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CONTENTS

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NATIONAL GEOGRAPHIC SOCIETY

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To carry out the purpose for which it was founded thirty-one years ago, the National Geographic Society publishes this Magazine. All receipts from the publication are invested in the Magazine itself or expended directly to promote geographic knowledge and the study of geography. Articles or photographs from members of the Society, or other friends, are desired. For material that the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage, and be addressed: Editor, National Geographic Magazine, 16th and M Streets, Washington, D. C.

Important contributions to geographic science are constantly being made through expeditions financed by funds set aside from the Society's income. For example, 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. So important was the completion of this work considered that four expeditions have followed and the extraordinary scientific data resultant 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, evidently formed by nature as a huge safety-valve for erupting Katmai. By proclamation of the President of the United States, this area has been created a National Monument. The Society organized and supported a large party, which made a three-year study of Alaskan glacial fields, the most remarkable in existence. At an expense of over $30,000 it has sent a notable series of expeditions into Peru to investigate the traces of the Inca race. The discoveries of these expeditions form a large share of the world's knowledge of a civilization which was waning when Pizarro first set foot in Peru. Trained geologists were sent to Mt. Pelee, La Soufriere, and Messina following the eruptions and earthquakes. The Society also had the honor of subscribing a substantial sum to the historic expedition of Admiral Peary, who discovered the North Pole April 6, 1909. Not long ago the Society granted $30,000 to the Federal Government when the congressional appropriation for the purchase was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people and incorporated into a National Park.

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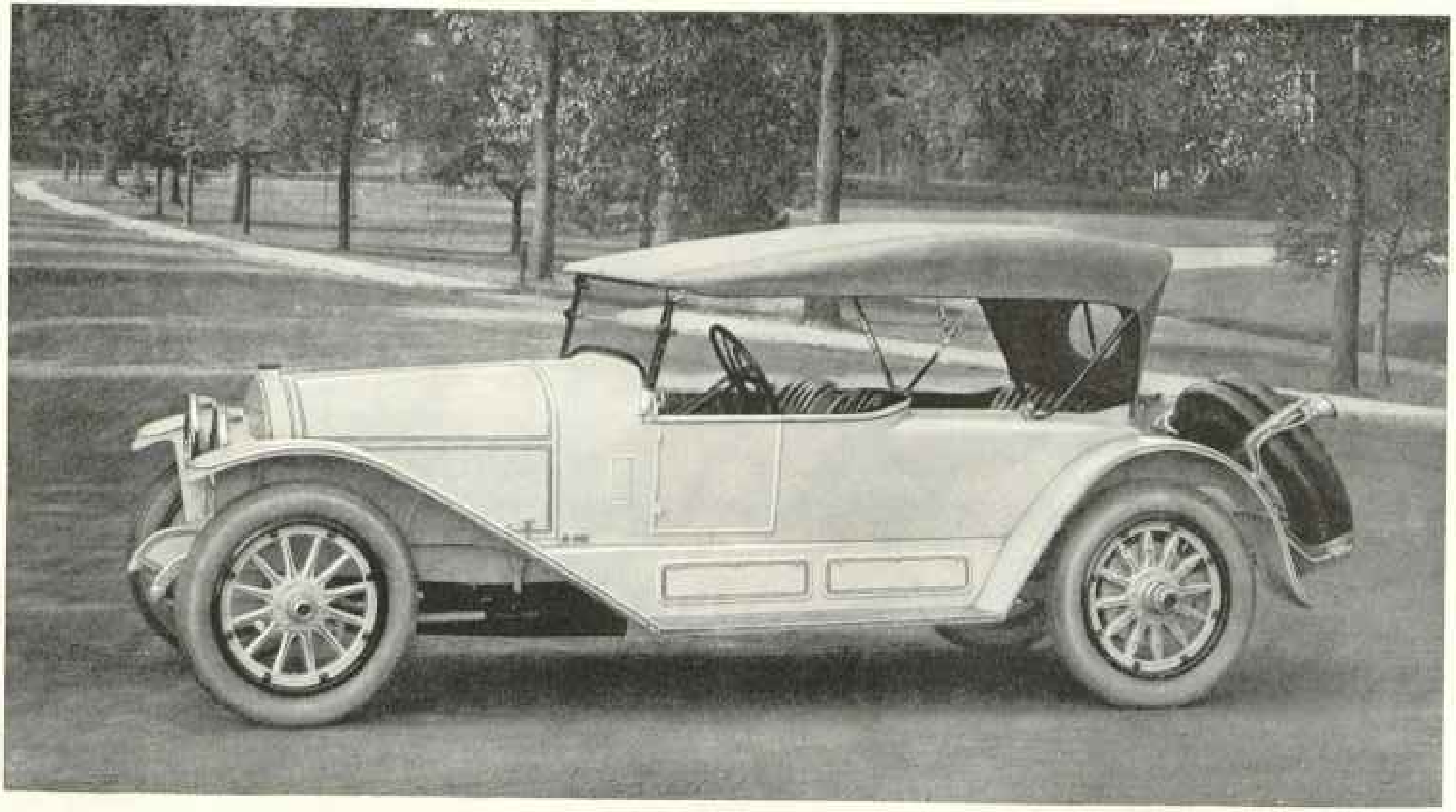

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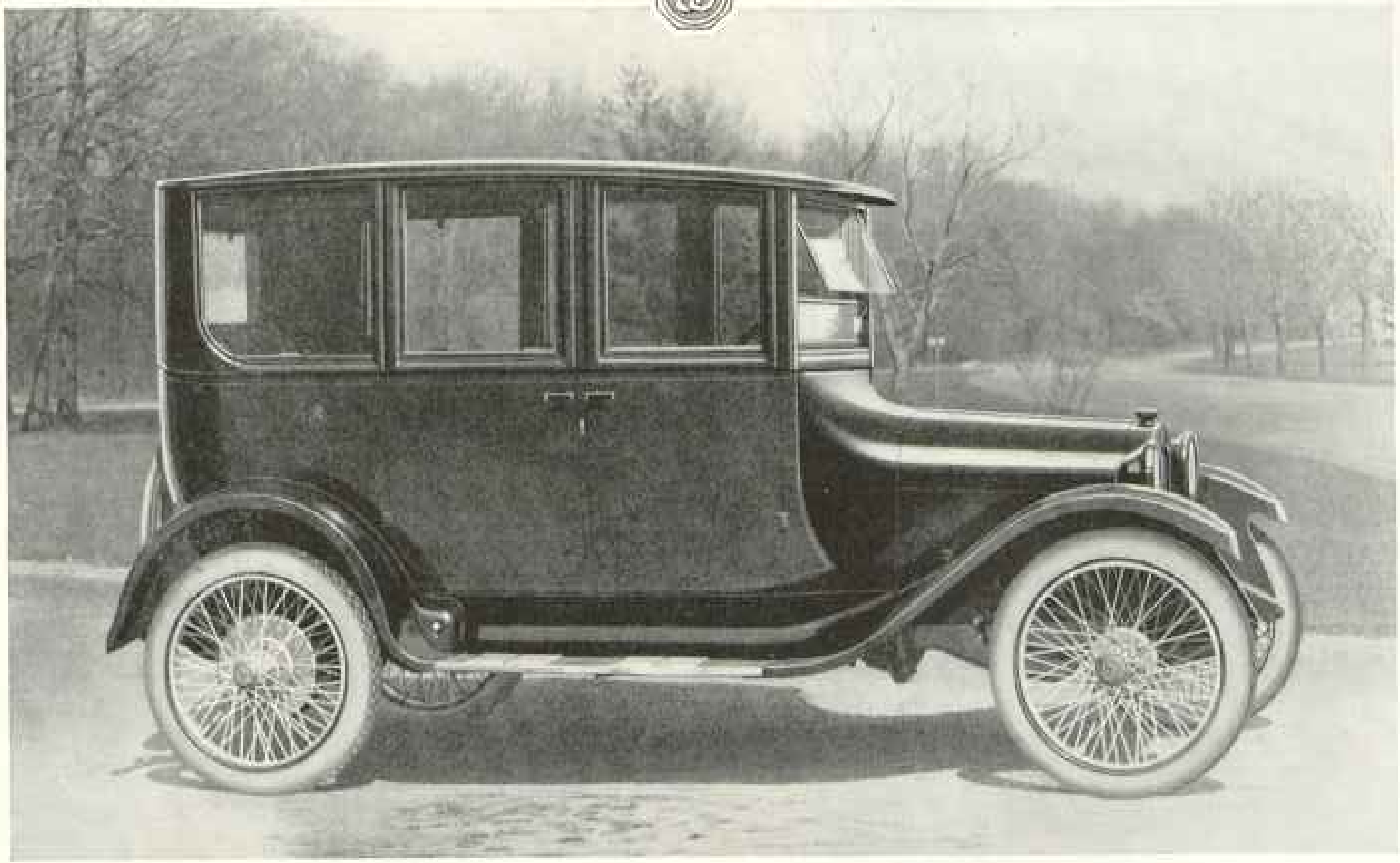

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Circle Around Puffed Grains

Strawberries call for Puffed Rice. Mix in these flavory, flimsy bubbles. They add what crust adds to a shortcake—a delightful blend.

Bowls of Milk all need Puffed Grains. What is half so good as these airy, toasted, whole-grain morsels, puffed to eight times normal size?

Playtime calls for Puffed Grains crisped and lightly buttered. This makes them food confections, enticing in their texture and their taste.

Home Candy needs Puffed Rice in it, to make it light and airy, and to give a nut-like taste.

Ice Cream has a multiplied delight when garnished with these almond-flavored grains.

Soups need these frugile toasted wafers.

Everybody's Choice

Ask children what they like best as a cereal, morning, noon or night. Almost to a unit they will vote for one of these bubble grains.

Ask men who want light luncheons to try Puffed Wheat in milk. One dish will win them.

Ask the doctor what is best. He will say that children need whole grains and rarely get enough.

He will say that Puffed Wheat and Puffed Rice are ideal whole-grain foods. Every food cell is exploded by Prof. Anderson's process. Every granule is fitted to digest.

He will say that these are all-hour foods which do not tax the stomach. He will call them, if he knows the facts, the best-cooked cereal foods.

Yet they are fascinating tidbits—flavory food confections. Think what a combination. Keep all three kinds on hand.

Puffed Wheat Puffed Rice Corn Puffs

All Bubble Grains Each 15c

Except in Far West

The Quaker Oats Company

Sole Makers

[1051]

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Put on your
WEED
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CHAINS
When the roads and pavements are slippery and uncertain.

"When I've got them on the tires I know where I'm at—but when I leave them off I don't know what's going to happen.

"***Look at that fellow over there***—see! He didn't put on his chains. Took a chance—thought he was some careful driver. He got what was coming to him—a dished wheel and a nice big bill for repairs. Lucky nobody was hurt.

"***Did you ever notice*** that us fellows who know our jobs—taxi drivers and paid chauffeurs—hardly ever have an accident because we have learned to be careful and never take chances. But look out for the average driver. He is inclined to be "stuck on" his driving. Hits it up—cuts corners—neglects his brakes—doesn't anticipate a skid. He gets into trouble himself and other road users don't feel safe when he is about.

"***I'd be scared to death*** on slippery, greasy pavements and muddy roads if I didn't have Weed Tire Chains. Bet your life *I don't take any chances.*

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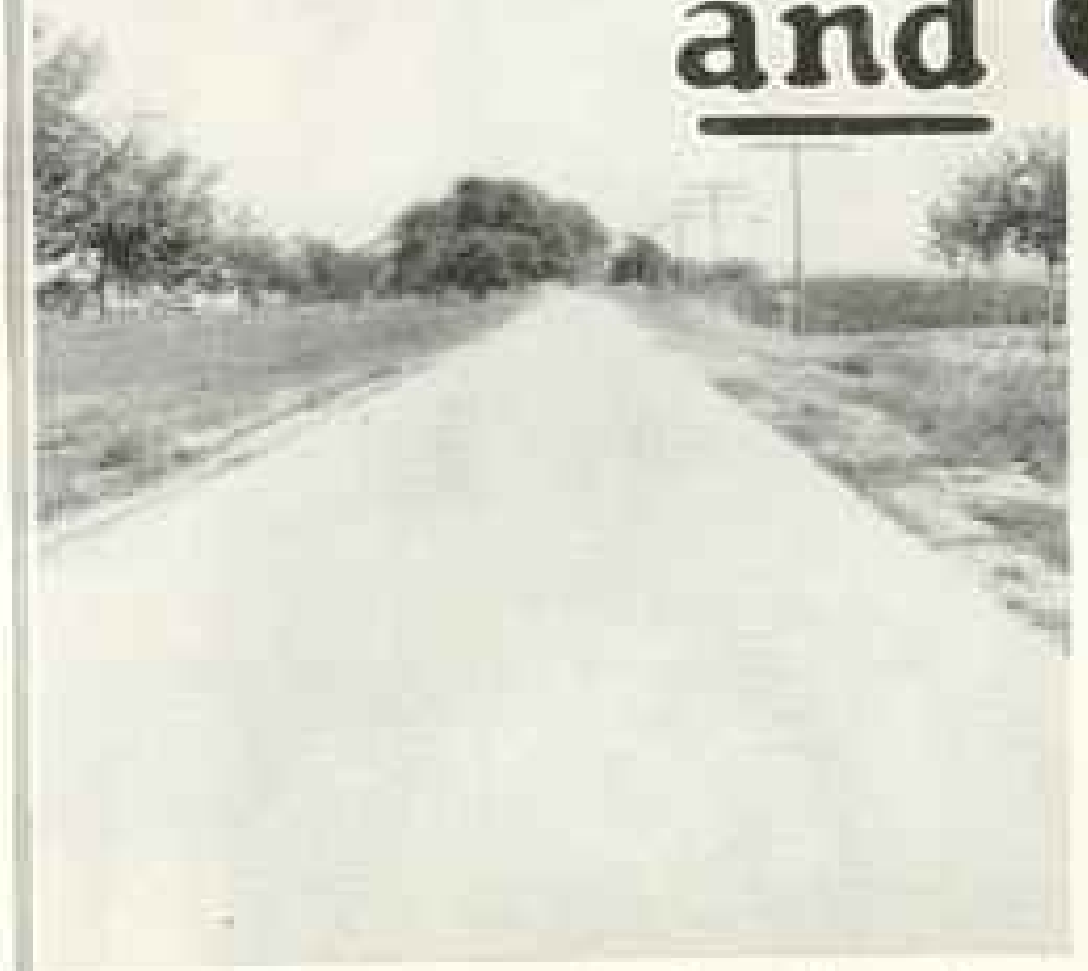
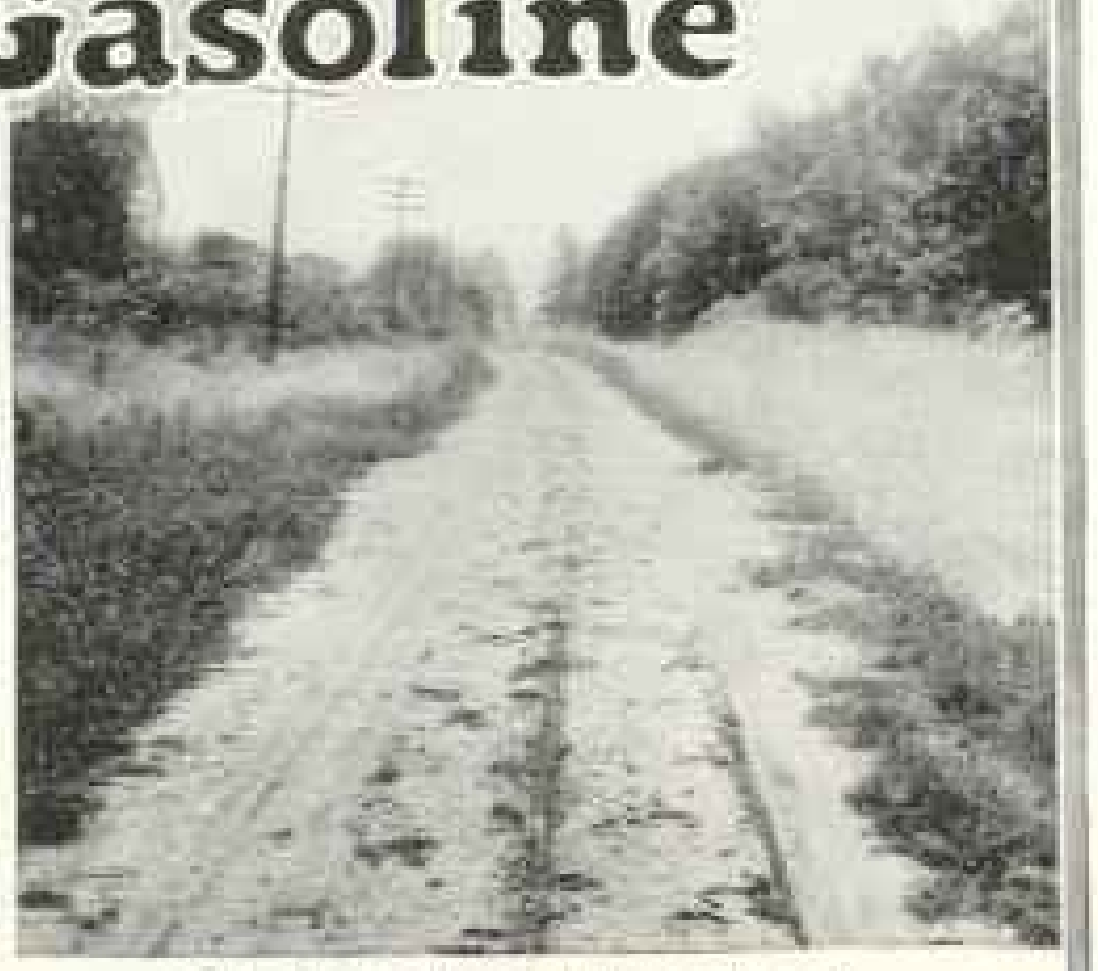
Concrete Roads and Gasoline

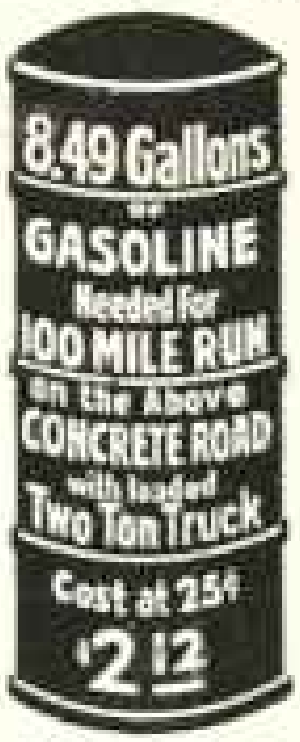


11.78 miles per gallon of gasoline on this concrete road. This is over double the mileage obtained on the earth road opposite.



5.78 miles per gallon of gasoline on this earth road—less than half the mileage obtained on the concrete road opposite.

Why Spend $2—$1 Will Do



Tests made last September at Cleveland, O., with five 2-ton White Trucks carrying full load, showed that on an earth road in fair condition, gasoline consumption was twice that on a concrete road.

The diagrams to the left and right illustrate the relative quantities of gasoline and its cost, used by one truck in making a 100-mile run under the same condition of load over the two roads pictured above. Think what 5,000,000 motor vehicles would save in gasoline alone if they always traveled on concrete.

Since one gallon of gasoline will carry you twice as far on a concrete road as it will on an earth road, why waste the other gallon?

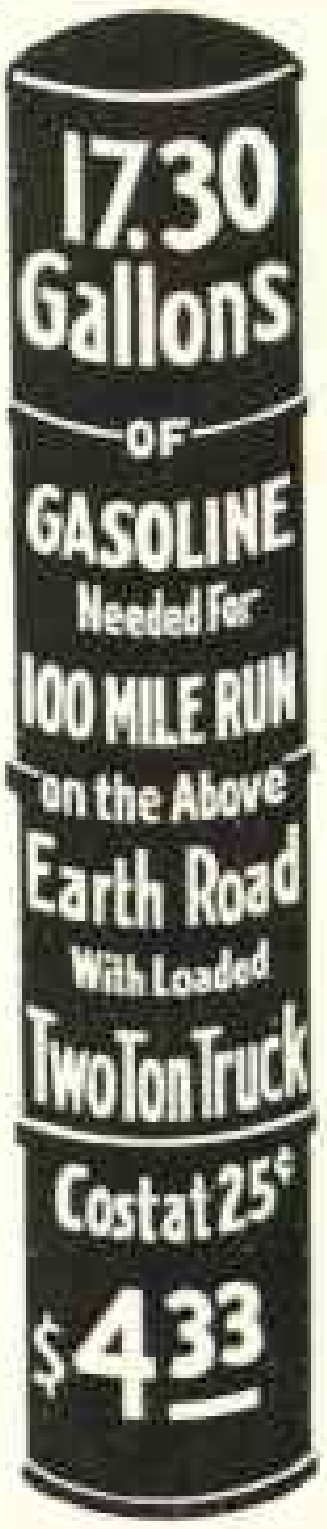
You pay the price of good roads whether you get them or not, and if you pay for **concrete roads** they **pay you back.**

Let's Stop This Waste!

Illinois, Pennsylvania and Michigan have voted big, road bond issues to do away with the mud tax. Many other states and counties are going to do the same thing.

When You Think of Roads—Think of Concrete; When You Ride—Ride on Concrete

Write our nearest District Office for free copy of *"Concrete Pavements Pay for Themselves"* and *"Facts About Concrete Roads."*



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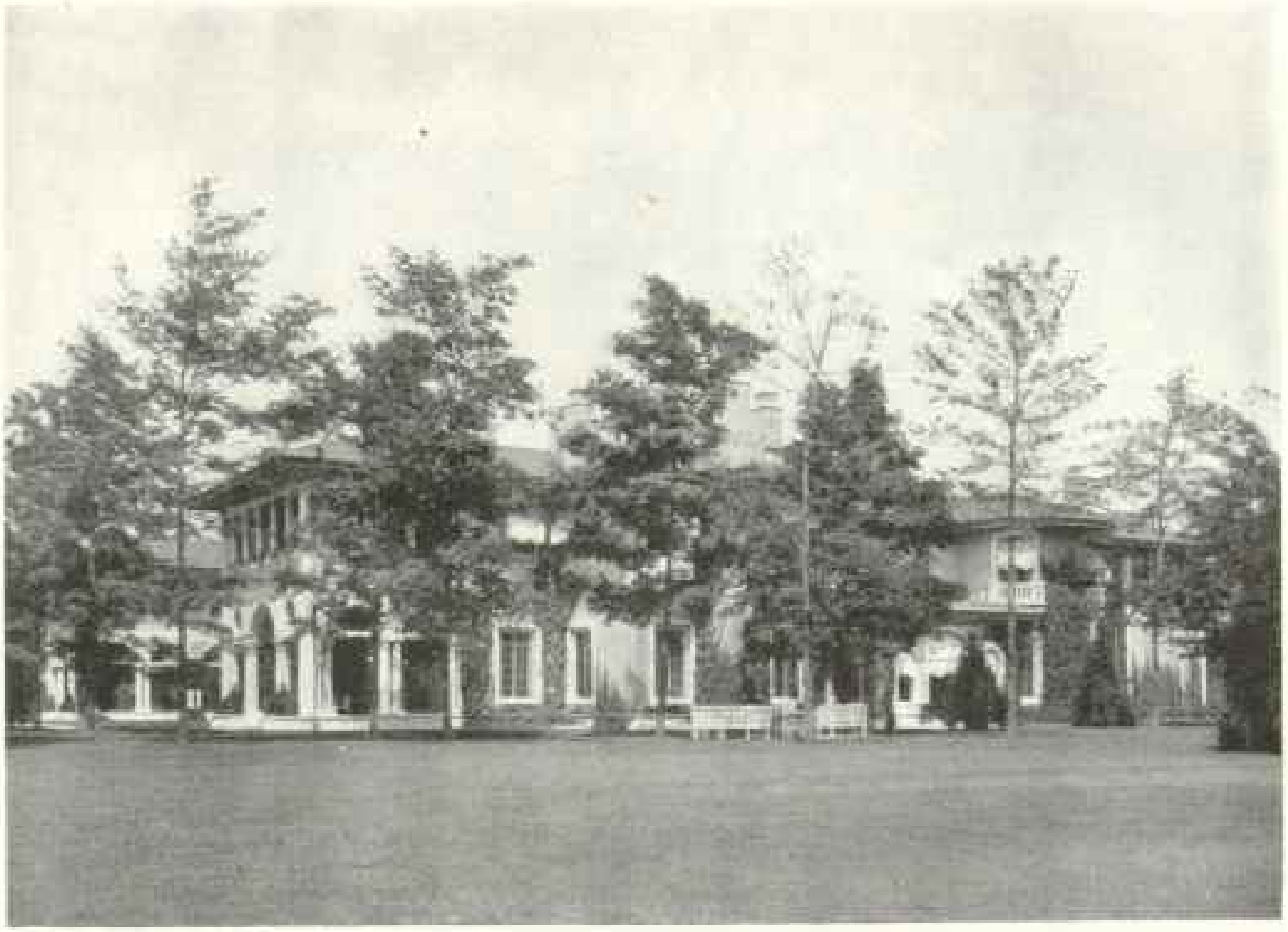

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THE WHITE HOUSE

JOHN DAVEY
Father of Tree Surgery

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Dark Barre Granite—"The Rock of Ages"—is quarried from the purest deposits of the Vermont hills. The dense crystalline texture of "Rock of Ages" and its beautiful bluish-gray tone, make it the first choice of dealers in memorials who specialize in highly polished work.

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Imagine a machine turning out by the many thousands, screws so small that the naked human eye sees them as points of metal shining under reflected light—screws that measure 254 threads to the inch, and you can put 47,000 of them in a small thimble!

Screws that are hardened and tempered, each one polished on the top—screws that are perfect in sphericity, perfect in thread, perfect for their place in the mechanism of that ladies' Waltham watch movement, which, when completed, is actually smaller in diameter than a dime—a ten cent piece!

The screws in the foreign made watch are made by hand. But comparing them under the magnifying glass we see the difference between these hand-made screws and the Waltham machine-made product. The foreign screw varies—the Waltham screw is standardized in size and perfection of workmanship.

No human hand could ever match the quantity and quality performance of machinery that creates such miracles as these.

This is one more of the many reasons why the world's leading horologists came to Waltham for time, and still another reason why your selection should emphatically be a

Waltham 7½ Ligne

The movement is actually smaller than a dime in diameter

$150 to $1,000 or more depending upon the case

WALTHAM

THE WORLD'S WATCH OVER TIME

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It seems natural to trust to Ivory Soap for bathing a cut or a bruise. Ivory is the only soap most of us would think of in this connection.

PURITY, mildness, aseptic cleanness—Ivory stands for all these qualities in the minds of all. Everybody knows that it is safe, pleasant, efficient. Are not these the qualities you want for your bath and toilet?

IVORY SOAP. IVORY IT FLOATS . 99 44/100 % PURE

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VOL. XXXV, No. 6 WASHINGTON JUNE, 1919

THE NATIONAL GEOGRAPHIC MAGAZINE

THE MILLENNIAL CITY

The Romance of Geneva, Capital of The League of Nations

By RALPH A. GRAVES

AUTHOR OF "FEARFUL FAMINES OF THE PAST," "SHIPS FOR THE SEVEN SEAS," ETC.

WHETHER the League of Nations prove a will-o'-the-wisp, leading peoples into a morass of war-breeding misunderstandings, or the beacon guiding them into the paths of perpetual peace, Geneva, its capital, will be known henceforth as the Millennial City. If the League succeeds, the Swiss municipality will become the city set on a hill, the center of man's moral universe.

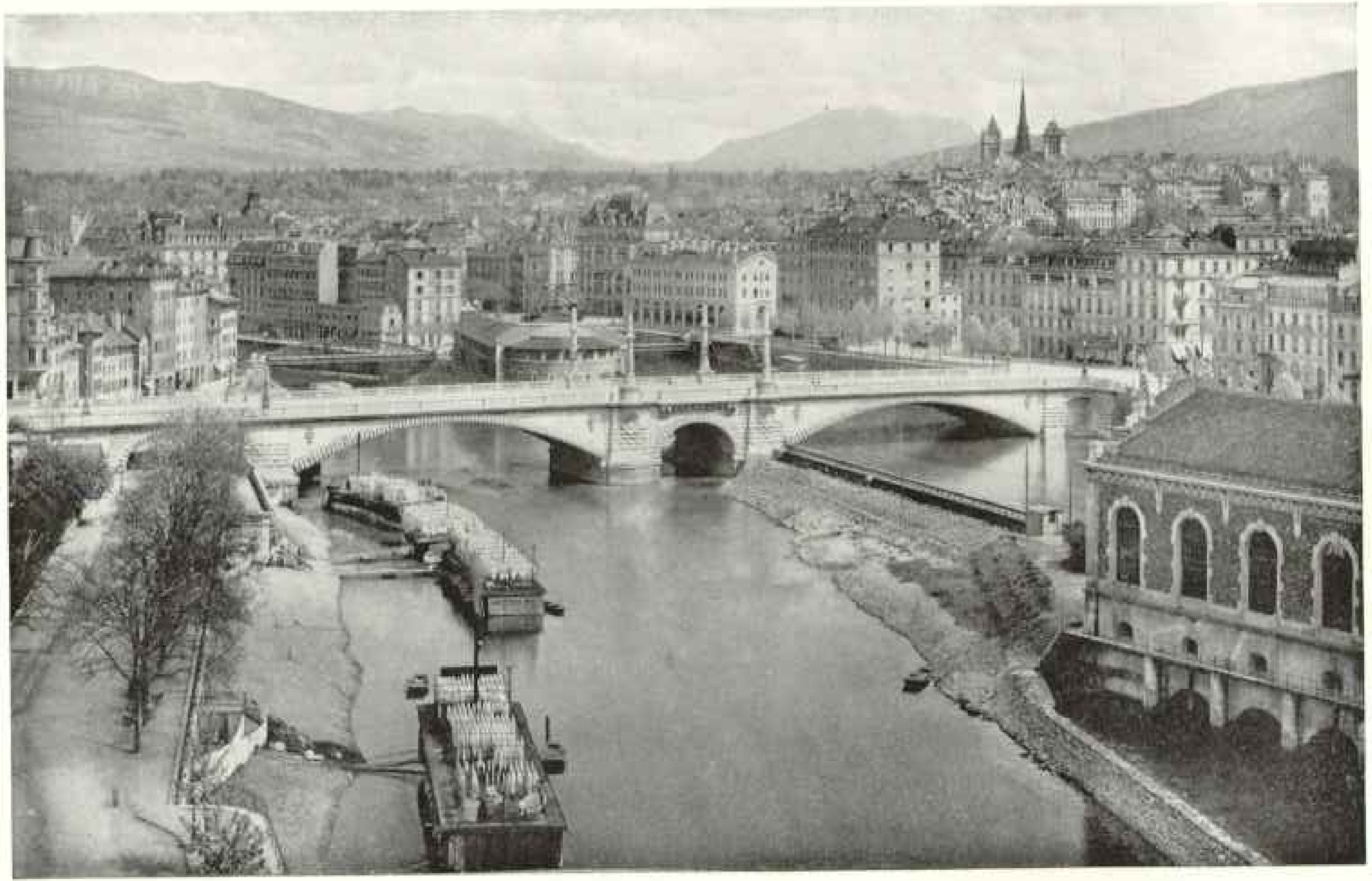
Viscount Bryce has said that there are four cities that belong to all men rather than to any one nation—cities that have influenced the whole world, or round which its history has at one time or another revolved; cities in which students and philosophers from every country are equally interested. To these four—Jerusalem, Athens, Rome, and Constantinople—must now be added Geneva.

Jerusalem gave to western civilization its religion. Athens was our great preceptress in liberty, literature, and art. Rome was the mother who gave us our laws and to most of us our language, while the power of her political and ecclesiastical institutions still sways half the globe. Constantinople, after the sacking of Rome, became the preserver of civilization, was the birthplace of the Justinian Code, the seat of an empire for fifteen hundred years, and the link between the waning glories of the Orient and the growing splendors of the Occident. Geneva now becomes the fountain-head of what may be either the most noble triumph or the most colossal failure in the history of human endeavor.

A HALF-WAY HOUSE BETWEEN BELLIGERENTS DURING THE WAR

Seated serenely on both banks of the River Rhone, where it leaves the limpid waters of Lake Geneva as a placid stream, in contrast to the muddy turbulence of its ingress at the other end of the lake, Geneva is not the metropolis of the miniature Republic of Switzerland, for Zurich surpasses it in population by 50 per cent and Bern is the capital. But it is doubtful whether before the world war any other city of its size was visited annually by as many tourists, for it was the main gateway into the world-famous "playground of Europe."

During the European conflict many of the finest Swiss hotels, which in seasons past have entertained thousands of Americans, suffered greatly for lack of wealthy patronage, and the federal government found it advisable to come to their financial relief by passing an ordinance



GENEVA, ASTRIDE THE RIVER RHONE, WHERE IT ISSUES FROM THE SLEEPING WATERS OF THE CRYSTAL LAKE

"Here dwelt the wise and wondrous," encircled by mountains whose heights and everchanging hues are constantly mirrored in the placid waters that lave its shores. Chosen as the permanent seat of the League of Nations, the physical aspects of the modern Swiss city are no less fascinating than the panorama of its historic background. This view of Geneva shows the Coulouvrenière Bridge and a flotilla of laundry boats anchored in the Rhone with linen hung out to dry on the decks.

extending the time for payment of interest on mortgages.

Other hostelries, however, were as crowded during the four years of horror and bloodshed as are the fashionable caravansaries of New York during Horse Show and Automobile Show weeks. But it was a kind of patronage different from any to which Geneva had catered since the days of the Reformation. Refugees from the belligerent countries flocked here, and thousands of interned soldiers were fed and housed by the government at a contract price, the country to which the soldier belonged reimbursing the Swiss.

Here, too, assembled the propagandists of every creed and complexion. Geneva, and in fact all Switzerland, fairly seethed with plot and counterplot, as agents and spies trafficked in military secrets and in the honor of foreign public officials. Here the nascent nations of middle Europe organized their bureaus of publicity and sent forth their pleas for recognition. Thus the Republic became the busy half-way house between the belligerent forces.

THE SORROWS AND GLORIES OF GENEVA'S PAST

Although its recorded history goes back beyond the Christian era, to the time when Julius Cæsar, in his commentaries on his first expedition into Gaul, mentions it as a stronghold of the Allobroges, its growth has been phenomenal only in its leisureliness. Today, after twenty centuries, it has less than one-third the population of the century-old capital of the United States.

But size has never been an infallible criterion by which to appraise influence. In the days of Pericles, the period of her greatest glory, Athens could boast of only 50,000 freemen—scarcely more than would have filled the stadium of Herodes Atticus, laid out by Lycurgus in the succeeding century!

Coupled with the heroism of the struggle of the Genevese against the Dukes of Savoy to secure political independence was the noble humanitarianism which prompted its inhabitants to accord shelter and succor to the fugitives from the shambles of the St. Bartholomew massacres in France and the persecutions during that era in England.

The city enjoys the distinction of being the birthplace of the International Red Cross, but also has some dark chapters in its past—the religious excesses of the Reformation, when the persecuted became the persecutors.

With such historic events must be associated the names of native sons, visitors, and exiles whose lives have added luster to the city and romance to its story. Rousseau, of whom Napoleon said, "Without him, France would not have had her Revolution"; and the patriot Bonivard, whose trials Byron immortalized as the Prisoner of Chillon, were Genevans. Farel, the Billy Sunday of his day, who could not be made to desist from preaching, even though the women of his congregation dragged him up and down the aisles of the church by his beard, made the lake city his headquarters during his ascendancy. And John Calvin, "who found Geneva a bear garden and left it a docile school of piety," was virtual dictator here for a quarter of a century.

Here, too, came Voltaire, who, as an exile from the court of Frederick the Great and from his own France, found it "very pleasant to live in a country where rulers borrow your carriage to come to dine with you." John Knox, the Scotch reformer, described this, his city of refuge, as "the place where I fear nor ashame to say is the most perfect school of Christ that ever was on the earth since the days of the Apostles"; but Madame de Staël, even amid the luxury of her Coppet estate, could not be reconciled to her banishment from Paris, as she gazed upon the sublimest glaciers of the Swiss Alps and sighed for "a sight of the gutters of the Rue du Bac." Byron and Shelley spent the fruitful summer of 1816 in adjoining villas in the outskirts.

A PHANTOM PROCESSION OF THE GREAT

Such are the people of Geneva's past—some gay, but most grave—with whom we can promenade arm in arm in phantom procession through the beautiful Jardin Anglais; along quays from which we glimpse the gleaming radiance of Mont Blanc; beneath the magnificent monument erected to the memory of

© Donald McLeish

THE CASTLE ON LAKE GENEVA WHERE THE PRISONER OF CHILLON WAS CONFINED FOR SIX YEARS

After his release from the dungeon of this castle, François de Bonivard, the original of Byron's "Prisoner of Chillon," was commissioned to write a history of Geneva. His style was more forceful than elegant. For example, in speaking of the manner in which the city was hemmed in by its enemies, he wrote: "One could scarcely spit over the walls without spitting on the Duke of Savoy," and "As the glutton likes a good plump fowl, so the Duke likes Geneva." He likened some of his timorous fellow-patriots to "those who want to catch the fish without getting their feet wet."

Duke Charles of Brunswick, who bequeathed 20,000,000 francs to the city he loved so well; through the narrow, step-like streets of the old town up to the eleventh century cathedral, and to the portals of the famous Hotel de Ville, within the shadow of whose walls Servetus heard pronounced the sentence of death at the stake.

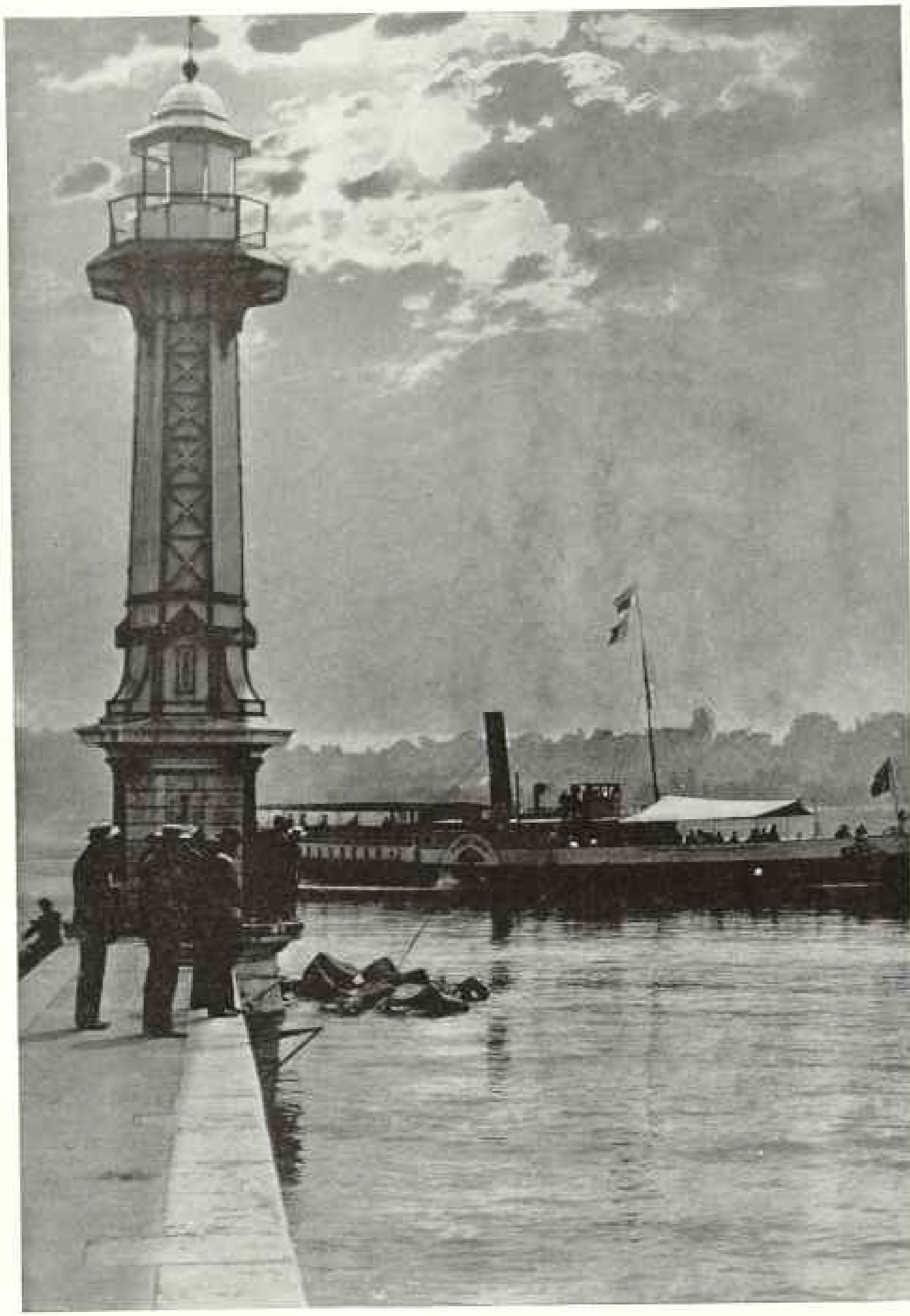
It is a poor European city that cannot trace its origin back to the age of myth and mythology. It took Geneva a long time to extend its family tree to Hellenic days, but traditionists now declare that four centuries ago there was discovered in the castle of Chillon a document which makes the lake city a contender with Rome for antiquity.

It will be remembered that the Eternal City was founded by the descendants of Æneas and his followers, who escaped from the Greeks after the fall of Troy. Geneva, which under Calvin's régime was to acquire the appellation, the "Protestant Rome," likewise turns to Troy for its traditional founder — Lemanus, son of Paris, whose abduction of the fair Helen from the palace of Menelaus brought on the Trojan war. And, to prove their case, Genevan guide-books point to their lake, *Leman* (from the old Latin name for Lake Geneva, revived in the eighteenth century), named in honor of their mythical progenitor.

Leaving the realm of fiction and tradition, the settlement at the southwestern extremity of the Alpine lake remained under the domination of Rome from the time of Cæsar until the break-up of the empire. In that period of five centuries, it was twice razed—once by the Ostrogoths and once by Attila and his Huns.

A MARINE BUTTERFLY ASAIL IN THE SHADOW OF THE SWISS ALPS

The advent of many commodious saloon steamers on Lake Geneva has not banished entirely these picturesque craft with their lateen sails of red. The first steamer to ply the waters of the lake was the *Guillaume Tell*, built in Geneva by an Englishman 96 years ago.



THE GENEVA LIGHTHOUSE

The level of the waters of Lake Geneva is subject to curious fluctuations, known as *seiches*. During these disturbances the whole mass of water in the lake swings rhythmically from shore to shore. A seiche has been known to cause a fluctuation of six feet in the level of the water at Geneva. One explanation advanced for this phenomenon is the sudden variation in atmospheric pressure on the surface of the lake.

In 800, together with the rest of the territory now embraced in Switzerland, it was an integral part of Charlemagne's dominions. Then for six centuries the city's history presents no points of compelling interest, the chief events being a succession of struggles between the prince-bishops and the counts of Genevois and Savoy for ascendancy.

A CITY OF GAYETY

In spite of political turmoil within and the constant danger of attack from without, this was an era of gayety in Geneva. Every one took life lightly. In the evenings, behind locked gates of the land fortifications and with the lake front protected by a row of stakes interwoven with heavy chains, the Genevese made the narrow streets their drawing-rooms. Beneath the flare of flambeaux they held high carnival, the women of exalted degree mingling with the common folk and dancing in the open with the gallants of the day.

The fact that during the day these streets were filled with lepers and beggars did not oppress the revelers. Nor was the cost of living high, if we are to accept the testimony of travelers, in whose diaries we find the entry that entertainment could be had at such inns as the Good Vinegar, the Hot Knife, or the Crowned Ox for man and beast at five pence a day!

THE SWISS CONFEDERACY A FRIEND IN NEED

Geneva probably would have been absorbed into the possessions of the Italian House of Savoy at this period in her history had it not been for the assistance from time to time of the cities of the Swiss Confederacy. In the fifteenth century Fribourg, a prosperous cloth manufacturing community, formed a commercial alliance with the Genevese, whose fairs were famous throughout western Europe.

This alliance aroused the ire of the reigning Duke of Savoy, who was the father-in-law of Louis XI of France. He induced that sovereign to forbid French merchants to attend the Geneva fairs, and at the same time to change the time for holding the rival Lyons fairs, so that they would conflict with those of the lake city. This was a serious blow and very nearly effected the commercial ruin of the Genevese.

During the first quarter of the sixteenth century, after the Reformation had gained full headway in middle Europe, a staunch Geneva patriot, Philibert Berthelier, succeeded in concluding a defensive alliance with Fribourg against Savoy, but not without bitter opposition from a strong ducal party in Geneva itself. The city was divided into two hostile factions—the Mamelukes, adherents of the Duke, and the Eidgenossen, or partisans of the Swiss Confederacy. It is interesting to note that from this term Eidgenossen (literally, oath companions) is supposed to have been derived the word Huguenot, subsequently applied to the French Protestants of the sixteenth and seventeenth centuries.

THE PRISONER OF CHILLON

One of the most picturesque figures in the history of Geneva during this period was Berthelier's associate in arms, François de Bonivard, who, when his victorious friends rushed into his dungeon at Chillon crying, "Bonivard, you are free!" responded with the query, "And Geneva?" Upon being assured that his city was also saved, he went home rejoicing.

Bonivard was a man of many contradictions. In inn and tavern he plotted revolution with compatriots who styled themselves the Children of Geneva. He engaged in armed strife for the possession of the priory of Saint Victor, and waged guerrilla warfare against a band of young "bloods" of Savoy, who called themselves Knights of the Spoon because they wore about their necks spoons with which to "eat" Geneva when they should capture it.

He bore with sangfroid his six years' imprisonment in the Castle of Chillon, four of which were spent in the dungeon beneath the level of the lake, chained to a pillar so that he could walk only three steps back and forth. He defended himself against the charge of beating one of his four successive wives by proving that "she needed it," thereby causing the reproof of the council to be shifted from his shoulders to hers, and in a subsequent domestic tragedy played a chivalric rôle

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THE TOWER OF THE CATHEDRAL OF ST. PIERRE AND THE HOUSE IN WHICH JOHN KNOX, THE SCOTCH REFORMER, RESIDED DURING HIS SOJOURN IN GENEVA IN THE SIXTEENTH CENTURY

The cathedral, which crowns the highest point in the old section of the city, is a Romanesque structure, said to have been erected during the first half of the eleventh century and rebuilt in the twelfth and thirteenth centuries. One of its treasured relics is a chair under the pulpit, which is said to have belonged to Calvin.

worthy of one of the Arthurian knights. Such was the stormy career of this Genevan.

THE LAST TRAGIC EPISODE

The story of the last grim episode in his life deserves to be told.

Having reached the age of nearly threescore and ten, and while still engaged in his literary pursuits, one of his works being his "Chroniques de Geneve," which he was commissioned to write by the City Fathers, Bonivard took into his house a young woman who had fled to him for protection.

The kindly act scandalized the proprieties of the religious community and he was called upon to marry the girl. All arguments that his relations with his ward were of a Platonic nature, and that he was old enough to be her grandfather, were of no avail. The marriage was solemnized.

In a short time Bonivard's worst fears were realized. This fourth wife, weary of her septuagenarian spouse, became involved in a love affair and the guilty pair were haled to trial.

Bonivard, who had not lodged the complaint, loyally testified in his wife's behalf, declaring that he did not believe the charges, and that she had always been a dutiful helpmate, his only cause for complaint being (and here we may assume that the veteran was adroitly pleading his wife's cause with the intense religionists who were her judges) that she had nagged him for his remissness in preaching the gospel and had beaten him for inviting friends to his house to drink wine.

It was a noble effort, but the evidence against the young wife was overwhelming. Her lover was decapitated and she, after the practice of the age, was sewn in a sack and thrown into the Rhone.

HOW CALVIN CAME TO GENEVA

Mention has been made of Guillaume Farel, the intrepid zealot whose missionary work, extending over a period of nine years, was responsible in a large measure for Geneva's definite adoption of the Protestant faith in 1535. But his influence did not end here.

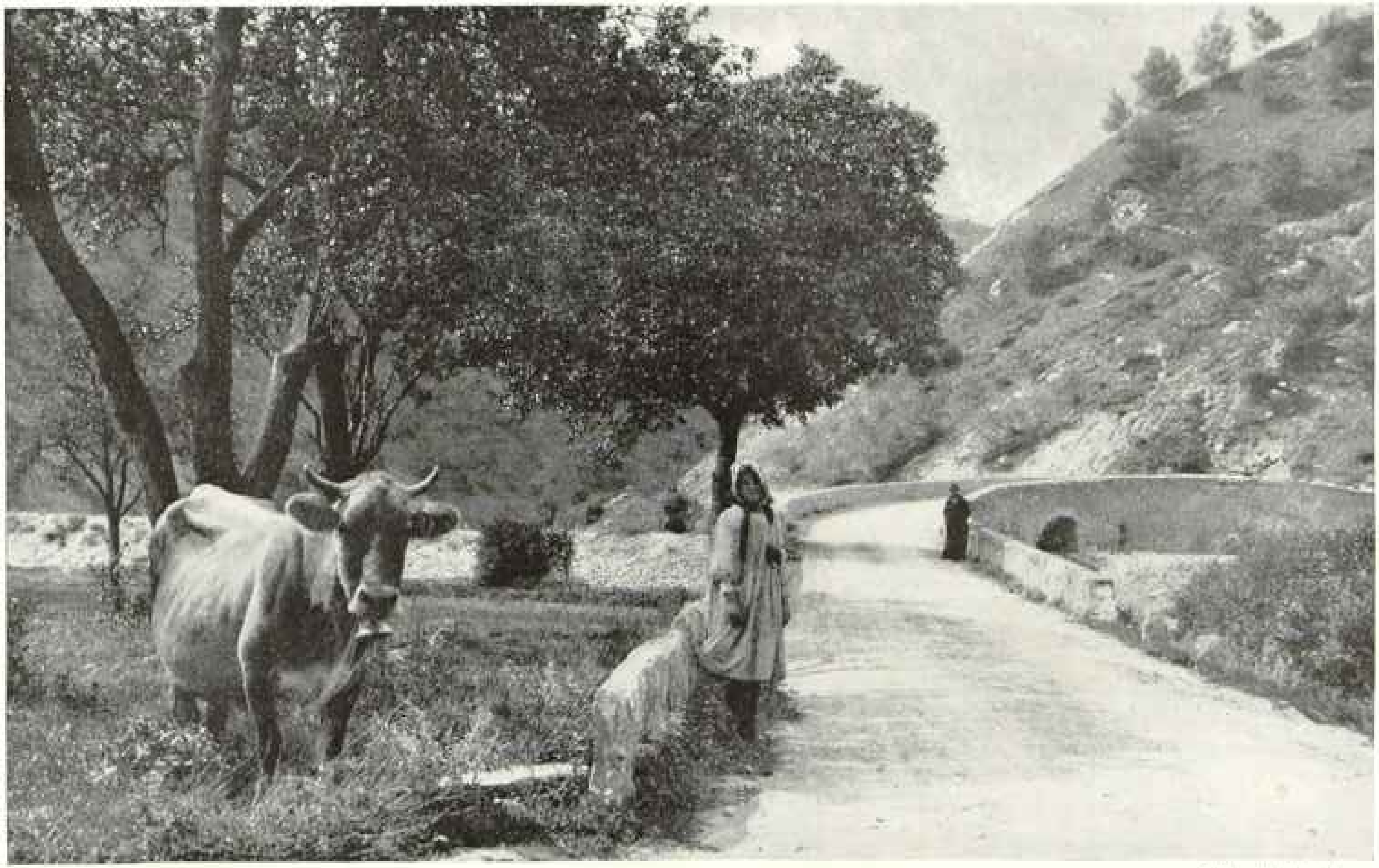
By one of those curious chances upon which hinge events of monumental moment, the young French philosopher, John Calvin, a native of Picardy, passed through Geneva one evening on his way to Strassburg. He had intended spending only one night; but Farel, hearing of his arrival, rushed to him and, with the fiery impetuosity which characterized every act of his life, convinced Calvin that it was his duty to remain and assist in the organization of a theocratic State.

Both men were soon driven from the city because they refused to officiate at a communion service for their "godless flock"; but upon his recall several years later, Calvin, who was then only 32 years of age, laid the foundation for a government which in its rigorous supervision of the private lives of the people has seldom, if ever, been equaled. Geneva became known as the City of Calvin as well as the Protestant Rome. Every act of the individual was under the scrutiny of the Council, of which Calvin was the moving spirit.

A CODE WHICH TOOK THE JOY OUT OF LIFE

The austerity of the Calvin code presents many amusing phases to the modern reader. For example, a hairdresser was imprisoned because he made one of his clients too beautiful. Any man who swore "without necessity" was required to take off his hat, "kneel down in the place of his offense, clasp his hands, and kiss the earth." The wearing of silk or embroidered hose was prohibited; likewise the adornment of one's person with chains of silver or gold, and eating or drinking in taverns outside of the city. Hosts and hostesses were enjoined to warn their guests to be in their own lodgings "after the trumpet sound to the watch or the ringing of the bell" (nine o'clock at night).

The penalties inflicted for wrong-doing under this hierarchy were of varying severity. The punishment meted out to Bonivard's wife has been related. In the case of Clement Marot, the famous French poet, who made the first metrical version of the Psalms and wielded tremendous influence upon Protestant thought in France, tradition says that the offender was whipped about the streets of the city upon complaint of an innkeeper, who had learned that his distin-



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ON HER WAY TO THE ALPS

At the end of the summer this Alpine beauty may be chosen to lead the herd back to the valley. The best cow is privileged to wear the statue of the Blessed Virgin, wreathed in flowers, between her horns, and, with head held high, wearing the biggest and deepest-toned bell suspended from her neck, she proudly steps out at the head of the procession of returning cattle.

guished guest had made love to the accuser's wife. This bit of gallantry on the part of Marot had been prompted by a spirit of retaliation for his host's insistence that the poet ask a blessing before every meal.

Of course, the indelible blot upon this period of Geneva's history and upon the careers of her men of authority was the infliction of the death penalty upon heretics. The two most notable martyrs were Jacques Gruet and Michael Servetus.

The former, convicted of having an heretical document in his possession, was subjected to the torture of the *corde*. The victim's wrists were bound tightly behind him with a cord, to which was then attached a rope thrown over a pulley, and by this means the sufferer was suspended in the air. Gruet underwent this intermittent torture for three weeks before "confessing." When he finally admitted his heresy he was taken to Champel, about two miles from the town hall, and there put to death.

Dr. Servetus, an eminent Spanish physician, while on a visit to Geneva, was burned at the stake following a doctrinal controversy with Calvin.

But the blackness of such tragedies was mitigated, in so far as such crimes can be atoned, by the generosity and solicitude of the Genevese for the persecuted of their own faith who took refuge here from many lands.

OPEN ARMS FOR HUGUENOT FUGITIVES

There is no more beautiful picture of Christian charity than the scene in this city when, on August 30, 1572, merchants of Lyons brought news of the massacre of the Huguenots on St. Bartholomew's Day. Pastors were dispatched to the frontiers to meet the fugitives who were reported to be on their way to this asylum, and the venerable Theodore de Bèze, who had succeeded Calvin as the spiritual head of the Council, directed the whole population to fast and pray for the sufferers.

Two days after the receipt of the news of the massacre the first fugitives began to arrive. In all, more than 2,300 refugees were housed and fed in this community, which at that time boasted of only 1,200 households. Although almost bankrupt herself, Geneva shared her all with the panic-stricken hundreds who arrived empty-handed.

A final episode remains to be related of the period antedating the advent of Rousseau. For a quarter of a century, beginning in 1578, the Genevese had succeeded in resisting the revived attacks of their hereditary enemy, the House of Savoy. At last the Council, after resolving "to ask the advice of God and M. de Bèze," declared war.

The citizen army numbered scarcely more than 2,000, as opposed to 18,000 Savoyards. Many Hun-like atrocities were committed. One prisoner is said to have been skinned alive, and peasants were hung up and roasted before their own fireplaces. The Genevese attempted to retaliate, but de Bèze, actuated by a spirit far in advance of his age, convinced them that by such acts they would be dishonoring their own city.

THE NIGHT OF THE ESCALADE

The closing act in the long drama occurred on the night of December 11, 1602, when the Duke's men, under General d'Albigni, made a treacherous assault upon the city.

There were 4,000 troops comprising the main body of d'Albigni's forces. These were preceded by a storming party of 200, which succeeded in gaining the ramparts unobserved, a single sentry being surprised and slain in silence. Unfortunately for the assailants, however, they decided to await the coming of dawn before launching the main attack. In the meantime a company of the Genevese guard stumbled upon the storming party.

In the mêlée a gun went off and one man of the guard, the drummer, escaped. He sounded the alarm.

It was now impossible to wait for daylight. The storming party gave their battle-cry and hurled themselves upon the town, expecting d'Albigni's 4,000 men to follow immediately; but the drummer's work had been done. An intrepid band of defenders at the Porte Neuve loaded a cannon to the muzzle with scraps of metal and old chains. Training the piece along the ramparts, the charge swept the

© Paul Thompson

IMPROVING MUSCLES AND MAINTAINING MORALE AMONG THE MEN OF SWITZERLAND'S NATIONAL MILITIA

Service in the militia is compulsory and universal among the Swiss, with few exemptions, except for physical disability. Those who are excused or are rejected pay additional taxes. Liability for military service extends from the 20th through the 48th year. The men from 20 to 32 years comprise the *Auszug*, or "élite," corps of the militia.

moat, destroying the ladders of the scaling party, and the city was saved.

The Duke of Savoy, who had been given a premature report of the success of this venture and had dispatched couriers to various courts of Europe announcing the gratifying results of his enterprise, upon receiving a true version of his ignominious rout, shouted at d'Albigni, "You blockhead, you have made a pretty mess of things!" Then he put spurs to his horse and rode for Turin, without thought of the fate of his defeated army.

To this day the Genevese gather at their cathedral on every anniversary of the Escalade, as this battle is called, and sing the 124th Psalm, the one which the venerable de Béze bade them sing on the morning after the night of their deliverance: "If it had not been the Lord who was on our side, when men rose up against us . . ."

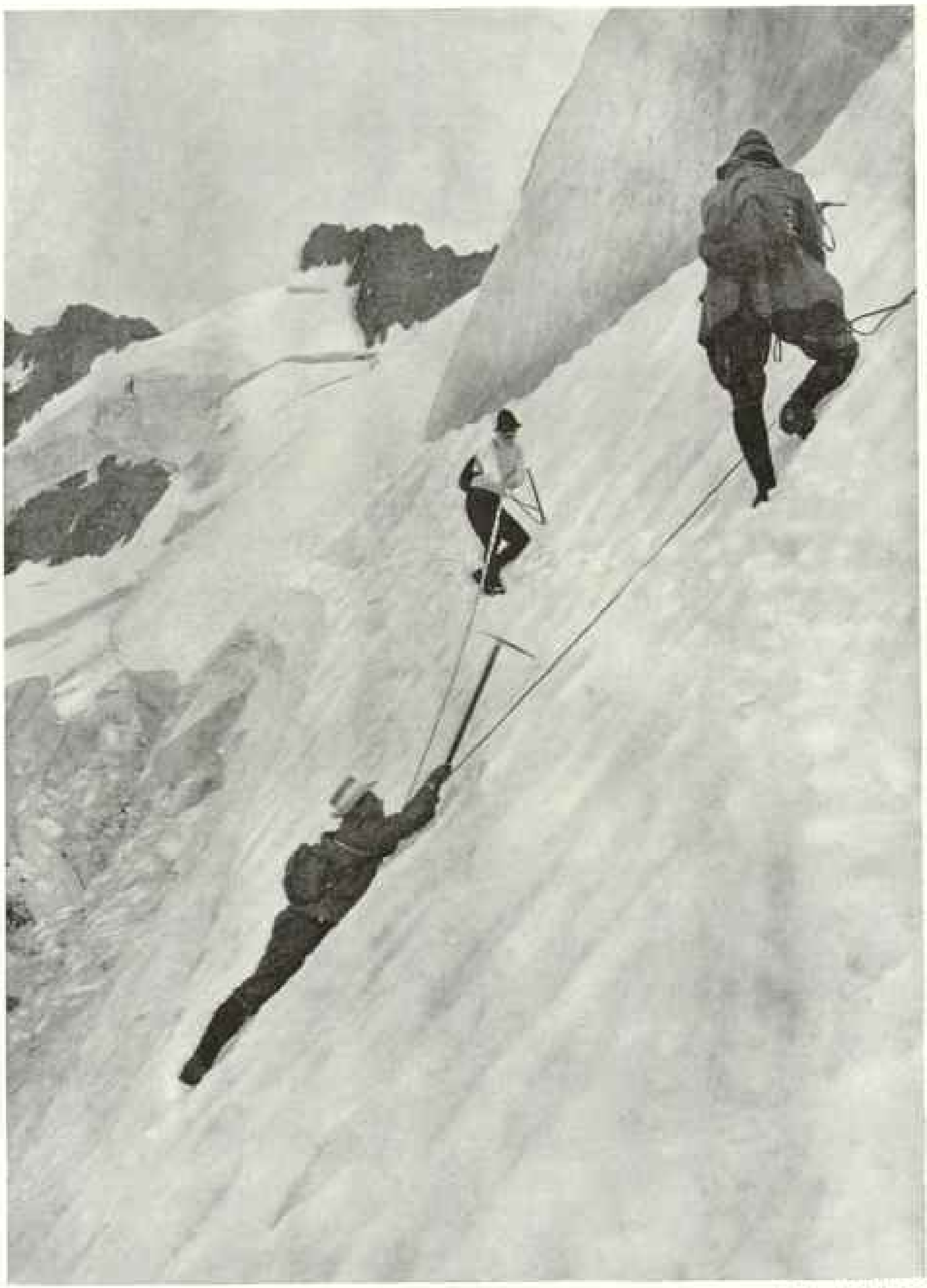
The story of Jean Jacques Rousseau, who delighted to style himself "the citizen of Geneva," although he did not take up his residence in the city of his birth until he was more than 40 years of age, is too familiar to warrant recital here. He is a careless tourist, however, who fails to make a pilgrimage to the little house at No. 40 Grand' Rue, where this son of a watchmaker and dancing master was born, or who does not linger over the balustrade of the beautiful Pont du Mont Blanc and look down upon Rousseau's Island and its Pradier bronze of the famous philosopher and people's advocate.

THE PARADOXICAL ROUSSEAU

Perhaps even more paradoxical than Bonivard's were the career and the character of this Genevan immortal. McCrackan has summed up his contradictions thus: "Although by temperament

A SWISS COWHERD IN NATIVE COSTUME

In each hand he holds an embroidered yoke and a huge bell. These are to be awarded the prize animals of his herd. Note his decorated pipe, which is an essential accessory of the holiday regalia.



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ALMOST A TRAGEDY: ON THE FACE OF A DANGEROUS ICE SLOPE IN THE ALPS

Among Geneva's many handsome quays, the most famous is the Quai du Mont-Blanc, from which a superb view of the majestic Mont Blanc group of mountains, to the southeast, across the lake, is obtained. The summit of Mont Blanc was reached for the first time on August 8, 1786, by Jacques Balmat, a chamois hunter of Chamonix, who had been spurred to the undertaking by a large reward offered by the famous Geneva naturalist, De Saussure. The elder Dumas, interviewing Balmat nearly 50 years after the event, quotes the mountain-climber as describing his sensations upon achieving the summit: "I was the king of Mont Blanc; I was the statue of that immense pedestal."

Photograph by A. G. Wehrli

UPWARD HO FOR THE HAY MARKET! THE GRASS HARVEST OF THE VALLEY STARTING FOR THE SWISS HEIGHTS

It is estimated that Switzerland has more than 300,000 peasant proprietors out of a total urban and rural population of less than 4,000,000. More than a third of the productive area of the country is under grass and meadows. The chief agricultural industries are the manufacture of cheese and condensed milk.

gross and sensual, he described the utmost delicacy and refinement of love in his 'Nouvelle Heloise'; he who abandoned his illegitimate children to the Foundlings' Hospital was a radical reformer in the education of the young; a mediocre musician, playwright, and poet, but an original and courageous philosopher; incapable as a political leader, but unrivaled as an advocate of popular rights."

A PILGRIMAGE TO VOLTAIRE'S VILLA

Nor does the twentieth century visitor to Geneva neglect a morning's walk to Ferney, where Voltaire spent his declining years. Both he and Rousseau took up their residence in Geneva in the same year (1754), and in death they rest side by side in the Pantheon in Paris; but it cannot be said that they dwelt in mutual amity. The great scoffer's plays, staged in the vicinity of Geneva, were the occasion of a bitter war between the exiled cynic and the vituperative citizen.

The inscription in the chapel at Ferney, "Deo erexit Voltaire," never fails to provoke from the guide the elder Dumas' ironic explanation of it: "It was erected to prove to the whole world, which had

Photograph by Edgar K. Frank

YOUNG SWITZERLAND AT A DRINKING FOUNTAIN

While the mountain republic revels in the sobriquet, "The Playground of Europe," it could also with much truth lay claim to the title of "a school-room for the continent and England," for its institutions of learning are widely known. Of its seven universities, that of Geneva, founded by Calvin in 1559 and generally recognized as one of his greatest gifts to the city, is the most famous, although that of Basel is a century older.

become very anxious about the disputes of the creature with his Creator, that Voltaire and God had finally become reconciled; the world heard the news with satisfaction, but it always suspected that Voltaire had made the first advances."

A mile or two farther along the northern shore of the lake brings the traveler to Coppet, where Madame de Staël held her brilliant court, surrounded by such satellites as the beautiful Madame Récamier, Guizot, the French historian, and Sismondi, the Swiss chronicler; Madame Le Brun, the noted artist, and Cuvier, the French naturalist. Yet, with all her wealth and her brilliant coterie of worshipers, who revolved around her as their sun, from which they derived their intellectual light and emotional warmth, she was unhappy, holding that a day of Paris was better than a decade of exile, even though that exile be softened by every material comfort and scenic charm.

THE HOME OF THE RED CROSS

The world recognizes Geneva as the maternal city of the International Red Cross. Not only did her citizen philanthropist, Henri Dunant, arouse the world with his book, "Un Souvenir de Solferino," in which he described the sufferings of those left on the field after that terrible battle in 1859, but it was to this city that the two famous conventions of 1864 and 1906 were called to deal with the problems of aid to the wounded and to noncombatants. In the latter year the representatives of 35 nations met and agreed upon the articles under which the Red Cross now operates throughout the world.

So, delegates from every clime and of every political creed, representing the League of Nations, will not be strangers

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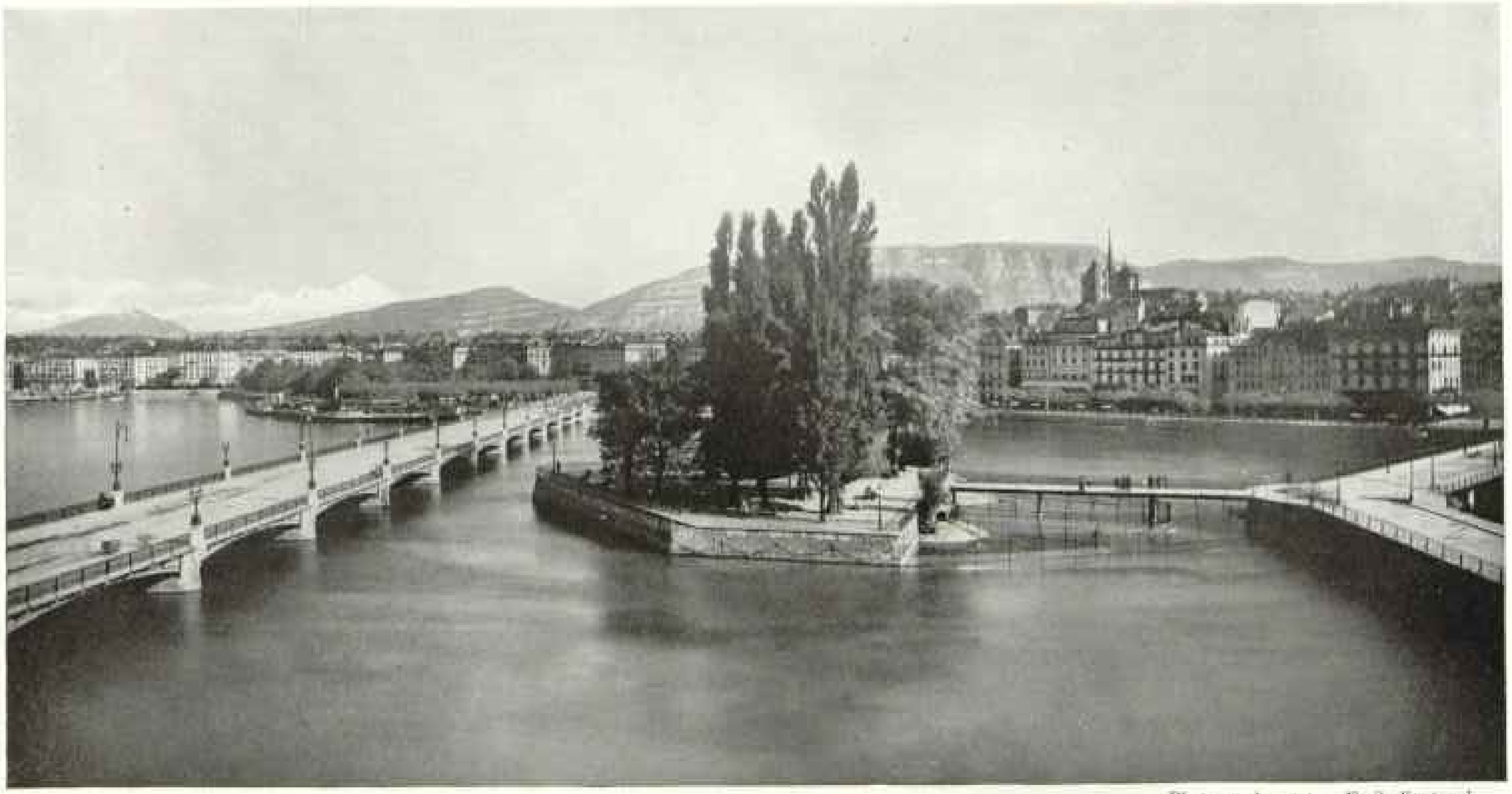
A SWISS MISS AND HER PLAYMATE

Her ancestors fought "the small battles of immortal memory"; she, her parents, and her descendants are to be hosts to the League of Nations. The Swiss Confederation, which students of history characterize as "a well-nigh perfect union," suggests in its make-up the possibilities for success of the new venture upon which the free nations of the world are entering. Its "twenty-five small States, differing from each other in nearly every point—religious, political, social, industrial, physical, and linguistic—are so organized as to constitute a federation which maintains public welfare, individual rights, and general harmony" (see "The Races of Europe," in THE GEOGRAPHIC for December, 1918).



Photograph courtesy Emile Fontanel

THE PEACE DELEGATES OF TWENTY-SEVEN NATIONS HAVE CHOSEN THIS CITY AS THE CAPITAL OF THE WORLD

In the distance looms the majestic summit of snow-clad Mt. Blanc. The fronded islet in midstream is dedicated to the memory of Geneva's most famous private citizen, Jean Jacques Rousseau, whose bronze statue by Pradier may be indistinctly seen through the foliage. A wooded park on the shores of the lake, five miles from the center of Geneva, has been selected as the site for the permanent home of the League of Nations. A mile below this point the Rhone is joined by the Arve, the clear blue waters of the former and the muddy, glacier-fed waters of the latter flowing side by side for a distance of several hundred yards before they mingle.

to the Millennial City, nor the city to them.

GENEVA IS FRENCH IN LANGUAGE AND CUSTOMS

Of the 25 Swiss cantons, the German language is spoken by a majority of the inhabitants in 19; but Geneva is one of the five where French is not only the popular language, but French customs and French habits of thought prevail. In the remaining canton Italian is the dominant tongue.

Geneva Canton is not naturally productive, but the frugal industry of its people causes it to yield a very respectable harvest of fruits, grain, wines, and vegetables. In extent, the canton measures 108 square miles, compared with the 70 square miles comprising our District of Columbia. Four-fifths of this area is cultivated—a far higher average than obtains throughout Switzerland, as indicated by the fact that before the war the little republic depended upon the outside world for five-sixths of all its wheat and a fourth of its meat.

From a material and physical standpoint, Geneva will make an ideal world capital. Its industrial activities are considerable, yet neither noisy nor sordid. Famous for its watches, the manufacture of which was introduced by Charles Cusin, of Autun, in 1587, it is also the home of the music-box.

Industrial statistics, which show that there are more than five hundred factories in the Canton of Geneva, convey a wrong impression to an American, for under the Swiss system of classification every workshop, even though it employ only two or three people, is called a factory. In these numerous small establishments chocolate, preserved fruits, synthetic perfumery, cigars and cigarettes, parts of watches, and jewelry are made.

The manufacture of watches, especially the wrist-watch type, condensed milk, and chocolate flourished during the war, and many a Genevan would have amassed a large fortune had it not been for the fact that the cost of materials as well as the cost of living increased from 100 to 300 per cent. In the manufacture of chocolate, the Swiss were greatly handicapped by the fact that their normal sources of raw materials were Africa and South America.

As typical of the minutiæ of Switzerland's manufacturing industries, it is the boast of one important firm that it conducts an international trade in the sale of the small bows which are attached to leather bands inside our hats.

HANDICAPPED BY DEARTH OF COAL

Heavy manufacturing establishments have never found a home in Geneva, as Switzerland lacks mineral resources, especially coal. More than half a century ago coal was mined in the adjoining canton of Valais, but the industry was abandoned owing to the inferior quality of the output. During the war, however, when the price of fuel mounted to unheard-of heights, even necessitating radical curtailment of the State-operated transportation facilities, this Valais mine was reopened.

Though poor in coal, Geneva and her sister cities have a wealth of water power, and it is highly probable that the republic will electrify its 3,700 miles of State-owned railways in the near future.

One practice which will seem strange to most of the representatives of the League of Nations will be the 24-hour clock, which the Swiss Federal Council last year decreed should be adopted upon the return of normal conditions.

The 24-hour system of time-keeping, beginning at the midnight hour, has been in use by astronomers and in one or two European countries for a number of years, but it is unfamiliar to the western lay world. According to these regulations, the Swiss transportation system, telegraph lines, customs service, and all institutions under Federal control will be operated by the new-style timepiece, one o'clock in the afternoon being designated as the thirteenth hour, etc.

THE SITE FOR THE LEAGUE'S PERMANENT HOME

Geneva has set aside as a site for the permanent home of the League of Nations a beautiful wooded park bordering on the lake some five miles from the center of the city. Behind the park tower the snow-clad Jura Mountains. While there are many villages in the vicinity of

the park which are suitable for offices and for quarters of the delegates and their secretarial staffs, the capitol building itself must be built.

Thus every external attribute conducive to comfort and pleasure will be provided for the statesmen whom it is proposed to commission with the responsibility for international justice, liberty, and world peace.

The aspect of Lake Geneva from this site will prove a constant source of delight to the visitor, its brilliant blue waters in calm weather reflecting at dawn and eventide the indescribable alpenglow of the mountains to the south, while the linteen sails of barge and pleasure craft present a perpetually changing picture, as if staged anew each moment for every spectator.

While here and there among the literary estimates and appreciations of its beauties one finds a somewhat critical note, as that of William Dean Howells, who only saw in the city "an admirable illustration printed in colors for a holiday number to imitate a water-color sketch," an overwhelming majority of those who have enjoyed Geneva's hospitality will lean rather to Ruskin's estimate, that it is "a bird's nest of a place; the most lovely spot and the most notable, without any possible dispute, of the European universe."

DEVIL-FISHING IN THE GULF STREAM

By John Oliver La Gorce

Author of "Pennsylvania, the Industrial Titan of America," "Warfare on Our Eastern Coast"

WHAT the rolling prairie of the Far West was to the buffalo in the olden days, when it roamed in countless thousands to and fro in search of new pastures and salt, the ever-rolling Gulf Stream—that mighty, warm river which parallels the east coast of Florida—is to the fish legions of our semi-tropical seas.

How many fishermen realize that there are found in the Atlantic Ocean offshore between Miami and Key West nearly 600 varieties of fish—an amazing total which constitutes one-fifth of the entire fauna of the American Continent north of Panama!

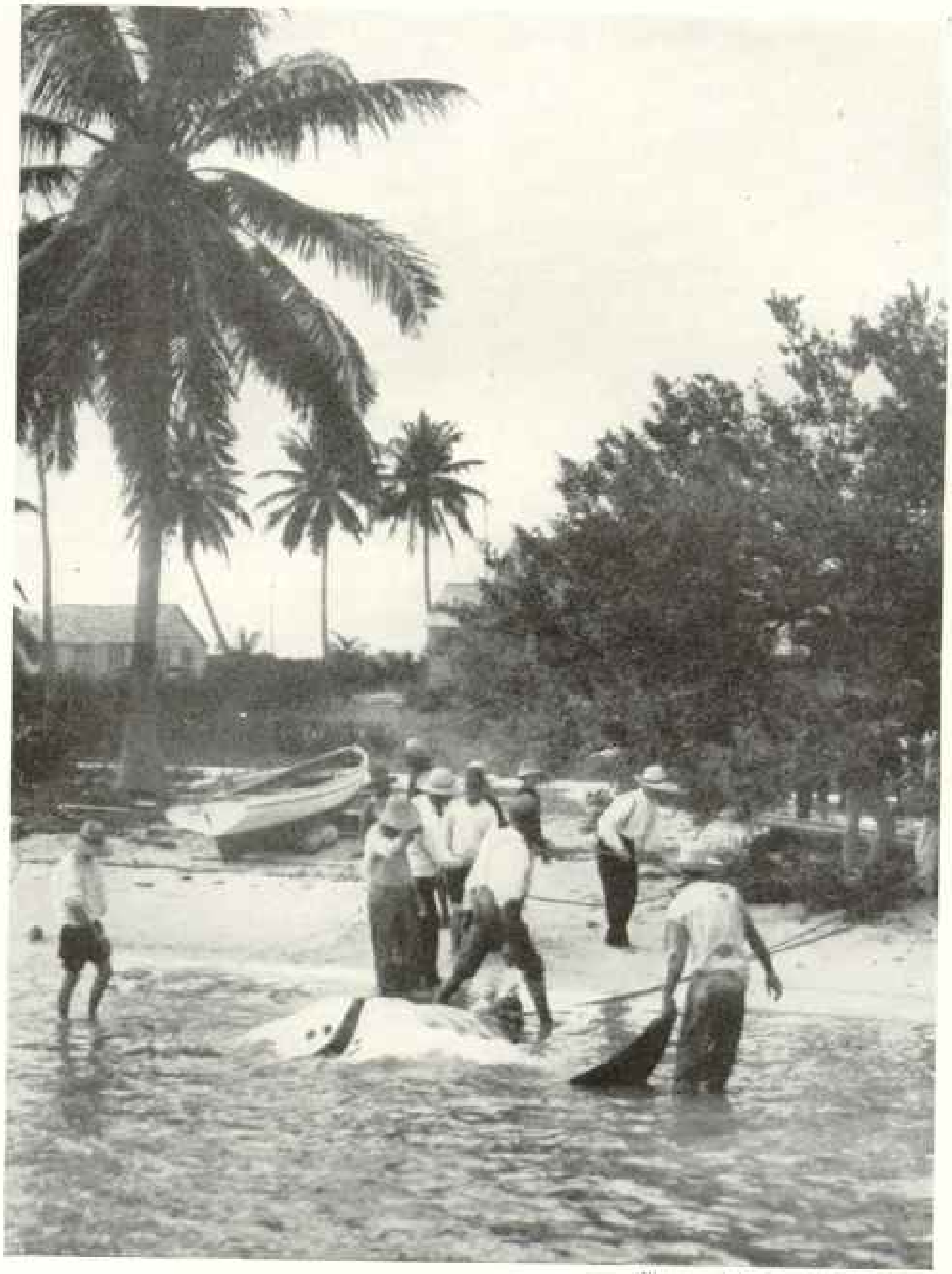
To even sketch the possibilities of sport fishing along the far-flung coral reef off Miami, the southernmost city of the Florida mainland and the fourth in size within the borders of the State, one must discount the old question: "Are all fishermen intentionally disingenuous, or do only liars fish?" for the facts concerning the variety, gameness, weight, and diversified color of the citizens of the deep, abounding in these waters, require a high rating as to the personal veracity and the courage to prove that ancient proverb about truth being stranger than fiction!

The fresh-water fisherman who, armed with light tackle, matches his wits against the quickness of the black bass, the brilliant generalship of the brook trout, or the fierce charge of the muskellunge, in his inland streams and lakes, may not consider it superior sport to "wet his line" in salt water along the *North* Atlantic coast, for not many of the fish in cold seas are considered foemen worthy of his steel.

DISCOVERING A NEW WORLD OF SPORT

Yet a different story can be told of their warm sea brethren, and he needs only to hunt out, for example, the fearless tarpon, the dashing sailfish, or the powerful and valiant bonefish, not to mention a score of other finished fighters of the Gulf Stream, to realize that he is called upon to extend his every faculty and skill to bring such game alongside as trophies of his prowess.

It would be interesting to have a motion-picture record of the thoughts which flash through the mind of even an experienced inland fisherman the first time he feels the tiger-like swoop of a five-foot barracuda, the yank of a hundred-pound amberjack, or the sullen surge of a big



Photograph by Charles W. Kotchet

GETTING THE FISH ASHORE AFTER IT HAD BEEN PARTIALLY DISMEMBERED

It took a long while and much effort to get the devil-fish ashore at Bimini so that the hide and cartilage structure could be preserved for mounting.

grouper on his line; for even when armed with the heaviest rod, a reel as big in comparison as the cylinder of an automobile engine, and a line which approaches a hawser in thickness, he is pretty sure to wish, at least subconsciously, that his equipment was twice as formidable and his arm thrice as strong.

What, indeed, must his sensation be the first time when, looking overboard at his baited hook 30 feet below in the clear waters of the Gulf Stream, he sees, as plainly as if in a mirror, the approach and attack of a giant jewfish, which is just as likely to weigh 500 pounds as 30, for it sometimes grows as big as a pony along the Florida coral reef and is just about as strong!

UNRELATED MONSTERS OF THE DEEP

When one starts in to tell of the amazing variety of undersea life along the Florida east coast, it is difficult to decide where to begin and end, for it is an inexhaustible subject. Such being the case, I will not attempt a survey of it now, but will confine myself to the experience of our party in hunting and capturing a devil-fish, said to be the largest specimen taken in American waters in twenty years.

In the general mind the devil-fish and the octopus are frequently confused, whereas they belong to entirely different fish families, and the only physical resemblance between these two gentry lies in the fact that they both live in the same waters. The devil-fish, or *Manta birostris* of science, belongs to the giant ray family—a huge batlike creature which uses its body fins as a bird does its wings in flying, with a waving, undulating motion, which propels it along beneath the water at remarkable speed.

Aside from its immense wing-spread, the outstanding feature of the devil-fish, and the one from which it derives its satanic name, are the lobes, or, as they are sometimes termed, cephalic fins, which extend outward and upward from each side of its flat head like curling horns.

In the adult fish the head fins are from three to four feet in length and about six inches wide. Nature has fashioned them of a leathery muscle tissue which spells strength in every ounce.

When the giant ray dashes into a school of fish, these head fins are of great assistance in obtaining food, for, like the arms of a boxer, they are in constant motion, whirling about and sweeping its living prey into the yard-wide mouth with almost lightning speed, as it hurls its great body about in its natural element.

The remarkable strength and twisting movements of the so-called horns are responsible for many of the allegations lodged against this fish as a menace to mankind, whereas, unless attacked and in panic, the huge sea-bat hurts no one.

As a matter of fact, however, there are a number of authentic reports of the devil-fish's running foul of a ship's anchor chain. True to instinct, it clasps the chain tight by wrapping its tenacula horns or feelers about it, applies its tremendous strength, lifts the heavy anchor as if it were a feather, and starts to sea with the anchor, chain, and ship, to the amazement and terror of the crew, who cannot believe their very eyes, as their vessel moves onward at a fast pace without a sail set or an engine's turning over, when, to all appearances, a moment before their vessel was moored to the ocean floor.

THE OLD MAN OF THE SEA

The octopus, on the other hand, although sometimes termed "devil-fish," is of another family entirely, an invertebrate, known to science as the typical genus of Cephalopods, or, in plain words, the highest class of mollusca, in which squids, cuttle-fish, and octopi are grouped. In Pacific waters the giant octopus, technically known as *Octopus punctatus*, grows to an immense size; indeed, captured specimens have measured a radial spread of 20 to 30 feet.

In appearance the octopus is most repulsive, having a large, ugly head, a fierce-looking mouth, armed with a pair of powerful horny jaws, shaped much like a parrot's beak, atopped with two diabolical eyes set close together, which are positively capable of sending forth a demoniac glare when angered. The grotesque head is mounted on a somewhat oval body, from which radiate eight arms, usually united at the body base by a membrane. The arms or tentacles are

provided with rows of suckers, with which it clasps and clings to its prey with uncanny strength and quickness.

As a rule, it will not give battle to man unless angered or injured, but when challenged will fight to the last, doing its best to pull the object of its wrath beneath the surface of the waters.

THE START FOR THE HUNTING GROUNDS

From the Florida reef the run across the Gulf Stream to the nearest islands of the Bahamas is a matter of 65 miles. We started from Miami at noon, guests of James A. Allison, on board his sea-going motor yacht *L'Apache*, with a 25-foot motor-driven fishing boat bobbing along behind in tow.

In the party of fishermen were Mr. Allison, Captain Charles H. Thompson, of Miami, the internationally known authority on the fish of the east coast of Florida; Commodore Charles W. Kotcher, A. G. Batchelder, and the writer, together with the captain and crew of the *L'Apache*.

Assisted by the northeastward pressure of the ever-moving Gulf Stream, we made splendid progress, and that evening cast anchor behind Bimini, a tiny isle which rests like a jeweled feather on a summer sea, the westernmost outrider of the Lower Bahama group. Bimini is a quaint little coral dot a few miles long and a quarter of a mile wide, quite covered with clusters of coconut palms and tropical plants, its tallest headland rising but a few feet above the surface of the old Atlantic—an out-of-the-world spot peopled by a few score of Bahama negroes, who eke out a precarious existence by fishing, gathering shells, and, in a small way, cultivating sisal, the fibrous plant from which hemp rope is made.

Approaching the island, the ocean bottom for miles offshore is carpeted with snow-white sand, and so clear is the water that there is no difficulty in studying the vast marine gardens 30 to 50 feet below the surface.

Due to the white sand beneath the sea and the glorious blue of the sky, with the ever-changing cloud effects overhead, the bewildering gradations of color to be seen in these waters challenge description and fill the heart of the artist with despair, although he paint with the inspired brush of genius.

OVERSEAS CEREMONY

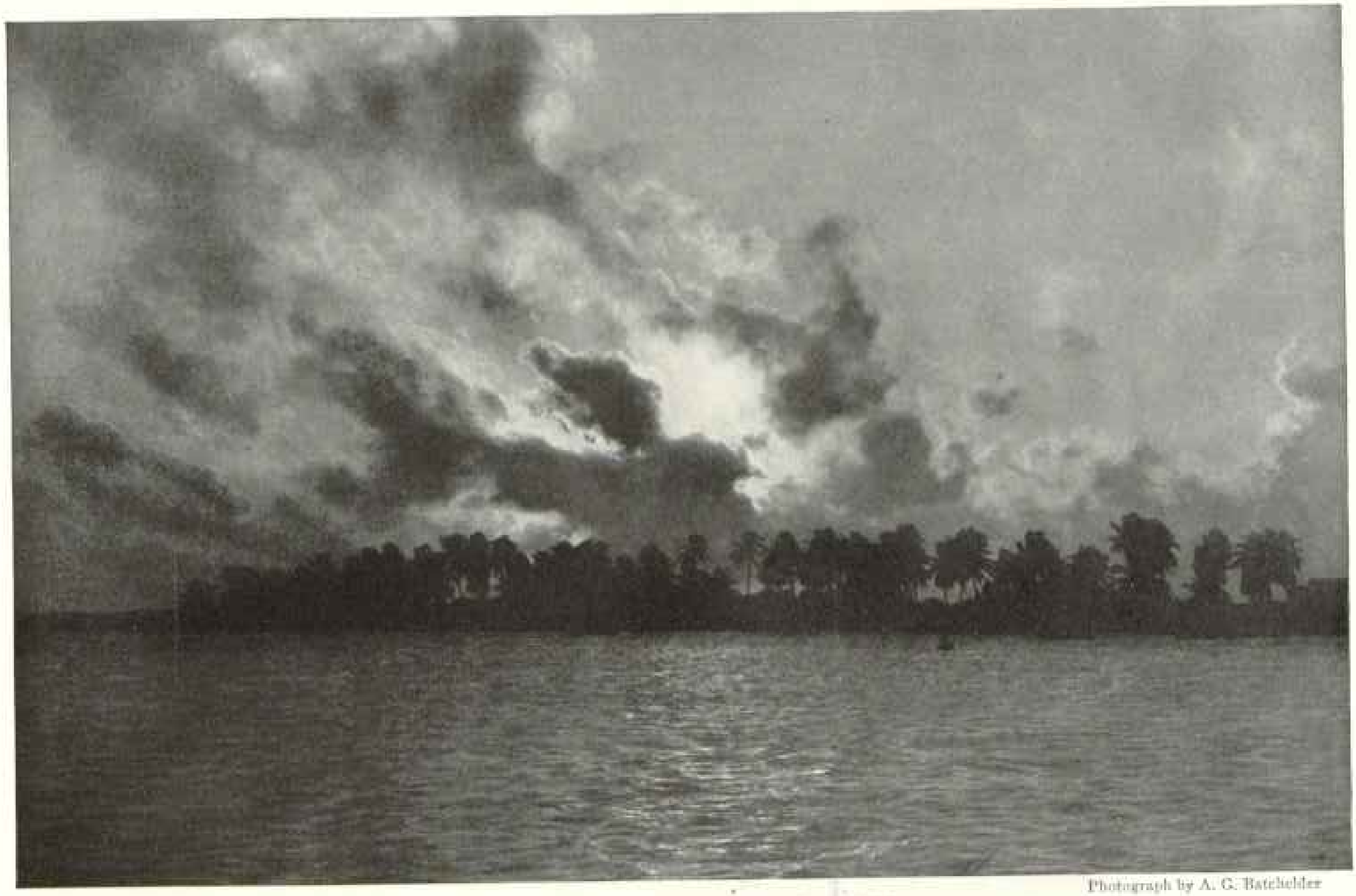
The Bahamas being colonies of Great Britain, of course her authority extends even to this little-known spot. Therefore, Bimini boasts a port officer—an English gentleman, who also serves as the Crown Commissioner, Police Magistrate, Customs Collector, and Consular Official for examination of passports, as well as being physician and school teacher to the island's inhabitants. In short, he is the Twentieth Century Pooh Bah, who, with much courtesy and dignity, meets the infrequent foreign craft when it drops anchor upon arrival, inspects all qualifying documents, then sadly waves adieu from the beach when the visitor sails away.

THE SEA SUPPLIES THE LARDER

Up to the day of our arrival, there hadn't been a piece of fresh beef or a bit of butter on the table of the Crown's Representative for nine months, much less that of a single one of Bimini's humbler inhabitants, for the isle is more than a hundred miles from Nassau, and even the mail-boat was conspicuous by its absence during the period of the European war, when enemy submarines were in South Atlantic waters.

So it is that the sea furnishes food for the Biminites, supplemented by a few vegetables, flour, and salt meats, when they can get supplies from Nassau. Conch, the marine animal which inhabits the beautiful spiral shell, so fashionable as a parlor ornament a generation ago, is the chief article of food, and the natives consume thousands of them each year; indeed, it can be considered their main article of food.

After we had received and returned the official call of the Crown's Representative, we had visitations alongside from several shore boats, manned by dusky-hued merchants, each tradesman clad, on an average, in one and a half garments, who, with a happy grin and a hungry look, offered for sale varieties of sponges, brilliantly colored conch shells, sea-beans, and tortoise shell, the last-named article being obtained from the



Photograph by A. G. Batchelder

SUNSET IN THE TINY HARBOR OF BIMINI

This little isle on the western rim of the lower Bahama group is destined to become very popular as a cruising haven for yachts sailing from Miami and other Florida ports. The inhabitants, 99 per cent Bahama negroes, earn a haphazard living by fishing and in a small way cultivating sisal, from which rope is made. They live almost entirely upon fish and conch, the latter because of its valuable properties being especially used for food.

Photograph by James A. Allison

THE BEACH AT BIMINI, BAHAMA ISLAND

The island of Bimini offers a safe and comfortable harbor for visiting yachts of not too great draft. The inhabitants are as quaint and interesting as the isle upon which they are born, live, and die. The *L'Apache* can be seen at anchor offshore.

hawk-bill turtle, which is quite plentiful in these waters.

THE LURE OF THE TROPICAL NIGHT

It was like pulling teeth to go below deck and leave the wondrous beauty of the tropical night, with the soft, cool touch of the ever-blowing trade wind, the shadowy grace of the giant coconut palms swaying and whispering on the near-by beach in the moonlight, while the surf, grounding upon the coral strand on the outer side of the isle, lulled us with its crooning obligato.

But the wiser heads spoke of the need of a good night's rest to prepare for the battle royal which we hoped was in the offing, and so we regretfully went below and to dreamland instead of having a try at the tarpon which we could hear jumping and rolling on the surface, like playful puppies, only a few hundred yards astern.

At sunrise the next morning all hands were up and ready for the fray. The chef soon had a hot breakfast served, after which we piled aboard our motor-driven fishing boat, upon which our rods, lines, and harpoons had been made ready the night before.

Making a course out through the island channel to the open sea, all of us excepting the steersman hung over the side to enjoy the amazing sights below in the deep ocean pools. One of us would excitedly point to a squad of six or eight big tarpon lazily wallowing about far below—lords of their element, unafraid; therefore ready to give battle to anything except, perhaps, a tiger shark.

Another startled angler would call from the other side that a 10-foot hammerhead or a nurse shark was rolling an eye at him from the ocean floor, while still another inland fisherman wanted to jump down among a school, numbering possibly ten thousand large and small mangrove snappers, busily parading up and down a long stretch of coral shelf on the bottom, which afforded them instant hiding places in case of the sudden appearance of hungry enemies.

Passing out over the entrance bar, we set a course for the open sea, and soon all were scanning the pulsing bosom of the Gulf Stream for big game, like the crew of a submarine destroyer peeling their eyes for a periscope in the danger zone.

Strange as it may seem, the fish of the warm seas do not appear to have the slightest apprehension of danger from the noise of a motor-boat, and if attracted by the bait or not disturbed by the approach of a natural enemy below water, one can not only get very close to them, but has little difficulty in keeping the big fish in sight, once they are located and something of their habits known.

After a while Captain Thompson called our attention in his quiet way to a long, dark shadow not far below the surface a couple of boat-lengths away, and the boat was turned toward the first sign of our quarry, which he said was a "herring-hog," a species of porpoise. It proved to be an adult about eight feet long, weighing around four hundred pounds, and as this species destroys great quantities of foodfish, we went for it.

Reaching the proper position to strike, a hand harpoon was thrown, found its mark, and away the herring-hog went at a fast clip, the line fairly smoking from the barrel. And soon we were being towed along—a novel sensation to the novice. One of the less experienced fishermen of the party was given the harpoon line with instructions to bring the big fellow alongside forthwith, and further instructed above all to "keep his head up," the rest of us sitting back to enjoy his attempts to obey orders.

About twenty minutes after the strike and while yet the herring-hog was showing slight signs of tiring, although this could not be said of the perspiring fisherman into whose care he had been given, a considerable disturbance was observed on the surface of the water about a quarter of a mile away, and it was judged to be either a leopard shark at kill or a battle royal between two big denizens of the deep. Anything can be expected in these waters.

THE REAL BUSINESS OF THE DAY

It was our business, however, to have ring-side seats at this battle, whatever it was. So all hands took hold of the herring-hog line and, reversing the engine, which was not very sportsmanlike, but decidedly effective in checking it, we

brought him alongside without further loss of time; then turned our attention to the new mystery now close at hand.

We were all excited at the thought of getting a harpoon into a big leopard shark, which will fight any and everything that swims, and, according to all deep-sea fishermen, is really the only member of the shark family of whom man need be afraid while in the water.

But the reader can imagine how our interest was increased when all at once Captain Thompson, who, having uncanny eyesight plus long experience with subsea life, suddenly exclaimed: "Stand by, men; it's the biggest devil-fish I have ever seen!"

As we drew near it seemed to me that the entire bottom of the ocean in that area was suddenly dark and slowly moving off, and I discerned in the translucent depths a gigantic shadow which had the appearance of a huge bird flapping its wings and swinging its long, thin tail from side to side, as it flew slowly along.

While we were coming up within striking radius of the fish, which was evidently devouring something it had killed and was paying no attention to anything else, our harpoon lines, used in dispatching the herring-hog, had been straightened out and put in readiness for the combat which was to come.

As soon as we came near enough, Captain Thompson let fly with his heaviest harpoon, and then, as the little boy said when he dropped the cat into the pail of stewed tomatoes, "the fun began."

I am sure that none of us was ready for what followed. The devil-fish rose as though hurled upward by a submarine explosion beneath it. One of its great bat-like fins broke above the surface, sending gallons of water over us and splintering the harpoon pole against the boat's side as if it had been a match stem; then its 10-foot pectoral wing struck the water with a terrific impact, making a noise which could have been heard several miles away.

For a moment the monster seemed bewildered, and that lost moment cost him dear, for it enabled us to throw another harpoon, which struck deep into its body near the spine. Away it started to sea, taking our harpoon line with it, at a pace which made us apprehensive regarding its length, although we had, as we thought, a wide margin for safety. Gradually all hands put their weight against the line, and as the boat was by this time moving properly on an even keel, we took a wrap around a bow cleat and started seaward—giant fish, boat, and crew!

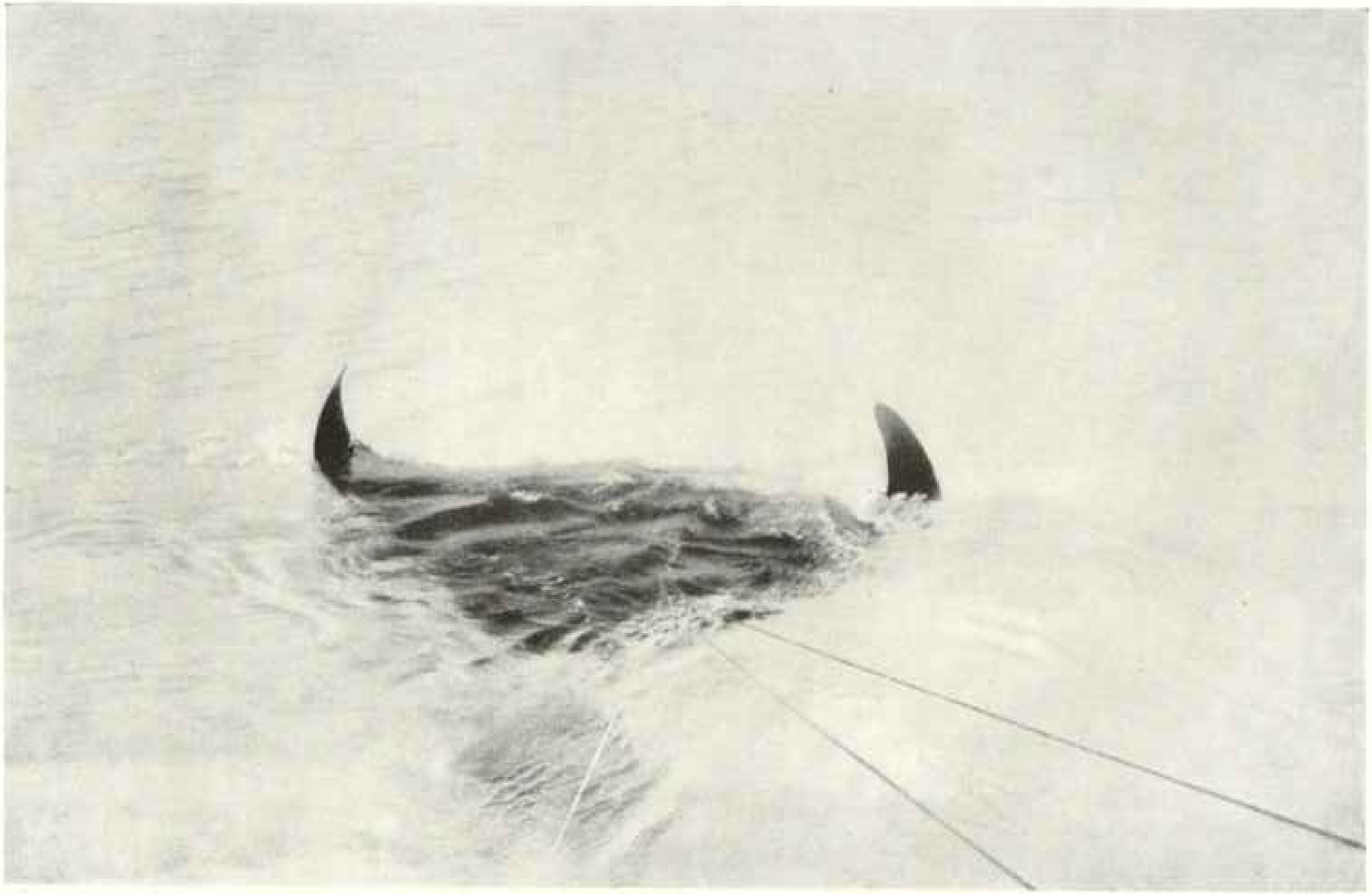
Every once in a while the devil-fish would literally hurl itself several feet out of the water, and its huge body would come down with a crash like the explosion of a 42-centimeter shell! Moreover, each time it broke on the surface it looked larger than before. Now and then it would sound for deep water in an effort to shake us off, and several times it went down so far that we stood by with hatchets to cut the lines at the last moment, in the event the bow should be drawn completely under water, as came perilously near happening more than once.

All of a sudden the lines slackened, and we frantically hauled in as the monster turned and dashed toward the boat, coming up almost, but not quite, under our craft, its gigantic bulk lifting one side of the heavy launch well out of water and giving us a pretty stiff scare.

THE BEGINNING OF THE END

With his usual skill and presence of mind, however, Captain Thompson let drive another harpoon he had at hand, which found lodgment in the devil-fish's head, and away it dashed again. With two harpoon lines, one in each side of the body, we were actually able to drive the monster as one would a runaway horse, swerving it toward the distant shore of Bimini and into more shallow water by the process of pulling first on one line and then on the other, which course was a little too much for the fish to resist. Meanwhile time was flying.

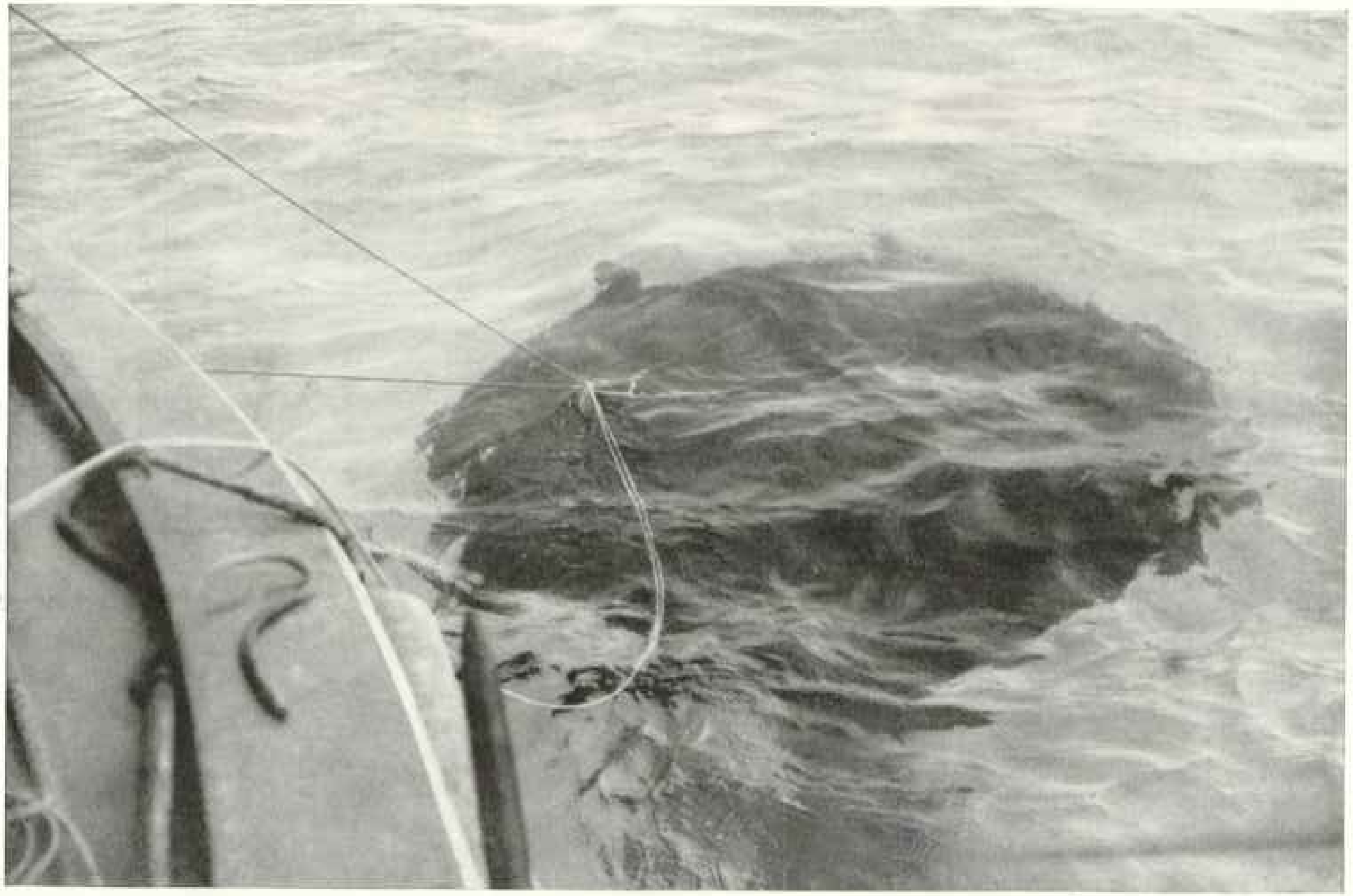
By this time the devil-fish had towed us for about ten miles, and although it was losing much blood, it was still going strong; so our next experiment was to throw out and let drag our anchor in order that this maneuver might further impede its progress. But this expedient made little difference to this giant, for it continued to pull us along as if our heavy craft were only a birch canoe.



Photograph by James A. Allison

TWENTY-TWO FEET ACROSS FROM TIP TO TIP

A most remarkable photograph of the giant devil-fish, with the tips of its wing-like fins above water, actually towing a 25-foot motor-boat at an estimated speed of 10 miles an hour. There were three harpoons in the broad back of the fish at this stage. The sea monster had towed the heavy launch many miles, but was still going strong when this picture was made.



Photograph by James A. Allison

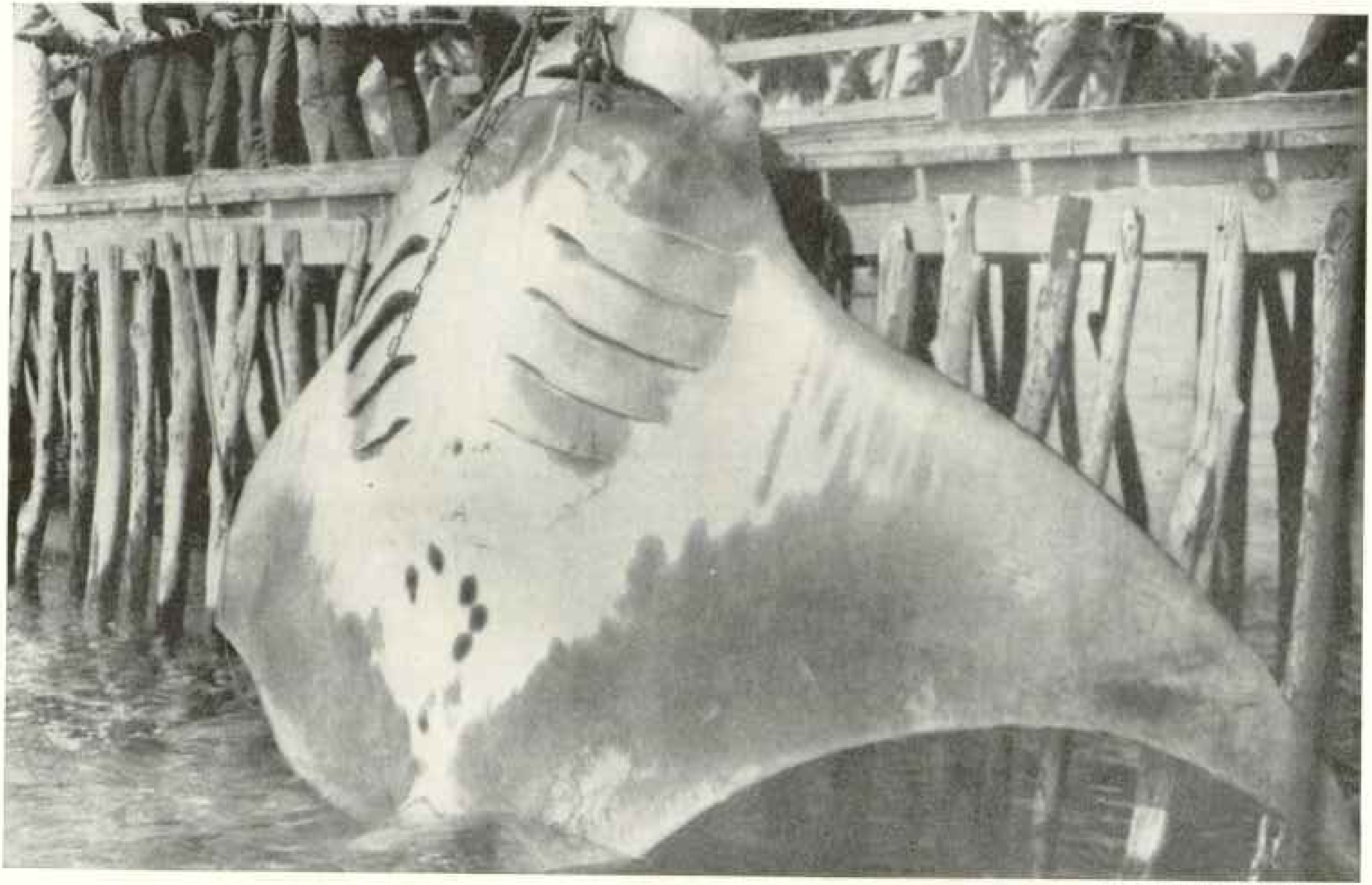
THE GIANT DEVIL-FISH IN ITS NATURAL ELEMENT

Undoubtedly the first photograph ever made of a live devil-fish under water. Note the two horn-like fins curving near the head, from which the devil-fish takes its name. The giant was about six feet beneath the surface and growing weak from great loss of blood and its long fight extending over hours.

Photograph by Carl G. Fisher

THE GIANT FISH AND ITS CAPTORS

Note the curling, horn-like head fins of the devil-fish, with which by a circular motion it sweeps live food into its mouth by the bushel when it dashes into a school of fish. The series of vents on its belly, which look like the hood of a well-known automobile, are in reality the breathing apparatus, or gills. The dark object hanging from the wharf on the left is a herring-hog, a species of porpoise, about eight feet in length and weighing about four hundred pounds.



Photograph by J. O. La Gorce

THE DEVIL-FISH PULLED OUT OF ITS HABITAT FOR INSPECTION

It required the continued effort of fifteen stalwart Bahama sponge fishermen, many thicknesses of the heaviest manila rope, and a large block and fall to pull the sea monster partially out of the water and alongside the wharf to be photographed. The ropes broke a dozen times, and even the wharf structure sagged and cracked with the dead weight of the huge fish. This view is the underside of the devil-fish.

After an hour or so, however, during which it alternated between trying to pull the bow under water and suddenly turning and endeavoring to come up under us, the anchor began to catch hold better, and our giant was becoming a little more amenable to reason, so that a number of times we were able to haul in slack, rearrange our lines, and even to get up within 20 or 30 feet, as it labored along with its great batlike fins, a little less powerful in stroke and somewhat slower, in plain sight, five or six feet below the surface of the water.

It was at this point that Mr. Allison secured the pictures, which we have every reason to believe are the first and only actual photographs of a giant devil-fish alive in its natural element. These photographs, because of the refraction of light in the water, do not give a clear idea of this monster's enormity, and make it hard to realize that our remarkable catch measured 22 feet across from the tip of one pectoral fin to the other and 17 feet 1 inch from the head to the end of the tail, and, moreover, weighed considerably more than 3,000 pounds.

Seeing that it was well-nigh impossible to give it a death blow, and that at any minute in its jockeying the fish might come up squarely under the boat and upset us in spite of all that we could do, and as all manner of sharks had been attracted by its struggle and loss of blood, we naturally did not relish the thought of any such experience, so we signaled to the *L'Apache* for a gun.

Luckily, about this time, a fast-sailing little island sponge boat approached us to see what the excitement was all about, and we managed to make the spongers understand that they must go back to the yacht and bring the rifles, which had, unfortunately, been forgotten in our hurry to get started in the early morning.

VICTORY AFTER HOURS OF BATTLE

The native mariners were most willing to help, and made all haste possible; so, after another half hour of skirmishing and ring generalship on both sides, the ship's motor-driven dory came tearing out with an express rifle, and we were enabled to give our giant its *coup de grâce*.

Until that moment not one of us realized that nearly five hours had elapsed since we first tackled this Jumbo of the deep, and none of us knew how tired we were, for in good truth we had been far too busy to give a thought to such small matters. Although this fish finally had four harpoons in its body and a dozen shots in its head and heart, it was by no means dead, and even then we had considerable difficulty in towing it into the harbor, some miles away.

Naturally, the natives of Bimini were very much interested in the capture, for devil-fish destroy great numbers of food-fish, and we experienced no difficulty in engaging the services of 15 of them to help to get the carcass ashore, having decided to try to remove the hide and bony structure for mounting.

By bringing into play a heavy block and tackle borrowed from the islanders, which was used for lifting and weighing cargoes of sisal fiber, and after much breaking of ropes, to say nothing of the wharf structure's being in serious danger of collapse because of the great weight of the fish, we finally succeeded in getting most of its body out of water, so that it could be photographed and weighed by means of a large sisal scale. The utmost capacity of this scale was 3,000 pounds, and this is all which is claimed for the fish, although we judged it weighed 4,000, or possibly 5,000, pounds.

Through the courtesy of some friends, who had run over from the Florida coast in a fast express cruiser to join us in the sport, but who arrived too late to take part in the actual capture, we were enabled to send back the necessary parts to an expert taxidermist for mounting, although it was a serious question to know what to do with so enormous a thing after it was mounted, for not many rooms will take care of a fish measuring 22 feet across, and it was decided it would be presented to the Cocolobo Club, the unique cruising and fishing club located near Miami, where a special room is being built to receive it.

SIGHT-SEEING IN SCHOOL

Taking Twenty Million Children on a Picture Tour of the World

By Jessie L. Burrall,

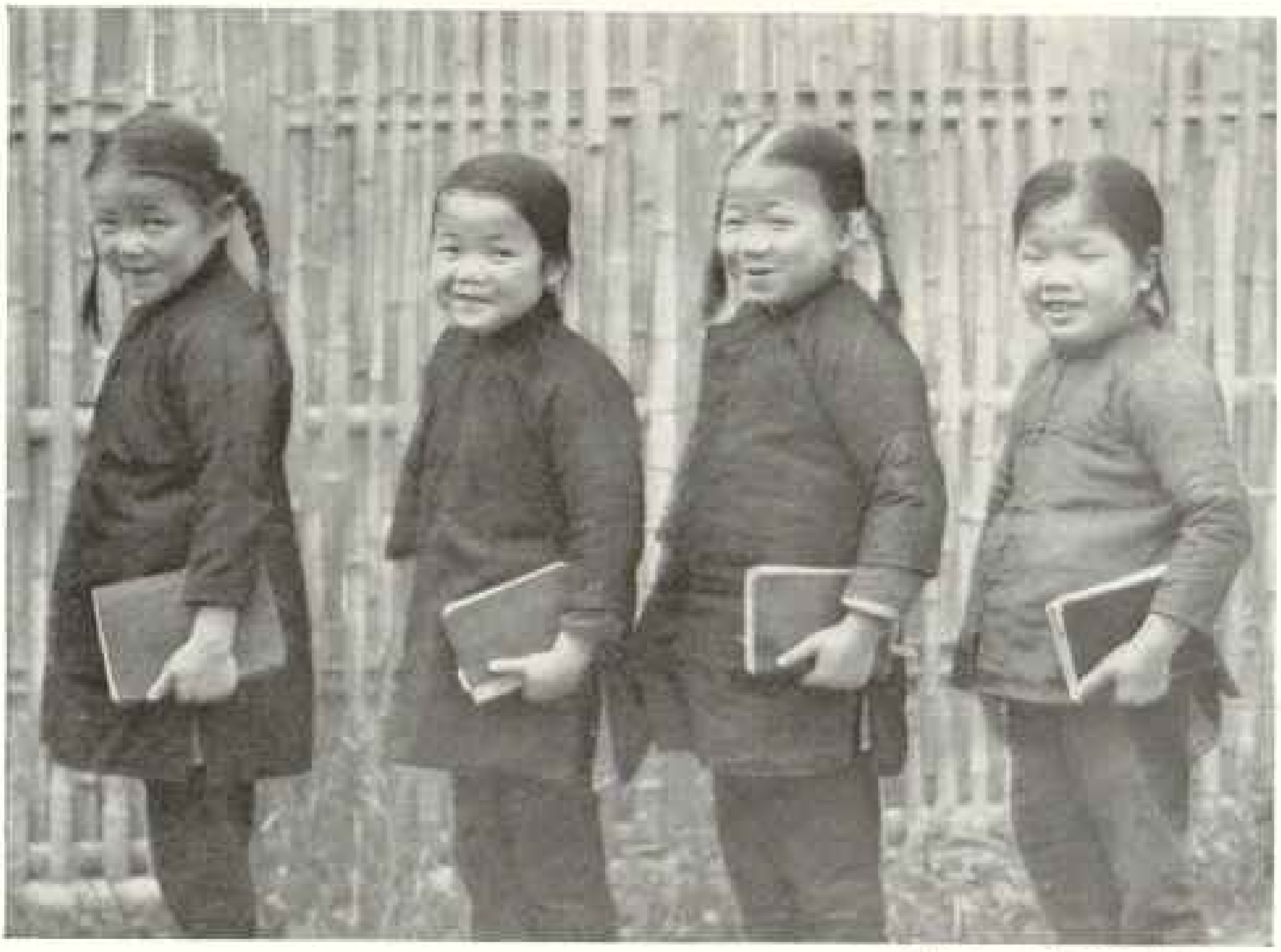
Chief of School Service of the National Geographic Society

NO FACTOR of American life affects us as a people more vitally than does the public school. It takes care of our boys and girls during more than half of their waking hours for nine or ten months every year. It molds their habits of body and mind for life.

How many are there of these boys and girls in our schools today? More than twenty million—enough to fill four magnificent cities the size of our great New York, or eight the size of our energetic Chicago.

The armies of war disband, but these children continue to come on and on, wave after wave, year after year, a mighty army mobilized for service and for life. Let us visualize them as marching some fine morning four abreast across the continent from the Golden Gate, and see how long the line will be.

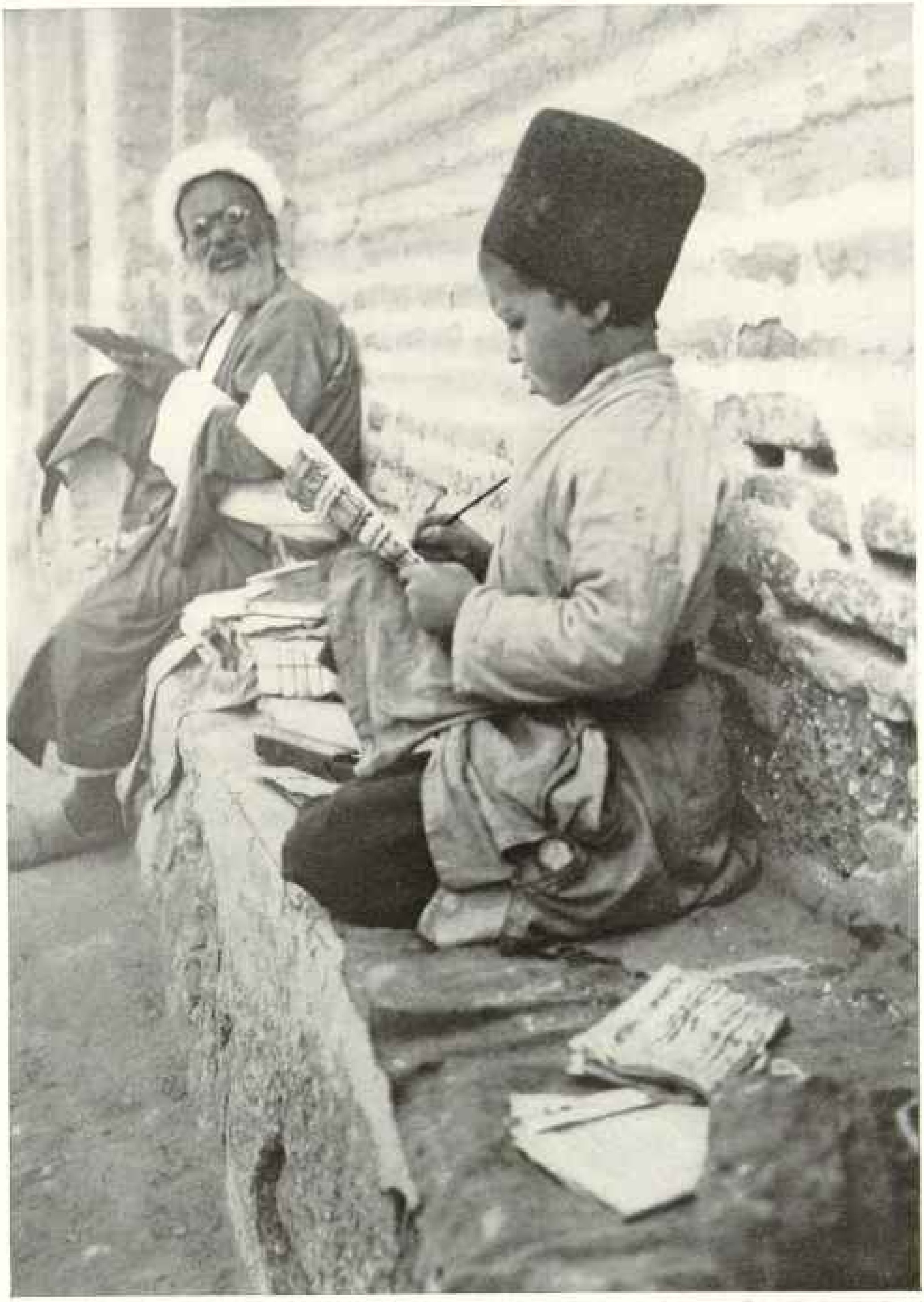
Here they advance, across the Sierra Nevada and the Great Basin, between the snow-covered peaks of the Rockies, down across the Great Plains—marching steadily on—crossing the Mississippi, passing



Photograph by M. O. Williams

"THIS IS THE WAY WE GO TO SCHOOL" IN CHINA

Every hour of the 24 sounds the call of the schools to hosts of girls and boys somewhere on the globe.



Photograph by Lieut. Col. Alfred Heinicke

A WRITING LESSON IN PERSIA

This budding savant, with his reed pen, Chinese ink, and knee-cap desk, gravely insists that, although Persian is undoubtedly the finest language on earth, it surely must be the hardest to write.

the headwaters of the Ohio, through the storied Appalachians, to the Nation's Capital—an unbroken line, four abreast, across the United States, with several thousand left over in San Francisco for good measure. There they are—the school children of the United States—with golden hair and brown hair, black eyes and blue, with rosy lips and springing step, all marching together in the army of the public schools.

CHILDREN THE CUSTODIANS OF THE FUTURE

And each unit in this stupendous number represents an eager, throbbing, little soul, looking out in joyous anticipation or in timid wonder toward the life ahead. Whatever is in the schools sends its vital currents through all these minds and hearts out into the life of our land.

When we think that within a few short years the fate of our country will be in the hands of these children, that inevitably they will be the next America, we realize the importance of the training that they should have.

The schools have suffered many an upheaval, but none at all comparable with the great crisis brought on by new conditions arising from the war. Educators all over the land are meeting these needs in amazing measure.

For several years vast changes have been going on, which, accelerated by the war, are now so far-reaching in their results as to amount to a practical revolution in aim, tending to alter radically the materials used as well as the methods of teaching.

GEOGRAPHY TEACHING—OLD AND NEW

An excellent illustration of recent and rapid advance is seen in the work in geography. To appreciate all that this means, we must think back to our own geography lessons.

We remember the reading over and over of the lesson and the halting recitations of such facts as we could call to mind. We learned, "An island is a body of land completely surrounded by water" and "A mountain is a high elevation of land composed mainly of rock." We struggled through, "Ponds and lakes are bodies of water that occupy depressions in the land." Whatever depressions in the land might be, it was beyond us to fathom; but woe engulfed us if we could not tell that lakes occupied them.

We sometimes had ten or more of these definitions in one day, and some of us were "kept in" on sunny afternoons because we just could not make them stick in our minds. We could not visit the real islands, peninsulas, straits, and gulfs, and pictures of them were few and expensive.

So the hard definition road was the only way to the dim and often inadequate mental pictures we formed of these things. As we read over and over the pages of our books, few of us ever dreamed of the fascination of Mother Earth and the lure of her mysteries.

But now our children have pictures of the snowy peaks, with timber-line and flowery meadow below. For them, as well as for the few who can travel, the Rocky Mountains lift their lofty ranges, the Yellowstone offers its wonders, and Niagara Falls pours out its rainbow spray. Pictures can now bring to our children all of the beauties and wonders of the earth.

THE MAP COMES TO LIFE

Even a map can glow with fire and meaning! The interests of our sturdy, active boys and girls center in the world about them. They are full of curiosity about all the varied wares of the corner grocery. The bunches of bananas turning slowly from green to yellow set them to wondering whence they came.

That seems a far cry from the map of Central America and a study of "the surface, climate, population, products, and capital cities" demanded by courses of study; yet now the pictures make the magic connection. With them the children go on a journey to Costa Rica. Paying neither carfare nor hotel bills, they, nevertheless, visit the banana plantations, learn of banana culture, and become acquainted with the black boys and men who gather the luscious fruit for them.

Costa Rica becomes a most interesting place. Now they like to study the map, for that country is no longer a small pink spot, but a place where real people live and work and play.

AN OPEN-AIR MOHAMMEDAN SCHOOL AT BISKRA, NORTH AFRICA

The mere reading of verses from the Koran is in itself considered a meritorious act, while to teach the boys to recite the book by heart is the great object of these schools. In rhythmic sing-song, to the accompaniment of swaying bodies, the class progresses through the long and difficult task.

Photograph by Harriet Chalmers Adams

THE VILLAGE PUMP IN THE PHILIPPINES

This Ifugao mother has brought her baby to the bamboo water tube for a drink, and perhaps a bath. Water is piped from the heights in this manner and is not impure unless it has drained rice terraces higher up.

Other regions become equally vivid. Washington is not a black dot in a tiny yellow square, where an unknown quantity called the Government makes laws; but it is its own true self—a city of beautiful parks and wide streets, of stately buildings and historic monuments, a capital city of which any girl or boy can be proud.

So the pictures bring the maps to life, and we find the children locating countries, rivers, and lakes, with a personal interest in each. Let us trace throughout the schools this fundamental change in geography teaching that has come about through pictures. Let us see how they give new life to the work from primary through grammar grades.

GEOGRAPHY FOR THE PRIMARY CLASS

No child needs to learn to read before he can know of the world beyond his horizon. He can have his geography lessons from the beginning. He no longer uses the laborious path of the printed page or even depends upon the clever oral pictures that the teacher is supposed to be able to give about "Little Indian, Sioux or Crow," or "Little frosty Eskimo." He now has innumerable pictures of far-away folks. He sees the Eskimo father at his hunting, the mother in her fur clothing, and the children with their toys.

At Thanksgiving time, when the stories of Pilgrim life and adventure arouse interest in the Indian, he learns how the red children live. In the spring the pictures tell him about his little black and brown brothers, who romp and play where the sun is high in the sky at noon and where no snow falls. By the same happy picture path he learns of the lives of children in England and Holland, in far-away China and Japan.

PICTORIAL PHYSICAL GEOGRAPHY

But, meanwhile, as he grows his interest broadens. Suddenly he wants to know where the brook comes from, what

Photograph by Harriet Chalmers Adams

MARKET SCENE AT ILOILO, PHILIPPINE ISLANDS

The market at Jaro, a suburb of Iloilo, is famous for its cloth of native weave. The finest jusi and pina in the Philippines is woven near Iloilo. At the window of every other house on the island a woman is seen at a crude loom.

makes the stones in its bed so smooth, and why the quartz pebbles are so white, while other rocks are gray or black. Then it is that pictures lead him to the story of the mighty forces of water. He need not begin by reading about detritus and erosion. He sees pictures of brooks and rivers, dashing down the hills near their sources, flowing broad and free across the plains, and lazily idling through their vast deltas.

He visits neighboring hills and sees how heavy rains dig out gullies in unprotected soil. Then he studies views of wooded and denuded slopes, and of floods caused by careless deforestation. From these he gains ideas of conservation and the wise use of our national resources. He has illustrations showing the skill and value of the forest ranger, and becomes careful in lighting his own camp-fires. Best of all, he gets the idea of his responsibility for the care of public property. "What belongs to all of us is for me to enjoy, but not to hurt," he thinks at the close of a lesson.

Again, the pictures tell him the story of the great glacier that once covered the whole northern part of the United States, and how it ground rock to powder, smoothed off the rough edges, made our lakes, and gave us our soil. From this the teacher leads him to volcanoes, geysers, and earthquakes. How fascinating they are in the pictures! He can take in at a glance what could not be gained in

Photograph by Harriet Chalmers Adams

HATS FOR SALE: CEBU, PHILIPPINE ISLANDS

These hats, of coarse weave, are worn by the taos in the rice field and are exported from Cebu. A fine grade of hat is exported from the Philippines, made from abaca, or manila hemp.

an hour's careful reading, and his knowledge is clear-cut and accurate.

INTERMEDIATE INTERESTS

The pictures likewise care for all the varied needs and interests of the liveliest group in our schools. Not even the darting humming-bird can vie with the activity of boys and girls between the ages of eight and fourteen. Nowhere else is to be found the abounding vitality and the insatiable curiosity that they possess. They run miles in the course of a day's play, and at night are ready to tease for just one more game of ball. They want to hammer up buttons to "see what they are made of," and to take the clocks apart. Their interest in how things are done is now used to broaden their knowledge of life and work.

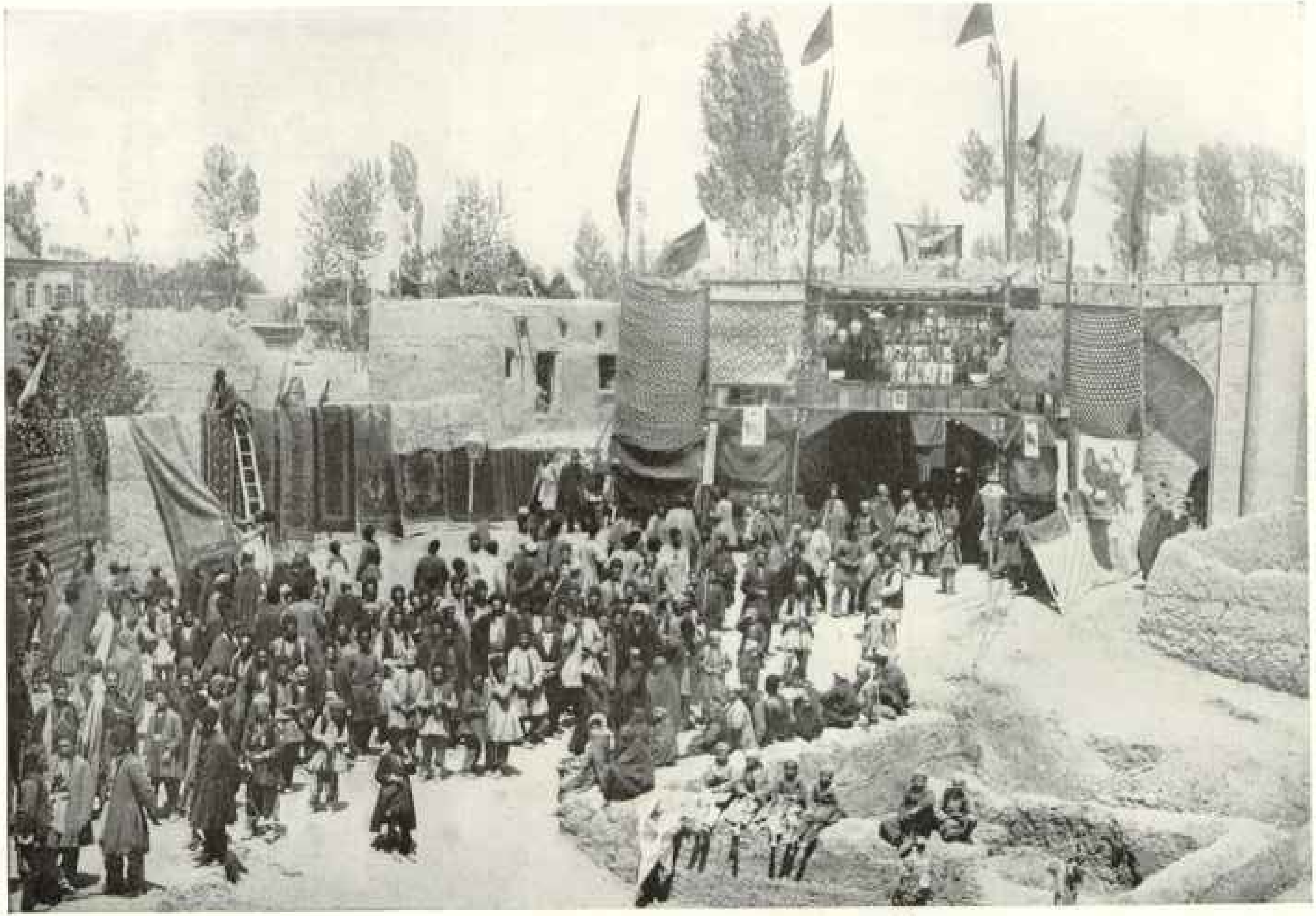
Here again pictures are the magic carpet that takes the children through the coal and iron mines and shows them how gold and silver are separated from their ores.

No Alice in Wonderland is more exciting than a visit to the South African diamond mines.

No fairy in story ever performed the feats that are done every day in our large factories, where lumps of graphite and slabs of wood are turned into lead pencils; or at our power-houses, where the force of water rushing over the dams is turned, at a flash, to light and heat.

No tale of the key-flower that opened the door of the rocks can vie in thrill with the opening of the mountain at Culebra Cut and the linking of the oceans at Panama.

No witch at her cauldron could arouse half the wonder and awe that comes from the sight of one of our huge blast furnaces, pouring forth its fiery flood of molten metal.



AWAITING THE ARRIVAL OF THE SHAH; PERSIA

With a history reaching back eight hundred years before Christ and a halo of fascinating tradition and legend three thousand years old, the Persia of today offers her share of interest to the student of the world. Many a touch of nature runs the earth around. Costume, complexion, and attainments may vary, but the same interests call and sway a crowd in either hemisphere. The arrival of a notable is a universal magnet.

All these wonders can now become a part of every child's life through pictures.

FOR THE OLDER BOYS AND GIRLS

But it is among the older boys and girls that the picture comes into its own. When the boisterous, noisy boy begins to be thoughtful, and the romping girl to appreciate and love the beautiful for its own sake, then the picture acquires a newer and deeper meaning. To the teaching of such practical things as the uses of water-power and the laws of vapor formation must be added the poetry of cloudland. Shelley's poem is a delight when illustrated by pictures:

"I sift the snow on the mountains below,
And their great pines groan aghast;
And all the night 'tis my pillow white,
While I sleep in the arms of the blast."

How much more of meaning is added to the words when the children see the "tent in the wind-built tent," and the "calm river, lakes, and seas."

As Browning so aptly puts it,

"We're made so that we love
First when we see them painted, things we have passed
Perhaps a hundred times nor cared to see."

So the picture,—giving, as it does, one definite, interesting idea, and shutting out all the distracting details, which always wait just outside a real landscape—shows to the student exactly the best. To the many children who have not been taught to see, as well as to the myriads who can never travel to the snow-clad peaks, the pictures bring world treasures.

THE BEST GIFT OF THE PICTURES

Realizing all that the introduction of pictures has meant in taking the horror from the definition, in bringing the map to life, in showing, as in a magic mirror, all the industries of our earth, we finally come to the best gift that pictures bring to the school—the friendly feeling toward all mankind which the children can get in no other way.

Our boys and girls can now know that children in every land, though wearing different kinds of clothing and eating strange food, like themselves work and play—often at the same games—listen eagerly to almost the same stories, and, best of all, enjoy a joke just as they do. Our boys and girls need no longer feel:

"Little Turk or Japance,
O! don't you wish that you were me?
"You have curious things to eat,
I am fed on proper meat;
You must dwell beyond the foam,
But I am safe and live at home."

The pictures make them want to taste the "curious things to eat," anxious to climb the coconut trees of the tropics, and to explore the far-distant Antarctic. Though the pictures of our own America make their hearts beat high with pride of country, they do not feel that they, as American boys, are different from French or Russian or Australian. They feel that they are a part of a great world family.

PROMOTING WORLD PEACE THROUGH GEOGRAPHY

Such a feeling of friendliness is absolutely necessary among our children if we are to lay a broad foundation for future world unity. Permanent world peace can only be promoted through a sympathetic understanding of world peoples.

If we are to stand shoulder to shoulder with a new Russia; if we are to succor a war-torn Europe in its recovery; if we are to help an awakened Asia to full realization of the joy of citizenship; if we are to cement our friendship with South America—to take, in short, our place as the great teacher of democracy to all the world—our boys and girls must acquire a wide acquaintance with world peoples, which is the only possible foundation for true appreciation and friendliness.

And to the National Geographic Society has been given the opportunity of leading our schools into the sane, happy, efficient picture way of teaching. Literally hundreds of thousands of school children look eagerly for the NATIONAL GEOGRAPHIC MAGAZINE each month. Through its wealth of illustrations it brings the whole world within the horizon of every child in all the vast school army.

A recent striking illustration of how thoroughly NATIONAL GEOGRAPHIC pictures, the universal language, have become a part of many varied educational

Photograph by G. Heurlin

A POLITICAL SPEECH IN SWEDEN

Our students can now become acquainted with young folks in every land, finding them fundamentally alike—playing similar games, listening to almost the same stories, and, best of all, enjoying a joke just as well as we do. The sympathetic understanding of world peoples, which is the only possible foundation for permanent world peace, is fostered through a wide knowledge of pictures.

Photograph from Leonard A. Williams

THE JOY OF THE SEPARATE PICTURE (SEE PAGE 503)

Louise and Mabel, Tom, Dick, and Harry forget the lure of marbles, tag, or teasing while studying these. At the words, "Pictures down," straight backs and shining eyes will attest intense desire in each eager brain to tell the wonders of a particular illustration. How different the expression when all the pupils are reading the same paragraph and every one knows what is going to be said!

interests is seen in their wide-spread use in teaching English to our foreign-born soldiers during the war. The magazines were cut up and the pictures mounted on charts with appropriate sentences for conversation.*

Again, schools and libraries everywhere have been mounting the pictures on separate sheets for teaching, not only geography, but history and literature as well. However, the teachers do not want to cut up their magazines; they have no time to mount the pictures, and they want text written especially for their needs and classes.

A CALL WHICH MEANS WIDENING SERVICE

And so it has come about that, because of the great work the National Geographic Society has performed in bringing pictures into the school-room and in revivifying the teaching of geography, an insistent call has been sounded for a greater responsibility and an ever-widening service.

For some time there has been a country-wide demand for NATIONAL GEOGRAPHIC pictures on separate sheets for easier handling in the school-room, and the Society, ever glad to coöperate to the fullest extent in making geography fascinating and intelligible to every one, has spared neither time nor effort to arrange these pictures in the best possible form for the schools.

The wealth of its pictures simplifies the problem of selection and adaptation. There is literally a picture for every phase of geography teaching, for every topic, even for every word.

In accordance with the invariable custom of the Society to avoid in the Magazine highly technical phraseology, but always to give the richest of geographic material with scientific accuracy, and yet in such form as to be enjoyed by every one, so these pictures are arranged for the children and the schools.

* See "Bringing the World to Our Foreign-Language Soldiers," by Christina Krysto, in the NATIONAL GEOGRAPHIC MAGAZINE (August, 1918).

Photograph from St. Cloud Normal School

AN EIGHTH GRADE READING ON SPECIAL TOPICS

Photograph from Dorothy Vollmer

GEOGRAPHIC ENTHUSIASTS

Photograph by Harriet Chalmers Adams

A FLOWER SELLER OF YOKOHAMA, JAPAN

The Japanese are a merry people, those who work hardest being the most cheerful. Their flower carts are in striking contrast to the ugly, squeaking wheelbarrows of the Chinese peddlers. The Japanese love flowers above all things, their floral calendar for the twelve months of the year (the first being February) reading: pine, plum, peach, cherry, wisteria, iris, morning glory, lotus, "seven grasses," chrysanthemum, maple, and camellia.

Realizing that nothing can be absorbed into the child's life unless it has an interest for him, these pictures are chosen and arranged primarily for his needs and growth. Based on an intimate acquaintance with innumerable educators and thorough familiarity with courses of study and methods of teaching in every State, they are fitted in every way to actual school-room conditions.

HOW THE PICTURES ARE ARRANGED

Arranged in sets of 24 and 48 pictures on special topics, they illustrate definite parts of the curriculum, with about two hundred words of interesting text accompanying each picture.

They are printed on sheets nine by eleven inches, with the text beneath in large, clear type which can be read easily by children. The paper chosen has the same fine finish as that used in the Magazine, but is from four to five times as heavy, so that the pictures may be easily and safely handled, and also stiff enough to stand up around the chalk rail if so desired. To cap the sheaf, each set contains two or four pictures in full color.

The pictures themselves are chosen largely from the thousands published within the last few years in the Magazine, so that much of the expense has already been met. Moreover, the methods and aims of the National Geographic Society make it especially fitted and prepared for this great service to the schools.

ALL THE SOCIETY'S RESOURCES AT THE DISPOSAL OF TEACHERS

Because the Society is not a commercial firm, but exists solely as a medium for the increase and diffusion of geographic knowledge, no profit is made for any corporation or individual. Therefore, the entire resources of the Society, backed by its 700,000 members, can be at

Photograph from Dr. J. Howard Gore

ROYAL STATE BARGE: SIAM

Interesting indeed is the grace and ease with which this queer structure of far-away peoples skims lightly along the surface of the water. This is the King's own royal barge, made of solid gold lacquer in filigree style. It is manned by 60 paddlers. After each stroke the paddles, which are covered with gold leaf, are thrown up in the air. The brilliant sun playing on them with the silver of the dripping water produces a most beautiful effect.

Photograph by Harriet Chalmers Adams

BENGUET BRIDES OF LUZON, PHILIPPINE ISLANDS

The little women in the picture are aged thirteen and fourteen. One of the bridegrooms is seen in the background. Benguet women wear blouses as well as skirts, and cloth wrapped about the head, forming a sort of turban. They are very fond of ornaments, and smoke small brass pipes.

the disposal of the teachers and schools, making it possible for these geographic pictures to be published at an exceedingly low figure.

The Society whole-heartedly devoted its energies and talents to winning the war, and with far-seeing patriotism also plans ahead for the new America, striving to create still better standards of teaching and to fill the demands which these advanced standards require.

Pictures in the schools will solve one phase of the gigantic problem of the reorganization of our education, because they can give the pupil an adequate knowledge of our great country. That knowledge is the sound basis of all patriotism.

The National Geographic Society, through its PICTORIAL GEOGRAPHY* series, is especially glad to present, as the largest scientific organization in the world, its wealth of geographic knowledge to the vast army of American school children in such a way as to help to make each child a worthy citizen of our country and a benefactor of his fellow-man.

*For details of the PICTORIAL GEOGRAPHY series, see announcement elsewhere in this issue of THE GEOGRAPHIC.

Photograph by International Film Service

A NEW JERSEY COUPLE AND THEIR SEVENTEEN STALWART CHILDREN

While one can never tell how long he is going to live "until he is dead," Mr. and Mrs. Charles B. Casale, of Newark, are probably destined to survive to a ripe old age. An examination by Dr. Alexander Graham Bell of the genealogy of the Hyde Family reveals the fact that the parents who lived the longest had the most children, on the average. There are nine daughters and eight sons in this household. Mr. and Mrs. Casale are shown standing in the back row. Next row, left to right, are: Rose, Elizabeth, Jennie, Margaret, Helen, and Michael. In the front row, left to right: Frank, Joseph, William, John, Evelyn, Charles, Josephine with Ryta (the baby), Dominick, Eugene, and Catherine.

WHO SHALL INHERIT LONG LIFE?

On the Existence of a Natural Process at Work Among Human Beings Tending to Improve the Vigor and Vitality of Succeeding Generations

By Dr. Alexander Graham Bell

Author, in the National Geographic Magazine, of "Prizes for the Inventor," "Discovery and Invention," "Our Heterogeneous System of Weights and Measures," "Aerial Locomotion," and "A Few Thoughts Concerning Eugenics"

MOST people die before reaching middle life, and comparatively few live to be old.

This has always been so from the very earliest times; and, in spite of modern sanitation and the advance of medical science, remains true today. Only a small proportion of each generation survives the traditional Biblical age of threescore years and ten.

Under these circumstances is it not remarkable that so many people should have parents who lived to be old? Seventy is by no means an unusual age for a parent. Examine the history of the people you know and you will find that very few of them had parents who died before seventy, while a considerable proportion had parents who lived to be eighty or even much older.

An examination of several hundred cases, noted in the Genealogy of the Hyde family[1], shows that 18.7 per cent of these persons lived to be seventy or older; but 81.7 per cent had fathers or mothers who lived beyond seventy. About 13 per cent lived to seventy-five; but 65 per cent, or nearly two-thirds of the whole, had fathers or mothers who lived beyond seventy-five.

The contrast is still more marked when we consider persons who lived to extreme old age. Only 8.7 per cent lived to be eighty or older; and yet 48.1 per cent, nearly one-half of the whole, had fathers or mothers who lived to be eighty or older.

These are the results of an investigation of 1,594 cases in which the ages at death of the persons and of their fathers and mothers were all known.[2]

Such results seem to point to the general conclusion that *a very large proportion of each generation has sprung from a very small proportion of the preceding generation, namely, from the people who lived to be old.*

Another inference is that the long-lived people left more descendants behind them in proportion to their numbers than the others, and therefore, on the average, had larger families.

Of course, many widowers may have married again when they were well advanced in years and have had families by each marriage, but this explanation does not apply to women.

MOTHERS' AGES AN INDEX TO THE SIZE OF THEIR FAMILIES

We cannot, for example, suppose that mothers who died at fifty would have had more children had they lived to be sixty or eighty or a hundred; and yet investigation shows that the mothers who lived to extreme old age actually had, on the average, larger families than those who died earlier in life.

From the Hyde statistics we find that mothers who died before forty had, on the average, only 3.4 children apiece; and this is intelligible because many of the mothers passed away long before the conclusion of the reproductive period, and

[1] Genealogy of the Hyde Family, by Reuben H. Walworth, LL.D., 1864; a work relating to the descendants of William Hyde, one of the early settlers of Norwich, Conn., who died in 1681.

[2] See "The Duration of Life and Conditions Associated with Longevity, A Study of the Hyde Genealogy," by Alexander Graham Bell; published by the Genealogical Record Office, 1601 35th Street, Washington, D. C. $1.00

Photograph by Gilbert Grosvenor

NINE SONS HAVE BEEN CONTRIBUTED TO THE WORLD'S POPULATION BY MR. AND MRS. MORRISON, OF ST. ANN'S, CAPE BRETON, NOVA SCOTIA

"The persons whose parents both died before sixty lived, on the average, 32.8 years (the Hyde Genealogy). Those whose parents both lived beyond eighty averaged 52.7 years; and where the parents died at the intermediate age periods the duration of life was intermediate."

A NEW YORK STATE FAMILY OF SIXTEEN

It is the pride of Horseheads, N. Y., that Mr. and Mrs. Oliver D. Eisenhart have fourteen children ranging from one to twenty-four years of age. Thirteen are shown in the picture, which was taken before the eldest son went to France, more than two years ago, as a member of the American Ambulance Corps.

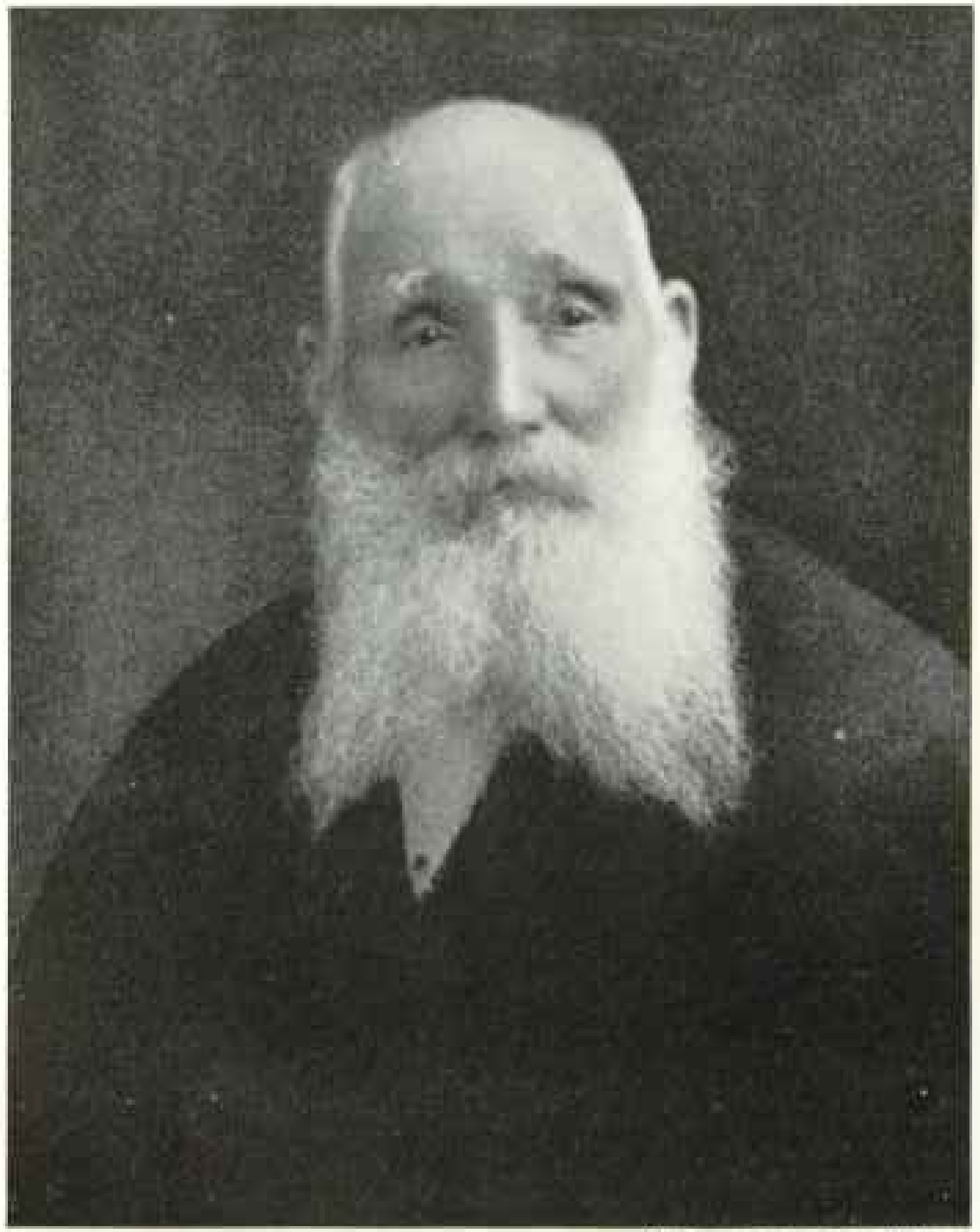
Photograph by Carey, supplied by Louise Lacey, Secretary of the Genealogical Record Office

ELISHA CLARK PECKHAM, AGED 92, MIDDLETOWN, R. I., WITH MRS. PECKHAM AND THEIR ELEVEN CHILDREN. ONE CHILD DIED AT THE AGE OF TEN YEARS.

The children of long-lived parents are, on the average, stronger, more vigorous, and longer-lived than the children of others, and there are more of them per family.

THE CENTENARIAN CLUB OF LOS ANGELES, CALIFORNIA, WHOSE MOTTO IS, "LIVE A HUNDRED YEARS AND GROW OLD GRACEFULLY"

Left to right, standing: Dr. J. M. Morrison, Vice-President, 97; Rev. H. Judd, 91; Rev. N. A. Millerd, 90; A. A. Annas, 96; Dr. H. L. Canfield, 90; C. R. Post, 92; J. H. F. Jarchow, 92; Senator C. C. Cole, 94. Left to right, sitting: Dr. A. M. Sherman, 93; Dr. J. M. Peebles, 90; S. Selleck, 94; Dr. E. C. Prugh, 94; Mrs. M. K. Bartlett, 92; Mrs. J. F. Howard, 92; Mrs. M. Offenbach, 90; Mrs. Stevens, 94; Rev. S. H. Taft, President, 92. Mrs. Taft in rear.



Photograph by L. H. Bellin

HE HAS SEEN MORE THAN A CENTURY OF WORLD CHANGES

John O'Reilly, born in Ireland, was 101 years of age when this photograph was taken. His father died at 45, but his mother lived to be 90. He was the youngest of eight children. His wife lived to be 84. The fact that more than a hundred years had passed over him had not prevented Mr. O'Reilly from planting his truck garden each spring or caused him to retire from the management of his grocery business.

Photograph supplied by Louise Lacey, Secretary of the Genealogical Record Office

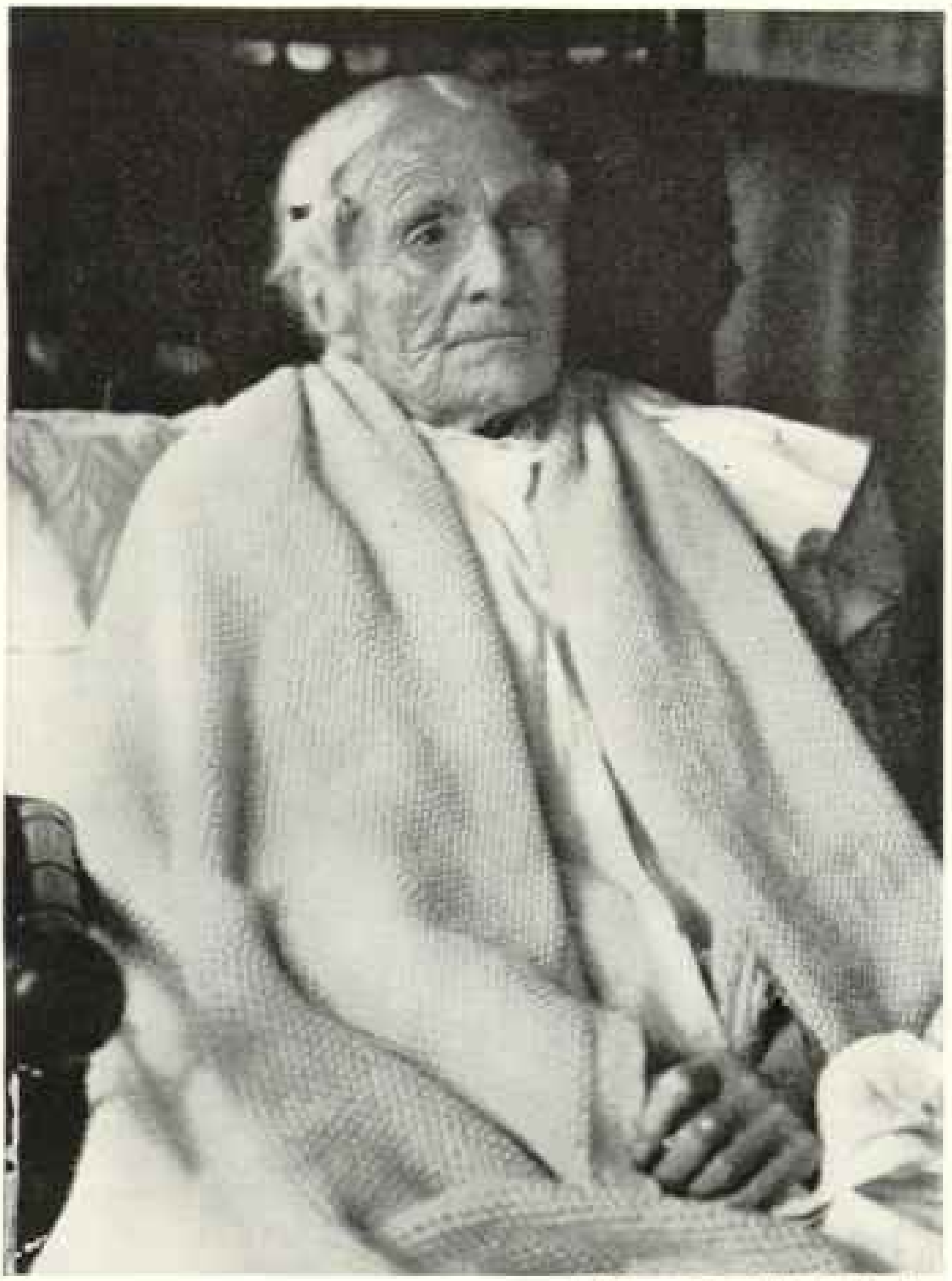
MRS. LOUISA K. THIERS ON HER 104TH BIRTHDAY

The few who live to extreme old age are people who have proved themselves to be immune, or at least resistant, to the diseases that have carried off the vast majority of their fellows. Mrs. Thiers, who lives with her daughter, Mrs. Charles Quarles, in Kenosha, Wis., is in excellent health today. Her eyesight is good and she is alert mentally, following closely the news of the day. She was born October 2, 1814.

might have had more children had they lived longer.

Mothers who died between forty and sixty had 6.2 children apiece, and we would naturally expect that no further increase in the size of the family would be found in the case of mothers who died at later ages. But, as a matter of fact, the mothers who died between sixty and eighty averaged 6.6 children apiece, and the mothers who lived beyond eighty had average families of 7.2 children.[1]

When we remember that in all these cases the children were born before the mothers had passed middle life, it becomes obvious that the mothers who reached old age were *inherently* more fertile than the others. There is thus some correlation between longevity and fecundity. The parents who lived the longest had the most children, on the average.



Photograph by Charles Martin

THE OLDEST HUMAN BEING OF WHOSE BIRTH WE HAVE AUTHENTIC RECORD

Mrs. Ann Pouder, of Baltimore, Md., photographed on her 110th birthday, in the summer of 1917. She died a few months later.

But how about the children? Did they, too, live longer than the others? Yes, upon the average, they did.

The average duration of life of the 1,594 persons referred to above was 40.6 years. Their fathers, on the average, lived 70.9 years, and their mothers 66.0 years. Thus the fathers and mothers, on the average, lived longer than their children. This is always found to be the case when we deal with large numbers; and the reason is very obvious; for, of course, no fathers or mothers died in infancy or childhood, whereas many of the children died young.

LONGEVITY IS AN INHERITABLE CHARACTERISTIC

Investigation shows that a larger proportion of the children of long-lived parents lived to be old and a smaller proportion died young than in the case of the others.

The Hyde statistics afford conclusive

[1] See "The Duration of Life," etc., by Alexander Graham Bell. Table 17, relating to 671 fertile marriages of females resulting in the production of 4,022 children, or 6.0 children per marriage.

evidence that a tendency to longevity is an inheritable characteristic. For example, divide the 1,594 cases into three groups:

1. Those whose parents, neither of them, lived to be eighty.

2. Those having one parent who lived to be eighty or older, and

3. Those having parents both of whom lived to be eighty or older.

Now note the proportion of long-lived persons in each group. Only about 5 per cent of the persons in group one lived to be eighty; about 10 per cent of the persons in group two, and 20 per cent in group three (exact percentages 5.3, 9.8, and 20.6). Few of the persons who did not have long-lived parents behind them lived to be old. The long-lived proportion was practically doubled where one parent lived to be old and quadrupled where both parents lived to be old. The evidence indicates that heredity is deeply involved in the production of longevity.

If we divide the 1,594 cases into groups arranged according to the ages reached by the parents, and then calculate the average duration of life of all the persons in each group, not simply the proportion who lived to be old, we find that the persons constituting the longest-lived group were the offspring of the longest-lived parents; the members of the shortest-lived group came from the shortest-lived parents, with intermediates intermediate.

Number of Cases

Father's age at death	Mother's age at death: —60	60–80	80+
80+	131	206	384
60–80	251	328	172
—60	128	120	74

Average Duration of Life

Father's age at death	Mother's age at death: —60	60–80	80+
80+	42.3	45.5	52.7
60–80	35.8	39.0	45.0
—60	32.8	33.4	36.3

The persons whose parents both died before sixty lived, on the average, 32.8 years. Those whose parents both lived beyond eighty averaged 52.7 years; and where the parents died at the intermediate age periods the duration of life was intermediate.

The figures indicate very clearly that there is a correlation between the duration of life of the individual and the duration of life of his parents; and, conversely, we may conclude that the longest-lived parents, on the average, had the longest-lived children; the shortest-lived parents the shortest-lived children; with intermediates intermediate.

We have only to glance around us at the different forms of animal life to find plentiful indications that the duration of life is influenced, and indeed controlled, by heredity. Each species has its own limit of life, and man is no exception.

The contrasts are often very great: For example, a horse born the same day as a child dies of old age before the child has reached full maturity. Just think of the differences. The horse may become a parent when the child is only a toddling three-year-old, a grandparent by the time the child is six, and several generations of horses may appear before the child has even reached marriageable age.

The duration of life of each species is controlled and limited by heredity, and heredity even establishes different limits for groups of animals within the same species. The long-lived tend to produce long-lived offspring, the short-lived, short-lived offspring, etc.

A million people may be born on the same day, and we know that multitudes of them will die during the very first year of life. So great is the mortality during infancy and childhood that we may be perfectly certain that the majority of the

Photograph by W. T. Osley, from the Collections of the Genealogical Record Office

FIVE GENERATIONS OF WOMEN IN A MINNESOTA HOUSEHOLD

Mrs. Karl Melden was 89; her daughter, Mrs. Anne Kastell, 61; granddaughter, Mrs. Hannah Gustafson, 41; great-granddaughter, Mrs. Ann Bergerot, 21; and great-great-granddaughter, Mary Valdine, aged 7 months, when this photograph was taken. Note the remarkable inheritance in similarity of the eyes, even in the baby.

people will have passed away long before the lapse of fifty years. The extreme limit of human life probably does not extend very far beyond the hundred-year mark, and only very few live to be even eighty or ninety.

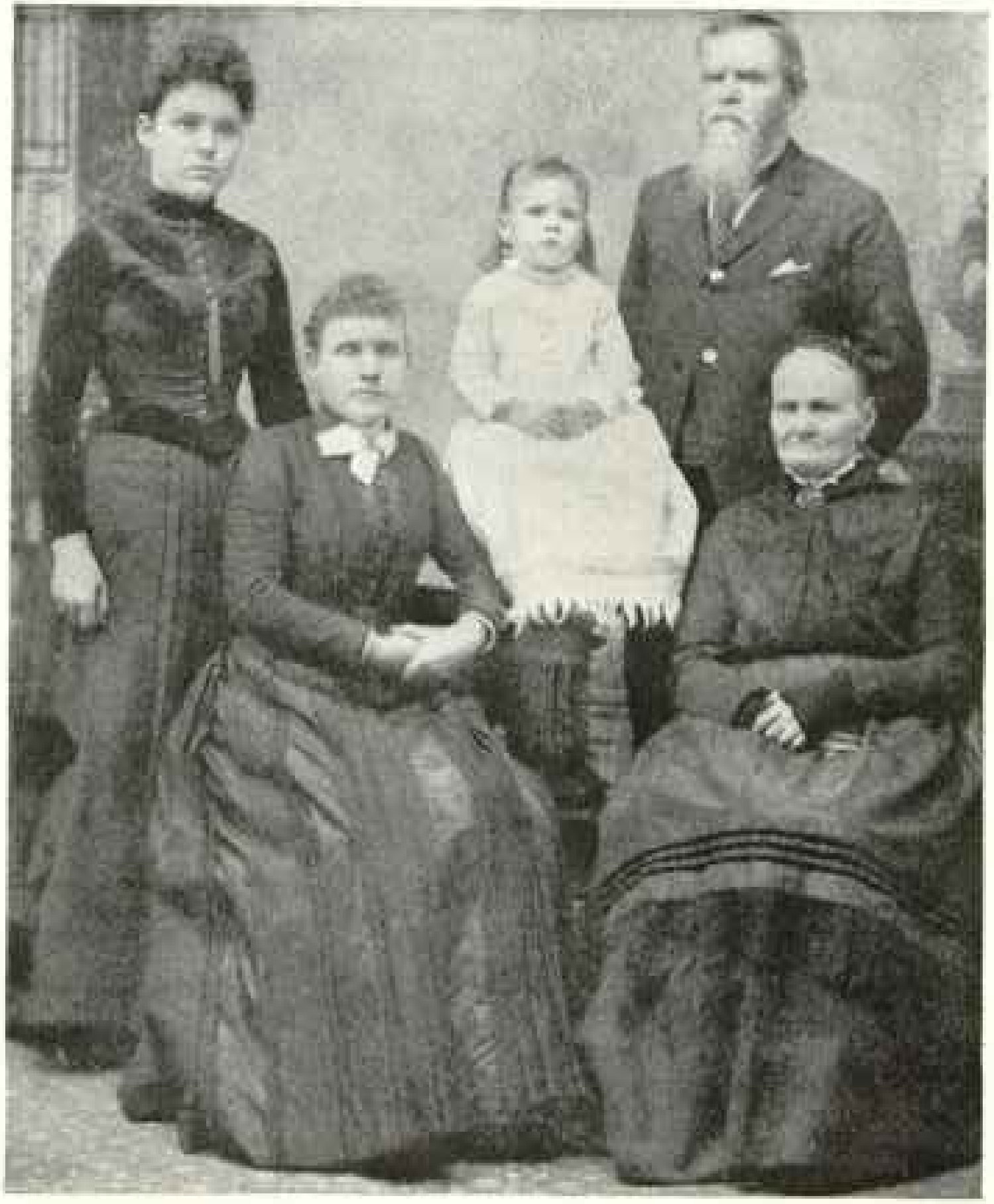
The few who live to extreme old age are people who have proved themselves to be immune, or at least resistant, to the diseases that have carried off the vast majority of their fellows. They have been exposed to all the diseases and accidents of life and have not succumbed. They have proved themselves to be resistant, not to a single disease alone, but to all diseases; and the fact that they

NO. 1. THE REMARKABLE MC MURRAY FAMILY: FOUR SUCCESSIVE FIVE-GENERATION GROUPS

This photograph, taken 28 years ago, shows Mrs. Lavinia McMurray, aged 83; her daughter, Mrs. J. B. Gregory, aged 63; her granddaughter, Mrs. Martha Violett, aged 43; her great-granddaughter, Mrs. A. J. Wood, aged 23; and her great-great-granddaughter, Veda Wood, aged 3 (see also page 513).

NO. 2. ONE FAMILY OF MRS. MC MURRAY'S DIRECT DESCENDANTS 22 YEARS LATER

Mrs. J. B. Gregory of the first picture is now a great-great-grandmother at 85. Her daughter, Mrs. Martha Violett, is a great-grandmother at 65; Mrs. A. J. Wood at 45 is a grandmother; and Veda Wood (now Mrs. Wesley Sibole), the mother of Ruth Sibole, aged 8 months.



NO. 3. ANOTHER GROUP OF THE MC MURRAY FAMILY

Mrs. McMurray, aged 85; her eldest son, Robert, aged 62; her son's daughter, Mrs. Lavinia Merkle, aged 40; Mrs. Merkle's daughter, Mrs. Annie Stevens, aged 23; and little Gladys Stevens, Mrs. McMurray's great-great-granddaughter, aged 4.

NO. 4. THE MC MURRAYS OF THE MALE LINE 19 YEARS LATER

Robert McMurray has become a great-great-grandfather, aged 81; his daughter, Mrs. Merkle, is a great-grandmother; her daughter, Mrs. Stevens, a grandmother at 42; and Gladys Stevens, of No. 3, is now Mrs. Poe, the mother of two children.

Mrs. Lavinia McMurray was the first of nine children. Her three youngest sisters all lived to celebrate their golden weddings. Her husband died at the age of 81. They had 11 children; four died in infancy and four at the following ages: 24 (M. Gregory), 84, 76, and 72. Three are still living, their ages being 70, 72, and 89. At the time of Mrs. McMurray's death, there were living three children, 43 grandchildren, 55 great-grandchildren, and six great-great-grandchildren—107 living descendants at the time of her death.

transmit to their offspring a tendency to live long shows that the disease-resistant quality is handed down to their descendants.

Of course, longevity itself is not a thing that is capable of direct inheritance; but the fact that longevity seems to run in families shows that a *tendency* to long life can be inherited. It is not longevity itself that is transmitted, but something else that tends to produce long life. What is really inherited is probably a tough, wiry constitution which enables the fortunate possessor to survive the multitudinous ills that flesh is heir to and live on to the extreme limit of human life. From this point of view, the attainment of old age is extremely significant.

The people who live to be old represent the *disease-resistant* strain of their generation; and, on account of their superior fecundity, this disease-resistant quality is distributed very largely through the population. The weak and delicate do not, as a rule, live very long; nor are they capable of bearing large families. It is the strong and vigorous who live to extreme old age and leave many descendants behind them.

The children of long-lived parents are, on the average, stronger, more vigorous, and longer-lived than the children of others; *and there are more of them per family.*

Here, then, we have evidence of the existence of a natural process at work among human beings tending to improve the vigor and vitality of succeeding generations.[1]

[1] The Genealogical Record Office, Alexander Graham Bell, Director, 1601 35th Street, Washington, D. C., will be glad to receive information concerning all authentic cases of persons now living who are more than 90 years of age. The data should include the date of birth of the individual, the age at which his or her parents died, and the number of children and ages of his or her children and direct descendants.

THE AZORES

Picturesque and Historic Half-way House of American Transatlantic Aviators

By Arminius T. Haeberle

Formerly American Consul at St. Michaels

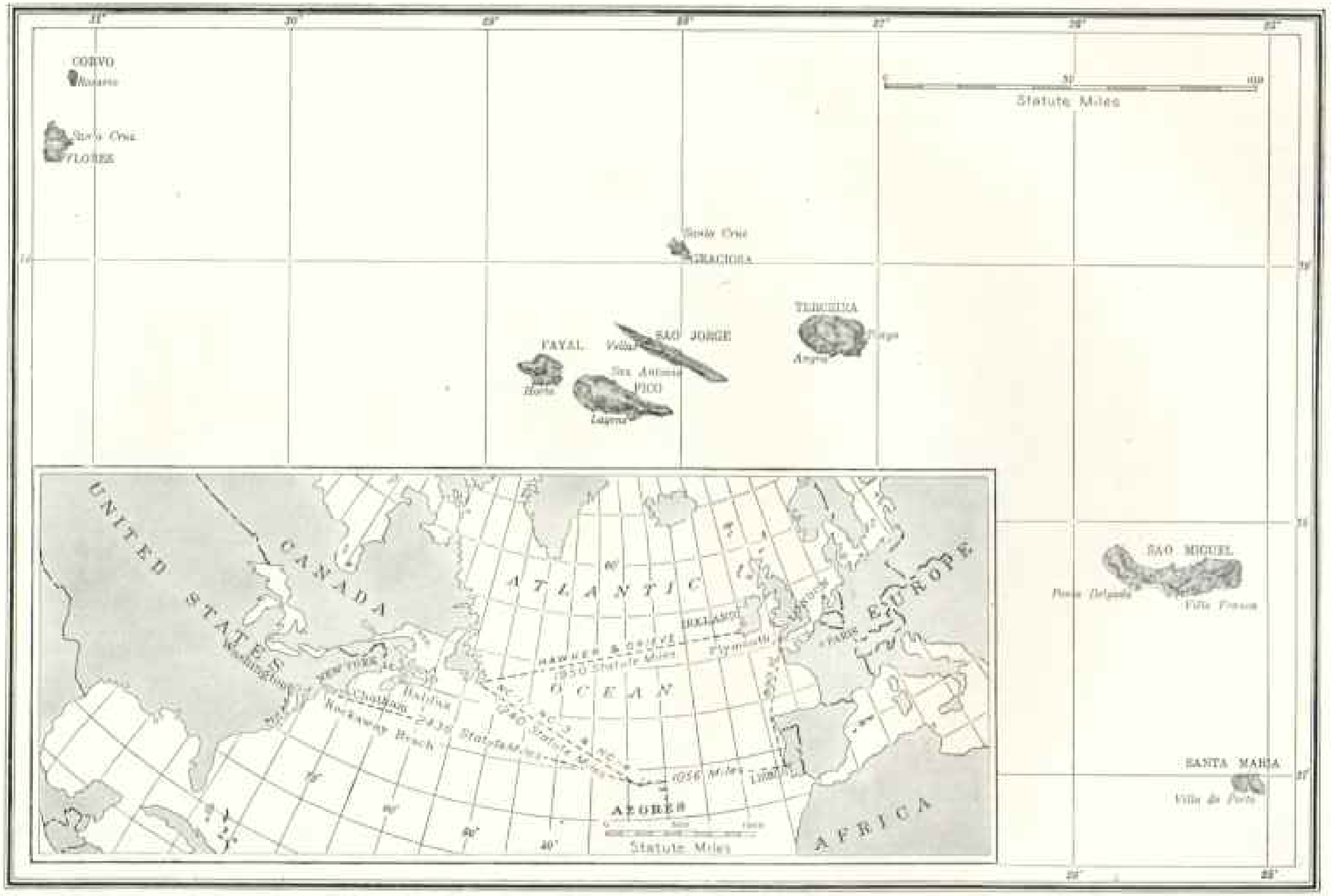
THE picturesque Azorean archipelago, situated between the 37th and 40th degrees of latitude, lies in the path of steamers plying between New York and the Mediterranean, as well as in the course of those sailing between Panama and the ports of northern Europe.

The central cluster of this group, formed by the islands of Fayal, Pico, Sao Jorge, Graciosa, and Terceira, lies more than 840 miles directly west of Lisbon. About 150 miles northwest of this centrally located group are Flores and Corvo, and approximately the same distance to the southeast Santa Maria, and the largest and most important of all, St. Michaels (Sao Miguel).

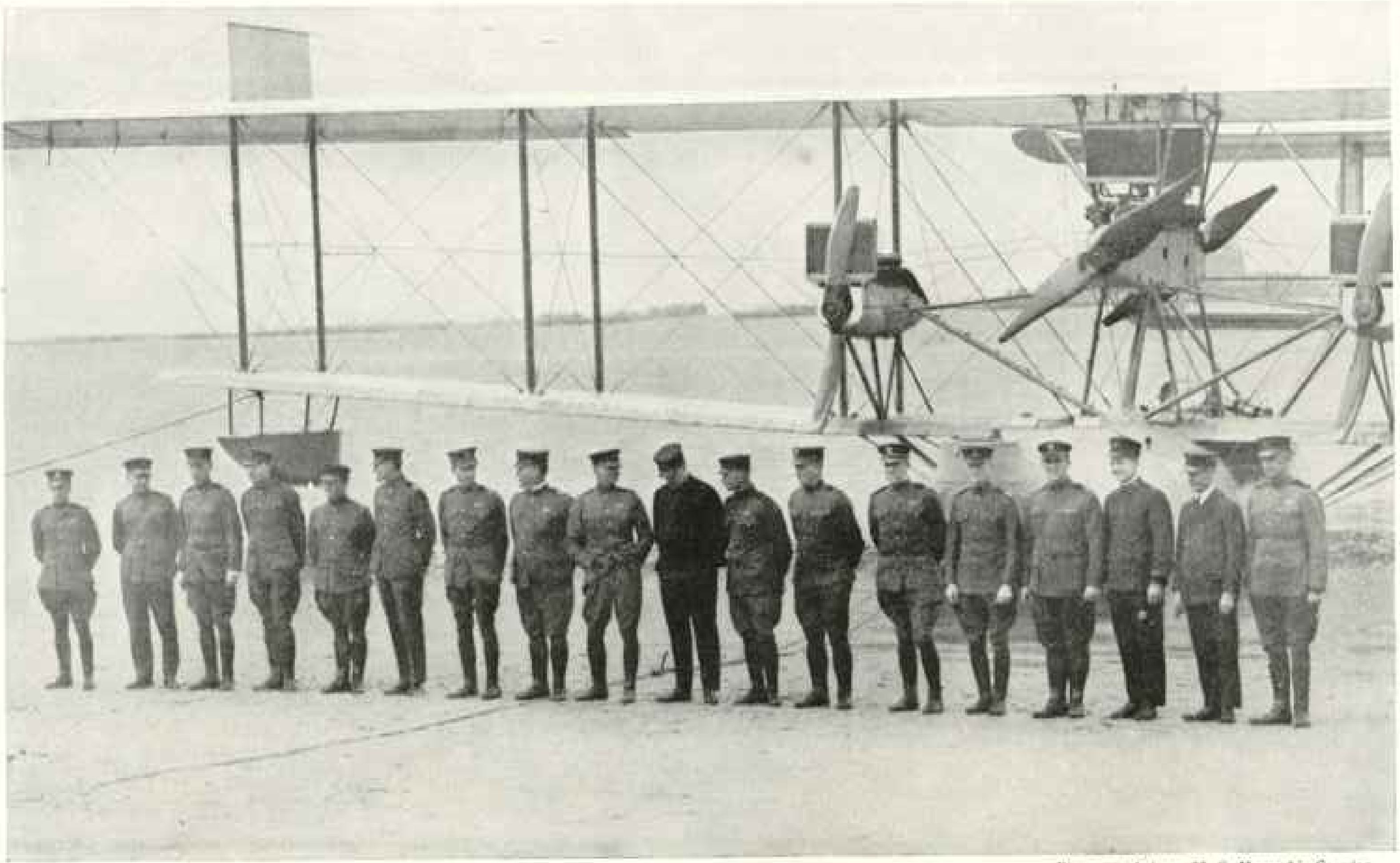
The Azores are not, as is generally supposed, a colonial possession, but form an integral part of Portugal. For political and administrative purposes, they are divided into three districts, each sending its representatives to congress at Lisbon.

Owing to their location, the Azores have played a very important part in the history of sea navigation, just as they have within the last few weeks played a vital rôle in aërial navigation as the half-way house in the epochal transatlantic flight by American naval officers in the American seaplane NC-4, and as ports of safety for the equally daring aviators who piloted the less successful NC-1 and NC-3.

The keen interest that the Azoreans manifested in the first transatlantic flight had a deeper cause than mere curiosity. They remember that the first sailing ves-



MAP SHOWING THE THREE GROUPS OF THE AZORES AND THE ROUTES OF THE SUCCESSFUL AMERICAN AVIATORS IN THEIR TRANS-ATLANTIC FLIGHT; ALSO THE ROUTE CHOSEN BY THE DARING HAWKER-GRIEVE EXPEDITION, WHICH CAME TO GRIEF 800 MILES WEST OF IRELAND



Photograph from U. S. Navy Air Service

THE CREWS OF AMERICA'S NC-1, NC-3, AND NC-4 BEFORE THEIR "HOP OFF" AT TREPASSEY BAY, NEWFOUNDLAND, FOR THE AZORES IN MAN'S FIRST TRANSATLANTIC FLIGHT†

Reading from left to right: Lieutenant-Commander Albert C. Read, commanding the successful NC-4; Lieutenant E. F. Stone, of the U. S. Coast Guard; Lieutenant Walter Hinton, Special Machinist's Mate E. Harry Howard, Ensign Herbert Charles Rodd, Lieutenant James L. Breese, Commander John H. Towers, commander-in-chief of the flying flotilla and of the NC-3; Commander Holden C. Richardson, Lieutenant David H. McCullough, Lieutenant-Commander Robert A. Lavender, Boatswain Lloyd Ray Moore, Lieutenant Braxton Rhodes, Lieutenant-Commander Patrick N. L. Bellinger, commander of the NC-1; Lieutenant-Commander Marc A. Mitscher, Lieutenant Louis Theodore Darin, Lieutenant Harry Sadenwater, Chief Machinist's Mate Clarence Irvin Kessler, and Machinist Rasmus Christensen.

Official photograph, U. S. Navy Air Service

A VIEW OF TREPASSEY BAY, NEWFOUNDLAND, FROM ONE OF THE NC SEAPLANES: THE PORT OF DEPARTURE FROM THE AMERICAN CONTINENT FOR THE U. S. NAVY'S FLEET OF THREE FLYING BOATS BOUND FOR THE AZORES, PORTUGAL, AND PLYMOUTH

The Navy made elaborate provisions for its flyers in the establishment of bases of supply and repair at Halifax, Trepassey Bay, and in the Azores. In the foreground may be seen a tank steamer and two American destroyers. The supply ships of the seaplanes, the *Aroostook* and the *Prairie*, are anchored in the middle distance, up the bay.

sel that crossed the Atlantic, over four hundred years ago, landed at one of their islands. They were the first to receive from Columbus the news of the discovery of a new world, and they hailed with delight the opportunity to welcome to their shores the first man to win the title of "Columbus of the Air."

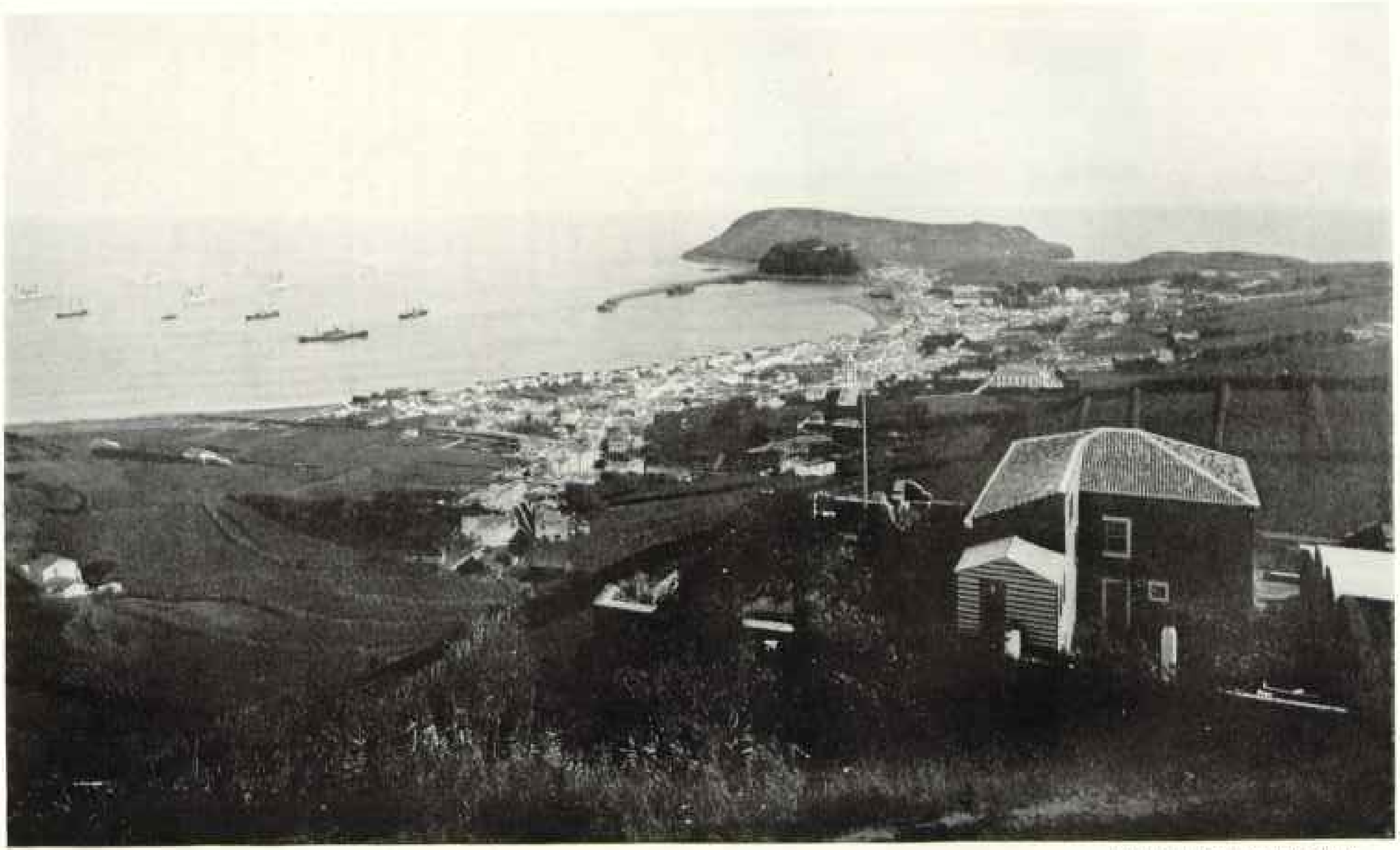
HISTORY OF THE AZORES

The discovery of Madeira, the Canaries, and the Azores Islands was a direct result of the persistent efforts of Prince Henry the Navigator, of Portugal, to double Cape Bojador and to discover a new route to India. It was during the glorious period of Portuguese explorations that Goncalo Velho Cabral discovered Santa Maria, the most southerly of the Azores, in 1432. In the course of succeeding years, covering a period of more than a decade, the other islands were discovered.

From that time on down to modern days the Azores, or Western Islands, became the scene of many an historic event. The first of these was the visit of Columbus on his return from America, in 1493.

Tossed about by a severe tempest, the great Italian navigator and his men made a vow that if their lives were spared they would worship, stripped of a part of their clothes, in the first church they reached. A few days later they sighted the Island of Santa Maria, where Columbus anchored and sent a part of his men to a small chapel near the shore to attend mass, in fulfillment of his vow. Today this chapel is one of the most interesting historical places on the island.

After the discovery of Brazil, the



Photograph from A. T. Haeberle

HORTA BAY WITH ITS BREAKWATER, THE CHIEF SEAPORT OF THE ISLAND OF FAYAL, WHERE THE NC-4 ANCHORED AFTER A RECORD-BREAKING FLIGHT OF 15 HOURS AND 13 MINUTES, AT AN AVERAGE SPEED OF 90 MILES AN HOUR

Through an enveloping fog, Lieutenant-Commander A. C. Read brought his seaplane safely into this port at 1:20 p. m. (Azores time) on May 17, after an all-night flight from Trepassey Bay, Newfoundland, the longest leg of the transatlantic air journey.

Azores were visited by ships plying between Portugal and South America. Vessels returning from the Western Hemisphere and from India, loaded with gold, silver, and spices, sought their way among the islands that became, in accordance with the turbulent spirit of the sixteenth century, the scene of many gallant fights for the ownership of these precious cargoes.

Those interested in the naval exploits of Drake, Sir Richard Granville, Frobisher, and other bold spirits of the sixteenth century, will find abundant romance in the early history of the Azores. Here they fought with vessels of the Spanish Armada of Philip II, and it was here that the U. S. privateer, *General Armstrong*, was sunk in the harbor of Fayal during the war of 1812.

Today the Azores are important as a coaling station for vessels engaged in peaceful commercial pursuits.

ORIGIN OF THE AZORES ISLANDS

Although much has been written about the origin of the islands, this is still a matter of conjecture. Interesting arguments have been advanced to prove they are remnants of the lost continent, Atlantis. One theory is that the islands are the topmost peaks of a subterranean range of mountains extending north and south, and another that they were at one time a part of the continent. English geographers have taken a deep interest in the study of the islands, and it is not improbable that botanical investigations will prove that the latter theory is correct.

But whatever may have been the origin of the islands, they are certainly the result of tremendous volcanic eruptions that have continued to change their physical aspect ever since their discovery in the fifteenth century. On every hand are evidences of former upheavals, from the gray lava stones that are used in the construction of houses and the building of roads to the underlying streaks of ashes that are visible in places where the surface soil has washed away, and the many cup-shaped craters and beautiful lakes on the tops of the mountains.

According to a Moorish account, written before the thirteenth century, an Arabian caravel started from Portugal to discover new lands. Sailing westward for eleven days, the sailors suddenly found themselves in a sea of "fetid gases" and confronted by dangerous rocks and shoals, which so frightened them that they turned southward. It is quite possible that these daring Arabian sailors reached the Azorean waters during a volcanic disturbance, which prevented their further discoveries.

It is most interesting to compare with this account a strange phenomenon that is described in the early archives of the Azores Islands in connection with the discovery of St. Michaels. Upon leaving the shore of this newly found land, the discoverer made a sketch of the island and noted especially the presence of two peaks that towered high above the others, one on the eastern and the other on the western extremity.

Soon afterward, he returned from Portugal to establish a settlement, but when he approached the island he was surprised to find that during his absence the western peak had entirely disappeared. Trees and large quantities of pumice-stones were seen floating in the sea. Today the town of Sete Cidades, built in the hollow of a crater, marks the site of the old peak.

The violent earthquakes that disturbed the Azores during the succeeding centuries down to the eighteenth are too numerous to mention. But the annals of the islands vie with those of Italy in graphic accounts of the ever-interesting and terrible volcanic phenomena. Cities were buried, mountains disappeared and sent their ashes to unbelievable distances; islands hundreds of feet high suddenly appeared and as suddenly disappeared, and flames of fire illuminated whole islands and their intervening waters.

Pico, 7,613 feet high, on the island bearing the same name, is interesting as the central and the highest volcano of the islands. It is considered by some as the principal communication of this region with the interior of the earth. Light clouds of vapor occasionally rise from its summit and the ashes at the top are still warm.

St. Michaels has perhaps suffered more from volcanic disturbances than any of the other islands; but Santa Maria, only

Photograph from A. T. Haeberle

THE VOLCANO OF PICO AS SEEN FROM FAYAL, THE WESTERNMOST ISLAND OF THE CENTRAL GROUP OF THE AZORES

Rising to a height of more than 7,600 feet, Pico is the loftiest peak of the Azores. The soil of the island of the same name is composed of pulverized lava, which until a little more than half a century ago produced a famous wine. A fungus destroyed the vines in 1852, however, and since that time the inhabitants have raised figs and apricots.

53 miles south of St. Michaels, has always been free from eruptions and even heavy earthquakes.

AZOREAN EMIGRATION TO THE UNITED STATES

There is perhaps no country in the world that has such a heavy tide of emigration, in proportion to the number of its inhabitants, as the Western Islands. Some of the emigrants go to Brazil, but by far the majority to the United States. During the year before the world war 6,000 Azoreans emigrated to the United States, and it is estimated that there are 35,000 Azoreans in California and over 60,000 in New Bedford, Massachusetts, Providence, Rhode Island, and other parts of New England, making a total of almost 100,000. The population of all the Azores is scarcely 300,000. Many of the emigrants return home, and almost all of the inhabitants of some of the islands have been in the United States.

It is not unusual, even on the small islands, remote from foreign influence and the busy world of the twentieth century, to hear a boy of 17 discuss his contemplated trip to Massachusetts, a gray-haired señor speak of the bark *Sarah* that carried him to American shores in 1850, or an aged mother refer to her son in the far-off land of California.

Most of these emigrants sail from Ponta Delgada, the capital of St. Michaels, where they gather from all the islands. Two Portuguese steamers make their monthly rounds to the various Azorean ports, bringing back to St. Michaels old men who have visited relatives and are now returning to America, and young men and young women, boys and girls, about to seek their fortunes in the New World.

Those are busy days in the port of St. Michaels. On first view, the Azorean emigrants, gathered on the wharf, differ little from those of other countries; but an opportunity to study them more closely will reveal many interesting faces and figures. These peasants have lived in a healthful, mid-ocean climate and led their simple lives among the hills and rugged mountains of their native land. Dejection is not pictured on their faces. Many of them are tall and strong. But perhaps the most notable feature to a stranger is the healthy glow of their faces.

Unfortunately, many do not find the fortune they seek in America. Some go to the western part of the United States and continue to lead a healthful life on the ranches in California and Nevada, but others seek employment in the manufacturing centers of the eastern States.

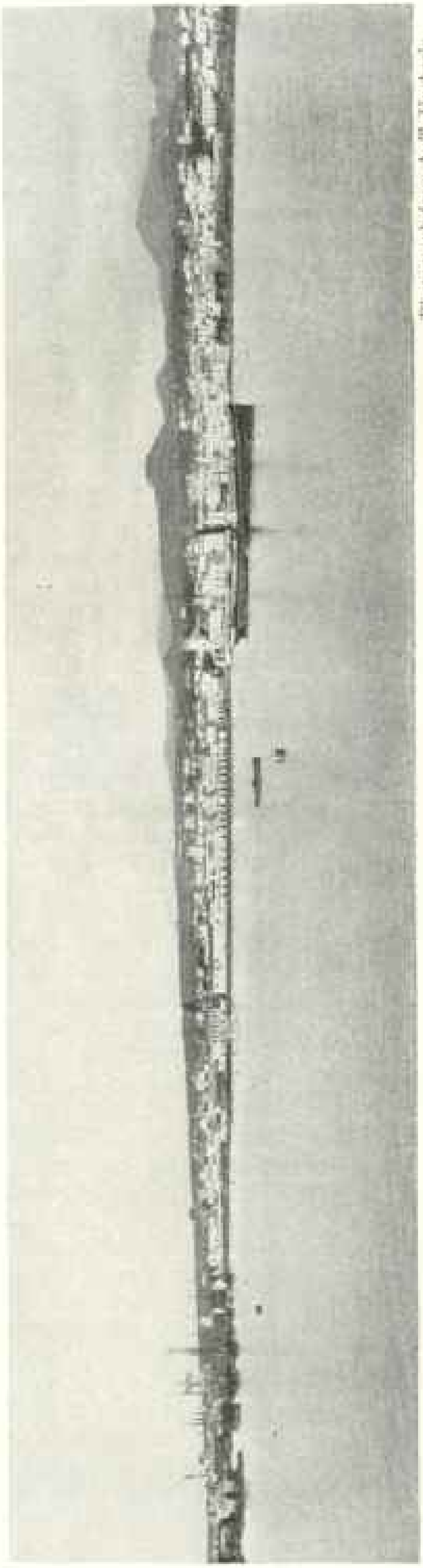
Not accustomed to the cold climate and indoor work, or the result of denying themselves some of the necessaries of life in order to accumulate enough money to return home, it sometimes happens that they contract consumption. While this is by no means the rule, the government of St. Michaels has, in connection with its hospital, a special department for those afflicted with this disease.

ST. MICHAELS—"A VISIT TO PARADISE"

"You are going to a paradise," was the information I received from a friend when he heard of my contemplated trip to the Azores. Naturally, my expectations ran high. Unfortunately, when our boat anchored off St. Michaels, February clouds, sending down sudden squalls, were hanging low over the hills. But, even with high expectations and the interference of low clouds, the scene was not disappointing.

A sudden burst of glory is not essential for a terrestrial paradise. St. Michaels does not overwhelm you with the grandeur of a Rocky Mountain scene. It captures you subtly. Little by little impressions pile up in your memory until your fancy lingers in the beautiful gardens, whose walls are covered with wisteria and climbing roses, in the magnificent parks, and among the extensive hedges of hydrangea that bloom along the country roads.

By way of contrast, St. Michaels will fret and frown amid fearful, stormy seas. But you are compensated when, on a sunny day, you stand on the summit of one of the many peaks and behold the tranquil scene below you. Then you will see the island studded with towns and villages, the verdant hills laid out in checkered fields and cultivated to the very tops, picturesque dome-like windmills turning their long wings, and the harbor and sur-



PANORAMIC VIEW OF PONTA DELGADA, ST. MICHAELS, AZORES; FROM THE TRANSATLANTIC FLIGHT

This was also the port of refuge into which Commander Towers piloted, under the most difficult conditions, the crippled NC-4, after a remarkable sixty-hour battle with a storm-tossed sea.

Photograph from A. T. Huberth

FINAL LEG OF ITS EPOCHAL FLIGHT

THE NC-4 HEADS THE NC-3 AS THEY PASS OVER PONTA DELGADA HARBOR

rounding ocean dotted with sails that glisten in the bright sunshine.

PONTA DELGADA, THE MID-OCEAN TERMINAL FOR AVIATORS

Ponta Delgada, the largest city in the Azores, has 17,600 inhabitants. Fortunately, it has preserved some of its old features, the inheritance of past centuries—just enough to breathe an atmosphere of quaintness and to make the place so delightfully attractive that the jumble of high, massive chimneys, the tall walls, and the small balconies that overhang the streets become a part of one's life.

Modern buildings there are, such as the imposing hospital, the quarantine station, the Governor's Palace, and many private residences. But it is not these one cares to talk about in a place that can boast interesting relics of the past.

Ponta Delgada still has a number of houses that have been handed down through generations in accordance with the law of the morgados. The morgado was the oldest son, who inherited the estate of his father and upon whom devolved the duty of providing for the other members of his family.

The architecture of these houses is the same as that used in olden times by the morgados of northern Portugal. Here they are built of massive lava rock. The interiors are divided into spacious rooms provided with many windows and doors that often connect with long rows of balconies. Ornamental designs worked in plaster of Paris decorate the painted walls and ceilings. Large chimneys stand like sentinels on the roofs. These chimneys, having long, narrow openings, are in some cases eight feet wide at the lower part, where they rise from the fireplace in the kitchen.

The date showing when the house was built and a coat of arms made of plaster of Paris are sometimes found above the entrance. Many of the morgado residences are provided with a special chapel for the members of the family. The best

Photograph from A. T. Harberle

THE TYPICAL THICK-WALLED, THATCH-ROOFED COUNTRY HOUSE OF THE AZOREAN PEASANT: NOTE THE CORN STACK TO THE LEFT

These peasants live in a healthful, mid-ocean climate and lead simple lives among their hills and rugged mountains.

example of this class of architecture in St. Michaels is the old palace of Santa Catharina.

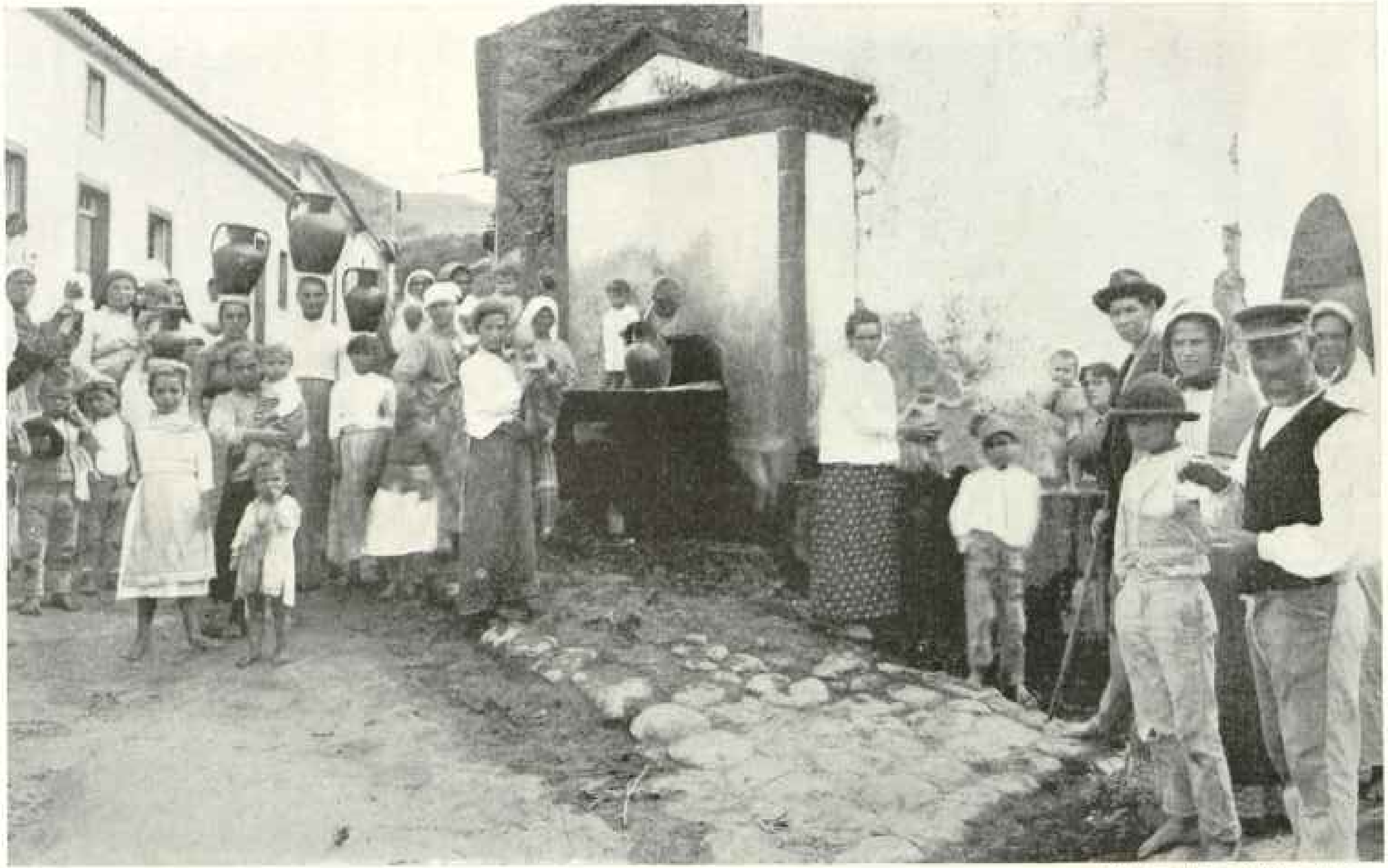
Back of the houses are flower gardens surrounded by high walls. These walls, sometimes 15 feet high, are found everywhere on the island, often inclosing the roads for a long distance. Some writers have attributed these walls to the necessity for fortification against foreign invaders in the early days of the island, but in reality they were built to protect the orange groves from the wind. Next to the walls, Faya, or beech trees, were planted as a further shelter. Like the houses, these walls are made of lava stones, skilfully piled on top of each other and the crevices filled with small pieces.

THE ROMANTIC STORY OF THE CHURCH OF HOPE

Many of the gardens have high stone towers that command a view of the sea and surrounding country.

There are several historical churches and convents in Ponta Delgada, of which the Church of the "Colegio" and the Church and Convent of "Esperança" are of greatest interest. The former was built by the Jesuits in 1625. When, in 1760, the Jesuits were expelled from the Azores during the reign of Don José, this church and the adjoining property were sold at public auction. In this way they came into the possession of one of the principal families of St. Michaels. Although a private church, it is open to public worship. The architecture is that of the Jesuit churches of the fifteenth and sixteenth centuries. The Colegio Church is frequently visited by tourists because of the elaborate wood carving of the interior.

But the church that holds the foremost place in the hearts of pious Azoreans is "Esperança," or Church of Hope. It is the abode of their most devoutly worshiped image, "Santo Christo," the origin of which dates back to the founding of



Photograph from A. T. Haeberle

AT A VILLAGE FOUNTAIN AND PUBLIC BATHTUB ON THE ISLAND OF ST. MICHAELS: THE AZORES

"St. Michaels is a little world in itself and the Azoreans have a little of everything." From the red volcanic clay to be found on the islands the natives make artistic pottery, examples of which are seen here as porous water-jars, which keep the water cool.

Photograph from Emil P. Albrecht

WE ARE NOT IN A MOHAMMEDAN LAND OF VEILED WOMEN, BUT THE EFFECT IS ALMOST THE SAME IN THE AZORES

When clasped at the throat, as the cloaks are meant to be, there is but a tiny strip of the wearer's face visible, and that only from directly in front. A street scene in Ponta Delgada, the flourishing capital of the Azores archipelago.

Photograph from A. T. Hacberle

CORN STACKS IN THE AZORES RESEMBLE GIGANTIC BUNCHES OF BANANAS

Much of the land of the islands is controlled by wealthy land-owners, who lease it and collect an annual rental of from $5 to $15 on each "alqueire," the Portuguese unit of land measure in this district, which is less than the American acre. The Azores must have had their St. Patrick as well as Ireland, for there is only one species of reptile, a lizard, indigenous to the archipelago.

the convent connected with this church. No one can remain long in St. Michaels without becoming acquainted with the truly important part this image plays in the religious life of the people—a worship peculiar to the island of St. Michaels.

In the sixteenth century twenty-seven nuns founded a convent in Caloura, a small town in the southern part of the island. Eighteen of these, fearing the ravages of Moorish invaders, entered the more securely protected convent in Villa Franca, the old capital, while the less timid decided to remain at Caloura.

Two noblemen of that town, feeling compassion for the faithful nine who refused to leave, undertook to raise sufficient money to build a convent in Ponta Delgada.

Two of the nuns were sent to Rome to make the necessary arrangements with the Pope. They brought back not only the desired permission to found a new convent, but also the image of Ecce Homo, or Santo Christo, which was placed in the new convent upon its completion, in 1541.

Years ago the Portuguese Government abolished all convents and prohibited women from taking the vow. But the Convent of Esperança was placed in the hands of a religious society and allowed to remain open under the auspices of an abbess. Today about forty women live there, performing their religious duties, but free from the usual vow and strict rule.

Many of the inmates of Esperança earn their living by making confectioneries that have become famous in the island.

TWO FAMOUS FESTIVALS

The procession of Santo Christo takes place on the fifth Sunday after Easter. In the afternoon of the day before, the image is taken out of the convent, where it remains all year. It is carried into the adjoining church, which is kept open all night for the 15,000 people who come from far and near, many of them from other islands, to worship and witness the great procession of the year. The pilgrims walk long distances, and make their beds in the park in front of the church or sleep in the vestibule itself. Nor do the faithful worshipers in the United States forget their beloved image. Generous contributions arrive from America, and, in remembrance of absent friends, the American flag is produced in the form of pyrotechnical displays in the Park of San Francisco.

Santo Christo is often spoken of by the islanders as being "rico," * or rich, which is certainly true; it is impossible to estimate his wealth; but the costly jewelry and precious stones that have been offered at his shrine and with which he is adorned represent a value of thousands of dollars.

The second of the great religious festivals is the Imperio do Espirito Santo, or Holy Ghost, which extends over a period of ten or more weeks, from Easter Sunday until Saint Peter's Day. The season is marked by a series of processions, but the principal and most interesting feature is the poor people. On the last Sunday mordomos, or chiefs, whose duty it is to collect money and other gifts, are selected for the ensuing year.

A SEASON OF CHARITY

Generous quantities of flour, wheat, beans, and cattle are frequently received from those whose fortunes enable them to bestow freely. The money is used to purchase wine and food.

During the Espirito Santo holidays the wheat and flour are converted into bread, the cattle are killed, and everything is distributed among the poor. The residents of certain streets form so-called imperios, or unions, each one electing its mordomo and distributing the collected gifts among its members. The food is placed in carts drawn by oxen, and both carts and animals are decorated with garlands and rosettes of bright flowers.

The festivities of Santo Christo and Espirito Santo are eventful days for the inhabitants of the rural districts, who think little of pleasure during the year. The husband or father leaves his home at daybreak to till the soil, while the female members of the family attend to their domestic duties, carry their corn to

* This term is used in a *most respectful manner* by the Azoreans.

Photograph from Emil P. Albrecht

A MODISTE WOULD STARVE IN THE AZORES—FASHIONS NEVER CHANGE

The cloaks worn by the women last a generation at least; sometimes several. Granddaughter dons grandmother's apparel without chagrin and without causing comment when she appears on one of the main thoroughfares of Ponta Delgada.

the nearest windmill, and bring back the meal for the week.

Mass on Sunday morning and a walk or visit in the afternoon constitute, in many cases, the only change in their simple lives until the approach of the festivities of Santo Christo and Espirito Santo. Then the men take out their violins, guitars, and accordions and lead their families to Ponta Delgada to worship, to see the decorations, and to sing and dance.

The native dances are on the order of our square dances, men and women winding in and out, with slight variations, according to the figures of the different dances. If the father is a musician, he will play his violin as he walks along the country road. It is an interesting sight to see a whole family marching home to the tune of lively native melodies.

One of the churches is situated on a high elevation and affords a perfect view of the city, harbor, and surrounding country. The real name of the church is "Mae de Deus" — Mother of God. When Colonel Roosevelt stopped at this island on his journey to Africa, he visited this spot, since then called Roosevelt Park. A tablet on the church bears the Portuguese inscription, "Passeio Publico Theodore Roosevelt."

CARNIVAL TIME IN THE AZORES

It was my good fortune to arrive at St. Michaels in time to witness the carnival festivities. Two Sundays are devoted to amusement during this time. Wax balls, called "limas," are filled with water and used to bombard people who may venture within range. Formerly, these balls were thrown promiscuously, but now certain places are set apart for that purpose. One may walk with safety through the city on carnival days, but if a person ventures near the happy revelers, he does so on his own responsibility.

The most attractive feature of carnival time is the "Battle of Flowers" in the square of San Francisco. Those wishing to participate prepare their coaches for that purpose, covering them with elaborate floral designs. Since the introduction of automobiles, these are also used, the bodies and wheels of the cars often forming solid masses of flowers and oranges.

The coaches are loaded with baskets full of flowers and confetti. Soon the street and park become a solid mass of people, and the progress of the vehicles is obstructed. Then the battle begins and rages everywhere until the battlefield is covered with a thick carpet of flowers and confetti, and the immaculately dressed women and girls, flushed with the exciting hardship of attack and defense, present a fascinating picture.

Photograph from A. T. Haeberle

AN AZOREAN PEASANT FAMILY ENTERING PONTA DELGADA TO PARTICIPATE IN THE FESTIVITIES OF SANTO CHRISTO

As they march along the road they sing native melodies to the accompaniment of guitar, accordion, and violin. Note that all the men of the family are barefooted.

PONTA DELGADA'S WONDERFUL GARDENS

Ponta Delgada has some of the most wonderful botanical gardens in the world. They have been pronounced by some as ranking next to those in Portugal, and by others as inferior only to the famous gardens of Brazil. That of José de Canto was begun in 1848. Señor Canto was connected with all the different nurseries in the world, and it was his ambition to gather specimens of all the trees and plants that could be obtained. The result is a marvelous collection.

The gardens contain tree ferns originally from Australia, many species of palms (such as the date, sago, and fan), Australia myrtle, great varieties of aloes, magnificent roses and camellias, India-rubber trees, banyan trees, acacias, magnolias, dracenas, brilliant red flame trees, screw-pines, and fine specimens of the cedar of Lebanon.

The dragon trees (*Dracæna draco*) grow well, and at Fraia, in the southern part of the island, there is a long avenue of them. This species is exceptionally interesting because of the famous dragon tree of Orotava, on Teneriffe, that existed until 1867. Humboldt estimated its age at 10,000 years. It is said to have been so large that ten men with arms outstretched could scarcely surround it.

St. Michaels does not distinguish itself because of rare flowers. It is rather the

Photograph from A. T. Hasheris

THE PROCESSION OF SANTO CHRISTO IS PONTA DELGADA'S NEW YEAR'S, LABOR DAY, AND FOURTH OF JULY ALL IN ONE

The celebration takes place on the fifth Sunday after Easter, and the inhabitants of St. Michaels walk long distances to the capital, where they make their beds in the park in front of the church or sleep in the vestibule itself the night before the eventful day (see text, page 527).

great exuberance with which they grow when introduced and their splendid development that surprise. Riding through the country, one will suddenly find himself among hedges of hydrangea and incense (*Pheta lacca undulata*). Here the white calla lily, the pink belladonna lily, the bright Guernsey lily, freesias, rambling Dorothy Perkins, wisterias, begonias, and gladioli blossom in indescribable profusion.

Years ago the Easter lily was raised for export. The flower grew so well that millions were planted, but the extensive fields were suddenly destroyed by a disease, and fortunes were lost. Owing to

Photograph from A. T. Hasberis

THE "ROOSEVELT CHURCH" AT PONTA DELGADA, ST. MICHAELS: THE AZORES

Its real name is "Mother of God"; but when Colonel Roosevelt was on his way to Africa he visited this spot, which has since been called Roosevelt Park. A tablet on the church commemorates the event.

the destruction of this flower, of the orange trees and the vineyards, years ago, the government now maintains an agronomer's station to examine all plants brought to the island.

"THE CAPOTE AND THE CAPELLO"

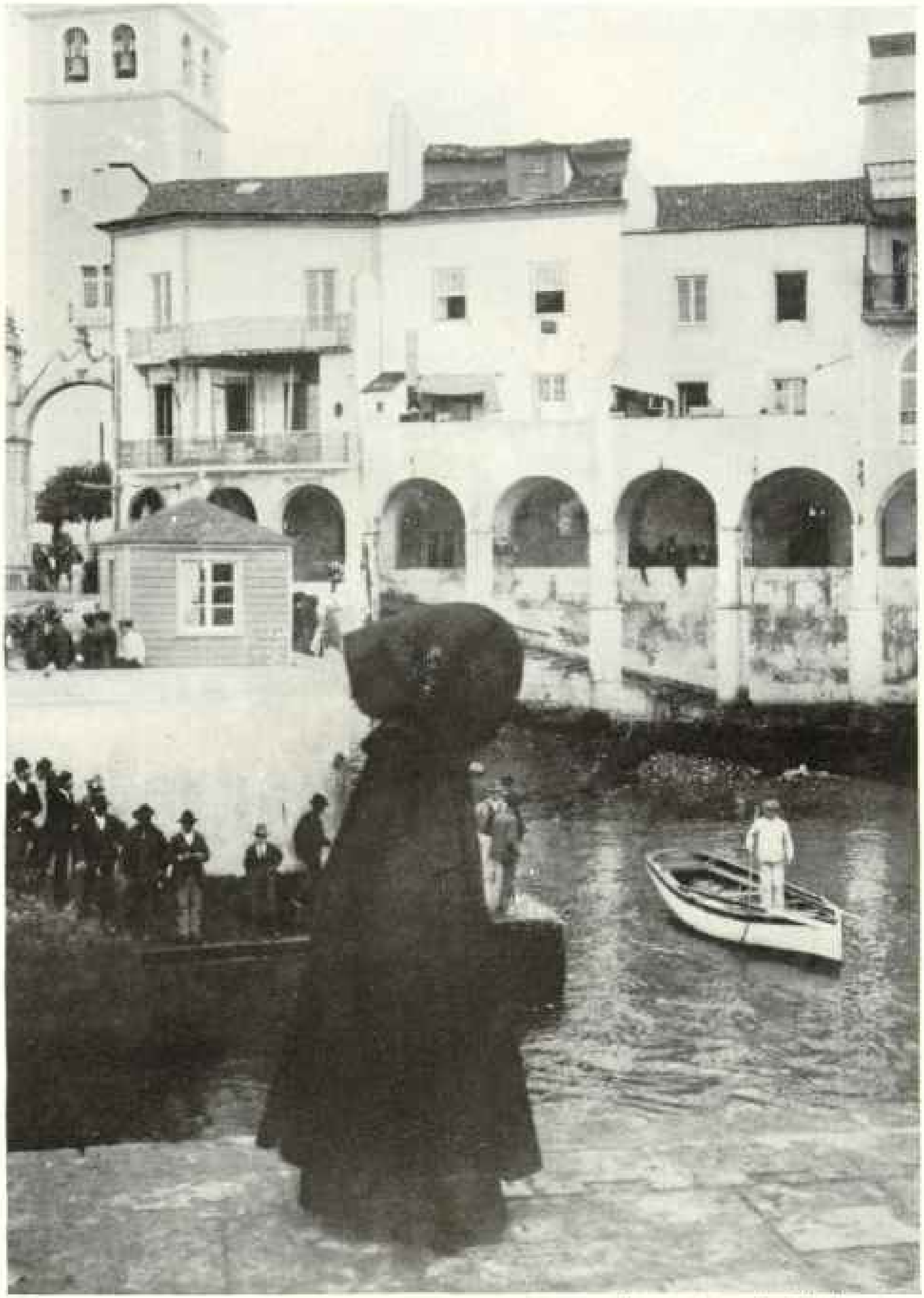
The handkerchief still forms the principal head covering of the older women of the peasant class, while the younger wear fancy scarfs. Wooden shoes are also worn by many of the peasant women and servants. The old carpauça, with its cape falling over the shoulders to protect the neck from the cold, is not used as extensively by the men as in former years, but the tasseled cap used by the laboring class is often seen in the streets of Ponta Delgada.

In the cities many of the women wear a special garb known as the "capote and capello." The capote is a long blue cloak, to which is attached the large bonnet-shaped hood known as capello, which completely hides the face, extending far out in the front and back. This costume is not found elsewhere in Portugal.

The Portuguese land measure is called "alqueire," which is less than the American acre. Much of the land of the islands is controlled by wealthy land-owners, who lease it and collect an annual rental of six milreis to twenty milreis, or about $5 to $15 in United States currency, on each alqueire. The rent is generally paid in money, but sometimes in the products of the field. One man often leases from 20 to 30 alqueires.

MILKMEN SLEEP IN CAVES

Although emigration has affected, to some extent, the cultivation of farm lands, the owners can profitably use the unoccupied parts for grazing purposes, as there is a good market for cattle. This pasture land is also rented out. In winter,



Photograph from Emil P. Albrecht

ON THE QUAY AT PONTA DELGADA

Through the archway to the left can be seen the entrance to the arcades of the Casa des Arcas, which faces on the inner harbor. The woman in the foreground wears the familiar "capote and capello."

when the cattle graze in the fields, the rent is based upon the alqueire; but in summer, when they are driven to the hills, where the land is not measured, the charge is based upon the size of the herd.

The men who attend to the milking go up into the hills in the evening, where they sleep in caves, in order to round up the cows early in the morning and milk them. The milk is then taken to town in large tin cans packed on burros.

Fields of broad beans and lupine are everywhere in evidence. These products are used as fertilizers. Walls of lava stone divide the green fields into small squares, giving the hills a characteristic checkered appearance.

HOTHOUSES HEATED BY FERMENTATION

Formerly, oranges were the principal article of export, and in 1872 300,000 boxes were shipped abroad, representing a value of about $500,000. From that time on the orange industry gradually declined, as a result of the destruction of the trees by disease, and agriculturists turned their attention to the growing of pineapples.

The first pineapples were grown in a small town, Livramento, but now the principal centers are Ponta Delgada and Villa Franca. The fruit is not planted in fields, as in the warmer climates of Mexico and Central America, but carefully nursed in hothouses, without artificial heat. To produce the necessary heat, beds of special fermenting material are made. The hothouses, approximately 40 by 90 feet, face north and south and contain as many as 3,000 plants. The young pineapples need replanting, and therefore several hothouses are used before the fruit is ready for market.

In the first house the earth is prepared by covering a heavy layer of small branches with soil that has been previously used. This is turned over and watered.

The young plants are placed about a foot apart and covered with a layer of loamy soil. After being carefully watered, they are allowed to remain undisturbed for about 12 weeks. When they appear above the ground the glass roofs are covered with a coat of whitewash to soften the light of the sun.

The plants are transplanted to the second hothouse after they have reached a height of about six inches. The beds in the second hothouse consist of three layers, the bottom one being old soil that has been used in the hothouse; the second, new earth; and the top, a thoroughly rotted hothouse soil. The plants are placed two feet apart and allowed to grow until they are one foot high.

Then follows the interesting process of smoking the plants. This method is the result of an accidental discovery. Years ago the furnace in one of the hothouses began to smoke and filled the entire house with fumes. The planter believed that his crop was ruined, but discovered later, to his surprise, that all his plants not only matured more quickly, but also simultaneously. Since then it has been learned that pineapples requiring several years to mature under the old system will show signs of bearing forty days after being smoked, and then mature more evenly.

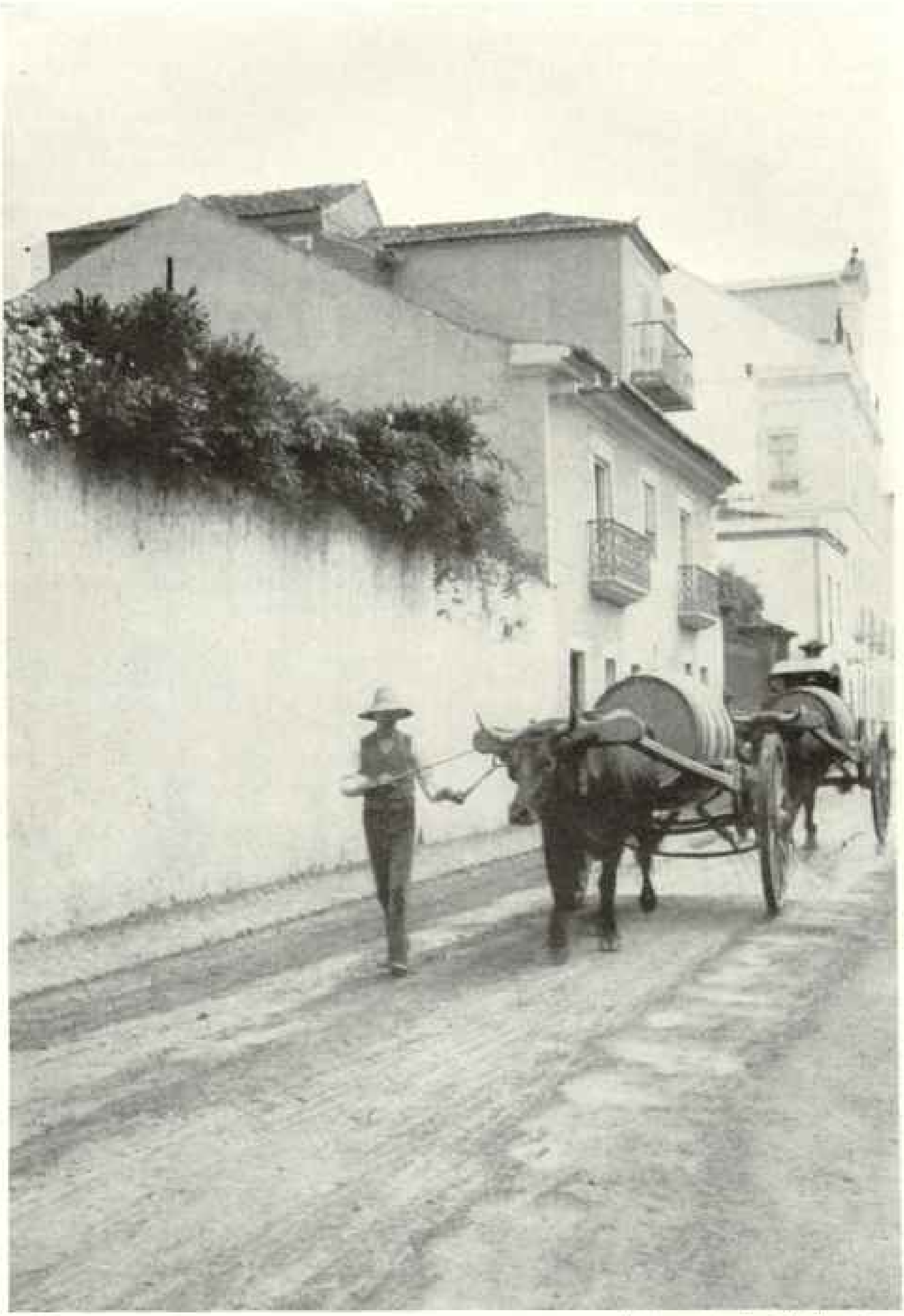
The furnaces used for smoking are filled with green grass or foliage and allowed to smoke three nights in succession. The plants mature in about one year from the time of planting.

The average cost of producing one pineapple, packed for export, is about 24 cents. While this is expensive, the fruit is remarkably free from all fibrous substances. The pineapples are packed in excelsior and shipped to England on fruit boats devoted especially to this trade. The pineapples raised in St. Michaels sell for four and five shillings apiece in London.

A GREAT WINE COUNTRY

The second great industry of St. Michaels is the manufacture of wine. It sometimes happens that the crop is so great that there are not enough pipes on the islands to hold the wine, and growers have to build special cement tanks.

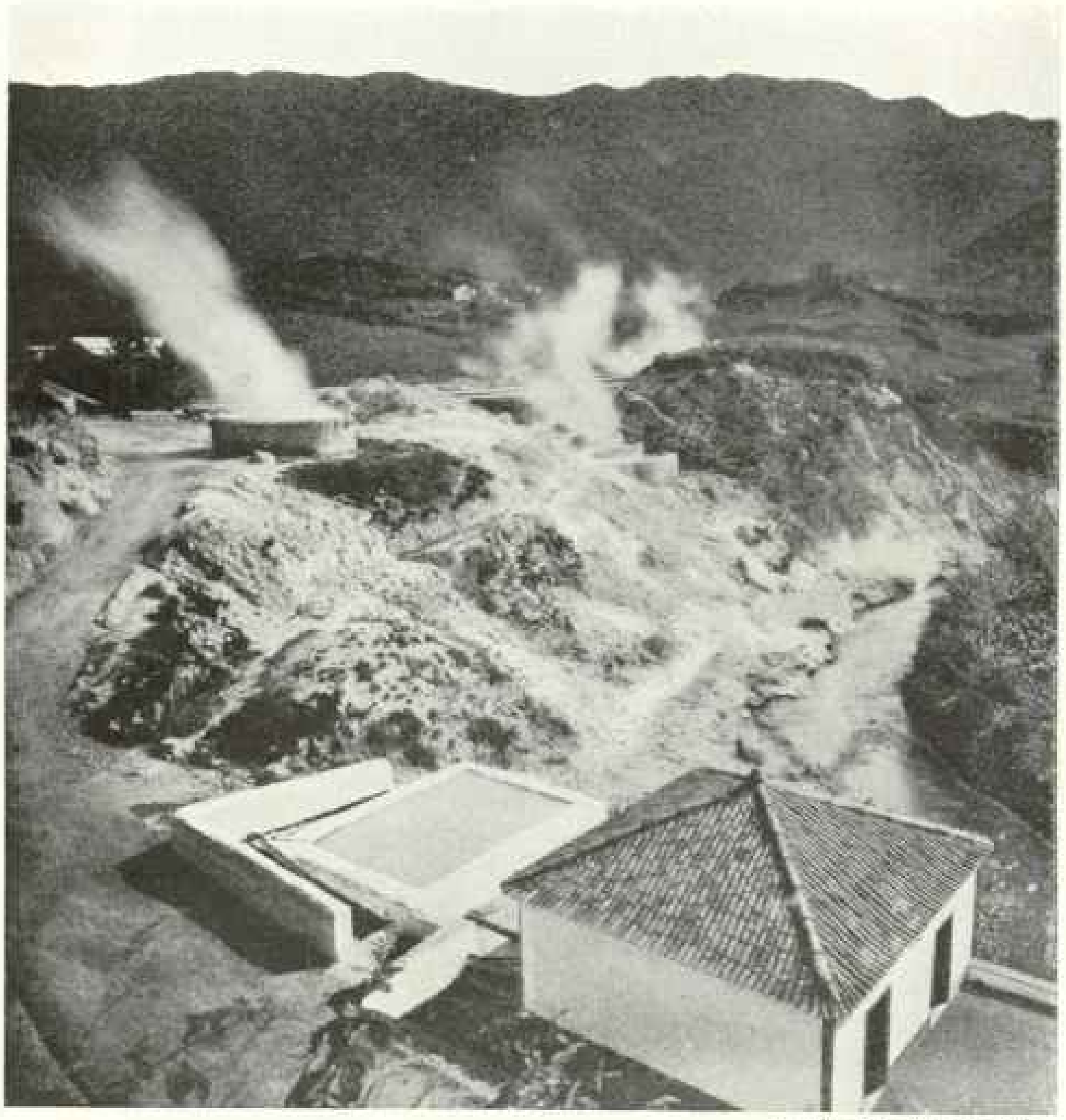
Several kinds of sweet and sour wines are manufactured, but that most widely used is a red wine (vinho de cheiro). It contains a very small percentage of alcohol and has a rich grape flavor. A liter of this pure wine is sold for 60 reis, or about five cents in American currency. It is almost impossible to become intoxicated on this "vinho de cheiro," and



Photograph by Emil P. Albrecht

OX-DRAWN WATER WAGONS OF THE AZORES

Over the creamy or soft gray walls of gardens billows of flowering vines droop down, purple and crimson and yellow.



Photograph by A. T. Haeberle

THE THERMAL SPRINGS OF FURNAS VALLEY, NEAR PONTA DELGADA, BESPEAK THE VOLCANIC ORIGIN OF THE AZORES

Here the waters seethe and boil and send up clouds of smoke, as in the geyser region of the Yellowstone. This is the Aix-les-Bains of the Azorean archipelago, with numerous bath-houses for invalids afflicted with rheumatism and palsy.

drunkenness among the people of the island is rare.

The island of St. Michaels is mountainous, but less precipitous than most of the others. That the hills can be so successfully cultivated is due to their even, well-rounded outlines. But three of them are old craters, with beautiful lakes and picturesque valleys—one in the eastern part, known as Furnas; one in the center, the Lagoa do Fogo, or Fire Lake, and another in the western part, Sete Cidades, or Seven Cities.

ST. MICHAELS' FAMOUS SUMMER RESORT

A description of St. Michaels would be incomplete without a visit to Furnas and Sete Cidades. A great number of towns and villages follow the coastline of the island, nestling peacefully among

Photograph from A. T. Haeberle

AZOREAN WHALERS USED AMERICAN METHODS IN PURSUING THEIR QUARRY WHEN THIS INDUSTRY FLOURISHED ON THE ISLANDS A FEW YEARS AGO

At Capellas, on the island of St. Michaels, a lookout was maintained on one of the near-by peaks, and whenever a whale was sighted a signal was given to the men waiting in the boats below. The direction was indicated by two signal fires built in line with the spot where the game had been seen to "blow." Here the whalers are seen hauling the dismembered carcass of their catch up on the beach by means of capstans.

the hills and valleys. Passing along the southern road to Furnas, clusters of white houses appear unexpectedly, disappear, and reappear above or below, as the road winds over the hills.

Twenty-seven miles from Ponta Delgada lies Furnas Lake. Its beauty is enhanced by a chapel of Gothic architecture on the southern shore that seems to add to the stillness of the place. A short distance beyond is the valley of Furnas, inclosed by steep mountain walls.

This valley marks an important spot in the history of volcanic disturbances of past centuries, and contains a number of important thermal baths, the waters of which boil and seethe and send up clouds of smoke. To appreciate the full beauty of the valley, the foremost Azorean summer resort, it is necessary to look down upon the town and lake and opposite mountain ranges from the heights of the northern road that descends into the old crater, where today the town of Furnas is located.

There is a charming spot in the valley of Furnas called "Tanque." This park is of interest to American readers, for it was there that the historian Prescott spent a part of his time during his stay on this island. Prescott came to St. Michaels to visit relatives, and to this day his Azorean kindred, both English and Portuguese, cherish his memory.

HOW THE SIGHT-SEER TRAVELS IN THE AZORES

When people go to Sete Cidades they pray for a fine day, for that is one condition—a perfect light to play upon the picture. We were fortunate enough to have the best of weather. A coach drawn by three horses took us to the little town of Lomba da Cruz in less than two hours. There we exchanged the vehicle for donkeys and mounted in native fashion.

The saddle used by the peasants is a heavily cushioned frame, provided with elevated cross-pieces in front and behind. The rider mounts sideways and may grip these cross-pieces like the sides of a chair. The first sensation is somewhat startling, but after a little practice this way of riding is not unpleasant.

A muleteer accompanied each donkey and supplied all the life and energy which donkeys the world over lack. "Chega la!" "Chega-te asno!" they shouted in a singing tone, with a long, drawn-out accent on the penult. The ascent is steep, but with the aid of many a "Chega la!" we steadily climbed toward the top amid ferns, heather, and tulip trees.

A MARVELOUS PICTURE FROM THE EDGE OF A CRATER

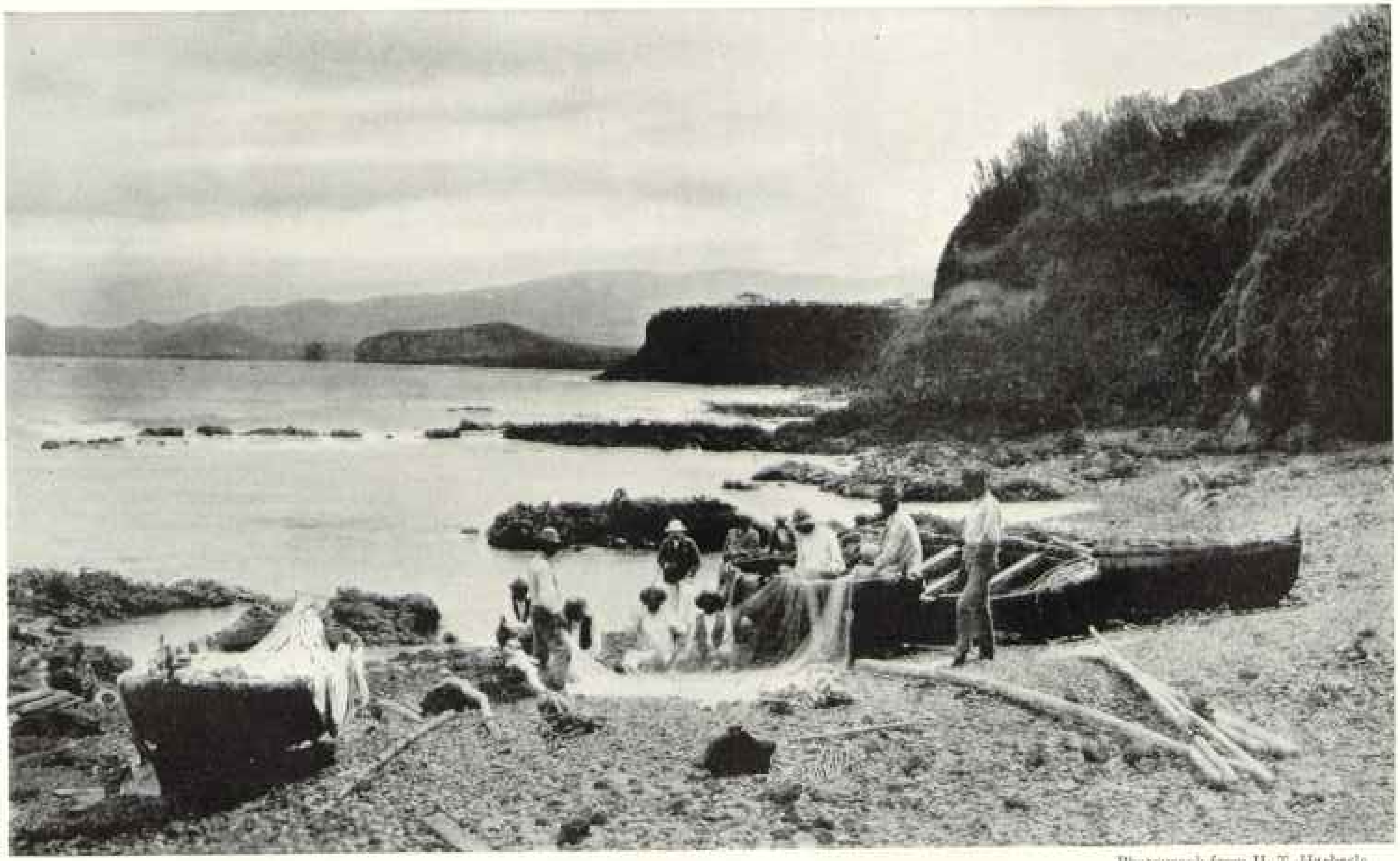
After dismounting, we were asked to close our eyes and be guided to a place overlooking the entire scene. A picture should be unfurled quickly. Perhaps this added to the effect. When we opened our eyes we found ourselves standing on the edge of a ridge 2,000 feet above the old crater that had puzzled the discoverer of the island centuries ago.

On the north and east steep mountain walls, rising to a height of 1,700 feet and covered with green trees, encircle the crater and reflect their hues in the clear waters of the lake below. The two round lakes are known as "Lagoa Grande" and "Lagoa Azul." Although they are connected, each retains its distinctive color—the one a beautiful blue; the other a green. Folk-lore attributes this phenomenon to the girl who jumped into one lake, which assumed the color of her petticoat, while her parasol, dropping into the other, changed the color of the smaller body of water.

On the western edge of the lakes is the small valley, with summer residences, and the village of Sete Cidades, which looks like a town in miniature when viewed from the top of the mountains.

The mountains are lower in the northwest, where the lava flowed down the mountain side during the eruption.

As I looked into the valley, I recalled the scene on the "Lookout Mountain" of Juan Fernandez, the old Robinson Crusoe Island, where Alexander Selkirk had scanned the ocean in search of a vessel that might take him away from his solitary abode. Here was the same view of the ocean on both sides. I recalled scenes in the Andes of South America and glimpses of the beautiful Honduran valley of Cantaranas from the top of San Juancito ridge, 6,000 feet high. But none of those was so beautiful a picture. They were simply fragments of the great



Photograph from H. T. Hucberle

THE WATERS SURROUNDING THE AZORES TEEM WITH MANY VARIETIES OF EDIBLE FISH

The sea furnishes a livelihood for a considerable proportion of the Azorean population. Thousands of lobsters are exported to Europe.

world the eye desired to reach but could not. They left one wondering what was beyond. But Sete Cidades is a complete painting, placed in a wonderful frame—the painting of a little village among the pines, resting peacefully on the edge of two beautiful lakes. That is all!

A LITTLE OF EVERYTHING

"We live happily. We have a little of everything on this island," remarked a resident of this city.

He was right. St. Michaels is a little world in itself, and the Azoreans have a little of everything. They raise their own wine and tea and have their own mineral water and thermal baths; they have their own tobacco and manufacture their own cigars; they cultivate large quantities of sugar-beet and manufacture their own sugar. The rich volcanic earth and humid, but healthful, climate lend themselves to the cultivation of great varieties of agricultural products, including vegetables and fruits of the temperate and tropical zones. Twenty-one thousand head of cattle graze in the hills and help to form one of the principal industries of the islands, the manufacture of cheese.

The sea furnishes a livelihood for a large number of its inhabitants. Thousands of lobsters are exported to the Continent.

The island is covered with a network of roads, over which 150 automobiles travel for pleasure and business.

In the year before the war St. Michaels' exports were valued at $1,839,954. For a small island home, 41 miles long, this is a record worthy of note.

HORTA A CABLE CENTER FOR THE WORLD

Santa Maria, the second island of the eastern district, is much smaller than St. Michaels. On a clear day its outline may be discerned from St. Michaels. Villa do Porto, on the Bay of Santa Luzia, is the largest town. This island furnishes much of the red volcanic clay that is used in the manufacture of all kinds of pottery, such as the porous water bottles that keep the water cool, vases, jars, and other receptacles, some of which are very artistically designed. The mountains of this island range from 1,700 to 1,900 feet.

Of the central group, Fayal is the most important. The city of Horta is the principal port. It has a well-protected harbor and is the great cable station of the Atlantic. Nine cables connect the Azores with all parts of the world. A message has been sent around the world from New York via Horta in 11 minutes.

The lace workers of Fayal are famous for their skill in making a beautiful drawn work called "crivo."

The patterns of animals used 60 years ago came from Brazil and are of primitive, medieval design. One lace expert stated that these designs date back to the fourteenth century. They were probably carried from Portugal to Brazil in the sixteenth century. But the Brazilian meshes were coarser than the present crivo work, which has extremely fine meshes.

These meshes, forming the groundwork into which the patterns are woven by hand, are always square. They are so fine and the work so delicate that it takes four months to make a five-inch border for a piece one yard square. Today promiscuous patterns are used as well as the old animal reproductions.

SPANISH INFLUENCE SEEN IN TERCEIRA

The islands of Pico, Terceira, Sao Jorge, and Graciosa lie close to Fayal. Pico is separated from Fayal by a narrow channel, only five miles wide.

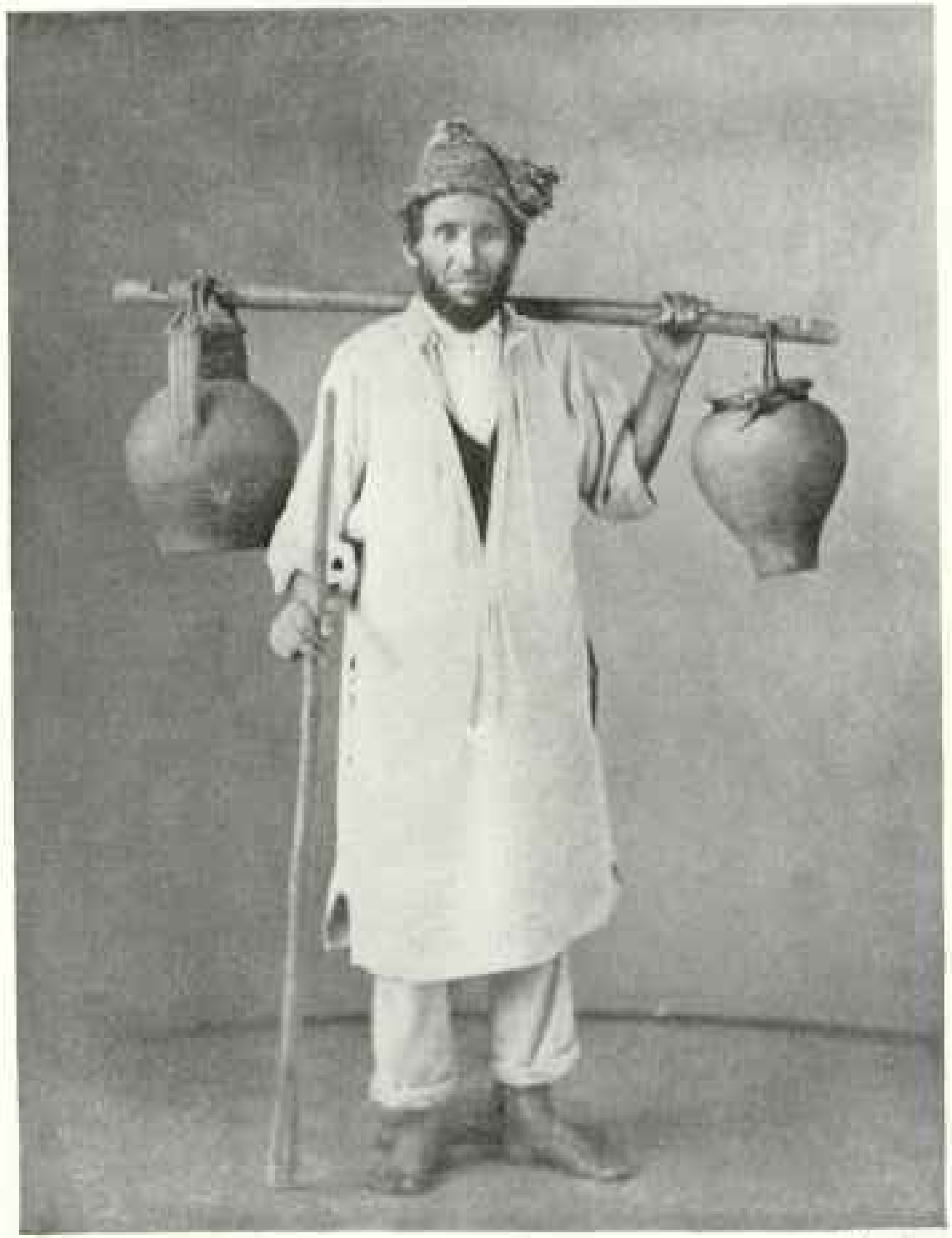
Terceira is the most interesting of this group from an historical point of view. A naturally fortified place, Angra, the picturesque capital, was the central point of battles and political disturbances of bygone times. The castle of S. João Baptista, the old Spanish fortification built on the slope of Monte Brazil, is an interesting relic of the seventeenth century. The massive walls of this castle extend down to the sea front and to the edge of the city.

To this day Terceira shows traces of the domination of Spain over Portugal in the latter part of the sixteenth and the first half of the seventeenth centuries. The short jacket, tight trousers, and Spanish style of hat distinguish the inhabitants of Angra from those of the other islands.

Photograph from A. T. Hasherle

THE MODEST HOTEL AT SETE CIDADES, ST. MICHAELS, WHERE THE PRINCE OF MONACO AND THE LATE KING LEOPOLD OF BELGIUM WERE ENTERTAINED DURING THEIR VISITS TO THE AZORES

The village of Sete Cidades clings to the western shores of two tiny lakes—Lagoa Grande and Lagoa Azul. The waters of one are blue; those of the other, green. Legend says that the green lake owes its color to the petticoat of a girl who jumped into it, while her blue parasol fell into the other.



THE PERIPATETIC WATER-COOLER OF PONTA DELGADA

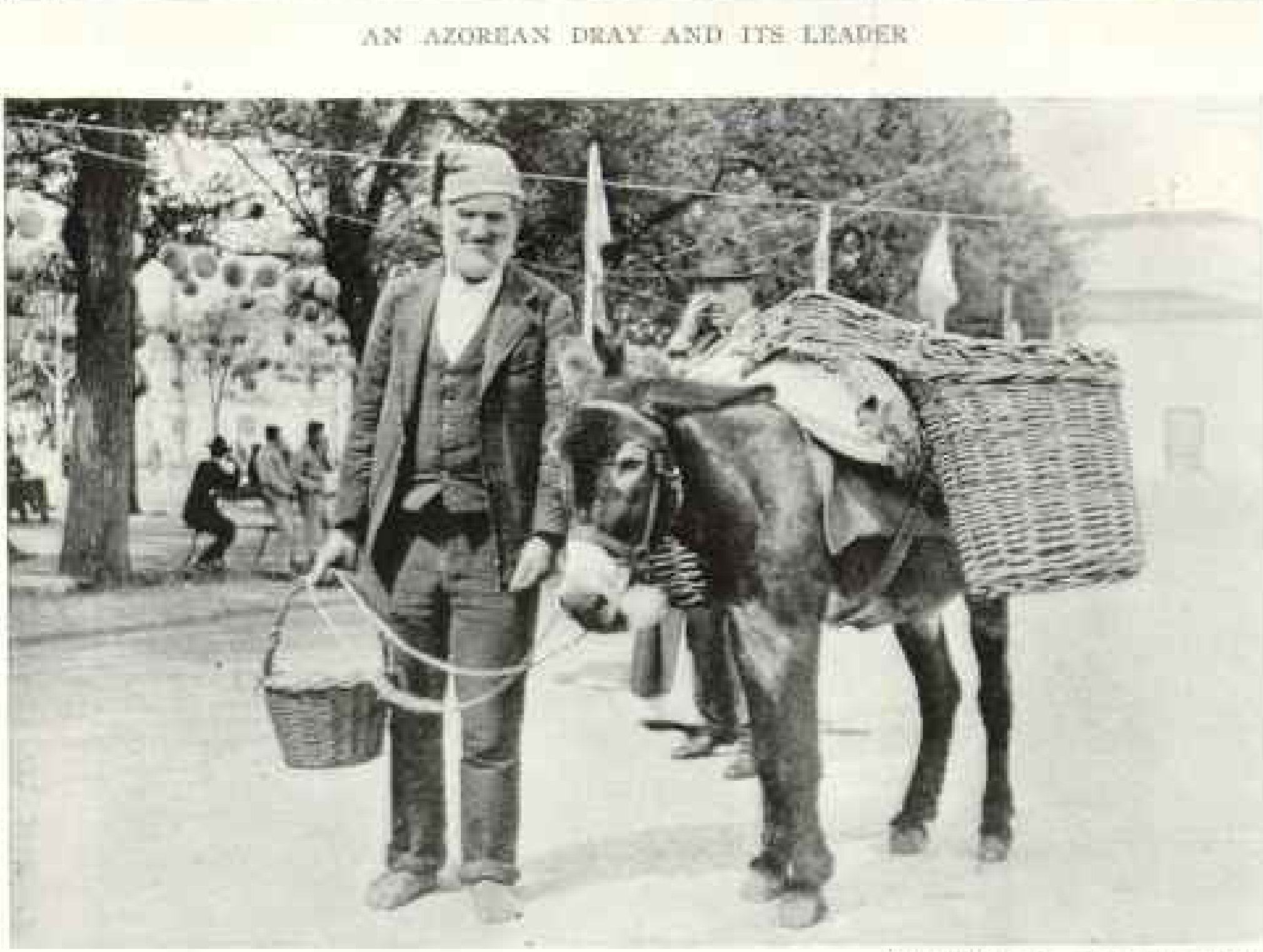
A drink from one of these jars is always refreshingly cool, for the pottery is of the porous variety, which causes rapid evaporation.

SELLING SIEVES IN ST. MICHAELS

This Azorean peddler's pack is a lighter load than that of the hat-laden vender of the Philippines (see illustration, page 495).

Photographs from A. T. Hacberle

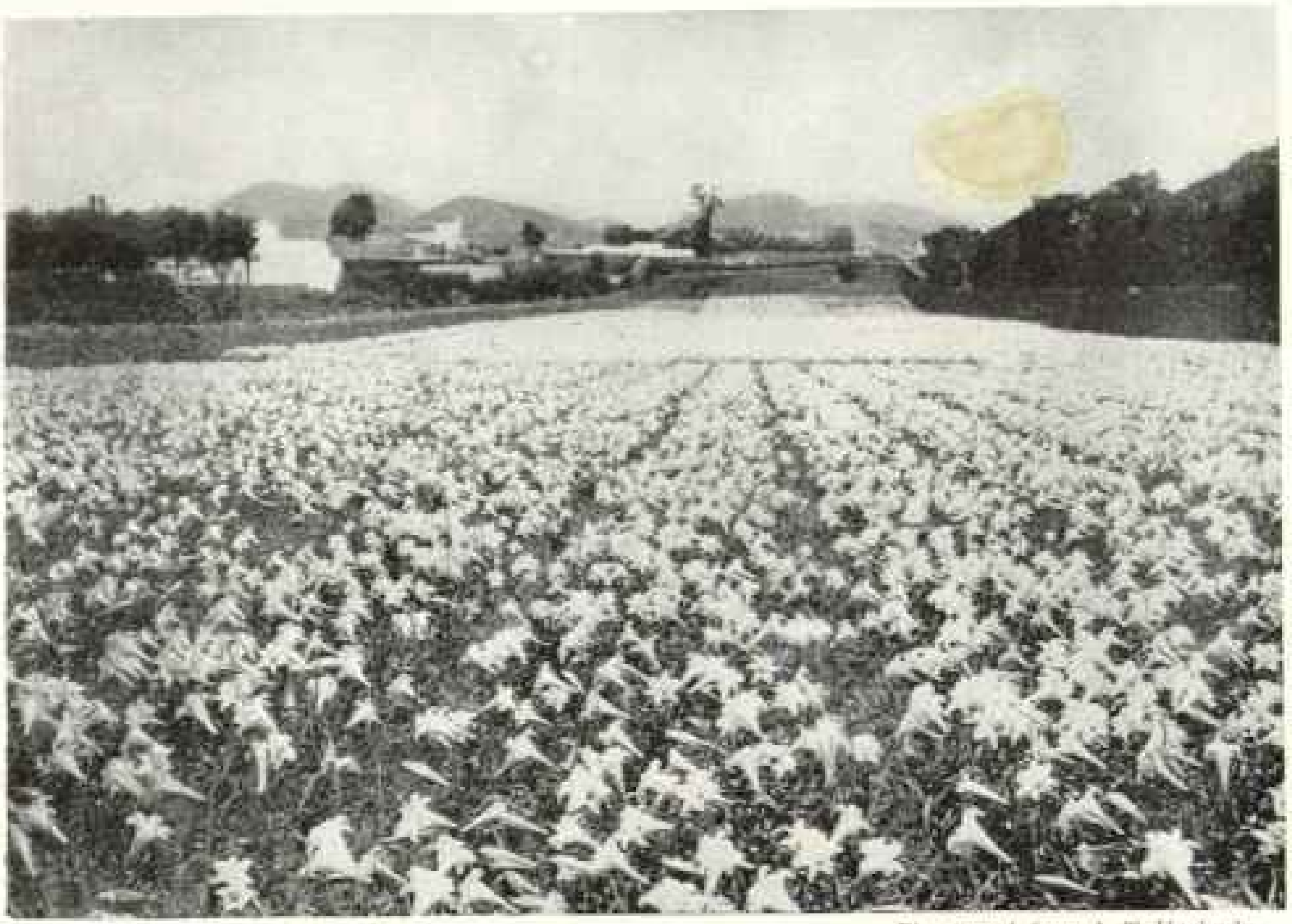
AN AZOREAN DRAY AND ITS LEADER



Photographs from A. T. Harbetle

THE TASSELED CAP, WORN BY THE LABORING CLASS, IS OFTEN SEEN IN THE STREETS OF PONTA DELGADA: AZORES

This genial barefooted native is a fruit vender. The wicker hampers borne by his donkey contain many varieties of semitropical fruits, including figs, oranges, bananas, pomegranates, lemons, grapes, apricots, and perhaps a few of the delicious hothouse pineapples for which the islands are famous and which sell in the London markets for four or five shillings each. Note the Chinese lanterns which festoon the trees, indicating that this is the Espirito Santo festival season.



Photograph from A. T. Hasberde

A FIELD OF EASTER LILIES IN THE AZORES

Years ago these flowers were raised by the millions for export, just as they are now an important source of revenue for the people of Bermuda. The bulbs were suddenly stricken with a blight, however, and fortunes were lost by the Easter-lily growers.

The Spanish pastime of bull-fighting was also introduced, and still exists, but in so modified a form that the bull-fights of Terceira are quite unlike those of other places. It is a sport not for the people, but by the people. When the bull charges, men and boys scramble up the walls and windows and disappear in the open doorway. A rope is attached to the horns of the bull to check, if necessary, the progress of the infuriated animal.

THE CORVO COW A "SHETLAND" VARIETY

Corvo is the smallest of the Azorean islands. It is so small that it looks like the very tip of an old volcano peeping out of the water. It is the home of less than a thousand souls, who live in almost complete isolation, for the Portuguese vessels call there only once every three months, and even then will sometimes forsake it when the weather is too rough to land. A lake has formed in the crater, called "Caldeira," containing nine small islands, that look as if they might be a miniature reproduction of the Azorean archipelago. The Corvo cow has developed in proportion to the size of its home. It is a neatly formed little animal, not much more than three feet high when fully developed, but is a good milcher.

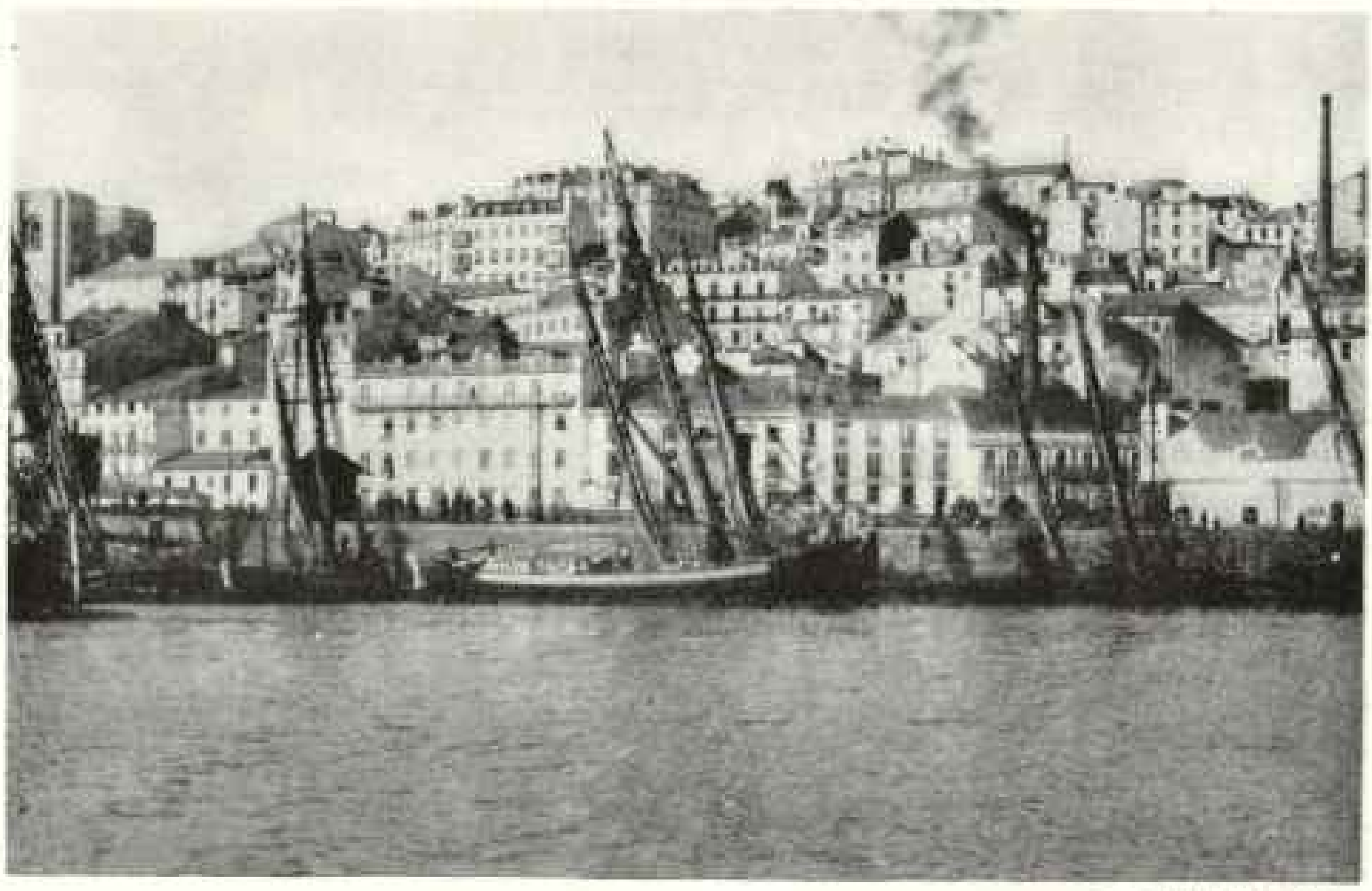
Corvo now has a wireless to save it from complete separation, but years ago the inhabitants built bonfires on its southern shores when they desired to communicate some urgent message to their neighbors on the island of Flores.

The island of Flores is the second of the northeastern group. It is about three times the size of Corvo. Many of the towns are built against the cliffs that rise abruptly out of the water.

The coast of Flores is full of treacherous shoals that often tax the skill of the Azorean sailors to the utmost. Several years ago the *Slavonia*, of the Cunard Line, was driven in a dense fog on the rocks of this island and hung for a long time with her bow fastened to the shoals on the very edge of great depths. When

BOTH SHEEP AND GOATS TAKE THE PLACE OF BELGIAN DOGS BETWEEN THE SHAFTS IN THE AZORES

Note the lava rock of which the houses are constructed. It is the cheapest building material available in the mid-Atlantic islands.



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LISBON FROM THE BAY OF TAGUS, CONTINENTAL SEAT OF GOVERNMENT OF THE AZORES AND THE PORT WHICH MARKED THE COMPLETION OF MAN'S FIRST TRANS-ATLANTIC FLIGHT, ACCOMPLISHED BY AMERICAN NAVAL AVIATORS

The capital of Portugal, which had a population equal to that of Washington before the war, is rated by travelers the most beautiful city in Europe, Constantinople and Naples alone excepted. A Portuguese proverb runs, "He who has not seen Lisbon does not know what beauty is."

she was finally lifted off by a heavy wave, caused by a passing steamer, she sank in only a few fathoms of water and may be seen today from the precipices above.

The Azoreans are good sailors. Although the sea between the islands is very rough at times and navigation very hazardous, their small boats are seen everywhere, even among the dangerous rocks, plying between the various islands.

Extensive trade in cattle and dairy products is carried on not only between the islands, but also between the Azores and Lisbon.

THE FUTURE OF THE AZORES

For years preceding the war European nations had been busily engaged in preparing for new trade opportunities following the opening of the Panama Canal, and the inhabitants of the Azores were likewise deeply interested. The "Junta Geral," or local government of St. Michaels, was active in its efforts to establish large hotels in Ponta Delgada and Furnas and to connect the principal points of the island with an electric railway. With the return of peace, the islands are taking on new life.

The highest and lowest temperatures ever recorded are probably 85 and 45 degrees. With a semitropical climate, famous thermal baths, and a favorable location, it certainly would appear that the inhabitants of St. Michaels are justified in their ambition to make their island the famous summer and winter resort of the Atlantic.

NOTE—The writer is greatly indebted to Colonel Chaves, the Junta Geral of Ponta Delgada; Miss Sophia Brown, Mr. J. J. da Costa, and others for their assistance in securing data and views for this article.

A MAP OF THE NEW GERMANY

BEFORE plunging the world into a war of aggrandizement, the German Empire in Europe had an area equal to our New England States plus that of New York, Pennsylvania, and Virginia. Today this Germany, which expected to be all-powerful, is shorn of territory equal to all the New England States, Maine excepted, and may lose by the vote of peoples in the affected territories additional areas equivalent to the State of New Jersey. Her name on a far-flung colonial empire of 1,270,000 square miles has been blotted from the map of the world.

Thus do the discord-makers not only fail to inherit the earth, but they have taken from them even that which they had.

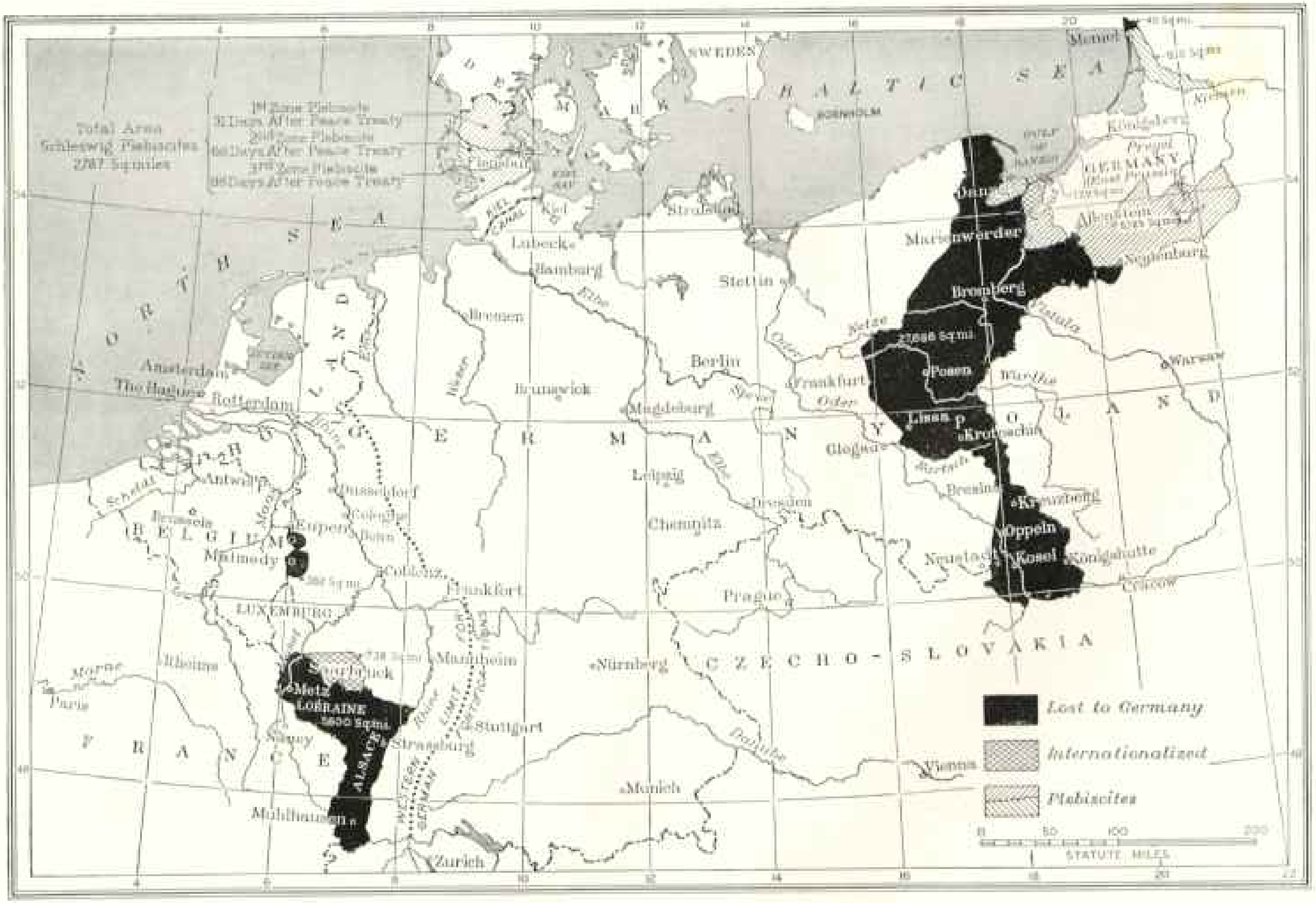
The boundaries of the new Germany, as limited by the Peace Treaty of Versailles (accurate in so far as can be determined by the official summary of the document), are shown on page 546.

The areas which Germany surrenders outright to her enemies are: Alsace-Lorraine, 5,600 square miles, to France; two small districts surrounding Malmedy and Eupen, 382 square miles, to Belgium; portions of Silesia, Posen, West Prussia, and East Prussia, 27,686 square miles, to Poland; and the 40-square-mile northeast tip of East Prussia in the vicinity of Memel.

In addition to these areas, Germany loses sovereignty over the internationalized Saar basin, 738 square miles, and the free city of Danzig, 729 square miles.

Those regions that may be lost to the former Teutonic Empire by vote of a majority of the inhabitants embrace 5,785 square miles (an area larger than the State of Connecticut) in East Prussia, which may go to Poland; three strips of territory in Schleswig, aggregating an area larger than Delaware, which may go to Denmark, and 910 square miles of East Prussia above the Niemen River, about whose future the Peace Treaty summary is ambiguous.

Nor do these statistics of area convey the full story of Germany's reparation, for many of these districts of which she is thus deprived are among the richest in mineral resources and in population of all her domains.



THE NEW GERMANY AS LIMITED BY THE PEACE TREATY

The people residing in the areas designated as "Plebiscites" are to determine by vote whether they wish to remain a part of Germany or be incorporated into Poland or Denmark, respectively, according to locality (see text, page 545).

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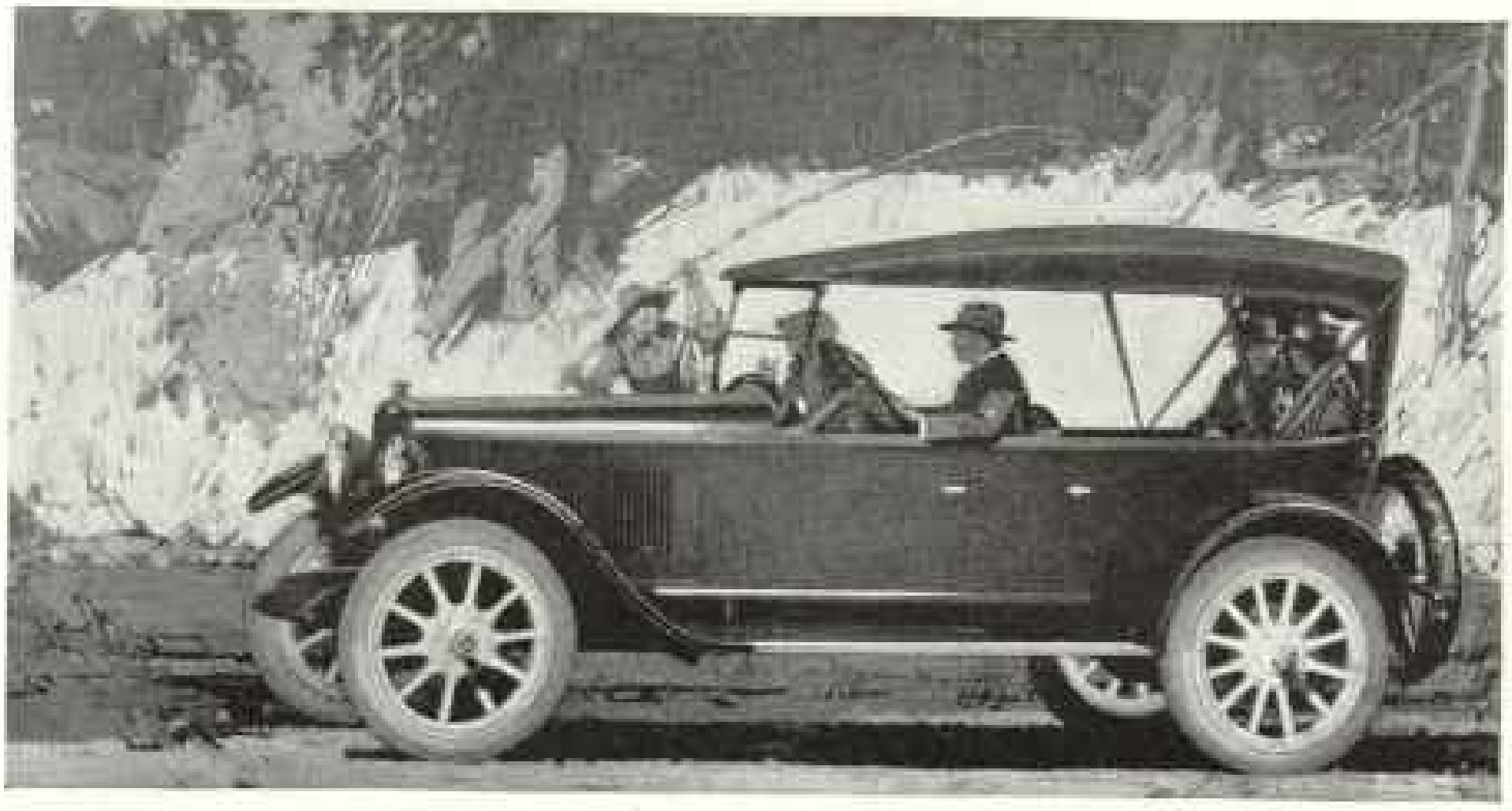

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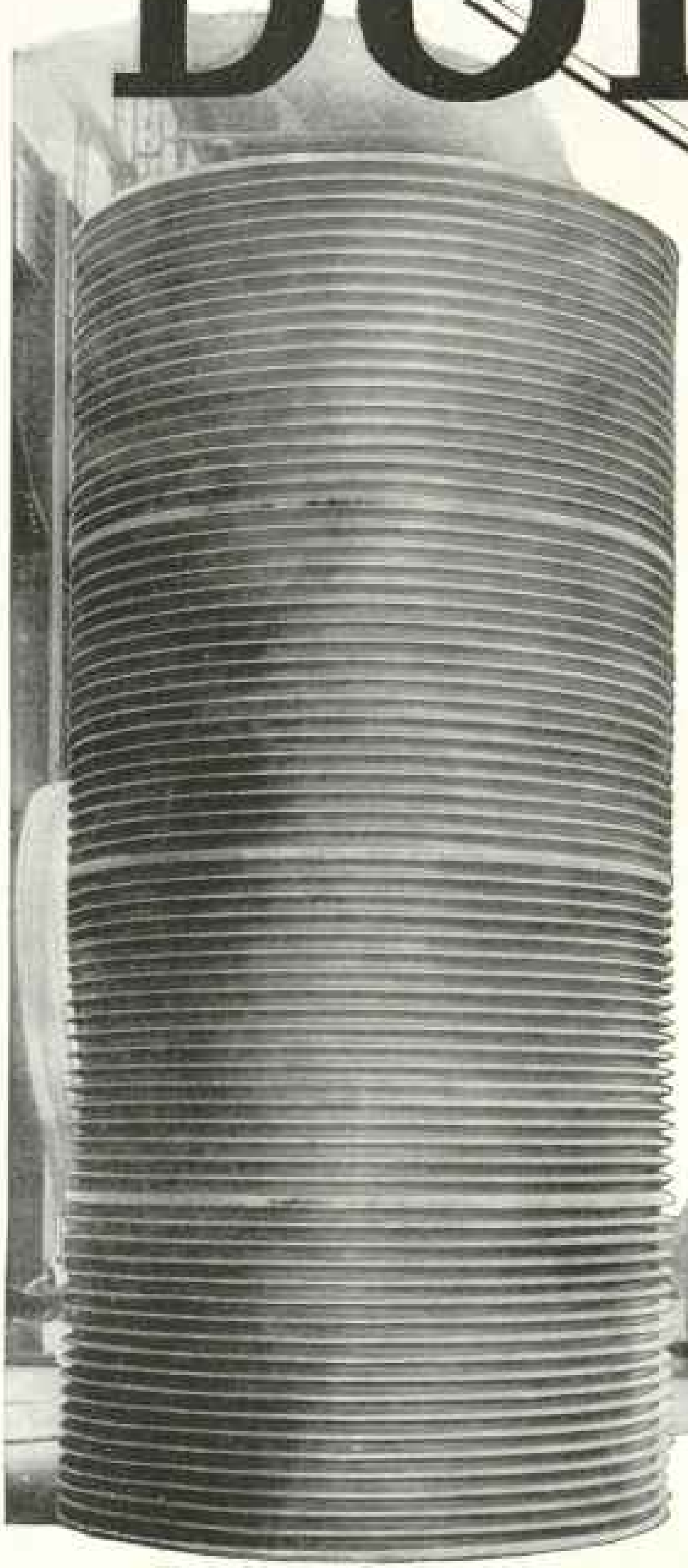

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Millions of Teeth
Are Being Saved in a New Way

All Statements Approved by High Dental Authorities

There's Now a Way To End Film

There is a new teeth cleaning method which everyone should know. It is embodied in a dentifrice called Pepsodent.

Able authorities have proved it by many clinical tests. Leading dentists everywhere endorse and advise it. Millions of teeth are now protected by it. And we are sending free to all who ask a 10-Day Tube to try.

There's a film on your teeth—a slimy film—which causes most tooth troubles. The ordinary dentifrice cannot combat it. It clings to the teeth, gets into crevices, hardens and stays. That is why teeth discolor and decay despite the daily brushing.

That film is what discolors—not the teeth. It is the basis of tartar. It holds food substance which ferments and forms acid. It holds the acid in contact with the teeth to cause decay.

Millions of germs breed in it. They, with tartar, are the chief cause of pyorrhea. This film is therefore the teeth's chief enemy.

Dental science has found a way to combat it. The fact has been proved beyond question. Pepsodent embodies this new method. And we urge you to learn by a ten-day test how much it means to you.

See Its Effects

You know, we think, that your present methods do not save your teeth. Try this one and see what it does.

Pepsodent is based on pepsin, the digestant of albumin. The film is albuminous matter. The object of Pepsodent is to dissolve it, then to constantly combat it.

Pepsin long seemed impossible. It must be activated, and the usual agent is an acid harmful to the teeth. But Pepsodent employs a harmless activating method. It is a new discovery which opens up an entirely new dental era.

Send the coupon for a 10-Day Tube. Use like any tooth paste. Note how clean the teeth feel after using. Mark the absence of the slimy film. See how the teeth whiten as the fixed film disappears.

Those ten days will convince you. The results will be a revelation to you. Let those results decide for you what dentifrice to use. Cut out the coupon now.

Pepsodent PAT. OFF. REG. U.S.

The New-Day Dentifrice

Based on activated pepsin. Now adopted and endorsed by leading dentists everywhere

Sold by Druggists in Large Tubes

(1961)

10-Day Tube Free

THE PEPSODENT CO.
Dept. 515, 1104 S. Wabash Ave., Chicago, Ill.

Mail 10-Day Tube of Pepsodent to

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When William Penn made his noted treaty with the Indians in 1682

HE established a precedent for high and honorable relationship among individuals which could not fail to affect favorably the history of the great state later to bear his name.

The relationship of business founded on the same broad principles of mutual respect and understanding cannot fail to benefit in the same manner all who are concerned. The growth of the Lehigh Portland Cement Company from one small mill to a great national industry owes much to the good faith which it has consistently kept with its thousands of customers from coast to coast.

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LEHIGH PORTLAND CEMENT COMPANY

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WHITE RUBBER TIRES

When tires grow dingy with use people paint them *white* to make them look new. Why? Because so many tires when new are *white* tires, taking their color from the Zinc Oxide that goes into them.

Zinc Oxide also contributes toughness and long life to any automobile tire. Satisfactory tires have not been produced without Zinc Oxide being used.

The New Jersey Zinc Company has been supplying pure Zinc Oxide for this purpose since the advent of the tire industry. This Zinc, made from the unique ore of its Franklin Mines, has always been the standard among manufacturers who have built their reputations on the merit of their tires.

We manufacture Zinc products only, devoting our experience, resources and research department to the one purpose of giving each industry the materials best suited to its needs.

THE NEW JERSEY ZINC COMPANY, *160 Front Street*, New York

ESTABLISHED 1848

CHICAGO: Mineral Point Zinc Company, 1111 Marquette Building

PITTSBURGH: The New Jersey Zinc Company (of Pa.), 1419 Oliver Building

Manufacturers of Zinc Oxide, Spelter, Spiegeleisen, Lithopone, Sulphuric Acid, Rolled Zinc Strips and Plates, Zinc Dust, Salt Cake and Zinc Chloride

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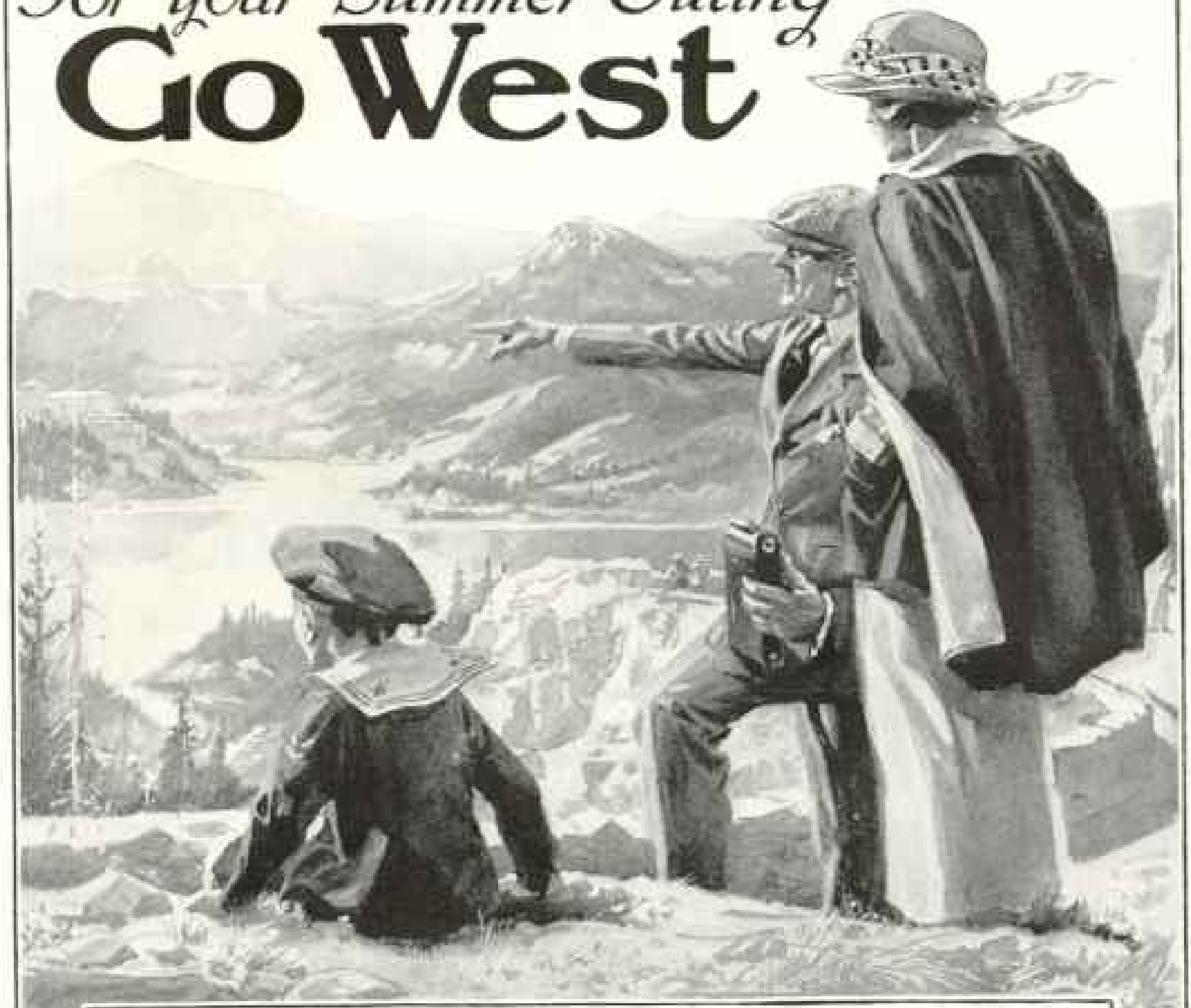
For your Summer Outing—

Go West



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To National Parks and Resorts of the West

Here are lakes and streams for fishing. Here you can climb snow-capped mountains, descend canyon trails, or bathe in the blue Pacific. Here, too, you can "rough it" off the beaten path.

Your outing in the West also may include glaciers and geysers—big trees and petrified forests—Indian pueblos and prehistoric ruins. Fine motor roads everywhere, and resort hotels.

Complete information, including illustrated booklets, may be obtained free. Ask your local ticket agent to help you plan your trip—or apply to the nearest Consolidated Ticket Office—or address the nearest Travel Bureau, stating what National Parks, or what section of the Rockies, the Pacific Coast, or the Northern Lakes you are interested in.

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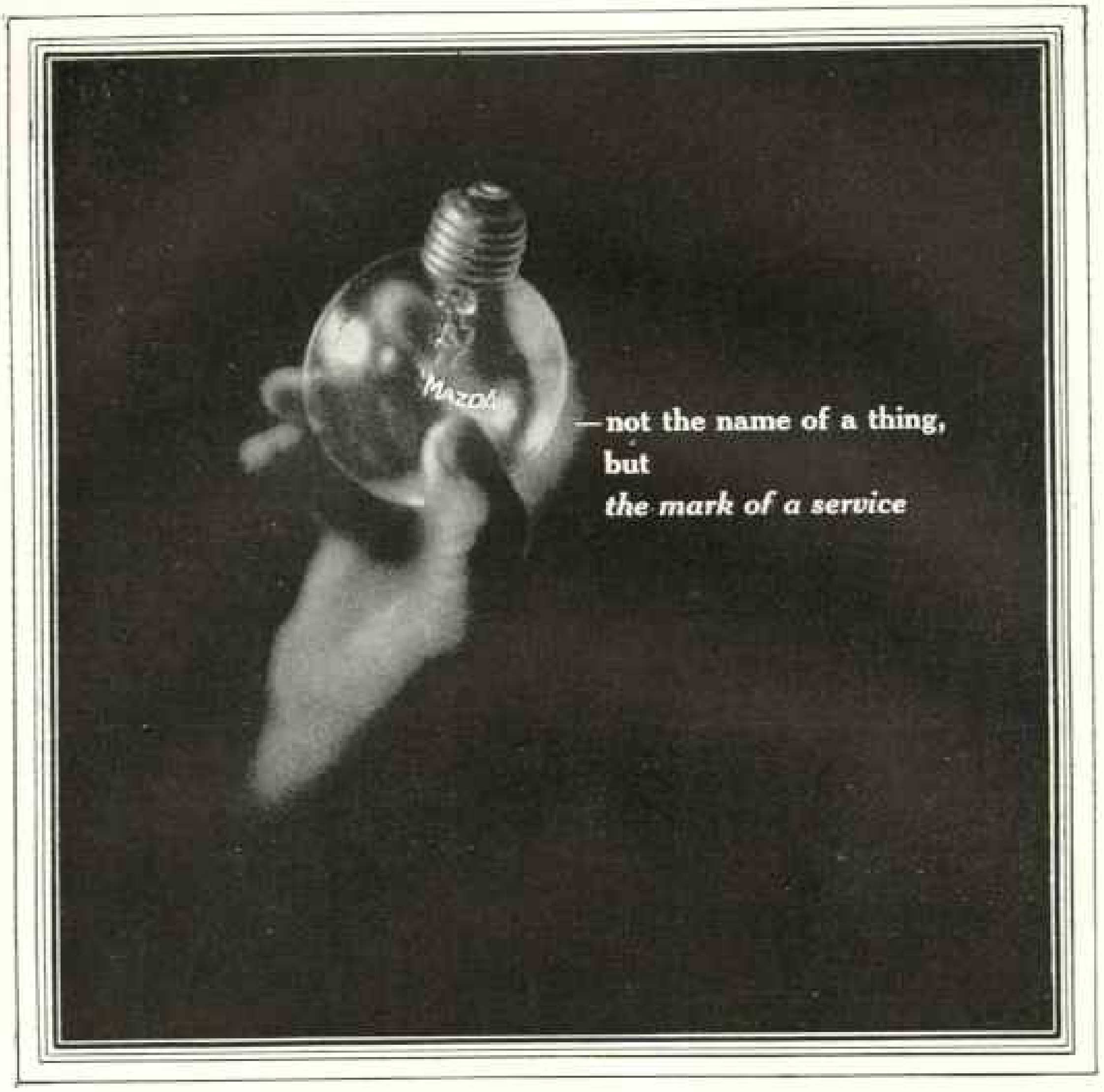

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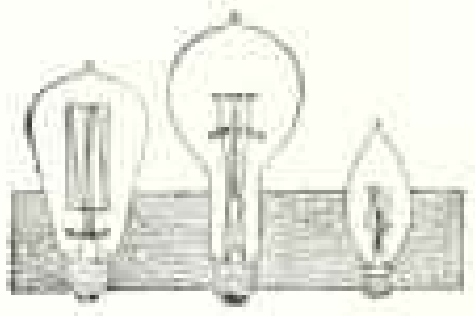

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RESEARCH LABORATORIES OF GENERAL ELECTRIC COMPANY

The Ostrich

This fine bird is one of the gifts of the desert. Countless persons have enjoyed wearing and seeing ostrich feathers.

But to Machla (mák'lä) and her friends the ostrich is much more valuable. When they find an ostrich nest with fresh eggs in it, there is always a feast. Each egg is as large as a cocoanut, the shell being pure white and about as thick as the edge of a china cup.

Ostriches like best to live far out in the desert, yet they need water to drink and are fond of bathing. Their long, strong legs carry them across the sands faster than a horse can trot. The head of the full-grown bird is almost eight feet from the ground.

Four or five hens with one cock stay together. They scrape a pit for a nest in the warm sand, and all five hens lay eggs in it. When there are about a dozen eggs, the cock begins to sit on them at night, while the hens take turns by day. Outside the nest they lay several extra eggs, perhaps as food for the young chicks.

Machla's people find fewer nests every year, for the wild ostriches are getting scarce. Tame ostriches are now raised on farms.

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By GILBERT GROSVENOR, Editor The National Geographic Magazine

EXCELLING in beauty and in compelling interest its three predecessors, the fourth volume of the National Geographic Society's "Scenes" series may now be secured from the Washington headquarters of the Society. The first two series of "Scenes from Every Land" have been entirely exhausted and cannot be had at any price, while only a few copies remain of the third. To insure your copy of the NEW series you should order at once.

"Scenes from Every Land" is like no other book in the world. It occupies a unique place in the literature of the universal language—the language of pictures, through which man becomes acquainted with his fellow-man on the other side of the world. The Editor has selected 200 photographic gems from the Society's great treasure-house of pictures, which is being constantly enriched by contributions from explorers, scientists, world-travelers, artists, and lovers of nature in every quarter of the globe. These pictures tell their own story of strange peoples, odd customs, the history of ancient civilizations written in the massive ruins of their temples, palaces, and amphitheaters, the master achievements of modern engineers—the builders of canals, bridges, and cities—and the inspiring manifestations of the handiwork of Nature, wrought in mist-crowned mountains, shimmering waterfalls, and landscapes of magic beauty.

The Society is able to publish this volume, which includes 24 pages in full colors, at a nominal price, owing to the fact that most of the illustrations have appeared previously in THE NATIONAL GEOGRAPHIC MAGAZINE and the expense of engraving both the color and the black-and-white plates has already been borne. No picture in the Fourth Series, however, is to be found in any of the earlier volumes.

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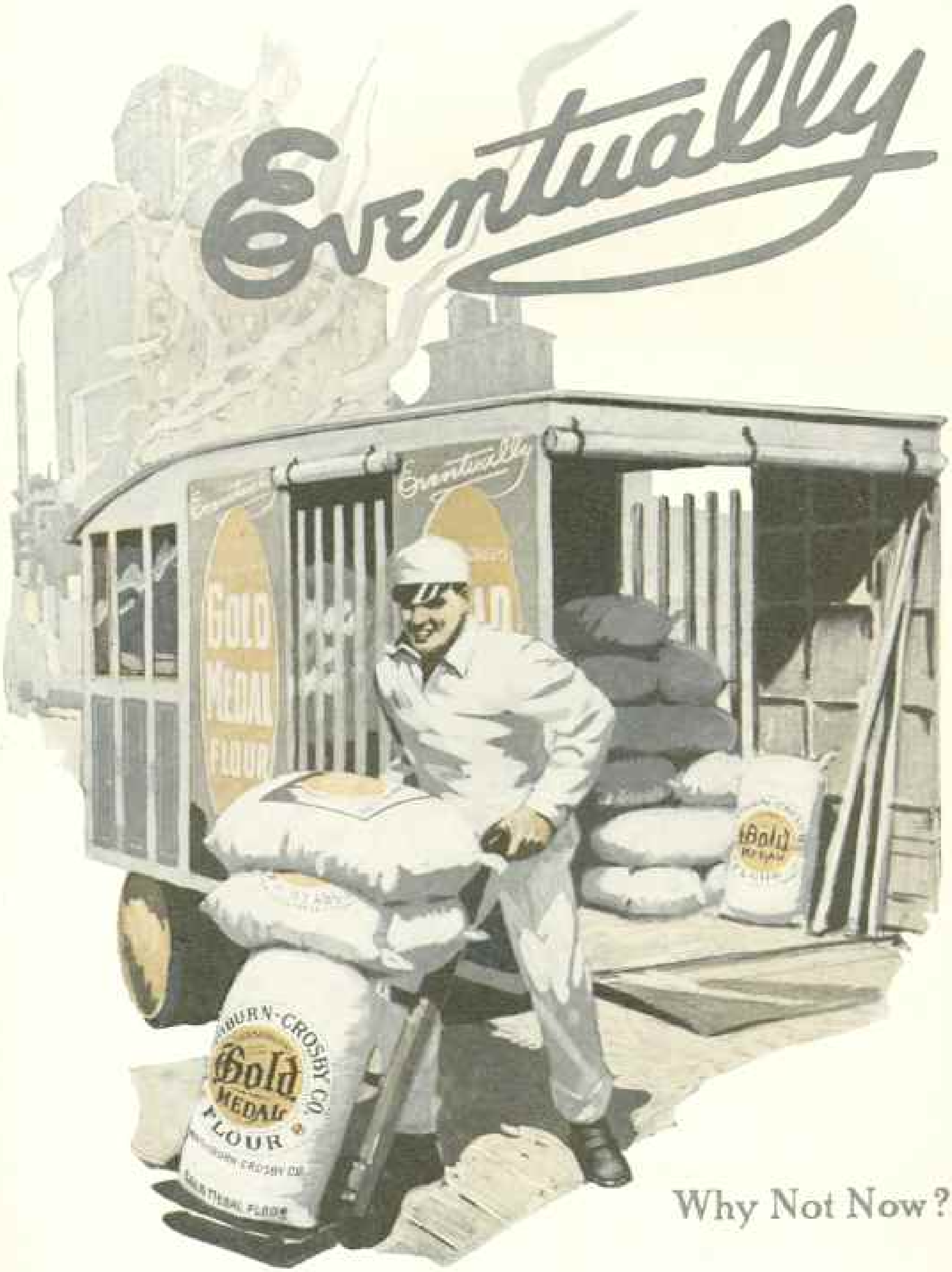

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