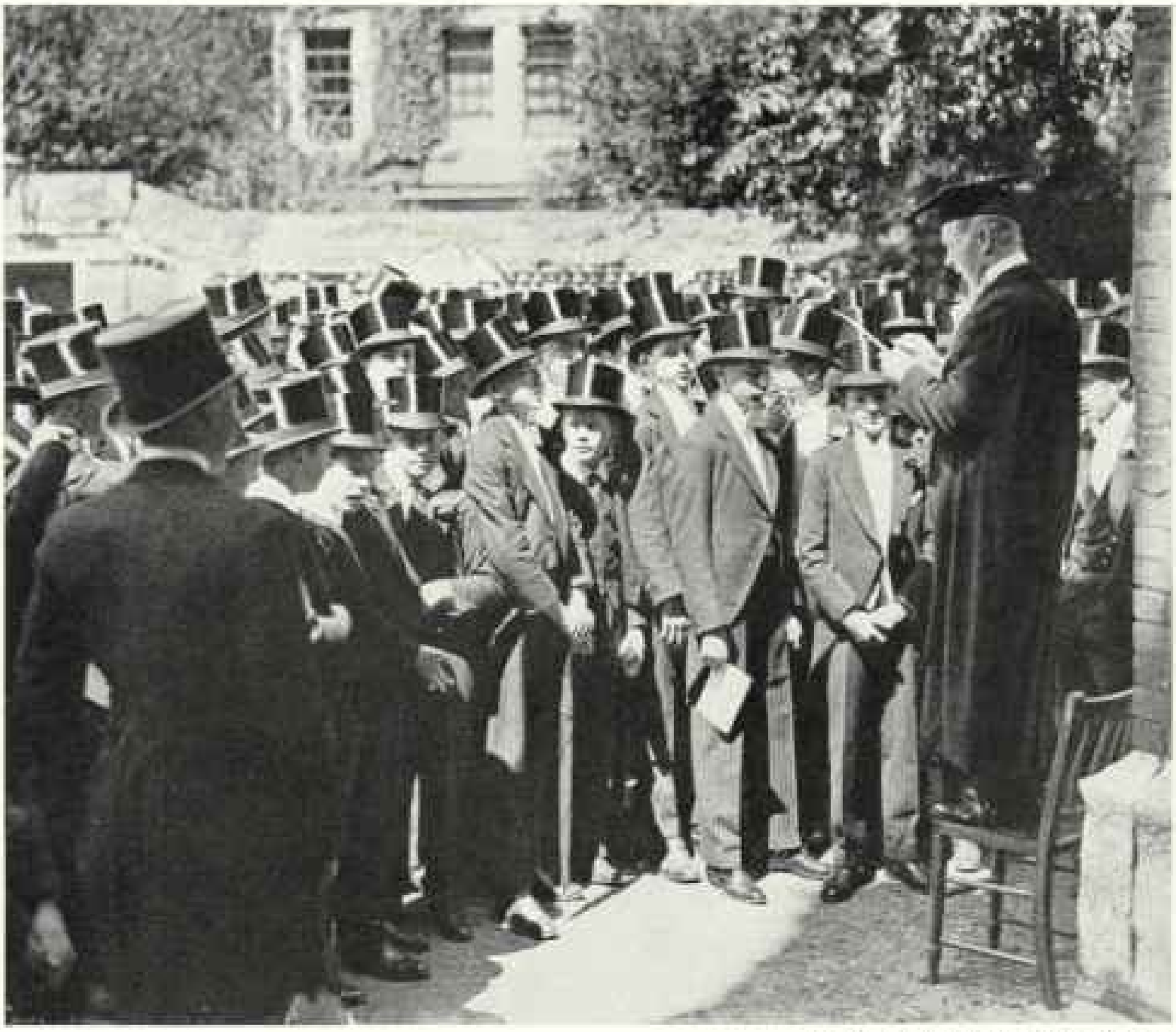
To the right are the long files of the Queen's Own Regiment and at the left is that of the King. Sikhs, Gurkhas, Punjabis, and Baluchis suggest the loyal troops of Asia, and those of Canada, Australia, South Africa, and New Zealand the far-flung fields of the Dominions. Fifty thousand voices join in singing "Abide With Me," and as the floodlights fade, the spirit of Kipling's "Recessional" takes possession of the night.

To photograph the Aldershot Tattoo, I attended the daylight rehearsal, given before 60,000 school children. As I entered the upper stand, the sea of youngsters below me burst into waves of fluttering song-sheets and I had *my* thrill, for the words to which these arms waved high were "Glory, glory hallelujah, his soul goes marching on."

Beside the Thames, a little below Windsor, is the historic meadow of Runnymede, whose tale runs back to Roman days, for up the valley of the Thames Vespasian led his second legion before he became Emperor. Nearly a thousand years later the Vikings, sailing up the river, massacred the monks of Chertsey Abbey.

There is no greater date in all of England's history than that when King John, surrounded by determined barons and forced to seal the Magna Carta, made English liberties depend on recorded principles rather than the whims of rulers.

Another scene pictured the jousts and tournaments of the Middle Ages, when Edward III, father of the Black Prince, was King, and knights from the whole Crusading world, welcomed to England, saw the King of France carry the "fleur de lis" to victory before the Queen of Beauty. For her apparel during the Tournament of St. George's Day, A. D. 1358, Edward allowed Philippa five hundred pounds—a fortune in those days (see opposite page).



Photograph by Topical Press Agency

SILK-HATTED ETONIANS REPORT "PRESENT" AT "ABSENCE"—REALLY A ROLL-CALL

On Speech Day at Eton, the boys attend an "Absence in Westons Yard," or "Absence in the School Yard," in order to report "Present" at the "call-over"! Seventy "Foundation Scholars" and about 930 "Oppidans" make up the student body of England's best-known "public school," which, in the United States, would be a private school. As the quotation marks indicate, Eton, which gave the traditional "Eton jacket" to world speech, has a language all its own (see text, page 152).

Scenes of Henry VIII entertaining Charles V, Emperor-Elect of the Holy Roman Empire, at Windsor, up the Thames; Charles II hunting in the Royal Forest, just over the hills to the south; and the opening of near-by Ascot by Queen Anne bring the surrounding countryside into Runnymede's tale.

THE ROYAL ASCOT FASHION SHOW

Famous characters of many an epoch in England's story were enacted by direct descendants, and to thousands of humble folk between Windsor and London the Runnymede Pageant, in which they appeared as Romans, Danes, or gypsies, was the event of their lives. The dinner hour beside the Thames was a salad of the centuries, with centurions taking photographs and Henry VIII reading a daily newspaper.

On Epsom Downs the real show is within the track, but Royal Ascot features fashion in the stands. Since Nell Gwyn's son won the hundred-guinea prize with which Queen Anne opened the course in 1711, there have been enough showers and windstorms on Royal Ascot day to discourage an Easter parade. If the English had been cowards about weather, even the Royal Procession of the course would not have lasted since George IV began it.

In 1934, in London, we were being urged to save water even to the point of using only six inches of it in our baths. In Egypt John Bull has harnessed the Nile and in the Punjab rivers hurdle one another, playing

THE ROYAL HORSE ARTILLERY GALLOPS TO MUSIC AT ALDERSHOT TATTOO

Racing to the rhythm of massed mounted bands, the spirited steeds of the "R. H. A." weave in and out, crossing each other's paths at top speed and banking their shiny bodies at the turns. Sixty thousand school children, attending a daylight rehearsal of Aldershot's famous "Searchlight Tattoo," watched the evolution of the "D" and "J" Batteries (see illustration, page 173, and text, page 162).

Photographs by Maynard Owen Williams

THE SOAP BOX IS BRITAIN'S SAFETY VALVE NOW

Only a few steps away, at Tyburn Gallows, martyrs, highwaymen, and enemies of the King were once "hanged, drawn, and quartered." Today, near the Marble Arch, every Hyde Park orator may have a hearing.

Photograph by Maynard Owen Williams

THE HIGH-STEPPING PIEBALD OF THE ROYAL HORSE GUARDS CALMLY AWAITS HIS CUE

Behind the scenes at Olympia, the best-known mount in Britain looks as heavy as a truck horse and almost asleep. But, when the doors open wide and the musical ride begins, the old war horse arches his neck, tosses his hoofs, and "struts his stuff." He loves a parade. The kettledrums were presented by King William IV (see text, page 147).

leapfrog to the bidding of the British Raj. But the Thames above Teddington is no Nile or Indus and the water shortage last summer was acute. Did it affect Ascot? Not at all! There the sprinklers kept the course green and soft for lightly shod hoofs.

Big hats and chiffons have displaced male cravats as symbols of Ascot, and on their way from grandstand to tea pavilion fashionable ladies tacked about in the breeze like Sunday morning sailboats off Twickenham. News photographers dashed in and out among the silk toppers and gray trousers of serious race followers who would no more miss an Ascot tea in their club tent than a debutante would miss being presented at Court. The Grand National is a horse race. At the Derby and at Ascot it is the human race that counts.

August has its round of classic drama at Malvern and Stratford, its Welsh Eisteddfod, its Dublin Horse Show, and enough cricket and motor racing to divert those who can withstand the temptation of seashore and countryside. But August Bank Holiday ushers in the official month of Nature worship, including pixies, wishing wells, and nymphs in rubber bathing-suits. I spent my time in Devon and Cornwall, resisting all temptation to mix with crowds except a visit to Devonport for Navy Week. A tea dance in an airplane carrier sounds like a

Photograph by Maynard Owen Williams

WOODEN FIGUREHEADS, HOME FROM THE SEA, ARE CHERISHED AT DEVONPORT NAVY YARD

Today's Jack Tars no longer man the "wooden walls" of England, whose planks and water casks, bought by ship-breakers, now serve as furniture or umbrella stands. But the old statues, which scanned the waves and felt salt spray over many leagues of sea, have been collected, repainted, and labeled in memory of earlier days. This imposing bust decorated a 110-gun ship, the *Royal Adelaide*, afloat from 1828 to 1905 (see page 171).

spacious function. But the rains came and beat upon the Navy Yard and a whole bedraggled brood sought shelter in one mother ship.

ACROSS THE SCOTTISH BORDER

For many years Britain's boundary has been the sea, her forts her ships. Today one rolls into Scotland across an invisible "border," unmindful of the boundary of other days so fraught with fear that even the Romans gave their legionaries the protection of a wall.

Today the King and Queen go north to the Highlands and an Empire's ruler becomes a Scottish laird.

When Princess Marina, visiting the Highlands, wished to learn the Highland dances, it was Queen Mary who taught her the steps that won the admiration of every kiltie in Balmoral Castle.

Queen Victoria first gave royal patronage to the gathering of the Braemar Royal Highland Society, and the presence of royalty sets this above many similar meetings of the Scottish clans.

Around the emerald circle of the Princess Royal Park motor cars begin to range them-

Photograph by Topical Press Agency

A HUNDRED AND FIFTY DERBY WINNERS FINISHED AHEAD OF "WINDSOR LAD"!

Here, in 1934, the Maharaja of Rajpipla's colt romps home. For more than a century and a half, the Derby, paragon of horse races, has been a popular picnic, its fleet three-year-olds almost lost amid a crowd of half a million holidaymakers (see text, page 161). This year the Derby was won by the Aga Khan's "Bahram." So celebrated is "The Darby" that its name has been lent to many similar contests, notably the Kentucky Derby, Britain's chief radio thrill from the United States.

Photograph by Maynard Owen Williams

ETON OARSMEN AWAIT THE PROCESSION OF BOATS—AND MAYBE A DUCKING

Between the oral fireworks of Speech Day and the pyrotechnic display which brings Eton's "Fourth of June" to a close, the most interesting feature is a procession of ten boats, led by the ten-oared *Monarch*. Wearing straw hats and directed by coxswains togged out like miniature admirals, the 82 oarsmen row up and down the Thames past the reviewing stand (see text, page 161).

Photograph by Topical Press Agency

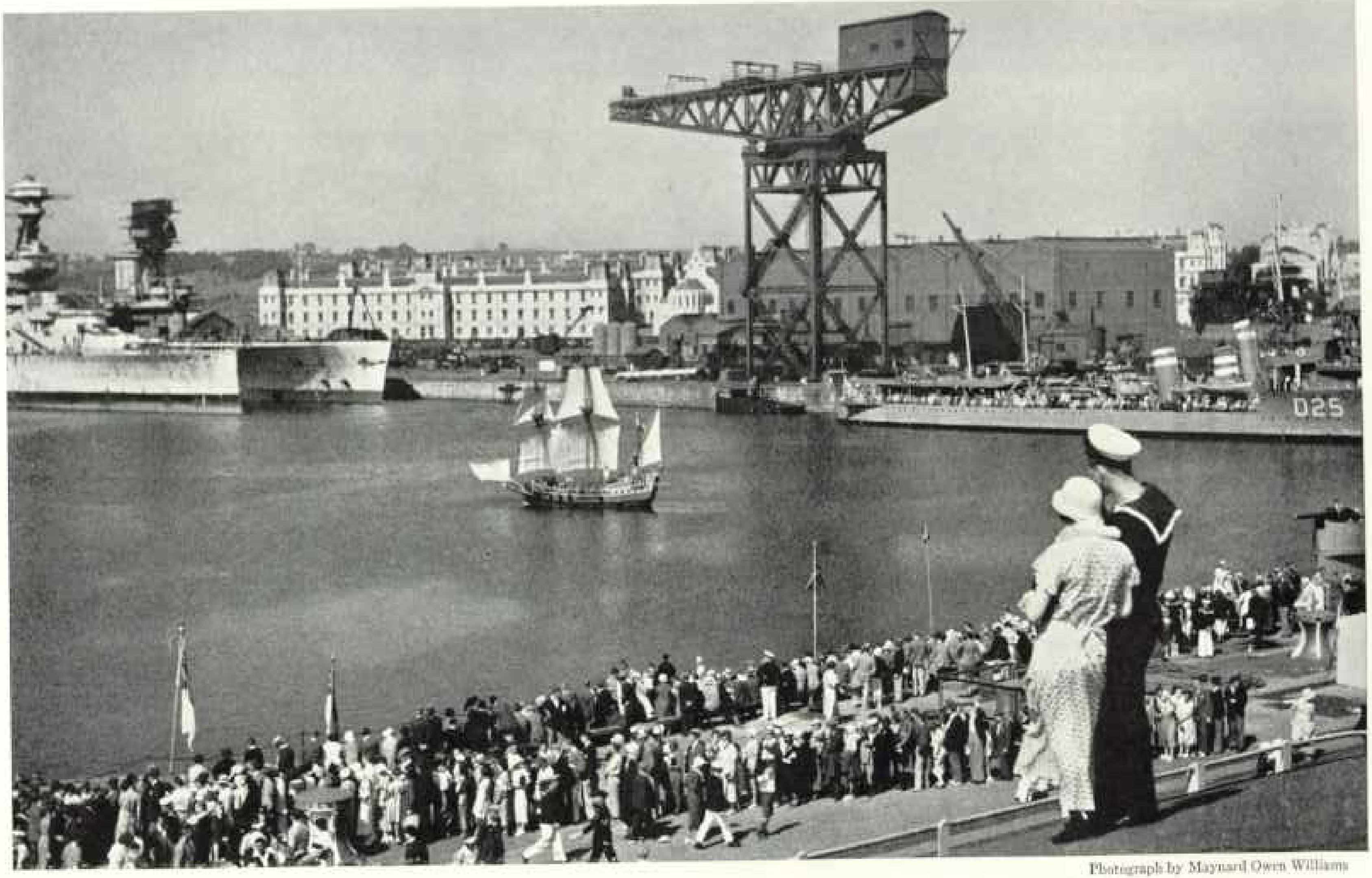
THIS MOTOR CAR INTRODUCED A MODERN NOTE INTO ENGLISH PAGEANTRY

In 1934, because of a cold, King George rode to the opening of Parliament, not in the Ciprianl coach that has served nearly 200 years (see illustrations, pages 144 and 150), but in an automobile flying the Royal Standard. Their Majesties occupy the middle seats as they leave the Houses of Parliament after the State Opening. President Wilson in 1917 was our last Chief Executive to ride to his inaugural behind four horses.

Photograph by Topical Press Agency

FAVORED GUESTS WATCH KING GEORGE, MOUNTED ON HIS CHARGER, TAKE THE SALUTE OF THE HOUSEHOLD CAVALRY

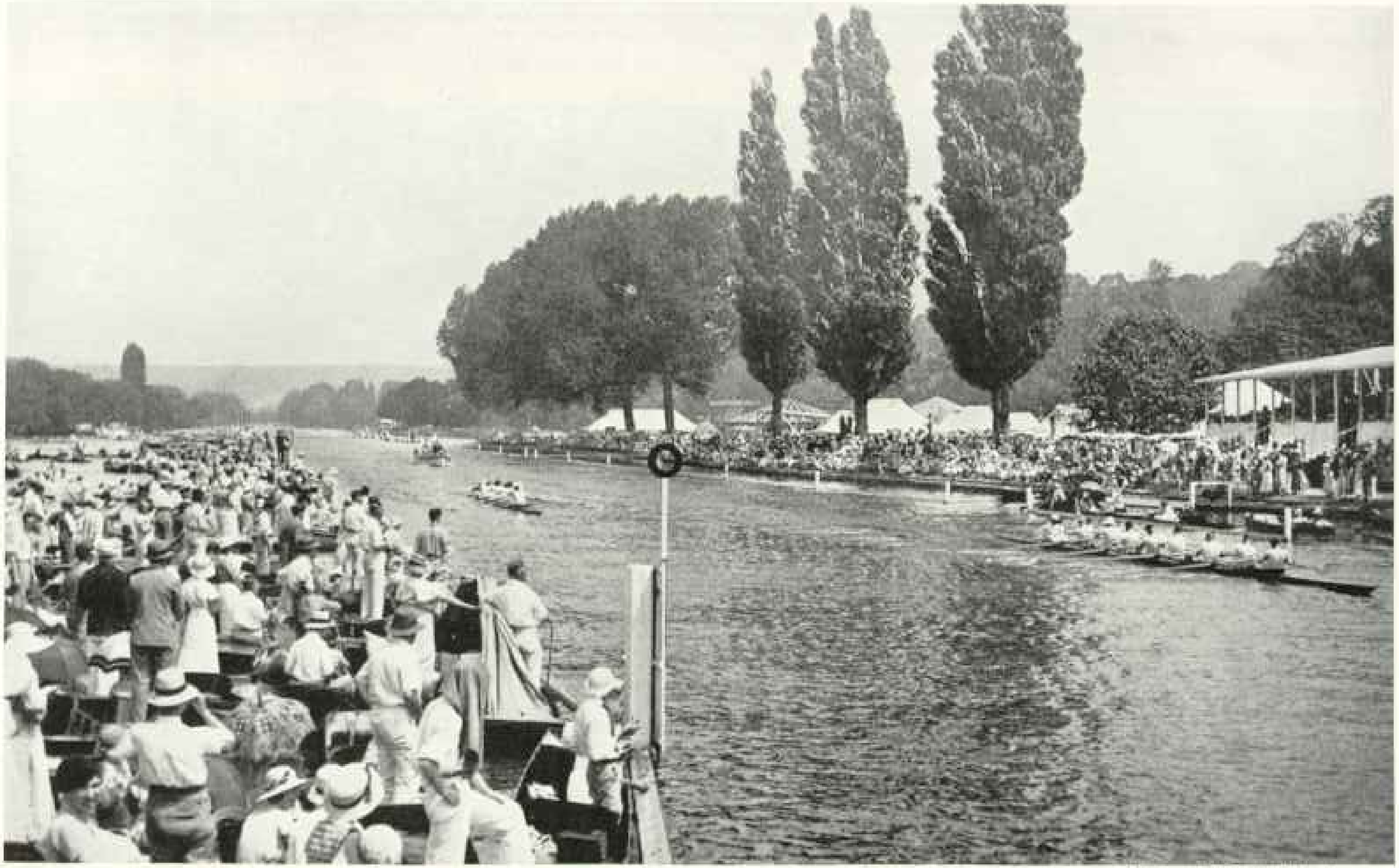
On His Majesty's birthday, June 3, the 1,800 officers and men of the Household Brigade "troop the Colour" on the Horse Guards Parade in honor of their Colonel-in-Chief. The March Past is both in slow and quick time to the music of the red-plumed Royal Horse, Scots, Grenadier, Irish, Welsh, and Coldstream Guards.



Photograph by Maynard Owen Williams

IN THE "GOLDEN HIND," TWICE THE SIZE OF THIS MODEL, DRAKE CIRCUMNAVIGATED THE EARTH

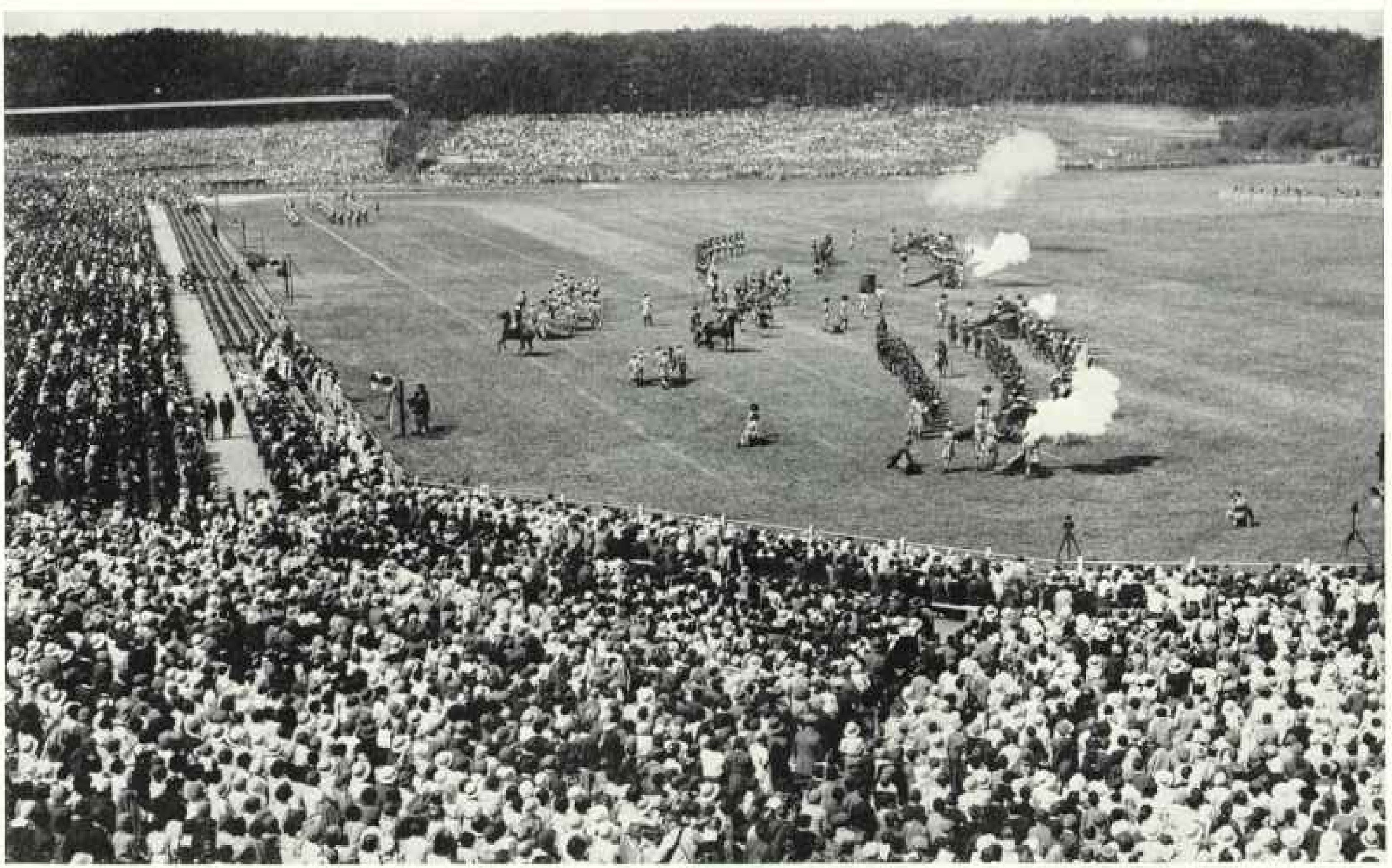
From the deck of the aircraft carrier H. M. S. *Glorious* a bluejacket and his sweetheart watch the little vessel sail in Prince of Wales Basin at Devonport Dockyard. The guns of Sir Francis Drake's famous 63-foot flagship could fire 10-pound shot a maximum of 500 yards. Near at hand lay H. M. S. *Rodney*, one of the largest battleships afloat, capable of hurling a salvo of nine tons of shells a distance of twenty miles (see page 167).



Photograph by Topical Press Agency

THE MECCA OF OARSMEN IS THE ROYAL REGATTA AT HENLEY-ON-THAMES

Over this historic upstream course of 1 5/16 miles, Princeton pushed the world-famous Leander Club to a new record of 6 minutes 48 seconds in the Grand Challenge Cup race of 1934. In this view the Reading shell wins from University College on the first day of the four-day regatta (see text, page 161). For a hundred miles, between King's Weir and Richmond, punters and boatmen use the Thames, not as a race course, but as a quiet retreat.



Photograph by Topical Press Agency

SIXTY THOUSAND SCHOOL CHILDREN CHEER TO THE ECHO AS BRITISH TROOPS REENACT THE SIEGE OF NAMUR, 1695

The annual Tattoo at Aldershot, south of Windsor, is held at night, under the glare of searchlights, totaling about four billion candlepower. But a dress rehearsal is given before youthful scholars brought by busloads from a wide area (see page 165, and text, 163). In the arena the army of King William III is bombarding the citadel before the final assault by grenadiers and pikemen. At the surrender, the French march out with colors flying and the British soldiers present arms as Marshal Boufflers salutes the King.

Photograph by Maynard Owen Williams

THE PIPES OF PETER PAN BRING MAGIC TO A LONDON PARK

Beside the Long Water in Kensington Gardens stands Sir George Frampton's delightful statue of Sir James M. Barrie's eternally youthful hero of Never-Never Land.

selves soon after the frosty dawn and preoccupied pibroch players stroll among the scrub pines, squeezing intricate bagpipe music into the air. Few remain who love and understand the music of the pipes. Young Scots now have radios, and why devote your life to learning Highland flings when your best girl is walking to jazz music with a rival's arm around her waist? Braemar fights for kilts and sporrans, flings and pibrochs with its back to the wall. It's a braw battle—and grand to watch and listen to.

THE LURE OF BRAEMAR

I lost my heart to Scotland years ago and Braemar drew me north to watch the King's Highlanders of Balmoral, the Duffs of Mar, and the Invercauld Farquharsons march; brawny athletes wrestle or toss the caber; bagpipes lament, and 70-year-old men waddle at top speed down the course, one of them rolling over and showing his "trouse," visual proof that even the kilt has its figleaf!

In the "guid old days" the Highlanders used to straggle in across the Grampians afoot. Now they roll in by the busload.

If a Bengal tiger can ride with dignity in a gilt circus wagon, it is no trick at all for a kilted group of clansmen to make an omnibus positively spectacular. What men these Highland laddies are! The music of the pipes has never been set to words. But when the pipers pass, you don't need words. And when a Scottish giant lifts a tree trunk which two lesser men have upended toward the sky, you don't need music.

Tossing the caber looks as easy as picking up the Empire State Building and spiking it into the Hudson by its mooring mast. First, you so balance the tree trunk, small

Photograph by Topical Press Agency

THE LORD MAYOR'S COACH ENTERS THREADNEEDLE STREET FOR HIS ANNUAL "SHOW"

On November 9 the Lord Mayor of mile-square London drives from his official residence, Mansion House (upper right), to the Law Courts to take his oath of office. Property in "The City" is so valuable that few homes are located there. Its daytime population is 32 times as numerous as at night.

end down in your palms, that you can toss it, not it you. Then tilt the butt just far enough so that you can stagger forward at top speed. Stopping in full cry, you plant your feet, say "humph" from the bottom of your diaphragm, and give a hard heave. If the small end describes the necessary semicircle up and over, instead of falling back for a loss, the spot where the butt gouged the turf may be a record (see Plate III).

The Queen looks on from the red-carpeted pavilion and the huge crowd is entranced by the little Princesses Elizabeth and Margaret Rose, who sit on the pavilion step and watch every move.

Behind her pure white horses Her Majesty departs. The Aberdonian police, who have maintained perfect order, set out for home. The best-dressed Highlander and the oldest clansman claim their rewards. With his plaidie held in place by a cairngorm brooch presented by one of the kings he has served at Balmoral, President Mackintosh waves good-bye to his Highland friends of many decades (Plate VII), and on the little town of Braemar stillness comes down with the dusk from the circling hills.

Hurry away in the crowd of motors and you'll miss all this. But sit around the tea table in the comfortable hotel and you will see the glow of the woodfire on shaggy sporrans brushing bare, knobby knees soon to be hidden by conventional clothing, ignoble after the tartan petticoats and plaid stockings which make a Highland Scot so braw a man.

Like many another river of Britain which, but for man's intervention, would be a mere trout stream, the Clyde was not inherited but made. Why should the leviathan of all

Britannia's ships be launched in a stream but little wider than itself is long? That is not so hard to understand.

The *Queen Mary* was known as "*534*" because 533 ships preceded her at "John Brown's Yard." For miles the Clyde runs between cranes and cradles within which steel plates and castings become the stately ships and ocean tramps that carry the Union Jack across the seas (see page 145).

After Queen Mary gave her name to 1,018 feet of Clydebank skill and craft, I rambled through the shops where stood some of the mighty machinery which will turn this graceful hull into a steamship. On that glad day, after years of delay and disappointment, the proud workmen were able to show their families around "The Yard."

For months it had been easier to get into Buckingham Palace than into the precincts of "John Brown and Company, Ltd." But with the rattle of those mighty drag chains still in one's ears and the giant craft safely berthed in the fitting basin after a perfect launching, discipline was temporarily relaxed. I watched these Clydebank men positively petting the shiny metal that would some day drive this gigantic speedboat across the Atlantic.

The day after the launching, I returned to Clydebank, for sunshine had replaced the downpour which added impressiveness to the ceremony. Once more the door of "John Brown's Yard" was closed. So I roamed the docks, seeking out Clydebank men who could give me their view of yesterday's historic event. At such a time hundreds of platers are left without a job, hundreds of fitters set joyfully to work.

The actual launching was the most impressive ceremony I saw during six months in Great Britain. Color was blotted out by a pouring sky. Few bright trappings of pageantry were present. The thrill was inherent.

Under the umbrellas there was an almost religious hush, broken only by the arrival of the Queen, closely followed by the King and the Prince of Wales, his head cocked sideways as he looked up at the bow which may cleave the Atlantic faster than any similar prow has ever done.

When the brief speeches were over and the champagne foamed across the bows, "the bubbly" dripped down into cinema lens hoods which the operators had pointed upward only at the last moment because of the pouring rain.

How six hydraulic rams started that huge mass of inert metal down the ways; how the unprecedented weight was transferred from earth to water without breaking the back of the half-built hull; how thousands of tons of drag chain so checked her that she did not sink her 150-ton rudder and four mighty propellers in the not-far bank of the Clyde—that is a story for engineers and the movie camera.

John Masefield, who knows the sea, wrote a poem to this so stately ship,

> "Long as a street and lofty as a tower,
> Ready to glide in thunder from the slip
> And shear the sea with majesty of power."

But for me the verses which best fitted the occasion were written a century ago by an American who has a monument in the Poets' Corner of Westminster Abbey:

> "Our hearts, our hopes, our prayers, our tears,
> Our faith triumphant o'er our fears,
> Are all with thee—are all with thee!"

The ship is a mighty monument to "faith triumphant," for there were years when her skeleton rusted on the ways and Clydebank wizardry might have lost its cunning for want of work. This colossal speedboat may never earn her keep. The blue riband may go to a foreign rival. But during some of England's darkest days, she brought back hope to the Clyde when proud men with shapeless caps on their heads and canny craft in their fingers had come to hate "the dole" with all their hearts. To them, the *Queen Mary* is a "job" well done.

Hardly had the steel shell come to rest in the Clyde before the vast crowd turned from the *Queen Mary* to their living Queen. Their hearts and hopes were turned toward a democratic, hard-working, and beloved pair of rulers who, in their persons and in their acts, help keep alive the proud pageantry of Merry England—a calm and confident act of faith amid a disordered world.

Westminster Abbey holds the bones of England's Unknown Warrior, but the petrified patriotism of the Cenotaph stands uncovered under the English sky—a silent example to the men who pass (page 149).

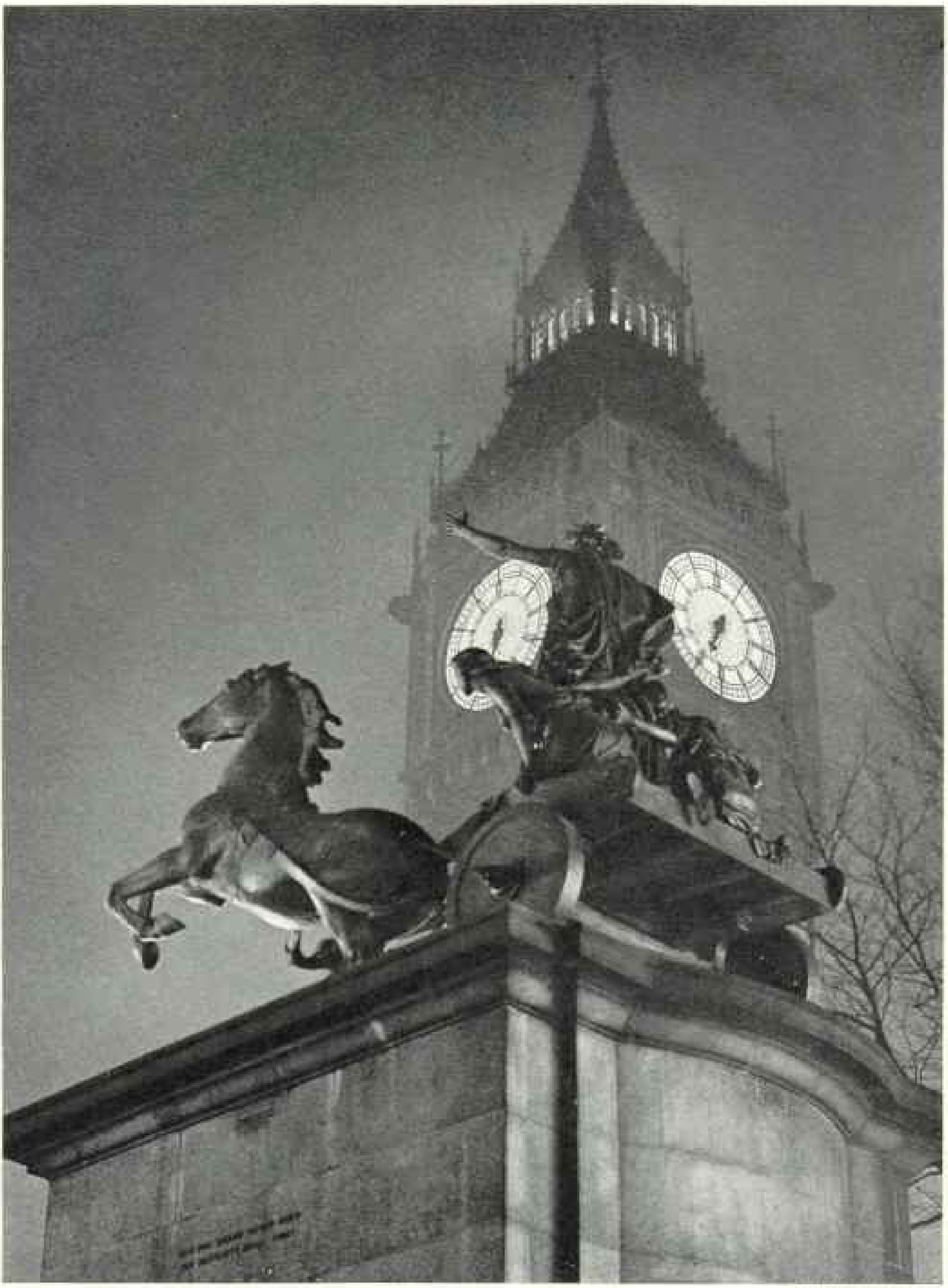
On Armistice Day all Whitehall, packed with soldiery and subjects of the King, falls silent to listen to the "still, small voice."

Around the world that hush of silence speaks. And there, before a chaste stone tower, the visitor bows before the most moving, sincere, and memorable of all of England's annual pageantry.

© H. B. Bardekin

BRONZE SPHINXES, CROUCHING IN THE SHADOWS, GUARD "CLEOPATRA'S NEEDLE"

The granite obelisk, which rises from the darkly silhouetted base at the left, has nothing to do with Cleopatra. It dates from Egypt's Golden Age, about 1500 B. C., whereas the famous Queen lived a generation before Christ. Beneath the column are sealed receptacles containing costumes, coins, and photographs of England's civilization of 57 years ago, when the obelisk was sent to London and set up here beside the Thames. Its twin, also popularly known as Cleopatra's Needle, stands in Central Park, New York.



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ONWARD SPEEDS THE CHARIOT OF A WARRIOR QUEEN AS IF RACING AGAINST TIME

"Regions Caesar never knew, thy posterity shall sway." So reads the inscription on the monument to Queen Boadicea, ever rushing forward to battle in the shadow of the "Big Ben" Clock Tower. When London was a Roman camp and Britain a group of rude tribes, she led a revolt, burned Roman London, was defeated, but won for her people better treatment from Nero's legions. Britain's voice, boomed round the world by radio, is the 13½-ton bell, Big Ben.

FROM HERE EXTEND THE FORMLESS FINGERS OF BRITAIN'S WIRELESS DOMINION

The headquarters of the British Broadcasting Corporation are decorated with the figures of Prospero and Ariel, the airy spirit in Shakespeare's *Tempest* who could change shape at will to serve his master. A shell of executive offices insulates the studios from the sounds of Portland Place. Unlike the American, the Englishman pays an annual radio tax at the Post Office, and programs are conducted without the advertising matter which accompanies entertainment on the air in the United States.

THREE TEMPLES DEDICATED RESPECTIVELY TO ART, AMUSEMENT, WORSHIP

A youthful director is using modern methods to win appreciation for the incomparable treasures in the National Gallery at the left, facing Trafalgar Square. At the brightly lighted Coliseum lavish spectacles crowd the revolving stage. Above the Corinthian portico of St. Martin's-in-the-Fields a crown surmounts the vane and in the crypt the homeless of London find unfailing shelter. Chantrey's stirrupless statue of George IV stands stark against the sky.

"MIDNIGHT AND ALL'S WELL" IN QUEEN VICTORIA'S TOWN HOUSE, NOW "THE PALACE"

Buckingham Palace has a history extending back through several reincarnations to the reign of James I. On the site then stood the house of the Keeper of the King's Mulberry Garden, established when the monarch foresaw the popular vogue of silk. An old mulberry tree, a relic of that early garden, still remains. The structure was rebuilt several times, once, in 1703, by John Sheffield, Duke of Buckingham, who named it Buckingham House. George III bought it in 1761. Queen Victoria made it a palace. King George and Queen Mary have made it The Palace to which debutantes look with longing and an Empire regards with affection and respect.

© H. R. Bundekis

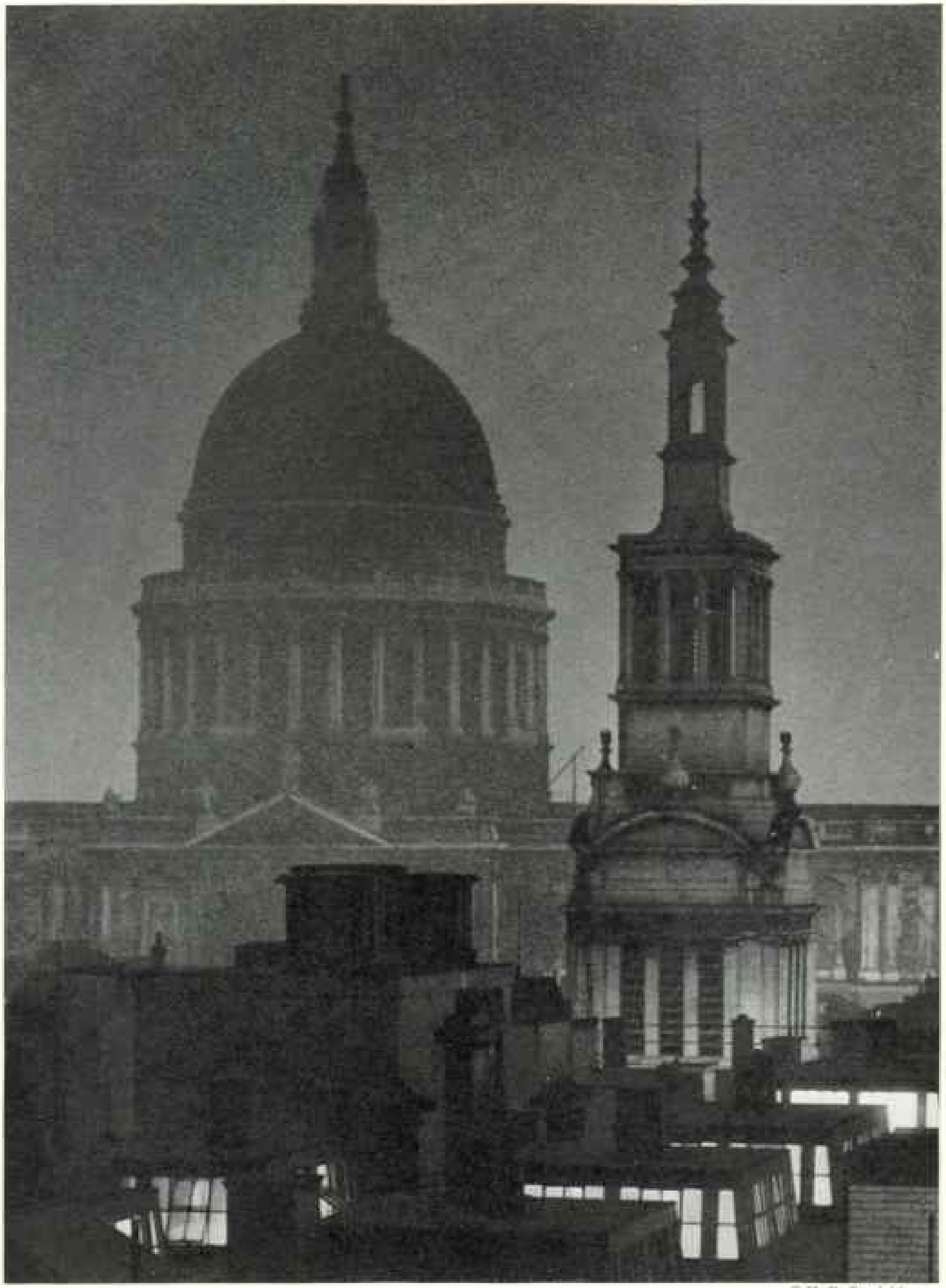
A MAN OF THE PEOPLE LOOKS TOWARD ENGLAND'S CORONATION CHURCH

In a tiny park near Westminster Abbey is a replica of the Saint-Gaudens statue of Abraham Lincoln which stands in Chicago's Lincoln Park. Between the flood-lighted abbey, an international shrine, and the shadowy statue presented by citizens of the United States, traffic moves from Westminster Bridge toward Victoria Station. The tomb of England's Unknown Warrior is in the nave, behind the halo of light to the right.

© H. B. Bardekin

A MONUMENT TO COMPASSION DIVIDES THE TRAFFIC TOWARD THEATERLAND

Having helped some two hundred Allied soldiers to escape from the Germans, Edith Cavell was arrested, court-martialed, and shot early in the World War. The British nurse, who had befriended many a wounded German, met death with a deathless phrase, "Patriotism is not enough." Her statue is here seen from the portico of St. Martin's-in-the-Fields (see page 180).



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DAWN LIFTS ST. PAUL'S CATHEDRAL DOME FROM THE LONDON NIGHT

The mighty masterpiece, seen from a neighboring roof, is a lasting memorial to the architectural genius of Sir Christopher Wren, who died more than two hundred years ago. He is buried under the choir with this peculiarly fitting epitaph, in Latin: "Reader, if you seek his monument, look about you." Liquid cement injected into the foundation has averted subsidence and a 30-ton chain of rustless steel now encircles the matchless dome.

MARAUDERS OF THE SEA

By Roy Waldo Miner

Curator of Marine Life, American Museum of Natural History

A NUMBER of years ago Herman Mueller and I were collecting back of the coral reefs on the south shore of Puerto Rico, near the entrance of Guánica Harbor. The deep blue waters of the Caribbean were dotted with whitecaps as the sea, whipped by the trade winds, broke in snowy lines of surf on the outer barrier, and slid rippling over the quieter waters within.

Wading waist-deep in the shallows, we examined the bottom with waterglasses, now and then plunging below the surface to bring up a sea star, a conch, or a coral specimen. We were interested especially in the flattened slabs of eroded coral rock lodged loosely on the bottom by the force of the waves. We loaded as many of them as we could detach into our dinghy, anchored near by, intending to tow them into Ensenada and break them up at our leisure to collect the sea worms and brittle stars hidden within their crevices.

As I was stooping for a particularly large slab, suddenly I felt a light, feathery touch against my wrist, then another. Then my arm seemed to be grasped by fairy fingers. I raised it above the water surface and saw a graceful little creature of redoubtable aspect calmly crawling up my arm, extending its tapering tentacles and rapidly drawing its bulb-shaped body along as it gazed at me coldly with a pair of shining bead-like eyes. With my other hand, I carefully detached the tentacles of the little octopus. It let go reluctantly; its cup-shaped suckers clung persistently.

I dropped it into a jar of alcohol solution to preserve it, and returned to raising the coral slabs. Almost immediately, a familiar caress warned me that another little beast was climbing agilely along the same route, as if to find its companion. The creature looked so comical and so interesting that I groped among the piled-up specimens in the dinghy for a dry jar in which to bring it back alive. Unfortunately, all contained alcohol and were filled with specimens, but I picked up an empty cigar box and thrust my little visitor inside, carefully tucking in the eight squirming arms. I shut the box tightly, hammering the cover down with little tacks, and then tied it securely, winding a cord around it several times.

After Mueller and I had worked a while longer we clambered into the dinghy and rowed over to our motor launch. We tied the boat to the stern, and soon covered the three miles back to the laboratory.

A Houdini of the Deep

When we landed, I picked up the cigar box. It was still tightly tied and apparently undisturbed. I decided to take a peep at my capture. Prying the lid open carefully, Mueller and I looked within. Lo! the box was completely empty!

We felt as if we had been fooled by a trick of parlor magic, but upon looking into the bilge water in the bottom of the dinghy, we saw the octopus calmly peering at us from under the blade of an oar, and quickly recaptured it. Apparently the weird creature had succeeded in pushing the delicate tips of its tentacles through the tightly closed crack below the box lid, and then, getting a purchase outside, had deliberately pulled its rubberlike body through the crack by flattening it to the thinness of paper. There was no difficulty in accomplishing this remarkable feat, because an octopus has no internal hard parts of consequence, and thus it can pass through unbelievably small crevices.

The octopus, with its relatives, the squid, cuttlefishes, the pearly nautilus, and argonaut, belongs to one of the most remarkable groups in the animal kingdom, the Cephalopoda, meaning the animals that have their heads united with their feet. This is one of a series of startling characteristics of these sea creatures.

They Stand on Their Heads!

The octopuses of the kind which effected its escape are relatively small animals with a centrally located bulb-shaped body about two inches in length, erected above a head with a pair of gleaming eyes, for the creature actually stands on its head! The mouth is pointed downward and is surrounded by eight radiating arms, which together correspond to the "foot" familiar in other mollusks. In our specimens, these had a spread of twelve inches. Many species are of about this size or smaller.

As we looked at their meager dimensions, it was hard to realize that their relatives, the

Photograph from Dr. Roy Waldo Miner

WITH HAND NETS THEY SCOOP UP SQUID THAT INVADE A MACKEREL TRAP

To take the catch, these fishermen in flat-bottomed boats close a gate at the entrance to the enclosure. Then the men raise the net at the bottom, bunching both squid and fish so they may be easily ladled into the boat. The ten-armed creatures play havoc with young mackerel and herring, but are preyed upon by bluefish. Squid are barreled for bait here at Woods Hole, Massachusetts.

common octopuses of European and West Indian waters (*Octopus vulgaris*), have arms five feet in length, giving their possessors a spread of ten feet or more, while the great *Octopus apollyon* of the Pacific is known to attain the enormous diameter of twenty-eight feet! Their cousins, the giant squid, practically double these dimensions from the tip of their tail to the end of their great tentacular arms, and are the largest invertebrate animals known to man (see Plate I and opposite page).

It seems impossible that these huge creatures, the submarinelike giant squid, with its efficient method of propulsion and aggressive habits, and the weird, soft-bodied octopus, with its baleful eyes, protean changes of form and color, and repulsive manner of engulfing its prey—both among the most active and intelligent inhabitants of the sea—should belong to the same animal phylum as the lowly snail and clam. Yet science found that such is the case.

The common octopus (Plate V) is one of the most gruesome marauders of the sea. Hiding in rocky crevices on the bottom, or squatting in the midst of a nestlike lair of bowlders, which it has dragged together, the repulsive creature lies in wait for its prey, the eight tapering arms sprawling in all directions, extending and contracting, clinging to the rocks with their powerful sucking disks, or undulating through the crevices as they explore everything within reach.

The large, coldly staring eyes are elevated on rounded protuberances, enabling it to see in all directions. Should an unwary fish or crustacean venture within reach, a long tapering tentacle darts forth, the slender tip encircles the prey, which struggles desperately to escape the adherent suckers, but without success, and the hapless creature is dragged down to the cruel jaws to be torn apart by the parrotlike beak.

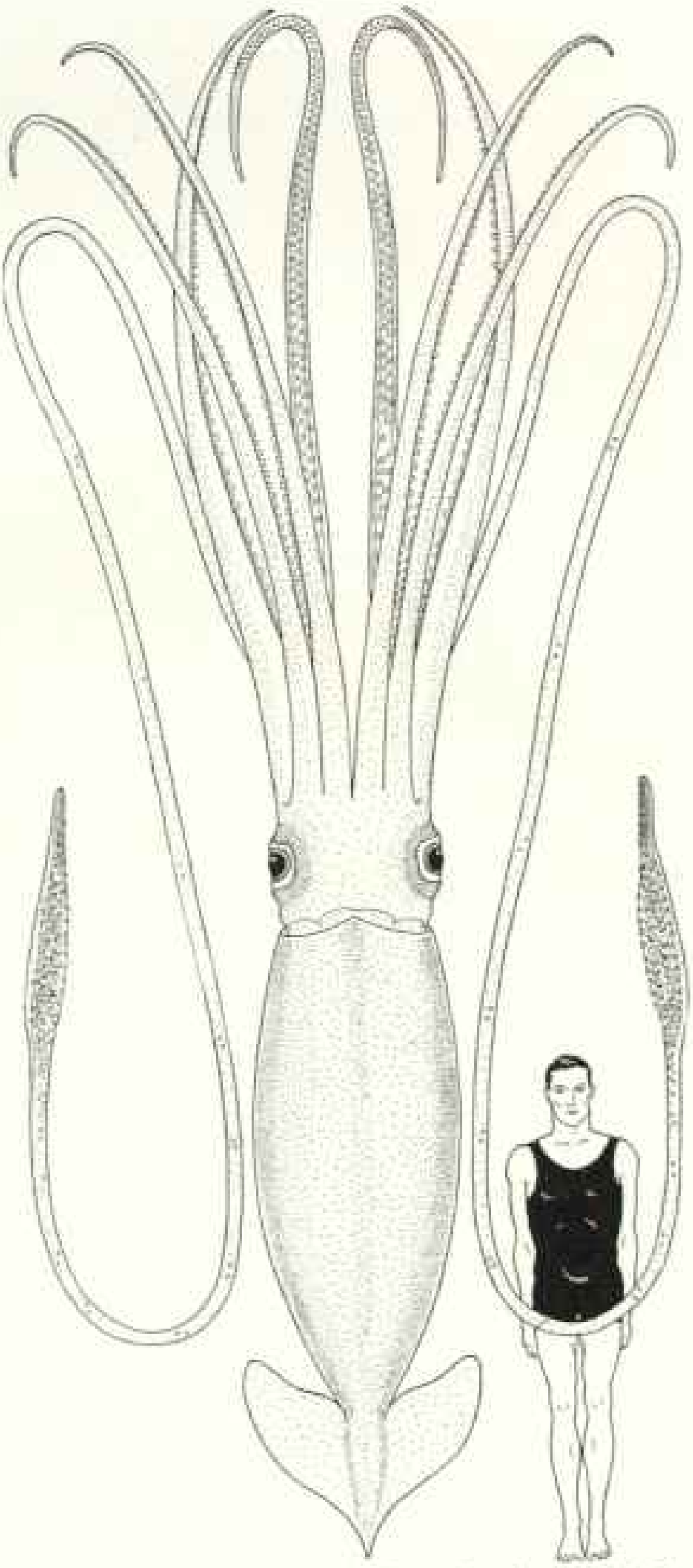
This species of octopus is equipped with a double row of suckers, arranged alternately, along the underside of its arm, gradually diminishing in size toward the slender, tapering tips. At their base, the arms are united by a membrane forming a flexible funnel, which engulfs the captured victim and presses it against the jaws in the circular mouth-opening at the bottom. If a crab or small sea turtle should swim a short distance away, the octopus launches its whole body backward with repeated squirts from its siphon and, with lightninglike speed, pounces sidewise upon the victim.

SWIMS LIKE A STREAM-LINED ROCKET

Though the octopus appears sluggish as it creeps over the ocean floor, nevertheless, on occasion, it swims rapidly backward through the water, trailing its tentacles out around its head in a stream-lined bundle. It propels itself like a skyrocket by shooting a stream of water from its siphon in the direction opposite to its motion. (See fuller description in connection with the squid, page 192.)

Occasionally two individuals meet in seemingly mortal combat, their tentacles twisted in a tangled mass as they strike at each other with their murderous, curved beaks. When excited, their color patterns, which normally are changing through various shades and mottlings of brown, yellow, and tan, become more vivid, and the warty prominences of their bodies project rigidly. Waves of red, purple, violet, and blue successively suffuse the body, sometimes standing out in contrasting colors on different areas at the same time.

A black, inky fluid may be discharged from the siphon, in the murk of which the beast conceals its maneuvers. When the octopus creeps over a sandy stretch, its colors fade to pale tan or



Drawn by Zhenya Gay after A. E. Verrill

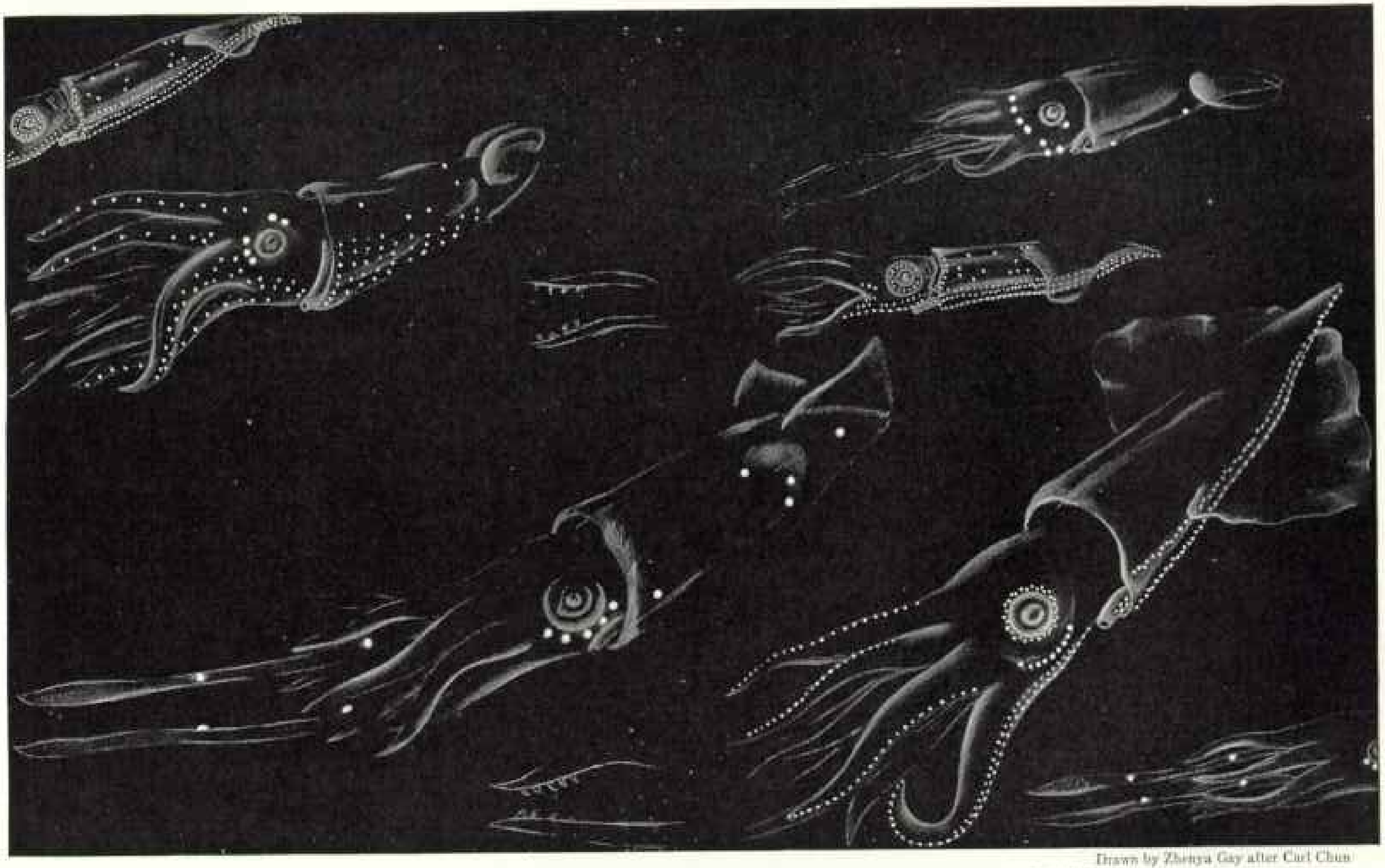
THE GIANT SQUID IS A MYSTERY OF THE SEA

No one knows how large they grow, how long they live, or how deep they dwell (see Plate I). There is a lifesize model of the 39-foot creature pictured above in the American Museum of Natural History, New York. Three fishermen sighted a 55-foot monster grounded on the shore of Newfoundland in 1878. They thought it was a wrecked boat until, rowing nearer, huge, snaky tentacles darted at them.

Photograph by Maynard Owen Williams

A GREEK FISHERMAN DRIES AN OCTOPUS CATCH IN THE SUN ON THE SPARS OF HIS BOAT AT PORTO LAGO

The warty, knot-covered creatures will be pounded to a pulp and then sold for food in the markets. Lurid tales are told by divers of struggles with large octopuses, and doubtless cornered animals would be formidable antagonists. If kept alive in captivity, common octopuses (see Color Plate V) sometimes devour their own arms, and individuals will fight seemingly mortal battles, with no actual damage.



Drawn by Zhenya Gay after Carl Chun

THESE DEEP-SEA DWELLERS KEEP THEIR HEAD AND TAIL LIGHTS GLOWING ALWAYS

No daylight penetrates half a mile below the ocean's surface to the haunts of the luminescent squid. Light organs, sprinkled over the body or arranged in rows around the eyes and along the tentacles, probably lure tiny victims within striking distance. Lenses, reflectors, and color screens enable some species to project beams of colored lights. The drawings are about natural size.

Photograph by R. D. MacDonald

CAN YOU FIND THE MOUTH OF THIS COMMON OCTOPUS?

A Greek boy holds the gruesome marauder underside up to make it visible. Trace one of the eight tentacles to the center of the body, where all of the arms converge. The small black dot is the tightly closed, parrot-shaped beak. When it is open, the mouth surrounding it is circular (see Color Plate V).

grayish white, harmonizing with the surroundings so perfectly that the creature becomes practically invisible.

Various tales are related of octopuses attacking persons who attempted to prevent them from returning to the sea. Occasionally, apparently authenticated cases are reported of encounters between divers and octopuses on the Pacific coast.

Pearl divers in the Pacific islands tell of fights with octopuses, and such incidents have strayed into literature, from Pliny to Victor Hugo. These are often inaccurate or exaggerated. In "Toilers of the Sea," Hugo describes a fight between Gilliatt and an octopus which, though thrilling, is erroneous, and even the spirited drawing of Gustave Doré depicts an octopus unlike any that ever existed.

Nevertheless, the 28-foot octopus of the Pacific, or even large examples of the common octopus of Europe and the West Indies, are formidable antagonists at bay.

The common octopus is one of about 200 species belonging to the order Octopoda. Most of them live in comparatively shallow water, about 100 fathoms or less, though deep-sea octopods are dredged from time to time. One of the weirdest of the deep-sea species is Baird's Octopus (*Octopus bairdii*), a pale, bluish-gray creature, with gleaming black eyes and elongate, tapering soft "horns" (or cirri) above them, ornamented with knobs on their sides (see Color Plate VI). Its entire body is covered with minute, granular tubercles. As is usual among octopuses, the third tentacle on the left-hand side in the male is modified for sexual purposes. In this species, the tentacle terminates in a spoon-shaped structure with nine transverse ridges across it.

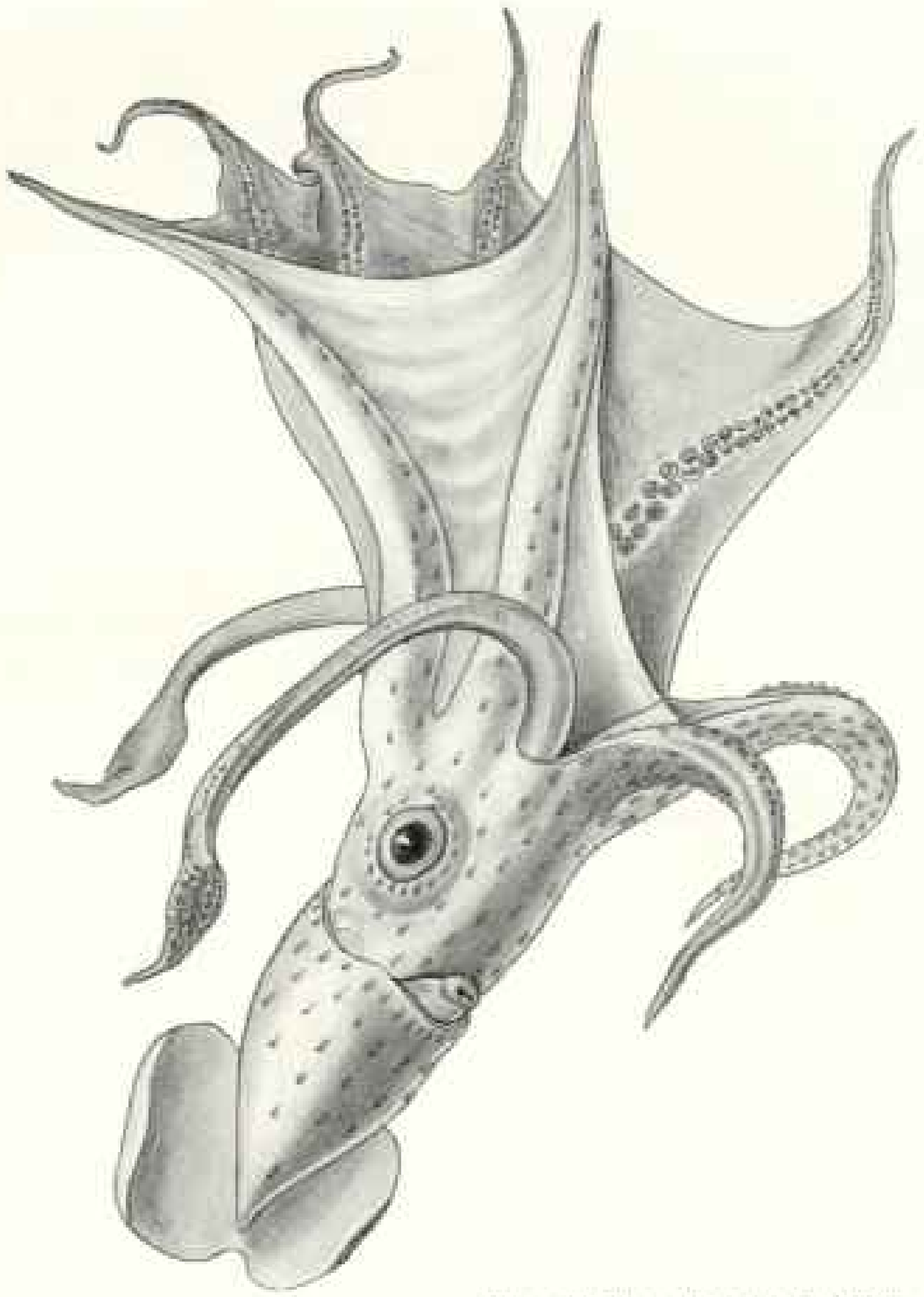
THE DANCING OCTOPUS OF BERMUDA

The fairylike Dancing Octopus (*Octopus bermudensis*) of Bermuda (Plate VI) may be seen flitting about in the shallow, transparent water among the coral reefs. The brown body, spotted with white, is balanced gracefully upon long, slender tentacles. Some of these wave about like the arms of a tiny sprite; others pirouette upon the sandy bottom, barely touching it with their

tips, for all the world like a ballet dancer.

In striking contrast to these species, the Umbrella Octopus (*Opisthoteuthis agassizi*) flaps about through the water, alternately opening and closing a parasollike membrane, thus assisting the siphon, which propels the animal through the oceanic depths by shooting a stream of water from the mantle cavity (Plate VI). This peculiar membrane connects the eight arms almost to the tips and, when spread out, is an efficient animal trap, enfolding within its embrace any fish or crustacea with which it may come in contact.

One of the most remarkable of all the cephalopods is the Argonaut, or Paper Nautilus (*Argonauta argo*). This delicate creature is so fairylike and so beautiful that it seems impossible it should be classed with the Octopoda, yet the eight arms and other structural characters betray close relationship (Plate VII). Its most remarkable feature is the fragile paper "shell," or "boat," of the female argonaut, famed in song and story. In it she was supposed to sail over tropic seas, unfurling the expanded tips of two of her arms as sails, or, as some poets have fondly imagined, using them as oars.



Drawn by Zhenya Gay after Carl Chun

STRANGE IS THE SQUID "WHOSE HEAD UNITES WITH ITS FEET"

Literally, that is the meaning of *Cephalopoda*, the highest order of mollusks, to which squid and octopuses belong (see text, page 183). An umbrellalike membrane unites six of this squid's arms, while the two lower ones have a web of their own. Starry light organs dot the underside of its tentacles and body. The specimen was caught in a plankton net, and measured about two feet.

These theories were long ago proved erroneous, but the truth is even more marvelous. The "shell" is not a true shell, comparable to that of other mollusks, for it is not secreted by the mantle. It is really an egg-case, formed between the oval expansions terminating the first pair of arms. The arms are held together, and gradually a thin gelatinous material appears between them. This is molded on the inner surface of the membranous expansions, and slowly hardens through exposure to the water to a spiral papery substance, sculptured with parallel ridges of most delicate texture. The two halves of the shell are joined on one margin to form a keel decorated by a double row of brown knobs spaced to correspond with the suckers of the arms, by which they are apparently formed, and by which they cling to the shell.

THE ARGONAUT MAY COME OUT OF HER SHELL

The argonaut inserts herself within the shell, still holding to the outside with her embracing arms, and lays her eggs, sus-

pending them in a grapelike cluster to the interior of the spire. She swims about at the surface of the sea, nearly submerged; more often she swims at some depth or near the ocean bottom.

At times she leaves the craft completely to forage in the neighborhood, propelling herself by her siphon like any other cephalopod. However, if danger threatens, she will pop back into her shell to protect her brood, curling herself down inside till nearly hidden, her black, gleaming eyes shining through the thin, translucent margin of her parchmentlike home.

The males are much smaller than the females and do not form a shell. They are found occasionally in the shells of females and probably are carried about parasitically. The third left arm is detachable and is specially modified to hold the sperm. Apparently the female carries the detached male organ about with her so that she can fertilize her eggs at will.

The body of the female is covered with minute pigment areas, or chromatophores, which expand and contract, causing waves of brilliant color to pass over the body in succession. Charles Frederick Holder succeeded in keeping a number of female argonauts alive in an aquarium. He describes most vividly the marvelous color changes which he observed:

"In appearance it is one of the most beautiful of all animals as it rests in its shell, trembling with color, as waves of rose, yellow, green, violet, and all tints of brown are continually sweeping over it; now irised in the most delicate shade of blue, now brown or green, changing to rose, vivid scarlet, or molten silver.

AN EVER-CHANGING COLOR DISPLAY

"So sensitive is it that every convulsive movement of the mantle of my paper nautilus in taking water to breathe and forcing it out of the siphon caused a wave of color to pass over the entire body. When the water was taken in, the color cells contracted, leaving it pale for the fraction of a second; when it was forced out they evidently relaxed and the entire surface was suffused with color, to disappear as quickly, giving a continuous heat-lightning effect."

These beautiful creatures redeem the Octopoda from the repulsive ugliness of most of the members of the group.

The argonaut is found in all warm seas, about six species being known. Though they are most abundant in the Tropics, individuals have strayed northward in the Gulf Stream, and have even been taken in Long Island Sound. Windrows of argonaut shells are often driven ashore in the Bay of Avalon, on Santa Catalina Island, off the California coast. They are so fragile that they are quickly broken up by successive waves, and must be rescued promptly if perfect specimens are desired.

SQUID SIPHON SELVES BACKWARD

The squid are distinguished from their relatives, the octopuses, by the possession of ten arms instead of eight, and therefore are grouped as the Decapoda, as contrasted with the Octopoda (Plate II). The squid also differ from the octopuses in usually having an elongate cigar-shaped body adapted for rapid swimming in the high seas, while the shortened bulblike body of their octopus congeners is better fitted for a less active, bottom life.

There are many diverse species of squid found in all the oceans of the world, including the huge giant squid (see text, page 201). These magnificent creatures have reached the summit of cephalopod evolution. Though descended from fossil ancestors of sluggish habits because of a confining external shell, they have thrown off this prison house, or, rather, have reduced it to a horny structure embedded in the tissues of their elongate body to function as a stiffening spine.

The octopuses have gone too far in skeletal reduction, as their soft and flabby bodies have only a couple of small internal rods, or styli. Some species have lost the shell traces altogether.

In the stream-lined squid, however, the internal "pen," or "cuttlebone," braces the body against water resistance and increases the locomotive power. Like all other cephalopods, the squid propel themselves backward by shooting a stream in the opposite direction, thus traveling on the principle of a skyrocket. By turning the siphon, they dart to one side, or by bending it toward the rear, they move forward, though the retrograde motion is the swiftest.

The squid wears its outer mantle almost like a coat. It is attached along the upper side of the body and is loosely open under the neck. From this space protrudes the siphon, like an inverted fleshy megaphone, with the narrow opening outward. The water is inhaled into the mantle cavity

 Painted by Else Bostelmann under direction Roy W. Miner

GIANTS OF THE DEEP GRAPPLE IN TITANIC STRUGGLE

Such encounters between the giant squid and the sperm whale have been reported by seafarers, especially whalers. Pieces of the squid's tentacles and the parrotlike beaks are found in whales' stomachs or between their jaws. These huge cephalopods may grow to 60 or 70 feet and weigh nearly a ton. Heads of captured whales are sometimes furrowed with imprints of their suckers. Early mariners described fabulous squid so large that they upset ships by seizing their masts! Authentic instances have been reported of men in rowboats being attacked by their wriggling arms.

 Painted by Else Bostelmann under direction Roy W. Miner

TO HIDE A QUICK GET-AWAY THE SQUID EJECTS AN INKY-BLACK SMOKE SCREEN

These weird creatures propel themselves backward on the principle of a skyrocket, by sucking water in at the collar-opening and forcing it out under pressure through the siphon beneath the neck. They shoot backward or forward without turning the body by quickly changing the direction of the "nozzle." Much smaller than its giant cousin (Plate I), this species, common along the eastern shores of the United States and Canada, preys on small fish, especially young mackerel, and is used as bait.

 Painted by Else Bostelmann under direction Roy W. Miner

A TRUE TIGER OF THE SEA IS THE CUTTLEFISH, SOURCE OF SEPIA

This curious inhabitant of the warm waters of the Mediterranean, especially around Naples, is sought for its rich brown ink, or "smoke," and for its oval internal shell or skeleton, familiar as cuttlebone for canaries. When it spies an unwary fish, it shoots backward in true squid fashion, and, dodging quickly, seizes its victim with a pair of concealed tentacles. The fish is then grasped by eight shorter arms and devoured head first. The cuttlefish lays eggs in "grape clusters" (upper right).

 Painted by Else Bostelmann under direction Roy W. Miner

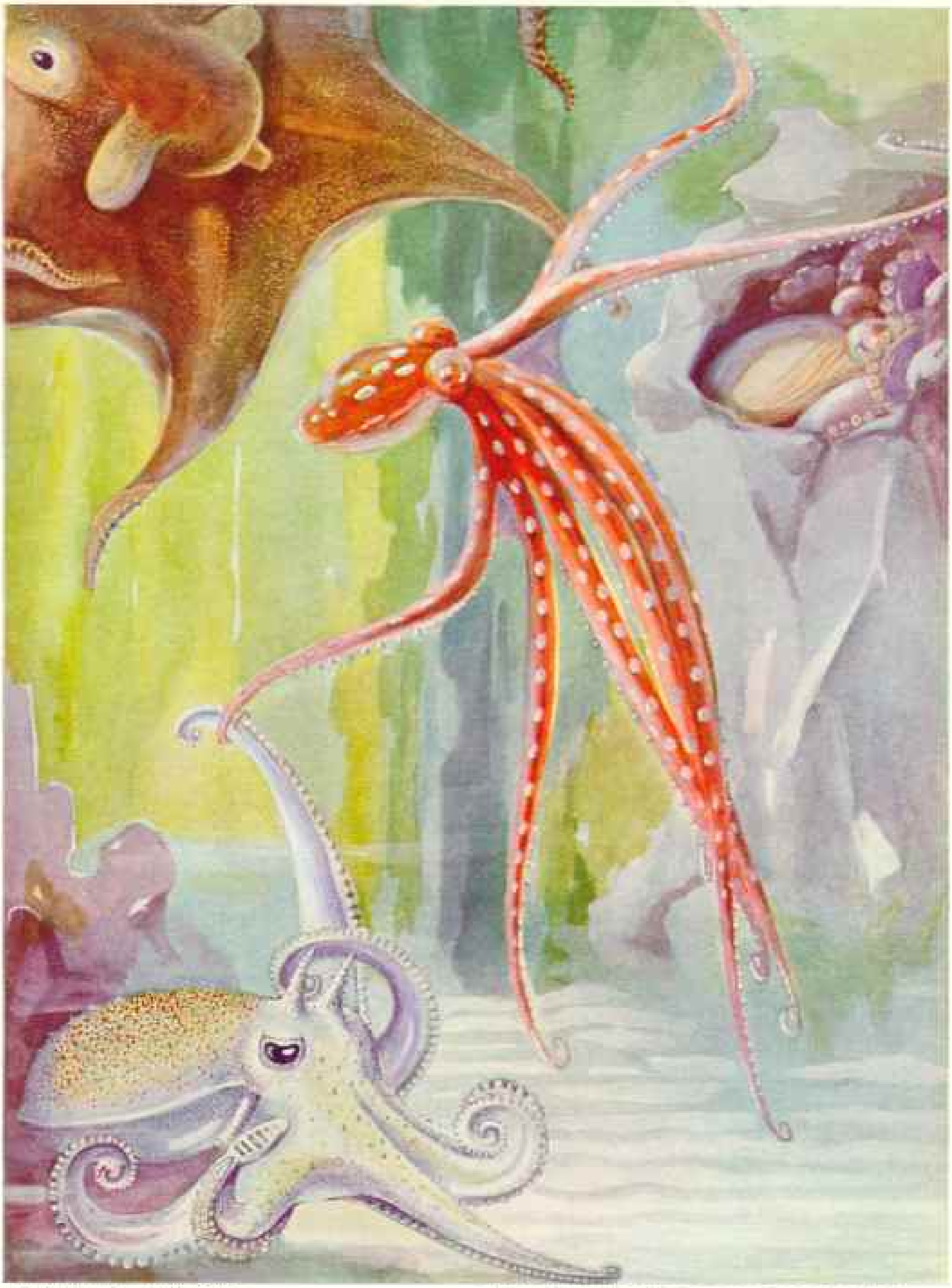
A LEATHERY, BROWN TRAPDOOR PROTECTS THE CHAMBERED NAUTILUS FROM INTRUDERS

When the coast is clear, out venture a multitude of pale tentacles, followed by two buttonlike, lensless eyes. Then appears the siphon. A stream flushes through it, and the animal, squidlike, shoots backward, shell and all. This survivor from early geologic times swims about near the floor of the ocean hunting shrimp or other bottom creatures. Sometimes it turns itself upside down and walks about, using its tentacles as feet. Native fishermen of the Philippines and the Netherlands Indies export the shell to China, where it is made into mother-of-pearl ornaments.

 Painted by Else Bostelmann under direction Roy W. Miner

EIGHT-ARMED HUNTERS STALK THEIR PREY ON THE SEA FLOOR

In rocky crevices or on sandy stretches lurks the gruesome common octopus. The color of its warty, bulblike body changes from mottlings of brown, yellow, and tan, to gray and white, to harmonize with its surroundings. Two ghoulish eyes on protuberances watch in all directions. When a crab approaches, the octopus launches its whole body sideways with repeated squirts from its siphon, and pounces upon the victim with lightning speed. The crab struggles, but, once bitten by the captor's parrotlike beak, it seems paralyzed by poisonous saliva. This octopus may have a total spread of eight to ten feet.



 Painted by Else Bostelmann under direction Roy W. Miner.

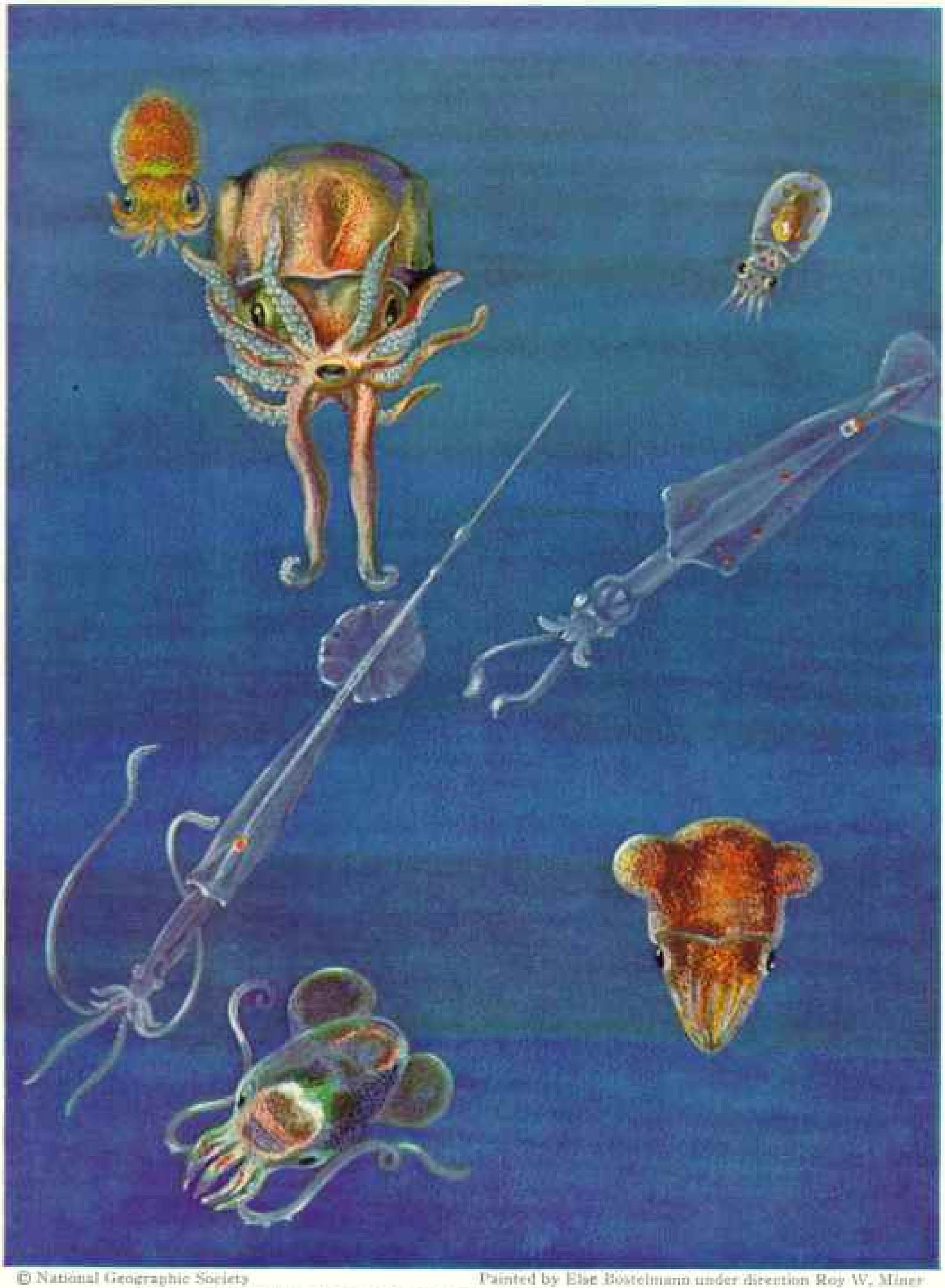
AS IF TO AMUSE OTHER MIDGETS, THE DANCING OCTOPUS PERFORMS AN ADAGIO

This tiny resident flits about the shallow, transparent waters among the reefs of Bermuda. Its brown body, spotted with white, is balanced on slender tentacles that seem to tiptoe on the bottom or dangle like limp arms. One of the weirdest of these small Atlantic octopuses is the pale, bluish-gray Baird's (lower left), with gleaming black eyes and tapering horns. He uses the ridged spoon-shaped structure that tips one of the tentacles for reproductive purposes. Hovering overhead like a bat is the umbrella octopus, which traps its prey in the folds of its membranous web.

 Painted by Else Bostelmann under direction Roy W. Miner

THE FAIRY ARGONAUT SAILS HER FRAGILE BOAT THROUGH TROPIC SEAS

Both sexes of the argonaut, or "paper nautilus," hatch naked, but soon filmy secretions from the front pair of the female's arms form two fluted, concave disks. Joined together, these form a "boat" with a spiral, knobbed prow. After suspending her egg clusters in this prow, she often leaves her shell to forage, but, if danger threatens, darts back and curls up inside, her black eyes gleaming through the translucent shell. She swims about near the bottom, or, as depicted above, on the surface, submerged nearly to the eyes. This delicate creature is an octopus.



© National Geographic Society Painted by Else Bostelmann under direction Roy W. Miner

HOSTS OF DELICATE BABY SQUID AND OCTOPUSES SWIM THE OPEN SEAS

The short-bodied *Sepiola rondeletii* (lower right), whose body color shifts through red, violet, and green, is sold on the streets of Naples as a table delicacy. The larger, short-bodied squid (upper left) extends its cephalic arms, revealing a circular mouth armed with a parrotlike beak. Some of the creatures, as they dart through the water, resemble fragile crystal vases; others appear to be needlelike lanceheads of glass.

beneath the neck of the squid and around the outer side of the siphon, which is now in a collapsed condition. Then the muscles of the mantle wall contract. A pair of cartilaginous buttons on the edge of the siphon lock into corresponding hollows on the inner side of the mantle wall and the water is forced out through the small end of the siphon with great force.

This remarkably efficient method of propulsion is of great advantage to the squid, for by sudden bursts of speed in unexpected directions it is able to outstrip its prey with ease.

The squid has a distinct head connected to the rest of the body by a narrow neck. On either side a highly organized eye, equipped with transparent lens and circular iris, gazes coldly but intelligently at its surroundings.

The mouth, equipped with a black, parrotlike beak, is hidden in the center of the circlet of ten arms, two of which are longer than the others, and may be shot out suddenly to seize a victim and then redrawn so that the captive may be laid hold of by the eight shorter arms.

The inner side of each arm is equipped with a single or double row of cup-shaped suckers along the entire length, while the two long arms are furnished with them only at the club-shaped ends. The suckers are pneumatic in action, though in some species their hold is strengthened by a marginal ring of chitinous teeth. Some are mounted on narrow stems, though most of them are cylindrical.

When a fish is captured by this efficient and irresistible outfit, the struggling creature is drawn in and held close by the myriad suckers of the shorter arms, while the central jaws tear the victim apart and a ribbonlike tongue behind them, furnished with hundreds of hook-shaped projections arranged like the teeth of a coarse file, rasps the fragments into bits.

When the squid is excited, it changes color, in the manner of the octopus or argonaut, except that in its anger it appears to blush almost to the point of apoplexy.

THE "PEN AND INK" SQUID

In the Common Squid of the Atlantic coast (*Loligo pealii*), the chromatophores, or pigmented spots on the body surface, are largely arranged in groups (Plate II). These are red, purple, and orange. Ordinarily the squid is flesh-colored, spotted with pink. When swimming over a white, sandy bottom, it suddenly fades to a corresponding paleness, rendering it almost invisible. As the creature rises through the water it becomes translucent. When irritated, it blushes through pink, orange, red, and purple. If alarmed, it suddenly squirts out dense clouds of inky fluid, forming a "smoke screen" under cover of which it beats a retreat. As the inner horny shell remnant forming the "skeleton" is shaped like an old-fashioned quill pen, and is so called, our friend the squid is literary enough to possess pen and ink!

The common squid of our coast (*Loligo pealii* and *Ommastrephes illecebrosa*) vary from about eight to fourteen inches in length. They prey on the smaller food fishes, especially young mackerel, swimming backward into the schools and striking vigorously right and left. They often get into the fish pounds and create havoc there. Thus they are a problem to the fisheries.

But there is a compensation, for the fishermen catch and barrel quantities of them as bait for larger fish, especially for cod. Bluefish, striped bass, and black bass are very fond of them and feed on them when alive.

The largest of all of these monsters is the Giant Squid (Plate I). This largest known invertebrate far exceeds the great octopus of the Pacific coast (*Octopus apollyon*) in size and power. The most familiar of these gigantic mollusks are the *Architeuthis princeps* and *Architeuthis harveyi* of A. E. Verrill. This eminent naturalist has recorded more than a score of instances in which these two species were seen in the neighborhood of the Banks of Newfoundland, while observations by Japetus Steenstrup and others have been published.

Among the giant squid noted by Verrill was a specimen which measured ten feet from tip of tail to mouth, while the tentacular arms were 42 feet in length, thus totaling 52 feet for this enormous denizen of the ocean! Many of the specimens taken were stranded in shallow water after storms; others were captured by codfishermen in the open sea and cut up for bait.

One specimen, caught alive in Trinity Bay, Newfoundland, in 1877, was preserved in brine and exhibited in the New York Aquarium. A model of this specimen is now on display in the American Museum of Natural History. The body measured nine and one-

Photograph from Dr. Ray Waldo Miner

SAILS SET TO THE BREEZE, THIS SLOOP CARRIED THE AUTHOR ON A SEARCH FOR STRANGE SEA LIFE

The party caught starfish, sea worms, squid, and octopuses on Puerto Rican coral reefs. To hunt specimens in shallow water, the motor boat and dinghy were used. Guánica Harbor, where the boats now lie, is landlocked, save for the narrow outlet to the Caribbean Sea in the background.

half feet and the tentacular arms thirty feet (see page 187).

Apparently the giant squid are inhabitants of deeper waters and have come to the surface through accident. They are reported in widely separated parts of the world. Many have been seen by Norwegian fishermen, among whom the creature is known as the kraken.

Along our own shores fishermen of the old whaling days regarded the giant squid as not at all rare. Battles between this monster and the sperm whale have been reported, while frequent finds have been made of fragments of the giant squid in the stomachs of such whales. These include squid beaks of large size and fragments of huge tentacles.

Sir John Murray, in the "Depths of the Ocean," published a photograph of a portion of sperm whale hide, taken from near its jaws, which was marked and scored by imprints of giant squid suckers more than an inch in diameter. These showed clearly the pattern made by the horny teeth reinforcing the rim of the suckers.

Apparently the giant squid served the sperm whale frequently for food, and it is possible that, in "sounding," when the sperm whale dives deep into the water, the huge sea mammal may chance upon its monstrous prey and bring it to the surface in the ensuing struggle.

Folklore is full of fabulous encounters between crews of vessels and the giant squid, and illustrations in old books show squid dragging down an entire vessel by seizing the masts. Some of the stories of sea serpents may have been based on views of giant squid swimming near the surface with their long, undulating tentacular arms appearing partly out of water.

Verrill has recorded, upon good authority, an attack by a giant squid upon two men in a rowboat. They saved themselves by cutting off the tentacular arms with a hatchet.

THE SOURCE OF INDIA INK

With due allowance for exaggerations, these immense monsters must be an imposing and terrifying sight, while a struggle

between one of them and a sperm whale would indeed be a titanic combat.

The Common Sepia, or Cuttlefish, of the Mediterranean is abundant in the neighborhood of Naples, where it is sought for its rich brown inky fluid, the India ink, or sepia, familiar to artists (Plate III). The internal calcareous shell, or "pen," is an oval structure often used in canary-bird cages as "cuttlebone."

The broad, flat body is striped like a tiger, and it is indeed a tiger of the seas, for it lies in wait, hidden by the submerged eelgrass, swimming slowly forward, undulating the ruffled fins that border its body on both sides.

Suddenly it shoots backward, propelled by the siphon in true squid fashion, and, dodging quickly sidewise, seizes an unwary fish, darting out a pair of tentacles ordinarily concealed within a sheath. The unhappy victim is then grasped by the shorter arms and devoured head first, the cuttlefish preferring the brain and fleshy part of the back.

The creature often erects the first pair of tentacles as it noses about the submarine jungle of water plants, and then its aspect suggests an old sort of double-trunked elephant. The outer arms have broad, ruffled, and fantastically mottled expansions, which spread out like the cowcatcher of a locomotive.

The eggs are laid in bluish-black grapelike clusters lashed about the stems of eelgrass, gorgonians, or various species of algæ. The animal often lies on the sea bottom with the broad outer arms outstretched like a striped tent, and, if the substratum is sandy, the changeable color scheme of the creature fades out to harmonize with the sand, within which it partially buries itself, blending completely with the environment.

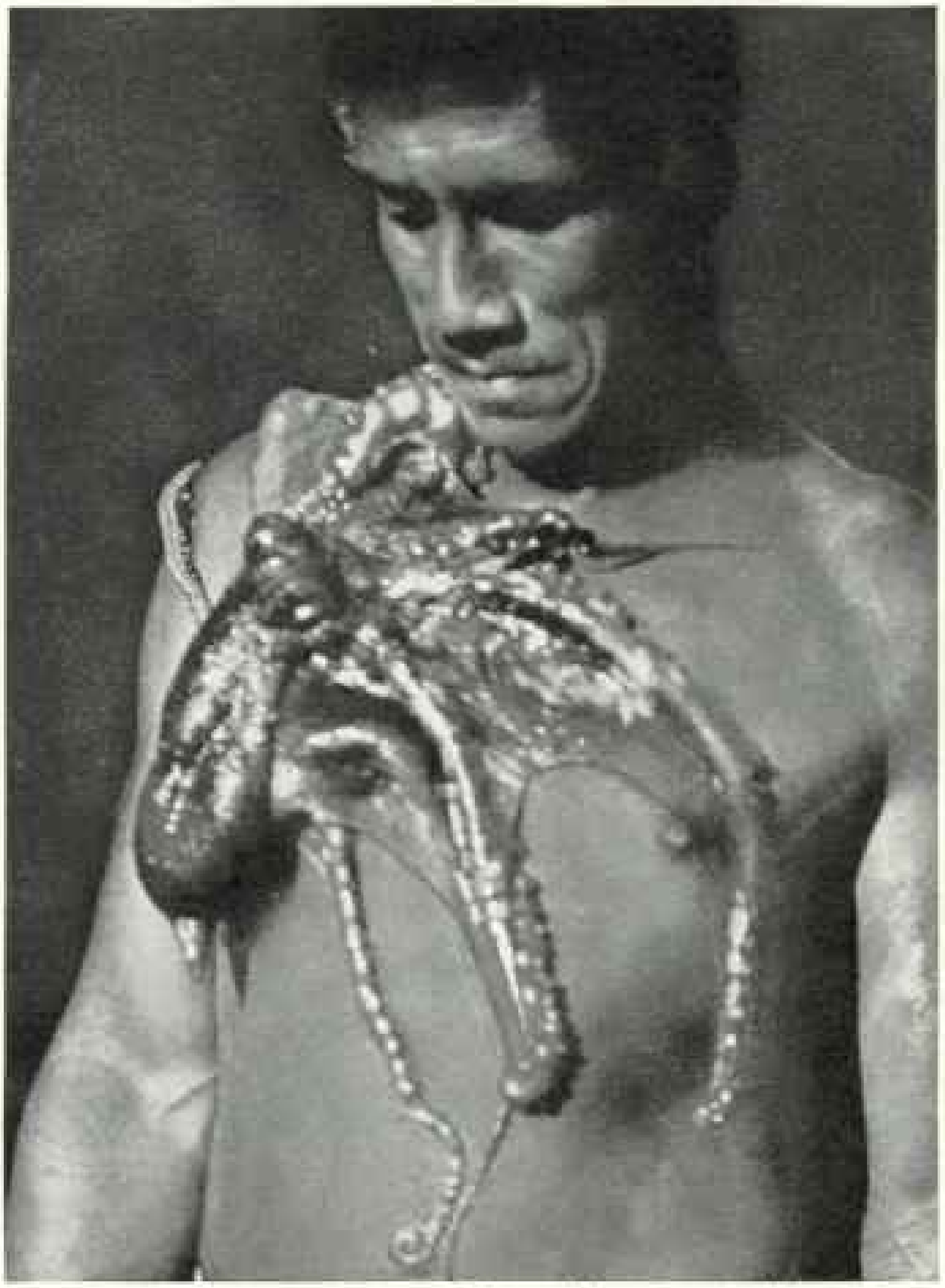
Swimming through the waters of the open seas, hosts of tiny squid and newly hatched octopuses (Plate VIII) gleam in the sunlight. Their translucent bodies, touched with color, stand out against the dark blue of the depths. Some are like fragile crystal vases (*Entomopsis velaini*). Others, equally transparent (*Doratopsis vermicularis*), resemble needlelike lanceheads of glass as they shoot backward through the water.

The short-bodied *Sepiolas* are brilliant with red, violet, and green, and resemble flashing helmets as the light shines on them.

Photograph from Dr. Roy Waldo Miner

THIS RAM'S-HORN CEPHALOPOD, NOW EXTINCT, FLOURISHED ABOUT 150 MILLION YEARS AGO

The fossil resembles the modern pearly nautilus, but belonged to a different group. Instead of separating its chambers with saucer-shaped structures like the nautilus (see illustration, page 207, and Color Plate IV), it built irregular, folded partitions. The specimen, found in Germany, is 10 inches across. Some species grew five feet in diameter.



Photograph from Frances Hubbard Flaherty

ALIVE AND SQUIRMING, THE OCTOPUS MAKES EVEN A SAMOAN SHUDDER!

The sucking disks on the tentacles of this animal caught on a reef are not strong enough to leave imprints on the man's skin. Natives wrap arms of the octopus in taro leaves, roast them over hot stones, and eat them with relish. Many species are found in the Pacific Islands, some making excellent bait for sea eels.

One species of these (*Sepiola rondeletii*) is sold in Italian markets for food. Another little swimmer, though resembling its squid companions superficially, is betrayed by its eight arms as a newly hatched octopus (*Eledone*). A larger squid, also short-bodied and helmet-shaped (*Rossia macrosoma*), is aglow with color as it darts by with tentacular arms outstretched to seize some smaller creature. Its black, parrot-like beak gapes within the circular mouth, disclosed by the spread cephalic arms, all agog with the anxiety of the chase.

An oval squid (*Heteroteuthis dispar*), looking like a highly colored Malaga grape, with flapping fins and trailing tentacles, displays a rounded body so translucent that its brilliant, flashing hues alone define it against the darkness of the tropic waters.

In the depths of the ocean, where the abysses are pervaded with eternal darkness, many forms of life are endowed with marvelous luminescent organs that gleam and glimmer through the black, silent waters with shining lights of various colors—blue, yellow, green, and red. Sometimes these show like rows of tiny lighted windows, or break out here and there like fireflies, or dart past like shooting stars.

LIVING SEARCHLIGHTS OF ABYSSAL DEPTHS

Clouds of light may shoot out from dimly illuminated organisms, or strange, elongate shapes are completely suffused with a glowing substance that causes every detail to become clearly visible, were there anyone there to see (page 189).

Though these shining creatures include fishes, salps, jellyfish, and crustaceans, among the most interesting of all are the deep-sea squid, many of which have been brought to the surface by oceanographic expeditions using a deep-sea dredge.

Rows and groups of luminescent organs adorn these strange animals, usually more numerous on the underside of the body. Semicircles of bright bull's-eyes arch over the eyes of some, and constellations are spread out along the tentacles. Each organ

somewhat resembles a shining eye, for it is equipped with lens and iris diaphragm. Even reflectors are grouped behind the luminous cells to increase and direct the rays that pass out through the lens, while pigmented areas and color screens are adjusted to give color to the emitted light. They are actually living searchlights.

Professor Edmund Newton Harvey of Princeton and other scientists have demonstrated that animal luminescence is due to two definite organic substances, which, when brought together in the presence of oxygen and water, produce an almost perfect cold light, with little loss of efficiency. This is accomplished in certain cells of these wonderful light organs. The organisms that give out clouds and trails of light and those that are completely covered with luminescence secrete a slimy material in which hosts of luminous bacteria are present.

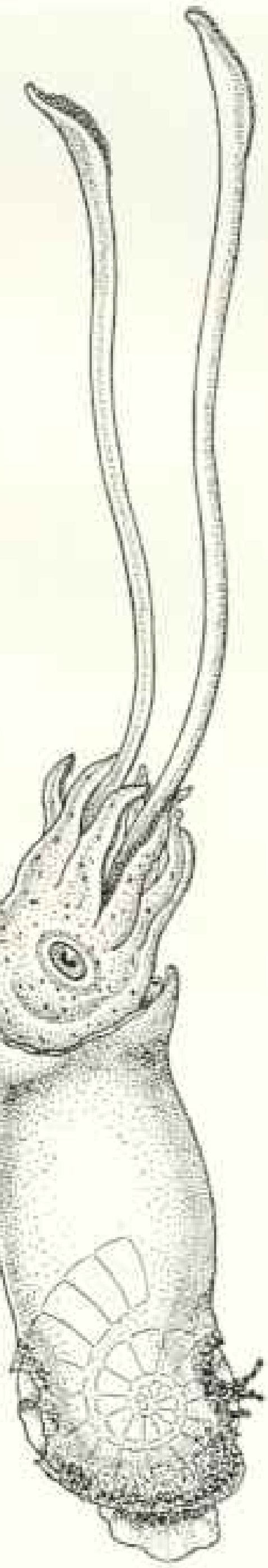
FIRST FAMILIES OF THE CEPHALOPODS

Cephalopods have an ancestral history reaching far back into the geological past. One strange creature, belonging to the group, has come down almost unchanged from those remote periods, giving us a clew to the appearance of certain animals, the remains of which have been preserved to us only as fossils imbedded in rocky strata laid down millions of years ago. This peculiar creature is the Chambered, or Pearly, Nautilus (*Nautilus pompilius*) of far eastern seas (Plate IV).

It is fairly entitled to be called a living fossil. The animal is still inclosed within an external shell, similar to many found imbedded in the rocks as far back as the Ordovician Period, about five hundred million years ago. It is a structure of amazing beauty, with outer wall of porcelain variegated with rich brown stripes, lined with mother-of-pearl. It lives in the outermost of a series of bubblelike pearlaceous chambers, arranged spirally within the shell and gradually diminishing in size, with the smallest of all in the center of the innermost spiral whorl. This was the original home of the creature, even before it hatched from the egg (see page 207).

NAUTILUS CARRIES ITS OWN TRAPDOOR

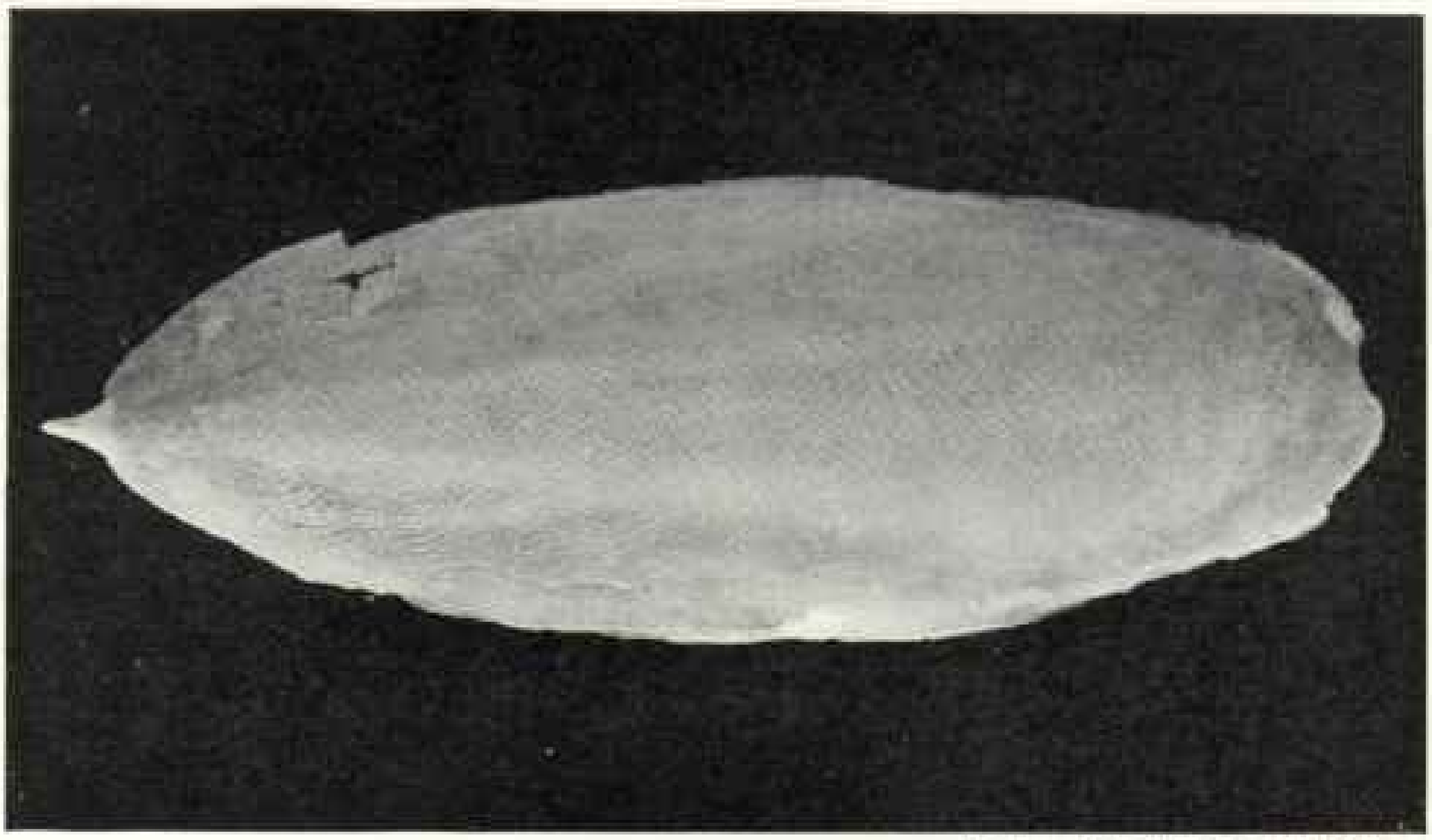
The chambers of the shell are connected by a slender tube, the siphuncle, which is said to supply them with nitrogen gas, keep-



Drawing from Dr. Roy Waldo Miner

A LIVING FOSSIL OF THE DEEP

This primitive squid carries a coiled shell imbedded in the hinder portion of the body. It is rarely captured, but its shell is often cast up on beaches after storms. The drawing is about natural size (see text, page 207).



Photograph from Dr. Roy Waldo Miner

FASHIONABLE ROMANS ONCE USED FINELY GROUND CUTTLEBONE AS A COSMETIC

This internal shell or skeleton of the Mediterranean cuttlefish is sought today for canaries, and is also used as a dentifrice and a polish (see Color Plate III). To catch the animals, fishermen sometimes tow a female behind their boat and capture the males that swim after her.

ing it in proper tension and thus making the shell buoyant.

The nautilus may withdraw itself within the shell, closing down a brownish, leathery trapdoor over its head to protect it from invaders. Soon, however, this is gradually lifted, and a multitude of pale, tapering tentacles emerge and gradually extend themselves, followed by a conspicuous pair of eyes with a pinhole instead of a lens. Then the animal extends a siphon, and, by squirting a stream of water, shoots backward, shell and all.

The primitive character of this relative of the squid and octopus is attested by the multitude of tentacles, instead of eight or ten; by the siphon, which is a rolled membrane, instead of a complete tube; and by many other details of structure, as well as by the coiled outer shell.

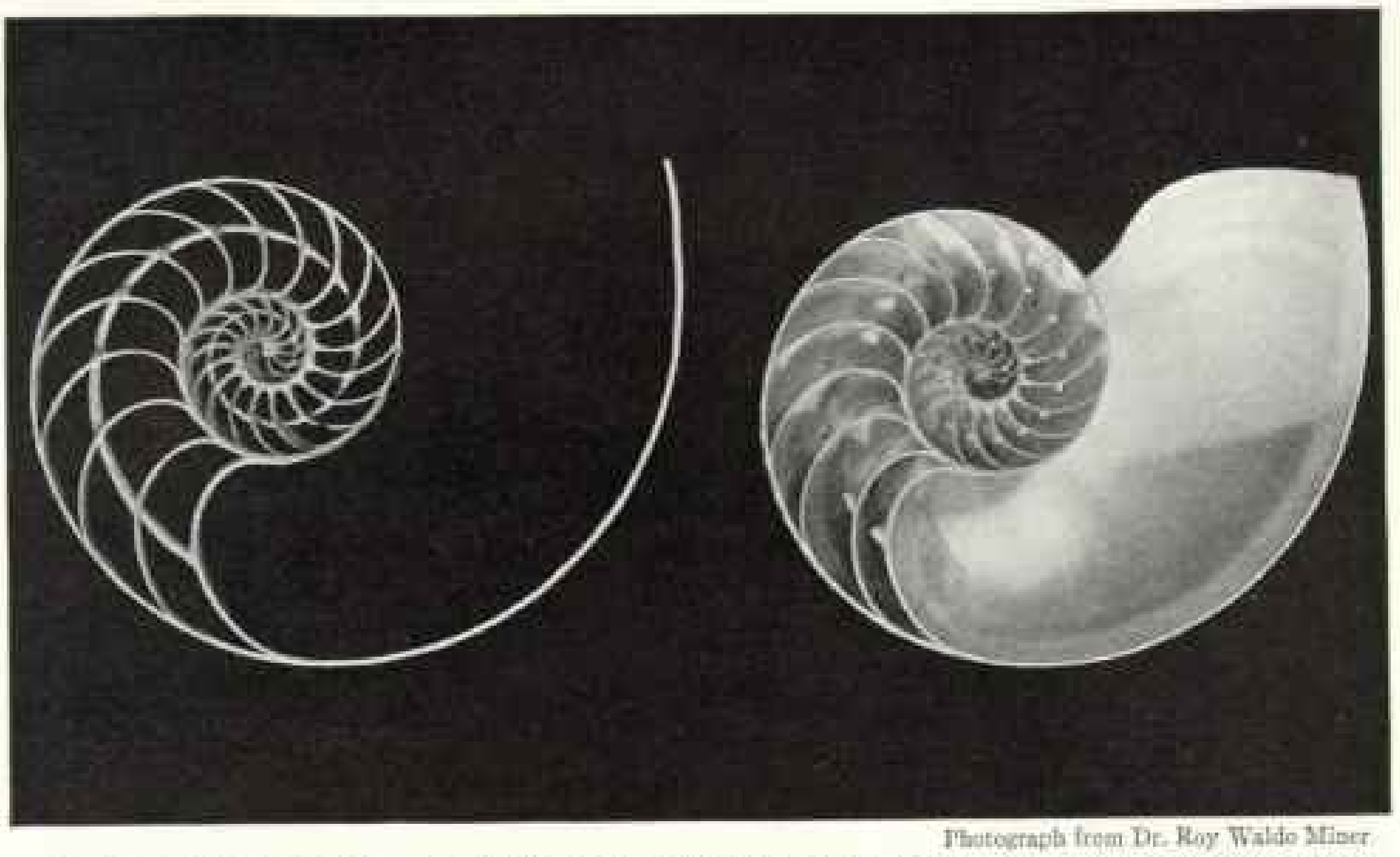
Native fishermen of the Philippines and the Netherlands Indies capture the pearly nautilus and export the shell to China for the manufacture of pearl buttons and mother-of-pearl ornaments. Also the flesh is eaten, but it is not highly prized.

COMES TO SURFACE ONLY TO DIE

Many older natural histories speak of the pearly nautilus sailing over the sea like a fairy boat, perhaps confusing it with other erroneous tales about the paper nautilus. As a matter of fact, the animal never comes to the surface unless it is in a dying condition. It is really a bottom species which swims about hunting for shrimp and other creatures of the ocean floor. It sometimes walks about on its many feet, with the shell opening turned downward.

The story of the evolution of the cephalopods, as already stated, is that of throwing off the shackles that confined their ancestors to the imprisoning shell. In spite of their diversity and relative perfection of type, the cephalopods are few as compared with their fossil progenitors. Not more than 400 living species are known, while over 8,000 fossil forms have been described, and it is impossible to guess how many species left no traces behind them to mark the millions of years during which their evolution took place.

The earliest cephalopods must have been sluggish forms, for all were contained within an external shell. In the most primitive nautiloids of which we have knowledge (*Orthoceras*), this was nearly straight. Some species were only a few inches in length, others more than six feet, but a many-chambered shell was always present.



Photograph from Dr. Roy Waldo Miner

THE CHAMBERED NAUTILUS PUTS ON AN ADDITION WHEN IT OUTGROWS ITS OLD HOME

Before hatching, it occupied the tiny shell in the center of the spiral. As this inhabitant of eastern seas grew, it constructed a saucer-shaped partition that shut off the old chamber, and built a new one in front. All of the rooms are connected by a spiral tube, the *siphuncle*, shown clearly in the thin section (left) sawed out from the middle of the shell. The nautilus secretes nitrogen gas which passes into the empty chambers through the tube. This gives buoyancy to the shell and enables the animal to swim about more freely (see Plate IV).

Later this became loosely coiled, and by the Devonian Age many species came into existence with a closely coiled shell similar to that of the modern *Nautilus*.

During Carboniferous times a great series of cephalopods arose having a shell closely resembling a ram's horn, and so are called Ammonites, after Jupiter Ammon, who was worshiped in ancient Egypt in the form of a ram.

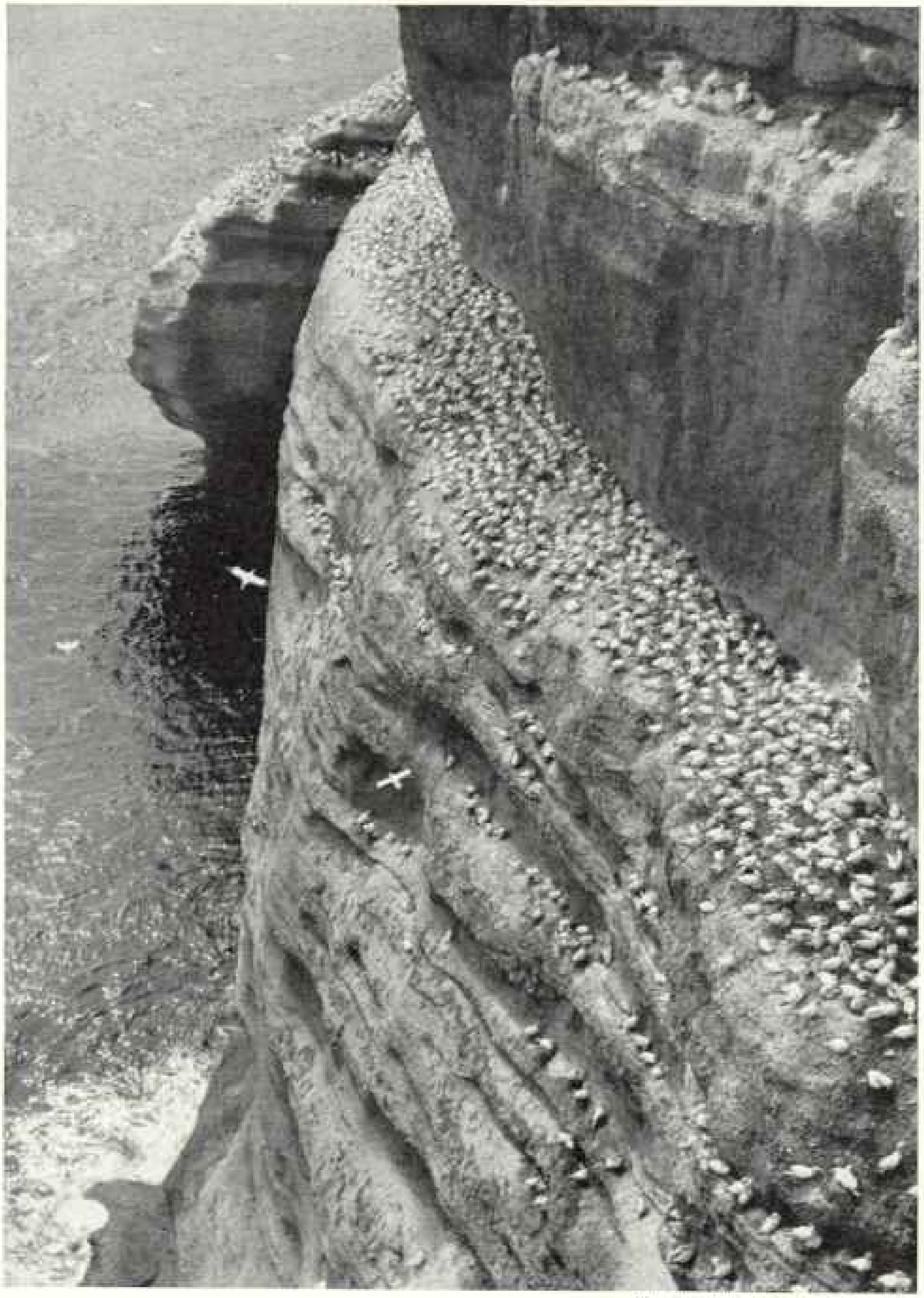
The chambers of the shell were separated by complicated and much-folded partitions. This group became very large and has left many fossils. It died out entirely at the end of the Cretaceous Period, about seventy million years ago, and therefore gave rise to no modern descendants (see page 203).

But from the main nautiloid stem a group originated during the Jurassic Age while the Ammonites were at their height. These creatures were straight in form and had a small-chambered shell at the end of the body, terminating in a sharp spike, and continued forward along the back by a straight supporting blade. These were the belemnites. They must have been active creatures and better adapted for swimming, with their body projecting permanently, half out of their reduced terminal shell.

HOW THE MODERN SQUID SHED ITS SHELL

Apparently they were the ancestors of the modern squid, in some species of which we still find a remnant of the chambered shell. The forward bladelike portion became embedded in the body to produce the internal "pen." One primitive species of squid, *Spirula peronii*, living in deep waters, still possesses a reduced spiral-chambered shell in the hinder end of its body, partly inclosed and partly exposed (see page 205).

It was the fact that the cephalopods divested themselves of the shell during the course of their long evolution, and utilized the remnant that was left as an internal supporting structure, that enabled them to evolve the swift, aggressive, and intelligent marauders of the sea known as the squid, and the equally intelligent though repulsive octopuses that hold sway on the ocean bottom.



Photograph by H. Armstrong Roberts

TEEMING THOUSANDS OF GANNETS FEATHER THE FAÇADE OF BONAVENTURE ISLAND

When strangers intrude, white clouds of these winged fishermen take off from the narrow shelf ledges, uttering a chorus of harsh cries. Black-tipped wings and snow-white bodies identify them quickly. As they dive headfirst for prey, folded wings and pointed bills give them the appearance of swift arrows (see text, page 228, and illustration, page 230).

THE GASPÉ PENINSULA WONDERLAND

By Wilfrid Bovey

LIKE an out-thrust tongue of land at the wide mouth of the St. Lawrence River lies the Gaspé Peninsula, newest wonderland of North America.

Here northern outposts of the ancient Appalachian Mountain system, eastern backbone of the continent from Alabama to Canada, meet the sea and sink beneath it in a chaos of cliff and headland.

Tremendous forces of Nature have left their mark all over the area. Hundreds of years of erosion have hollowed out huge valleys on the northern shore. On the south side of the peninsula red cliffs and red pinnacles stand out in striking contrast with the blue of water and the green of pines.

Beneath the waters lie other mountains, worn and leveled by the waves of centuries. Into these shallows, in countless millions, swarm the cod. Down the slopes flow rivers filled with salmon, streams with romantic, musical names — Matapédia, Restigouche (see map, page 210).

HOME OF HARDY FISHER FOLK

The climate is literally unique. There is plenty of bright sunlight, but no really hot weather. July and August seldom see more than 75 degrees.

Thanks to Gaspé's northern latitude, it has an hour or so more daylight each day in midsummer than Toronto or Boston.

Best of all to me in this favored land is the air—once breathed, never forgotten. "Atmospheric champagne," it has been called.

The Gaspé folk are a strange and interesting mixture.

The first settlers were a few Norman and Breton fishermen who annually made adventurous journeys across the Atlantic to these famous codfishing grounds and finally decided to stay the year round instead of returning to France when the season was over.

Next came the Acadians, driven out of Nova Scotia. A few of them reached some isolated spots on the north side of the Bay of Chaleur, began fishing, and have been fishing ever since (see page 210).

These Acadians have a distinctive accent and a way of speaking largely produced by their maritime habits. A horse "swings" in its course to one "board" or the other—starboard or larboard, as old-time sailors had it—and when you stop the steed is "moored."

After the cession of the country to Britain came Channel Islanders, Guernseymen and Jerseymen from the English islands off the coast of France. Those English-French newcomers, speaking either language with complete facility, as they still do, settled down in some vacant spaces, set to fishing and privateering with Norman energy, and left plenty of descendants behind them.

A few years later, about the time of the American Revolution, groups of "loyalists," or "Tories," left the new United States to establish themselves at the head of Gaspé Bay and in other well-selected spots.

Then the Irish arrived—they, too, had settlements of their own—and another group, northern Irish or Scottish, of bold sea-roving stock in either case.

The Canadian *habitant*, most persistent and prolific of colonists, finally worked his way along both north and south shores and set an example of farming in a country which so far had been entirely devoted to fishing.

Finally, on the St. Lawrence near the mouth of the Metis River, at the landward end of the peninsula, was established a colony of Scottish and English settlers.

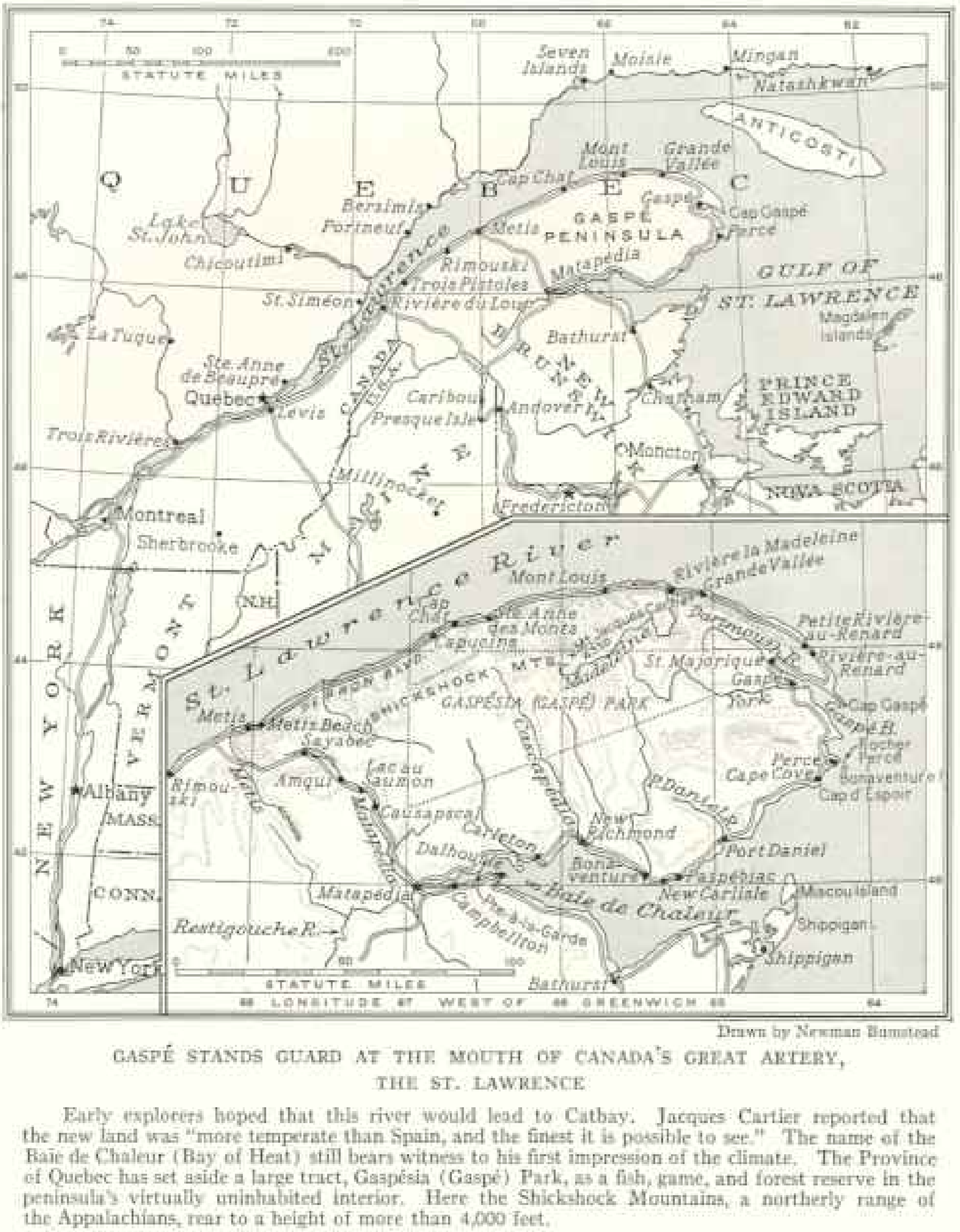
For more than a hundred years, because of the lack of communications, all these little settlements remained isolated from the world and from one another. There were places where a man from one village could visit the next one only at the risk of a broken head.

As you sailed along the shore you spoke Canadian French at one port of call, Acadian dialect at another, Channel Islands French and English or everyday American somewhere else. Still another tongue, that of the Micmac Indians, dotted the map with wild-sounding place names.

A NEW HIGHWAY TO OLD ROMANCE

Ten years ago only a few outsiders had any idea of the interest and beauty of the Gaspé area, for it was difficult of access. The last few years, however, have seen astonishing changes.

By a remarkable feat of highway engineering, a broad, safe, 553-mile road, linked with the general systems of Quebec and New Brunswick, and so with those of



Drawn by Newman Bumstead

GASPÉ STANDS GUARD AT THE MOUTH OF CANADA'S GREAT ARTERY, THE ST. LAWRENCE

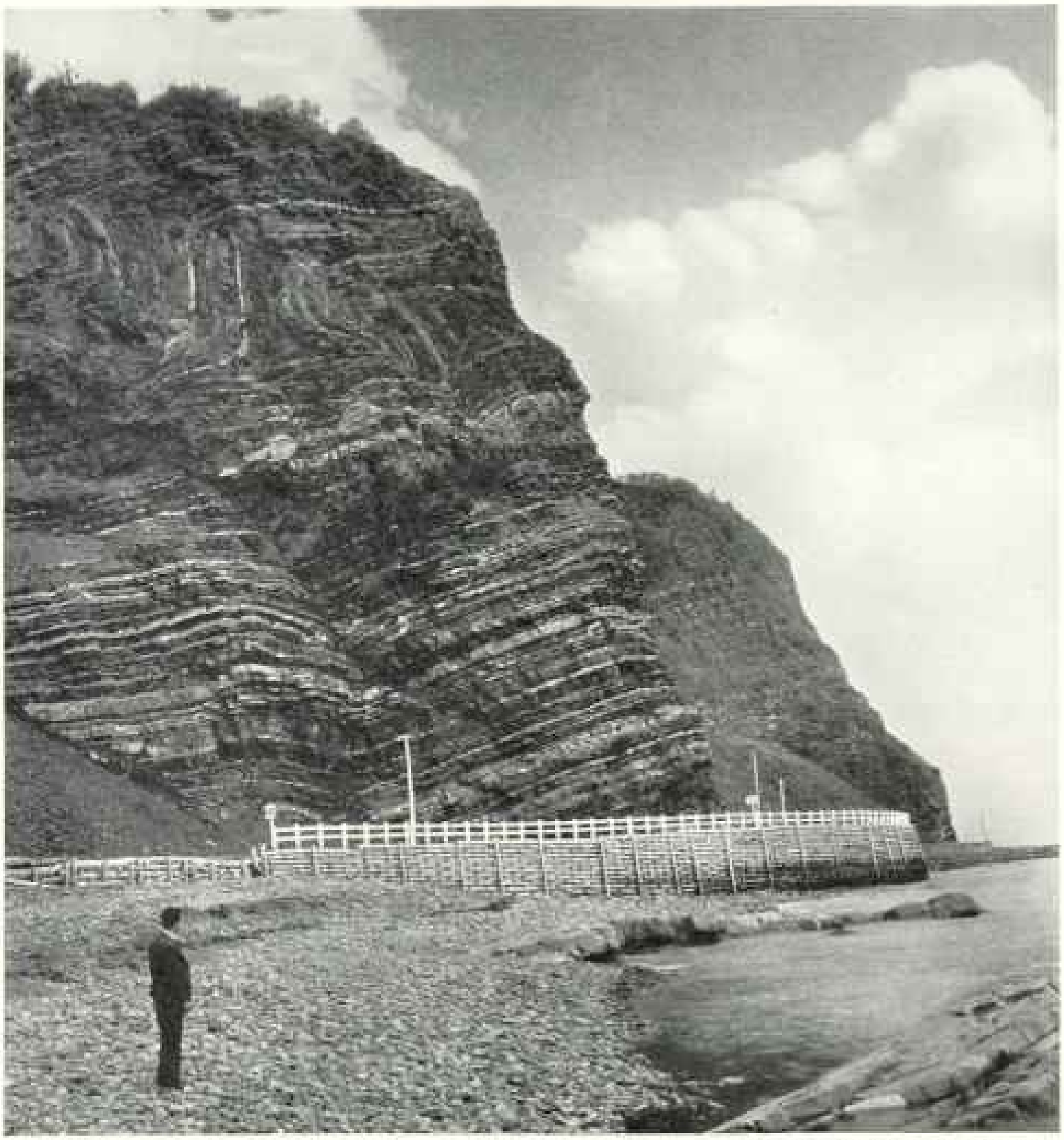
Early explorers hoped that this river would lead to Cathay. Jacques Cartier reported that the new land was "more temperate than Spain, and the finest it is possible to see." The name of the Baie de Chaleur (Bay of Heat) still bears witness to his first impression of the climate. The Province of Quebec has set aside a large tract, Gaspésia (Gaspé) Park, as a fish, game, and forest reserve in the peninsula's virtually uninhabited interior. Here the Shickshock Mountains, a northerly range of the Appalachians, rear to a height of more than 4,000 feet.

New England, has encircled the entire peninsula.

On a sunny morning we crossed the St. Lawrence from Quebec to Lévis. An easy day's journey eastward we drove, through old seigneuries, each with its village, past beautiful old churches and sadly less beautiful new ones, past gray manors and white farmhouses. On our left flowed the great river, growing wider as we sped along.

Late afternoon brought us to Metis Beach, one of the most northerly summer resorts of eastern Canada, and our first town of the Gaspé Peninsula.

We had a supper of red salmon and homemade preserves, and sat watching the incredible St. Lawrence sunset, red and gold and aquamarine, until the beam of the lighthouse grew bright and the stars shone out of the velvet sky.



Photograph by B. Anthony Stewart

UNDER TOWERING HEADLANDS THE HIGHWAY SKIRTS THE ST. LAWRENCE SHORE

With completion of the Perron Boulevard in 1928, rugged Gaspé Peninsula was opened to motorists around its entire area—about ten times that of Rhode Island. The broad road is here protected by a breakwater where it swings around a stratified cliff.

Here at Metis Beach the golfer has his last game, for a while, at any rate. The angler finds excellent trout fishing near by. The sportsman who is not afraid of cold water goes for a swim or a sail in the bay. Already the tonic effect of the northern air is in the blood.

The driver had heard that Metis produced excellent homespun tweed, and we visited a home where it was made.

As we looked around the cozy cottage and spied a young woman in the pleasant kitchen, we thought that life in eastern Quebec was not so uncomfortable after all. We saw when we went out a round of beef and some fat puddings on the table, and knew that we were right.

Morning found us on our way south, across the base of the peninsula, climbing the hills behind the village to the watershed which separates the valley of the Metis River, flowing into the St. Lawrence, from that of the Matapédia, flowing toward the Bay of Chaleur.

Soon we were in a rolling vale filled with farms, with a long, beautiful stretch of

YOUR NOSE KNOWS THE CHIEF INDUSTRY OF GASPÉ

Here a young salt cleans his catch while his patient ox waits with a cart to carry the fish to the drying racks (see illustration, opposite page). Thousands of gulls soon clear the shores of cod refuse left by industrious fishermen.

Photographs by B. Anthony Stewart

LIKE HUGE INVERTED PINE CONES ARE THESE DRIED COD STACKS

Protruding from the piles are hundreds of stiffened tails of fish held down by stones placed on pieces of birch bark. For centuries Gaspé fishermen have heaped their catch in this manner for the buyer's visit (see text, page 225). Rows of nets, beyond, hang in the sun to dry.

Photograph from A. E. Harper

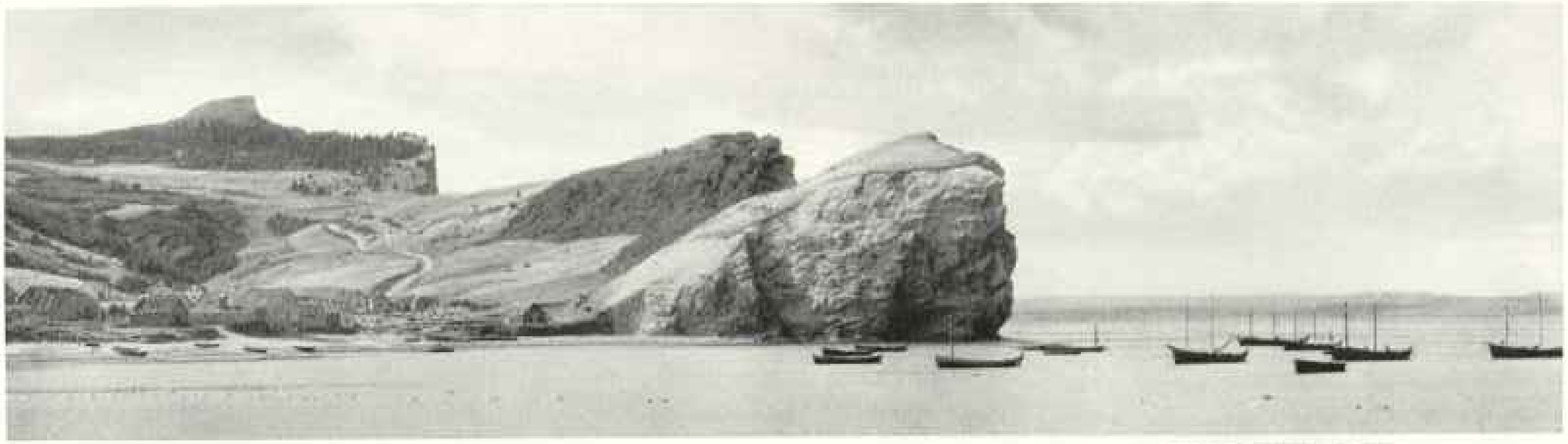
LUCKY FOR THE DOG THAT ONLY BABY CAN'T WALK

Many years ago bicyclists on such isolated highways of Quebec rode in constant fear of roving packs of dogs that would nip the legs. Fortunately, these canine pirates were eventually destroyed by the natives and travelers who often went armed.

Photograph by R. Anthony Stewart

WHEN SPLIT, SPREAD OPEN, AND DRIED, COD BECOME HARD AS BOARDS

Such fish-laden benches, or "flakes," may be viewed and smelled at almost every turn of the road that encircles Gaspé Peninsula. It is estimated that from 20 to 30 million cod are caught annually along the coast. Gaspé fisheries today employ some 5,000 men.



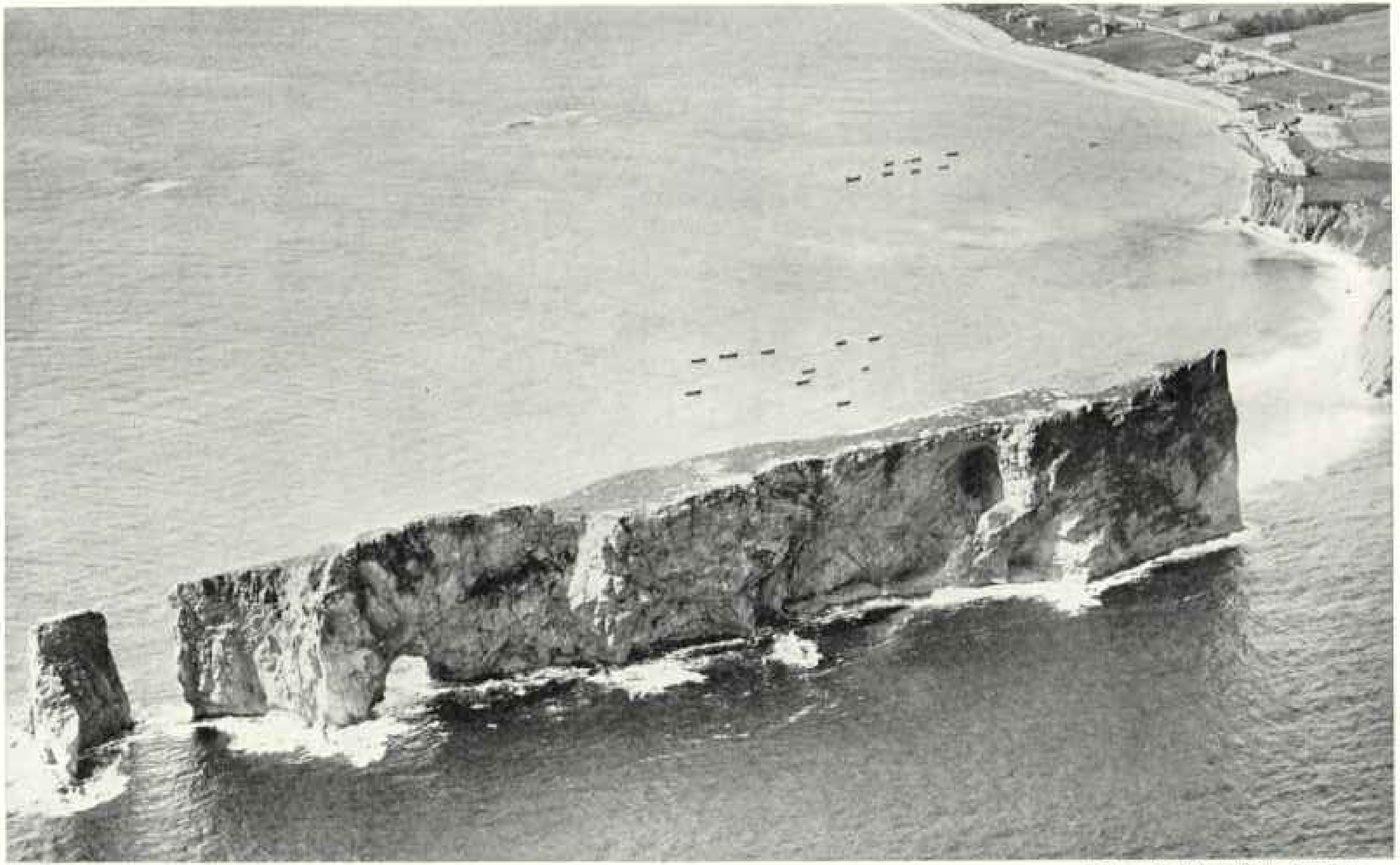
SO SIMILAR DO THESE JUTTING HEADLANDS APPEAR TO SAILORS AT SEA THAT THEY ARE CALLED THREE SISTERS

Not far from Rocher Percé (see illustration, opposite page) tower the striking limestone and granite formations that thrust into the sea like the square jaws of defiant boxers. From the road winding upward there is a splendid panorama of the village, with its cottages sheltered in the valley and the fishing fleet lying at anchor.

Photographs by R. Anthony Stewart

JACQUES CARTIER SOUGHT REFUGE FROM A STORM IN THIS HARBOR FOUR CENTURIES AGO

Warships of France and England, anchored off Gaspé, brought emissaries to the 1934 celebration that commemorated the landing here of the brave French explorer. The drawbridge is raised to admit a gaily dressed vessel to the inner harbor where holiday pennants flutter from smaller craft.



THIS MAMMOTH ROCK SHIP SEEMS HEADED FULL SPEED FOR DESTRUCTION ON THE CLIFFS OF GASPÉ

Angry waters of the Gulf of St. Lawrence have gnawed a hole in the "hull" of Rocher Percé and separated its "tender," towing behind. The rock is disintegrating rapidly. It is estimated that 300 tons of stone and earth fall into the sea annually, and if this rate continues, in about 13,000 years the mass will be annihilated. Dwarfed in contrast is the tiny village of Percé, beyond, with its bright fishing boats anchored in the bay (see Color Plates IV and V and text, pages 225-7).

water in the center. We ran through little towns with Indian names: Sayabec (Obstructed River), so named because of dams built by beavers; Amqui (The Playground); Causapscal (Swift Current, or Water With a Rocky Bottom).

Presently the farms ended; the wooded hills closed in on us; the valley narrowed until there was room only for the road on one side and the railway on the other.

Pines and birches covered the stony slopes; here and there a higher peak dominated the rest. Beside us the river ran like liquid glass over its gravel bed. A wild mountain tributary rushed under the highway.

PLENTY OF FISH, BUT NO FISHING

All too soon the lovely valley ended; we reached the village of Matapédia and the bridges over the Restigouche, the famous salmon river which flows into the Bay of Chaleur and partly divides Quebec from New Brunswick. Bay of Chaleur rivers, and there are plenty of them, are full of salmon, but the fishing rights are strictly reserved. One of Canada's best-known salmon fishing clubs is here at Matapédia.

The road curved round to the east, the Restigouche widened out to flow around a whole archipelago of low, green islands; we were between the tree-clad hills and the beach. A white notice board beside the road told us that we were passing Pointe-à-la-Garde, off which took place the last sea fight between French and English before the cession of Canada.

Now the highway went inland to avoid the detour around another point. We traversed a long valley, its sides cut into natural terraces, and soon found ourselves once again down by the shore.

But it was a different shore. A river had become a bay. The New Brunswick hills were far away in the distance across the water. Brown sandy beaches had replaced the reedy edges of the Restigouche. In front of us rose a round-topped mountain, standing out from the other hills, at its foot a small white town. This was Carleton, named for an 18th-century Governor General of Canada. The manager of our hotel told us a little of the town's history.

"This was one of the Acadian settlements," he said. "You know, monsieur, that in 1755 the Acadian settlers, the French farmers on the western shore of Nova Scotia, were driven from their homes by the English governor of Halifax and American soldiers from Boston. Some of them were taken away in ships, but a few escaped and came to Gaspé and settled here and there along this shore. They called this settlement Tracadigèche, from a Micmac word meaning "The Place of Many Herons."

"But where did the English people come from?"

"Well, monsieur, some of those same American people from Boston did not fight against the English at the time of the Revolution and many of them came to Gaspé, too. Later the name was changed to Carleton."

Frequent use of the phrase "from Boston" is interesting and a survival from colonial days when that city made such a deep impression upon the French of Canada that all Yankees came to be known among them as *Bastonnais*.

As we left Carleton, we noticed a curious beach. Two long strips of sand ran out to form a kind of point, their shore ends nearly two miles apart, their seaward ends separated only by a narrow strip of water, and these two arms enclosing between them a shallow, triangular lagoon. We saw many more such sand bars and lagoons—"barachois" as they are called in Gaspé—as we went along. Indeed, they are characteristic of all the Bay of Chaleur shore.

A few miles more, hills and woods still on our left, brought us to the broad mouth of the Cascapedia River, from where a road runs off to the north to zinc and lead mines. We crossed the river, passed through the pretty town of New Richmond, and traveled on along the south shore. Both road and railway follow the more or less even grade along the top of the low cliffs and there is a level crossing almost every mile.

A CARDINAL'S BLESSING FROM A TRAIN

A train was passing—rather, we were passing the train—one of the specials on the way to the celebrations of Gaspé's fourth centenary. Here and there along the line were groups of children and we saw a red-cloaked and red-gloved figure come out on the rear platform and hold up his hand in blessing as the children knelt. It was the kindly Cardinal Villeneuve, prince of the Roman Catholic Church in Canada.

In the town of Bonaventure we were buying some postcards when a black-robed

CANADA HONORS THE BRETON SAILOR WHO DISCOVERED THE ST. LAWRENCE RIVER

Pressing through the Strait of Belle Isle, Jacques Cartier, a native of St. Malo, first explored the Gulf of St. Lawrence. As part of the 1934 celebration marking the 400th anniversary of the explorer's landing at Gaspé, the Papal Delegate to Canada blesses the site of a new church.

 Finlay Photographs by B. Anthony Stewart

TRIM RED-COATED "MOUNTIES" LINE UP FOR THE GASPÉ CELEBRATION

Renowned and respected, the Royal Canadian Mounted Police force maintains law and order throughout the Dominion. The shields around the arch represent the badges of the various Provinces: left to right, New Brunswick, Alberta, British Columbia, and Prince Edward Island.

MODERN GIRLS POSE IN THE COSTUMES OF THEIR GALLANT FOREMOTHERS

From Brittany, Normandy, and the Channel Islands, fishermen brought their families to settle this peninsula. Later, Acadians hailing from the Annapolis Valley and British loyalists from New England found refuge here.

Finlay Photographs by R. Anthony Stewart

GARNISHED GASPÉ SALMON MADE THE FEAST A COMPLETE SUCCESS

These Acadian girls display the delicious fish on planks. Some settlers on the Gaspé Peninsula were cast up by shipwreck. Many families of English descent now speak French.

UNION JACK AND LILY BANNER VEIL THE CARTIER MONUMENT

In the Baie de Chaleur, in 1534, the French navigator found his way hemmed in by mountains. Realizing he had failed to discover the Northwest Passage to India, he landed at Gaspé near this spot, erected a 30-foot cross, and took possession of the soil for France.

 Finlay Photographs by H. Anthony Stewart

FISHING CRAFT WERE DRESSED WITH ROYAL FLAGS

On the feast day fishermen from near-by waters, piloting small boats decorated with the flags and banners of pre-Revolutionary France, escorted the delegates arriving on the French liner *Champlain*.

Finlay Photograph by B. Anthony Stewart

ROCHER PERCÉ LOOMS OFF THE COAST LIKE A GIANT BATTLESHIP MOORED IN HARBOR

Sea birds wheel and scream at visitors who go out in small boats to see the holes tides have bored through its base at one end. Herring gulls and cormorants find the inaccessible ledges an ideal nesting place. Bonaventure Island in the distance, once the haunt of a privateer captain, is now a sanctuary, guarded by one of his descendants, for countless gannets, kittiwakes, auks, and murres.

A ROCK THAT REFLECTS THE BRIGHTEST MOODS OF NATURE

So many attempts to scale the steep walls of Percé's "prow" have ended in disaster that it is now forbidden to try (see Plate IV).

Finlay Photographs by B. Anthony Stewart

"WHOA, BROTHER . . . LET ME BE HORSE AWHILE"

In this community, where toys have not yet penetrated, parents make at home such crude playthings for their children.

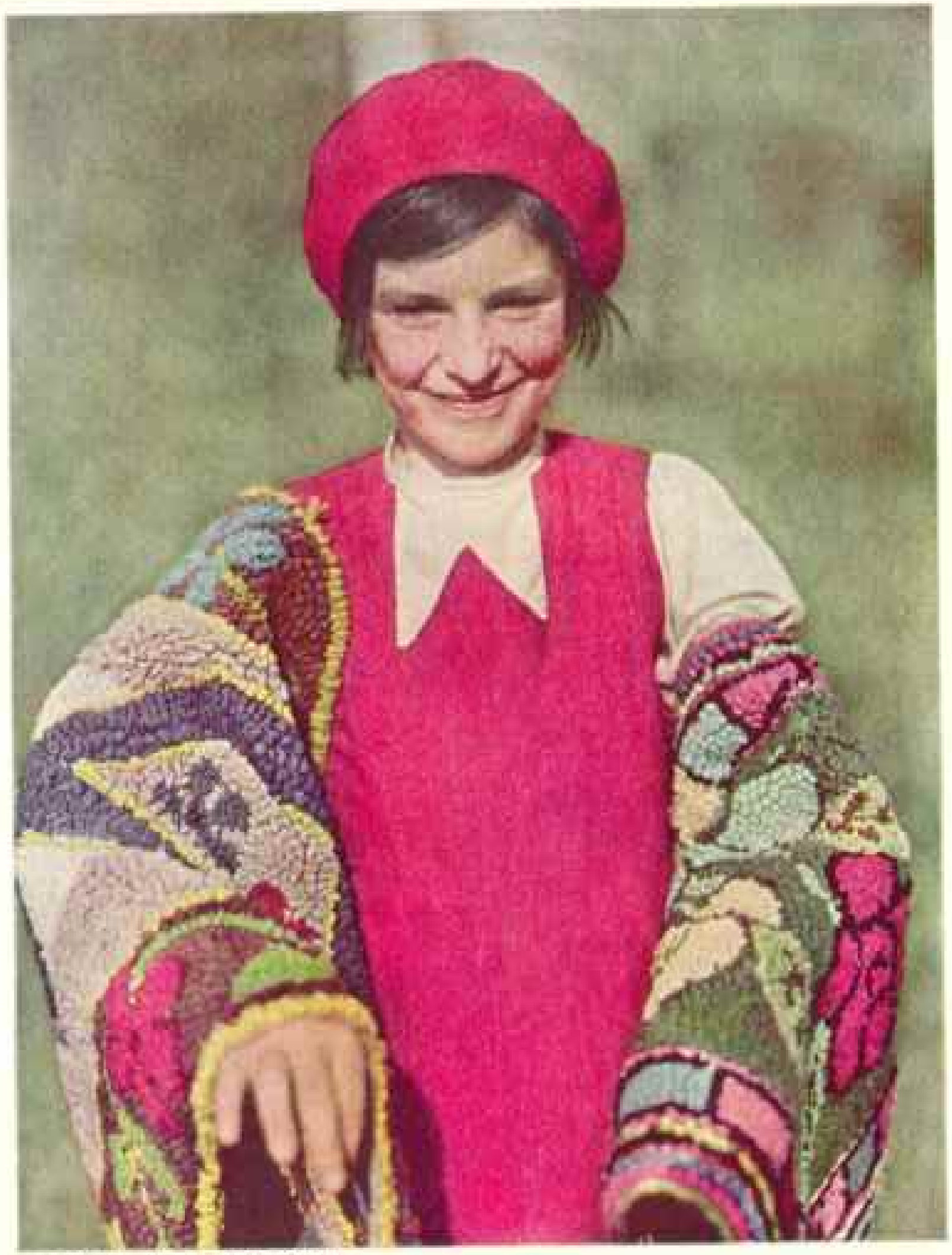
A FISHERMAN OF TOMORROW BEGINS HIS CAREER

Descended from generations of seafarers and trained to the ways of the sea early in life, men living in the coastal villages of the Gaspé Peninsula become expert fishermen.

Finlay Photographs by B. Anthony Stewart

TWO MORE COD TO CLEAN AND CHORES ARE DONE

These boys of Petite Rivière au Renard (Little Fox River) are young but capable fishermen. The cod are cleaned, split open, and then laid out on racks to dry in the sun.



A FRIENDLY PITFALL AWAITS LADEN PURSES

Fishermen's womenfolk used to design and hook gaudy rugs from strips of rags chiefly to pass long winter evenings. Now with the opening of the Perron Boulevard they find their handiwork a source of income.

Finlay Photographs by B. Anthony Stewart

DEEP THICKETS YIELD BIG SUN-WARMED BERRIES

Ranging the hills in search of wild blueberries may be, as one old French-Canadian woman said, "mighty hard on the legs," but the rich harvest of fruit is well worth the effort.

AN IMPORTANT PART OF THE KITCHEN IS OUT OF DOORS

The housewife keeps a fire inside the masonry oven until the thick walls are thoroughly heated. Then she rakes out the coals with the hoelike implement and shoves in the dough to be baked into bread by fireless heat.

 Finlay Photographs by B. Anthony Stewart

A VETERAN SKIPPER EXPLAINS THE TRICKS OF THE FISHING TRADE

On a warm Sunday afternoon, while he watches the nets to see that they dry properly, this old salt spins tall yarns to summer visitors. Collectors of song and legend find the Gaspé a fertile field.

curé came in, the first we had met on our trip. He bade us a polite bonjour.

Our always-inquiring driver asked him about his parish, "Is it an old settlement?"

"Non, monsieur, not so old as some. Hereabouts you have *Canadiens* who came from the upper part of Quebec."

At last we understood that Canadiens still consider themselves different from the Acadians of New Brunswick and Nova Scotia, although to us they had all been French Canadians.

"These people," went on our curé, "were always farmers, and when they came here they began to cultivate the soil. The Acadians who were here first were mostly fishers, but lately they, too, have become farmers.

"The farms are small but good; our farmers think first of supporting their families. They share their machinery and they have their technical advisers from the Government."

We were beginning to find out what important rôles the Government and the Church play in Quebec life.

"Let me tell you this, monsieur, which will surprise you," went on the curé. "Along the coast here, at Cape Cove, are produced the finest peas in North America."

That was the last thing we had expected in Gaspé—something as astonishing as the Idaho potato. We found later that the good curé was right.

At near-by Paspébiac we caught a whiff of the authentic Gaspé industry. The town is an old-fashioned codfishing center, and the smell of cod permeates most of its corners.

Down on the beach were warehouses, and there we found a cheerful guide.

A GASPÉ INDUSTRY FOUR CENTURIES OLD

"Yes, codfishing is an old business on the Gaspé coast," he told us. "It began soon after the time of Jacques Cartier, 400 years ago. This particular company was established by a young Jerseyman, Charles Robin, who was sent over by his relatives some 170 years ago, and Robin is still part of the firm name. Do you see that door and key? Those are the same ones he built into this very room. Of course, things are run differently now; the fishermen are much more independent, for instance, but a great many things are the same. Look at these two piles of dried cod" (see pages 212, 213).

He took us over to two stacks of codfish, split, spread open, and dried so that they were hard and flat as boards. They were arranged in cylindrical piles, the lower end smaller than the top and covered by pieces of birch bark held down by stones.

"So far as I know," said our guide, "cod were stored that way by the first fishermen on the coast and we have never found a better way to do it.

"This whole codfishing business has always been mainly in the hands of Jersey people and soon after the cession many of them moved over here to stay. That is why you find so many Jersey and Guernsey people here now.

"For a long time," he continued, "the Channel Islanders, even though they were able to speak French, kept separate from the Acadians, and the loyalists who settled at Carleton and Gaspé after the Revolution kept separate from both.

"But now education is putting an end to all these differences. People on the Gaspé coast are mostly either English-speaking and Protestant or French-speaking and Catholic. The various accents are all disappearing, although our older Paspébiac folk still have their own dialect."

A few miles more and we found ourselves at the top of a long hill running down to a lovely bay. This was Port Daniel, where Jacques Cartier made his headquarters while he explored the Bay of Chaleur. It is a lovely spot. A wide sand bar almost closes the broad mouth of the Port Daniel River, and most of the village is built on the sand bar.

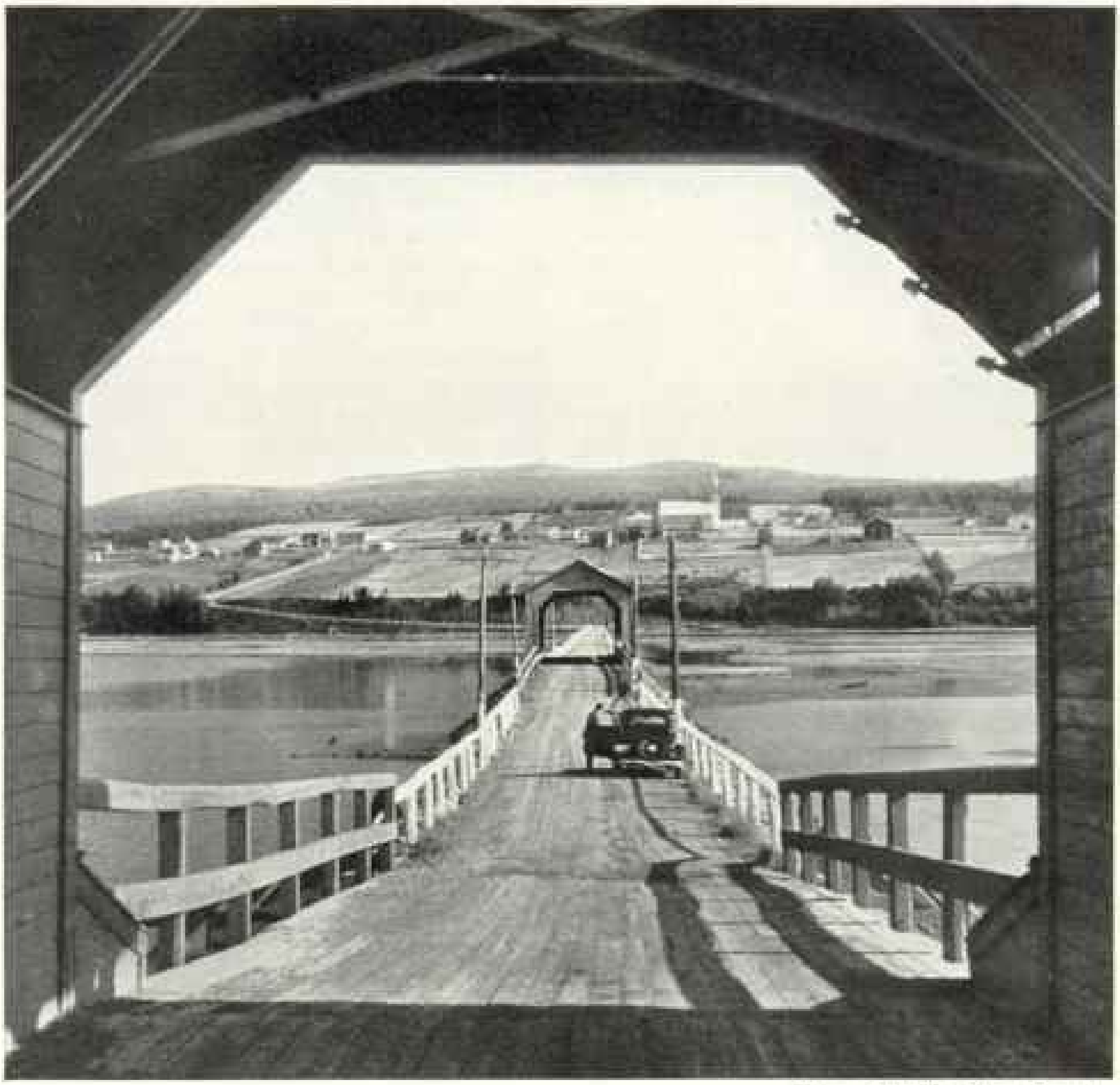
Our road lay between rows of fishermen's cottages and boats. Once across, we had a long hill to climb, for the mountains on our left had come down close to the shore. Then for 40 miles we had a beautiful shore road, every shade of green in the woods and fields, red rocks on the edge of the blue water, white cottages and white sails at sea.

A MONSTROUS SHIP OF STONE

Then suddenly Percé lay before us, and we beheld an incredibly lovely view.

On the landward side were red peaks, partly covered by greenery, then the tops of three fanglike cliffs and a white village nestling between them and the headlands fronting the bay (see Color Plate IV).

Offshore stood the magnificent Pierced Rock, Rocher Percé, looking like the wall of some huge sea fortress or a monstrous



Photograph by B. Anthony Stewart

AN OLD COVERED BRIDGE FRAMES THE FARMS OF ST. MAJORIQUE

A few miles north of Gaspé, and beyond the broad lagoon at the mouth of the Dartmouth River, sprawls this prosperous little parish. The trestle and bridges, with their suggestion of an old New England landscape, form a link between the northern half of the peninsula along the St. Lawrence River and the south shore bordering the Baie de Chaleur (see Color Plate III).

battleship, dwarfing to insignificance the village to which it gives its name. Near its outward end an arch had been cut through by the action of the water. Farther seaward was the sentry tower of the wall, a smaller pinnacle of rock, originally joined to it by another arch which long since has fallen in (Plate V and p. 215). Farther out still lay Bonaventure Island, its cliffs topped by trees and meadows.

The golden evening light behind us gave its own charm to the scene, and, to add a touch of life, a little fleet of fishing boats was slipping out for the evening catch.

Early next morning we wandered down to the foot of the great rock. One can walk along a sand bar there at low tide and look up at its gigantic bulk as if at some huge ocean liner.

From stem to stern, without counting its outlying pinnacle, it is 1,420 feet long—400 feet longer than the new French liner, *Normandie*. Its greatest beam is about 300 feet and its prow stands 288 feet high. The weight of only the part of the rock above the waterline has been estimated at four million tons.

The massive rock is an eloquent page in geological history. Once part of a bed of ancient limestone lying flat in the ocean, it was torn from its place and tilted straight upward. The brown mass is streaked with

Photograph by R. Anthony Stewart

PETITE RIVIÈRE-AU-RENARD SHOULD BE PETITE RIVIÈRE-AU-POISSON

Little Fish River rather than Little Fox River would seem a more appropriate name for this settlement, since the livelihood of most of its inhabitants depends upon cod, herring, and salmon hauls. Boats and benches for catching and cleaning fish are strewn over the limestone shingle beach within a stone's throw of natives' homes. The Society's photographer excited much wonderment in this rather isolated, but delightful, village of the northern coast of the peninsula.

red and purple lines, and in it are the fossil remains of the symmetrically scalloped bivalves which aeons ago were living out their placid life deep under water—brachiopods of the Lower Devonian, the geologist labels them. Time indeed has built them an extraordinary monument. In bright sunlight, in mist, or under clouded skies Percé Rock's colors are different and constantly changing, through hues of purple-red, bright yellow, gray-blue, and a thousand other shifting shades. A mantle of greenery and a ribbon of orange-red lichens further adorn the mass of multicolored limestone.

This, then, is the famous natural wonder that was found by Cartier on a July day four hundred and one years ago as he sailed out of what he called the Bay of Heat—the Baie de Chaleur.

As we gazed and walked, the morning air was full of the smell of fish and the screams of birds. Above the beach near by hundreds of gulls were volplaning and crying, diving to seize bits of the offal thrown aside the night before when the cod were being cleaned. They had learned through years of experience not to go near the low frames on which dozens of cod, headless, split, and flattened, were drying in the sun.

Photograph by H. Armstrong Roberts

DOBBIN STANDS PATIENTLY IN THE WATER WHILE HIS MASTER TRANSFERS CODFISH AT PERCÉ

French-speaking natives of the peninsula told the author that such vessels were adaptations of the originals built by early Breton sailors. Beyond looms the Rocher Percé (see Color Plates IV and V and pages 215 and 225), a bold rock cliff cut off from the mainland at high water.

"When the French fishermen first came here, very long ago," said a local patriarch, "they dried cod just as we do now, and they tell that there was a chapel here for them four hundred years ago." (We found later that he had exaggerated a little, but not much.)

A good-natured sailor, the owner of a stout and seaworthy boat, took us out to Bonaventure Island. As we came near we saw the high cliffs streaked with white. We wondered; then we saw—and heard as well! Thousands and thousands of gulls, white gannets as big as geese, kittiwakes, and cormorants thronged the rocks and filled the air like snow (see pages 208 and 230).

BIRDS ADD BEAUTY TO RED CLIFFS

Bonaventure Island is a bird sanctuary and the birds know it. They flock here in vast legions and add to the lovely beauty of these red cliffs as they circle about in white whirlwinds of plumage or stand at attention along the lofty ledges.

In early days the Indians lived in fear of Miscou Island, to the south. There, according to legend, lived a fearsome ogre which was wont to stride across the channel, gather up a handful of humans, and bear them back to its island lair to be devoured.

We climbed the cliff and found ourselves looking at another miraculously beautiful view. In the foreground lay the bright island meadows filled with brilliant flowers. Then came the blue strait, the wall of Percé Rock, the shore cliffs, and the three pinnacles which we had marked as we drove in from the west, their landward sides cloaked in greenery, their seaward precipices red in the sun. And in the background climbed to its central height the climax of that wonderful panorama, Mount Ste. Anne, mighty remnant of a much larger mountain, the rest of which has split off and slipped down to build the wild and lovely scenery.

But time was flying; we had just enough of our day at Percé left to get back to the shore, climb the hills behind the village and find ourselves in a maze of trees, red buttes and pillars of rock such as one sees in Col-

orado, looking out over the immense inland plateau of Gaspé, seemingly as wild today as it was when Cartier came to Canada.

The sun was setting amid red lines of cloud. Beyond the wooded plateau and in the distance, silhouetted against the light, we saw the Shickshocks along the northern shore of the peninsula.

These Shickshocks are strangely shaped. Their summits are almost level; the peaks have been washed and ground away, and only the flat foundations are left. In the distance they look like a barrier, with higher towers rising here and there above it.

The next day we started for Gaspé. Our road lay first through a mountain valley. We ran along a shelf above a wilderness of woods, with a peak on our right, green and rounded on the landward side, that ends in a vertical red cliff, hundreds of feet in height, fronting the sea.

Down a steep hill to the beach, along the bar of another barachois, up and down hills we went, around the end of the peninsula, until Gaspé Bay lay before us. On its south side, along which the road runs, are hills and woods and farms. On the other side we saw a line of cliffs, then a narrow strip of farm land, then a range of wooded heights ending in the 700-foot cliffs of Cape Gaspé, a long stone finger pointing southeastward across the mouth of the bay.

As we drove in toward Gaspé village, we saw the Basin, the upper section of the bay, filled with ships, gray warships, British and French, this time visiting Gaspé together in peace.

When we reached the bridge across the York River south of the little town, we found it crowded with people; through its arches a fleet of fishing boats, each bearing the banner of a province or a city or a mariner of Old France, was chugging out to meet the visitors.

"It is not Old France coming to visit New France," said the Marquis de Lévis-Mirepoix. "This is Old France, they welcome us, the people of a new country."

FRENCH LILIES, BRITISH UNION JACK

A notable character of early Canadian history was Marguerite Bourgeoys, one of the first teachers of the children at Montreal. When Henri Bordeaux, famous French littérateur, stepped off the gangplank, a smart and charming young lady greeted him.

"Your name, mademoiselle?"

"Marguerite Bourgeois." The words were an echo of long ago.

It was a great day for Gaspé. The Mayor told us how they had been making ready for months and showed us the huge granite cross still veiled with the lilies of Old France and the Union Jack, waiting for the ceremony of unveiling. Later the unveiling took place, with guards of honor from French and British navies trying to keep their eyes off the charming young ladies—dressed like their ancestors, the first settlers — whose songs were as sweet as their looks (see Plate III).

The Cardinal gave his blessing; a Minister from Britain, a future Prime Minister of France, the Prime Ministers of Canada and Quebec, all had their tribute to pay to the courageous Frenchman who discovered the St. Lawrence.

We stayed till evening and watched the sky fill with fireworks, then departed for Rivière-au-Renard (the residents usually call it the Fox River), across the hills and on the north shore of the peninsula, where we found an old fish storehouse converted into a hotel. It was the custom in Gaspé to call the storehouses after the names of wrecked ships. The Caribou Inn has "China" over the door, and another warehouse is named "Actæon."

THE JOURNEY'S MOST THRILLING RIDE

Next day came the most thrilling part of our journey. Starting westward from Rivière-au-Renard we ran up- and downhill along the shore, then struck inland, climbing all the time along the side of a hill, a valley on our left, wild green mountains beyond it. Suddenly we reached the crest, dropped steeply down to the side of a lovely lake and followed it to the shore. A few more miles of up and down, the elevations getting greater and greater, brought us to Grande Vallée, a little fishing village at the mouth of a river.

From here on we must make our way across spurs of the Shickshocks, spurs which run down to the sea from the main range like the bones of a fish from its backbone.

We turned inland, climbed a seemingly endless hill, and went down a steep incline marked for our encouragement "DANGER COMPRESSION LOW GEAR." The woods grew darker; we swung across a brook, made a sharp turn and climbed another hill, to come out 2,000 feet above the river, with

Photograph by H. Armstrong Roberts

LONG-BILLED GANNETS HUDDLE TOGETHER, SHELTERED FROM HARM ON THEIR ISLAND SANCTUARY

Driven from one breeding site after another by advancing civilization, these interesting and curious birds have been given a nesting home at last on Bonaventure Island, off Percé, in the Gulf of St. Lawrence (see Color Plate IV and illustration, page 208). In such inaccessible cliff rookeries they rear their young in saucerlike nests of seaweed.

such a panorama of blue and green as we shall never forget.

Down we went to another village, its boats far out on the water, up, inland again to avoid impassable cliffs, more woods, more hills, then down three miles, an 800-foot drop to the mile, to reach the Madeleine River. A little town lies at the foot of the cliffs, and we paused for a lazy luncheon at a bungalow with its front lawn decorated with Noah's Ark animals. Twenty miles more, now on the face of a hill looking out over the water, now dropping through a glade of trees to sea level.

At last we angled down the face of a huge cliff to reach Mont Louis, at the head of a bay, the only real harbor on this wild coast.

We ran for miles along the foot of towering precipices. A little stream drops a thousand feet and turns to rainbow dust long before it reaches the roadside; the highway is built on a causeway of rock and heavy timber to protect it from the tide. Once again we climbed and climbed, 1,500 feet this time. Down we went into another deep valley, then up 2,000 feet into the clear air. The scent of firs was in our nostrils, the sunbeams sparkled back from the dancing waves far below.

A marvelous road this is, a veritable Corniche Road of the New World.

Finally we reached Ste. Anne des Monts, St. Anne of the Mountains, whose name commemorates Quebec's favorite saint.

After a "shore dinner" we started on the last lap. The sun set across the St. Lawrence, the lights of a ship twinkled out as the sky and sea grew darker. We caught a glimpse of a deep rocky cove; saw the strange rock, cut by ice and weather into the shape of a friar, which gives a village the name of Capucins. A yellow harvest moon climbed the sky. Our Gaspé trip was over.

WITH WILD ANIMALS IN THE ROCKIES

By Lucie and Wendell Chapman

With Illustrations from Photographs by Wendell Chapman

OUR close association with many species of wild animals during the past two years came about in a curious manner.

In the National Geographic Magazine and in books we had read much about the remarkable fauna of the United States. During vacations spent in the western mountains we had made the acquaintance of some of these unique animals, and had been fascinated by the strange realm in which they live.

The call of the wild plus the universal desire to get away for a while from the strain and worry of everyday life led us to that land within our own country where peace and contentment can be found.

The home land of the American eagle, symbol of freedom, beckoned as an escape from the grind which makes men old before their time.

Accordingly, we obtained an indefinite leave of absence from business, and left with complete outing and camera equipment for the mountains of Colorado, Wyoming, and Montana, on a two years' jaunt.

Many of the most interesting wild creatures, we found, are slow to accept man as a member of their communities. Some are nocturnal, the heat of day as well as fear keeping them under cover until evening. Superb senses of sight, smell, and hearing enable animals to avoid such a noisy, odoriferous, and conspicuous being as man.

During the evenings and early mornings, the best times to see them, the air currents in the mountains usually shift, broadcasting man's presence regardless of how well hidden he may be.

A BEAVER'S APPETITE RUINS A BLIND

Blinds are satisfactory for observing birds; "out of sight, out of mind" generally applies for them. But most mammals can detect a man readily unless the wind blows steadily in his favor, a condition not to be relied upon in mountain haunts.

Elk and moose steered clear of our blinds. We were no more hidden than a goldfish. One evening a beaver tore a hole in our blind of aspen branches, sniffed knowingly at us, and then proceeded to wreck the structure and haul it to storage for winter food.

No matter what we did, we were as conspicuous as a cat with a bell, and so we gave up trying to hide.

Then we tried camera traps, but had no better luck. A bear knocked the camera over, a badger nearly buried it with the dirt he showered out of his burrow, and a pine marten ran off with it. He got the trout which was used for bait so tangled with the string tied to the trigger that he dragged the camera twenty feet, and probably would have carried it farther had not the string broken. He evidently had no intention of abandoning the meal.

From the zigzag streaks the camera had made on the ground, we judged the marten had entered into a savage tug of war, weaving back and forth as he leaped away with the fish.

FRIENDLY ADVANCES SUPPLANT STRATEGY

Now that blinds had proved unsatisfactory, not a single good photograph had been obtained by the camera trap method, and stalking had given but fleeting glimpses, we decided upon another course. Perhaps the animals would respond to friendly advances and go about their normal activities, just as they do when harmless wild neighbors are present.

The idea was suggested to us by the beaver who wrecked the blind, and that evening came up and walked over our feet, sniffing us with her cold nose and touching us with her damp paws as she pulled the branches away. Subsequently her colony disregarded us while they went about the harvesting of quaking aspen trees for storage under deep water in the winter food pile (see pages 239, 241).

At another time, we had been quietly stalking a beaver along a river bank, but were unable to approach before he dived and swam upstream. Finally, tiring of being shadowed, he whacked the water with his paddle tail and swam about impatiently.

Realizing that stalking was futile, we decided to walk boldly out and if possible take a picture of him splashing. When we did so and began talking to him, he stopped "slaplunking," approached within a few yards, and crawled onto the shore to cut and eat a willow twig.

Several times later, beavers became confident upon our walking out in plain sight and talking in soft tones. Others familiar with the beaver in the wilds have reported similar responses.

ANIMALS, LIKE MAN, RESPOND TO FRANKNESS

The reason for the actions of the beaver may be that minds of animals are more human than we ordinarily realize. Probably the beavers react much as people do. If they observe someone slinking about, they assume he is trying to hide, and for no good purpose. But if he goes about in an open, friendly manner, they may conclude he is not an enemy.

At any rate, frankness gained the confidence of many wild animals and afforded opportunities to observe at leisure individuals of nearly every species we encountered. Bighorn sheep, mountain goats, moose, elk, marten, and many others, including the wary cony, often paid little attention to us as they worked, played, and fought.

However, most animals were suspicious of quick movements or sudden noises. Wild creatures are usually very deliberate except when excited. Consequently, they associate rapid action with excitement, and excitement usually means danger. Therefore, to gain their confidence, one must move slowly and quietly.

A few animals in protected areas deliberately seek man for his food. Black bears, squirrels, and many birds are in this class. However, they are not entirely natural in such surroundings. The more timid animals, such as the marten, beaver, grizzly bear, elk, and moose, can best be observed far from human habitations.

A boat supplies quiet transportation wherever there is sufficient water. Many lakes are accessible to automobiles at some point along the shore. Such lakes often have excellent wild-life communities on their distant shores and up their tributary streams, particularly if there are no boats on the lakes.

To reach such districts we have for years used a folding boat consisting of a steel and wood frame covered with heavy waterproofed canvas (see page 238). The boat weighs 150 pounds and is capable of carrying half a ton. Although it packs in an automobile, it is more seaworthy than the ordinary rowboat. An outboard motor provides power for long runs and oars give quiet transportation in the animal territory. The boat is more satisfactory for entering animal haunts than pack trains, which create a commotion and frighten wild creatures away.

During varied experiences and close contacts with wild animals, we have had few evidences of hostility, but, of course, those few cases stand out in memory—sometimes even in nightmares. The mere circumstances under which a large wild animal is seen often make the experience a vivid one, even though the animal had no unfriendly attitude.

For example, sleeping on the bare ground many miles from the nearest habitation and awakening in the middle of the night to peer up and see a black bear standing at his full height on a moonlit ledge a few feet overhead on the mountainside, craning his neck and waving his nose from side to side to find out what on earth that thing in the sleeping bag is, does not exactly lull one back to sleep.

PINE MARTEN HOSTILE, BUT TOO SMALL TO BE HARMFUL

One of the most hostile creatures we met, in so far as spirit is concerned, was a pine marten, who was entirely harmless because of his size. Although he came to the bedside several times a night and received bacon, eggs, jelly, bread, or cookies, all of which he relished, he bared his teeth and growled a surly thanks. If he had weighed fifty or more pounds instead of three, a human being would not have been safe in his woods (see page 240).

Bison on several occasions hoisted their small tails, which are by no means flags of truce. A hoisted tail and a glare mean in buffalo language "Proceed at your peril."

Late one evening in midwinter a bull moose bristled his mane and quarter-circled one of the authors who was on skis and unarmed. Unable to reach safety, he merely stood as the moose charged; it was the only thing to do. The moose stopped seventy-five feet away, slowly settled his bristles, and then trotted off through the three feet of snow.

Incompleted charges are quite characteristic of wild animals, who are familiar with the art of bluffing. This trait is well developed in the bear.

REMNANTS OF BUFFALO HERDS THAT ONCE POUNDED THE PLAINS SURVIVE IN YELLOWSTONE

When American bison charge, they give warning by raising their tails, but it is difficult to dodge them, for they are as nimble as cats and on rough ground can outrun a horse. Their shaggy "robe" is impervious to cold, but they fear deep snows that bury the grazing range.

Photographs © Wendell Chapman

THESE "MILITARY GRIZZLIES" OFTEN MARCHED AND MANEUVERED IN STEP

High shoulders, saddle back, and long hind feet like a man's distinguish the grizzly bear. Brown fur, frosted with white on the upper parts of the body, has earned him the nickname "Silvertip."

THIS ALERT PRONGHORN DELIGHTED IN RACING BY AND CUTTING IN AHEAD OF THE PHOTOGRAPHER'S GALLOPING HORSE

Living in open country, the American antelope depends for protection upon keen eyesight and superior speed. The race horse is only slightly swifter than this slender little animal

Photographs © Wendell Chapman

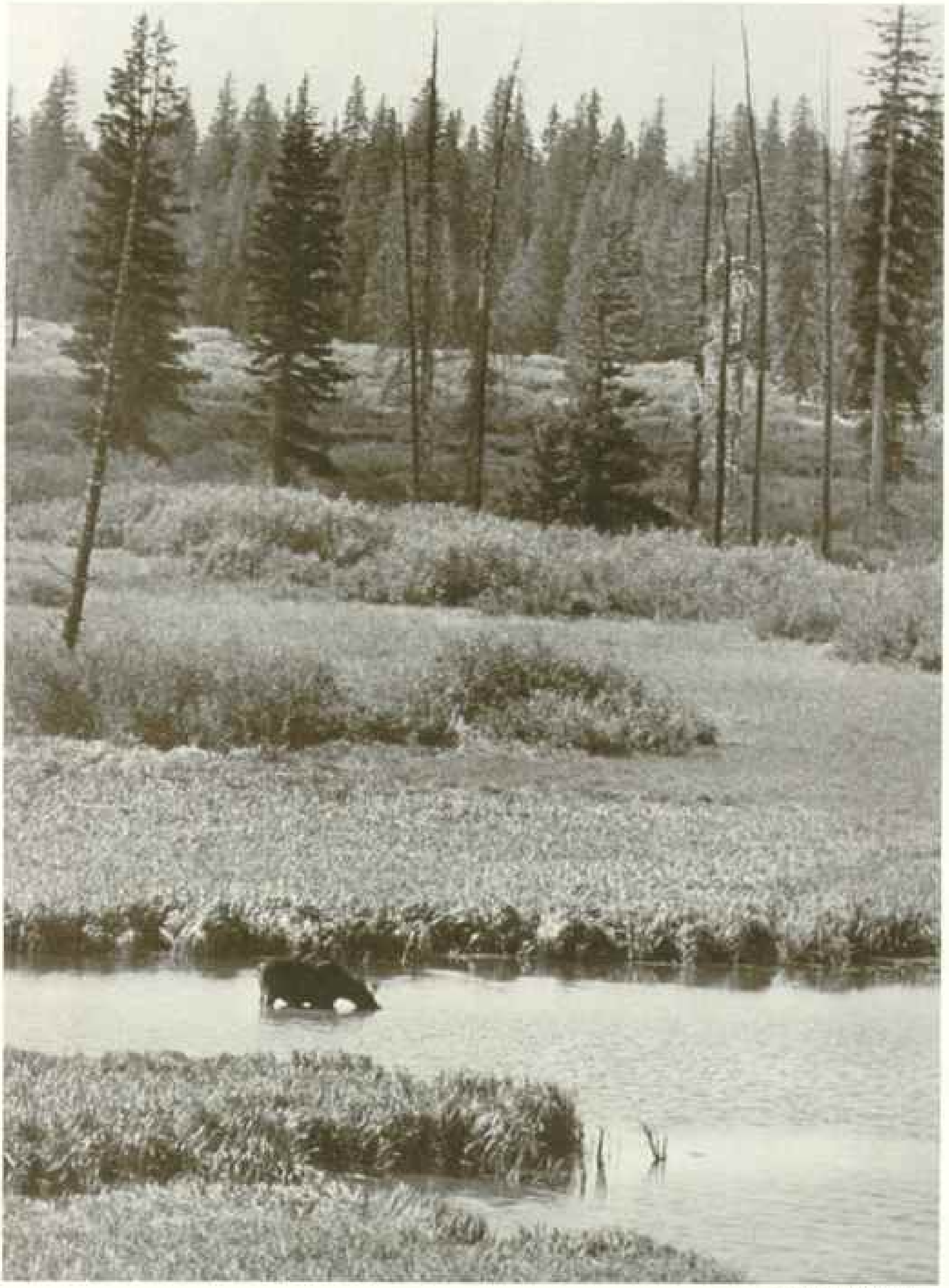
THE MOOSE CALF WAS TIMID ABOUT ENTERING WATER, BUT, FRIGHTENED, IT FINALLY WADED OUT AND JOINED ITS MOTHER

In summer they feed on plant life in shallow lakes and marshes. Twigs, leaves, bark, and sometimes grasses supplement this diet.

© Wendell Chapman

THE BRIDGER LAKE DISTRICT, SOUTH OF YELLOWSTONE NATIONAL PARK, IS IDEAL MOOSE COUNTRY

When the authors first approached, the calf (left) was hidden, and the cow, upon seeing them, barked a deep throaty "waugh." Evidently she was telling the calf to lie low. As the human visitors came upon the hiding place, the youngster jumped up and waded across the pond.



© Wendell Chapman

THIS YOUNG BULL MOOSE IS LOOKING FOR TENDER WATER PLANTS, NOT TROUT

Day after day he remained near the pond, not traveling more than a mile in any direction. Moose are not wanderers, and prefer a small range where they can live the year round. The Thorofare country in Wyoming provides everything they require. When shallow lakes freeze over, the animals browse on willow bushes, and find shelter in the heavy timber.

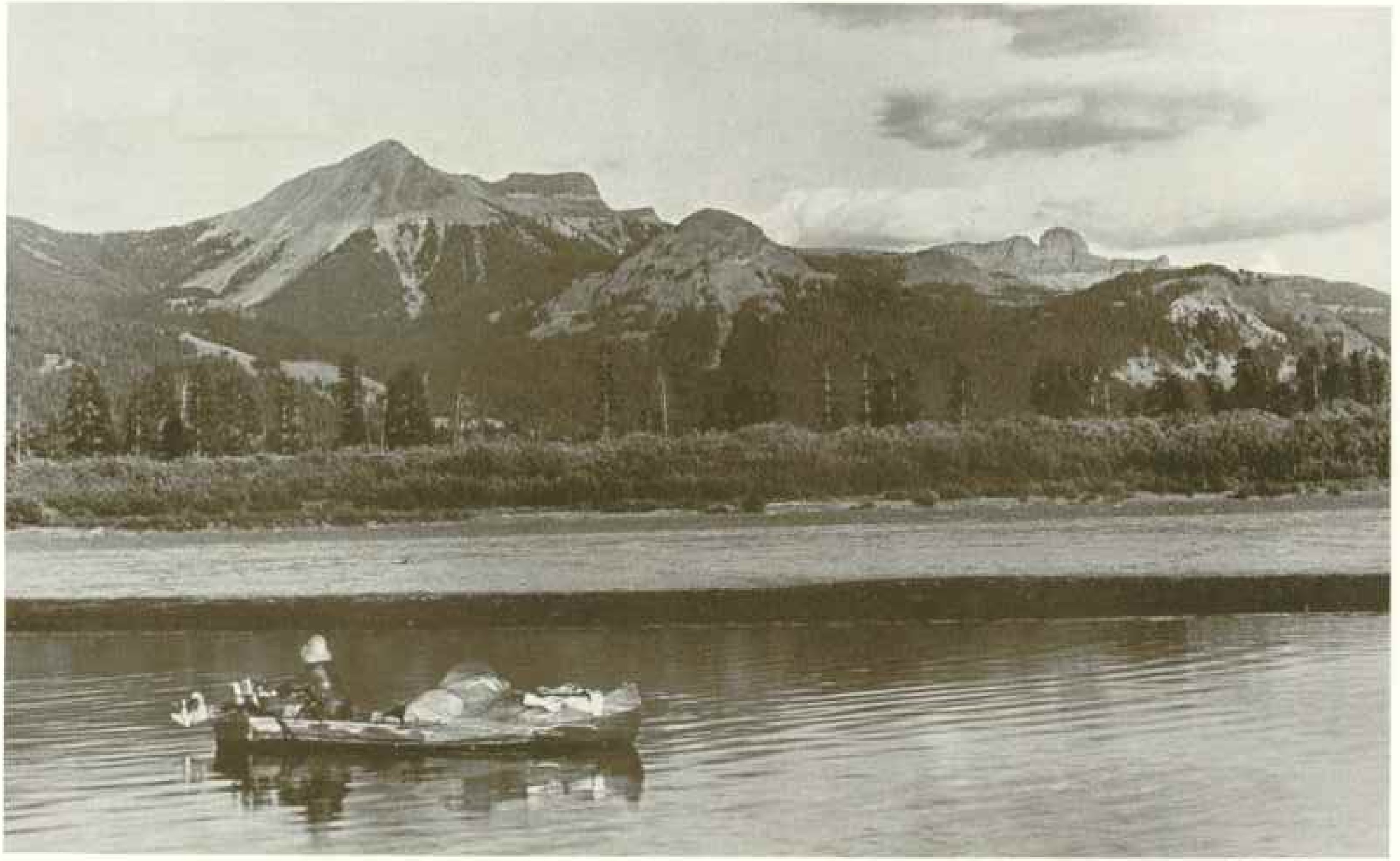
BLACK EAR TIPS TRIM WISE JACK RABBIT'S WINTER COSTUME

When snow is deep the white-tailed jack needs his camouflage against coyotes, foxes, ermines, and weasels. In summer he bounds across the prairie in wild, high leaps. The summer coat is soft, mottled brown, and a bushy white tail stands out like a signal flag.

Photographs © Wendell Chapman

ANTELOPE KIDS KNOW HOW TO FADE INTO THE BACKGROUND

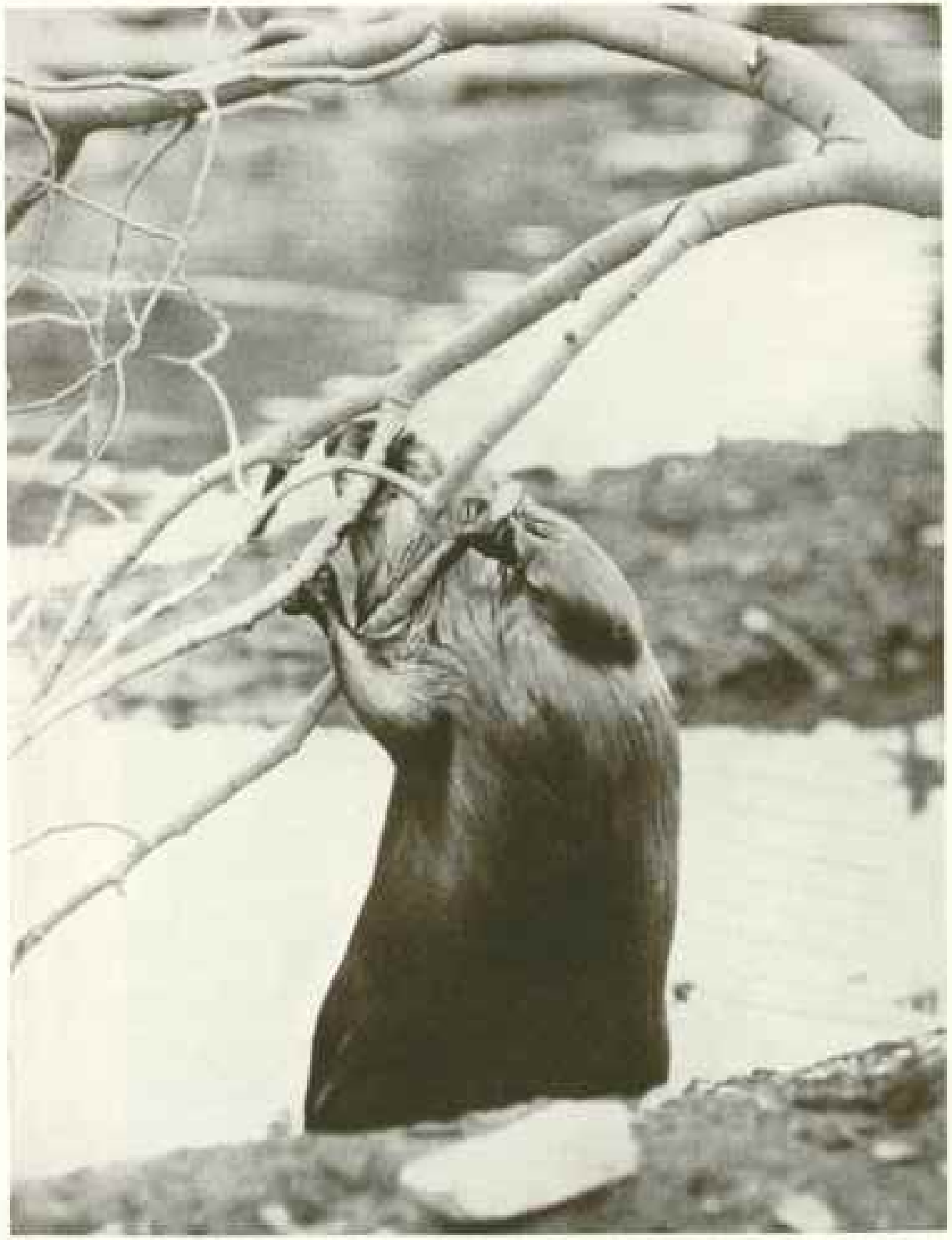
A spotted coat of gray and tan makes them invisible. They wear it until they are old enough to depend upon their legs for protection. For two or three days after birth the young are "hidden" by lying flat on bare, open ground. Should a coyote prowl too near, they play dead while the mother decoys the enemy.



© Wenzell Chapman

OUTBOARD MOTOR IS TIPPED UP AND OARS ARE USED WHEN STALKING BIG GAME IN THE YELLOWSTONE

The authors' portable folding boat is loaded with provisions for two months. Here, in the southeastern corner of the park, the Yellowstone River flows close to the peaks of the Absaroka Range. The rocky pyramid of Colter Peak, named for John Colter, a pioneer white man who entered this region about 125 years ago, raises its bald head in the left foreground. Turret Mountain marks the skyline on the right.



EFFICIENT BEAVERS SCORN LIGHT LOADS

This one holds a severed aspen branch in one paw while he cuts another to make the trip worth while. Then, adjusting them in his mouth, he will tow them away, using webbed hind feet for propellers. When all trees near a pond have been cut, beavers often build canals to transport supplies from a distance.

Photographs © Wendell Chapman

THE WOODMAN WHO USES HIS TEETH FOR AN AX

Tree felling is usually done by a pair of beavers, who can cut down a three-inch sapling in three minutes. On larger trunks they work in turn while one stands guard or rests. There are extensive beaver workings near Tower Falls, in Yellowstone National Park.

THIS LITTLE MARTEN RAN OFF WITH THE COOK'S EGGS

Although his head was not much larger than the egg, he opened his enormous mouth and carefully slid his sharp teeth over the shell. After tucking it in gently, he ran up or down the tree with perfect ease.

Photographs © Wendell Chapman

WHITE COATS ARE CONSPICUOUS WHEN WINTER COMES LATE

The authors were sitting near a beaver pond one fall afternoon before snow had fallen when this ermine with jet-black tail appeared. It stood on its hind feet, stretching to its full height of twelve inches, red eyes glowing. Small creatures fear this ferocious weasel, whose white pelt, ornamented with black-tipped tails, is prized as a luxurious fur. The white coat becomes yellowish brown in summer.

A BEAVER'S SHARP INCISORS MAKE SWIFT WORK OF ASPEN

When a tree has been felled, branches are trimmed off first and used either for dam building or food. Then the trunk is cut into short lengths and stacked on the pond bottom near the lodge.

Photographs © Wendell Chapman

PADDLE TAIL IS RUDDER, PROP, AND DANGER SIGNAL

Before a beaver dives, it gives a warning slap with its tail that echoes across the pond. On land, tail and hind feet make a stable tripod. Long, coarse hairs cover the soft underfur of commerce. The high price set on this fur lured trappers and explorers westward. Thus the beaver, to its own misfortune, helped colonize North America.

THE "MONARCH OF THE GLEN" IN THE PRIME OF LIFE

The bull elk sheds his antlers after each mating season and grows a new pair in summer. By autumn he is ready to fight his rivals and win a harem. Clashing horns lock, sometimes dooming losers to a lingering death.

Photographs © Wendell Chapman

MOOSE LOLL IN SHADY SWAMPS ON HOT AFTERNOONS

This family belongs to the herd of 700 moose that roam Yellowstone National Park. The two on the bank seem unevenly matched, but perhaps one is an adopted orphan.

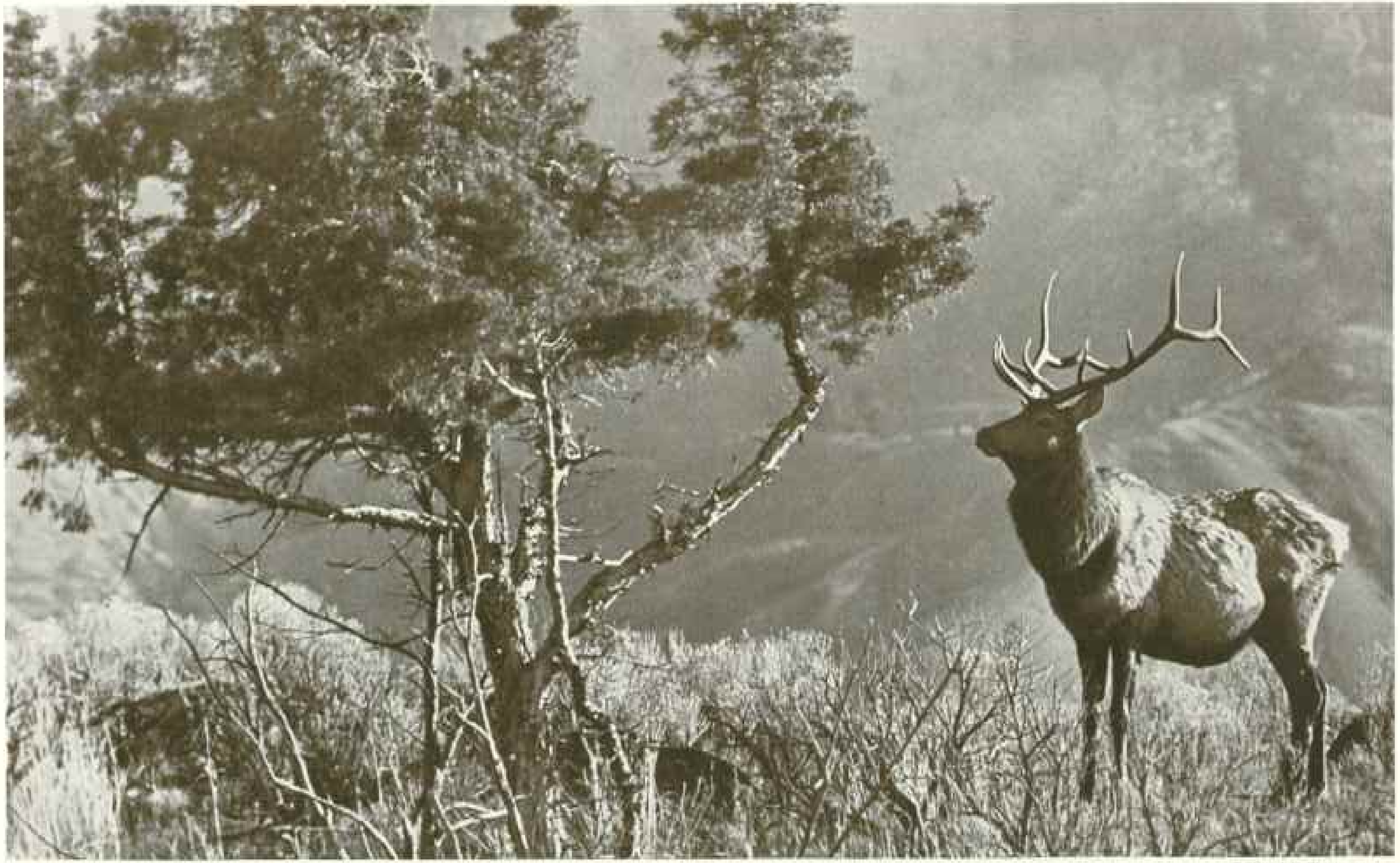
FLASHLIGHT PORTRAITS DID NOT FRIGHTEN THIS PINE MARTEN

The savage little animals, resembling large brown squirrels, frequently came into camp at night to steal bacon, sweets, bread, and eggs (page 232). This one was photographed near the eastern boundary of Yellowstone Park.

Photographs © Wendell Chapman

A V-SHAPED RIPPLE BETRAYS A SILENT SWIMMER

Often curious beavers swim to a log jam and peer out, perhaps realizing that overhead obstructions prevent an attack. A deserted dam disintegrates, and the bottom of the drained pond becomes a "beaver meadow."



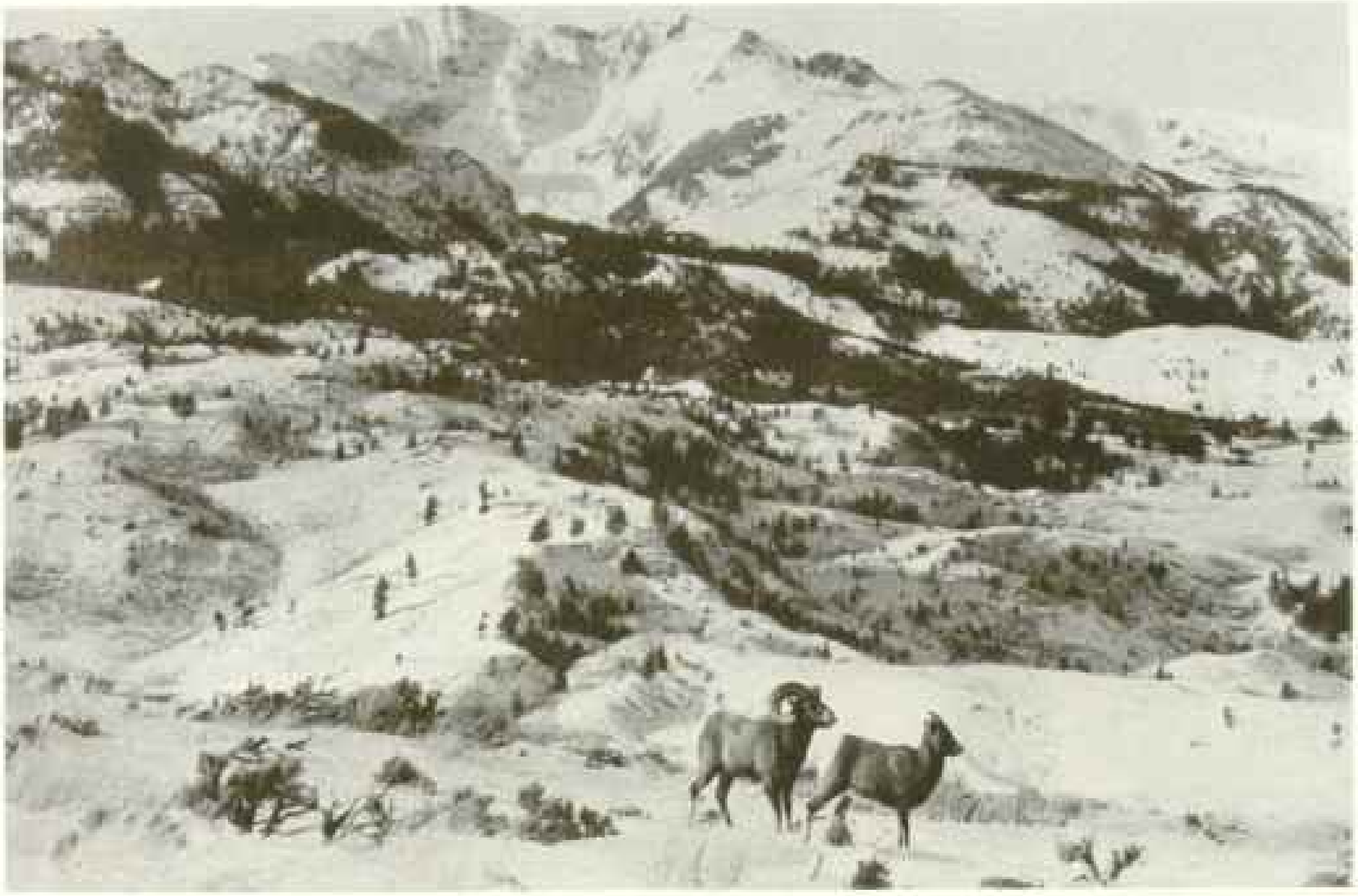
AFTER TRYING PATIENTLY FOR TWO YEARS TO PHOTOGRAPH A BULL ELK CLOSE UP, THIS MASTERPIECE WAS THE REWARD

Bulls are usually wary and easily frightened, but this one was indifferent when the photographer approached to within a few feet. The American elk, or wapiti, is larger than and closely related to the European red deer, or stag, hunted by royalty for centuries. More than 15,000 roam Yellowstone National Park, where they find summer forage on high mountain pastures and winter protection in the valleys.

© Wendell Chapman

THIS MOTHER GRIZZLY BEAR EVIDENTLY TOLD HER THREE CUBS TO "STAY THERE"—AND THEY DID!

The youngsters know by experience that the old bear will return and knock them end over end if they disobey. Twins are the rule in grizzly families, but triplets are not uncommon. Newborn cubs are small as pups, often weighing less than two pounds. They are taught early in life to climb trees for protection, but, unlike the black bear, their parents always stay on the ground. The grizzly's diet is strangely varied, ranging from elk and deer to fish, berries, grass, and ants.



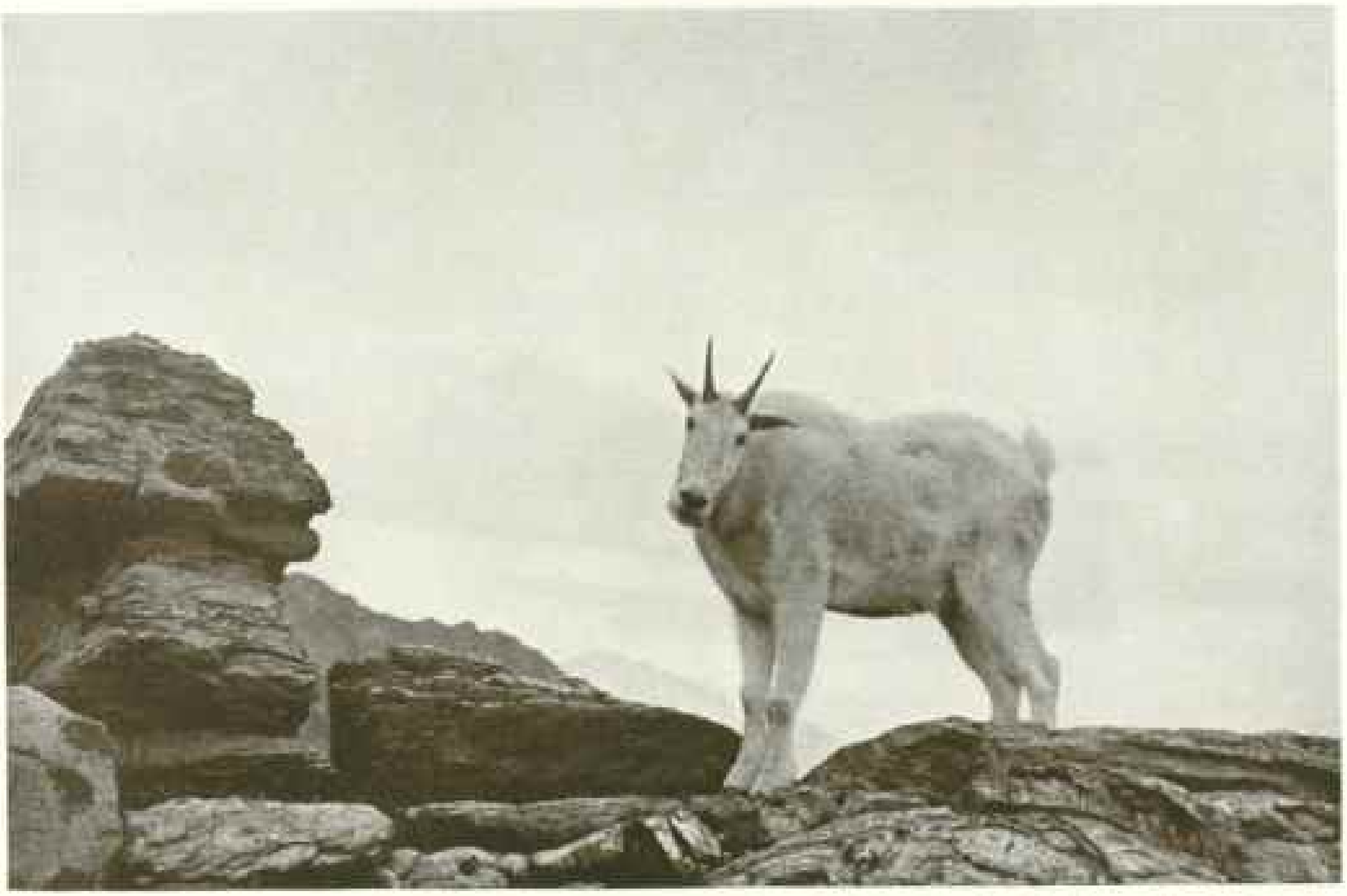
SEVERE STORMS DROVE THIS PAIR OF ROCKY MOUNTAIN SHEEP DOWN TO GRASSY SLOPES

Near-by cliffs make a safe retreat when danger threatens. Rams carry massive, curling horns, the ewes stubby ones. Once bighorns were so numerous that whole Indian tribes subsisted on their flesh and became known as "sheep eaters." Across the valley rises the rough profile of Electric Peak.

Photographs © Wendell Chapman

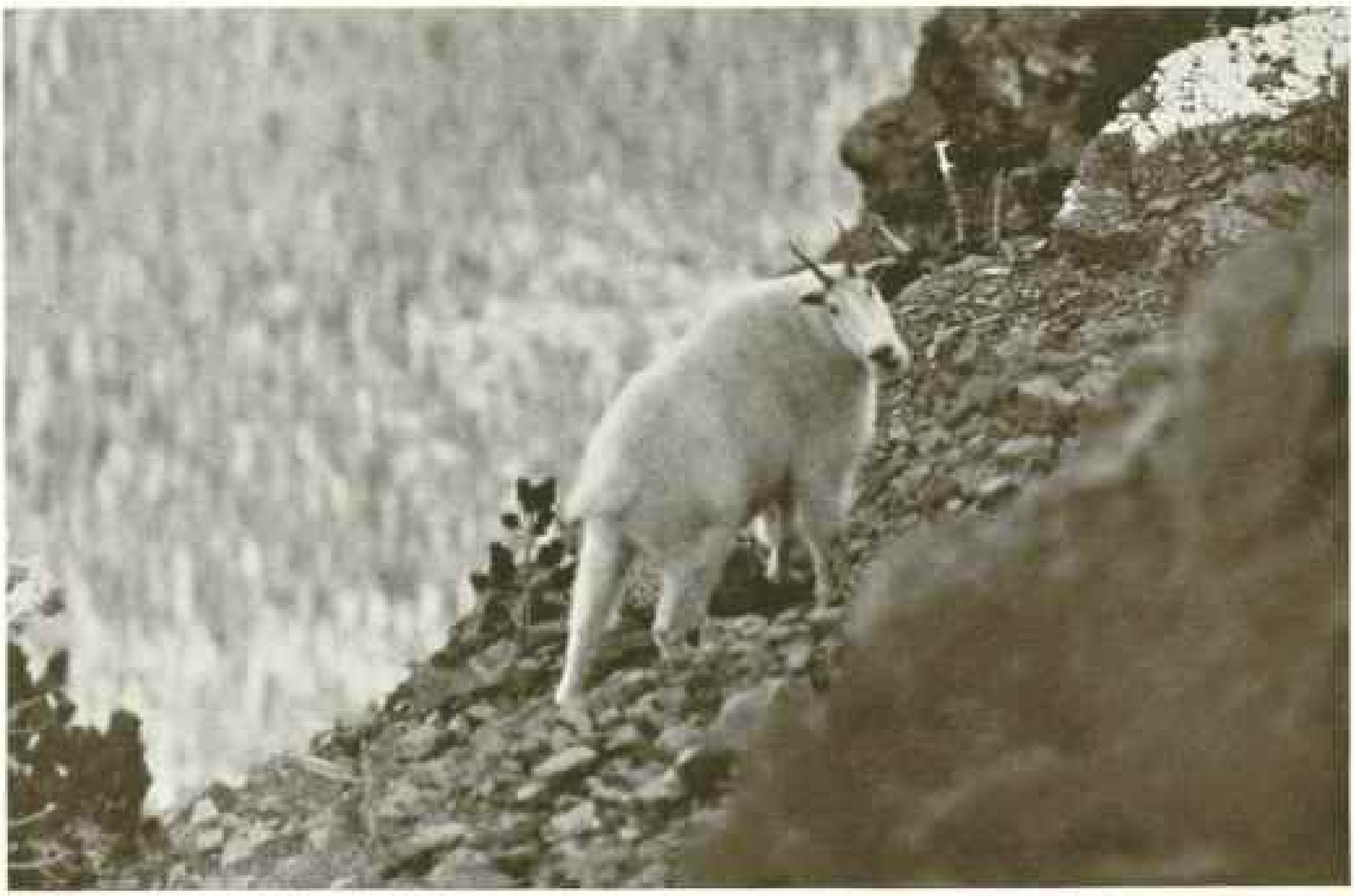
GRACEFUL FORM MARKS THE SWIFT FLIGHT OF THE BIGHORN RAM

This young sheep is known as the "white ram" in Yellowstone National Park. An almost albino coat distinguishes him from his grayish-brown comrades with creamy-white rump patches.



BILLIE COCKED HIS HEAD LIKE A DOG AND WATCHED THE AUTHOR'S EVERY MOVE

The sight of this Rocky Mountain goat 12 feet away amply repaid a 6,000-foot climb in Glacier National Park. The joint, or knee, of most animals is about midway of the leg, but with this goat it is low so that the "forearm" may be used as a hook for reaching up and over ledges.



Photographs © Wendell Chapman

TREACHEROUS ROCK LEDGES SELDOM WORRY THE MOUNTAIN GOAT

If a slide starts, he calmly waits his chance and leaps to safety. He looks surprised when an intruder appears, but soon nimbly climbs above. This "goat" is really a member of the antelope family.

© Wendell Chapman

ONLY A GOAT COULD DISCOVER A PATH UP THIS NEARLY VERTICAL CLIFF

The two nannies in the lead are teaching their kids a bit of alpine technique. Their knife-edged, padded, vacuum-cupped feet can cling to the smallest cracks and ledges. No human being without artificial aid could have followed this nonchalant quartet. There are more than 700 Rocky Mountain goats in Glacier National Park.

One night as we were fumbling our way without lights through a deep forest, a bear "woofed" from a few yards above the trail on the mountainside. Then he broke into a series of growls. Although we knew he was bluffing we felt like little Red Riding Hood in the forest of the wolf.

That same night, after retiring in a lonely camp, we heard hair-raising snorts from the dense timber near at hand. Throughout the night those hostile sounds continued. Not knowing what they meant, naturally we were frightened.

In the morning, an investigation of the tracks about camp revealed that the snorts had come from white-tailed deer protesting at our presence in their land.

An offering of raisins, salt, and crackers the following night associated the scent of man with choice delicacies, and the next morning the deer were poking their heads into the tent and eating off the bed, while spotted fawns whose appetites craved little but milk stood a few feet off, often bouncing up and down in alarm at their parents' foolhardiness.

EVEN THE GRIZZLY IS SOMETIMES A BLUFFER

The grizzly bear, who has a degree of courage not possessed by the black bear, also resorts to bluffing. One day we observed fresh grizzly signs on the side of a high peak in the Rockies. A rockslide cut abruptly through a dense growth of dwarfed evergreens near timber line. Up this we silently climbed into a strong wind which swept down the mountain.

When one of us spoke, a growl came from the edge of the timber, a few yards above. Retreat was impossible, all the trees being nearer the bear. Instinctively we wanted to run, but such action might invite the grizzly to take us at our own low appraisals. Consequently, we stood still, expecting the worst at any moment.

Fortunately, the bear did not appear. We surmised that the grizzly was a mother and that her growls were warnings to send her cubs to safety as well as to intimidate us. A few hours later, on the return trip, an examination of the tracks confirmed this theory.

Sometimes grizzly bears charge without attacking. We were present when one charged a couple of men who had molested her cubs. Roaching up her coat, tremendously increasing her apparent size, she presented a spectacle to shake the steadiest nerves.

One man had a revolver; the other tried to climb a small tree near which they were standing, but his two hundred pounds broke off every limb he seized.

As he stood frantically stripping the dead limbs from the tree, unable to get off the ground, his companion squatted down in order to rest his arm on his knee for a steadier aim. Because there was little chance of placing a vital shot at a distance with a revolver, he was waiting until the last moment before firing.

The defiance of the man disturbed the grizzly and she stopped short within a dozen feet. Slowly she settled her coat, and, after blustering a bit, turned around and swaggered away, just as a person might whose bluff had been called.

However, the grizzly has unlimited courage in actual conflict, and had the man wounded the bear she would probably have turned instantly from a bluffer into a fearless antagonist.

Such experiences, although rare, at the time make one wonder if Nature is so soothing after all. Yet, like wild animals which relax after a narrow escape, we found we could sleep the next night as if nothing had happened. Such is the tranquillity born of living in the open.

Notice of change of address of your NATIONAL GEOGRAPHIC MAGAZINE *should be received in the offices 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 October number, The Society should be notified of your new address not later than September first.*

THE WHITE SANDS OF ALAMOGORDO

A Dry Ocean of Granular Gypsum Billows Under Desert Winds in a New National Playground

By Carl P. Russell

Chief, Eastern Museum Division, National Park Service

AS ONE stands upon the heights of the San Andres Mountains in the neighborhood of Rhodes Pass, New Mexico, one looks out upon an ocean of white. South and east stretches a vast sea on which the glint of whitecaps appears as real as the rocky shores. The view is a startling mirage. Closer inspection reveals that the billowing snowy expanse is the White Sands of Alamogordo.*

The windrowlike dunes seem velvety in their softness, yet many of them are firm enough to permit motorists to roll their cars from one crest to the next in roller-coaster fashion. Some of the hills have attained a height of 100 feet, but 50 feet probably represents the average.

Curious stories of the origin of the sands have circulated since they have been known to Americans, but the truth is not less interesting than the fanciful explanations. The processes of making are going on constantly.

WATER CARRIES GYPSUM TO THE SURFACE

Underlying the Tularosa Basin are beds of Permian limestone and sandstone, between the layers of which are interspersed thick beds of gypsum. Borings made in recent years reveal that the gypsum is hundreds of feet below the present valley floor and that water is encountered at depths of a thousand feet or less.

The nature of the sedimentary rocks above the water-bearing sands is favorable to upward seepage. As the water on its upward course passes through the gypsum deposits, it dissolves that material and carries a rather full load to the surface. The limestone through which the solution passes is not readily soluble; very little in addition to gypsum is carried by the rising water. When evaporation takes place at the surface a fairly pure crust of gypsum is deposited, which, under action of the atmosphere, crumbles to form crystalline grains.

The prevailing southwest wind sweeps these crystals from the surface upon which they were formed and piles them in huge drifts to the north and east of the point of origin. The wind erosion excavates basins, the flat floors of which may be 10 to 30 feet below the surface of the plain and 50 feet or more below the tops of the dunes.

Nearly everywhere in the basin floors moist sands are encountered at a depth of a few inches. Ordinarily sand erosion does not develop flat surfaces, but the flatness of these floors is manifestly caused by the water table which limits the depth to which the sand can erode (pages 252, 256).

The largest of the basins from which the sands are blown is a boggy lake bed at the south end of the dune area, but many of the smaller flat-floored depressions are scattered through the area. The size of the depression apparently affects the height of the sand piles built up to the lee of it.

Hills and mountains surrounding the Tularosa Basin contain gypsum, and it is evident that some of the deposit is brought from this source by surface waters that feed it to the large natural evaporation pan at the south end of the sands. Whether the source is the deeply buried beds or the visible deposits in the mountains, the processes of evaporation, crumbling, and drifting with the wind are the same. The end product is invariably beautiful, white, winnowed, and clean.

ZOOLOGISTS STUDY COLOR ADAPTATION

The picture afforded in this expanse of white sand is unlike anything known. The white environment has produced a notable effect upon the limited animal life of the sands, and zoologists look to this natural laboratory for possible answers to questions bearing upon adaptation. Botanists long ago turned to the White Sands as a field in which to study the responses of plants to unusual physical influences.*

* See The National Geographic Society Map of the United States, National Geographic Magazine, May, 1933.

* See "The American Deserts," by Frederick V. Coville, National Geographic Magazine, April, 1904.

In places large cottonwood trees nearly covered up with sand live a strange existence, producing roots where upper branches once grew. When the sand drifts and exposes their modified anatomy, they still stand, amazing specimens, with roots interspersed with dead branches along trunks much changed as a result of long burial.

Disinterred specimens of the yucca are to be seen that have struggled in an effort to keep their heads above the shifting sands until their stems have elongated to some thirty feet.

From Coville and MacDougal, Carnegie Institution of Washington

THIS YUCCA STRETCHED ITS NECK MANY FEET TO KEEP ITS HEAD ABOVE THE SANDS

The shovels of inquiring botanists reveal how a stubborn fighter of the plant world has refused to accept defeat and death. It grows up through a dune 30 feet high in the White Sands of New Mexico. Some of the upper circles of leaf bases may be seen in the picture.

BURIED WHEELS HINT AT FORGOTTEN HISTORY

For several years the appearance and disappearance of "red lakes" in the sands have caused conjecture among biologists and chemists. Studies made during the last few months have tentatively identified an organism which may be responsible for the strange color changes that take place in the waters of certain ponds and pools. Apparently the vermilion "lakes" can exist only when the water has evaporated to a condition of high salt content, for the organism is known to grow only in salt water of high concentration.

Sites once occupied by an ancient people are well known to the present residents of the region, and obscure reminders of early Spanish activity are to be seen in many places throughout the valley.

Three centuries ago Spanish explorers and missionaries frequented the Tularosa Desert and wondered at its white sands. They noted the unusual chemical properties of the nearly 300 square miles of drifting gypsum and, quite likely, wished for means of transporting this abundant supply of pure alabaster to the settlements and churches a hundred miles to the north.

Recently, at the mouth of Deadman Canyon in the San Andres, just west of the White Sands, a prominent son of the State of New Mexico uncovered unmistakable evidences that the Spanish Americans of a generation long dead had entered the Tularosa Desert area with vehicles. Divulgence of this forgotten travel came in the form of two massive wooden wheels from an early Mexican oxcart.

Photograph by Dr. Gilbert Grosvenor

IN GALE-SWEPT FLATS THE LOOSE SANDS OF THE DUNES HAVE THEIR ORIGIN

Upward seepage of water brings dissolved gypsum from beds within the earth. Evaporation deposits a crumbly crust on the floor of the basin. The wind sweeps the floor and so forms the vast white drifts (see text, page 250, and illustration, page 256).

Photograph by G. A. Grant, U. S. National Park Service

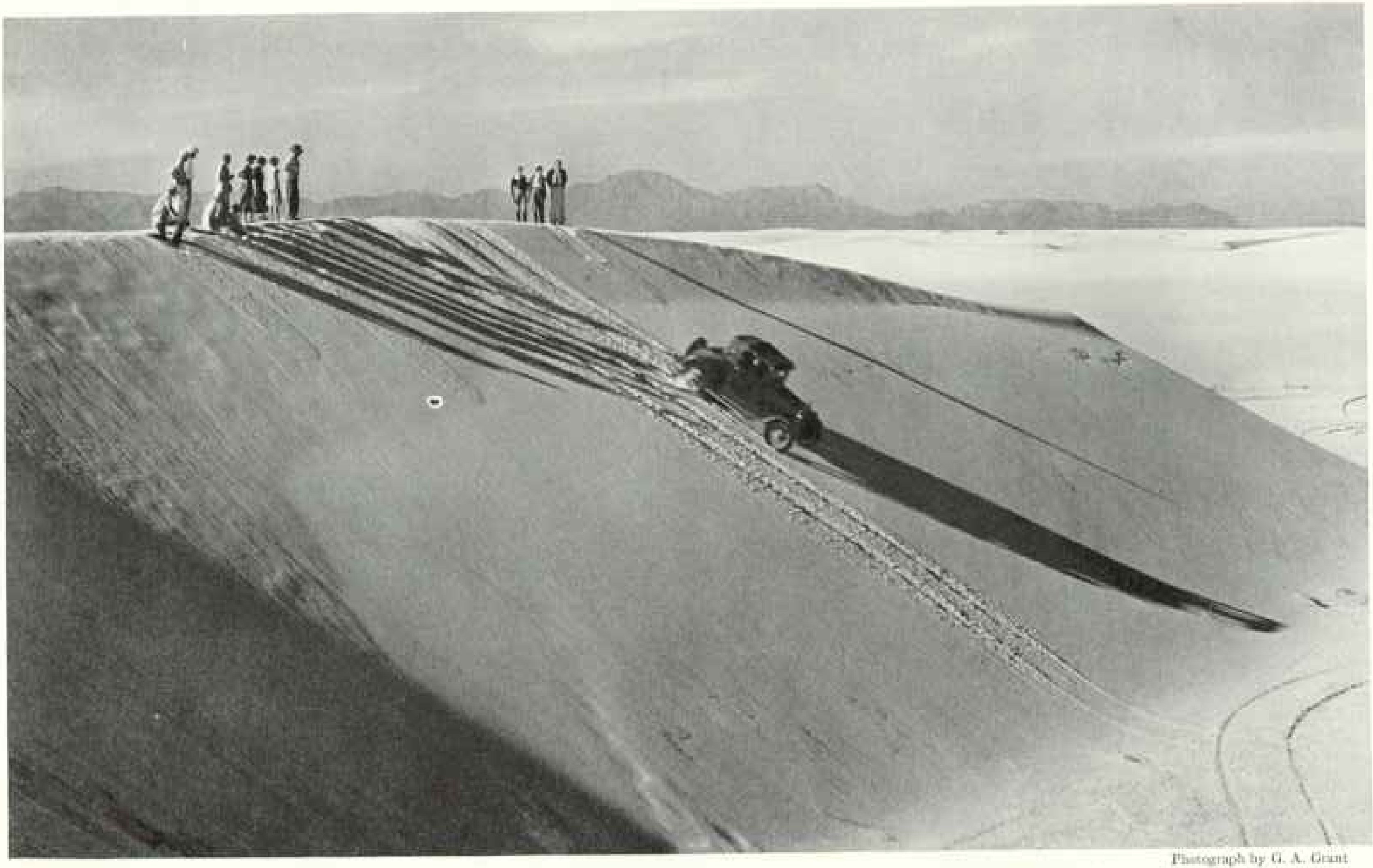
CIVILIAN CONSERVATION CORPS MEN HAVE BUILT A HIGHWAY INTO THE SANDS

For about eight miles it penetrates the white waste, following the basins among the drifts. The shifting dunes, always pushing north and east, will bury parts of this road, but shovels will keep it open. It connects with New Mexico State Highway No. 3, near Alamogordo. The flats are often covered with grama grass.

Photograph by G. A. Grant

DOWN THE SLOPES GO SLEDLESS SLIDERS, ONLY TO TOIL UP AGAIN

The car, having coasted down to the flat basin, can drive around to windward and mount an easy grade to the top of the slide, but the "tin pants" tobogganist takes the shorter and more strenuous way back (see page 258).



Photograph by G. A. Grant

OVER THE TOP AND DIZZILY DOWNWARD SWOOPS A CARLOAD OF AUTOMOBILE COASTERS

This new kind of sport has become popular in the White Sands National Monument. The leeward slopes of the dunes are steep and afford opportunities for thrilling descents. Motor cars cannot ascend them except from the windward where gradients are gradual.

Photograph by Dr. Gilbert Grosvenor

MILLIONS OF TONS OF WHITE GYPSUM ARE PILED UP BY THE WINDS

The flat-floored basin on the left has been swept clean to the level maintained by the water table. From such low stretches comes the supply of gypsum, brought to the surface with upward-seeping water (see text, page 250).

Photograph by G. A. Grant

A DESERT COTTONTAIL LEAVES MARKS OF HIS PASSING AT THE EDGE OF THE DUNE

Some of the small creatures of the area tend to adapt themselves to the color of their surroundings. One of these is the White Sands pocket mouse, a tiny, nearly white animal discovered by biologists from the University of Michigan a few years ago.

Photograph by G. A. Grant

A GOOD PUSH, AND AWAY THEY GO DOWN THE LEEWARD SIDE OF A DUNE

Though the white is realistic, neither temperature nor slipperiness compares to that of a snowfield. However, the appeal of the clean sands as a playground is felt by grown-ups as well as by children. Last year 33,900 persons visited the area, although the White Sands National Monument was opened only on April 29, 1934, and is rather more difficult of access than some of the Government's older recreation regions.

If an authentic story could be woven about those relics, perhaps the period of the bullwhacker who abandoned his conveyance would be established as no earlier than the 19th century. However, maps of the padres and dons definitely point to 18th-century routes east and west across the Tularosa as well as north and south, where the trails parallel the mountain boundaries of its basin.

No written record of moment is known to have come down from the Mexican predecessors of the inhabitants of the Tularosa region, nor have many of the American pioneers left contemporary journals. The local frontiersman did, however, experience a phase of Americanism which has produced a rugged folklore replete with gripping stories of bravery, outlawry, and cold revenge.

When this history can be put into print—and it may yet be gathered from participants—it will add materially to that bold brand of story exemplified by the unexpurgated tale of Billy the Kid and the Lincoln County War.

Billy the Kid's range of activity, it may be mentioned, was this Alamo-Sierra Blanca (White Mountains)-Tularosa territory. The Kid's exploits constitute only a part of the bloody events that took place in the Tularosa region, and it is expected that the White Sands will yet yield gruesome relics of the range war of the 80's.

Today, hard-surfaced highways through most of the canyons of the White Mountains invite the throngs of motorists who each year enjoy the offerings of Lincoln County. In the little town of Lincoln visitors question accommodating citizens as to the identity of historic landmarks. They have pointed out to them the courthouse where Billy the Kid, handcuffed and shackled, killed his two guards with their own guns.

The guards hated Billy and taunted him about the day when he was to be hanged. Bob Ollinger, one of the guards, before going to lunch on the 28th day of April, 1881, carried his double-barreled shotgun into the prisoner's room, loaded it with two shells filled with buckshot, and said, "Billy, I'll kill you with these if you try to get away."

"There are too many shot for a kid like me," Billy answered. "They would fit better between your shoulders."

The story—there are many variations—continues with the details of how the Kid induced Bill, the other guard, to play cards with him, and, while playing, intentionally pushed a card onto the floor. When Bill stooped to pick it up, Billy slipped Bill's gun from his holster and killed him.

The scene shifts to a point beneath the second-story window of the courthouse. Billy the Kid waited at the window above until Bob Ollinger returned from lunch. As Ollinger passed beneath the window Billy called, "Hello, Bob," and emptied both barrels of buckshot into him as he looked up.

DEATH OF "BILLY THE KID"

The conclusion of the Billy the Kid episode came with the killing of Billy by Pat Garrett, noted peace officer, whose daughter, Elizabeth Garrett, today is known for her poems and songs.

More than a hundred men were reported killed in the Lincoln County conflict. Billy the Kid, though only 21 years of age, boasted of killing 21 of the hundred himself.

Dramatic incidents in veritable parade can be associated with many of the striking physical features of the Tularosa region. Ancient Indian dwellings beckon the attention of archeologists; faintly discernible Spanish trails require study by the historian; battle grounds of the American fur trade era may yield information on a wholly forgotten chapter of New Mexican history. Only the geology of the region has had adequate study.

In connection with petroleum investigations, water resources studies, and the possible commercial use of 13 billion tons of granulated gypsum, geologists for the last 35 years have applied themselves to determining what natural resources may be developed.

C. L. Herrick, N. H. Darton, O. E. Meinzer, E. H. Wells, and others have published papers on the general geology of the Tularosa Basin and have given particular attention to the nature of the phenomenal White Sands.

The value of these sands for plaster of paris and fireproofing material is well recognized, and repeated attempts have been made to make commercial use of them.

Gypsum finds a multitude of uses in commerce and industry. As a fertilizer and

Photograph by G. A. Grant

THE HEART OF THE WHITE SANDS OFFERS GLAMOUR AND MYSTERY TO THE HIKER

Here the terrain shifts so constantly that no trail is ever very old. Like the colors on canyon walls, the gypsum ocean presents an ever-changing appearance because of the continual drifting and, at nightfall, the shadows that come and go. The San Andres Mountains, on the west side of the Tularosa Valley, are silhouetted on the horizon.

Photograph by G. A. Grant

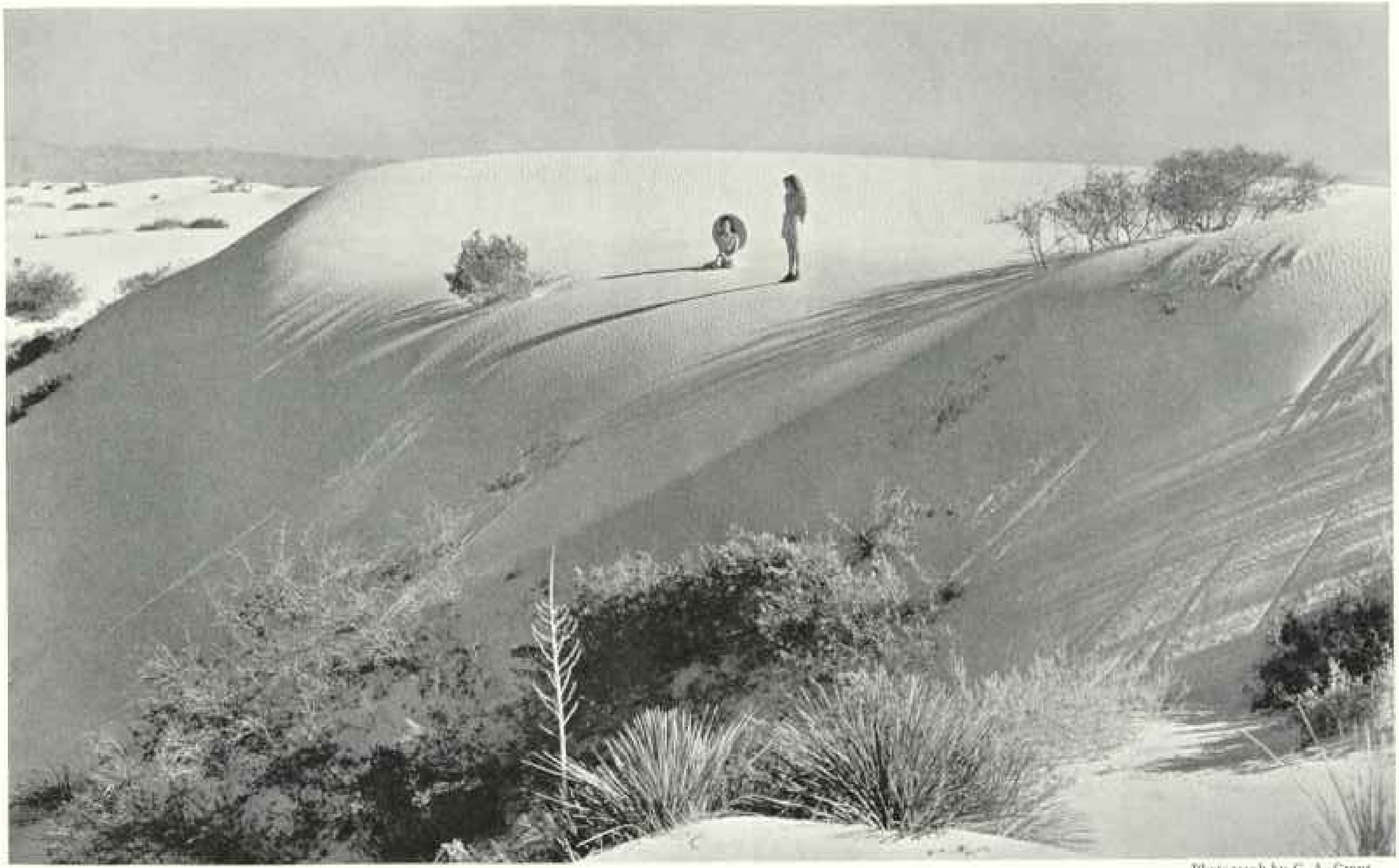
TO OLD-TIMERS THE ADVANCING GYPSUM OCEAN WAS A MENACE

Now fear has turned to appreciation of one of Nature's wonders and vacationists visit the area in numbers. The view south near the entrance to the National Monument shows the margin of the White Sands, and how the dunes slowly encroach upon the flats of the valley. The Sacramento Mountains are in the distance.

Photograph by G. A. Grant

ADVENTURERS OF THE PLANT WORLD INVADE THE WHITE WASTES

A few species, principally lemonade sumac, saltbush, rabbit brush, and yucca, gain a precarious hold at the edge of the sands, but within the vast central area little or no sign of life is to be seen. Disinterment of some yuccas would reveal that they have reached upward 20 feet or more to keep their crowns above the gypsum flood. Often the winds shift dunes away and disclose botanic marvels (see pages 250 and 251).



Photograph by G. A. Grant

WEARING SHORTS FOR WHITE SANDS TRAVEL, THEY RISK SUNBURN

For a brief sun bath, however, the abbreviated attire is satisfactory. The girls with sunshades are overlooking the steep lee side of one of the dunes. Swept onward by the winds, the sands fall into form like huge snowdrifts, with the more gradual slopes on the windward side.

soil conditioner it is distributed as "agricultural gypsum." As "mineral white" it finds use as a filler in paper, paint, and fabrics. The makers of Portland cement require it as a retarder. In sculpture and the making of decorative devices in architecture and building it is known as "alabaster." Even the school boys' crayons utilize much gypsum.

When natural gypsum is dehydrated by heat, it becomes the quick-setting cement known as "plaster of paris." About four million tons of this calcined gypsum are used each year for wall plaster or stucco. Plate-glass makers imbed their glass in plaster of paris preparatory to polishing.

Plasterboard, wallboard, and gypsum lath require much gypsum each year. "Gypsum blocks" and tile are used in partitions, roof construction, and flooring, where fireproofing and sound insulation are important. Surgeons, dentists, and artists demand the finer grades of calcined gypsum for casting plaster.

It appears on first thought that here in the nearly pure gypsum of White Sands is a veritable fortune in plaster. But Tularosa is far removed from large markets. Freight rates have made it impossible to compete with the many other deposits more favorably located.

OLD SETTLERS FEARED THE SANDS

Old settlers of the region have watched, feared, and hated the White Sands for half a century. This, one of the world's greatest deposits of pure gypsum, has grown before their eyes, threatening homes and land that might be useful.

These pioneers — cattlemen, sheepmen, farmers, and lumbermen—had few interests outside their own business. The spreading sands, ever increasing in volume, struck dread into the stockman, who came to believe that the snowy-white mass would creep upon and envelop not only his ranch, but the towns of Alamogordo and Tularosa —now 15 to 20 miles from the heavy white sea.

With the increase in population in the little cities about the basin there came the realization that the alabaster dunes provided charming sites for church picnics, school parties, and lodge gatherings. Intimate and happy association with the sands caused fear to turn to love and pride. In 1930 the communities of Alamogordo, Las Cruces, El Paso, Carlsbad, Artesia, Roswell, Mescalero, Ruidoso, Cloudcroft, and Tularosa joined forces in an effort to create a national reservation in the White Sands.

Commercial interests revived old hopes and argued that this vast tract of gypsum was too valuable for manufacturing purposes to be "wasted in recreation." Statistical studies precipitated by this argument revealed that within the 176,000 acres of the White Sands is enough building material to reproduce the fireproof walls of every skyscraper in America, to duplicate all wallboard ever manufactured, to replace every piece of interior decoration and statuary on the American continent, and still leave one-third of the Tularosa gypsum untouched.

Investigation of the merits of the White Sands project by the United States Government resulted in the creation in January, 1933, of the White Sands National Monument in the southern end of the dune area. A road was built from State Highway No. 3, from a point near Alamogordo, to the heart of the sands and Tom Charles, resident custodian, opened the new National Park Service area on April 29, 1934.

The scientific features touched upon by investigators, plus the obvious archeological and historical features that have not yet been approached by the scholar, indicate that the White Sands are important to the student.

Yet it is not the scientific interest alone which justifies the reservation of this unique bit of the American scene. The loveliness of its white and green, the cleanliness of its vast expanse, and its appeal to the lover of the unexplored and desolate mark it as an area to which will go those discerning travelers who would see Nature's masterpieces.

NATIONAL GEOGRAPHIC SOCIETY

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ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

TO carry out the purposes for which it was founded forty-seven 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 $5,000 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.

"EXPLORER II" *timed by Hamilton in 1935 Stratosphere Flight*

Valuable Scientific Data Secured by Battery of Hamilton-Timed Instruments

HAMILTON performance in the 1934 Stratosphere Flight won for this trustworthy timekeeper the honor of being also the "official watch" of the 1935 National Geographic - U. S. Army Stratosphere Expedition. This year nine Hamilton Watches rise with the giant balloon, "Explorer II," from the Black Hills of South Dakota.

During this flight, Capt. Albert W. Stevens carries out more scientific projects than have been attempted before in the stratosphere. And, as in the flight of the "Explorer I" a year ago, Hamilton accuracy plays an integral part in timing the observations of the many instrument dials.

In the stratosphere or at the poles of the earth, in transportation or research, Hamilton is chosen where accurate timekeeping is essential. What better endorsement can you ask for a watch to be carried in your pocket or on your wrist? Ask your jeweler to show you the season's smart new ACCURATE Hamiltons. Illustrated folder sent upon request. Hamilton Watch Company, 882 Columbia Avenue, Lancaster, Penna.

* * *

(Upper right) Captain Stevens, aiming by the gondola of the "Explorer II," examines a group of Hamilton Watches used in the 1935 Stratosphere Flight.

* * *

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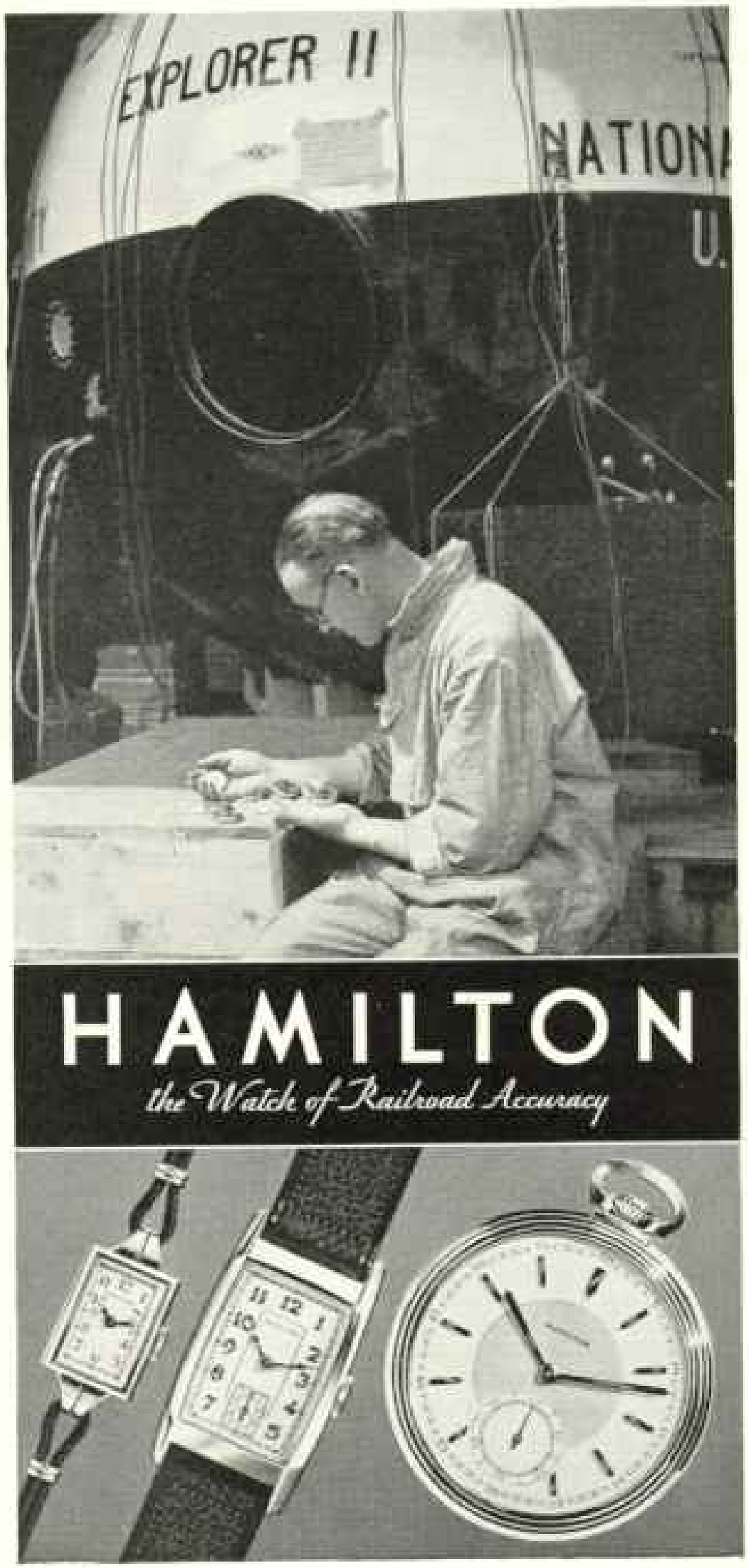

See Hong Kong from your apartment

As you bask in the sun on the terraces of the biggest ship ever in this harbor, you look across another teeming scene. This one swarming with sampans, Chinese junks, coasters, warships, liners . . . all the colorful life of this crossroads of the seven seas. You think back to other long-to-be-remembered sights from those same decks . . . that morning you saw Madeira rising out of the sea . . . the days you first gazed on India, Siam, exotic Bali.

Then you wonder about places that still lie ahead . . . North China, Japan, Hawaii, Panama. Each a memorable adventure. And in between each port, the cozy satisfaction of a ship you love to call home.

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Empress of Britain

WORLD CRUISE

Canadian Pacific

SINCLAIR WINS NAVY OIL CONTRACT

5th time

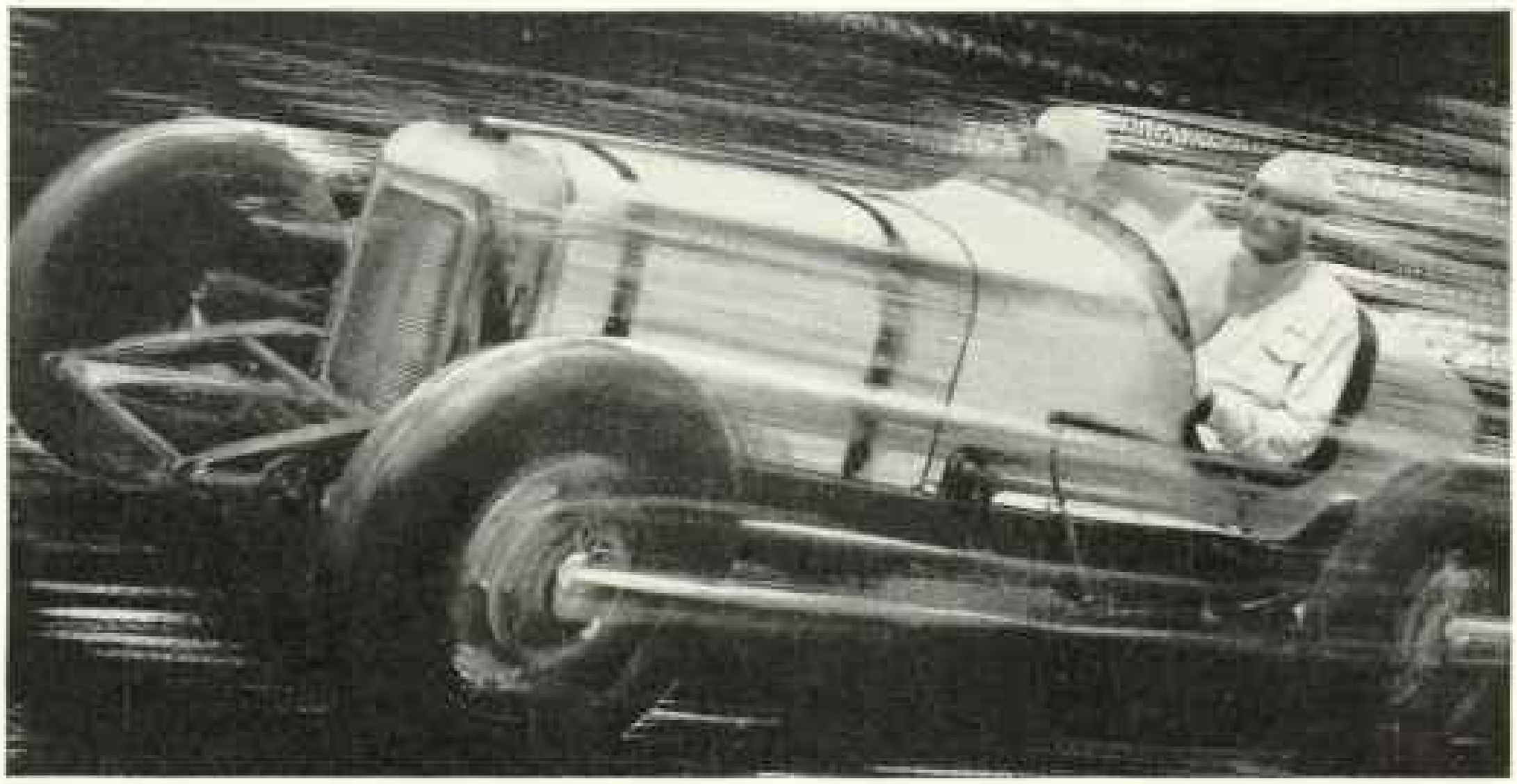
Painting of U.S.S. Saratoga Courtesy General Electric Company

The U. S. Navy has awarded Sinclair for the 5th year in succession the annual contract for supplying lubricants to the Navy on the Atlantic seaboard and to other government departments in 42 states. Included in this contract are lubricants for battleships, submarines, destroyers, airplane carriers and airplanes, motor cars, trucks, tanks, tractors, etc.

Due to the vast Public Works program and improved types of automotive and aircraft equipment used, the Navy this year called for a wider range of lubricants and made more stringent many specifications. As before, the contract was awarded Sinclair on the basis of *lowest service cost* as determined by Navy Work-Factor tests and competitive bids.

INDIANAPOLIS RACE *Proves* PENNZOIL!

RACE DRIVERS USE NEW PENNZOIL IN CARS INSTEAD OF USUAL RACING CASTOR OIL



DON'T TAKE CHANCES WITH YOUR CAR—PLAY SAFE BY USING NEW PENNZOIL

THIS year's spectacular 500-mile Memorial Day speed classic marked an achievement more important than new speed records. For the first time in history, *a regular passenger-car oil*—the same New Pennzoil you can buy for *your* car—was the chosen motor lubricant instead of racing castor oil! More racing cars used New Pennzoil this year than castor or any other brand of oil.

Stands up at high speeds

Daredevil drivers flashed down straightaways and into saucer-like turns at speeds that would have been imaginary a few years ago . . . speeds at which motors actually burn themselves up . . . speeds that only special racing castor oil was formerly expected to withstand. Yet *New Pennzoil* withstood these speeds, allowed motors to work freely, run faster and cooler, kept moving parts *safely* lubricated.

Here is one more recognition of New Pennzoil's acceptance as the world's fastest motor oil . . . one more evidence that New Pennzoil's tough film stands up longer and safer under today's highest speeds and motor temperatures . . . one more proof that with New Pennzoil you go farther, faster, safer. Why be satisfied with plain oil when you can buy New Pennzoil? It costs no more.

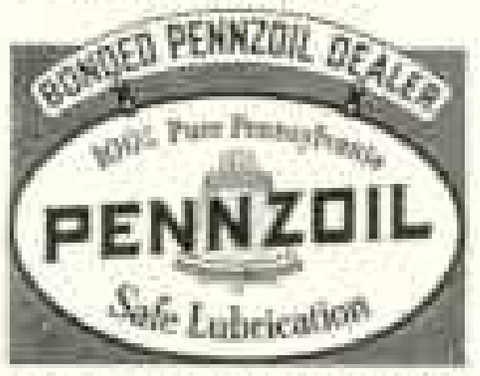
Wilbur Shaw 100.500 m.p.h. | Chet Gardner 101.129 m.p.h. | Deacon Litz 100.367 m.p.h. | Doc Mashentte 100.598 m.p.h.

500 GRUELLING MILES WITH NEW PENNZOIL

These racing drivers used New Pennzoil instead of castor oil . . . another proof that New Pennzoil *stands up!*

LOOK FOR THIS SIGN WHEN YOU BUY MOTOR OIL

Stop along the highways wherever you see this sign. You will find a bonded Pennzoil dealer who sells the correct grade of New Pennzoil for *your* car.



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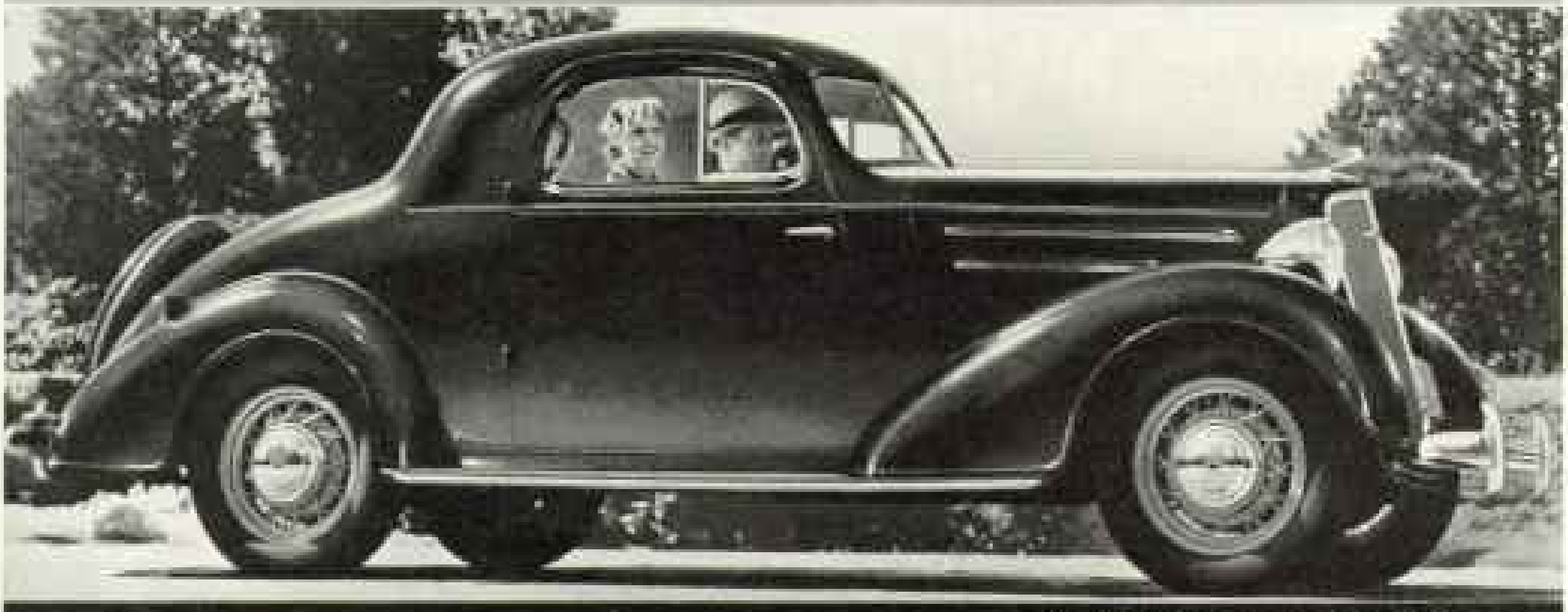
Chevrolet

FOR 1935



The Master De Luxe Sport Coupe

ITS PERFORMANCE IS QUALITY IN ACTION

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Have you ever tried?

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Continued on next page

The National Geographic Directory of Colleges, Schools and Camps

Boys' Schools

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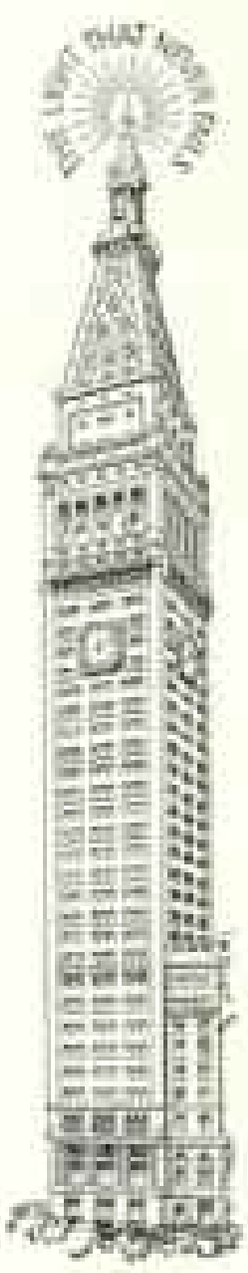

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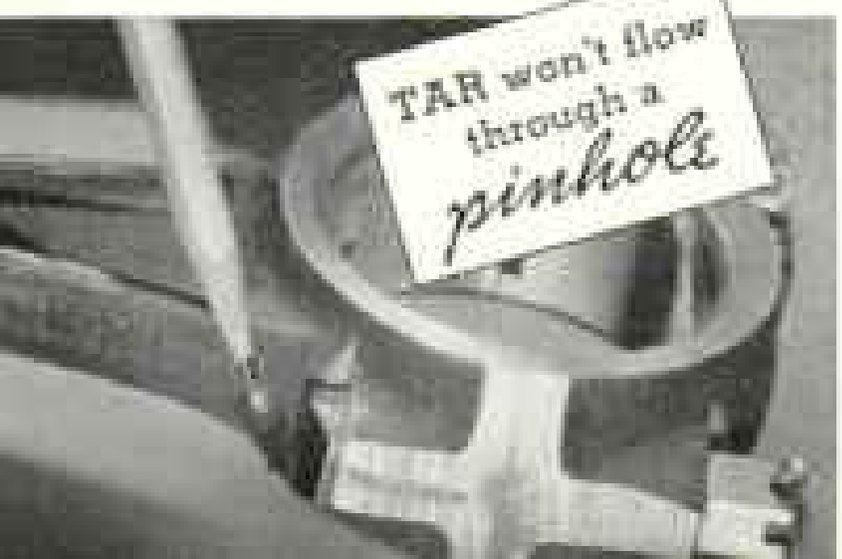

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*The star denotes a steamship line whose advertising appears in the May, June, July or August issues of THE GEOGRAPHIC.
† Leave Boston. All others leave New York.

Leave New York	Date	Steamship Line	Route (See list below)	Ship
Aug.	10	Canadian National	21	Lady Rodney
	10	*Cunard	27	Franconia
	10	*Furness Prince	10	Eastern Prince
	10	*Grace	5	Santa Barbara
	10	Munson	5	Monargo
	10	7-14 New York & Cuba Mail	4	Oriente
	10	8	*Panama Pacific	4	Pennsylvania
	10	13	Standard Fruit	17	Castilla
	10	6	Swedish American	9	Kungsholm
	10	18	United Fruit	8	Ulua
Aug.	13	9	*Canadian Pacific	28	Duchess of Athol
Aug.	14	21	Red "D"	6	Caracas
Aug.	15	11-18	Columbian	10	Columbia
	17	10	*Dollar	6	President Pierce
	17	10	New York & Cuba Mail	11	Sithoney
	17	11	New York & Porto Rico	12	Ozama
	17	17	United Fruit	7	Quirigua
Aug.	17	13	*Cunard	29	Olympic
	17	30	*Grace	3	Santa Lucia
	17	17	*Grace	18	Santa Paula
	17	13	Holland America	29	Rotterdam
	17	11-25	Munson	29	American Legion
	17	7	New York & Cuba Mail	4	Oriente
	17	13	*Panama Pacific	22	Columbia
	17	13	Standard Fruit	17	Atlantida
	17	18	United Fruit	8	Calamares
Aug.	18	14-28	Canadian National	21	Lady Nelson
Aug.	19	4	*Cunard	30	Britannic
	19	6	*French	29	Lafayette
Aug.	21	21	Red "D"	6	Carabobo
	21	14	Southern Pacific	22	Dixie
Aug.	22	17-18	Columbian	13	Haiti
	22	17	*Dollar	2	President Van Buren
	22	20	Furness West Indies	14	Nerissa
	22	19	New York & Cuba Mail	11	Turrialba
	22	11	New York & Porto Rico	12	Barinquen
	22	17	United Fruit	7	Penas
Aug.	23	9	*Canadian Pacific	28	Duchess of Athol
	23	30	*Grace	3	Santa Inez
Aug.	24	20	Canadian National	21	Lady Somers
	24	13	*Cunard	27	Franconia
	24	29	*Furness Prince	10	Northern Prince
	24	9	Hamburg-American	6	Bellanre
	24	12	Munson	5	Munargo
	24	7	New York & Cuba Mail	4	Oriente
Aug.	24	9	*Panama Pacific	4	California
	24	13	Standard Fruit	17	Castilla
	24	18	United Fruit	8	Tolon
Aug.	27	7	Holland America	30	Volendam
Aug.	28	27	Red "D"	6	Falcon
Aug.	29	11-18	Columbian	12	Pastores
	29	19	*Dollar	8	President Taft
	29	20	New York & Cuba Mail	11	Orizaba
	29	11	New York & Porto Rico	12	Ozama
	29	5	Swedish American	2	Gripsholm
	29	17	United Fruit	7	Veragua
Aug.	30	4	*Cunard	1	Georgic
	30	6	*Cunard	30	Olympic
	30	4	Hamburg-American	1	Hamburg
	30	4	Holland America	28	Rotterdam
	30	4	*Panama Pacific	29	Columbia
	30	17-24	Royal Netherlands	15	Stuyvesant
Aug.	31	1	*French	1	Champlain
	31	30	*Grace	28	Santa Clara
	31	17	*Grace	18	Santa Rosa
	31	13-25	Munson	29	Western World
	31	7	New York & Cuba Mail	4	Oriente
	31	13	Standard Fruit	17	Atlantida
	31	18	United Fruit	8	Ulua
Sept.	11	14-28	Canadian National	21	Lady Hawkins
Sept.	4	25	Red "D"	6	Lara
Sept.	5	11-18	Columbian	13	Colombia
	5	17	*Dollar	2	President Garfield
	5	25	Furness West Indies	14	Dominica
	5	19	New York & Cuba Mail	11	Siboney
	5	11	New York & Porto Rico	12	Barinquen
	5	17	United Fruit	7	Quirigua
Sept.	6	30	*Grace	3	Santa Rita
	6	7	Hamburg-American	1	Ballatine
Sept.	7	20	Canadian National	24	Lady Rodney
	7	13	*Cunard	10	Olympic
	7	29	*Furness Prince	10	Southern Prince
	7	13	Holland America	27	Rotterdam
	7	12	Munson	5	Munargo
	7	7	New York & Cuba Mail	4	Oriente
	7	9	*Panama Pacific	6	Virginia
	7	13	Standard Fruit	17	Castilla
	7	18	United Fruit	8	Calamares
Sept.	11	21-28	Canadian National	21	Lady Drake

ROUTES

1 Bermuda.
2 Havana, Panama.
3 Panama, Guayaquil, Callao, Valparaiso.
4 Havana.
5 Nassau, Miami, Havana.
6 San Juan, La Guaira, Puerto Cabello, Curaçao.
7 Havana, Kingston, Cristobal, Port Limon.
8 Kingston, Cristobal, Cartagena, Puerto Colombia, Santa Marta.
9 Bermuda, Halifax.
10 Curaçao, La Guaira, Panama, Nassau.
11 Havana, Progreso, Vera Cruz, (Mexico City).
12 San Juan and Santo Domingo.
13 Haiti, Jamaica, Colombia, Panama.
14 St. Thomas, St. Croix, St. Martin, St. Kitts, Antigua, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, Barbados, Trinidad, Demerara.
15 Port au Prince, Curaçao, Puerto Cabello, La Guaira, Guanta, Puerto Barrio, Pamputar, Carupano, Trinidad, Demerara, Paramaribo.
16 Rio de Janeiro, Santos, Montevideo, Buenos Aires, Trinidad.
17 Santiago, Kingston, La Ceiba.
18 Cartagena, Puerto Colombia, Panama Canal, La Libertad, San Jose, Managua, Los Angeles, San Francisco.
19 Kingston, Panama Canal, Buenaventura, Guayaquil, Salaverry, Callao, Valparaiso, Havana.
20 Bermuda, Rio de Janeiro, Santos, Montevideo, Buenos Aires, Trinidad.
21 Bermuda, St. Kitts, Nevis, Antigua, Montserrat, Dominica, St. Lucia, Barbados, St. Vincent, Grenada, Trinidad, Demerara.
22 New Orleans.
23 Port au Prince, Puerto Colombia, Panama, Kingston.
24 Bermuda, Nassau, Kingston.
27 St. Thomas, Curaçao, La Guaira, Kingston.
28 Quebec, Montreal.
29 Quebec, Saguenay, Murray Bay, Gaspé, Nova Scotia, Bermuda.
30 Halifax.

REGULAR SAILINGS FROM AMERICAN PORTS

(From New York unless otherwise indicated)

*Alaska Line	9- to 12-day cruises from Seattle to Alaskan ports.
American Export Lines	13- to 73-day cruises to Mediterranean ports.
American Mail Line	48- and 66-day cruises from Seattle to Japan, China and the Philippines.
*American Seattle Line	Weekly to Sweden, Poland, Russia, Denmark, Finland.
*American South African	Monthly sailings to South Africa.
*Anchor Line	To Ireland and Scotland.
Baltimore Mail Line	From Baltimore and Norfolk to England, France and Germany.
Arnold Bernstein Line	To England, France and Belgium.
Canada Steamship Lines	Summer schedule on Great Lakes, St. Lawrence and Saguenay to September 8.
*Canadian Pacific	Round-the-world sailings. . . . From Montreal to England, Scotland, Ireland and France. . . . From Vancouver via Hawaii to Japan, China and the Philippines. . . . From Vancouver to Alaska. . . . From Vancouver via Hawaii and Fiji Islands to New Zealand and Australia.
Clyde-Mallory Line	To Charleston, Jacksonville, Miami and Galveston.
*Cunard White Star Line	To England, Ireland and France. (Also sailings from Boston and Montreal to Great Britain.)
*Dollar Line	Around the world. Also from San Francisco via Hawaii to Japan, China and the Philippines.
Eastern Steamship Lines	Summer schedule, New York and Boston to Maine, New Brunswick, Nova Scotia.
*French Line	To England and France.
*Furness Bermuda Line	To Bermuda.
*Grace Line	From New York, San Francisco and Los Angeles to ports noted on routes 3, 18, 19.
Hamburg-American Line	
North German Lloyd	To England, Ireland and Germany.
Holland America Line	To England, France and Holland.
*Italian Line	New York and Boston to Gibraltar, French Riviera, Naples, Genoa and Trieste.
*Matson Line	From San Francisco and Los Angeles to Hawaii, Samoa, Fiji, New Zealand and Australia.
*Nippon Yusen Kaisha	From Seattle and Vancouver to Japan and China.
	From San Francisco and Los Angeles via Hawaii to Japan and China.
*Panama Pacific Line	Via Panama to San Diego, Los Angeles and San Francisco.
Red Star Line	To Southampton and Antwerp.
States Steamship Line	From Portland, Oregon, to China and the Philippines.
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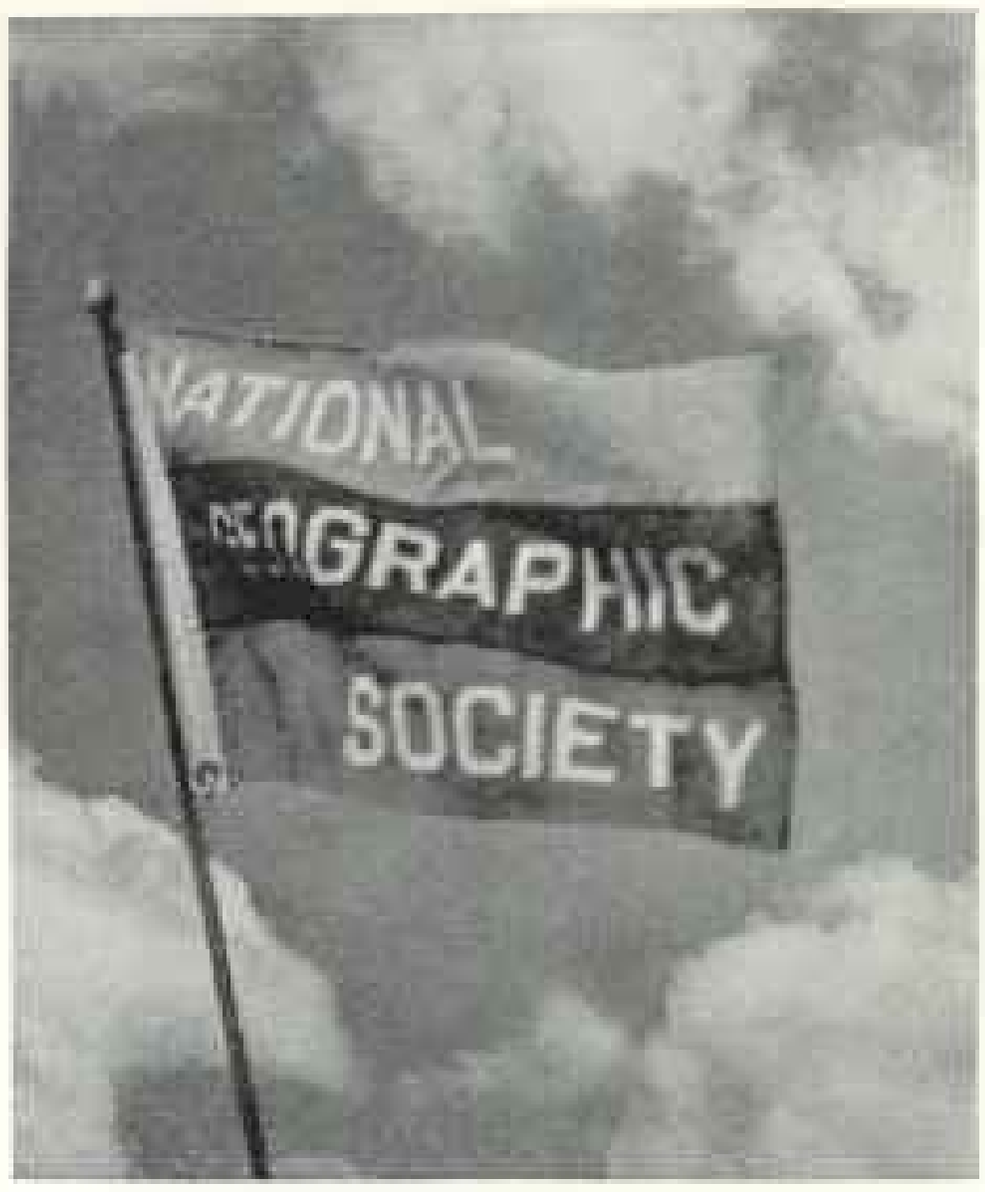

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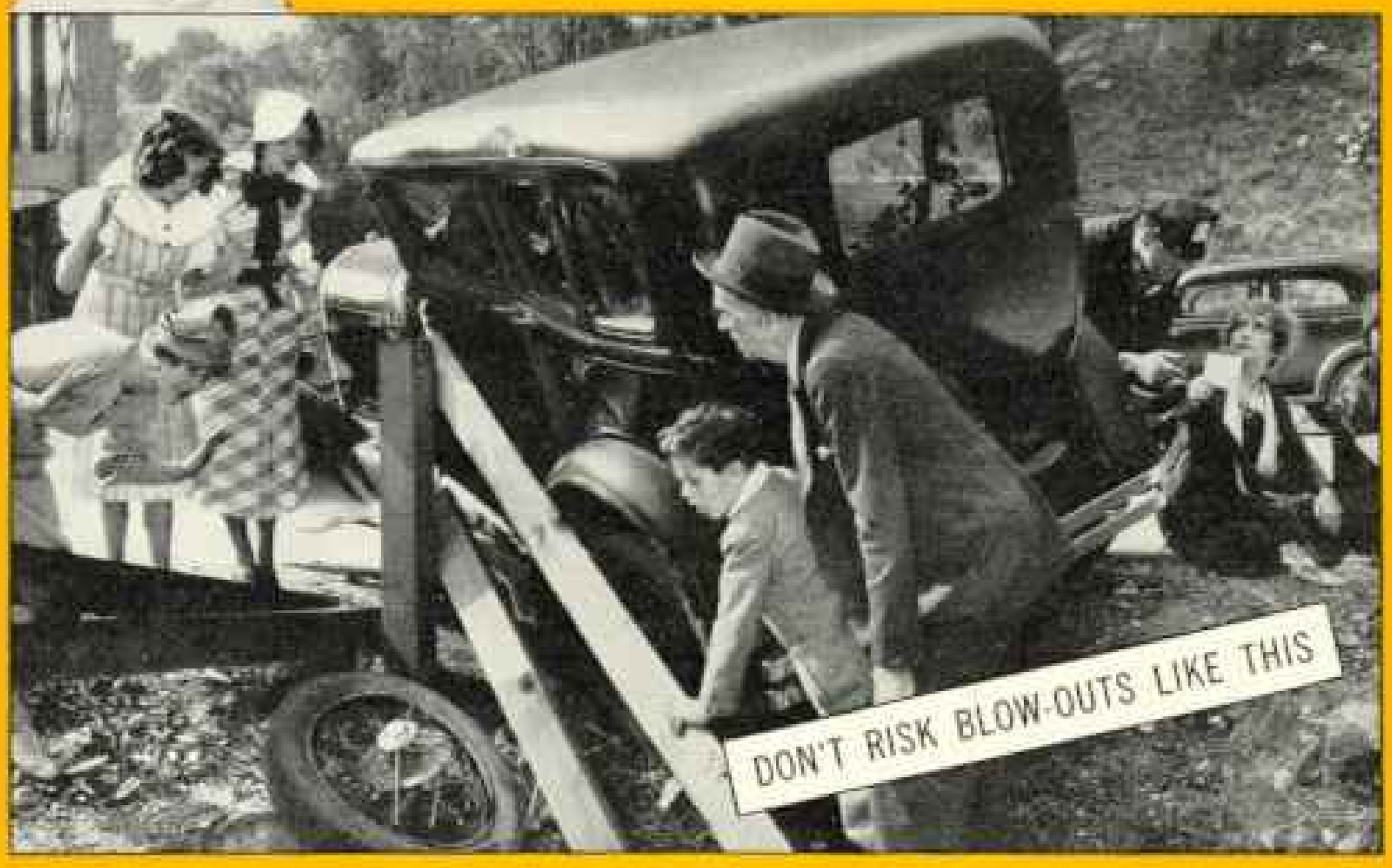

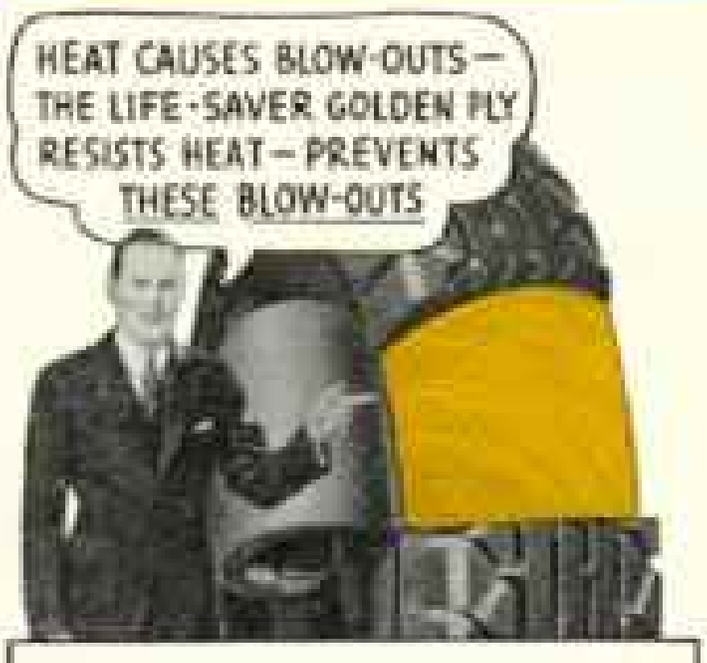

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