THENATIONAL GEOGRAPHIC MAGAZINE

APRIL, 1948

Founders of Virginia

With 7 Illustrations and Map 22 Natural Color Photographs

SIR EVELYN WRENCH B. ANTHONY STEWART

Around the "Great Lakes of the South"

With 9 Illustrations and 2 Maps FREDERICK SIMPICH 18 Natural Color Photographs

J. BAYLOR ROBERTS

In Search of Arabia's Past

With 9 Illustrations and Map PETER BRUCE CORNWALL

Saudi Arabia, Oil Kingdom

20 Natural Color Photographs

MAYNARD OWEN WILLIAMS

The Idyllic Vale of Kashmir

With 6 Illustrations and Map 20 Natural Color Photographs

VOLKMAR WENTZEL

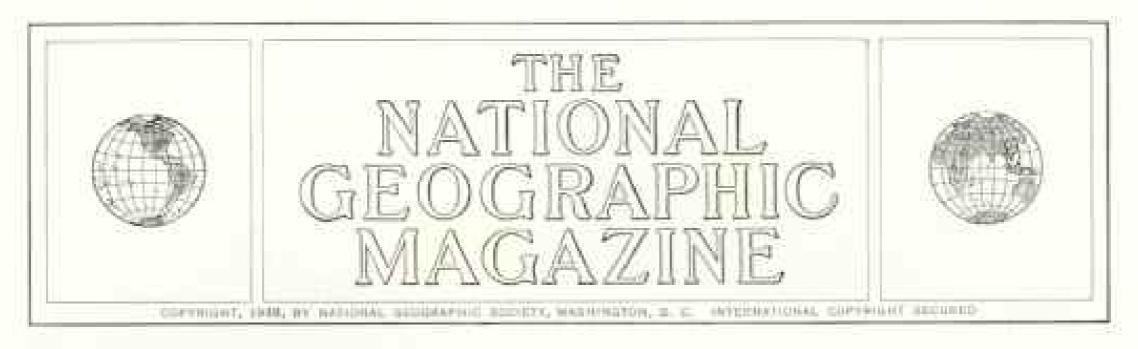
Down Mark Twain's River on a Raft

With 21 Illustrations and Map REX E. HIERONYMUS

Sixty-four Pages of Illustrations in Color

PUBLISHED BY THE NATIONAL GEOGRAPHIC SOCIETY

WASHINGTON, D. C.



Founders of Virginia

BY SIR EVELYN WRENCH

With Illustrations by Staff Photographer B. Anthony Stewart

THE founding of Virginia makes an epic story. It is not possible to read of the adventures and sufferings of the pioneers and settlers without a thrill. Among those ordinary folk were many heroes whose names we shall never know, but they played their part in the expansion of the English race across the Atlantic—one of the great dramas of history.*

Surely in this dramatic story of Virginia and its founders the "unknown settler" deserves to have his place of honor. We have the tomb of the Unknown Soldier at Arlington National Cemetery, and in Westminster Abbey, but no monument to the unknown Virginian; yet we cannot overestimate our debt to him.

When we look around the world today and thank God that there are 260,000,000 free men and women all speaking the English tongue, we do well to remember there were fewer than 5,000,000 at the time of the Spanish Armada.

The thousands of our stock who shared that western exodus in the early decades of the 17th century came chiefly from southern England (map, p. 457). Among them were discharged soldiers; farm laborers displaced by the ruinous policy of land enclosures; peasants dissatisfied with their humble lot; younger sons of worthy families; and decent souls who longed to worship God in their own way.

"The first steps in the founding of Virginia "See, in the Naurosal Geographic Magaziste: "Tidewater Virginia, Where History Lives," May, 1942, and "Potomac, River of Destiny," July, 1945, both by Albert W. Atwood: "Approaching Washington by Tidewater Potomac," by Paul Wilstach, March, 1930; and "Restoration of Colonial Williamsburg," by W. A. R. Goodwin, April, 1957.

were taken in the reign of Queen Elizabeth, but in all fairness some share of the credit is due to her grandfather and father.

Henry VII comes into the picture because in his reign John Cabot and his son Sebastian sailed from Bristol in 1497 and traced the northeast coast of North America.

Had the Cabots not made that voyage, there is every likelihood that the ruling tongue in Virginia today might be Spanish instead of English.

Henry VII was as miserly as his burly son was prodigal. This is why he spent but £300 on colonial enterprises. When Bartholomew Columbus sought to arouse the monarch's interest in his brother's scheme, his mission failed because, he was told, there was "no present profit in the enterprise"!

Cabots Left Few Records

When Cabot had his interview with Henry VII, the monarch bad grown wiser; he had, of course, heard of the Columbus journeyings, and he must have rued his refusal to Bartholomew Columbus. He now gave permission to "our well-beloved John Cabot" to sail uncharted seas, but with an eye on the main chance he demanded one-fifth of the profits.

If the Cabots have not been tendered their rightful place in the annals of discovery, this is doubtless due to the fact that they left no proper records, as did Columbus. Much of our scanty knowledge of the subject in its early stages comes through letters from Italians resident in London.

Lorenzo Pasqualigo, writing in August of 1497, after the first voyage, tells us how Henry VII had promised Cabot ten ships for the next spring.



Tower of London "Beefeaters" Tread the Walk Where the Imprisoned Raleigh Exercised

As a captive in Bloody Tower (left), Sir Walter Raleigh wrote his History of the World. Since the wall on the right did not then exist, sailors on the Thames could see him pacing back and forth (page 437). As this is a holiday, the yeomen warders wear their scarlet state dress, dating from the time of Henry VII or Edward VI. In the distance is a part of Tower Bridge, which spans the river.

The letter adds that the King had given him "money with which to amuse himself till then, and he is now in Bristol with his sons and wife . . . vast honour is paid him; he dresses in silk and these English run after him like mad, so that he can enlist as many of them as he pleases."

Nevertheless, the reception accorded to Cabot on his return was very different from the wonderful welcome given to Columbus by Ferdinand and Isabella at Barcelona. There is a terse entry in the Privy Purse account recording the gift of £10 "to bym that founde the new isle," and the fact that he also received a pension of £20 a year, which he did not live long to draw.

When Spain's claim to world domination had to be challenged, Elizabeth was ready, in no small degree because of her father's interest in naval matters and coast defense. Henry VIII and his minister had built the dockyards of Woolwich and enlarged those of Deptford on the Thames (both now in metropolitan London) and built forts on the south coast; he had founded Trinity House in London as a school for pilots, and popularized everything to do with the sea.

There is an entertaining account from the

pen of the French envoy of the launching of the Princess Mary, He was an eyewitness, and we learn that Henry VIII "acted as pilot and wore a sailor's coat and trousers made of cloth of gold, and a gold chain with the inscription 'Dieu et mon droit,' to which was suspended a whistle which he blew nearly as loud as a trumpet."

A number of circumstances had been conspiring to identify the Virgin Queen with North American colonization. During her reign we can watch the beginnings of one of the most exciting periods in the history of the English-speaking peoples; all England was looking westward. The harbors of the south had caught the prevailing "Spanish fever"; younger sons out for adventure, sea dogs, explorers, pirates, and traders yearned to join in the crusade against Spain.

The Elizabethan age ought to have witnessed the settlement of Virginia. It might have done so had Raleigh's expeditions settled on the Chesapeake and not Albemarle Sound.* By their failure the colonization of North America by England was delayed till the reign of King James I. Nevertheless, "to Raleigh belongs the credit of having, first of Englishmen, pointed out the way to the formation of a greater England beyond the sea."

Drake's Potatoes and Raleigh's Tobacco

In the popular mind Drake and Raleigh are usually regarded as the introducers of potatoes and tobacco into England. I remember as a boy suddenly coming upon a statue of Drake, "the discoverer of the potato," in the little town of Offenburg in southern Germany. These "rare plants" were certainly growing in Lord Burghley's garden in the Strand, London, in 1596.

Raleigh was apparently "the first Englishman of rank to smoke." I wonder how many of the smokers of Virginia tobacco today realize with what disfavor the seductive weed was regarded in the heroic age of Virginian exploration.

Both James I and Sir Edwin Sandys, the champion of Virginian rights, shared an utter dislike for it, although the latter recognized its importance as a valuable export from the young colony.

* See, in the National Geographic Magazine: "Bit of Elizabethan England in America." by Blanch Nettleton Epler, December, 1955; "Motor-Coaching Through North Carolina," by Melville Chater, May, 1926; "Tarheelia on Parade," by Leonard C. Roy, August, 1941; and "Exploring America's Great Sand Barrier Reef." by Eugene R. Guild, September, 1947.

* See "Pathfinder of the East," by J. R. Hilde-

byand, November, 1927.

Sandys referred to tobacco as a "deceavable weed" which "served neither necessity nor for ornament to the life of man, but was founded only upon an humour which might soone vanish into smoake and come to nothing."

In a debate during the reign of James I a Member of Parliament stated that "tobacco hindereth all the kingdom in health and otherwise"; another worthy Member wanted "to pull it out by the roots"; while Sir J. Horsey thought "not to speak of this vile weed," and added when he was first a Parliament man "this vile weed was not known."

Hakluyt's Part in the Birth of Virginia

Richard Hakluyt is only gradually coming into his own as one of the prime movers in the settlement of Virginia. Although he never crossed the Atlantic, his was the mind behind most of the colonization projects, and his was the pen that preserved for posterity the records of that wonderful age.

Hakluyt was educated at Westminster School, within the shadow of the Abbey, a seat of learning patronized by the sons of wealthy Virginians and Carolinians in the 18th century (Plate IX). While at school he saw a map depicting recent discoveries, and the Psalmist's account of "the wonders in the deep" became a living reality to him. And he fell under the spell of Humphrey Gilbert, who was to "settle" Newfoundland.

In the hundred years prior to his birth most of the great voyages of discovery had taken place. Bartholomew Diaz had rounded the Cape of Good Hope, Vasco da Gama had reached India,† Columbus had explored the Caribbean, and the Cabots had sailed along the northeast coast of North America.

His object was to preserve for future generations the records of the part Englishmen were playing in exploration, and above all to convince his countrymen that their true interest lay in oceanic trade and colonization.

While at Oxford—he was at Christ Church -Hakluyt tells us he read "whatsoever printed or written discoveries and voyages I found extant " While serving as chaplain to the English Ambassador in Paris, he continued his studies of Portuguese, Spanish, and French exploration, and made "diligent enquiry of such things as might yield any light unto our western discovery of America."

An Early Ship News Reporter

At the age of 30 he published Divers Voyages Touching the Discoverie of America. He was appointed to a prebendal stall at Bristol Cathedral, and in no place could be have been more at home, because the West Country was



Elizabeth us She Looked at the Age of 53

This London monument, standing over the vestry door of St. Dunstan-in-the-West, is one of the two statues of the Queen which are believed to have been made during her lifetime. St. Dunstan, mentioned as early as 1237, escaped the Great Fire of 1666 by a few yards.

humming with the exploits of the seamen just back from the Spanish Main.

Hakluyt could almost sniff the tang of the Bristol Channel from his study. When his religious duties permitted, he had but to stroll to the near-by quay to check his information at first hand. He was a careful historian; once he rode to the Norfolk coast to obtain information from the survivor of an expedition.

In 1587 he wrote to Raleigh, encouraging him to persevere in his Virginia enterprise: "I can see great comfort of the success of your action, hoping that the Lord, Whose power is wont to be perfected in such weakness, will bless the foundations of this your building. Only be you of valiant courage and faint not, as the Lord said unto Joshua exhorting him to proceed on forward in the conquest of the Land of Promise."

While Hakluyt was busy with what Froude calls "the great prose epic of the modern English nation," Michael Drayton, the poet, thus referred to the plantation of Virginia by the Queen:

Who sent her navies hence Unto the either Inde and to that shore so green. Virginia, which we call of her a Virgin Queen.

Makhuyt, now a prebendary of Westminster, was among those who petitioned King James for the Virginia Charter in 1606; as a member of the Virginia Company he followed closely the stirring events of the next decade and witnessed the realization of some of his hopes. He is buried in the Poets' Corner of Westminster Abbey, and there is a tablet to his memory in Bristol Cathedral.

Raleigh must be reckoned as an Elizabethan, for his endeavors to settle "Virginia" took place before King James came to the throne. There are associations with Raleigh in many places in southern England, and above all in Devon. He was essentially a man of Devon and spoke with a Devonshire accent all his days."

He was born at Hayes Barton farmhouse, thatched and three-gabled, near East Budleigh, ten miles from Exeter in the vale of the River Otter (Plate II); there he must often have talked with sailors back from the sea; Millais' familiar picture, "The Boyhood of Raleigh," was painted in Budleigh Salterton rectory,

* See "Down Devon Labes," by Herbert Corry, National Geographic Magazine, May, 1929.



England, Mother of Virginia, Is Dotted with Shrines Venerated by Americans

Old World garden. In the kitchen we found a crescent-shaped settee, dating from Raleigh's time, facing the open hearth.

Upstairs is the four-poster in which it is believed be was born, and "Raleigh's little smoking room." In various places the visitor is shown the spot where Raleigh is supposed to have had his first smoke!

In All Saints' Church, East Budleigh, "the mother church of the district," near Hayes Barton, we can see the Raleigh family pews. and on one of them the family arms are carved.

In our school days we read of Raleigh's gallantry to the Queen. It was not in Devon, however, that he put down his cloak for Elizabeth to walk on, but more likely near Canonbury Tower in north London. One of the tragedies of his life was that, while he schemed and poured out his wealth to found an empire overseas, he was never to visit Virginia.

"For several years Raleigh belonged to the Court, the recipient of the Queen's bounties to an extent which gave much occasion for scandal," but trouble was near. He committed

In front of Hayes Barton farmhouse is an the serious crime, from the Queen's point of view, of falling in love with one of her maids of honor, Elizabeth Throgmorton.

Victim of a Jealous Queen

The Queen never did things by halves. When she heard of the romance, she had Raleigh and the young lady locked up in the Tower of London. It is curious that the marriage should have begun and ended there.

Subsequently they were released and settled down at Sherborne Castle, now in ruins.

Near by is the house which Raleigh started to build but never lived in. During World War II it served as an American hospital, and in the autumn of 1946 I observed American personnel in a jeep careering along the Dorset lanes which Raleigh knew.

During Queen Elizabeth's later years Raleigh was restored to favor. We read that he was in daily attendance at Court in 1597. "In the evening he rid abroad with the Queen and had private conference with her."

With her death, however, hard times lay ahead; King James confined him for a dozen



In St. Ethelburga's, Henry Hudson Took Communion Before His First Voyage of Discovery Dating from 1390, the church stands on Bishopsgate in the London financial district. It has defied time, wreckers, Great Fire, and blitz. Three stained-glass windows commemorate Hudson's voyages.

years in the Tower of London, whither his wife repaired to join him and where one of his sons was born.

Raleigh's last two years were dogged with misfortune. He obtained a release by subterfuge in 1616 and set out on a last expedition to Guiana, again in search of El Dorado.

After a series of disasters he returned to Plymouth, in June, 1618, and here his wife rejoined him with terror in her heart. How she must have wished that he had remained at the Tower of London, completing his History of the World, instead of embarking on a barren expedition with almost inevitable punishment ahead (page 434).

The mystery of his burial place will probably never be solved. He was executed on October 29, 1618, in Palace Yard, Westminster, and his body undoubtedly lay for some hours in St. Margaret's Church. This claims to be his burial place (Plate V), and there, incidentally, is a window to his memory erected in 1882 by American admirers.

There are, however, other factors to be considered. Beddington Church, in Surrey, situated in an oasis of the Old World that has escaped the enguling tide of modern suburbia, also claims to be his resting place. The church that existed in Raleigh's time is still there, and the home of the Carew family. Raleigh's mother-in-law was a Carew.

The red-brick wall still stands that may have sheltered the first oranges grown in England. Local legend has it that they were planted from seed Raleigh obtained from Florida; the trees survived for 140 years but succumbed to the hard frost of 1739. I am told the original iron gates of the house are now in Virginia.

A Letter from Elizabeth Raleigh

After the decapitation of her husband Elizabeth Raleigh wrote to her brother: "I desire, good Brother, that you will be pleased to let me hury the worthy body of my noble husband, Sir Walter Raleigh, in your Church at Beddington, where I desire to be buried. The lords have given me his dead body though they denied me his life. This night he shall be brought to you with two or three of my men. God hold me in my wits."

It is not surprising, in view of this letter, that Beddington claims to be regarded as the resting place of Raleigh. The sorrowing widow would certainly have wanted to bury the body in some place associated with happy days and as far as possible from the scene of execution. If the body is here, it must be in the Carew vault, which was filled up with concrete half a century ago.

Anyhow, no more poignant picture of the days of King James comes down to us than that of poor Elizabeth, bearing with her all ber days her husband's embalmed head in a red-leather bag.

West Horsley Place, also in Surrey, was inherited by Raleigh's younger son, Carew. The son buried his father's head in the local church, having received it from his mother on her death.

Sandys Helped Pilgrim Fathers, Too

I sometimes wonder why the story of the founding of Virginia has not received as much attention as the sailing of the Pilgrim Fathers. There would have been no Mayflower had there been no Virginian settlement; Sir Edwin Sandys, leading champion of freedom in the Virginia Company, was also connected with the voyage of the Pilgrim Fathers (Plate V).

When the exiles in Holland decided that they wanted "to live as a distincte body by them selves under the generall government of Virginia," It was to Sandys that Robert Cushman and John Carver came in 1617.

Sandys encouraged them in their project, and thanks to his help the Virginia Company was well disposed to them. In November that year Sandys wrote to the Reverend John Robinson, and to his old friend, Elder William Brewster, whom he had known since Scrooby days, encouraging the exiles in their undertaking.

American historians have done much in recent years to help us arrive at a fairer appreciation of the work of the men who sponsored the Virginian settlement in its early days, and we certainly owe them a debt of gratitude. I can never read the records of the Virginia Company without being deeply stirred. There is an entire lack of formality about its proceedings. It is almost as though we were in the friendly atmosphere of a family concern.

Of Christopher Newport, who piloted the expedition that founded Jamestown, little is known beyond the fact that he was a skilled navigator and made the journey to the colony five times. There is a reference to one stormy scene at the Company's deliberations, when, in a moment of tension, Sir Thomas Dale, the early Governor who brought back John Rolfe and Pocahontas with him, pulled the beard of Christopher and threatened to hang him! Anyhow, Dale certainly never carried out his threat, because Newport died in the East Indies.

To our modern way of thinking, it seems incredible that the Company never, apparently, had an office building of its own. The members usually met in the London house of one of the leading adventurers; in Philpott Lane, where Sir Thomas Smith resided; in the house of Sandys in Aldersgate, and even, after the death of Nicholas Ferrar, Senior, in the parlor of his widow in Sythe Lane; or in the house of Henry Wriothesley (third Earl of Southampton) at Southampton House, Holborn.

The members of the Virginia Company concerned themselves with every manner of problem connected with colonization, and almost of necessity mistakes were made.

The doctrine was widely held that a colony was a place where the mother country's unwanted population could be dumped: too little attention was paid to the selection of the human material at the outset. Many misfits were sent across the ocean at first,

but wiser counsels soon prevailed.

Capt, John Smith and others urged the need of sending men who could work with their hands. The Board soon took up this matter energetically, and on my desk lies a list of the settlers sent across the ocean in 1610. There were farm laborers, swineherds, millwrights, gunmakers, brewers, bakers, distillers of aqua vitae, hatmakers, apothecaries, ship carpenters, tinkers, tailors, bricklayers, hiscuitmakers, bellowsmakers, fishermen, husbandmen, gardeners, and so on—all sound workers, and just the material urgently needed by a new country.

Ten years later, while Sandys was governor of the Company, it sent many ironworkers from Warwickshire, Staffordshire, and Sussex to help in the creation of the iron industry. Sandys held that there was "no better iron in the world" than the Virginia product.

"A New and Better England"

No body of men, not even the colonists themselves—called the "venturers," as distinct from the "adventurers," who remained at home—had the welfare of Virginia more at heart than the Company's liberal group. For the most part, they were not thinking of colonization in terms of immediate profit; they were inspired by the vision of a common-wealth across the seas where a new and better England would be created, and where the individual rights of the settler would be safe-guarded.

Their purpose was nearly frustrated by James I, but the goddess of destiny stepped in. No sooner had the Company been dissolved than James I died; and luckily his successor, Charles I, was well disposed to several members of the liberal group.

The political rights which Sandys had won

for the colony were allowed to stand; and an American historian has written that Jefferson's dream of human liberty was based on the ideals so dear to Edwin Sandys. Sandys and his friends must have discussed the fundamentals of democracy in the parlor of Mrs. Nicholas Ferrar, and in the homes of Sandys and Southampton with Francis Bacon, and, in all probability, with Shakespeare.

The meetings of the Company were by no means confined to matters of high policy, for there was the ordinary humdrum work of a colony more than 3,000 miles away to be dealt with. The settlers needed livestock; and shipments of cattle, horses, and swine were dispatched. We read that £10 per head was the fee paid to the shipper for each cow

landed in good condition.

The acute shortage of women in Virginia was one of the main problems. In a note accompanying "one widdow and eleven maids for the people of Virginia," detailed instructions were sent to John Pountis, one of the Company's local officials, in these terms: "Most especially we recommend to you, Mr. Pountis, that at their first landinge they may be housed, lodged, and provided for of diet till they be marryed, for such was the haste of sending them away, as that straightened with time, we had no meanes to putt provisions aboard."

On one occasion the good vessel Tiger conveyed "fifty maydes" to Virginia, and the reception official (I wonder if he was our friend, Mr. Pountis?) was shouldered with the responsibility of "providing for them at their first landing and disposing of them in marriage (which is our chiefe intent); we leave to your care and wisdom."

Poor Mr. Pountis must have had his hands full; he combined the functions of a modern representative of the Ministry of Food, a matrimonial agent, and a billeting officer in one! Fortunately, there was variety in his job; if intending wives began to pall, there was other living cargo to be dealt with.

The vessel Discoverie was evidently a floating farm and menagerie, for it bore from England "divers sorts of seeds and fruit-trees as well as pidgeons, connies, peacocks, mastiffs, and beehives." I wonder who were the recipients of the peacocks!

Difficult times for the Company were now ahead. King James, egged on by the Spanish Ambassador, Gondomar, was jealous of its activities. The result of the machinations of the Crown party was the canceling of the Company's charter in 1624.

Fortunately, Sandys and his friends anticipated this move of their opponents; and when



Like Sir Walter Raleigh of Virginia Fame, This Bobby Speaks with a Devon Accent Clifford Jones, clasping daughter Dianne, represents the Devon Constabulary in Chagford. He carries no firearms except in emergencies. As a policeman during the blitz, he won the Defence Medal (ribbon).



ipe of Virginia Tobacco in This Thatched House, His Birthplace near East Budleigh Devon Men Say Raleigh Smoked His First P



Elizabeth, for Whom Virginia Is Named, Is Shown in Wax

Owing to events shaped by Queen Elizabeth, Americans speak English rather than Spanish. Rejecting the King of Spain as a suitor, she harried his commerce and defeated his Armada. During Elizabethan times. England planned the colonization of the New World.

In Madame Tussaud's waxworks exhibition, London,
Elizabeth gets a hairdressing
from an attendant. Her contemporaries are portrayed not
strictly according to their relastrictly according to their relative ages. The group includes
three children of Henry VIII
—Elizabeth, Mary 1, and Edward VI.

On the left is Queen Mary (Bloody Mary), Elizabeth's half sister, Beside her stands her victim, Lady Jane Grey, who, briefly proclaimed Queen, was put to death at Mary's command.

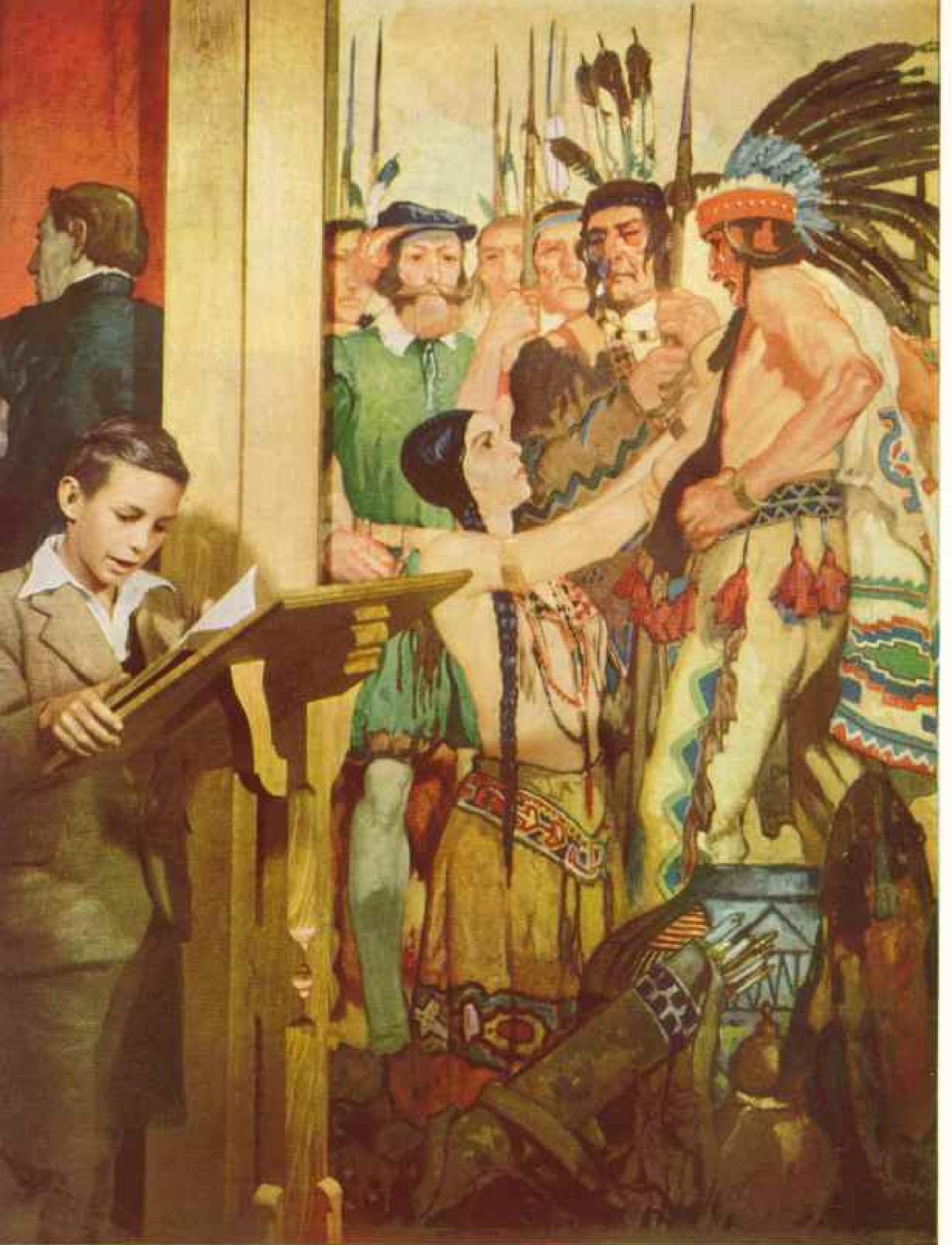
Edward, Elizabeth's half brother, had a brief reign.

Catherine Parr (right), as Henry's sixth Queen, was noted for her kindness to her three stepchildren.

From Elizabeth's unofficial title, the Virgin Queen, Virginia derives its name.

ID National Geographic Becket

Disabilities by B. Asthany Street



@ Maximust Georgiustile Seebers

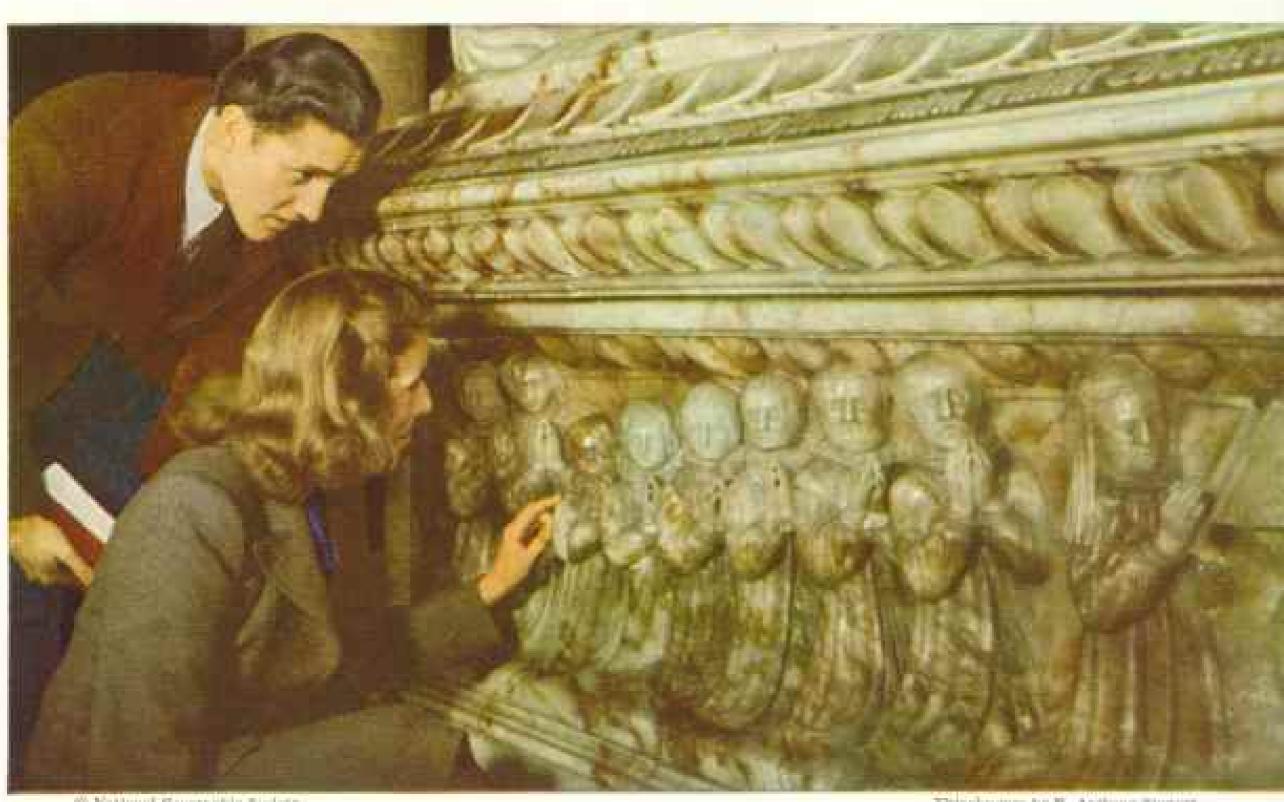
Ektachronie by B. Author: Bewert

Capt. John Smith Is Commemorated by the Lincolnshire School from Which He Ran Away

A mural in the Edward VI Grammar School in Louth represents the Jamestown Colony leader as the prisoner of the Indian chief Powhatan (right). Princess Pocahontas, on her knees, begs for Smith's life. Both Smith and Pocahontas are buried in England, she as the Christianized Lady Rebecca, following a visit to the Court of King James. Many years after Smith, the poet Tennyson attended this same school.



Two English Churches Claim Raleigh's Beheaded Body. His Burial Remains a Mystery St. Margaret's, Westminster, displays this marker. A Surrey church disputes it. West Horsley claims the head.

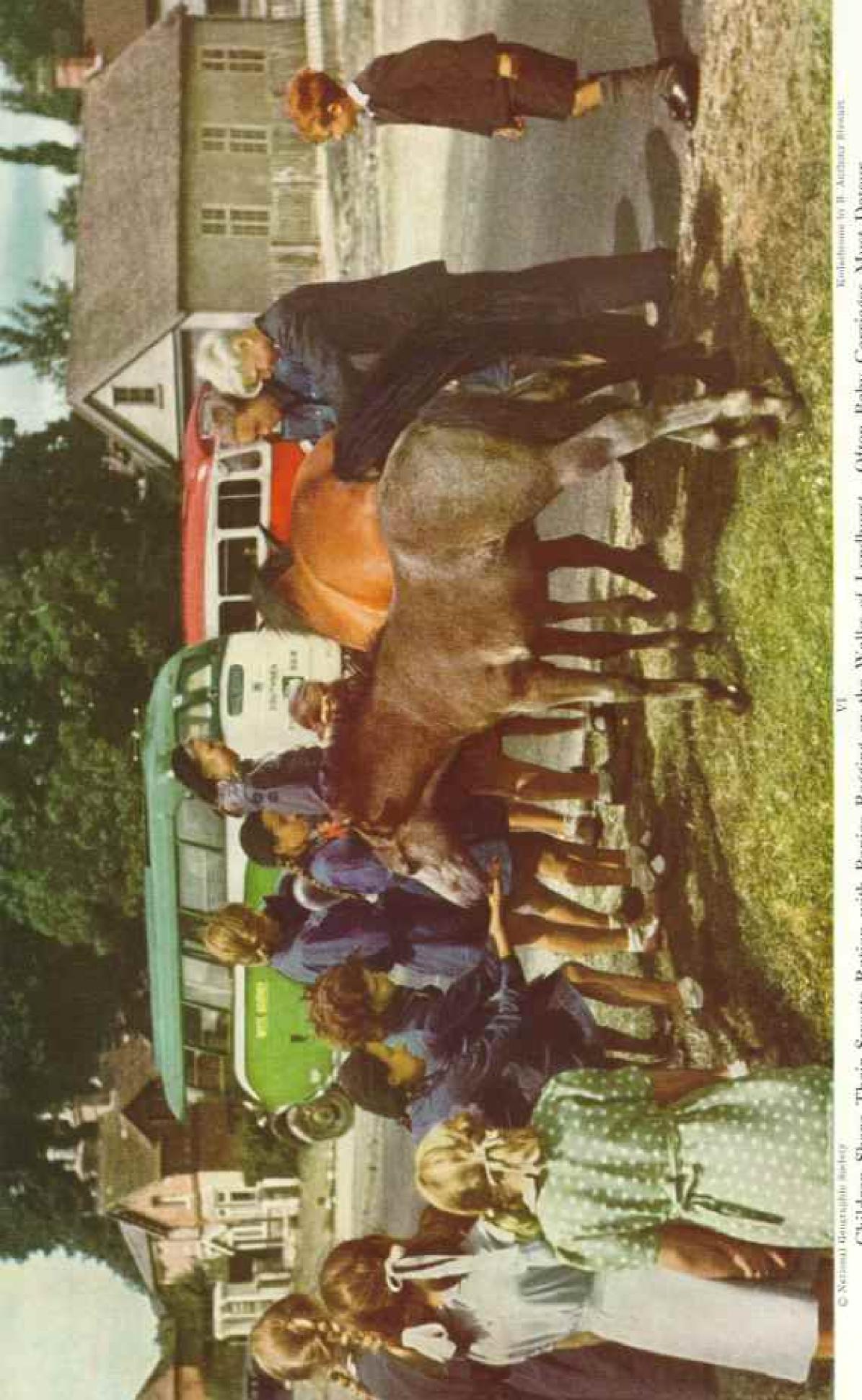


@ Nathout Gographic Sicisty

Extrachronou by H. Anthony Shreurt.

Sir Edwin Sandys, a Virginia Founder, Is Pictured on a Tomb (Third from Right)

As a theological writer, Sandys was remarkably tolerant for his time. A Member of Parliament, be championed democracy. Manager of the Virginia Company, he won political rights for the colonists. Jefferson's "dream of human liberty" has been ascribed to Sandys' ideals. In Southwell Cathedral be is shown, with other members of the family, on the tomb of his father, the Archbishop of York.



Children Share Their Sweets Ration with Ponics Begging on the Walks of Lyndhurst. Often Baby Carringes Must Detour Once a year the wild peoples are nounded up in the surrounding New Forest. Oak from this preserve built some ships that founded Virginia.



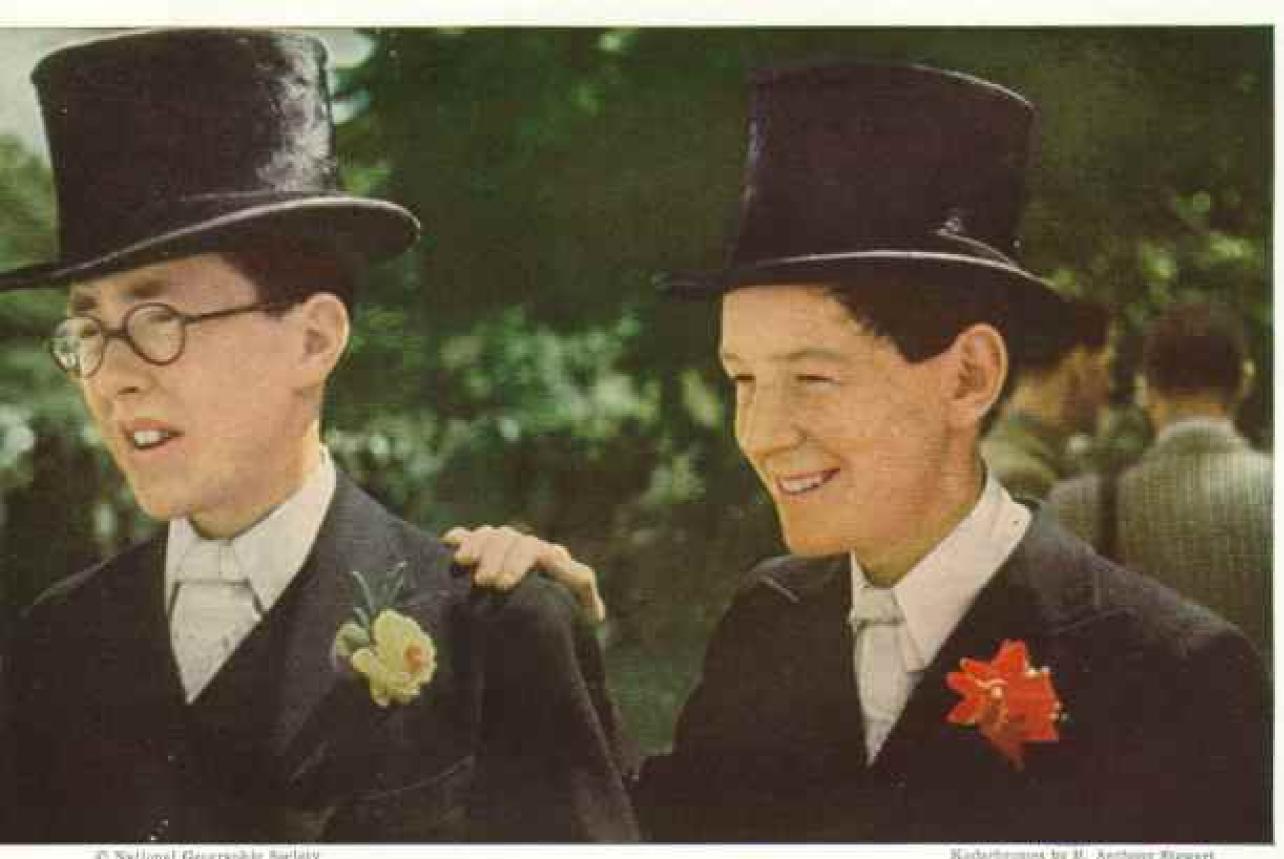
Britain's Children Were Never Healthier; Grownups Make the Saerifices. This hedgerow near Chagford, grown as a living fence, is typical of the Devonshire landscape.



Love of Horses Shines in This Boy's Face.
He attends a pony auction in the New Forest.



In Garlanded Straw Hats, Eton's Coxswains Dress for Action on the Thames Each summer they parade before parents, standing up as crews row past. Afar: Windsor Castle Round Tower.

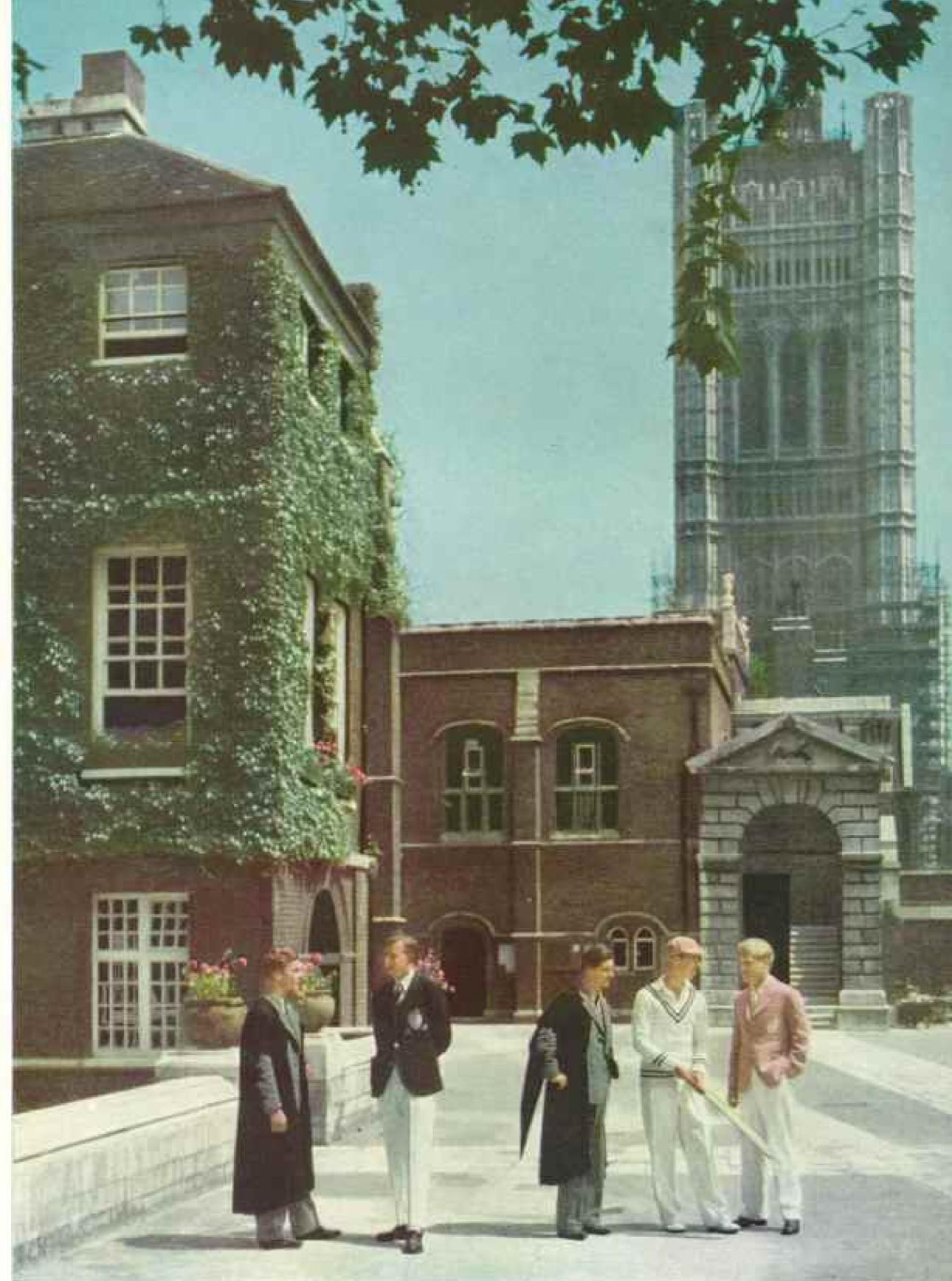


© National Geographic Society

Nodaritecous by H. Anthony Stewart.

Buttonhole Roses Fly for June 4, Birthday of George III, Eton's Friend

These boys wear classroom attire, which they often succeed in thoroughly rumpling. For play, they put on sports togs. Here, on visitors' day, they await their parents' customary treat.



(5) National Gregorphie Berietz

Ditachesse by B. Aerbour Wewart.

Where Colonial Virginians Studied: Ivy-clad Westminster School, in the Heart of London
On completion of classes these students, one bound for a distant cricket field, meet almost in the shadow of Parliament's Victoria Tower. Richard Hakluyt, historian of colonization times, attended Westminster.



from the United States.

a mile from town.

place,

Lived the Genius of

the Virginia Epic

courted his bride-to-be.

When

© Statistial Geographic Sedety Redardween by M. Anthony Memory

came close;

speare."

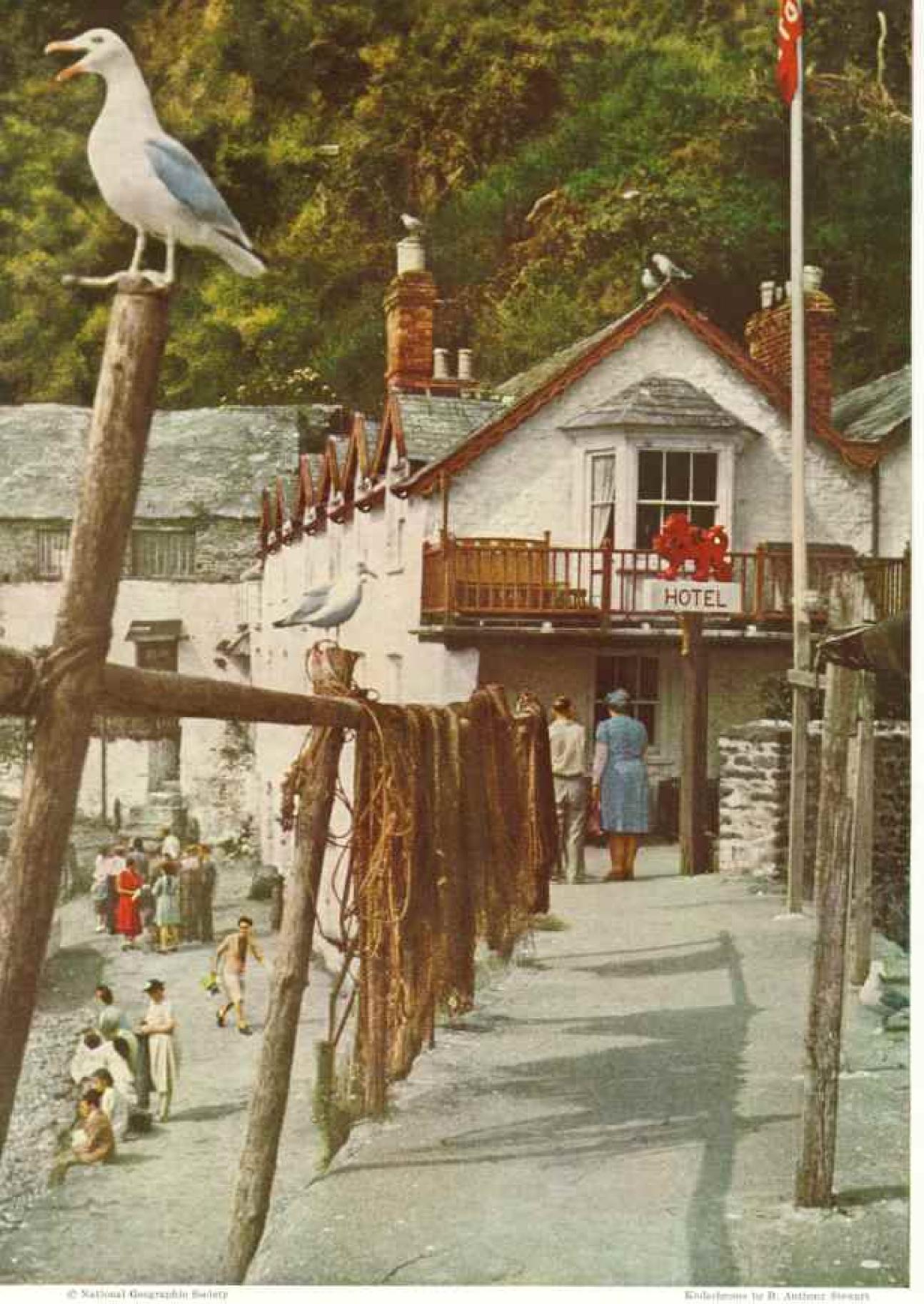
HER





Tavern Signs Don't Reflect Dearth of Paint Scarcity of beer is the problem at Minstead.

Derectablic knew Rabigh and some of the founders of Massachusetts. Flowers hang in wire bashets. the Butcher's in Sherborne Ment Is as Searce as Flowers Are Plentiful at



Tourist-fed Gulls Grow Fat and Saucy in Clovelly, Nestling Against Atlantic Cliffs in Devon



Kodarbrone by B. Arthour Survery.

The Family Car Lacks Petrol, but Who Cares if There's a Bicycle Built for Three?

New bikes, like new automobiles, go into export channels, so old ones are treasured. Holiday cyclists so crowd country roads that motoring becomes a hazard. One more addition to this London family will haunch a handlebar hasket. America's baby sitter has not become an English institution.



C National Geographic Society

Exceptome by H. Anthony Street.

Soldiers of the Fields, Struggling for Food, Are Heroines of England's Land Army



Their Pursuers, Almost Shoulder to Shoulder, Line the Witham's Banks What Chance Have Fish, So Plainly Outnumbered?

Club competer against club, village against village, in matches engaging thousands.
Close by is old Tattershall Castle, which has a link with America. These days, when so many pleasures are denied, fishing is increasingly popular. "
These days, when their dinners. Week-end buses carry these sportsmen."



To a Returning Englishman, No Sight on Earth Can Equal the White Cliffs of Dover: St. Margaret's Bay, Kent



A Yank at Oxford Tries to Reconcile Study with the Distractions of Fatherhood Stanley Sprague, a war veteran, has tough going as his daughters play with his mertarboard cap. A Rhodes scholar, he enjoys the generosity of Cecil Rhodes, who left a fortune to foster international good will.



io National Generative hieriety

Ektnelnomes by H. Anthony Stewart:

Dour Austerity Need Not Invade the Farm. This Family Can Grow Much of What It Needs Sister serves brothers near Stratford on Avon. Cakes may be from home-ground wheat; tea is rationed.

the royal commissioners took possession of the official records, the liberal party had already taken steps to preserve copies of the Minutes

during these vital years.

The preservation of these records has thrown much light on the early proceedings of the Company, and, above all, on the struggle made by Edwin Sandys to establish a settlement of a "free popular state" in the New World, where the English settlers would have "no government putt upon them but by their own consente."

The Saving of the Records

The story of the saving of the records begins with Nicholas Ferrar. At a cost of £50 to himself, he had an exact copy of the Minutes made. Each folio was compared with the original and initialed by the secretary of the Company, and Ferrar then took the volumes to Lord Southampton.

So delighted was the latter that he threw his arms around Ferrar and said: "Let them be kept at my house at Titchfield. They are evidences of my honour, and I value them

more than the evidences of land."

William Byrd, of Virginia, bought the documents from the executors of Southampton's son half a century later; they found their way to Jefferson's library, and after his death to the Library of Congress, where they now rest and are referred to by Alexander C. Brown, American writer, as "the most precious volumes preserved in the Republic."

Southampton flits across the stage in the reigns of both Elizabeth and James. Literature was his chief interest, and he is best known as the patron of Shakespeare, who dedicated to him his early poems. He shared with Raleigh the experience of becoming enamored of one of the Queen's waiting women, also an

Elizabeth.

When the Queen heard of her young attendant's love affair, she bundled her and Southampton into London's famous Fleet Prison for a time, and he was never restored to the Queen's favor.

When James came to the throne, one of his first acts was to release Southampton from the Tower, where he had been imprisoned, this

time for treason,

By reason of his influential connections Southampton was to prove a useful friend to Virginia, and henceforth he devoted his energies and wealth to colonial enterprises. He equipped an expedition to Virginia and helped to expedite a voyage of Henry Hudson in his search for the Northwest Passage.

The last years of his life were intimately connected with Virginia, for he succeeded

Edwin Sandys as governor (treasurer) of the Company, a position which he occupied for four years, till the canceling of the charter. Before the end of the year both he and his son died fighting in Holland.

They are buried in Titchfield Church, which has safely survived the war, even though it is in the neighborhood of Southampton."

Another liberal member of the Virginia Company, Sir John Danvers, must have been an attractive young man. A contemporary described him as possessing "in a fair body an harmonicall mind," and a fellow traveler relates that when in Europe "the people would come out into the street to admire him."

His chief hobbies, apart from his interest in Virginia, appear to have been laying out gardens and architecture. He had a curious link with George Herbert, the poet, wellwisher of Virginia, and with John Donne, the Dean of St. Paul's, who preached a wellknown sermon about the Virginian settlement.

Danvers, when little more than 20 years old, married George Herbert's mother, who was twice his age. Magdalen Danvers must have been a woman of great charm, for Donne wrote of her:

No spring, nor summer beauty bath such grace, As I have seen in one automnal face.

Lady Danvers was certainly a remarkable woman to have made a success of such a marriage. Donne is our authority, and he tells us that he saw much of their married life and that they lived happily till Magdalen's death; the partnership had lasted 19 years.

A "Pure Maid, Chaste Wife, True Widow"

Edwin Sandys' father, the Archbishop of York, was born at Hawkshead, close to Windermere.

In Hawkshead School the Archbishop's family Bible is preserved, with the entry of the birth of his second and famous son, on December 9, "At six of the clock in the morning of the year of our Lord God 1561" (at Hartlebury Castle, Worcestershire, which has been in tenure of the See of Worcester for more than 1,000 years).

The Archbishop is buried at Southwell Minster, and his wife is buried at Woodham Ferrers, Essex. "She lived a pure maid twentyfour yeares, a chaste and loving wife twentynine yeares, a true widow twenty-two yeares to her last."

"See, in the National Geographic Magazine: "Henry Hudson, Magnificent Failure," by Frederick G. Vosburgh, April, 1939; "Southampton—Gateway to London," by Stanley Toogood, January, 1940, and "A Modern Pilgrim's Map of the British Isles," issued as a supplement, June, 1937. Edwin Sandys was a student at Corpus Christi, Oxford, where his tutor was Richard Hooker, but a few years his senior. Hooker was undoubtedly largely responsible for inculcating in him the love of freedom. In 1599 Sandys wrote Europae speculum, a work of great toleration to every religious sect.

Sandys was highly respected in Parliament and, with possibly the exception of Francis Bacon, also deeply interested in Virginia, no man enjoyed the confidence of the Commons

to a greater degree.

One of Sandys' best-remembered speeches was delivered in the reign of James I, and could not have added to his popularity with the monarch. With views, as usual, much in advance of his time, he maintained that "the origin of every monarchy was in election; that the people gave its consent to the King's authority, on the express understanding that there were certain reciprocal conditions, which neither King nor people could violate with impunity; and that a King who pretended to rule by any other title, such as that of conquest, might be dethroned whenever there was force sufficient to dethrone him."

Sandys, having spent much of his later life in Kent, was buried in Northbourne Church, a couple of miles from Deal; and despite Nazi bombing of this portion of "Hell Fire Corner,"

it has escaped devastation.

For a time Sandys was a Member of Parliament for Sandwich, the picturesque and ancient port probably best known to Americans as the scene of international golf cham-

pionships.

Sandys was married four times, and by his fourth wife he had seven sons and five daughters. Just when his struggle for Virginian freedom was at its height, he was in constant anxiety about his wife's health. As a matter of fact, she outlived her husband by eleven years.

One of the closest friends of Sandys was Nicholas Ferrar, who stood by him and Southampton in their struggle with the Crown,

A Bequest for "Higher Learning"

Nicholas loved Virginia, although he never visited the colony; he worked for its welfare during six strenuous years when he and his brother John were actively engaged in its management. The religious aspect of colonization made a deep appeal to him, and he longed to go with George Thorpe to convert the heathen. He also wanted to translate the New Testament "into the language spoken by the savages on the Virginia Plantation."

Nicholas was educated at Enborne near Newbury, in Berkshire, and at the age of 14 went to Clare College, Cambridge, His father, also Nicholas, was a leading Merchant Adventurer in the City of London and had been interested in the voyages of Hawkins, Drake, and Raleigh; so young Nicholas was brought up in an atmosphere of exploration.

He was but 14 when the expedition which founded Jamestown sailed from the Thames.

His father was the first man to bequeath a sum of money for "an American institution of higher learning"; he left the sum of £300 towards the cost of educating "infidel children" at the college to be established in Virginia.

His mother was a woman of deep piety, and it was undoubtedly from her that he inherited his burning faith and the desire to consecrate

himself to the spiritual life.

When the battle for the Virginia Company was lost, Nicholas Ferrar decided to withdraw from the rough-and-tumble of ordinary life and devote himself entirely to prayer and meditation. Who can say how much we owe to the prayers and example of that little community of between 30 and 40 souls that he and his mother set up at Little Gidding, in Huntingdonshire?

A Patch of Unspoiled England

Little Gidding is not too easy to find. On the way thither we asked a farmer for directions and inquired apprehensively if the church had suffered from German bombs.

He soon set our fears at rest and laughingly replied: "You're not the first, by a long way, and won't be the last, who've not been able to find Little Gidding. Neither could Hitler!" In a neighboring field we noted some German

prisoners hard at work.

My two visits to Little Gidding stand out as red-letter occasions. The church, one of the smallest in England, situated on a hill-side near some farm buildings, looks out, as it did in Ferrar's day, on gracious uplands golden with buttercups and with lambs gamboling in the sunshine. If I were asked to show a visitor a bit of unspoiled England after this second World War, I would take him to Little Gidding.

The buildings in which the community lived no longer exist, but the little church still stands and is lovingly tended (page 462). The door is left open; the visitor can wander about at will. In front of the church door are the tombs of the two brothers, Nicholas and John; over the porch are the words, "This is none other but the House of God and Gate of Heaven."

Although Nicholas and John Ferrar were no longer responsible for the affairs of Vir-



Land's End, Americans' First and Last Sight of England, Warms Visitors with Tea

This spot, where the Cornwall peninsula juts into the Atlantic, is England's farthest west. Here many
an America-bound settler got his last glimpse of the old country.

ginia, they constantly held the colony in their prayers. Nicholas, who had pledged himself to celibacy, was ordained deacon in his thirtyfifth year by Archbishop Laud in Henry VII's Chapel in Westminster Abbey. Edwin Sandys offered him preferment, but this he refused.

John Ferrar became the proud father of a little daughter on the first Christmas Eve at Little Gidding. John, in his life of his brother, relates that she was named Virginia, "out of their affection to the remembrance of the plantation of Virginia, which they so dearly affected, and that John Ferrar might daily more and more have the memorial of it so as not to cease praying for it."

J. H. Shorthouse gives a wonderful picture of life at Little Gidding in John Inglesant—Mrs. Ferrar, the mother, seated in her armchair, and around her the female members of the community, working with deft fingers at the famous Harmonies, so arranged that the four Gospels could be read separately or in one continuous history, "the printed text being cut out and pasted on large sheets of paper, and illustrated with engravings." They were richly bound by the ladies; two of the series are preserved in the British Museum (461).

George Herbert was said to have met Nicholas Ferrar only once, but this meeting was responsible for a lasting friendship, and Nicholas became to Herbert "his exceeding dear brother" and "his entire friend and brother."

Shortly before his death George Herbert desired to leave Bemerton for a living in Huntingdonshire, where he would be within reach of his friend. Herbert was deeply interested in Virginia.

Izaak Walton has described the scene at Herbert's deathbed. To the envoy whom Nicholas Ferrar had sent to Bemerton he said:

"Sir, I pray deliver this little book to my dear brother Ferrar, and tell him he shall find in it a picture of many spiritual conflicts that have passed between God and my soul. Desire him to read it, and then, if he can think it may turn to the advantage of any dejected poor soul, let it be made public; if not, let him burn it."

Nicholas Ferrar duly published The Temple, albeit after some delay because the authorities disapproved of the lines:

> Religion stands on tiptoe in our land, Readie to pass to the American strand.

Memories of John Smith

Historians have used much paper in discussing the writings of John Smith; as the early records have come to light, Smith's version of the founding of the colony is no longer exclusively relied on, but we cannot ignore



A Wigged Barrister Gets a Smoke

Taking a breather from court, this group stands in Lincoln's Inn Fields, London's law district. The statue of Sir Thomas More honors a successful lawyer whom Henry VIII put to death. Inspired by explorations of the New World, More wrote Utopia (Nowhere), the story of an ideal community, him. He undoubtedly performed a useful service in drawing attention to Virginia's needs in the early years.*

I have recently revisited most of the places connected with his name. There is the quiet little village of Willoughby, in Lincolnshire, where he was born; the church must be very much as it was in 1580 when, according to the register still preserved, he was baptized at the old font.

Next we come to the King Edward VI Grammar School at Louth, not far away, where he was educated and from which he ran away (Plate IV). Smith's bust is preserved here, presented by Lord Baden-Powell, founder of the Boy Scouts, a descendant.

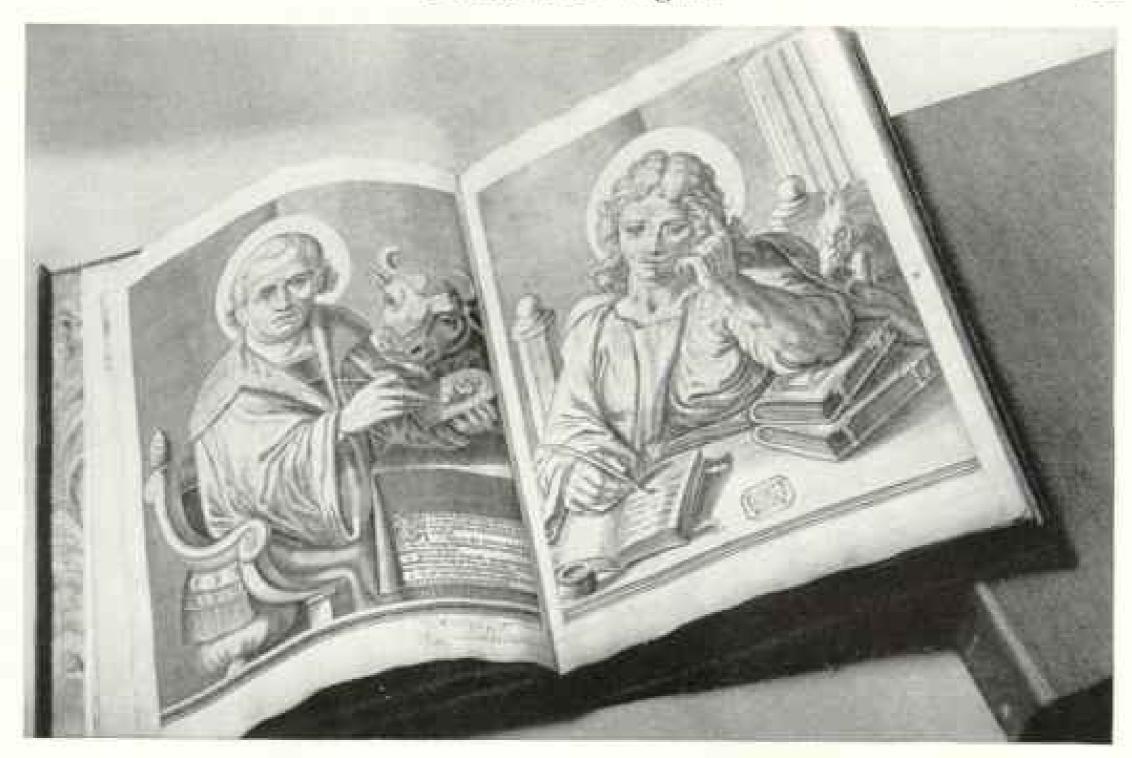
Smith's body rests under the altar of St. Sepulchre's near Newgate Prison, in London. There is a tablet to his memory in which he is described as "sometime Governor of Virginia," and on his coat of arms are three heads because of "the pagans he slew while fighting for the King of Hungary."

St. Sepulchre's stands in a muchbombed district and is lucky to have escaped, for a surprising number of churches were destroyed in the area, and it seemed almost as if the Prince of Darkness had been guiding the Nazi bombers. The Church of St. Giles, not far off, where rest the remains of another Elizabethan explorer, Martin Frobisher, has been destroyed too, although the tower still stands.

There are two other churches associated with Virginia in the neighborhood, St. Mary-le-Bow, where Patrick Copeland, "the first great missionary" that the Anglican Church produced after the Reformation, preached a sermon recording the Company's achievements in Virginia, is also in ruins, save for its glorious Wren tower. St. Michael's Cornhill, where other sermons on Virginian colonization were delivered, has luckily escaped.

The tragic figure of Pocahontas remains for but a brief moment on the stage as we watch the Virginian drama, "The Lady Rebecca" captured the imagination of Londoners during her brief sojourn, as was natural; for an American princess, married to an Englishman, who

* See "Chesapeake Odyssey (Following the Course of Capt. John Smith)," by John Maloney. NATIONAL GEOGRAPHIC MAGAZINE, September, 1939.



As the Founders Prayed for Virginia, Their Ladies Compiled Gospel "Harmonies"

Some 300 years ago the creation of harmonies was a favorite pastime in Little Gidding, an English religious community related to the Virginia Company (page 459). Bible texts and contemporary engravings were pasted on sheets of paper and handsomely bound. Nicholas Ferrar, Little Gidding's leader, left such a volume. The one shown is preserved in the British Museum.

"wore a hat and ruff and wielded a fan like a civilized fine lady," was certainly a surprising sight in Whitehall. She attended Ben Jonson's mask, and was presented to King James and his consort.

Samuel Purchas describes the visit of Pocahontas and her entertainment by the Bishop of London, when "she did not onely accustome her selfe to civilitie, but still carried her selfe as the daughter of a King, and was accordingly respected not onely by the Company [Virginia], which allowed provision for her selfe and sonne, but of divers particular persons of honour in their hopeful zeale by her to advance Christianitie."

Purchas thus records her death, for she soon succumbed to consumption: "At her returne towards Virginia she came to Gravesend, to her end and grave, having given great demonstrations of her Christian sincerity, as the first fruits of Virginian conversion."

St. George's Gravesend still stands, and is best known as the resting place of Pocahontas, "the darling child" of Powhatan, the first "American woman" to be buried on English soil. As one of her chroniclers says, "Hers was perhaps the first love story of the British Empire overseas." And now we approach the exalted figure of Shakespeare in our brief story of the founding of Virginia.

Americans have given much time and research to the subject, among them my friend Prof. Charles Mills Gayley, of the University of California, alas, no longer with us. Shakespeare rightly interpreted the age in which he worked, and during 20 years of his lifetime Virginia attracted a great amount of attention in the motherland. One historian claims that the whole of England, judging from contemporary evidence, was as much absorbed in Virginia as was the United States in California in the days of the gold rush.

Writing of 1607 in his History of the United Netherlands, John L. Motley says:

"It was in this year that two words became more frequent in the mouths of men than they had ever been before; the words which, as the ages rolled on, were destined to exercise a wider influence over the affairs of this planet than was dreamed of by any thinker in Christendom." The two words were "America" and "Virginia."

Dr. Tobias Matthew, Archbishop of York, a contemporary, complained that Virginia was so much "in the news" that he longed for more



In Little Gidding Churchyard, Huntingdonshire, Lie Two Champions of Virginia

After dissolution of the Virginia Company, the brothers Nicholas and John Ferrar retired to a religious community here and prayed for the New World colony which they had helped to guide. John's daughter, born in Little Gidding, was named Virginia that she might remind him of the Jamestown endeavor. Parliament dishanded the Ferrar community in 1647. Its old farm cottages are no more, but the church, one of England's smallest, remains a shrine to American pilgrims (pages 458 and 461).

information concerning the countries of continental Europe, "for of Virginia there be so many tractates, divine, human, historical, political, or call them as you please, as no further intelligence I dare desire."

Matthew Page Andrews draws our attention to the fact that the famous Virginian charter was borne to America by the expedition that sailed in 1609, and that the "Charter Ship," the Sea Venture, was wrecked on the coast "of the still vex'd Bermoothes," immortalized in The Tempest. William Strachey's narrative is supposed to have provided Shakespeare with material for the play.

The name of Sir George Somers will always be associated with the great chapter of colonization, as, with Christopher Newport, he commanded the fleet of nine vessels that sailed from Plymouth in 1609. The ship which Somers was aboard was the one wrecked on Bermuda. Certainly Virginia, if she had had the choosing of her sponsors, could hardly have brought together a more remarkable group of men and women.

We have the wayward, volatile, and yet fundamentally sagacious Elizabeth; Raleigh, the man of vision, whatever his personal ambitions and shortcomings; Hakluyt, the consecrated man of letters; John Smith, the "venturer"; Christopher Newport, the master mariner; George Somers, "a lamb on shore, a lion on sea"; Edwin Sandys, one of the great figures in man's march toward freedom; George Herbert, the "Saint of Bemerton"; Nicholas Ferrar, mystic and man of affairs; Southampton, courtier and patron of literature; and, in the background, the elusive shadow of the mighty Shakespeare."

* For additional articles on Great Britain, London, Virginia, etc., see "National Geographic Magazine Cumulative Index, 1899-1947."

Around the "Great Lakes of the South"

By Frederick Simplicit

With Illustrations by National Geographic Photographer J. Baylor Roberts

FROM my front yard—if I could get down to it—I might look up now and see a 30-pound cathish swimming where wild geese used to fly," said an Alabama farmer. "Or up in what used to be the sky, I might see an excursion steamer from Cincinnati, a wheat barge from St. Louis, a speedboat race—or even a beyy of bathing beauties diving from a raft!"

Fantastic? No! This man's farm now lies in the bed of an inland sea, one of that long string of "Great Lakes of the South" created when Uncle Sam built dams in the Tennessee River and made it a part of nearly 15,000 miles of navigable inland and coastal water-ways.

One of these lakes, formed by Kentucky Dam near Paducah, Kentucky, is 185 miles long (page 487). Some are so deep that in certain seasons you could let your hook down 60 or 70 feet and find fish (Plate IV).

For 650 miles downstream from Knoxville, Tennessee, across northern Alabama, then back north through Tennessee and Kentucky to where it flows into the Ohio, this river is just one lake after another; their total shore line measures as much in miles as our combined Gulf and Pacific coasts.

Barely 15 years ago this turbulent Tennessee—draining parts of Virginia, North Carolina, Georgia, Tennessee, Alabama, Mississippi, and Kentucky—what with its floods, land erosion, and wasted power, balked the welfare and progress of this populous region, which covers 40,910 square miles.

Now all that's changing fast.

Dams for Many Purposes

Today, multiple-purpose dams control floods, aid navigation, and provide electric light and power for millions in this area (map, pages 488-9).

This gigantic job began in 1933 when, by Act of Congress, the Tennessee Valley Authority, or TVA, was set up. Its nonpartisan board is named by the President, by and with the advice and consent of the Senate.

Rainfall in the Great Smokies drains into the Tennessee, and may reach 80 inches a year. By radio, telephone, and teletype, watching engineers know just what rainstorms are doing along the Tennessee River and its upper tributaries.

The 28 dams in this river system (of which

12 were constructed during World War II and two are under construction) form as many lakes. They stand, each a bit lower than the one above it, like a series of big bathtubs.

So, to control floods and still hold water enough behind the dams to run turbines and make power, the engineers simply open or close a water gate here or there, like turning a faucet on or off in a bathtub (map, pages 482-3).

Most Completely Controlled River

This makes the Tennessee now the most completely controlled major river anywhere in the world.

But for this control, high water as of old would still lay waste the Tennessee Valley and add to lower Ohio and Mississippi River floods. When you see how puny man has balked this wild river, you think of that Biblical tale of how God held back the waters of the sea while Moses' Israelites walked through with dry feet.

Since 1936, when the first dam above Chattanooga was built, 15 floods have started on the Tennessee River. The crests of all have been reduced. In the two largest, those of January, 1946, and January, 1947, flood stages at Chattanooga were reduced by 10 and 12½ feet. Total estimated savings in flood damages to that city alone are well over \$20,000,000.

Similar benefits accrued all down the valley. Kentucky Dam, which corks up the Tennessee near its mouth, helps cut down flood levels in the Ohio and Mississippi by from one to three feet.

For this magazine the writer covered the historic Ohio and Mississippi floods of 1927 and 1937.* Then, rowboats landed at the second story of a hotel in Paducah, drowned mules lodged on people's front porches, long reaches of the Lower Mississippi became vast inland seas, and some 600,000 people had to be removed to higher ground.

You can no longer blame the Tennessee for any part in such disasters.

Imagine the U. S. Coast Guard setting up navigation markers along new waterways which now lie over what used to be Alabama

* See, by Frederick Simpich, in the National Geoomarine Magazine: "Great Mississippi Flood of 1927," September, 1927; "Men Against the Rivers" (Mississippi and Ohio Rivers), June, 1937; and "Taming the Outlaw Missouri River," Navember, 1945.



"Lightning Hit You? O.K., More Juice Right Away!"

At central dispatching rooms in Chattanooga and at Wilson Dam, alert men are on duty around the clock. Wall diagrams show all switches in the TVA system; colored pegs show whether a switch is open or closed. Dispatchers, in constant touch with all power plants and substations, can instantly order power sent to any point in the system. For instance, if a plant is damaged by lightning, others step in to carry its load.

cotton fields! U. S. Army Engineers look after the locks in this newest of our navigable inland waters.

I knew Decatur, Alabama, as an inland town. Yet in the late war it built ocean-going freighters and sent them to sea—down the Tennessee. Lately I saw it building power barges for the French Government's use on the Rhine (Plate XV). Its flour mills haul in wheat from Midwest river ports.

Guntersville, Alabama, when I saw it first on a hot summer day, was a dusty cotton town. Few of its people had ever seen a ship.

Soon visitors may come by excursion steamer from Cincinnati, St. Louis, or even St. Paul, and a 9-foot water channel leads to such far ports as Pittsburgh, Minneapolis, St. Paul, Houston, New Orleans, Mobile, or even through Chicago to the Canadian ports of the northern Great Lakes!

"We built an elevator at Guntersville," writes the Norris Grain Company of Chicago, "feeling that distribution through that point would be advantageous to the South." The South, to a large extent a depleted area in grain production, must import considerable quantities to make its own bread and livestock and poultry feed.

Cargill, Incorporated, of Minneapolis, owns a terminal grain elevator on the water front of the big lake which now covers some of Guntersville's low areas.

Autos Shipped by Water

Flying over open water near Guntersville, we looked down and saw a strange craft packed with four decks of shiny new automobiles. This carrier belongs to Commercial Barge Lines, Inc., of Detroit. They wrote me:

"Now we have two new Diesel-powered 3-sectioned articulated automobile-carrying boats, the Commercial Clipper and Commercial Express, which can haul 602 automobiles per shipping (Plate V).

"We originate traffic for water transportation from various automobile-manufacturing points in Michigan, Ohio, Indiana, and Wisconsin. These cars are shipped from the river ports of Cincinnati, Ohio, and Evansville, Indiana, to the ports of Memphis, Tennessee, and Guntersville, Alabama, whence they are sent overland to dealers throughout the South and Southwest. . . .

"Besides automobiles, we carry general commodities, particularly hooded trailers."

Other barges, both common carriers and

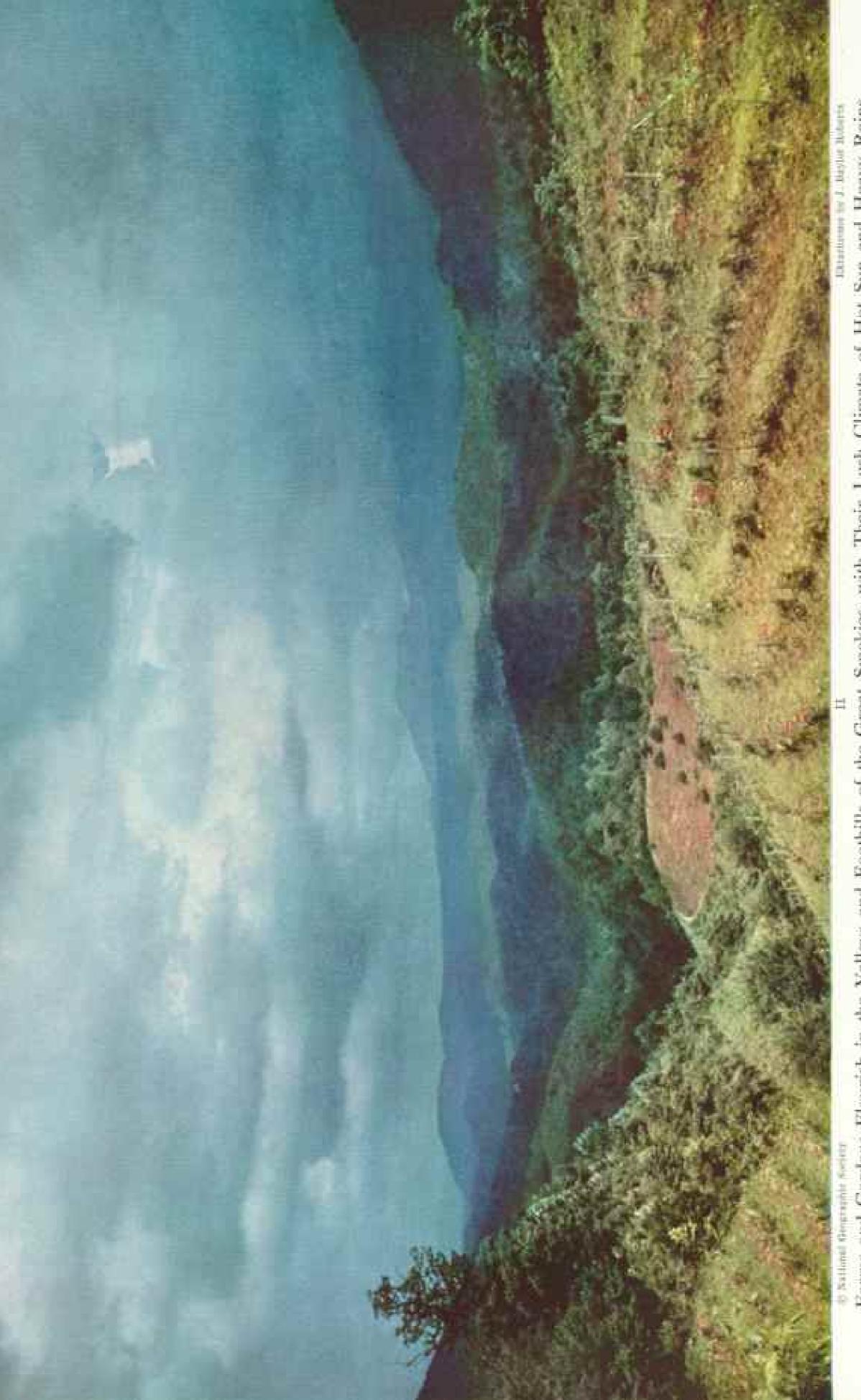


(5) National Geographic Society

Efficience by J. Barlor Bolorta

Forest Sprites Play on the Rhododendron-strewn Slopes of Great Smoky Mountains

Homes are few and far between in this wilderness of wild animals and primeval forests. Tributaries from the vast watershed flow down to feed the Tennessee River, turned now by dams into a chain of shimmering lakes.



Farms and Gardens Flourish in the Valleys and Foothills of the Great Smokies, with Their Lush Climate of Hot Sun and Heavy Rains



From World's End, Visitors Flock to Study This Great Project Here it group of 30 engineers from Stam inspects a mural of Norris Dam, which stands in the Clinch River near Knoxville and creates the beautiful take of the same name.

After the lecturer has explained why and how the dam was built, how it helps control floods and aids navigation, the young Starnese will inspect the dam itself and its silent-running powerhouse.

Foreign observers, coming here by hundreds, want to see not only the multiple-purpose dams themselves and their relation to floods, navigation, and power generation but also what is being done to grow more trees, restore croded farms, and stamp out malaria.

New industries seeking handy electric power adjacent to river and other forms of transportation now are locating in the valley.

O Nathania Georgida's Smith Militarium 14 J. Natha Bahetts



Big "Cats" and Bass Are Caught in Swifter Water, Just below Kentucky Dam I Caught Six Before I Needed a Fresh Worm!"

New Cars Ride to Market by River Barge, Passing Here Through Guntersville Dam Lock This giant 4-decker, the Commercial Cheper, can hand 602 automobiles at once. With its twin, the Commercial Express, it is a Diesel-powered, 3-sectioned craft, built especially for this inland water trade on the Ohio, Mindssippl, and Tennessee Rivers.

New cars from factories in Wisconsin, Michigan, Ohio, and Indiana are picked up and assembled at such Ohio River ports as Cimcinnati, and Eyanaville, Indiana. Thence they go by these giant barges to Mornphis or to Gunternville, Alubama, for further distribution overland.

The big Commercial barges are 525 feet long, can make 17 miles an hour, and have a cruising radius of 2,300 miles.

Each vessel is made up of three 173-foot sections and can be separated into three pieces for convenient passing through locks. The three upper docks overhang the bow like a carrier's flight deck; the fourth platform is within the hull itself.

No crane is needed to fond or unload cars; they simply run on and off over rumps to floating docks.

Softenment Memorraphic Southern Statestonnes by 3, Baylein Sements

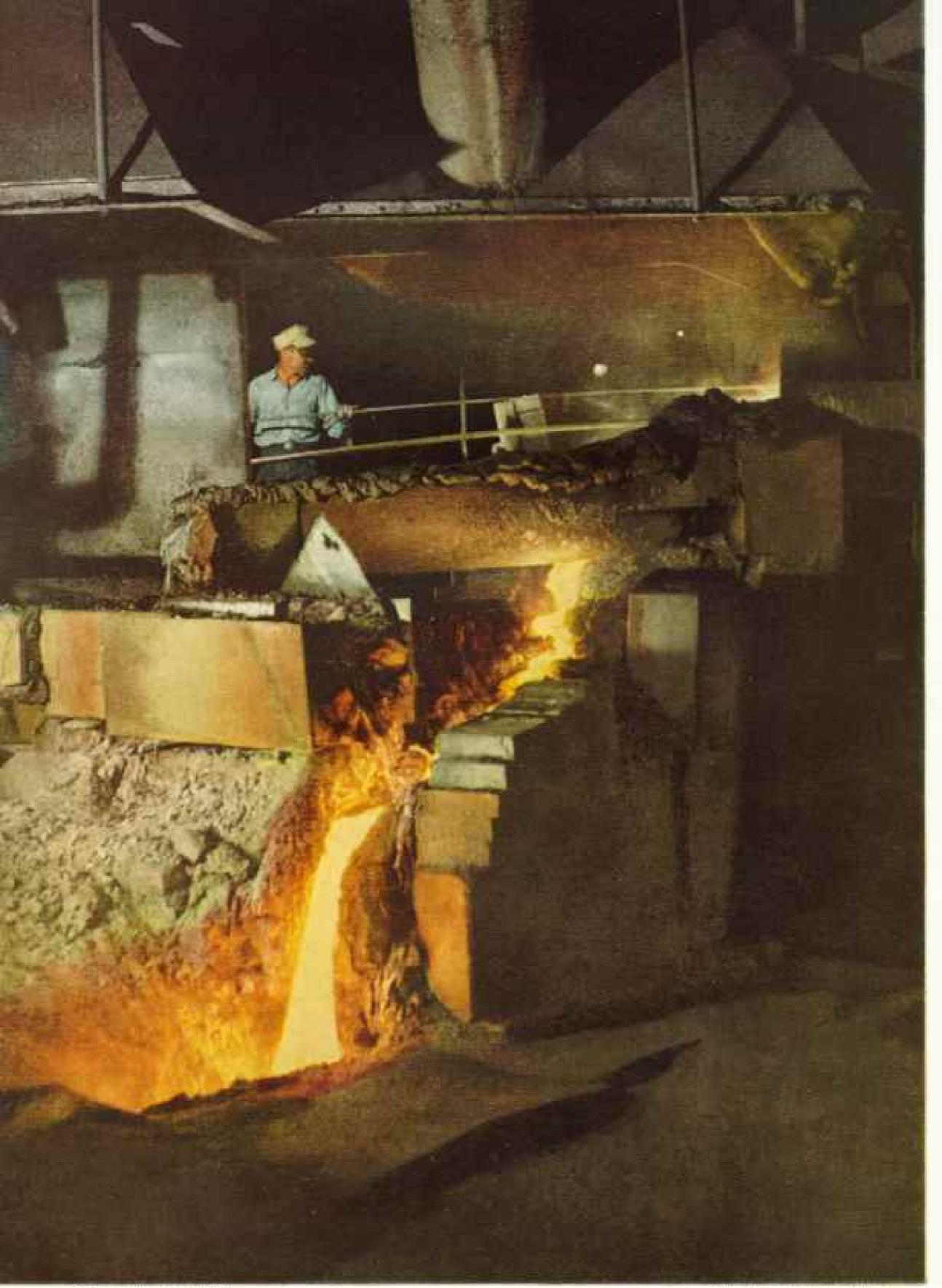




Lookout Mountain, Where Blue and Gray Fought That "Battle Above the Clouds" Chattanooga, on the Tennessee River, Lies Below



High above Imposing Fontana Dam, Which Blocks the Little Tennessee in North Carolina, a Husky Farmer Hoes His Hillside Corn Patch



Satiseal Geographic Society

Extactionne by J. Baytor Bidsets

Phosphate Rock Turns to Fertilizer in This Electric Furnace at Muscle Shoals

Indians planted fish with their seed corn and beans so that phosphorus in the fish might fertilize their gardens. Phosphate-rock beds, some in Tennessee, were formed long ago by dying marine life. Today TVA's most valuable Nation-wide job is the manufacture of this triple superphosphate and its distribution to our impoverished soils.



Summer Visitors Now Stay in Cottages Once Used by Men Who Built Fontana Dam Even the maid service is motorized in this model village beside Fontana's 30-mile lake.

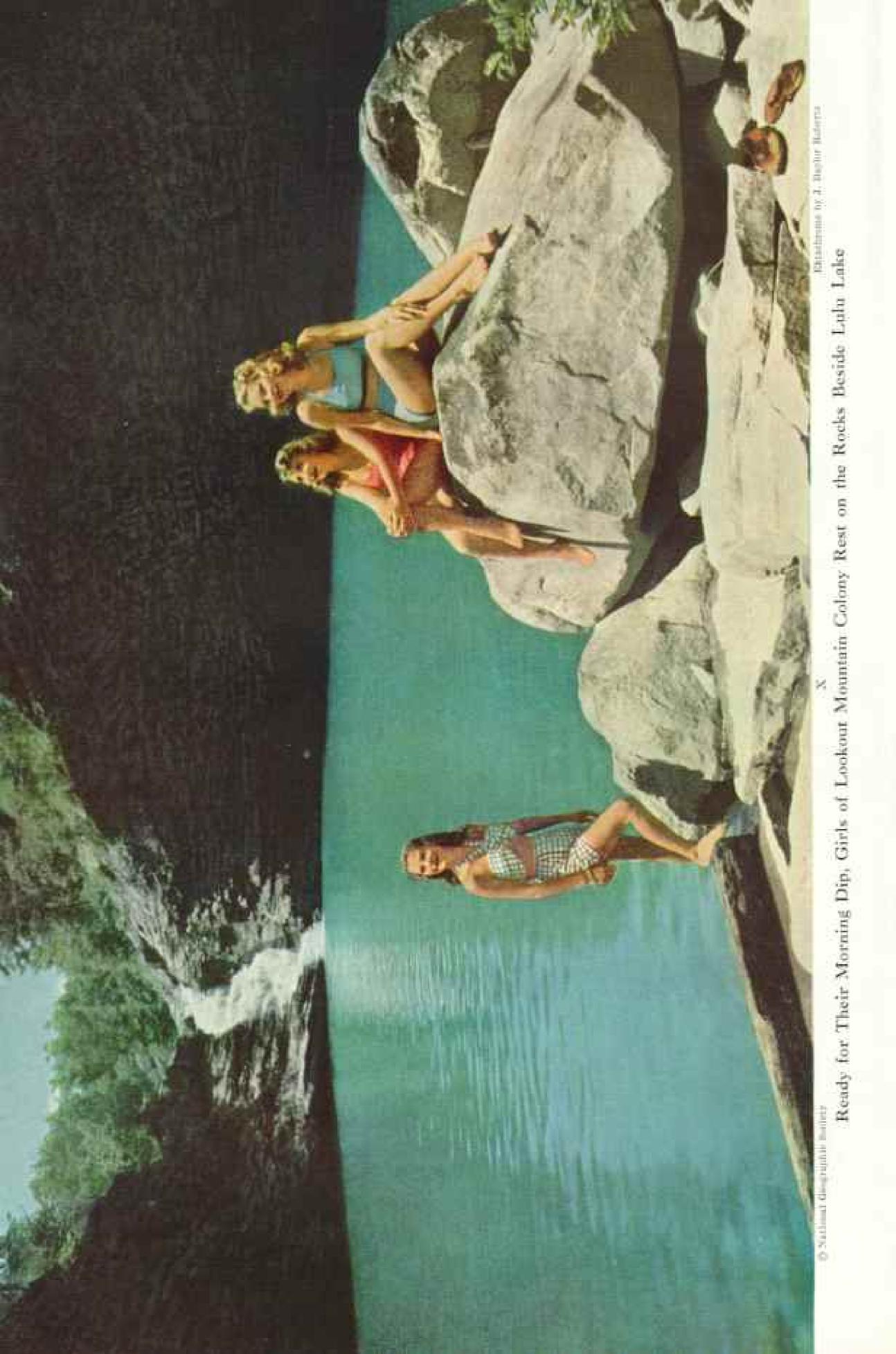


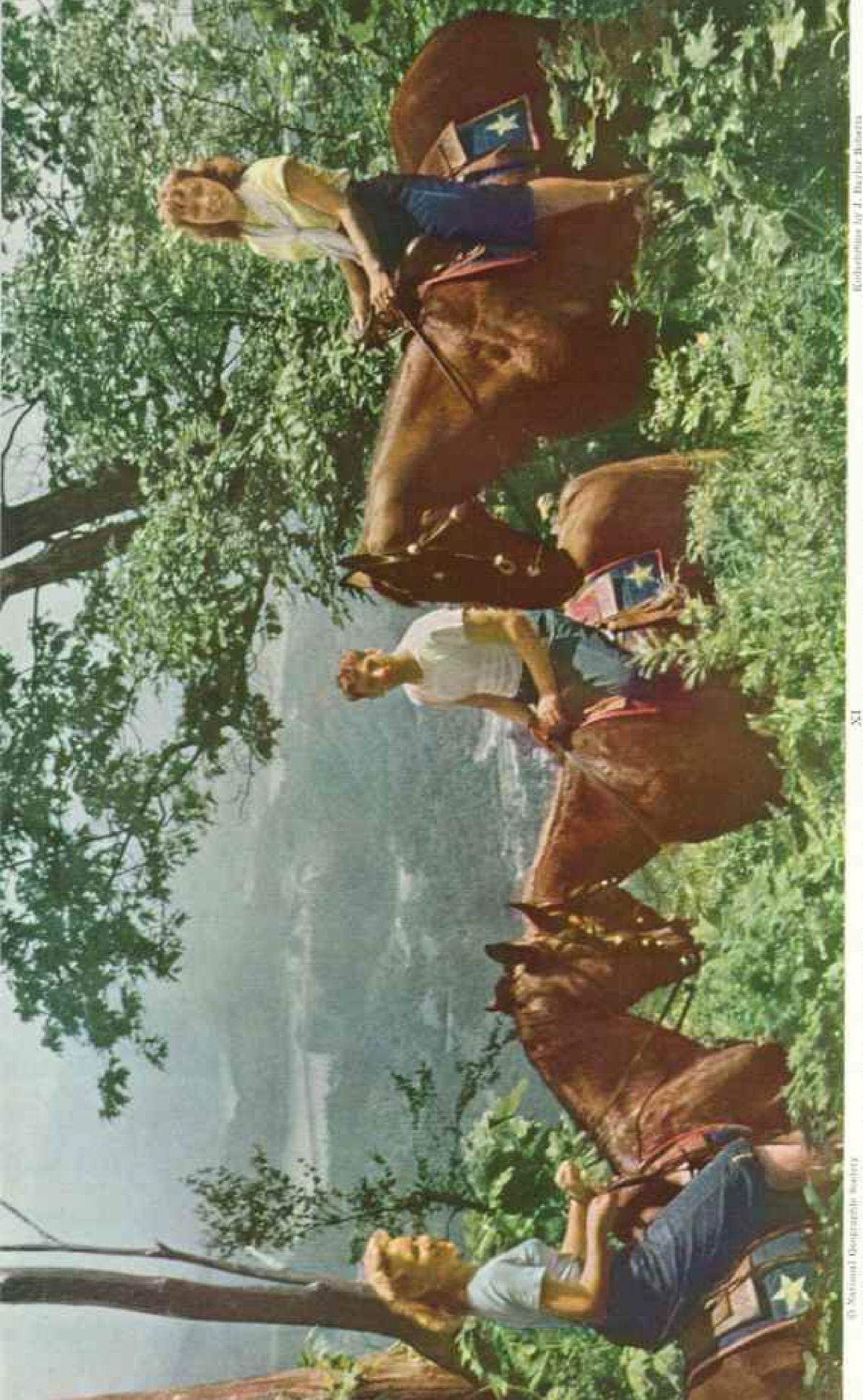
O National Geographic Sorbetz

Risdachtemus by J. Baylor Botseta

"It's Plenty Cold-Right Out of Our Old Oaken Bucket"

Lyda Benton brings the drink to her brother Clarence, 17, who won that new tractor for being the best 4-H Club boy farmer in Georgia in 1946. Lyda runs the tractor when Clarence works with his dairy herd.





Bridle Paths Wind over North Carolina Hills Around Fontana Village, Comfortable Resort Managed by Government Services, Incorporated

Man-made Lakes on the Tennessee River Suddenly Bring Unexpected Water Sports to This Area

Here Chattanooga's Privateer Yacht Club repairs its stripe floot and makes ready for a holiday regatta on Chickamauga Reserveir, upstream from Chattanooga.

These astonishing "Great Lakes of the South" not only afford timpredented near-at-hand opportunities for fine fishing and bathing, but they also being speed-boat, cruiser, scaplane, and sail-bent fans here from all over the Middle West.

The sportsmen's advent has started scores of new businesses, from lisheside lodges and boat-repair shops to sporting-goods stores.

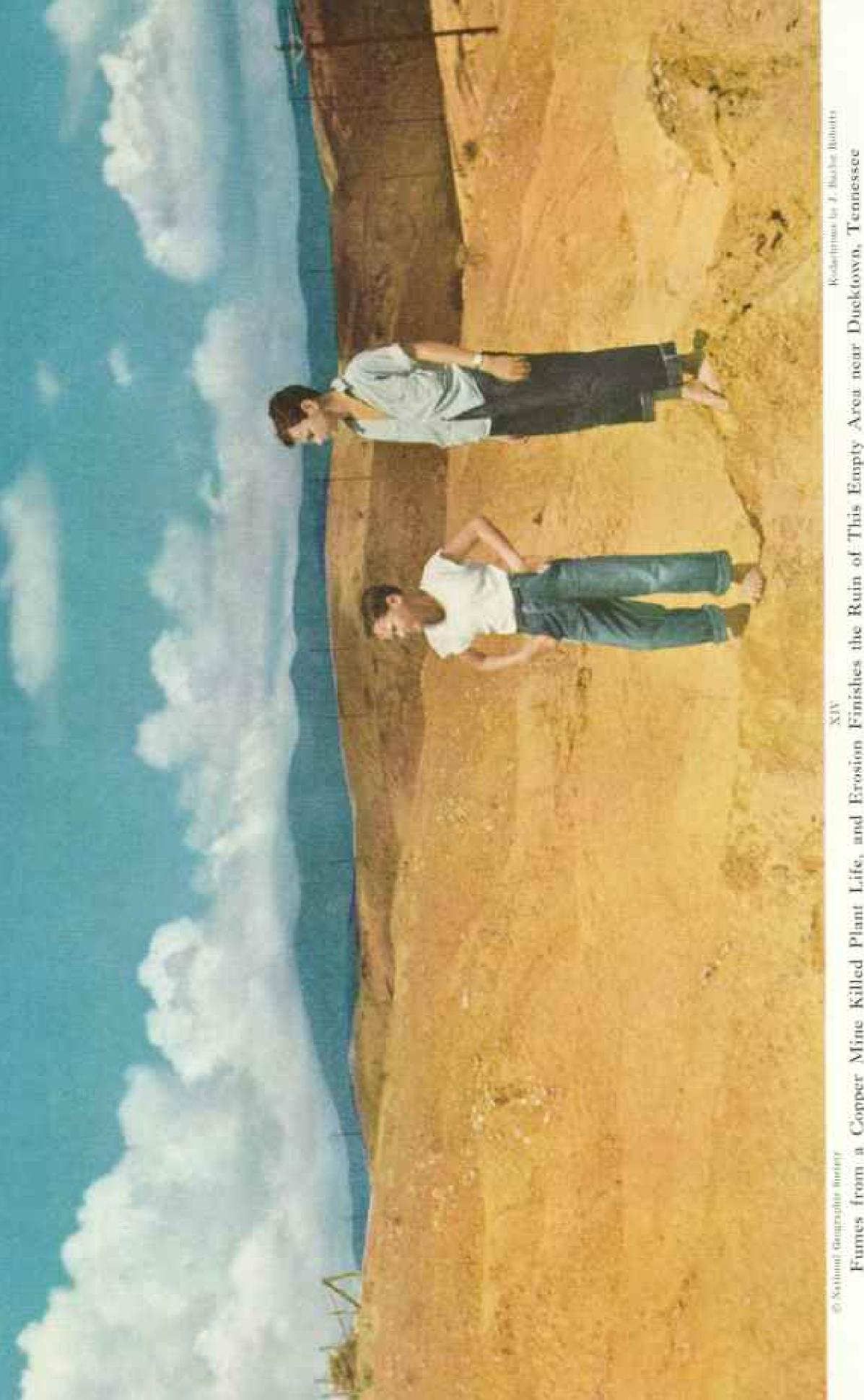
Incredible numbers of rods, reels, life preservers, motors, beats, sails, musts, and anchors are sold here far from salt water. One Chattanooga dealer runs a special truck, bringing five balt from Indiana in tanks.

O Statemed Generality Bestery Electronic by J. Berlier Roberts





Owners, Pilots, and Spectators Gather about the Outboard Motor Pits at Chickamanga Reservoir During a Fourth of July Dixie Regatta



Fumes from a Copper Mine Killed Plant Life, and Bresion Finishes the Ruin of This Empty Area near Ducktown, Tennessee The mine company now controls fumes and aids conservation. How to cure aroston and restore worm-out fields are besoms TVA teaches furnities



France bought 25 of the self-propelled craft. They are shipped down the Tennessee and Missisphi to New Orleans, thence by sea to Rotterdam for amembly. In the Ingalls Yards at Decatur, Alabama, Big Steel Barges Are Built for Use on the Rhine



Industrial Besearch Institute. Curverity of Charmeouse

Even a Blowtorch Won't Burn Chenille after Fireproofing

The tufted fabric patterned after "candlewick" spreads made by housewives in colonial times is now familiar in both mats and bedspreads. Resemblance to a caterpillar suggested its French name, chenille.



D Nathoul Geographic Society

Experimenter 2, traytor Botterns

On a White Inspection Table She Hunts Flaws in Nylon Hosiery for Evening Wear Nearly three miles of yarn go into one pair of 51-gauge stockings. Davenport Hosiery Mills, Inc., Chattanooga,



Garbage Cans Yield a Banquet for This Greedy Bear

Bruin gobbles the refuse noisily while Great Smoky Mountain visitors take his picture. Sight-seers always look for the bears, but they're a nuisance to National Park employees. Here, as in western parks, they may scratch or bite careless people who feed them or try to pet or tease them. A good rule is: "Don't mankey with a bear—the tamer they are, the more trouble they make."

privately owned lines, use this new waterway, Some towboats push 11 steel barges at a time; a tow of five or six 1,000-ton barges is the average.

Some oil companies use their own barges and have built their own terminals. Coal, grain, lumber, gravel, oil, gasoline, scrap iron, clay, aluminum, cement, machinery, and smaller shipments of peanuts, soap, stoves, canned goods, paint, glassware, and fertilizer move by water.

Several months ago Alcoa, or Aluminum Company of America, wanted to move some huge furnaces from its Alcoa, Tennessee, plant, to Iowa. It would have cost them too much to break these up into carload lots; so, after transporting them two miles to a dock, they used special barges, moved the heavy, cumbersome objects on board, and hauled them cheaply to destination.

For some kinds of freight, however, water transport is too slow. Also, if freight originates far from river ports, often shipments cost so much to reach the water that water transportation is defeated.

Till these lakes rose, and new roads ran up into the Great Smokies, people hereabouts enjoyed little in the way of water sports. Now dam and lakeside visitors number about 2,000,000 a year (Plates XII, XIII)."

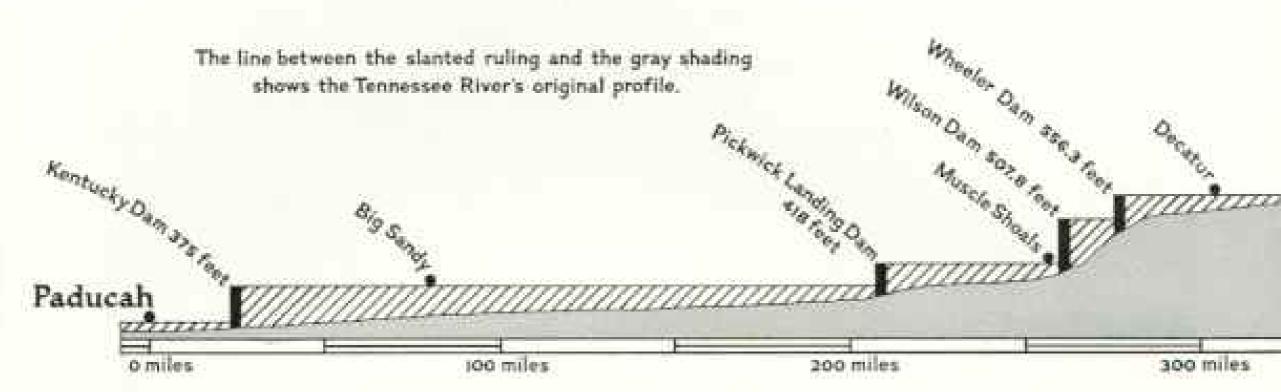
A Chicago mail-order house finds this one of its richest markets for boats, bathing suits, and fishing tackle. Floats, cabins, clubs, lodges, and summer camps line the lake shores, where some 7,000 powerboats, including those that take outboard motors, are in use. Many visitors ship their motorboats here, or haul canoes and skiffs on trailers or on top of their automobiles.

Big Lakes Bring New Kinds of Fun

"These new lakes, with all their outdoor sports, are having a fine moral effect on our youngsters," said one editor. "Our boys drink, fight, and loaf less in the poolrooms on their days off; now they want to swim, fish, sail, or race their speedboats. When we had only the muddy river, not so many could swim. Now you can push most any kid into the drink and he'll swim out, even if his stroke is dog fashion."

One weekday, at Guntersville Dam in Alabama, we saw more than 1,000 people

*Sec "Rambling Around the Roof of Eastern America," by Leonard C. Roy, NATIONAL GEOGRAPHIC MAGAZINE, August, 1936.



TVA Dams Stairstep Tennessee River; Figures Show Their Gate Heights above Sea Level

fishing. They had good strings; one man had caught a 30-pound paddlefish. Some men in boats fished the rapids boiled up by the turbines and caught big catfish just below the dam. Boys scooped up small bait shad by dozens in a dip net.

These tail waters on the Tennessee support 300,000 individual fishing trips per year. Most anglers fish from the bank. Huge signs warn the boat fishermen that these turbulent waters are dangerous for small craft.

On Galilee the Disciples caught no fish till they cast their nets in the right place. It's so here. Time is as important as place.

In spring, fishing is poor till water reaches a temperature of about 60 degrees, when most fish become more active. When the water is cold, some species are inactive. Fish are coldblooded creatures. When temperatures are low, a single minnow takes care of their food needs for a number of days. But the walleye and sauger move and feed all winter.

Later so many tiny inch-long young ones appear that then the game fish can fill their stomachs with these, and they lose interest in chasing your plug, your minnow, or spinner.

Says Dr. R. W. Eschmeyer, TVA fisheries investigator: "Fishing is best in April, May, and June. In midsummer, at the height of the tourist season, angling here, as in most other parts of the country, is not at its best."

No Closed Season for Fishing

There's no closed season here; you can fish the year around.

When the several conservation departments discarded the closed season a few years ago, the catch greatly increased. Even so, TVA biologists find that most fish die from natural causes and so never reach the frying pan.

In the last few years TVA has tagged several

thousand fish to see how much of the fish crop is being harvested. Some were taken in nets, tagged, and then released. In other cases sportsmen's clubs cooperated by taking the fish with hook and line for tagging.

The fish are marked with small numbered tags on the upper lip. That doesn't slow them down; one crappie, so tagged, was again caught on a book the same day, thrown back, and caught twice the next day.

But only 84, or less than four percent, of some 2,500 fish tagged early in 1947 had been recaptured by the end of June.

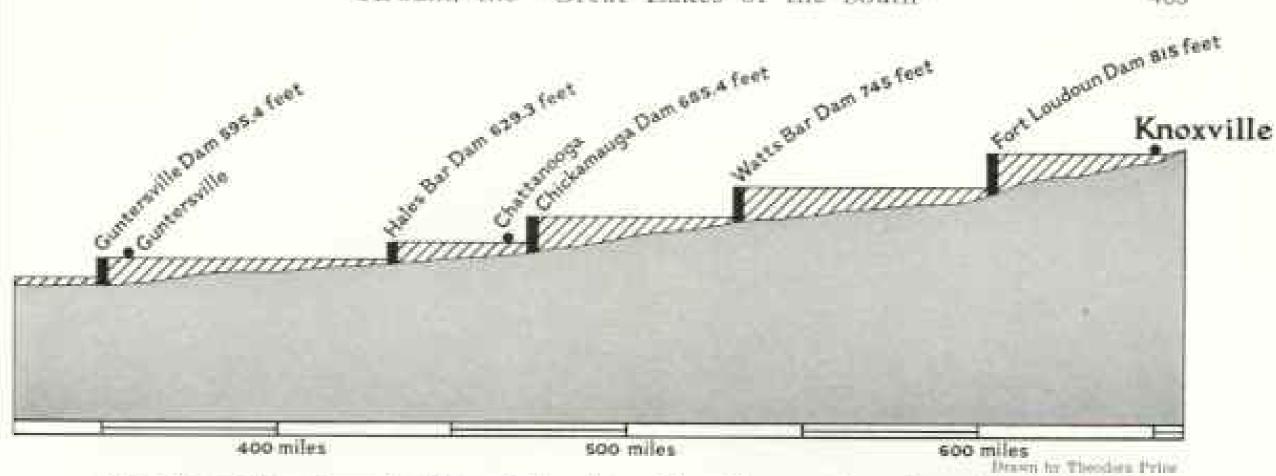
It's proved, too, that fish grow faster here, but live shorter lives, than those in northern waters. A few live to a ripe old age, but most of these fastgrowers must be taken during their first four years if they are to be caught at all. Few live to be five years old.

Many of these new lakes have never been stocked. Fish in them are children of pike, sunfish, cats, sauger, bass, crappie, etc., that swam the Tennessee and its tributaries before the dams were built. But it's known that the fish are multiplying enormously.

In April of 1945, for example, a man's average catch on Cherokee Reservoir was 3.2 fish. In April, 1947, the catch on this reservoir averaged nearly 10 fish. Many of the fish caught in 1947 were hatched without benefit of a closed season.

Fishing has become a major form of recreation on TVA waters. With 10,000 miles of shoreline, the angler has plenty of room to cast his plug.

From this chain of lakes fine roads now lead up into the Great Smokies, long an isolated region with houses few and far between. Parts of it, notably the virgin forests of the Great Smoky Mountains National Park, are still wild and unspoiled.



Nine Dams Transform the River Below Knoxville; Above and on Branches Are 19 More

A mamma bobcat and her three young ones remped in the road when cameraman Joe Roberts rambled out at dawn, looking for bears to photograph (page 481).

"These wildcats sneak around at night and rob our garbage cans," said the clerk at Fontana Village.

This camp took over as a pleasure resort when the army of workers moved out after finishing spectacular Fontana Dam, on the Little Tennessee River (Plate XI).

"It took 6,000 men to build this dam, but now it takes only four of us to a shift to run its power plant," said a turbine operator.

The vast hall which shelters the silent, powerful turbines is so gracefully designed and softly tinted it made me think Nebuchadnezzar's palace at Babylon must have been much like it. Even from Europe, architects have come here to admire this structure.

When building Fontana and other dams, TVA introduced rolling libraries; they took loads of books from one dam job to another for workers to read. When construction work ceased, people in the neighborhood wanted this book service kept up. At a public meeting, demanding books, Mrs. Willis Shadow said:

"We have 6,000 people in Meigs County, Tennessee, but no railroad, very few telephones, and no newspapers. The bookmobile and grapevine are our only means of communication. If we lose the library bookmobile, how shall we know what is going on in the world? There's not a family in the county the library doesn't touch."

So, after TVA showed the way, the State took over. The bookmobiles still run, and today more than 500,000 readers enjoy this library service!

White man's wampum is welcome at North

Carolina's Cherokee Indian village on Route 107. Cowbells tinkle hereabouts; so do the cash registers in curio shops where copper-shaded Cherokee maids—some akin to pioneer Scottish traders—sell tiny drums, bows and arrows, and elaborate feathered headdresses (though the Cherokees themselves never wore them).

Sequoyah, famed Cherokee for whom the genus of giant trees was named, was born in Tennessee. He was a smart Indian, Intrigued by the "talking leaves" of the whites, he invented an alphabet for the Cherokees. The Gospel of St. John and other parts of the Scriptures were translated into Cherokee and printed in this alphabet. A missionary had special type faces made in Boston so the Cherokees could read their own language in their own "talking leaves."

If you collect miniature wooden rabbits, pigs, horses, or even turtles, you'll enjoy a day in the wood carvers' colony at Brasstown, North Carolina, on Route 64.

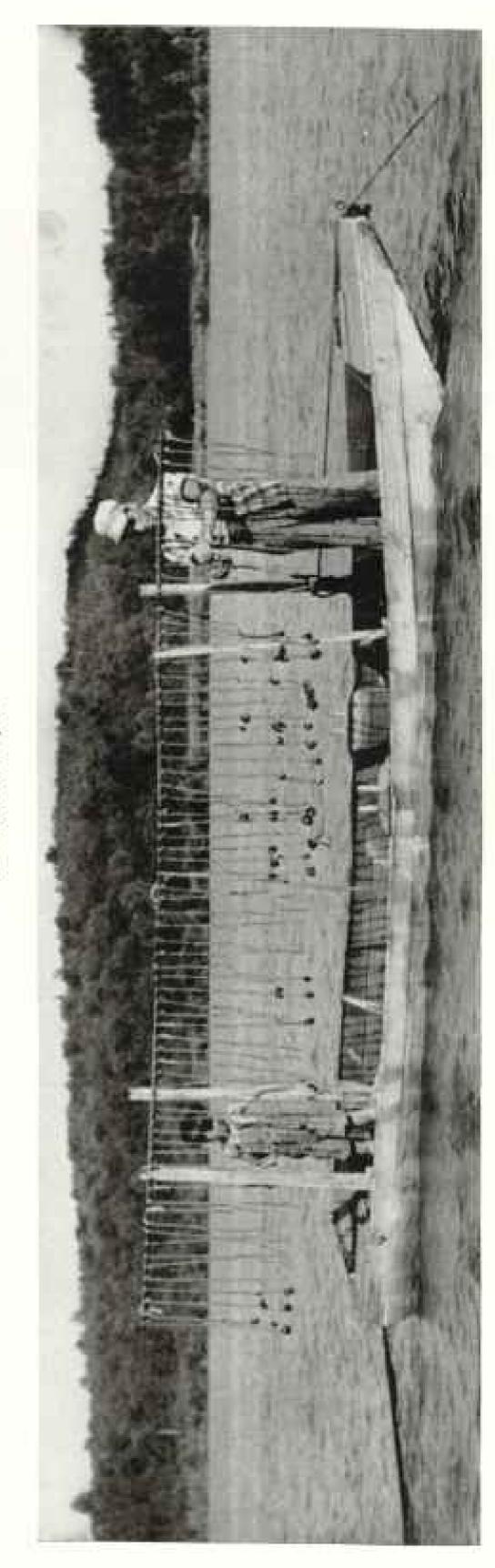
Power Cables Spread from Dams

All through these mountain valley floors you pass modest fruit, dairy, and grain farms. More important, to these farmers, than whittling out toy animals or sparking the bashful Indian maids is the electricity from the big TVA dams that now lights their homes and lightens the housewives' work.

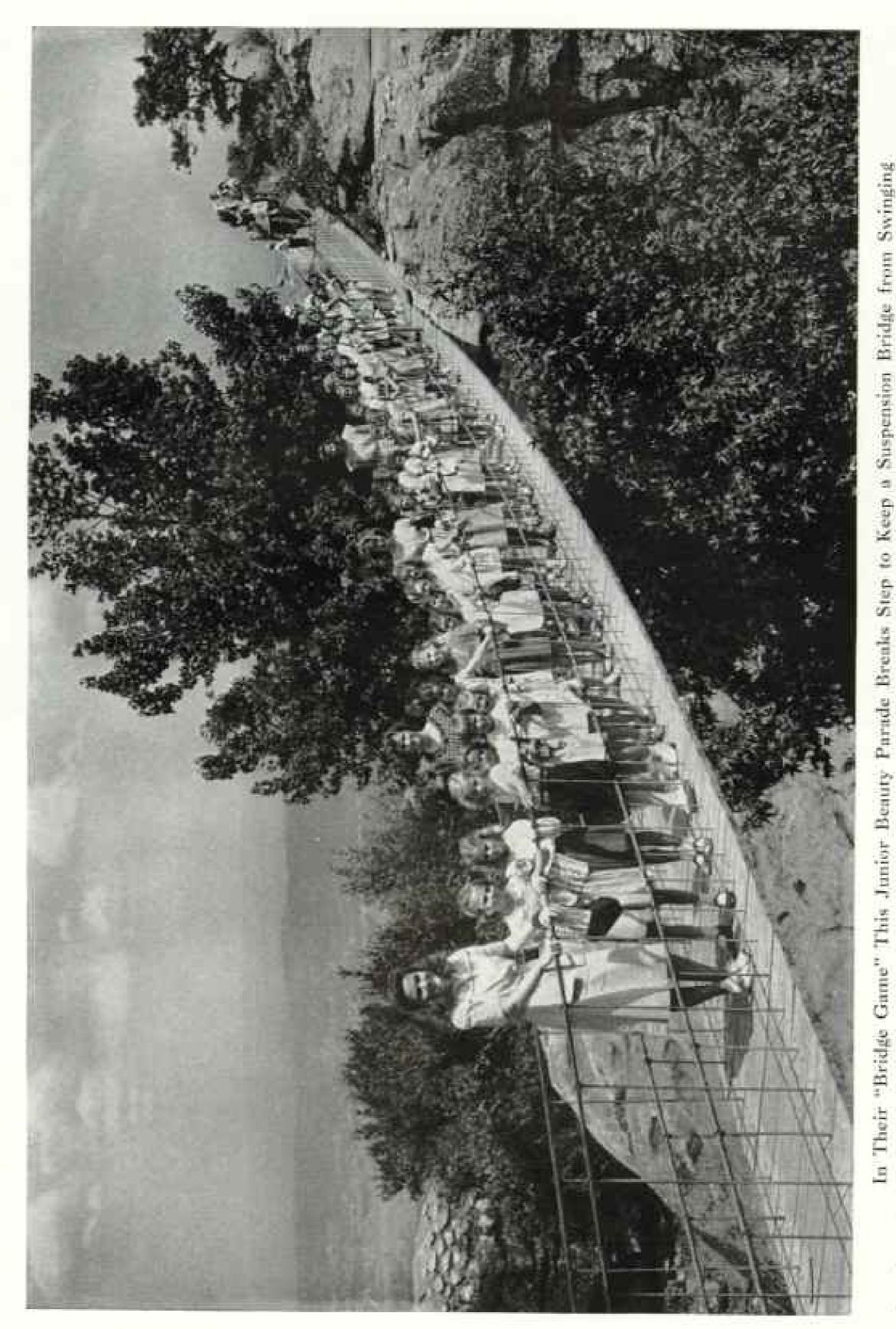
Fly over any dam, with its hydroelectric plant such as that on Chickamauga Reservoir near Chattanooga, and you look down on what resembles the spreading web of a giant spider. That web is the net of copper and aluminum cables, carried on steel towers, to feed power and light to farms, towns, and cities. On wooded hillsides such cables hang in long straight lanes cut through the forests.



"If Fish Don't Bite Here on Fort Loudoun Reservoir," Says Pilot W. P. Cook of Alcoa, Tennessee, "I Just Fly Our Republic Scabce to Another Spot"



Dragging a Pole Set with Hooks along the River Bed, This Man and Boy Catch Mussels; the Pearly Shells Make Buttons



Spanning a chasm in Lookout Mountain's spectacular "Rock City," the bridge carries a trail through that amazing labyrinth of caves, crevices, and canyons. Rock City is not a city, but the name of a geological jumble explored each year by hordes of visitors. Its caves are decorated with figures of dwarfs and goblins.



That Plane Is Not in Trouble! It's Spraying DDT on Watery Areas to Control Malaria.

Where the poison mist falls, mosquitoes perish and their larvae cannot live. This flooded area lies near Big Sandy, in the Kentucky Dam region.

So much hush-hush hid it that few know what all electric power did here in the fighting years. TVA provides most of the power for the atomic bomb works at Oak Ridge.

More than half the elemental phosphorus we used in fire bombs, tracer bullets, and smoke screens came from TVA shops; so did trainloads of calcium carbide for artificial rubber, mountains of ammonium nitrate crystals, and other chemicals; and power from here made more than half of all the aluminum we used to build our fighting planes during the critical early part of the war.

Electricity and Its Users

Power production was stepped up to such a high rate in the war that people asked, "What are you going to do with all that stream of energy when the war's over?"

Well, today more electricity is being used here than ever before; so much, in fact, that hydroelectric plants alone can't meet the demand and coal-burning steam generating plants have to help out. TVA now owns 6,507 miles of high-tension power lines to distribute its energy to customers far and near. It owns also 1,000,000 acres of land.

TVA has a combination hydro and steam generating system with an installed generating capacity of 2,538,902 kilowatts, of which about 450,000 kilowatts is in steam plants. Its hydroelectric generating plants average about 13 billion kw-hr per year.

In a year of very low rainfall the output from hydroelectric generation may fall to 10 billion kw-hr. In the fiscal year which ended June 30, 1947, the TVA integrated system produced 14.797 billion kw-hr, of which 92 percent came from hydro plants.

Other electric systems of comparable capacity are Commonwealth Edison, serving Chicago, and Consolidated Edison of New York, with an all-steam generating capacity of 2,732,000 kilowatts.

So world-wide is interest in this big job that visitors come from far lands to see how it's done, and take the lessons learned here back to their own countries (Plate III).



Fleecy Clouds Float Lazily over Newly Built Kentucky Dam

To cross the Tennessee River, tracks of the Illinois Central Railroad are laid on top of the dam. At left are navigation locks. Below the dam, cultivated fields and patches of woods appear; above spreads the lake, 185 miles long, inundating former farms and pastures to create inlets and islands. With 2,380 miles of shore line, this is the largest body of water impounded behind any of the TVA dams.

Most observant was a Chinese engineer I talked with. He wanted to see how we have slowed down a racing river and made it "walk" through a basin nearly as large as England.

Here, with forty or fifty of his countrymen, he was learning what American methods and machines may do to help China battle the floods which for centuries have ravaged the unhappy valleys of the dangerous Yellow and Yangtze Rivers.*

Mosquito Control Methods Studied

Government officials, engineers, doctors, scientists, writers, and agronomists flock here from India, Russia, Poland, Britain, and France.

From Latin America, with all its problems of irrigation and undeveloped water power, have come more than 200 experts.

*See "Taming 'Flood Dragons' Along China's Hwang Ho (Yellow River)," by Oliver J. Todd, NATIONAL GEOGRAPHIC MAGAZINE, February, 1942. Australia sent a medical officer to see how TVA fights malaria. It kills mosquitoes by spraying marshy spots, lake edges, etc., with DDT and, lately, experimentally with 2,4-D, to kill aquatic vegetation which favors mosquito development. Some oil is used, but that method is largely outmoded.

Another method used is that of fluctuating the level of water behind the dams, during the mosquito breeding season, for a 5-day period. When water is thus lowered, grassy edges of lakes are left exposed to sun and dryness, which kill the larvae; when that's done, the level of water is raised again.

The dean of a Melbourne engineering school came to look into the cost of producing power and fixing rates. Brazil's Minister of Agriculture was here, and so was Lord Halifax when Ambassador at Washington.

A man from India's public works office came, and so did the senior engineer of the Niger River Project in French West Africa.







Barchanded But Veiled, He Robs a Beehive Without Getting Stung

This Lincoln County, Tennessee, farmer participates in the TVA farm demonstration program, which helps the rural valley folk to take full advantage of the power and fertilizer produced at the dams:

Egypt's Minister of Public Health arrived to look at malarial and plant nutrition problems. Ontario's Minister of Planning and Development wanted to study social conditions and decentralized industry.

And students—busloads of them from Chile, Uruguay, Mexico, Turkey, Panama, and scores of other foreign countries—come; some stay from one month to a year and a half to see how TVA works—and take home the lessons.

Fossilized Bones Make Plant Food

As early as World War I, Uncle Sam built Wilson Dam at Muscle Shoals, Alabama, to make nitrogen compounds needed in explosives. Again in World War II that plant made munitions, and now it's making phosphate fertilizer.

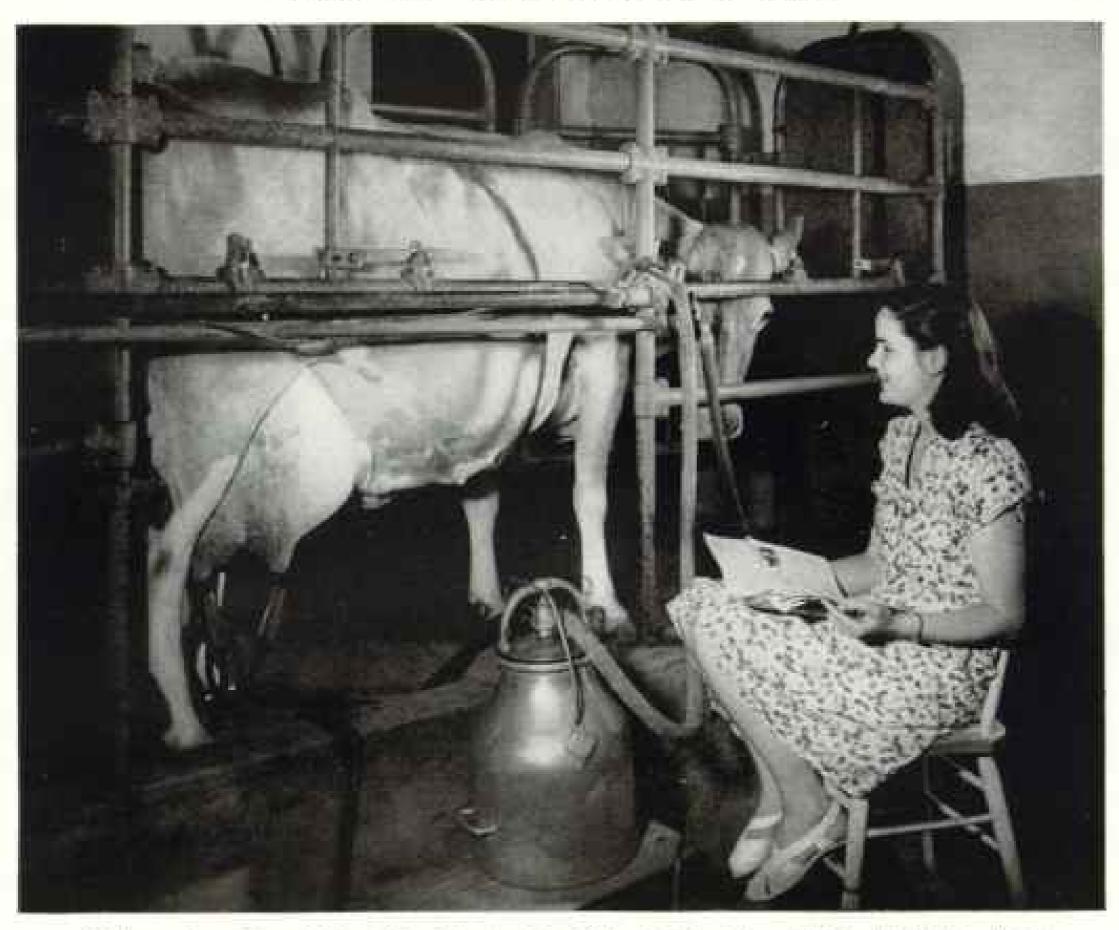
Indians planted dead fish in their hills of corn to enrich the soil. We could, if we had enough fish; instead, we use as one kind of plant food the phosphates derived from phosphate rock. To the whole Nation, of utmost importance is the making of concentrated fertilizer from this rock, which consists of petrified remains of marine life.

Major mineral requirements of a fertile soil are lime, potash, nitrates and other nitrogen compounds, and phosphates.

Lime is abundant. In the Southwest we have great potash mines. Nitrates we import from the natural beds in Chile or make from the air. Legumes also draw nitrogen from the air; pull up a pea or bean plant, or a bunch of clover, and those whitish nodules you see clinging to the roots are collecting nitrogen.

For phosphates the United States has about half of the entire world's known supply of phosphate rock. The biggest deposits are found in Utah, Idaho, Wyoming, and Montana, but the rock also exists in Florida and along the Tennessee River, convenient to TVA power.

This fact has been of great importance,



"Where Are You Going, My Pretty Maid?" "Going A-milking, Sir," She Said

But nowadays, thanks to electricity, she takes it easy. That milking machine, with vacuum cups slipped over Bossy's teats, does the work. Here on the Slagle Dairy Farm near Franklin, North Carolina, 115 cows are milked in 55 minutes.

because it has enabled TVA to perfect the electric furnace method of producing triplesuperphosphate, a concentrate of extremely high plant nutrient value.

Fertilizer from Electric Furnaces

With electric furnaces using terrific heat at Muscle Shoals, Uncle Sam produces from these fossilized remains of long-dead marine life thousands of tons of highly concentrated phosphates, which cut down hauling and handling charges and have a remarkable effect upon soil productivity (Plate VIII).

TVA's output in the 1946-47 fiscal year was between one-fourth and one-third of the country's total production of concentrated superphosphate.

Teaching farmers everywhere what this concentrated phosphatic plant food can do to restore lost land fertility is one of the most valuable jobs TVA is doing.

All through this Tennessee River area I saw

how worn-out farms are being reclaimed by erosion control and cover crops, through judicious use of phosphate from the big plant at Muscle Shoals.

Near Ringgold, Georgia, I visited G. C. Benton's farm. Lately it was a sad example of erosion and overcropping. Then Benton's 17-year-old son Clarence won about \$1,600 worth of prizes in a State 4-H Club contest.

That boy, aided by a U. S. county agent's advice, put electricity and phosphate to work on his father's tired land. He's turning a worn-out cotton patch into a dairy farm. Among his prizes was a tractor, which his 15-year old sister Lyda handles as well as any man could.

TVA, as such, was designed especially to meet the peculiar problems of the Tennessee area. It couldn't be transplanted, in toto, to any other stream. But some lessons learned here could be applied to other streams. They are another story.



Harold Corried from Standard GII Co.

Bedouins, Camels, Goats, and Sheep, a Happy Desert Family, Camp Beside a Well at Al Jauf Sheep, about twenty blacks to one white, put heads against fat tails (center) and blindly follow the leader. Goats, corralled on the side lines, are more independent. A pipe line, gift of Americans who drilled here for oil, leads to a Diesel pump. Black goat-bair tents of the nomads date back to Bible times.

In Search of Arabia's Past

By Peter Bruce Cornwall*

ODAY no other part of Saudi Arabia's desert kingdom is so progressive, so Westernized, and of such immediate world importance as the Province of Hasa, a long, narrow strip of bleak land bordering the Persian Gulf.

Under its rocky surface American engineers have tapped an immense oil deposit at Dammam Dome and have also proved three other

rich fields.†

Some 4,000 Americans are now living in Hasa. A great refinery has been set up at Ras-at-Tannura (Plate X). Cottages, clubhouses, even a swimming pool, have been constructed.

A network of roads carries hundreds of trucks and motorcars, necessary to the working of this expanding industry, which is bringing wealth to Arabians and much-needed oll to Europe and America. But all of this growth is recent.

One hot day in September, 1933, American geologists came ashore and set up a small camp, headquarters for exploration that soon brought about one of the greatest oil develop-

ments in history.

Before that time Hasa was a secluded, forgotten land. A few Europeans had passed through on camels, a few others had landed briefly. Yet the history and topography of Hasa were little known. And no one knew what archeological treasures the region might possess (map, page 495).

As they went about their work, American oilmen came upon many thousands of round burial mounds. They picked up coins, beads, fragments of bronze weapons; they heard of statues and inscriptions, and saw evidences of

many old, contrasting civilizations.

First to Delve into Husa's Antiquities

In late 1940, I was suddenly given the rare opportunity to begin exploring Hasa. Thus I became the first archeologist to record its

antiquities.

Crossing the Pacific and Asia by air, I arrived at oil-rich Bahrein Island only a few days after it had been bombed by Italian aviators in a daring attempt to knock out the island's great oil refinery.

It was an odd time for a scientist to appear in the Persian Gulf. But the Bahrein authorities proved sympathetic, and before crossing to the mainland I commenced work by opening a number of the island's famous burial mounds. These round tumuli may number close to 50,000. They cover much of the northern quarter of Bahrein and range in height from a few feet to 82 feet. The largest, some 100 feet in diameter at the base, look like small pyramids.

Since American geologists reported that many acres of ground on the near-by Arabian mainland were covered with similar tumuli, it seemed possible that the mounds in both localities were relics of the same people.

The Bahrein Government generously put at my disposal an overseer with a gang of laborers to handle the pick and basket work. They were cheerful, willing men, often encouraging each other by shouts of "Yallah!" (O God!), or joining in a droning chant.

This custom of singing while at work is common in Arab lands, and Bahreini boatmen of the Shiite sect use for a chant the names of the grandsons of the Prophet, "Husain!" with a rising tone, "Hasan!" with a falling one.

Rings and Make-up Kits of Long Ago

I soon discovered that although most Bahrein tumuli belonged to the Bronze Age, at the northern end of the island were a few score elongated mounds dating from the Persian period and later.

In these I came upon plaster and rock cists containing skeletons, clay bowls, bronze finger rings, necklaces of beads, little make-up pots

for women, and small alabaster jars.

And just under the surface of a street in Manama, Bahrein's chief town, I uncovered a strange council chamber holding nine seats in

a circle (page 515).

The seats are un-Arab in appearance and seem to reflect Greek or Roman influence. The mystic number nine enjoyed special veneration in classical days. Who doesn't recall the nine Muses, or Lars Porsena's oath "by the nine gods"?

After more than a month's digging I crossed the shallow strait that separates Bahrein Island from Hasa. Then, with headquarters at Dhahran, the oil company's comfortable air-conditioned settlement, I set about making

* Dr. Cornwall has specialized at Oxford and Harvard Universities in Arabian history and archeology. His field work in Saudi Arabia was under the auspices of Standard Oil Company of California, the University of California, and Harvard University.

See in the National Geographic Magazine, "Guest in Saudi Arabia," by Maynard Owen Williams, October, 1945, and "Bahrein: Port of Pearls and Petroleum," by Dr. Williams, February, 1946.



Teacher's Pet Gazelle Emulates Mary's Little Lamb in the American School at Dhahran

Dhahran, an oil center, is a bit of the United States 6,600 miles from home. Here the American colony enjoys air-conditioned homes, swimming pool, tennis courts, soft-ball diamonds, and hospital. Boy Scouts and glee club carry on the tradition. Two Americans and one Arab conduct a school for 50 children. To this wild-life class, teacher doubtless explains that English owes the word gazelle to the Arabic ghazal.



Harold Carelat from Standard Oil Co.

Oil Drum and Tin Can, Beaten by Hand, Serve a Hot Arab Band Deprived of Instruments

Not only music but liquor and tobacco are tabooed by the Wahabis, the puritanical Moslem sect controlling Saudi Arabia. These men, possibly Bahreinis, were found working on the 31-inch line of the Trans-Arabian Pipe Line Co. running from the Persian Gulf to the Mediterranean. an archeological survey of the Province.

Field trips were made in two pickup trucks, my usual companions being an American geologist, two Arab drivers, and an armed soldier.

My first objective was a visit to the small port of 'Oquir,

Close to that place there is a ruin-field which some scholars believe may mark the site of ancient Gerrha, one of the "lost cities" of Arabia.

In Greek and early Roman times Gerrha was a famous emporium of the Middle East.

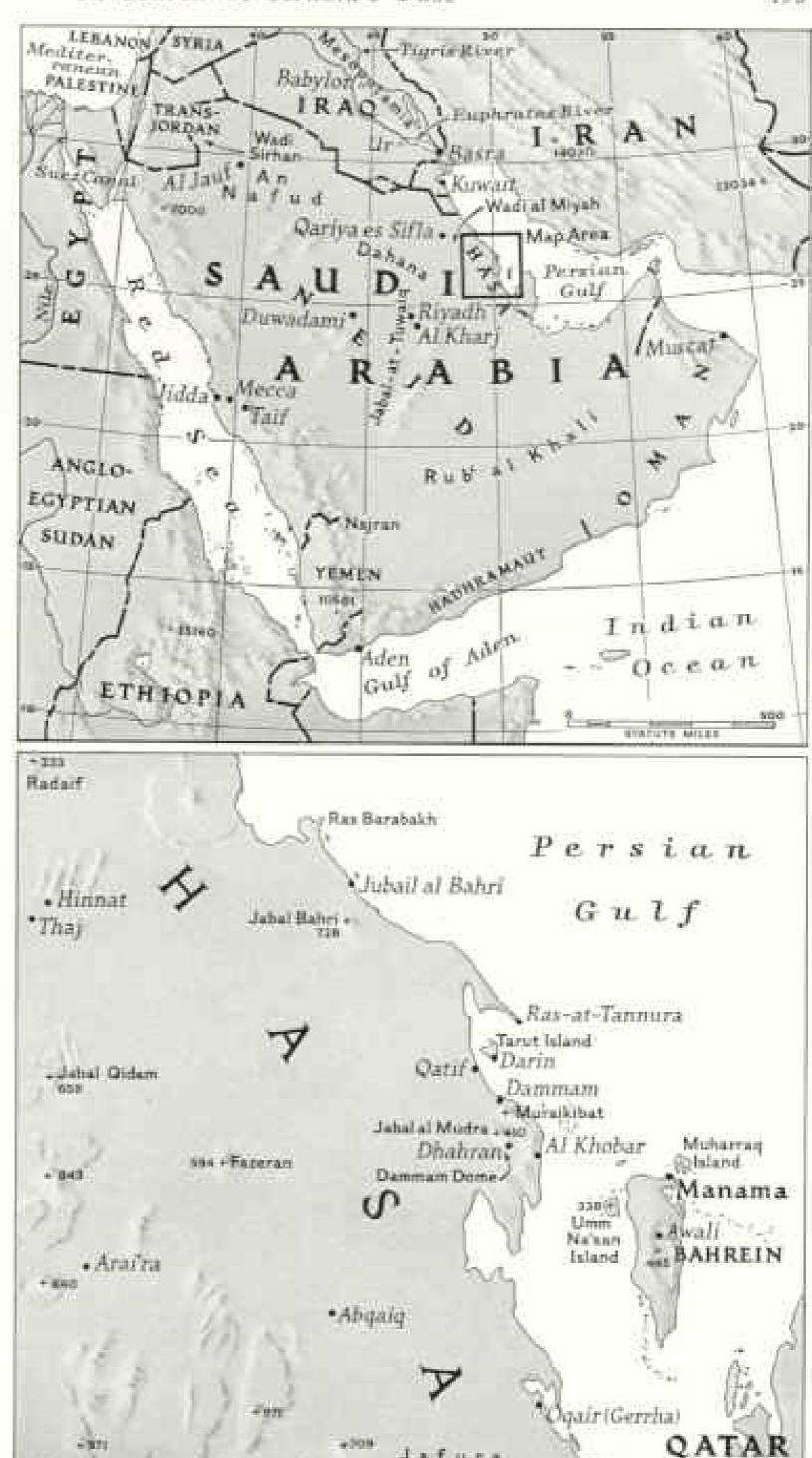
It probably was founded by Chaldean refugees from Babylon, and into its warehouses poured tons of frankincense, spices, and many other goods from south Arabia, India, and even Africa.

At that period the trade routes linking Europe with the "fabled East" ran through the Persian Gulf and Arabia, rather than the Red Sea.

So the merchants of Gerrha grew ever richer, till they were said to rival the famous Sabaeans, and to possess "a great quantity of wrought articles in gold and silver, as couches, tripods, basins, drinking vessels."

The doors, walls, and even the roofs of their houses were reported to be inlaid with "ivory, gold, silver, and precious stones."

From Gerrha's landward gates long caravans trailed off into Arabia, making for the



Araby's Sands Yield Clues to Ancient Man

Hofuf

STATUTE MILES

Jafura

Desert

The Persian Gulf region, haunt of Sindbad the Sailor, is famous for its petroleum pools, pearl fisheries, and mysterious sepulchral monuments. Digging into Bahrein Island's mounds, the archeologist-author identified the builders as the Dilmunites, long lost to history. Close to 'Oqair, he rediscovered antiquity's ruined city of Gerrha. Medieval Chinese coins proved an Arabian commercial link with the Far East,

Hadhramaut, the Red Sea ports, or the Mediterranean.

But long before the Middle Ages, Gerrha had dwindled and sunk into obscurity. By the 19th century its very location was uncertain,

Some scholars pointed out the similarity between the names Gerrha and 'Oqair, so this report of a big ruin-field in southern Hasa sounded promising.

"Like Small Bugs in a Sand Pile"

To reach 'Oqair we drove southward from Dhahran, passing through the mountainous dunes of the north Jafura Desert. Often these dunes are a hundred feet high, with a steep drop on the southern face.

One moment we might be climbing steadily; the next, our car's front wheels were at the brink of a void, with a sharp incline falling away to a pebbly surface far below. Then the car had to be backed, swung about, and taken off on a wide detour.

So our pickups, equipped with wide lowpressure tires, proceeded rather like small bugs in a sand pile—weaving back and forth, climbing, sliding, and changing course a hundred times (Plate VII and page 520).

We traveled by compass, finally turning eastward and coming out of the dunes close to where 'Oquir's clustered buildings overlook the deep-blue waters of the Gulf,

Just northwest of the harbor lay a vast ruin-field, littered with potsberds and pieces of colored glass. Stone foundation walls twisted whitely through the debris, while here and there were a few piles of coral building bricks.

Here was indeed the sarcophagus of ancient Gerrha. But no buildings or inscriptions were visible and no pillars; nothing save acres of dreary rubble, over which a few gulls hovered and called shrilly.

Pliny, Rome's "human encyclopedia," wrote that Gerrha "measures five miles round and has towers made of squared blocks of salt."

Strabo, the Greek geographer, adds: "The soil contains salt and the people live in houses made of salt; and since flakes of salt continually scale off, owing to the scorching heat of the rays of the sun, the people frequently sprinkle their houses with water and thus keep the walls firm."

It is a fascinating picture—a great city built entirely from blocks of snow-white salt, the inhabitants running about with pails of water and dashing the contents onto sizzling walls.

The probable explanation is less romantic. No actual salt beds exist near by, but the flat sabhka areas are extensive. In this clayey soil the percentage of gypsum and crystalline salt is high, and bricks made from it would have been subject to strong chemical change.

So Strabo must really be referring to the effect of efflorescence on saline mud. It is easy to understand why in time this "salt city" crumbled away, leaving nothing above its stone foundations.

I found the country around 'Oqair barren, wind-swept, and all but waterless. About 205 B. c. a Seleucid monarch, King Antiochus III, sailed hither with a fleet, intending to reduce the city of Gerrha and the neighboring tribes. One look at this sterile region made him abandon all idea of a permanent occupation.

Early Search for Peace and Freedom

So when the Gerrhaean chief sent him this message: "Destroy not, O King, those two things which have been given us of the gods—perpetual peace and freedom," Antiochus settled for a large tribute in silver and precious stones, and then sailed away.

On our journey back to Dhahran we met only two Arabs, one coming out of nowhere at the head of three scrawny camels, the other with a falcon on his arm. He was perhaps hoping to bag a desert bare—pale-colored and very small.

When done in the grand manner, Arabian hawking is carried out by a party of mounted men, accompanied by lean salukis (grey-hounds). Black slaves carry the birds, which are hooded with small leather helmets, often red or green and richly ornamented with gold and silver thread.

If a fleet gazelle is the quarry, the falcon will swoop down from on high, dig claws into its head, and fiercely peck at the terrified creature's eyes until it is blinded and can no longer escape the pursuing greybounds.

But game is scarce along the Hasa littoral, and even the restless Bedouins seem to avoid this region. Geologists believe that many thousands of years ago Hasa was comparatively free of sand, that rainfall was much heavier, and that trees and lakes were common.

Dunes Move Before the Shamal Wind

With a change of climate and of wind direction, Arabia began to dry up. Coming from the northwest, drifting dunes began rolling down into Hasa. They have never ceased to come, nor to encroach on the various oases.

Moving 40 to 50 feet a year under the impact of the *shamal* (northwesterly) wind, giant dunes have passed over many ancient towns and gardens. Near 'Oqair, for instance, where once stood a large date grove, there is



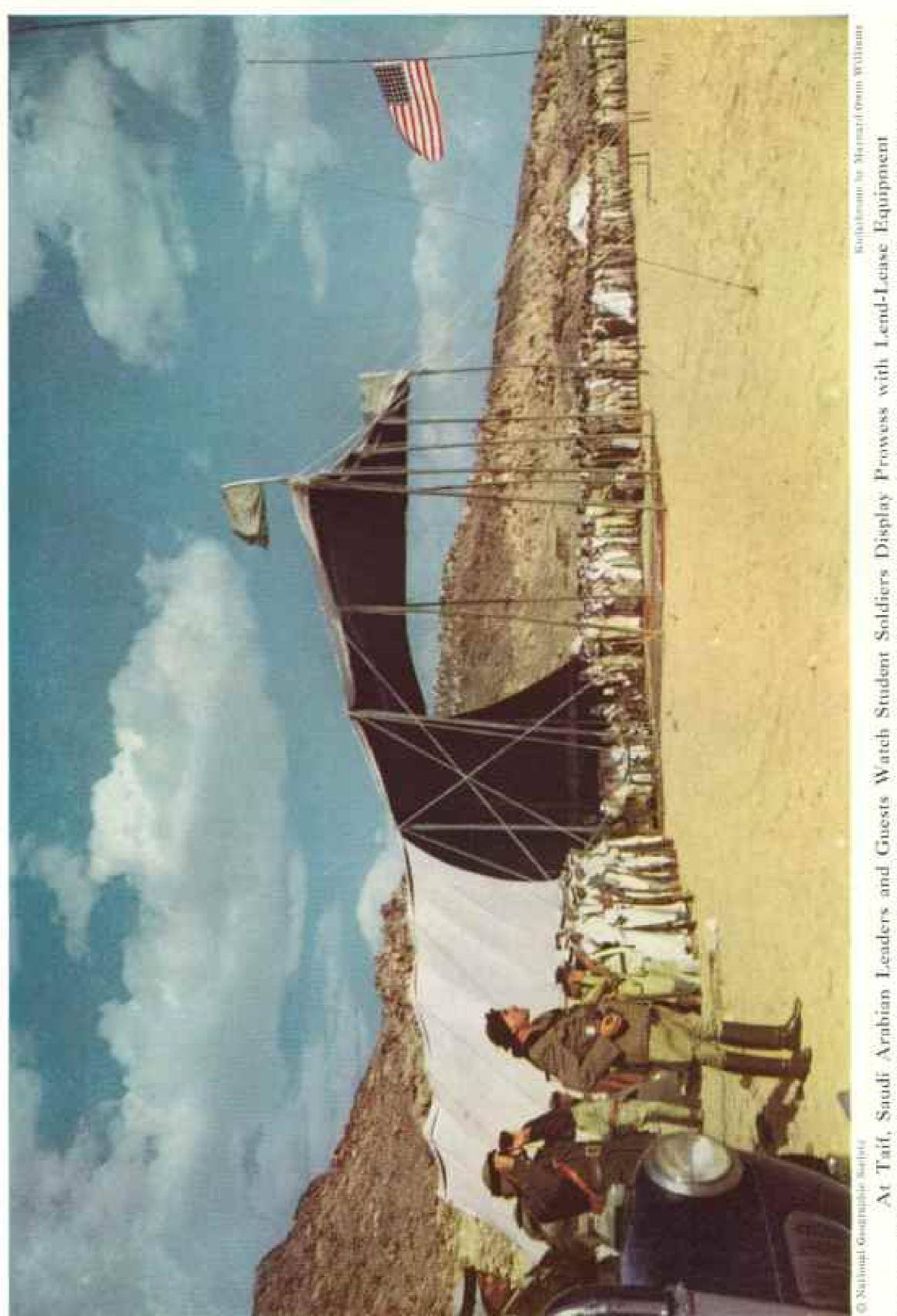
King Abdul Aziz al Saud, Architect of the New Saudi Arabia, Builds with Oil Millions For every barrel of petroleum Americans pump from his desert sands, His Majesty receives 21 cents.



(2) National Geographic Society

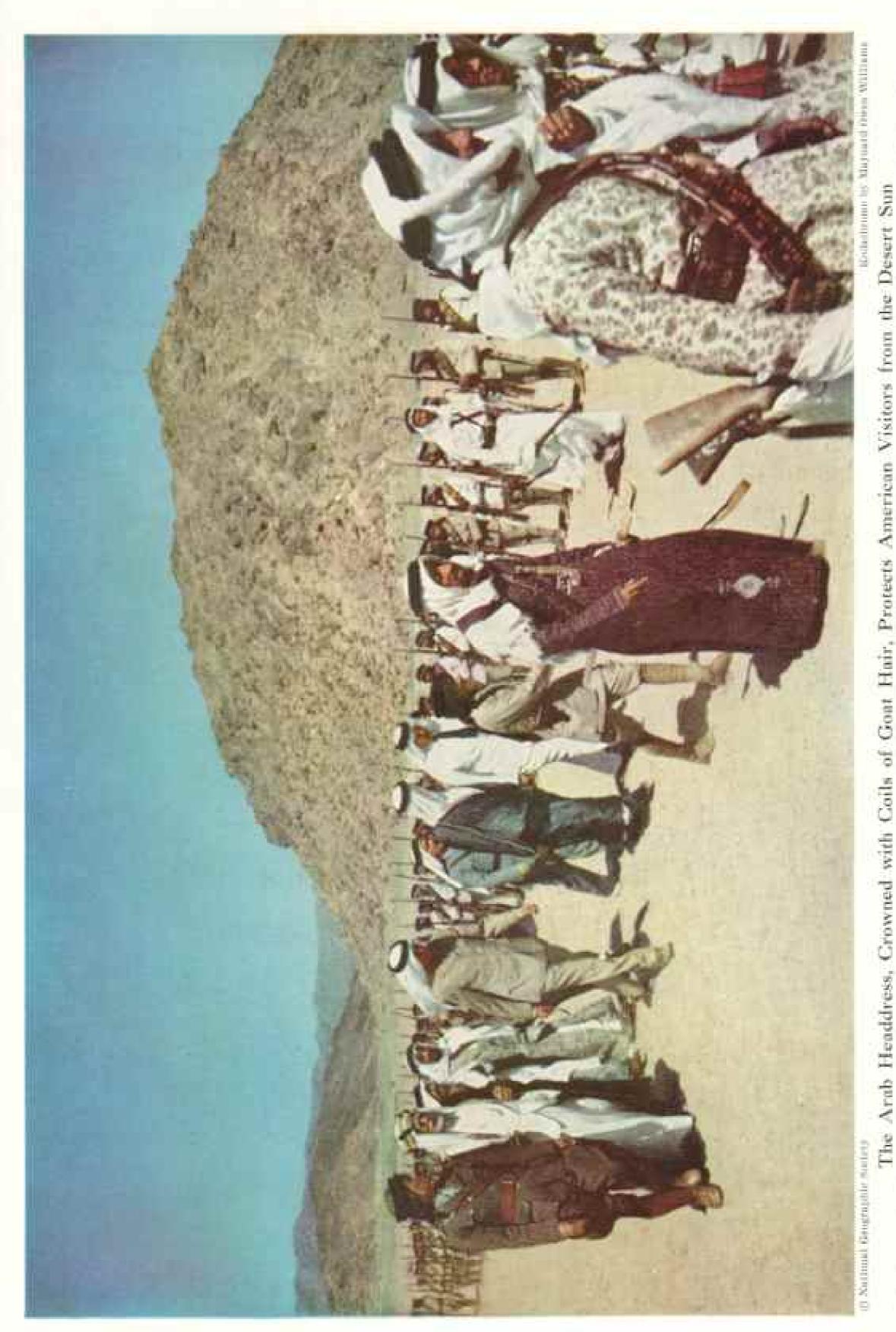
Kotherhronies for Maymand Ovies Williams

Side Arms and Cartridge Belts Complement Well-dressed Arabs' Gowns and Shawls
These desert stalwarts gathered at Taif, summer resort amid the barren hills behind Mecca, to witness
graduation exercises of the Student Officers Training School.



Exercises closing a 3-month training course during World War II coincided with Franklin D. Roosevelt's death; hence the half-masted dag. Officers (left) observe a

marksmanship test.

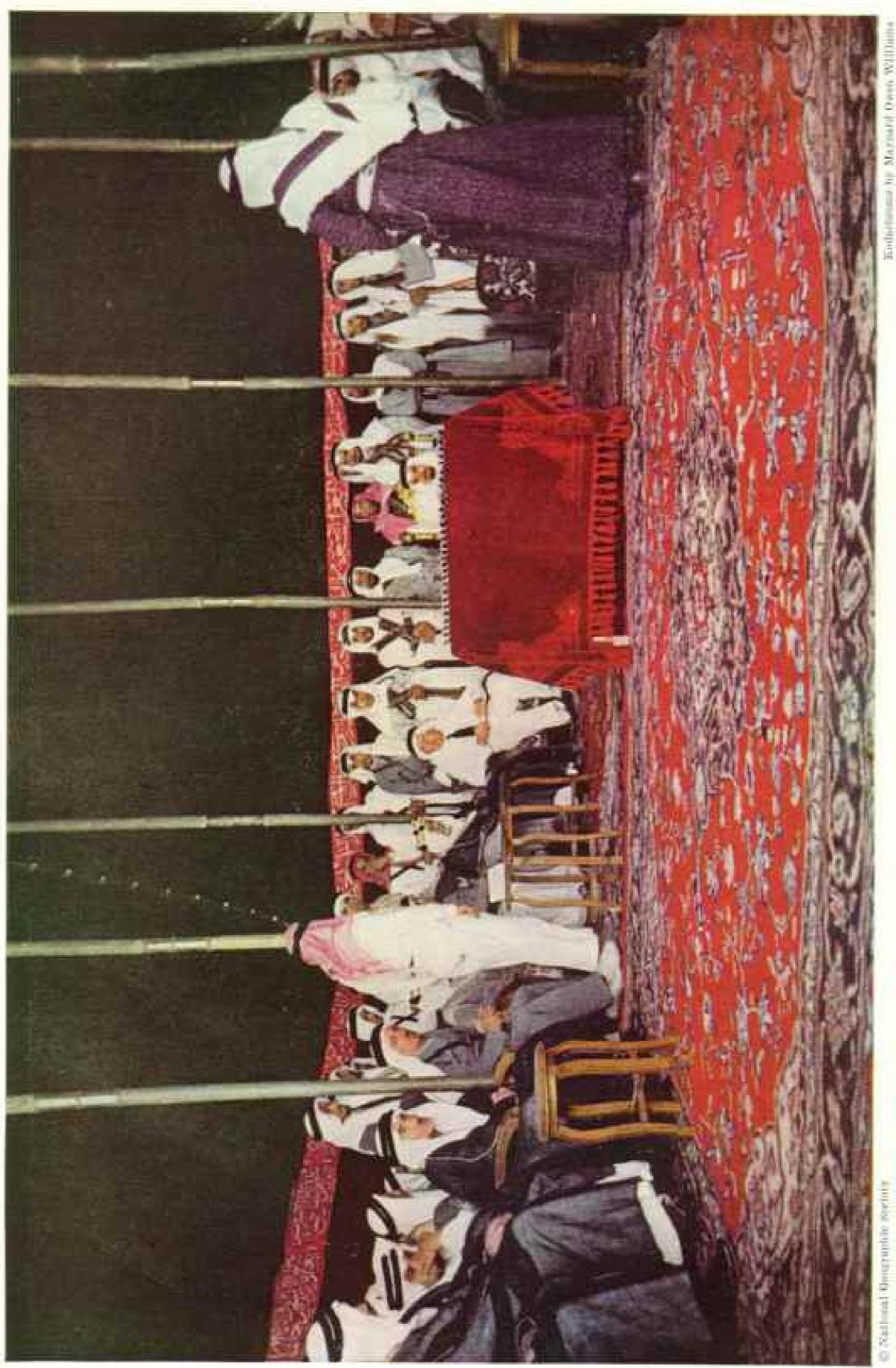


Col. Garrett B. Shomber, head of a World War H training mission, and Col. William A. Eddy, former United States anyog (in white suit, center), flunk Prince Mansur,
 Minister of Defense, as they arrive for a military demonstration at Tail (Plates V and VIII).

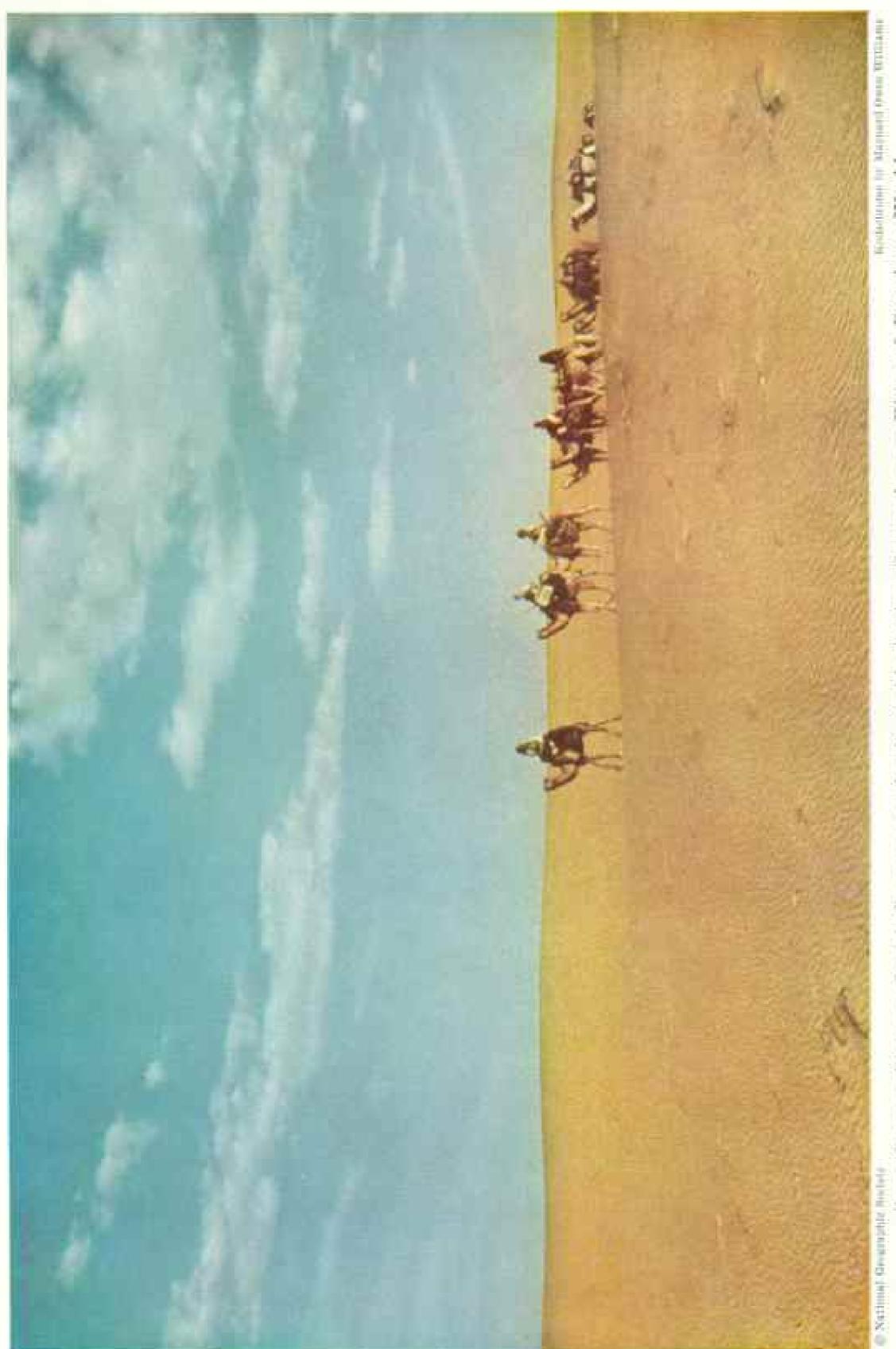


Though Tribal Warfare Belongs to Saudi Arabia's Past, Bedouins Like These Seldom Venture Forth Without Rifles
Under Klag Abdul Aziz al Saud's modernization program, many of his subjects have abandoned the role of nomand to till the soil in Gevernment-sponsored agricultural
communities. This group saw some and brothers complete a wartime course in the use of American equipment.

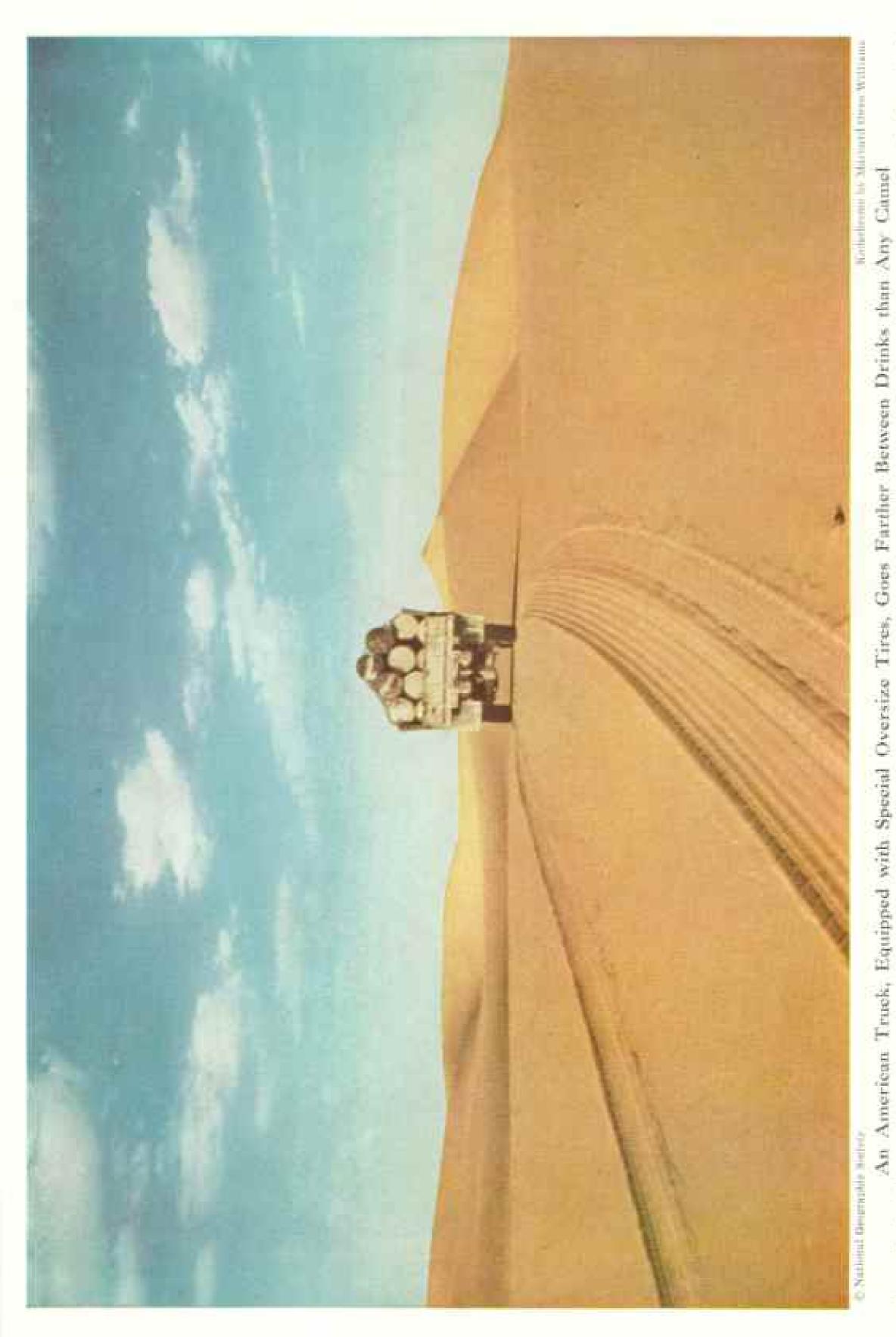
IV



Prince Mansur, Minister of Delense, occupies a gilded thronelike chair behind the table. Karl S. Twitchell (standing, left), confidant of King Abdul Aziz, translates Arabic into English for American guests. Col. William A. Eddy (center), former U. S. Minister, weats Arab headdress. Under a Geremonial "Big Top" at Taif, Diplomas Await Arabian Military Specialists Trained by Americans During the War

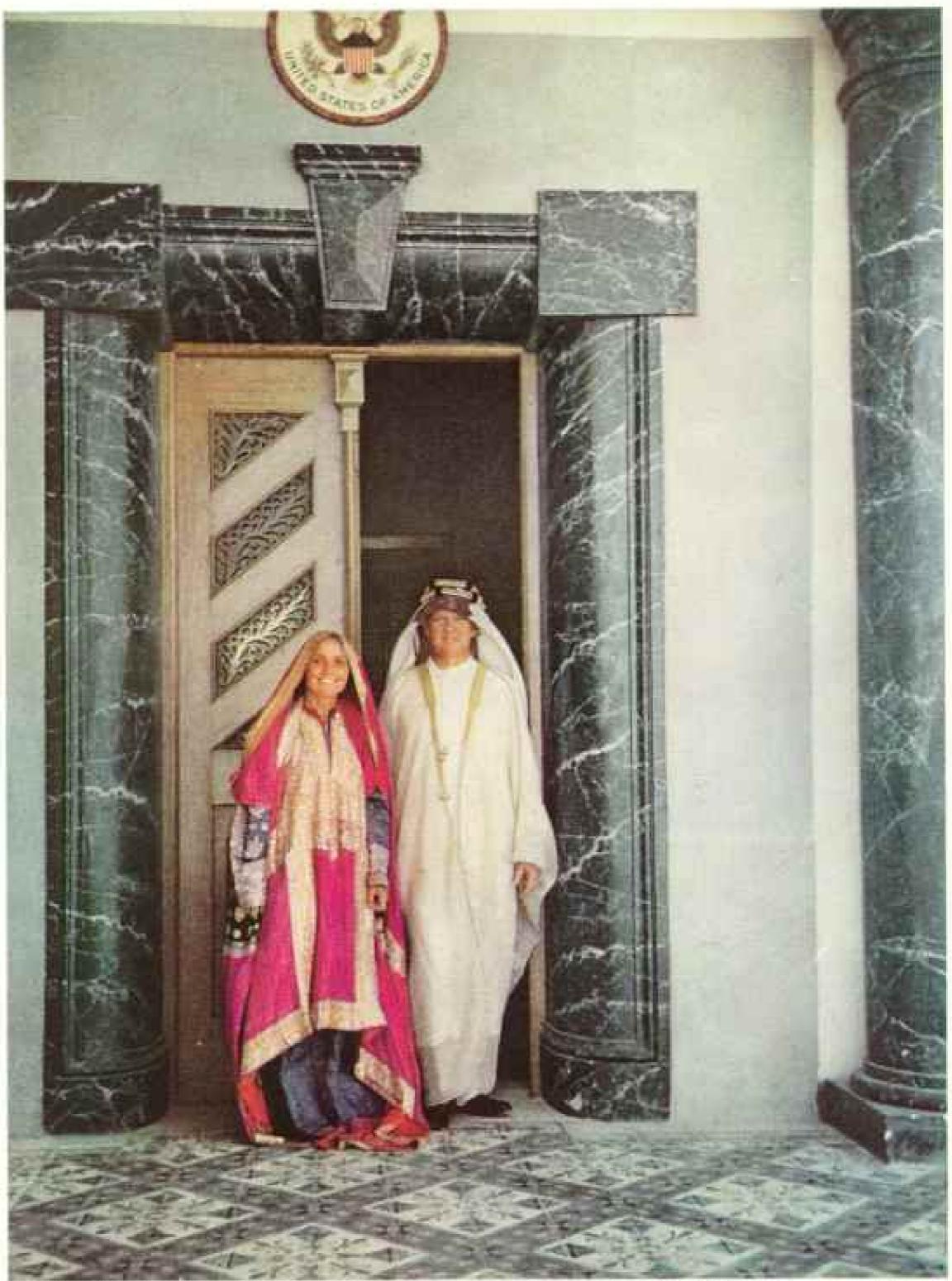


Trucks and tractors, driven by American-trained ex-normads, displace "ships of the desert" like these plodding across the Dahana dunes. Experts have recommended systematic breeding to produce camel hair for export. Ever Searcer Become Camel Caravans as Saudi Arabia Rushes Forward on a Wave of Petroleum Weilth



A new kind of "footprint" on the sands symbolines oft-rich Saudi Arabia's modern trend. This Diamond T "six-by-six" tackles the dums between the American Agricultural Mission at Al Kharj and the Arabian American Oil Company's Ras-ar-Tannura refinery.

The National Geographic Magazine

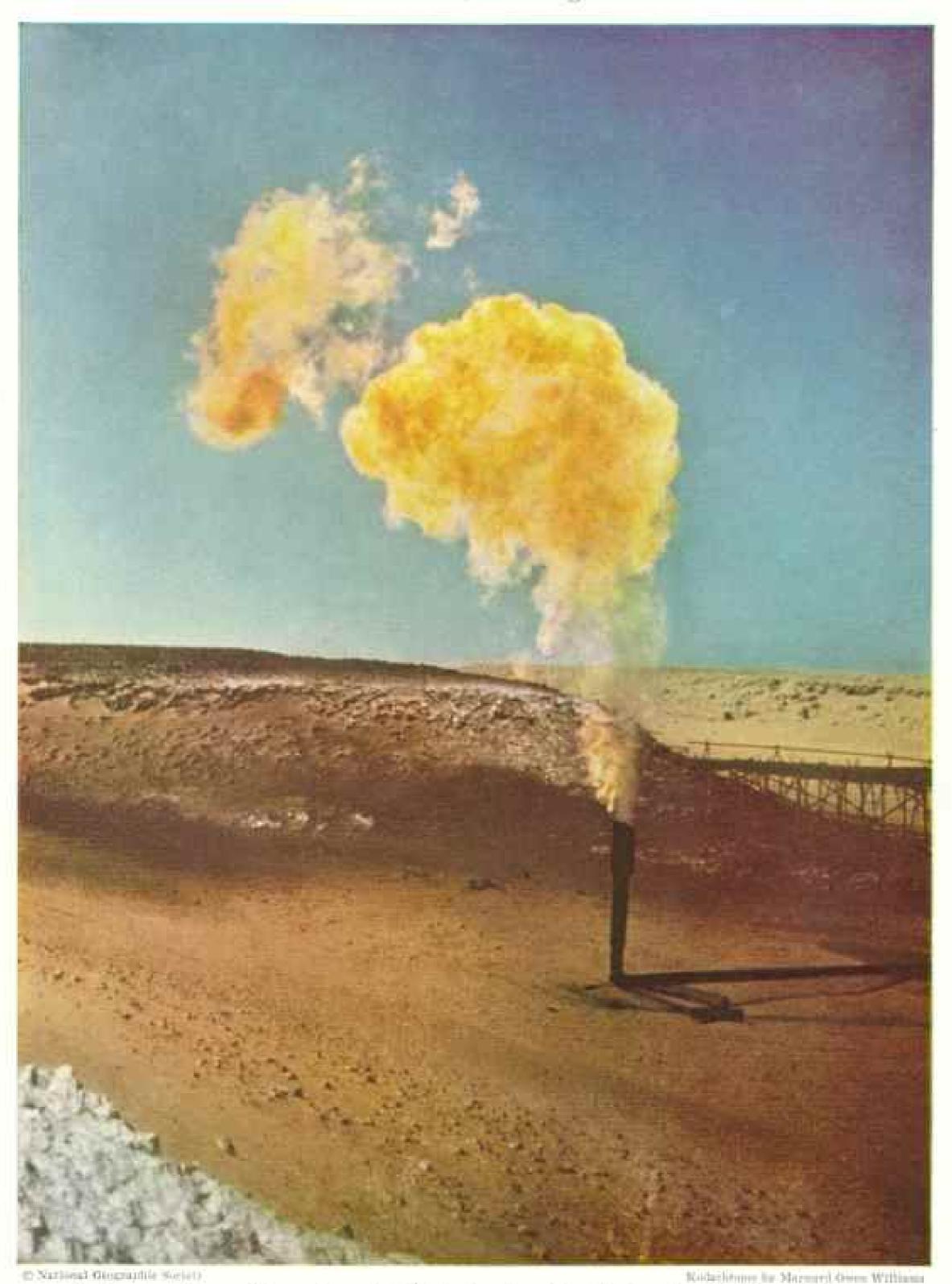


Sational Congrephic Society

Keiferinsme by Marnaut thesis Williams

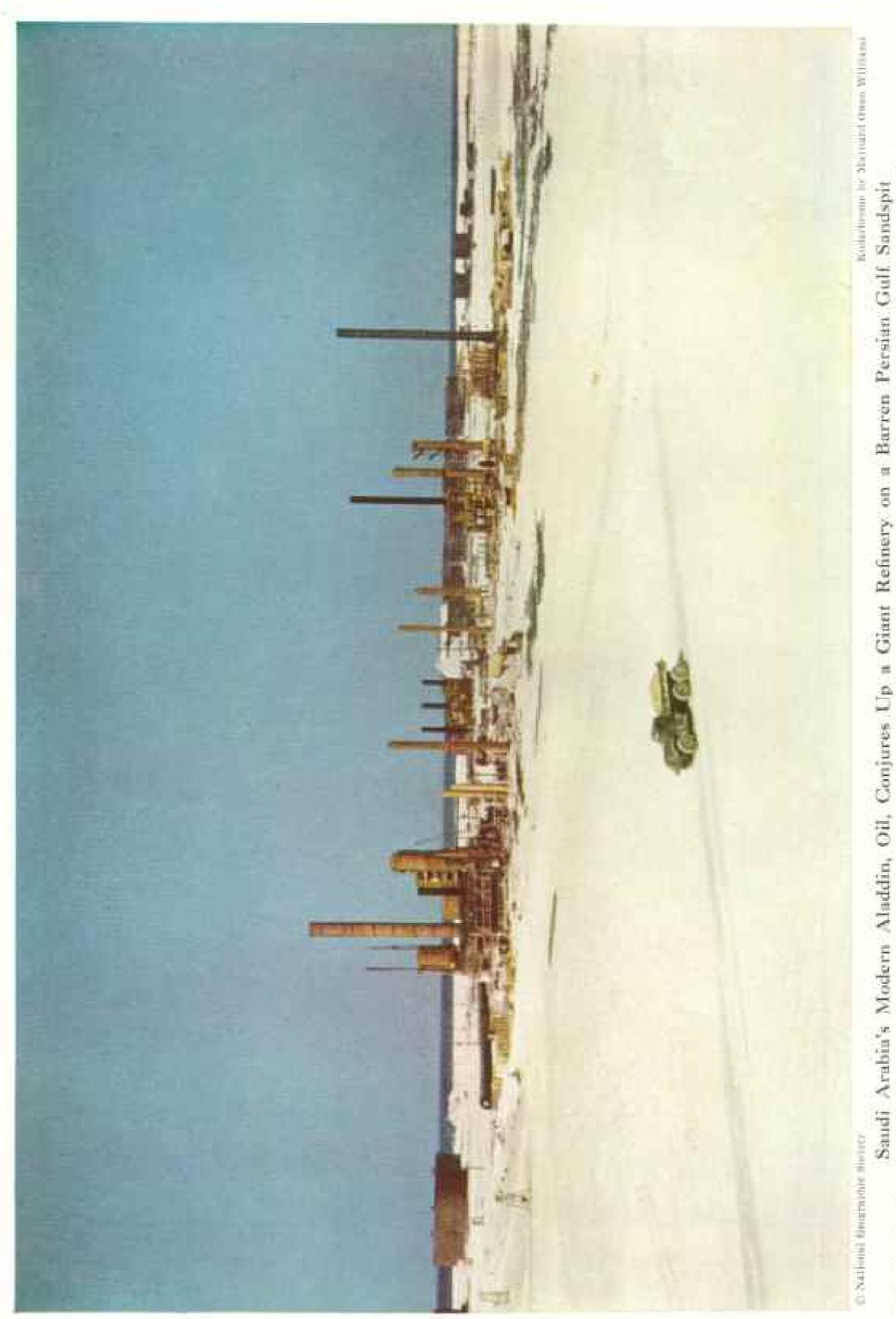
An American Envoy and His Wife Put on Arab Dress and "Welcome" Smiles

Col. William A. Eddy, former United States Minister to Saudi Arabia, and Mrs. Eddy wear costumes presented by King Abdul Aziz al Saud. They stand in the doorway of the Legation at Jidda, formerly the home of a wealthy Syrian merchant. Colonel Eddy now is a consultant on Middle East economic affairs.



Poisonous Gases, By-product of Oil Production, Vanish in a Tall Pillar of Flame

Such flares burn night and day near the Arabian American Oil Company's wells at Dhahran. They consume noxious material which, if allowed to spread unchecked, might cover the near-by refinery area. A friction spark or a truck's backfire could ignite the tumes and touch off a catastrophic blaze.



This Arabian American Oil Company plant #1 Ras-at-Tannura, incomplete when photographed, now turns out about 115,000 barrels of feel a day. Under construction is a 51-inch pipe line from the refinery to a Mediterranean outlet at Sidem, Lebanon.



Oilmen Ride a Launch to Their Persian Gulf Outpost

Manned by Arabs, this coaft plies between Al Khobar, on the Saudi Arabia mainland, and Manama, near another American concession on Bahrela Island.

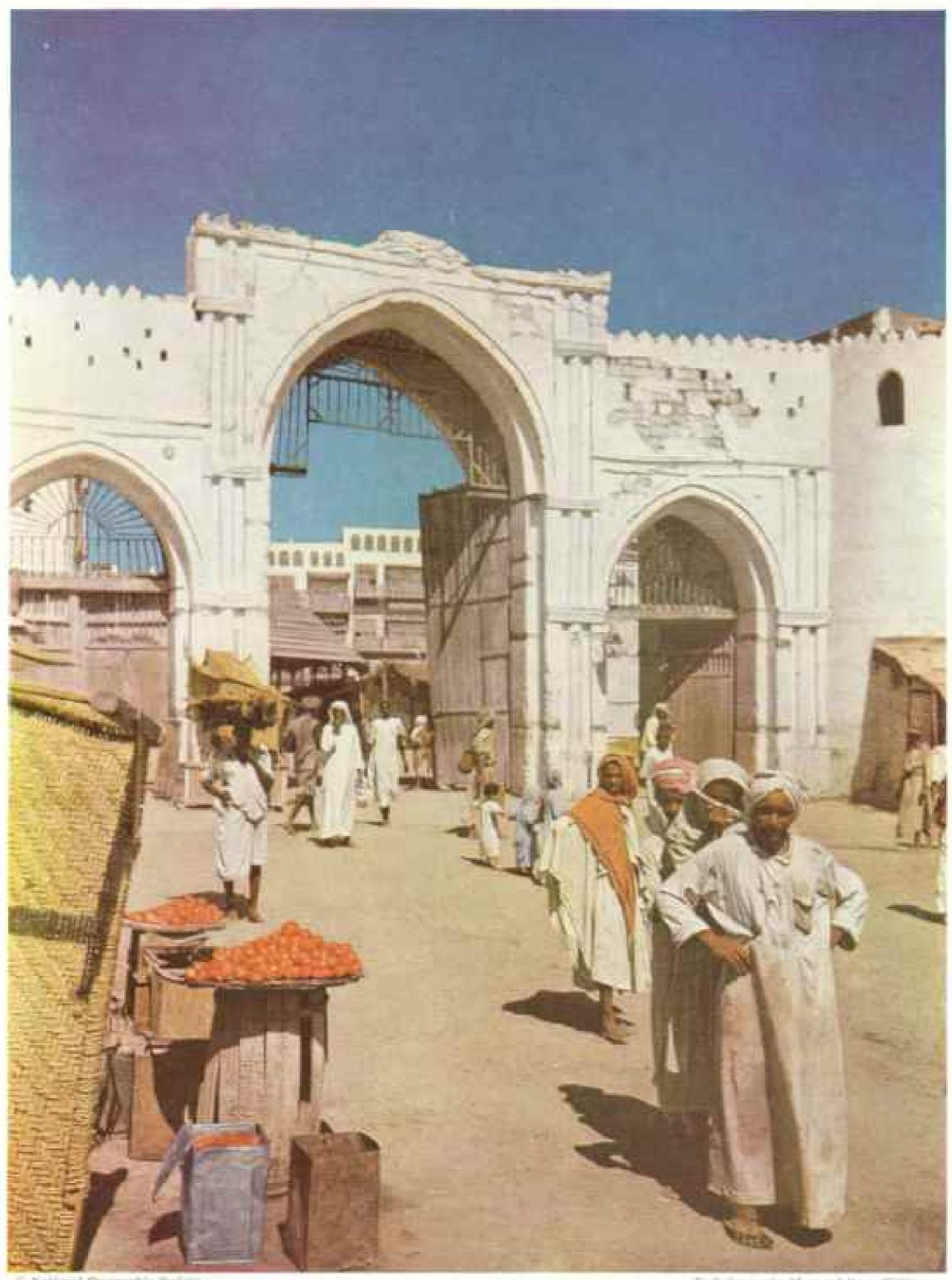
Obstruct Ocupation South Marke the Man in Saudi Arabia,

Too

The shopkeeper (standing) wests skullcap, gown, and wide trousers. He visitor favors a head shawl, goat-halr crown, and gold-embroidered aba.

XI

The National Geographic Magazine

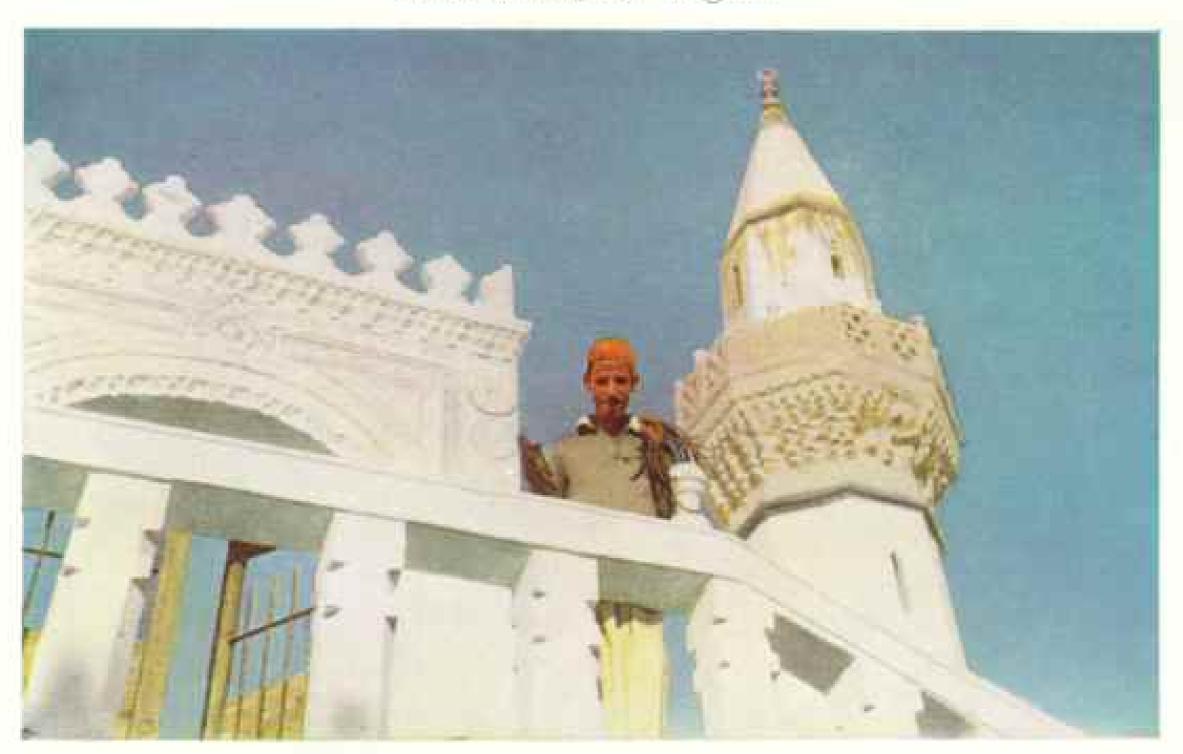


fi National Gaugraphic Belieur

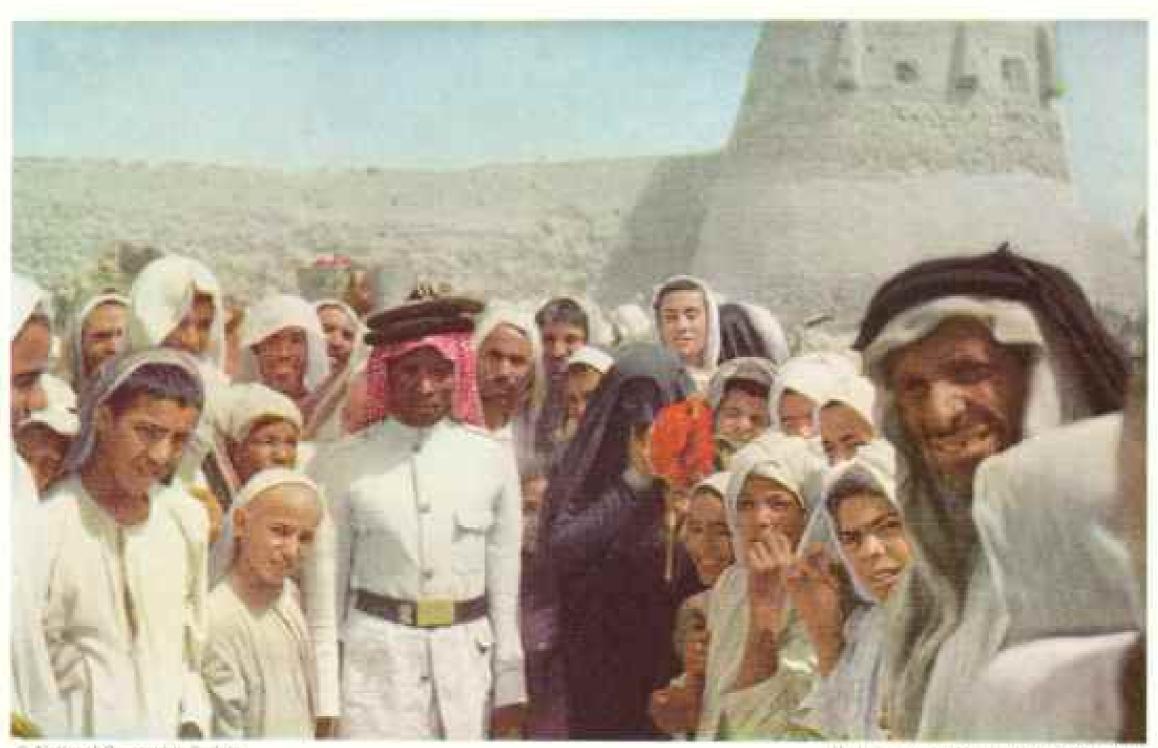
Radioference for Majorard Ower Williams

Blinding White Walls under a Deep-blue Sky Make Tall Jidda Seem a Spotless Town

Though gates sag at the hinges, smake-blackened oil tins replace graceful pottery, and packing cases serve as fruit stands, this city on the Red Sea still holds glamour. As gateway to Mecca, Jidda annually attracts Mostern pilgrims from Asia, Africa, Indonesia, and the Philippines.



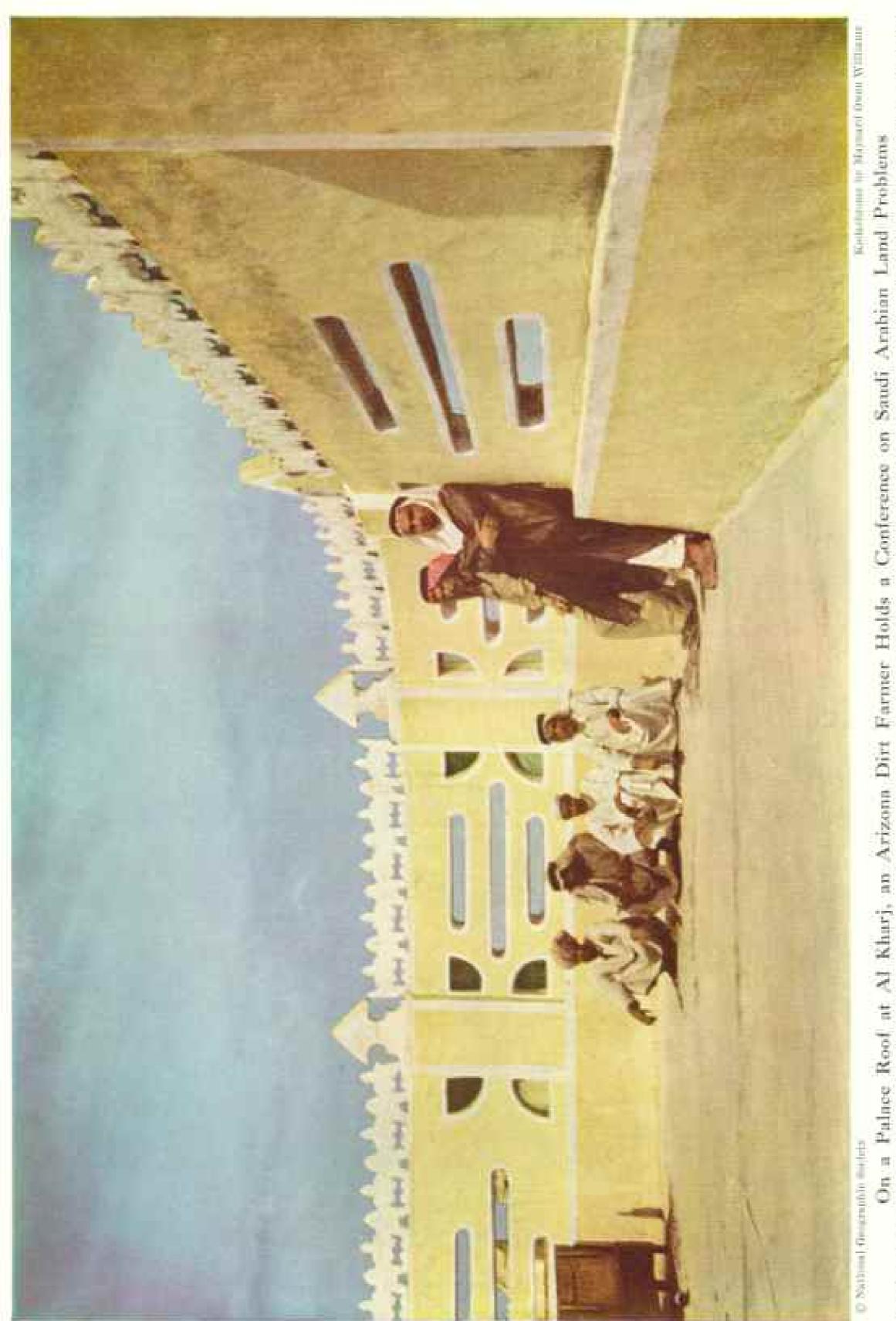
Whitewashed Stairway and Gleaming Minaret Form Cubistic Patterns under the Sky of Jidda



C National Congruptor Section

Redechemors by Mariani Ossa Williams

An Arab Policeman, Honoring a King's Guest, Lets a Camera Look into a Woman's Eye in Hoful's market place her red yarn attracted the photographer. Moslem law decrees that women live in obscurity, but this one volunteered to pose. She was supported by the officer and crowd.

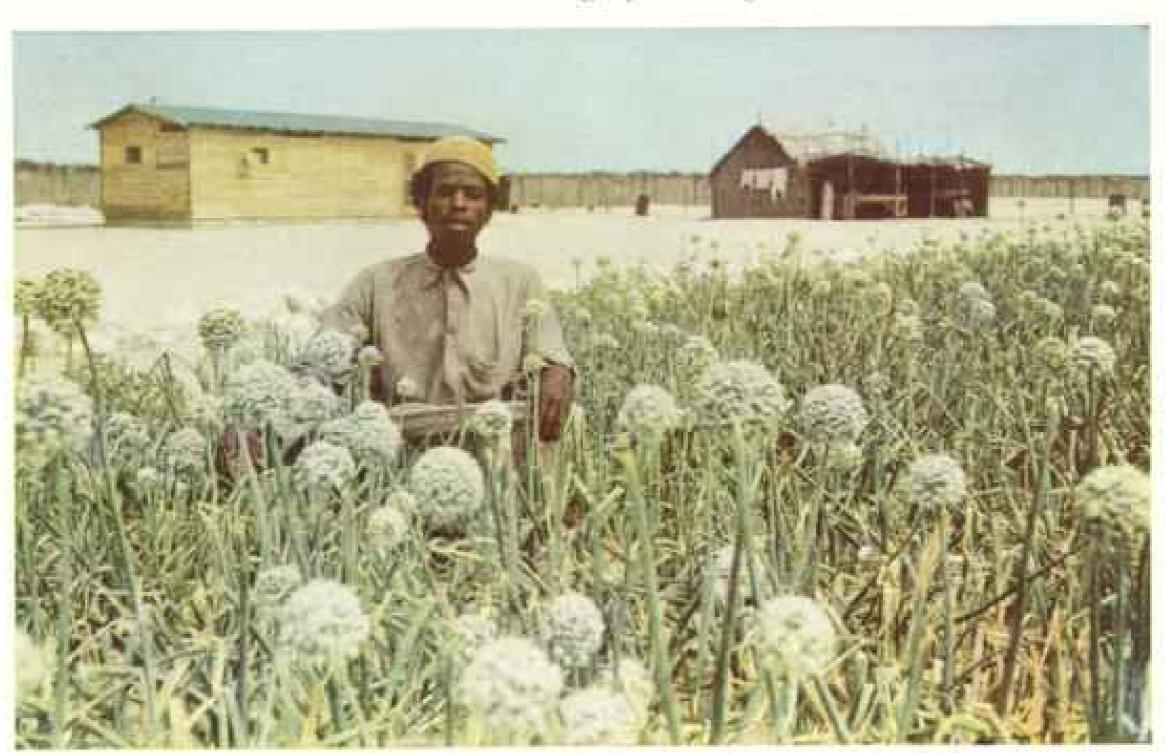


David Rogers (second from right) headed an American agricultural mission seeking to provide fields where nominds could jettle down and take food for their feders work.



contrast with traditional abir (gown) and kofflych (headdress) worm by others of the King's retimes. Two went cereminal dargers and earny richly carved swords. men (lett) Western-style tunics and breeches (center and extreme right)

The National Geographic Magazine



Near Dhahran, Flowering Onions Recall Wartime Days when Food Was Scarce
American refinery workers planted these and other vegetables when the Axis menaced the Persian Guli approaches.

They were allowed to go to seed when shipping was resumed.



Surjound Beographic Seriety

Kedamtunes by Massani Hwen Williams

A Desert Dairy near Al Khobar Provides Milk for Oilmen Far from Home

Output of these cattle was vital to Americans in Saudi Arabia when Rommel was at El 'Alamein. Now there is plenty of condensed milk from the States, but the cows remain on the oil company's pay roll.

now only a sea of sand, above which some stunted palm trees poke their shriveled heads.

Not to have found any inscriptions or other good relics in Gerrha was a big disappointment.

To make matters worse, I woke up at Dhahran next morning to find myself locally infamous. The oil company's manager asked to see me, and when we met he asked in a worried tone, "Where is that elephant?"

"Elephant?" I repeated.

"Yes, the big elephant you found at 'Oqair."

My Arab companions, it developed, had disliked having no "news" for their friends. So they reported that I had found an immense stone elephant at 'Oqair which had been hauled away by our cars, to be crated and sent off to a distant land.

In the excitement the elephant grew ever greater, and with it indignation that such a national treasure should be removed from Saudi Arabia!

I weathered the storm, but have often regretted that in this particular case smoke was

unaccompanied by any spark of fire.

The most interesting locality in all Hasa is that around Dhahran, the oil company's principal base. Here is a great bowllike rim-rock structure, and the outer slopes of this depression are sprinkled with thousands of the same sort of Bronze Age burial mounds as those on Bahrein Island.

Some of the mounds at Dhahran are encircled by a low rampart of gravel, presumably to prevent too close building of other mounds. One mound has a peculiar "avenue" leading from it—two parallel walls 60 feet in length, facing due north.

In places these conical tombs cluster in such profusion that they resemble a cemeterycity or a settlement of gigantic prairie dogs.

In Bahrein, as well as Hasa, the smaller mounds cover a stone cist; the larger ones contain at least one tomb chamber, made of stone blocks and occasionally plastered. Where there is a doorway, it faces southwest, W. 25° S. being the most frequent reading.

What can be the reason for this orientation? Did the mound builders come from that

direction?

A possibility is that, when one of these tombs was constructed, its entrance was oriented toward the evening star. For astronomers calculate that the range in azimuth of the tomb entrances corresponds fairly well with that of Venus at sunset. And we have plenty of evidence that the worship of a mother-goddess, often identified with the planet Venus, is immeasurably old in this part of the world.

It was only after months of excavation, plus years of research, that I established the identity of the people buried within these Bronze Age mounds,

They were known as the Dilmunites; their king ruled over both Hasa and Bahrein Island. For at least 2,000 years, from 2,500 to 500 n. c., they fought and traded with Sumerians, Assyrians, and many others.

The Dilmunites never attained the high level of culture reached by the kingdoms of Mesopotamia. Except for one cuneiform inscription found on Bahrein, all our written sources for Dilmun come from the Babylonians and Assyrians.

These records, inscribed in wedge-shaped script on clay tablets or on stone, tell that Dilmun was a "holy land" to the Sumerians. To the island of Dilmun (Bahrein), Ziusudra, the Babylonian Noah, went to live after the Great Flood.

To this land, too, the demigod Gilgamesh journeyed to learn the secret of life from the wise Ziusudra, he who had been given eternal life "like unto the gods."

Dates Exported in Early Times

Other tablets actually suggest that Dilmun was an earlier home of the talented Sumerians, where they may have dwelt for a time before settling in the valleys of the Tigris and Euphrates.

Detective work among crumbling clay records has produced much other information about this very early Arabian kingdom.

For example, the chief export of the country was dates. They were evidently as highly esteemed as the amber-colored, semitransparent fruit of modern Hasa, which is shipped to all parts of the Arab world.

We learn, too, that the special deities of Dilmun were the god Inzak and his consort Lakhamun; that about 2360 B, c, the famous Sargon of Akkad, having conquered Dilmun, carried away its ships as spoils; and also that even earlier the princes of Lagash sent southward to the Dilmunites such useful articles as wheat, cedarwood, cheese, and shelled barley—all sent in exchange for copper ore, which the venturesome sailors of Dilmun got from the country we call Oman.

During Assyrian times the kingdom of Dilmun became the object of a Hitlerlike "pressure-campaign," for the Assyrians were determined to make the country tributary to their empire. So in 689 B. C., when Sennacherib destroyed Babylon, he cunningly sent to Dilmun some of the brown dust that had been this far-famed city.

Evidently the "present" had considerable

effect, for Assyrian records proclaim: "The Dilmunites looked upon it (the dust), and the terror of the fear of Ashur fell upon them and they brought their treasures. With their treasures they sent artisans, mustered from their land, carriers of the head pad, a copper chariot, copper tools, vessels of the workman-ship of their land. . . ."

In the reign of Sennacherib's grandson, the luxurious and cultured Ashurbanipal (the Asnapper of Ezra 4:10), Dilmun is mentioned

in a list of Assyria's provinces.

So it seems that eventually the Dilmunites had to yield to Assyria and "take the oath

of allegiance by the great gods."

In the early Bahrein mounds, most of which probably date from the second millennium B. C., I found human skeletons, pottery, bronze weapons and tools, as well as ostrich-egg shells and parts of ivory boxes.

Many tomb chambers also contained the bones of a ram or sheep, evidence of a blood sacrifice—a custom that Islam has never entirely uprooted in this region. Even today the figureheads of Bahrein boats are sometimes covered with the skin of a sheep or ram.

Home of Early Pirates

Where the Dilmunites originally came from remains a mystery. Yet there are reasons for believing that they drifted up from southwestern Arabia.

In their new home they must have taken rapidly to trade—and piracy. For at that time (perhaps not long after 3000 s. c.) there already sailed past this coast ships engaged in commerce between Mesopotamia and lands lying to the south: India, Oman, south Arabia, and places whose identity is still in doubt.

During navigation's infancy it was the custom to hug a shore line. The Iranian coast of the Gulf is so much more inhospitable than the Arabian one that even modern steamers prefer keeping near the western shore.

So the Dilmunite kingdom lay athwart the earliest sea-trading route of which we have

any certain knowledge.

The goods carried northward included goats and copper ore from Oman, frankincense and myrrh from south Arabia, teakwood from India; also linen, diorite for statues, ivory, precious stones, and no doubt, "apes and peacocks."

Soon after my arrival at Dhahran, an American engineer told me that at Duwadami, in the very heart of Arabia, a "large arrowhead" had been dug up during construction of water tanks.

When he brought it forth, I recognized that he had made an exciting discovery, for it was a finely shaped hand ax of the Lower Paleolithic period (page 518). This weapon had been fashioned and used by some Acheulean man perhaps a hundred thousand years before Christ!

Link Between Africa and Palestine

It was a hint of the archeological treasures that must lie concealed in the center of Arabia, territory still completely unknown to prehistorians. For Arabia was a link between Africa and Palestine.

Before leaving for the Middle East I examined many aerial photographs of the Dhahran area with a magnifying glass. One place especially struck me as being a likely spot for finding traces of Stone Age man.

This was Jabal al Mudra, known as the "Shield of the North." This hill, whose summit is 410 feet above sea level, has a wide rock "bench" or terrace about a third of the way up. I suspected that its commanding position would have made it a natural port of call for early hunters.

Therefore, it was with a feeling of anticipation that I first climbed up to examine the rock bench. Here and there on its flat surface were small burial mounds; but what drew my instant attention were many bright flints lying on the ground between them. Recent rains had washed them clean.

I spent several days collecting flints and packing them away in small canvas sacks. They included scrapers, points, cores, and rejects, of various interesting techniques.

Some of these tools probably were made by the earliest mound builders; others seem to have been fashioned by true Stone Age men, but men far nearer to us in time than were the primitive Acheuleans who must have roamed central Arabia.

While I was gathering these artifacts, two young Bedouin brothers appeared out of nowhere. For a long while they watched me, much puzzled as to why anyone should stoop, pick up a small stone, study it, and then place it in a bag.

Presently one of the boys knelt and selected a flint, which he offered me. But as it showed no working by man, I shook my head.

He kept gathering stones and offering them, until at last I took one, a true artifact, and put it in a bag. At that both boys broke into wild giggles and exclaimed, "Mashallah!" (As God wills!).

Pearling Camps of Ancient Days

They evidently thought it a fine guessing game: to see which stones the mad stranger would accept, and which he would refuse.

In this central district of Hasa I found many other things worthy of study. Near the coastline, east of the tumuli fields, are huge, elongated shell heaps, one over a hundred yards in length. The type of shell proves that near by were old pearling camps.

We know from medieval geographers that along this shore pearl diving was a chief industry. It is the same today. Bahrein is known far and wide for the excellence of

its pearls.

How ancient is the exploitation of the pearl oyster we cannot say, but it dates at least from the time of Alexander the Great (356-323 n. c.).

Over 300 years later Pliny declared that in his day Bahrein was "famous for the vast number of its pearls."

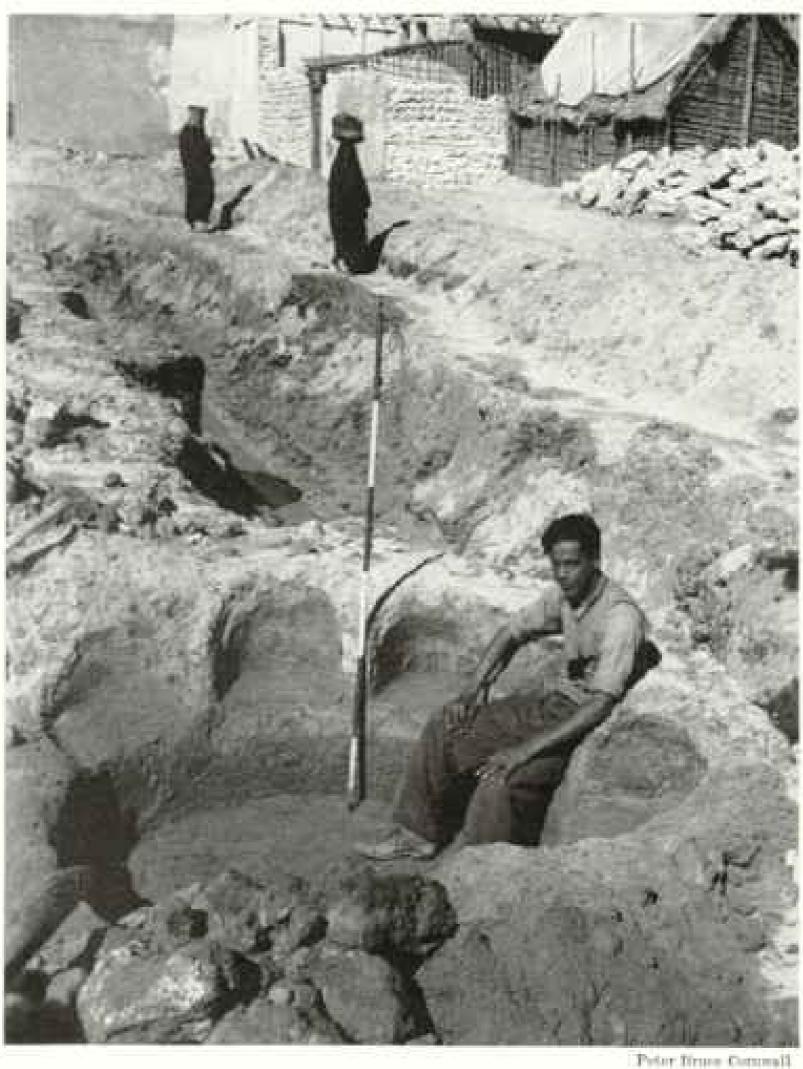
A cuneiform tablet found at Ur mentions a parcel of "fish eyes" brought from Dilmun, If this refers to pearls, then the pearl oyster was very early sought for, and its gleaming jewel used, perhaps to set off the dark-brown skin of Sumerian beaulies.

North of the shell heaps, and about two miles inland, I came upon a fossil dune called Muraikibat by the Arabs. Like a petrified tree it lies there, a finely preserved mummy of the late Pleistocene, when Europe still shivered in the Glacial period.

The "Tower of Silence"

This fossil dune is more than a mere curiosity, though: it provides valuable information to geologists and other students of Arabia's remote past. For whereas today the drifting dunes of Hasa move towards the south-southeast, Muraikibat faces the southwest.

So when this dune was solidified, the winds



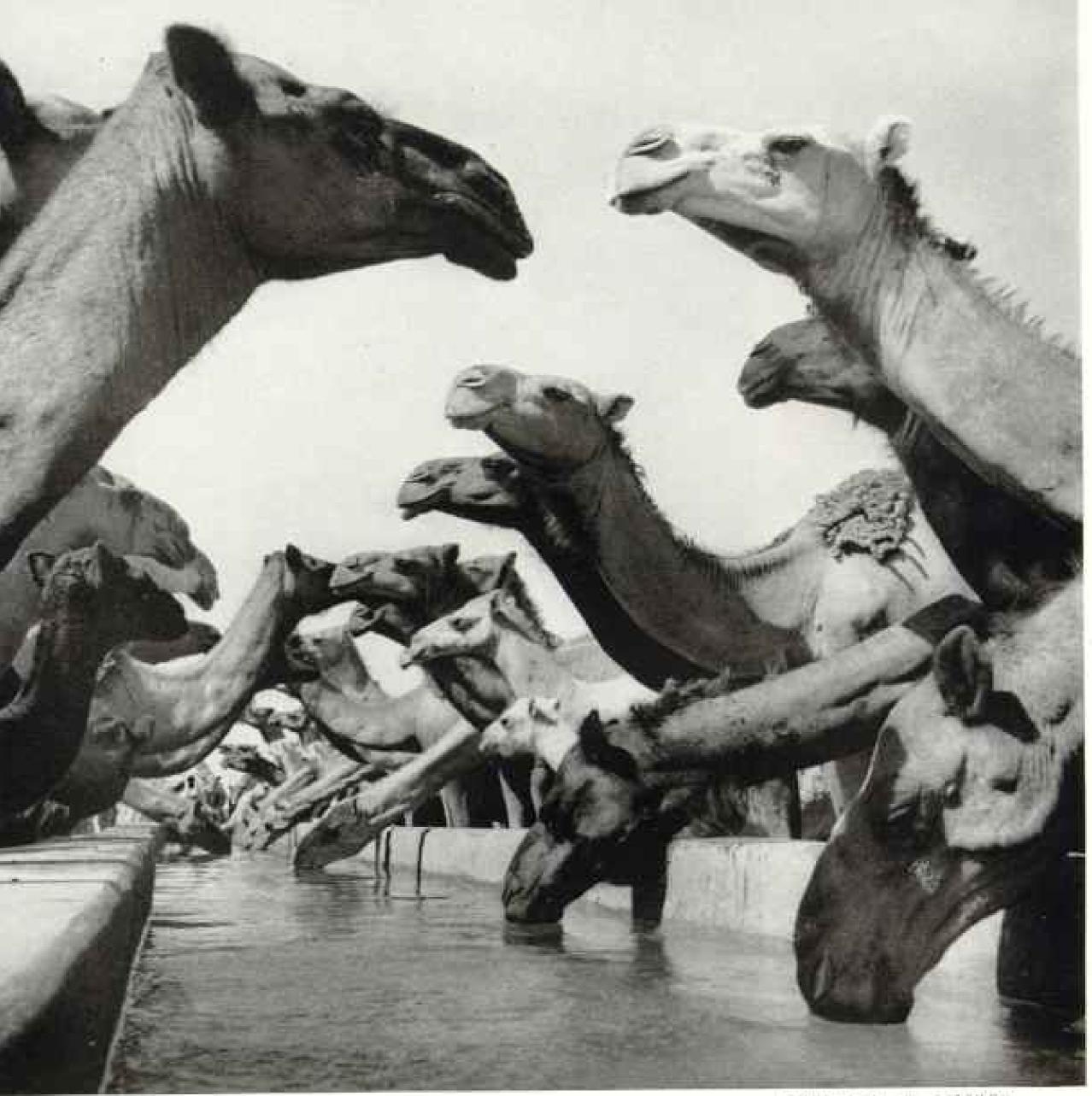
Who Built Bahrein's Nine-seat "Council Chamber"?

Just below street level in Manama the author uncovered this circular monument to Bahrein Island's "forgotten men." That Arabs did not build it he deduced by the shape. The mystic number nine, venerated by the ancients, suggests it was erected in Greek or Roman days. Next to a metal rod, used as a probe, sits a young Bahreini (page 493).

> were coming from the northeast, which means that then climatic conditions were radically different throughout Arabia.

> On the sloping southwestern face of Muraikibat I found more than a score of curious pits. Some are about two feet by one foot, and eight inches deep; others resemble small coffins in size. Possibly Muraikibat once served as a dakhma, or "tower of silence,"

> Many followers of Zoroaster's creed from Iran dwelt hereabouts in the early centuries of our era. They may have exposed their dead in these lonely pits, leaving them to be devoured by vultures and wild dogs. Such was the custom of these folk, a custom



Harold Cordal from Bundard Oil Co.

The King's Thirsty Camels Arch Long Necks and Fill Reserve Stornach Tanks

Before the oilmen came with mechanical rigs, the Bedouins depended on hand-dug wells. Now one caravan route which formerly watered 75 samels a day is able to support 5,000. This well near Al Jauf was dug to supply water for a drilling operation. As soon as oil was brought in, the water rights were turned over to King Abdul Aziz al Saud (page 492). Going where trucks cannot operate, the camel feeds freight to Arabia's new motor roads.

maintained today in India by their Parsee descendants.

Driving to the shore line two miles north of Muraikibat, I next visited the little town of Dammam, notable for a stone castle that perches on a coral reef offshore and is surrounded by water at high tide.

This fortress, in whose courtyard a few long cannon lie rusting, is believed to have been built by the Portuguese, who came to the Persian Gulf in the early years of the 16th century.

Wresting out of Moslem hands control of

the lucrative trade routes, the Portuguese founded the first modern European empire to be established in Asia. The massive castles they erected in the Gulf provide mute witness to their short-lived power, which crumbled before the attacks of rebellious Arabs and Iranians, and then was swept away by a combination of Dutch and English sea power.

The "Most Successful" Pirate

During more than a score of years at the beginning of the 19th century, Rahma bin Jabir, "perhaps the most successful pirate that ever infested any sea," made Dammam his lair.

While Rahma's ruling motive was fierce enmity towards the sheiks of Bahrein, he overlooked no likely prize. With five or six large vessels, each manned by two or three hundred lean rascals, he sallied forth to capture vessels from Kuwait, Basra, Muscat, and other ports.

A European who saw this pirate tells us that his figure "presented a meager trunk, with four lank members, all of them cut and hacked and pierced with wounds of sabers, spears,

and bullets in every part."

In the last encounter at close quarters between his vessel and that of an opponent, Rahma, seeing that his men were losing, blew up the ship with his own hand and perished along with all his companions,

The principal seacoast town of Hasa is Qatif, which stands some 10 miles northwest of Dammam. I found ample evidence that ever since the Bronze Age the area lying between these two places has been the most thickly populated along the entire littoral.

The debris of centuries is mixed haphazardly, and I picked up many a piece of medieval pottery, as well as Chinese coins dating from the reigns of the Emperors Che Tsung (A.D. 1085-1100) and Li Tsung (A.D. 1224-64).

As early as the tenth century unwieldy Chinese junks appeared in these waters to exchange products of their distant land for pearls, dates, aromatics, and other commodities. At one time Chinese copper money became current in some ports of the Gulf.

Near Qatif I also found examples of the tawila, or "long bit," a piece of copper having a small amount of nickel in it. The tawila is shaped like a V, but with one prong straight and the other slightly curved at the tip. Although minted by one of the Carmathian princes, over 100 years before William the Conqueror set foot in England, it is still accepted in the shops of Hofuf, Hasa's capital!

Just west of Qatif's date-palm gardens stands a long line of wells. The water in them, artesian and warm (84° F.), flows eastward in subterranean channels, from which cylindrical shafts rise at intervals,

As the drifting dunes encroached on this area, the men of Qatif kept building up the shafts higher and higher (page 521). But now the sand has shifted or passed on, leaving some masonry columns towering nakedly in the air, like tall chimneys.

According to local tradition, which scientific study confirms, these wells once stood in the center of an immense tract of date palms. The Arabs also claim that the irrigation system was set up "long before the time of Islam." Since it is Iranian in style, the builder may well have been one of a series of Sassanian monarchs who once ruled over this Province.

About A. D. 320 Shapur II, the first of them, brought an army across from Iran and conquered Hasa. He put to the sword many of its people, all but exterminating the leading tribes.

When tired of killing, this butcher ordered his troops to pierce the shoulders of the vanquished, tie them with ropes, and bring them in as prisoners. Because of this piece of cruelty, Shapur is known in Oriental history as *Dhu'l Aqtaf*, "Man of the Shoulders."

Since a few of the Qatif wells are as much as 160 feet in depth, American geologists are puzzled as to how they could have been constructed. For when the well shaft approached the porous Eocene strata, there must have been rapid seepage into the hole.

Fresh Water from Beneath the Sea

Inasmuch as the water flow is now several thousand barrels a day, it is considered amazing that the original diggers, with their crude equipment, managed to open up the porous formation to that extent. As usual, Arabs have a simple explanation: "Falling stars knocked holes in the ground, and Allah cupped them up!"

Like Hasa, Bahrein Island has numerous wells, the most remarkable being submarine springs that exist just offshore. Fresh water courses up from beneath the sea in such abundance that the islanders may wade out and fill their jars with pure drinking water.

This wealth of fresh water in Hasa, a supply unparalleled in other parts of Arabia, is often commented on by ancient writers. It seems always to have been regarded reverently as a special gift of the gods.

The source of this water supply remained an enigma until very recently. It was even imagined by Arabs that a hole existed in the bottom of the Euphrates River, whence the water ran underground all the way to Hasa.

We know now that the source is in the Tuwaiq Mountains (Jabal-at-Tuwaiq), some 250 miles to the west of Qatif. Thence underground rivers flow into Hasa.

Somewhere amid the ruins spread around Qatif may be the remains of Bilbana, a city located here by the geographer Ptolemy. And Pliny tells us that on Qatif bay, which he called Capeus, lived two tribes known as the Gaulopes and Chateni. Qatif is thought to preserve the name of the latter tribe.

What these Gaulopes and Chateni were like,



Gathery Plutz Studio

Arabin's Skull Cracker of 100,000 B. C.

An American oilman gave this Stone Age hand ax to the author under the impression that it was a "large arrowhead." Chipped from a volcanic rock, it is seven inches long. Workmen digging a water tank discovered the ax in central Arabia (page 514).

we can only guess. But judging from what later writers say, they must have dabbled in piracy. So plagued by sea robbers were the Eastern trade routes at that period that a "cohort of archers" was regularly placed on board each ship.

Throughout the centuries, in fact, piracy remained a flourishing profession in the Gulf. It was not stamped out until early in the last century, when British men-of-war systematically hunted down the pirate bands, in one instance landing thousands of troops to storm a town swarming with freebooters.

Qatif city, which I visited next, was once a place of importance. Here the Portuguese built a fort soon after 1550, in which year they captured the settlement and routed a mixed army of Arabs and Turks.

Captive Birds Are Children's Pets

The fort remains, but the city is unattractive and shabby. Along the streets trot sturdy white donkeys, carrying people, baskets of dates, fagots, and every manner of article. In the time of the Portuguese they were considered "the finest asses in the world," and even today one finds them as far off as the center of Tanganyika Territory in East Africa. whither they were transported via Zanzibar and Dar es Salaam.

Whenever I entered Qatif I was surrounded by swarms of inquisitive children, many of them pockmarked. Not infrequently they carried pet birds, secured by a string around one fragile leg.

As in most Gulfside ports, the population is heterogeneous, including many folk of Iranian or Iraqi descent. And in the early centuries of our era, Nestorian Christians as

well as Jews were numerous hereabouts.

Qatif's men have little initiative, are somewhat small in stature, and seldom possess clean-cut features. But in the oil company's employ at Dhahran and Ras-at-Tannura are many robust, fine-looking Arabs from Hofuf and the interior Province of Nejd. These men are capable, dignified, and surprisingly quick at learning new ways.

No one who comes to know them fails to realize that, given proper education and opportunities, young Saudi Arabians have it in them to form the backbone of a new and progressive Arabian nation.

While exploring the Qatif area I heard rumors of a stone statue and inscribed tablet. They were said to have been reburied in a date garden.

Having obtained the local sheik's permission to dig for them, I set out one afternoon with a gang of diggers and assorted tools.

The sheik, small and bearded, joined our party. He tried to remember just where the objects had been hidden. He walked up and down between the tall date palms, studying the smooth sand and pondering. Finally he faced me, flung wide his arms, and announced, "Tawakkul 'al' Allah!" (Rely on God!).

He could not remember. The relics lay somewhere within a 50-yard radius, he thought. That was all he could say.

Anxiously I set my men to probing the sand roundabout with long metal surveying rods. But the shadows of late afternoon lengthened, and still our luck was bad. On an impulse I finally seized one of the metal rods, took a few paces at random, then plunged the shaft deep into clinging sand. At two feet it struck stone.

Stone Tablet Shows Early Spread of Christianity

With cries of "Mashallah! Mashallah!"
my men hurried forward and commenced
shoveling. Soon we had both buried objects
above ground and standing upright (page
522).

The stone tablet contained a Sabaean epitaph: "Tombstone and grave of Eliya the son of 'Yny the son of Shasar of the family of SMM of the clan of D'L of the tribe of Shawdhab, 30."

The most interesting point about this inscription, which dates from the fifth or sixth century after Christ, is that the name Eliya (Elijah) suggests that the man was a Christian.

When Mohammed began his teaching in the seventh century of our era, Christianity had reached into many corners of Arabia.

The gospel was carried by missionaries out of Syria, Iran, and even Ethiopia, Wherever it bore fruit, Arabs abandoned their worship of the sun, moon, the planet Venus, or a host of other gods. There is a real possibility that if Mohammed had not been born, the Arabs would today be Christians.

Five Nestorian bishoprics had been established in Arabia by the seventh century, and one of them seems to have included Qatif. I saw a stone, found here some years ago, bearing a carved cross of seventh-century style.

The statue which we dug up is three feet in height. Both head and shoulders are lacking, probably having been knocked off by Wahabi "idol smashers," for a graven image has ever been taboo among strict Mohammedans.

The figure is thought to represent a pagan priest, assisted by a boy, performing a sacrifice. Its date must be around A. D. 200.

According to our friend the sheik, this statue was unearthed originally on Tarut, an island in Qatif bay. Arabs have found on Tarut statuettes of similar form, and also golden coins.

My next step was to pay a visit to Tarut Island, which on the Arabian map of Claudius Ptolemy, the Greco-Egyptian geographer who flourished under Hadrian, was labeled Tharo.

Two days before Christmas, accompanied by a geologist and several Arabs, I set out from Al Khobar in a native coastal boat and headed north for the island.

The shamal, or prevailing northwester, was blowing briskly, and the sky had grown over-cast. So there was some danger of being caught by a storm. At times this shamal attains a velocity of more than 60 miles per hour, bringing with it great quantities of dust and sand out of the Nafud.

Even worse, in the view of navigators, is the unhealthy southeaster, or quus, which is accompanied generally by rain and violent squalls. We know it has always been feared, for in the ruins of "Ur of the Chaldees" diggers have found a charm against "the evil of the South Wind."

The Seene of Sindbad's Voyages

As we approached the island, Tarut recalled scenes from the voyages of Sindbad the Sailor, for the steep walls of Darin, its principal town, cover most of the southern side and so give the impression of a city rising abruptly from the sea.

Tarut exudes an indefinable atmosphere of romance and mystery. This is true of nearly all the islands in the Gulf, and is notably reflected in the account of Sindbad's adventures.

On Tarut I could find no trace of an early temple, nor of any likely looking ruins. But the houses of present-day Darin apparently rest on the remains of earlier buildings.

Just north of the town is one place worth archeological attention: a field of small, crude, irregular mounds, which the natives say is an old burial place. Only excavation could lay bare its secrets.

In the Middle Ages this island grew famous for its stocks of musk and spices, imported from the south.

The modern islanders seem to subsist largely on fish, which from time immemorial has been the staple food of all peoples dwelling



Blanchard Off Cir.

Crescent-shaped Dunes in a Sea of Sand Arch Like Breakers: A View from 10,000 Feet

Arabia's prevailing wind, the shamal, approaches the convex side and sweeps sand up over the crest, where gravity deposits it at the angle of repose, 20 to 40 degrees. In such fashion the dunes creep 50 feet a year, and some grow 100 feet high. Storms blow the sand like snow in a blizzard. While hunting for Gerrha, one of antiquity's lost cities, the author drove across such dunes in a light truck. Enormous tires, inflated to only a few pounds' pressure, make desert travel possible (page 496).

One of Alexander the Great's admirals, while exploring the sea route from India to the Euphrates, came upon some men who "had shaggy bair all over their body; their nails resembled the claws of wild beasts, and were used, it would seem, for dividing fish and splitting the softer kinds of wood." For clothing they occasionally wore "the thick skins of the large sorts of fish."

Island of the "Fisheaters"

Sumerian priests, as seal impressions reveal, dressed at times in the guise of a great fish.

Alexander's sailors also visited a folk called Ichthyophagi (Fisheaters), whose diet consisted entirely of fish, which they caught by setting nets and waiting for the ebbing tide to leave a catch. At Dammam town I saw inshore nets of much the same pattern as those reported made by these "Fisheaters."

Soon after returning from Tarut I set out for the northern quarter of Hasa, passing on the way shambling camel caravans bound for various oases in the northwest (Plate VI).

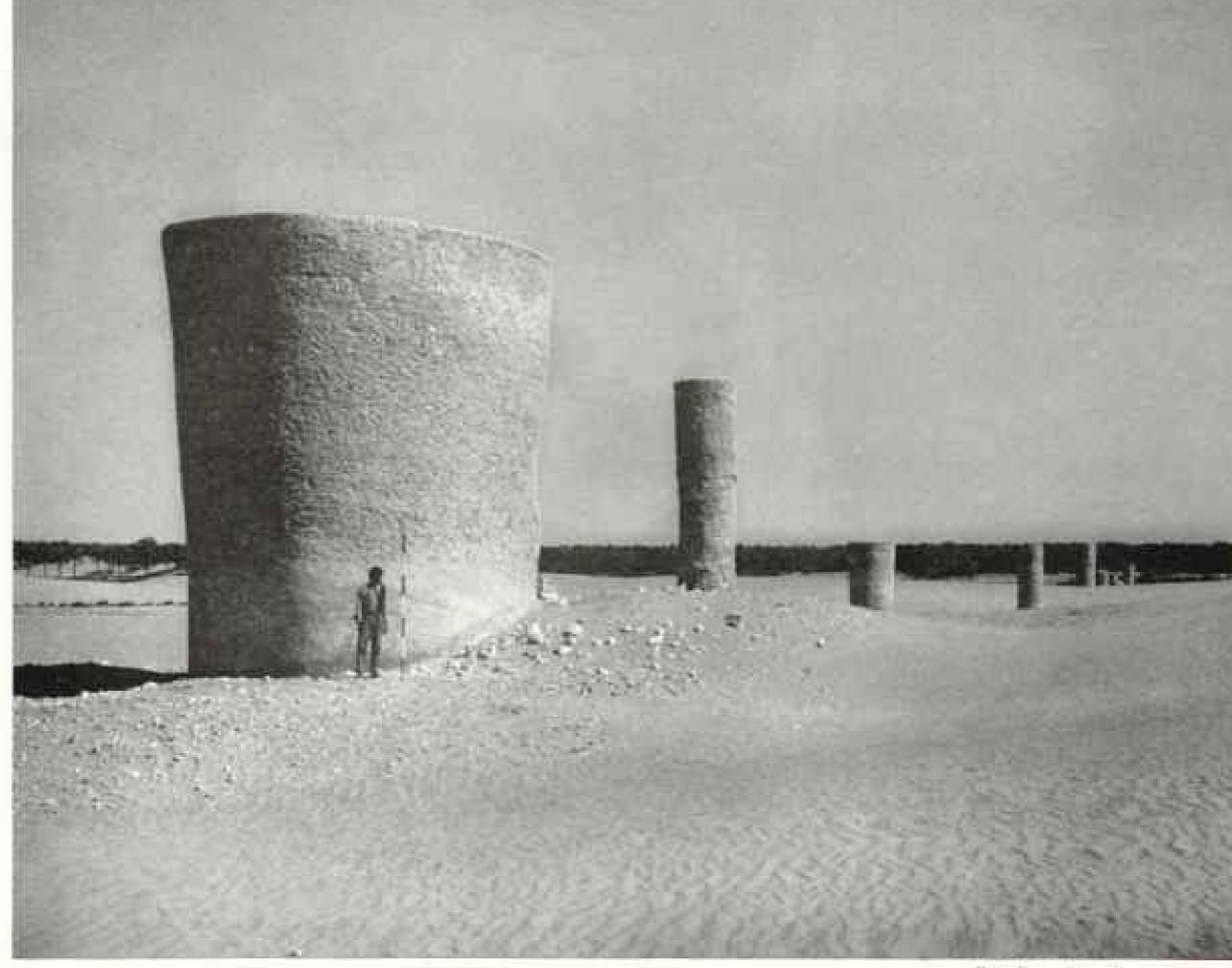
The land was barren, almost treeless, with very little of interest. But seven miles south of Jubail al Bahri, a small port, I found a queer, deserted town on the top of Jabal Bahri.

On the hilltop stand the ruins of oblong stone houses separated by streets, the whole laid out in orderly pattern. No wells exist in the hill or at its foot, nor are any reservoirs visible. Yet somehow its inhabitants must have provided themselves with water.

The place is strong defensively and may have withstood many a sudden attack by mounted raiders from the desert. Potsherds of green or blue glaze indicate that this hill town, whose name has long been forgotten, belonged to the Middle Ages.

From time to time I had heard talk of old cliff castles about 85 miles west of Jubail. With the usual pair of trucks I now set out in search of these promising ruins.

Our route westward ran through rolling



Peter Brace Committ

Ghost Wells, Long Necks Exposed by Wind Erosion, Mark the Grave of an Oasis near Qutif

Once the distant polm grove extended into this empty space. Then, as dunes encroached, wells were built ever higher. Receding, the sand wave left the columns high and idle. They mark the course of an underground river rising 250 miles away. Qutif's irrigation system dates possibly from the Iranian conquest, some 1,600 years ago (page 517).

country, so the journey was much like riding in a small motor launch over a seemingly endless series of waves.

An Early Caravan City

We stopped to refuel at Hinnat, one of the very few villages in this desolate region. Here and at the ruin-field of Thaj, about five miles southwest, an earlier visitor, Capt. W. H. I. Shakespear, discovered in 1911 three interesting Sabaean inscriptions.

Shakespear, then British Political Agent at Kuwait, made a number of excursions into the interior, until in 1915 he was killed in a tribal skirmish on the borders of Nejd.

The place known as Thaj lay on the important caravan route running down from the kingdom of Hira, in Mesopotamia, to Najran in south Arabia. In both places Christians were numerous; so many an early missionary must have stopped at Thaj while traveling through the peninsula.

From Hinnat we continued westward, entering the great interior Province of Nejd, "heartland of the Arabs." Brown flat plains stretched away to the far horizon, and here and there mesas gave a touch of grandeur to the landscape, recalling the Apache country of the American Southwest.

First of the Cliff Castles

After passing through a series of low enclosed basins called the Wadi al Miyah, we came to the easternmost escarpment and there spied the first cliff castle.

It was a fairly small settlement perched on top of an isolated butte. The mud-mortared stone walls enclosing it were built flush with the cliffside; it must have proved a tight and secure fortress.

At one point a little limestone platform jutted out. In its center was a round porthole through which only one man at a time could ascend, by means of a rope. In the rock floor of the settlement a very deep well had been dug.

Long abandoned, this cliff castle may be a relic of the turbulent ninth century, when



Print Bruss Cornwall

Tombstone of an Elijah, Found in a Qatif Orchard, Suggests a Christian Burial

Some 1,700 years old, the tablet is inscribed in Sabaean, a Phoenicianlike alphabet, used in ancient Saba (the modern Yemen, the Biblical Sheha), whose queen visited King Solomon. On the right, a mutilated figure is thought to represent a heathen priest. Islam's spread in the seventh century replaced both paganism and Christianity along the Persian Gulf (page 319).

Carmathian fanatics ranged and fought in eastern Arabia.

Sworn enemies of the caliphs, and possessed of a prophet of their own, the Carmathians gained control of numerous towns and strongholds on this side of Arabia. Once, too, they actually raided Mecca and carried off Islam's sacred Black Stone, keeping it in Hasa for a score of years.

After leaving this cliff castle, we camped at a place some 24 miles east of Qariya es Siffa. During the evening there shuffled into the tent an aged Arab, reputed to be one of the best and most trustworthy guides in the peninsula, a man who "knew Arabia from the Rub" al Khali to the Wadi Sirban."

By lamplight we discussed the topography of the northeast, and I asked particularly whether any caves or notable ruins were known to him. But he assured me that the cliff castles were all that mattered.

I could not help thinking, though, that during his wanderings in the interior this man must have passed by many sites which some day will reveal a story to archeologists, and that his feet may have kicked aside flint artifacts discarded by primitive men whose very existence he has never suspected.

Inner Arabia may hold much for the pale-

ontologist also. In Pliocene strata, 90 miles west of Dammam Dome, oil geologists have discovered some teeth and leg bones from a primitive form of mastodon, together with a jaw fragment of an early antelope. These fossils are perhaps 25,000,000 years old.

Gulf a Fiery Furnace in Summer

On the following day I explored two more cliff castles. They turned out to be much like the first one, and around all these settlements were scattered flint bird arrowheads, together with quantities of potsherds.

Our route now led back to headquarters at Dhahran, and a few weeks later I returned by motor launch to Bahrein Island. For spring was already near, and there was much further excavating to be done on Bahrein before increasing heat turned the Gulf into a fiery furnace.

During the four summer months temperatures range as high as 130 degrees in the shade. If workmen lay down their metal tools, they must bury them deep in the sand; otherwise they become too hot to handle.

So with many regrets I left Hasa and its diverse antiquities, hoping it was "au revoir" only, not farewell. But as the Arabs express it, "Allahu 'Alim" (God is the Knower).

The Idyllic Vale of Kashmir

By Volkmar Wentzel

With Illustrations from Photographs by the Author

TABORING hard, our onetime Army ambulance reached the top of 9,000-foot Banihal Pass, raced through a tunnel, made a sharp turn, and suddenly before us spread a sight that made the pulses leapthe emerald Vale of Kashmir, in the lap of the snowy Himalayas."

Veining the valley were poplar-bordered roads and silvery willow-lined watercourses. Above this vision reared the ermine peaks of the mightiest mountain range on earth-cool, aloof, immaculate contrast to the flies, dust, and sweltering heat of the Indian plain be-

hind us.

Strife in Fertile Vale

Such was my first view of the Vale of Kashmir, in August, 1946. Fourteen months later this "Happy Valley" was to be racked by strife. Airborne Sikhs and Spitfire fighting planes of the Hindu-ruled Dominion of India were helping Kashmiri forces check advancing tribesmen from the Moslem Dominion of Pakistan (page 525).

Kashmir's fatal beauty and fertility had caused a tragic triangle, with the two new Dominions which had fallen heir to the British Empire of India contending for her favor.

But peace reigned in the Vale of Kashmir when it burst upon our view with somewhat the breath-taking impact of an ice-cold shower bath.

Up from Delhit we had come, my Hindu aide Ram Rau and I.

In the ex-ambulance which I had converted into a National Geographic Society survey car, we had followed the old route of the Moguls from India's ancient capital to their summer pleasure land (Plate I).

Those rulers had traveled in sumptuous

* See, in the National Geographic Magazine: "House-Boat Days in the Vale of Kashmir," by Florence H. Morden, October, 1929; "First Over the Root of the World by Motor," by Maynard Owen Williams. March, 1932; "Outwitting the Water Demons of Kashmir," by Maurice Pratt Dunlap, November, 1921: "On the World's Highest Plateaus," by Hellmut de Terra, March, 1951.

4 See "India-Vesterday, Today, and Tomorrow," by Lord Halifax, NATIONAL GEOGRAPHIC MAGAZINE.

October, 1943.

For, in the NATIONAL GEOGRAPHIC MAGAZINE: "New Delhi Goes Full Time." by Maynard Owen Williams, October, 1942; "India Mosaic," by Peter Muir and Frances Muir, April, 1946; "Delhi, Capital of a New Dominion," by Phillips Talbot, November, 1947.

style. On a leisurely trip from Delhi to Kashmir in 1664-65, the entourage of the Mogul Aurangzeb contained more than 300,-000 people, and its transport consisted of at least 200,000 horses, mules, camels, oxen, and elephants.

In the mountains which rim the Vale of Kashmir there occurred a tremendous traffic accident as the Mogul's moving city made its elephantine way. Fifteen elephants fell over a cliff when unable to advance or turn around on the narrow road.

In contrast, our only misfortune was a flat tire caused by an abandoned oxshoe which had been worn to razor sharpness. Over good roads we easily made the 600-mile trip from Delhi to Kashmir in three days rather than the several months consumed by Aurangzeb. who often stopped to hunt and otherwise enjoy himself on the way.

Beef Barred from Kashmir

As we crossed the border from the Punjab into Kashmir, turbaned customs officials stopped us briefly. Bringing in beef is prohibited, since the Hindu religion forbids the killing of cows. (The Maharaja is a Hindu. though most of his people are Moslems.) Even canned goods must be checked lest they contain a trace of the forbidden flesh,

All the way from Delhi the oppressive heat of India in the monsoon season had lain upon us like a smothering blanket, but as we climbed into the mountains of Kashmir it seemed as if a heavy load had been lifted from the soul.

Even the car seemed to take on new life as, climbing through ever cooler air, we passed the temple spires of Jammu, the Maharaja's

winter capital (map, page 526).

In this old city on the bank of the Tawi River, an electric power station, a silk factory, and the Prince of Wales College contrast with royal palaces of oriental splendor and with fort and museum buildings redolent of the past.

Where the first big glacial stream, the Chenab River, crossed the road, Ram and I stopped the car by common consent. Stripping, we luxuriated in the icy, tingling water.

From the river the road led upward in a series of horseshoe and hairpin turns to the summit of the Banihal Pass, 9,291 feet. dramatic gateway to the Vale of Kashmir.

On the crest we met our first typical Kashmiris—six men who had struggled up the steep slopes from the Vale and had stopped to rest before resuming their long, slow trek to market. On their backs they carried heavy loads of dried apricots and other produce.

Forked Stick Serves as Seat

Each man had a forked stick which served the purpose of the portable seat sometimes carried by golf fans in the United States. Placing the unforked end on the ground, the wayfarer half sits, half leans on the fork, as if reluctant to sprawl on the ground lest he find

it too hard to get up again.

All six, evidently Moslems, wore the tight Kashmiri cap, a long shirtlike garment, short pants, and sandals. They had the somewhat Semitic features of the Kashmiri, with dark hair and dark, sad eyes. Their skin, though brown and weather-beaten, was lighter than that of the southern Indians, and I remembered what Dr. François Bernier, French traveler, had written nearly 300 years before:

"The women especially are very handsome; and it is from this country that nearly every individual, when first admitted to the court of the Great Mogul, selects wives or concubines, that his children may be whiter than the Indians and pass for genuine Moguls."

Much earlier, Marco Polo had paid the Kashmiri women a somewhat similar compliment. "The men," he wrote, "are brown and lean, but the women, taking them as brunettes,

are very beautiful," *

Ram tried to talk with the men in Hindustani, but they seemed shy and soon resumed their toilsome trudge while we started down toward the carpet of green with its clusters of villages.

In a few minutes we were driving through a verdant countryside dotted with farmhouses and quaint little towns. In this Vale live about half of the State's 4,000,000 people, more than a mile above sea level.

Tradition Says Vale Was Once a Lake

Built largely of sun-baked brick, but with framework and trimming of wood, the houses were suggestive of Alpine chalets, an impression heightened by the snowy mountains beyond.

Wooden balconies hung from the house fronts like happy afterthoughts. The top story was usually left open for drying and storage. Roofs were thatched, and on many of them red peppers were drying. Ducks and geese waddled about the farmhouses and near the many streams.

Everywhere was running water, and I remembered the old Kashmiri legend that a great lake had once covered the Vale. The story goes that an aged saint miraculously split the mountain at Baramula, releasing the flood and transforming the lake into fertile, well-watered land.

At a good-sized town called Anantnag or Islamabad, depending upon whether you happen to be talking to a Hindu or a Moslem, we paused for a cup of tea, an amenity easily obtained in Kashmir because of the number of Englishmen who come there from the plains of India on holiday or retire to spend their remaining days in this beaven of the Himalayas.

The ten and biscuits served us at a sunny table under the chinar trees tasted as if they had come from an English inn instead of a Kashmiri kitchen with an oven of clay.

Refreshed, we followed the widening Jhelum down the valley to Srinagar, summer capital of the Maharaja and beloved pleasure place of generations of Moguls. Today the city has a population of about 200,000.

At a hotel with no plumbing but plenty of servants, who brought a tin bathtub and buckets of hot water, I slept gratefully under blankets for the first time since I landed in India many weeks before.

A Red-bearded Genie Materializes

Next morning there came a knock on my door, and a tall, elderly, bearded Mohammedan in turban, baggy trousers, and shoes with upturned toes stood before me like a genie conjured forth by a twist of an Arabian Nights wishing ring.

His beard was hennaed a rich shade of red, a sign of deep religious devotion among the followers of Islam. Distinctive turban and handsome eaglelike features proclaimed him a Pathan, or Afghan, a people renowned for courage and martial spirit.

Gravely and politely this apparition introduced himself as Nur Mohammed, veteran of expeditions to Nanga Parbat and other Himalayan peaks. From a European acquaintance in Srinagar he had heard of my coming and wished to be my servant and guide.

He turned out to be far more than that, including cook, philosopher, and friend, all for 100 rupees a month—little more than a dollar a day.

I had heard so much about difficulties between Hindus and Mohammedans in India that I half expected trouble when Nur Mohammed and Ram Rau met. But my fears soon proved ungrounded. Each treated the other's faith with respect as we visited Mo-

*See "World's Greatest Overland Explorer," by J. R. Hildebrand, National Geographic Magazine, November, 1928.



Max Desfor from Press Ass'n

Trenches Sear the "Happy Valley" as Indian Troops Defend Kashmir

Sikh soldiers dug in to guard the road between Baramula and Srinagar when tribesmen from Moslem Pakistan clashed with them last fall in the State of Jammu and Kashmir (map, page 526). Prompt arrival of troops by air from the Hindu-led Dominion of India blocked the way to Srinagar, the summer capital, and brought recapture of Baramula, at the entrance to the Vale.

hammedan mosque and Hindu temple alike in the course of our picturemaking.

We must have made a strange-looking trio—the tall, dignified, red-bearded Mohammedan, the slender, scholarly looking young Hindu who had majored in Sanskrit and usually had several books under his arm, and finally the American, in old Army trousers, checkered Kashmiri shirt, and tightfitting red skullcap.

The Kashmiri cap was a master stroke. I bought it to keep my hair from blowing into my eyes, but it gave the Kashmiris no end of amusement, broke the ice, and made photography easy. Apparently they had never before seen a sahib wearing one of their caps.

Gondola with Inner-spring Mattress

To see a cross section of life in Srinagar, we boarded a *shikara* on the Jhelum River, which winds caressingly through the city as if reluctant to leave.

A characteristic institution of this Venice of India, the shikara, made of boards, is both a water-borne taxicab and a romantic pleasure boat akin to the Venetian gondola. Many have inner-spring mattresses upon which the indolent may recline, and such inducements are shouted to the world by the decidedly unbashful boatmen as they compete for patronage.

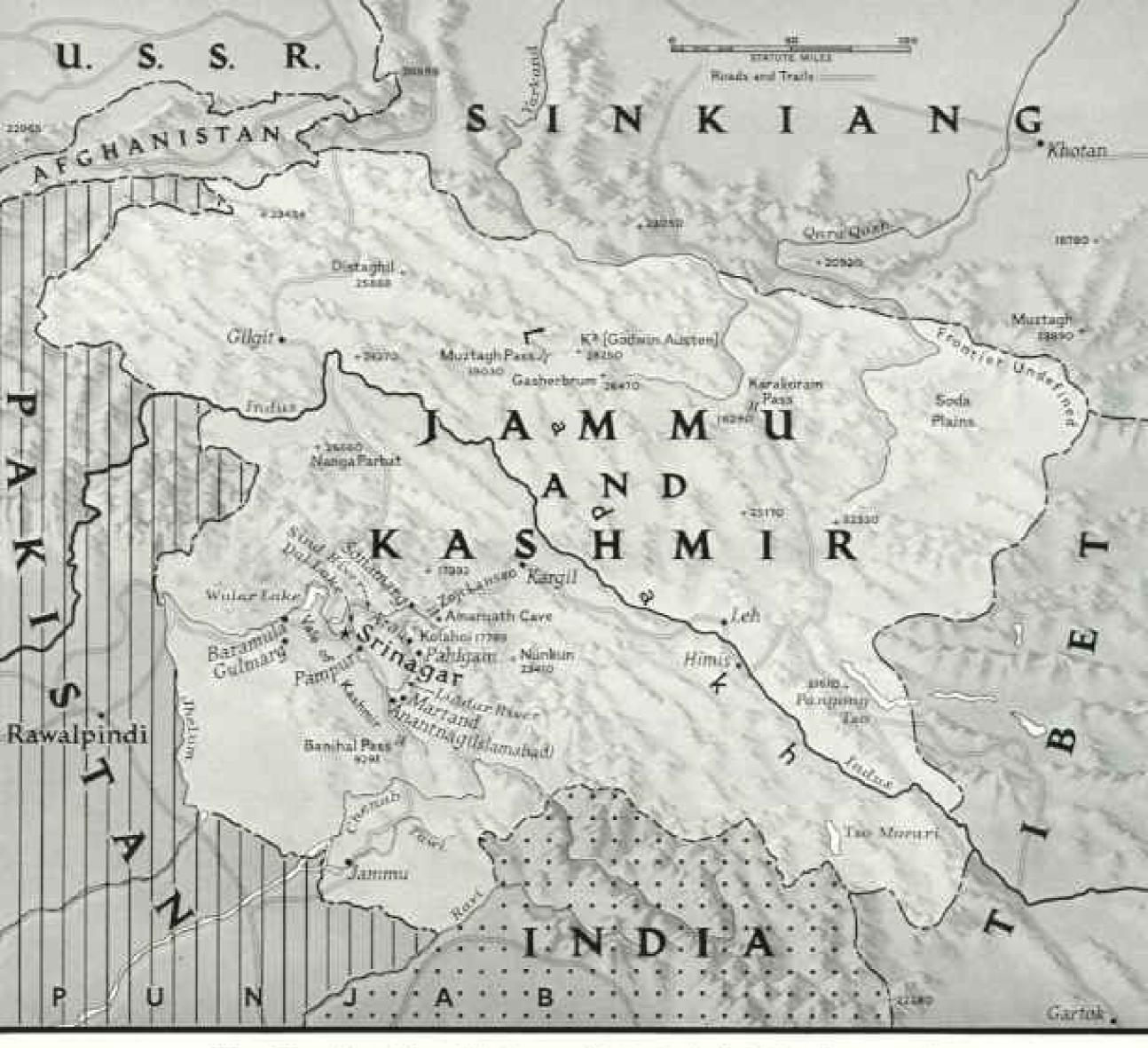
Coney Island, Honeymoon Springs, Good Fortune, Susy Q—nearly all the boats have names, like American bombing planes.* Many are designed to appeal to visitors from the United States, for numerous GIs came to Kashmir during the war and left their initials and chewing gum even on Himalayan mountaintops.

On a canopy-covered inner-spring mattress we glided smoothly down the Jhelum as the boatmen plied their paddles with curious heart-shaped blades (Plate IX).

The winding street of water was alive with colorful traffic. In one oversized shikara reclined a well-fed businessman smoking the Kashmiri equivalent of a large, luxurious cigar—an elaborate hookah, the hubble-bubble water pipe. In another, three or four Moslem girls were going to school.

Pretentious houseboats of the wealthy and

* See "Fun Helped Them Fight," by Stuurt E. Jones, National Geographic Magazine, January, 1948.



Two New Dominions Clash over Kashmir, India's Northernmost State

Tribesmen from Moslem Pakistan (stripes) fought their way into the Minnesota-size State of Jammu and Kashmir last October. To get armed help, its Hindu Maharaja announced its "provisional" accession to the Hindu-ruled Dominion of India (dots), although the bulk of his people are Moslems. India's Prime Minister, Jawaharlal Nehru, a Kashmiri Hindu, sent immediate airborne aid, and sharp fighting followed. Later the case was laid before the United Nations Security Council. The lofty Himalayan State lies close to Russia and adjoins Sinkiang. Its heart is the fruitful Vale of Kashmir, along the Jhelum River between the mountains of Jammu and towering, lonely Gilgit and Ladakh.

the narrower, more graceful, but shabbier dungas on which native families live and die were moored along the shore or crawled like crabs from place to place under the patient urging of poles (Plates IV-V).

"All That Glitters Is Not Gold"

Along the banks women washed clothes, men unloaded wood or grain, and both sexes performed their ablutions.

From a balconied building overhanging the river came the monotonous drone of Mohammedan schoolboys learning the Koran by rote.

As we neared the heart of Srinagar's Old Town, a particularly conspicuous Hindu temple mirrored in the water caught my eye. Its gracefully tapering roof gleamed as if with gold.

Closer investigation showed that the temple had been roofed with tin from old kerosene cans. Rusting, these produced the golden glint.

In contrast, many of the Hindu temples which dot the Kashmir landscape have endured for centuries. In some, now ruined and abandoned, I noted traces of Greek architectural features, for ancient Greece began to make its arts and power felt in northern India in the time of Alexander the Great.*

*See "Greece—the Birthplace of Science and Free Speech," by Richard Stillwell, NATIONAL GEOGRAPHIC MAGAZINE, March, 1944, and "Alghanistan Makes Haste Slowly," by Maynard Owen Williams, December, 1933.

Unlike the Hindu temples, the Mohammedan mosques which punctured the skyline were made of wood. Strikingly different from the marble mosques of the Indian plain with their domes and minarets were these square blockhouse-type buildings of deodar logs. They bore little resemblance to any I had seen elsewhere in the Moslem world.

Wooden spires surmounted the sod roofs of the mosques, on which, as on many of the houses, sprouting grass gave the appearance of a man who needs a shave.

Above our heads on the seven bridges over the river passed an ever-changing parade. A couple of the bridges carried automobiles and tangas, two-wheeled horsecarts. But traffic on the others was mostly on foot—capped or turbaned men and veiled or unveiled women, many bearing burdens on their heads.

Most colorful were the Hindu women, their embroidered skirts bright with reds and greens. Many wore heavy earrings and necklaces, while the

Mohammedan women often had anklets of silver. I concluded that the prettiest must always go veiled, because I had yet to see a real Kashmiri beauty.

Wholly different is the New Town, where Occidental influence is reflected. Two White Russians run a night-club houseboat called the Bluebird. On another houseboat is a beauty shop. Permanent European residents and visitors meet at the Srinagar Club amid surroundings reminiscent of a London club, and the little vine-covered Anglican church looks as if it had been taken right out of England, vines and all.

From the streets of the city one's eyes lift up to an age-old temple and a Pathan fort,



A Gujar Crone Sits by the Roadside, Selling "Jewels"

In race and language the Gujars differ from the Kashmiris, with whom they rarely intermarry. Seasonal nomads, they follow their herds between alpine meadows and lowlands (page 547). In the mountains this woman picked up shiny quartz crystals, which she offers to every passing traveler.

each on its separate hill. These are the capital's twin landmarks—Shankar Acharya Temple and Hari Parbat Fort (Plate V).

Near the base of the temple hill, known to Moslems as Takht-i-Suleiman (Solomon's Throne), I visited the Church Missionary Society's hospital (English), founded more than 80 years ago. The land allotted for it was a Moslem burying ground—not only an inauspicious site for a hospital but also a physical handicap, since the buildings and walks had to be so placed as not to disturb the graves.

Here I heard native patients singing familiar old English hymns in Urdu. The courteous English doctor in charge invited me to tea, but as we sipped he had to excuse himself to perform an emergency operation. The hospital ministers to hundreds of patients, many suffering from trachoma and other eye diseases.

Cheap John and Suffering Moses

Strange to Westerners are some of the names on the Kashmiri shops which line the Bund along the Jhelum in New Town. The proprietors seem to go out of their way to depreciate themselves. Subhana the Worst is the name of one. Another calls himself Cheap John, but whether the adjective refers to John or his products I could not determine. A floating shop on a near-by houseboat is run by a worthy named Suffering Moses!

In the first shop I entered I was greeted in English by the Kashmiri proprietor.

"The crepe rubber for this pair of shoes came from America," he said, "and we're sending our son to New York next year to open an export business in leather goods."

Both he and his son had learned English

in the Kashmiri public schools.

I bought a pair of the native sandals, which are here particularly recommended for mountain climbing. But what, I wondered, keeps snow and cold from coming in at the open toes? The answer, it developed, is a pair of chamois socks.

In shop after shop I sought one of the famed Kashmir shawls of finest wool. My father bought a Paisley, an imitation of the Kashmir, long ago in an antique shop in New England—a thing of beauty, with reds, yellows, and greens glowing against a black background. But I soon discovered that one couldn't buy a genuine Kashmir shawl in its home country today for three times the price. Shawl weaving has virtually ceased.

One shop where I sought a shawl and found only a single torn, inferior specimen was also the place of business of a silver-smith. As I entered, I saw him furtively hide some work he was doing. Later I saw what he had been making—"old" Grecian

coins for sale to tourists!

Subbana the Worst, from my point of view, might better have been named Subbana the Best. When I looked over the beautifully decorated articles of papier-maché in his shop and inquired where and how they were made, he took me to Old Town by shikara.

There I gained a good insight into the industries and handicrafts which keep so many Kashmiri hands busy and strain so many Kashmiri eyes. Never shall I walk on a Kashmiri rug again without feeling I am walking on somebody's eyesight.

Although Srinagar has electric light, I saw little sign of it in the rickety buildings I visited to photograph the typical Kashmiri handicrafts—wood carving, pashmina wool weaving, rug making, metalworking, and the production of intricately decorated articles of papier-maché.

Openings which hardly could be called windows admitted a moderate amount of light in summer, but were covered with oiled paper at the approach of winter. Few of the places I saw had glass windowpanes. The result was a general semidarkness in which the artisans squinted over their exacting work (Plate VI).

Typical was a papier-maché products "factory," really a down-at-the-heel private house. This was a family industry, and despite adverse conditions the workers, with cat-hair brushes, turned out beautifully painted napkin rings, trays, lamps, boxes, candlesticks, large screens, and elaborate urns (Plate XVI).

In considerably more pleasant surroundings, an airy balcony above the Jhelum, wood carvers were plying their chisels. All employees here were men and boys who learn the art from their elders.

Child labor appeared to be common, and some of the lads were obviously only nine or ten years old (page 550)

ten years old (page 550).

In a primitive building devoted to pashmina weaving, most of the workers were old men. One turbaned old-timer in horn-rimmed eyeglasses explained that it takes a lifetime to master the art (page 546).

Soft, beautifully woven scarves and other articles are made on small hand looms from the superfine pashmina wool. This comes from the under fleece of the belly of goats raised in lofty, cold, snowy Ladakh, sometimes known as "Little Tibet" but actually a forbidding, seldom-visited part of the State of Jammu and Kashmir.

Workers Carry Their Own Heat

Winters in the Vale of Kashmir also are cold; yet these handicraft "factories" had no source of heat. Each worker carries his or her own heat, a small earthenware-lined wicker basket, called a kangri, in which burn charcoal embers. This brazier is snuggled as close to the body beneath the garments as possible.

Walking through the Old Town of Srinagar was like stepping back into medieval Europe: narrow streets, crowded and confined, with people pottering away as they did centuries ago, pariah dogs everywhere, and somebody throwing a bucket of waste from an upper story when you least expect it!



On the Road to Ludukh, Kashmir's "Little Tibet," the Photographer Entertains Visitors

After a 175-mile walk from Leh, these Ladakhis paused at Sonamary to inspect the National Geographic Society's photo-survey truck, a converted war ambulance. As Buddhists, they had little concern in Kashmir's Hindu-Moslem strife. Kashmir, predominantly Mohammedan, is ruled by a Hindu maharaja.



@ National Geographic percept

A Moslem Potter's Daughter

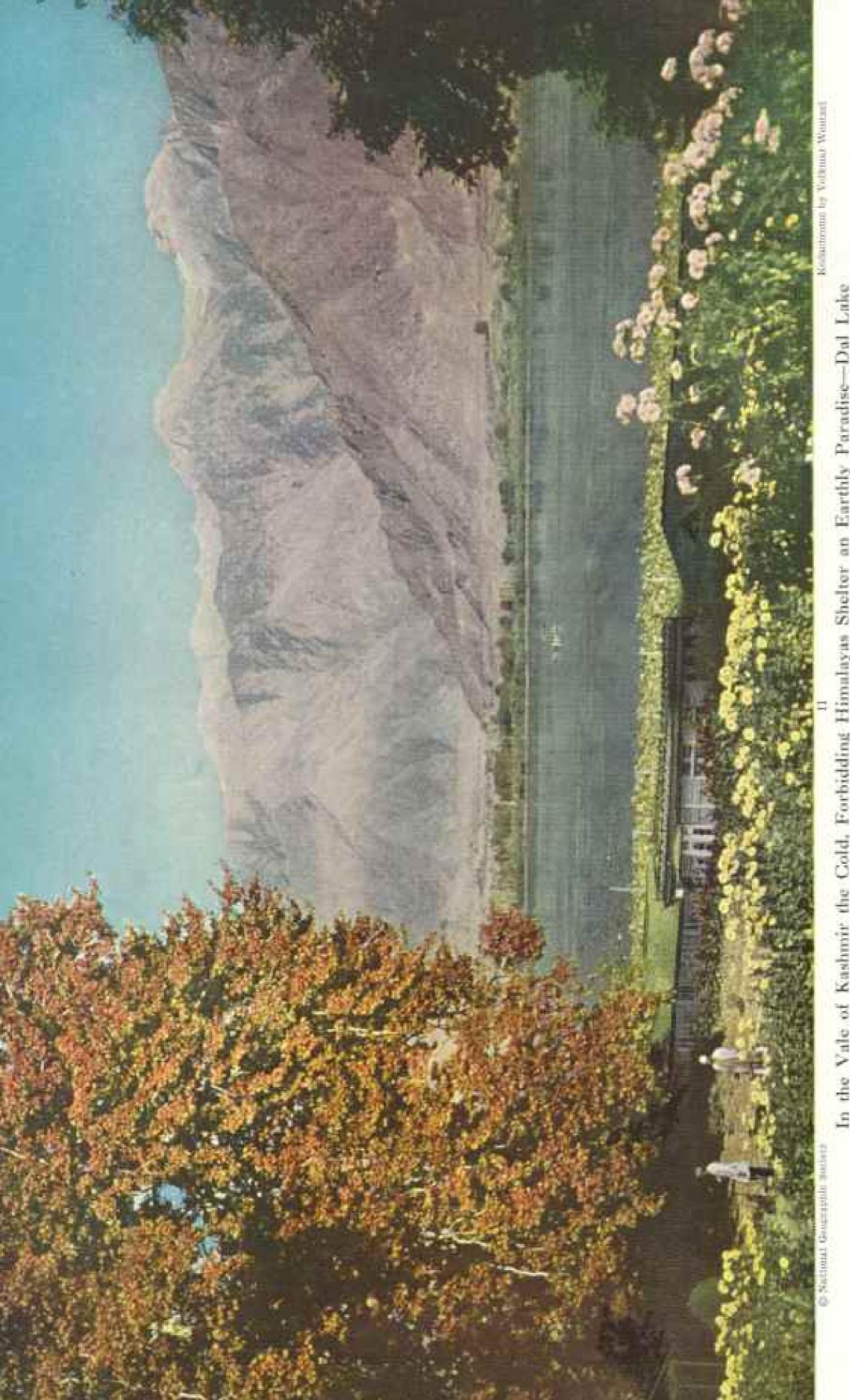
At eight years, she's still free to play; hard work will come later.



Kodarhtonier by Vellmer Weisland

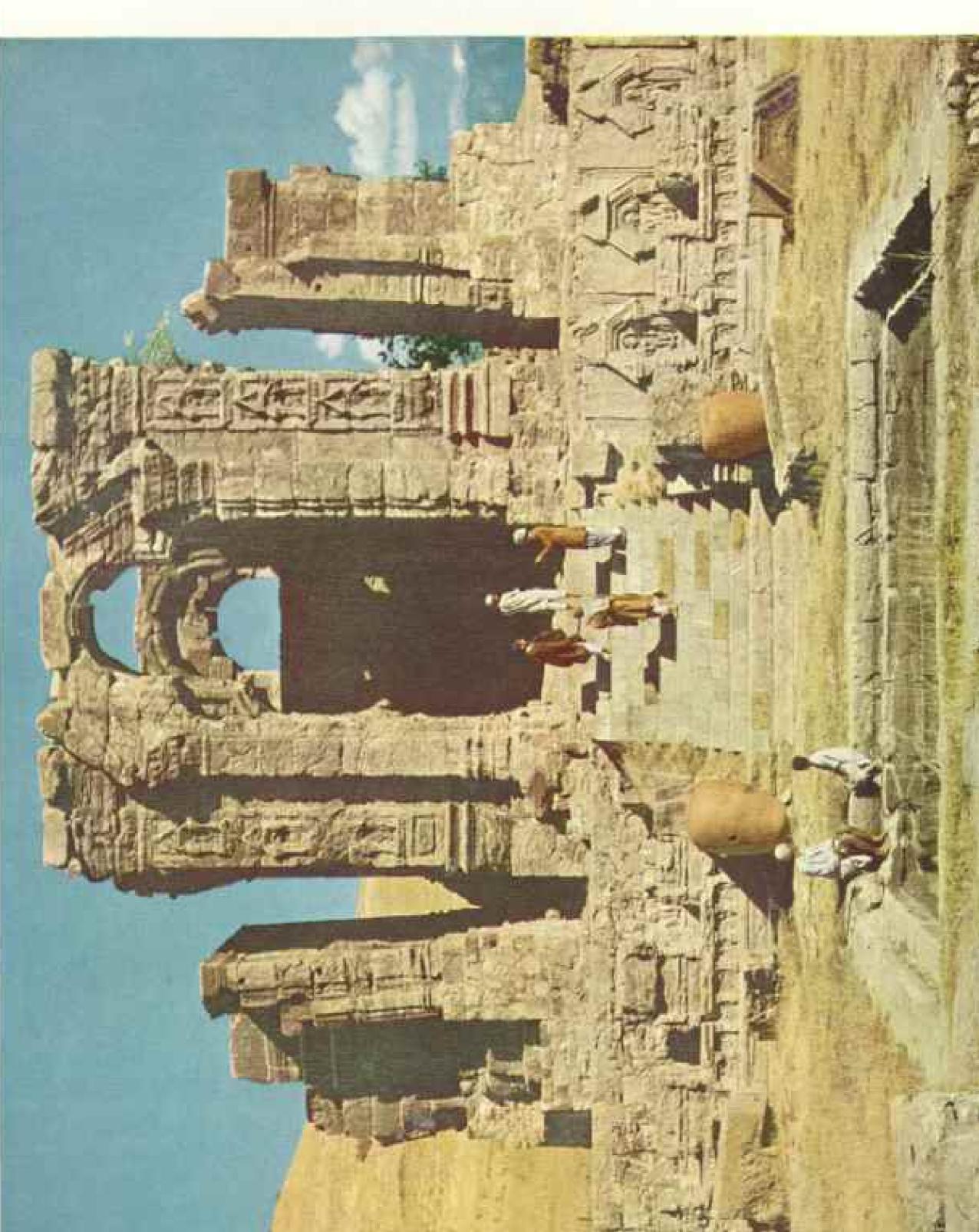
Proud Father and Gloomy Son

Dressed up for a festival, the boy wears silver jewelry; his parent, the Kashmir woolen skullcap.



In the Vale of Kashmir the Cold, Forbidding Himulayas Shelter an Earthly Paradise-Dal Lake

In Mogul times the emperors from aweltering Delhi established pleasure gardens beside these cool waters. Today their sanctuaries are public parke. On this flowery and times there, shaded by buge chinar trees, an Englishman has anchored his houseboat. His servants go on an errand.



In Crumbling Grandeur Stand the Ruins of the Sun Temple

Martand, Hindu temple to the son-god, has been called "a precious specimen of ancient art."

Surmaninting a lofty plabrast a few milles from Estamahad (Anantaug), Martand overloods one of the world's finest views, the long, wide Vale of Kashmit, Sunset floods the sanctuary with golden light sanctuary with golden light

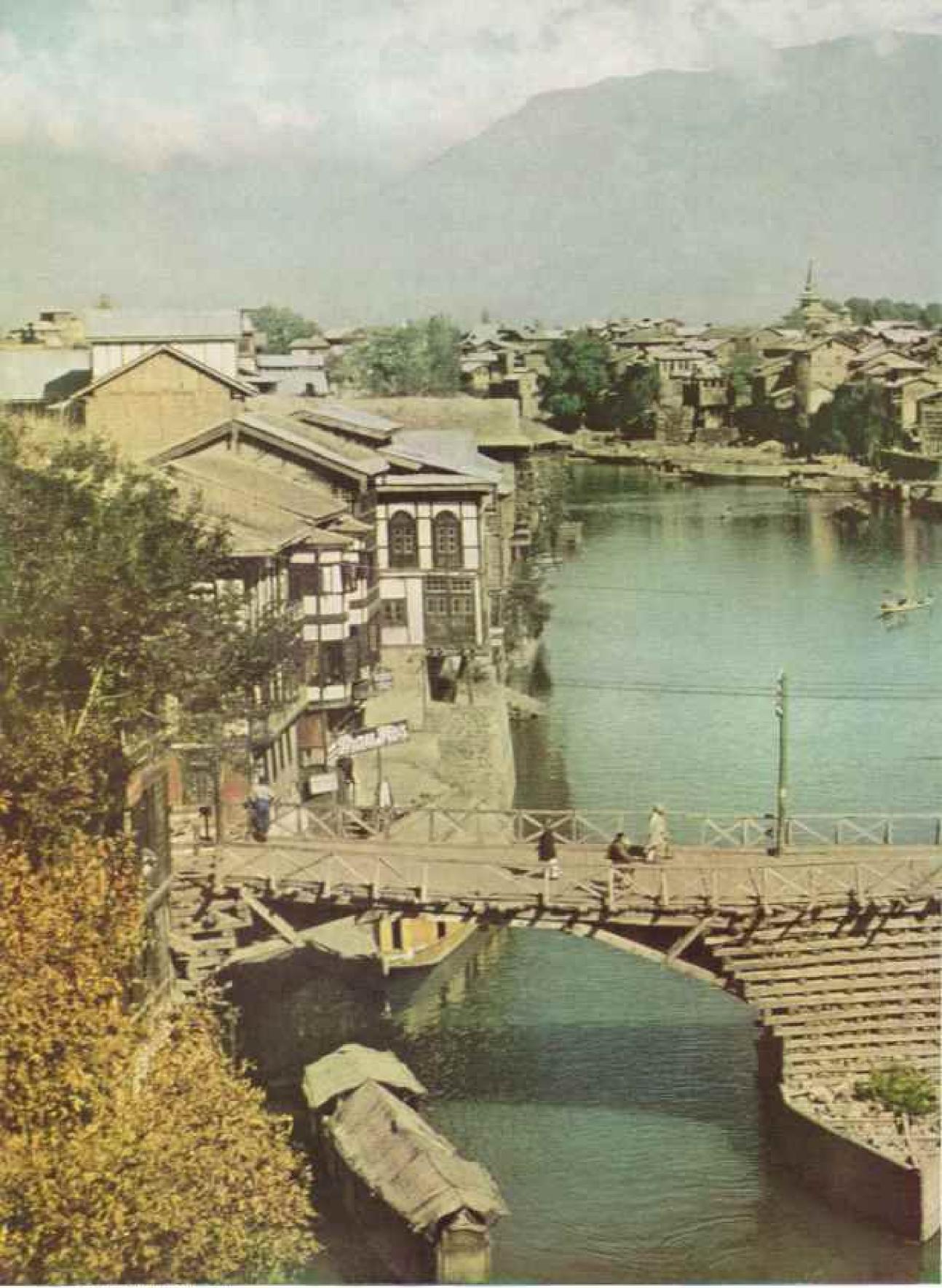
The roof, whether of stotte or wood, has collapsed, and two leaning wings give the impression of belong about to toppile.

The interior is bare of ormanded with uithes which reproduce the temple's form and embrine its images (right). A colonnade of 84 crumbling pillars lies outside the camera's view. In olden stays the ablution pool was used by pious Hindus.

The temple's age, suppowed to be some 1.700 years, is uncertain, but architects are positive that Greek atyle influenced its builders. Whether it was wreeked by earthquakes or Moslem konnoclasts remains a question.

© Strong Gennish Autory

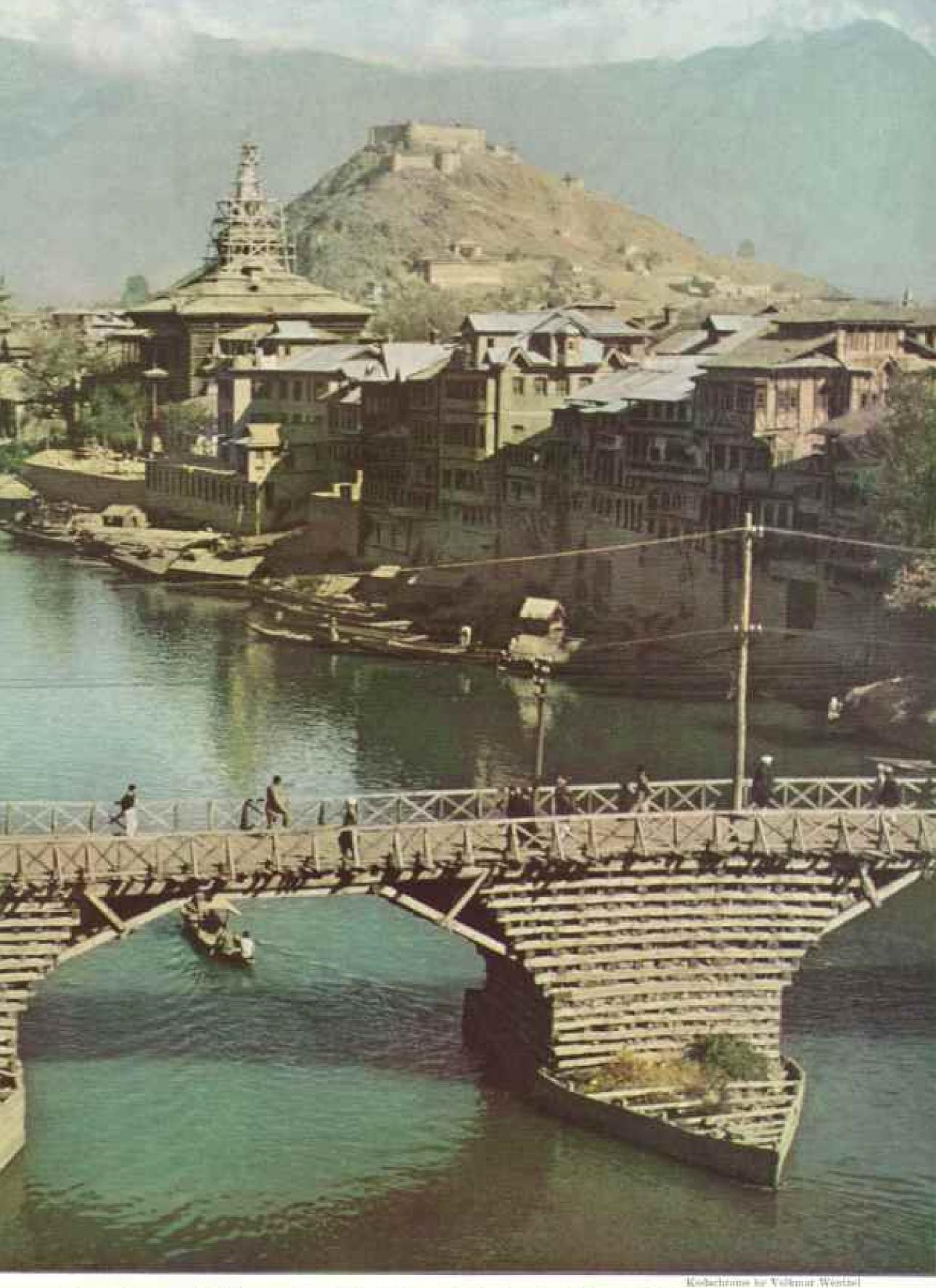
Soilaitemen by Volkman Wentard



D National Geographic Society

Main Street in Srinagar for Three Twisting Miles Is the Himalaya-fed Jhelum River

A water taxi, called shihars, passes beneath one of the city's seven bridges (Plate IX). Cargo boats are tied up on the right, a houseboat on the left. Shops of merchants and craftsmen line the water front.



Streets Cramped, Houses Jumbled, Kashmir's Capital Is Like a Medieval European City.

Here minarets resemble spires and mosques are built of wood; three may be counted on the right bank. Hari Parbat, the bill on the right, is crowned with a fort.

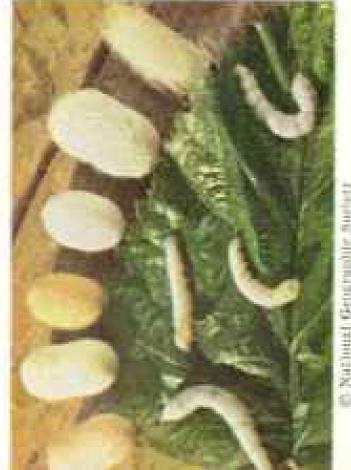


From Morning to Night, Srinngar Craftsmen Squat on a Floor, Giving Their Eyesight to a Rug quarters in winter that eyes often fail. Turban, fer, and cap all cover Mostems, So fine is the work and so dark the



Raw Silk Spills from Her Bonnet

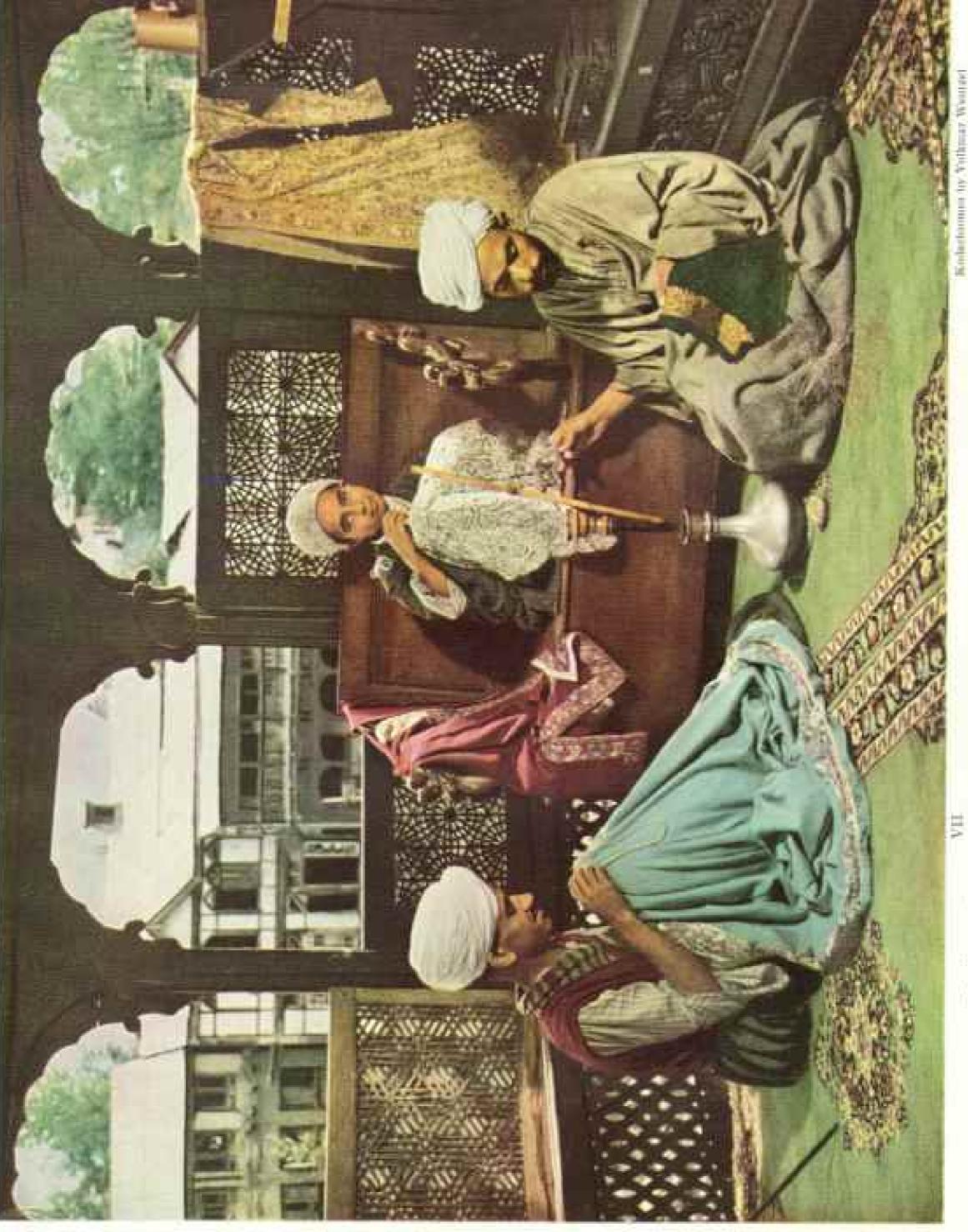
Kashmir. Women, who are not represented among most Srinngar trades, do a large part of the work in this factory. SIII, is an unclear industry in



C Nathoust Geographic Soutesty

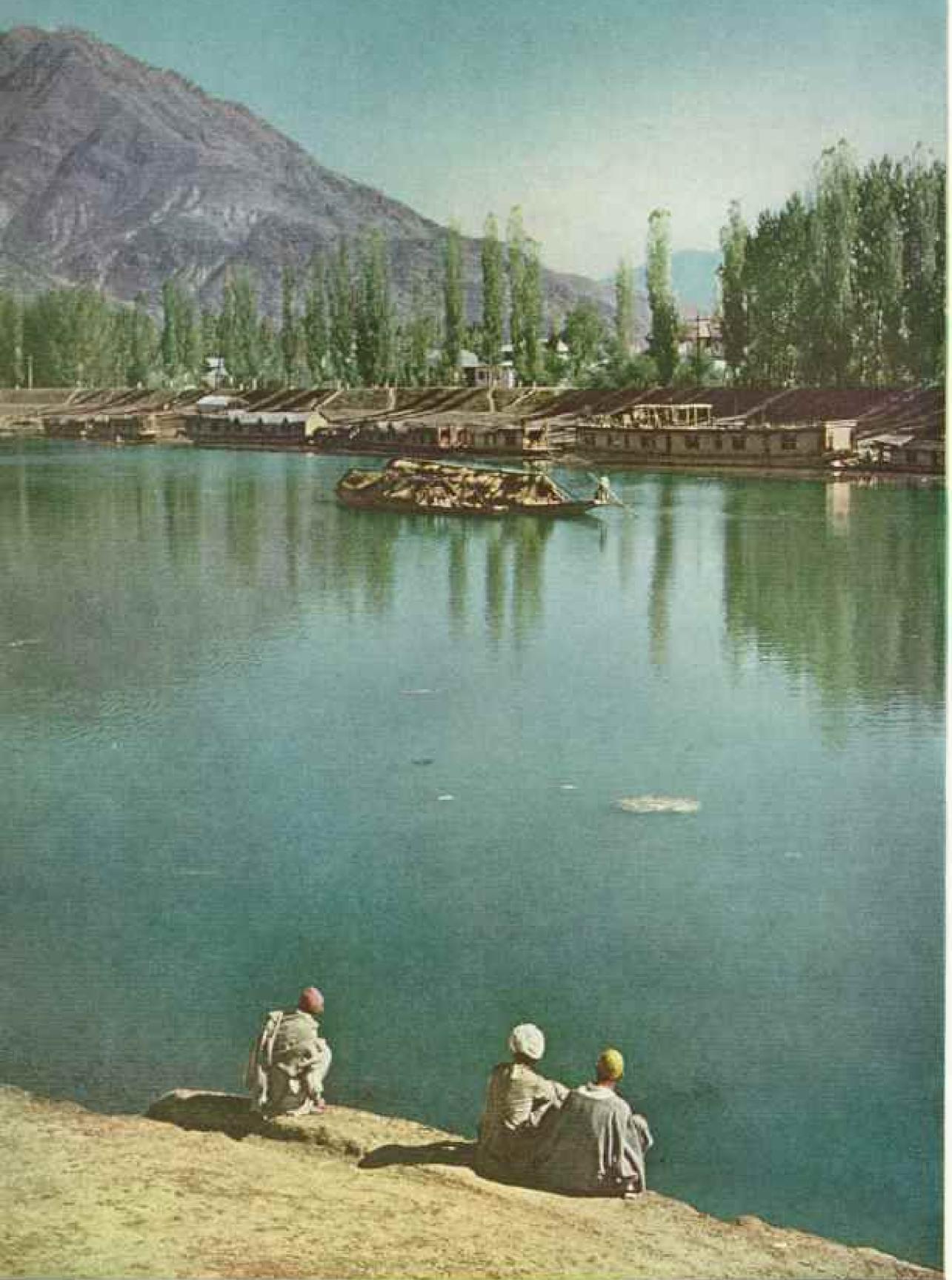
Leaves, Worms, and Cocoons.

A cocoon is \$42 pure-sille.



Needleworkers, One Using Gold Thread, Embroider Intriente Designs on Silk

On a riverside balcony in Srinagar, they share the same water pipe (center).

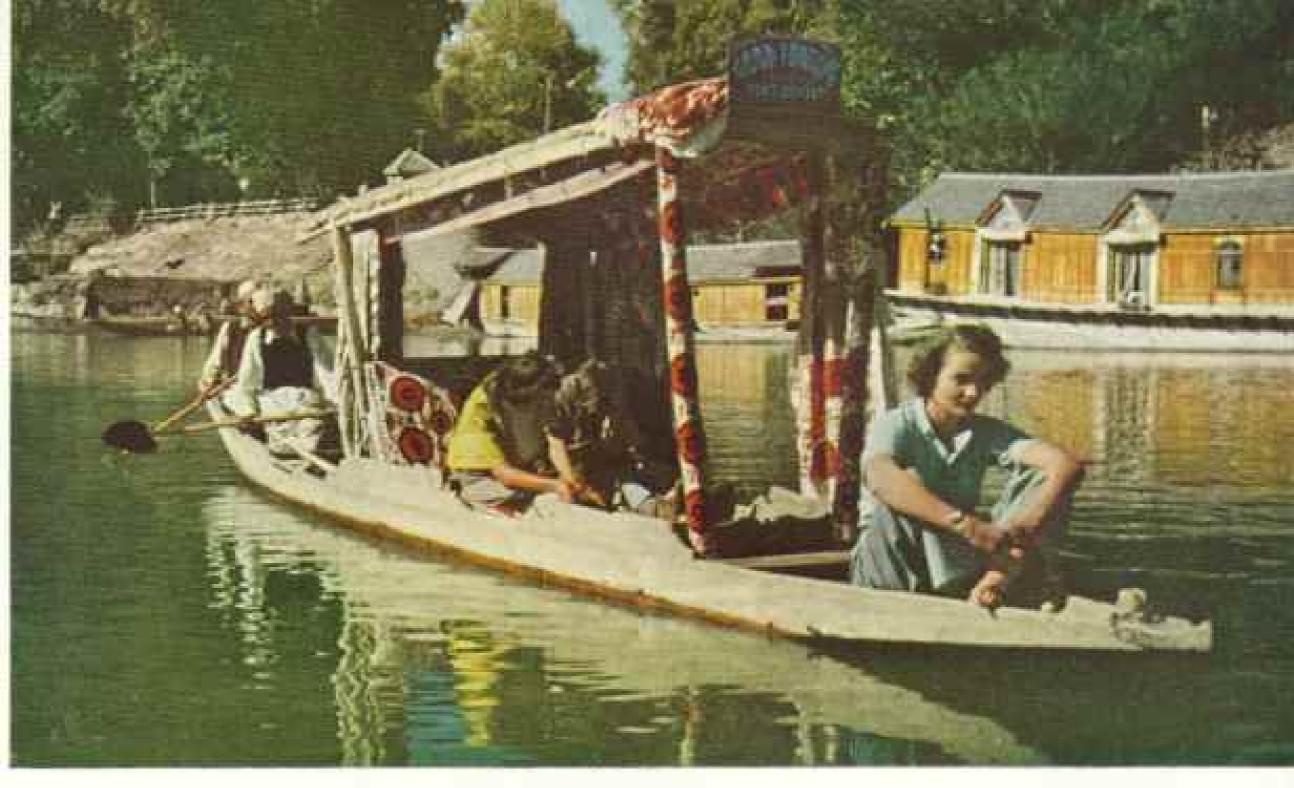


© Sational Geographic Selety

Kedachrono by Volumer Westaul.

Riverman's Workshop and Home Is His Barge, Which He Poles on the Jhelum

Houseboats line the opposite shore, one (right) connected to its cookboat by gangplank. Europeans choose houseboats because they may not own Kashmir real estate. They have compensations. Without bothering to pack, they may move at any time the fancy strikes. Many moor beneath shady trees (Plate II).



Heart-shaped Paddles Drive the Gondola Good Fortune, Carrying Three English Passengers

Many Yunks on furlough rode Srinagar's skikaras during wartime. They enjoyed one comfort which even the luxury-loving Moguls never knew—liner-spring cushions. Some water taxis bear names such as Mac West with Full Spring Scats and Dancing Girl with Full Spring Scats.

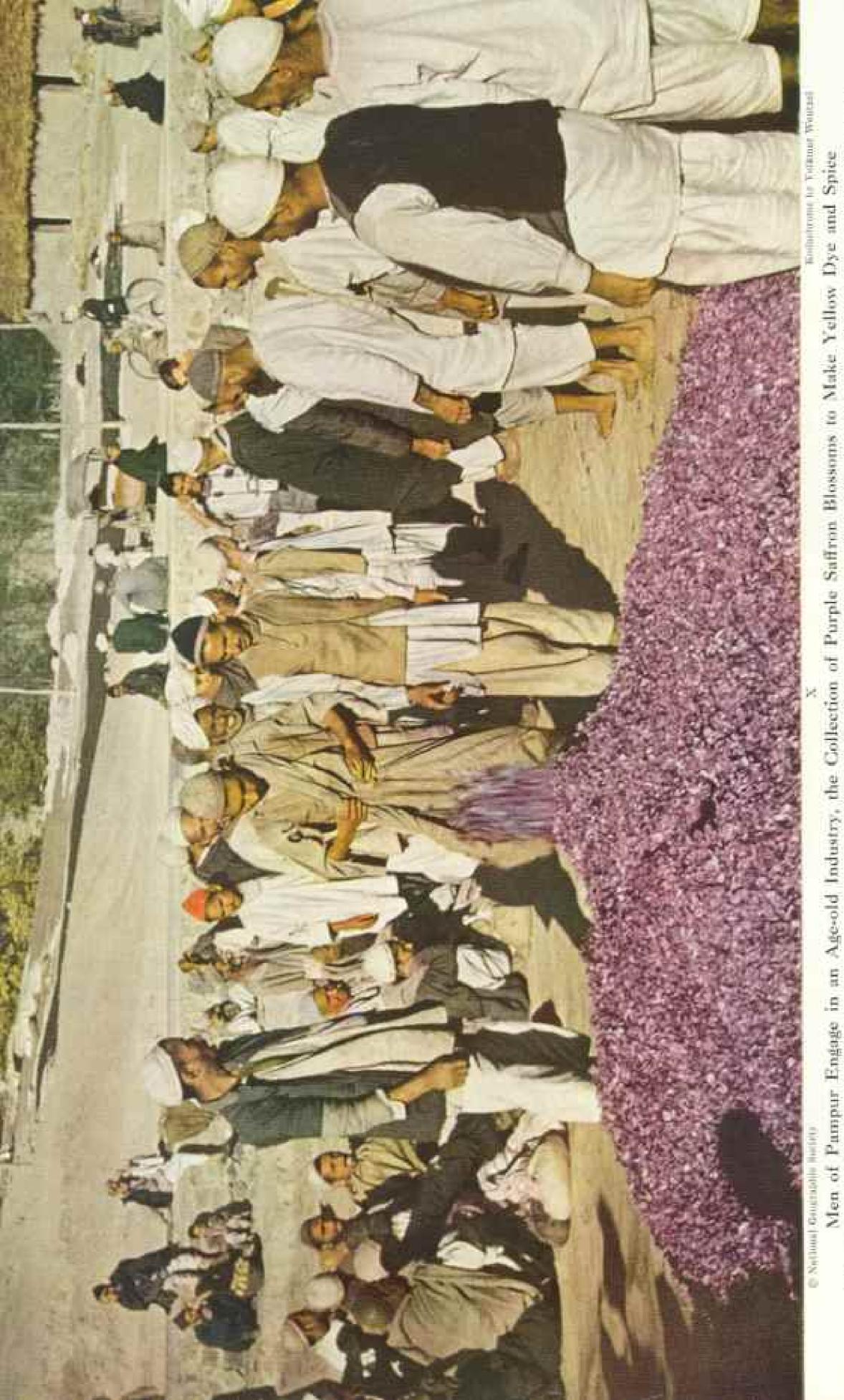


@ National Geographic Society

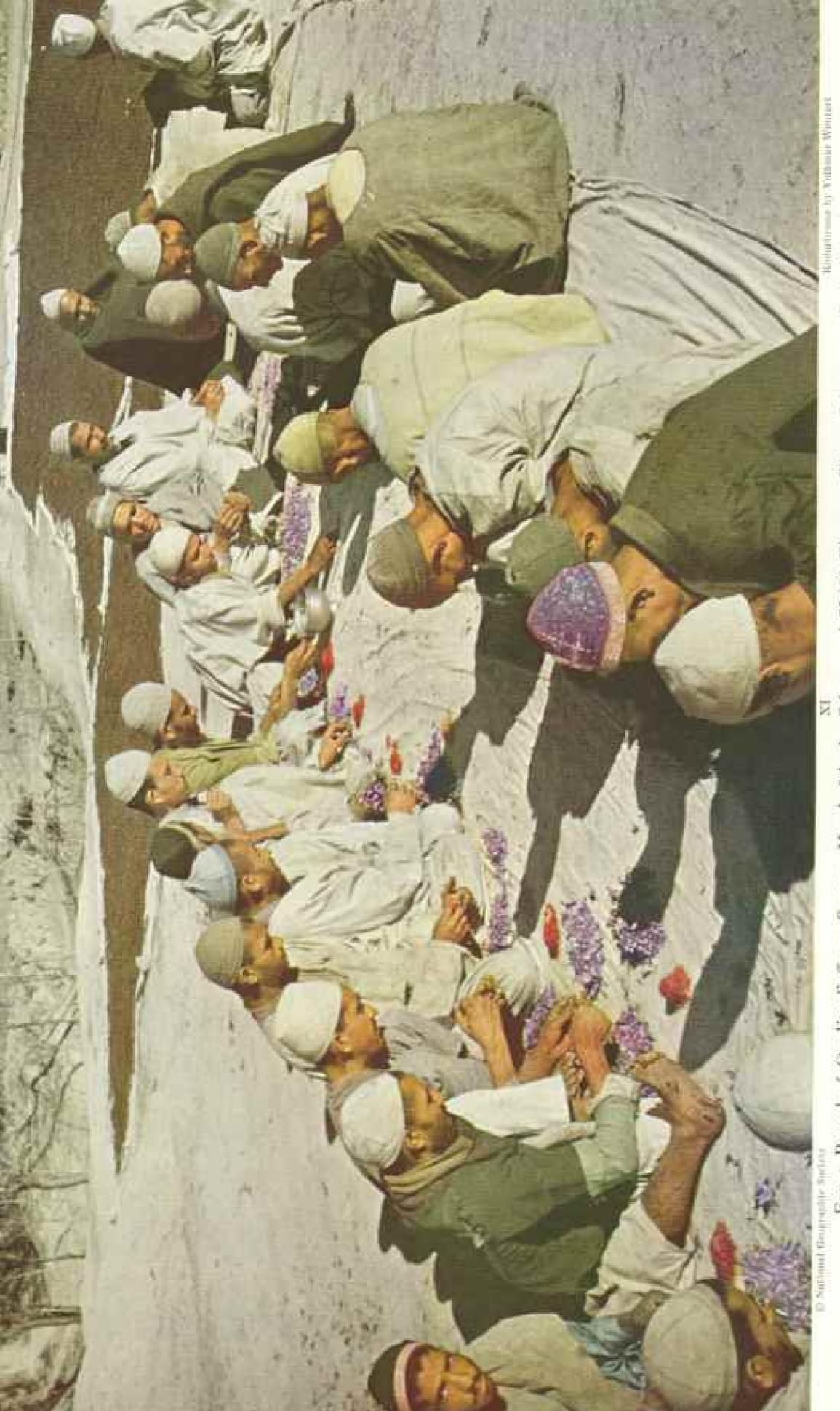
Kodariyanus by Volkmar Westasil

All the Comforts of Home, Including a Dog, Brighten a Retired Couple's Houseboat

In November, 1947, when Pakistan tribesmen raided Kashmir, some Europeans refused to fiee because RAF planes barred their dogs. This Englishman, a member of the National Geographic Society, observed the photographer's truck and invited him to tea. His houseboat once belonged to a maharaja.



Saffron, a word derived from the Amble za'faran, comes from Crocks saffour, a bulb resembling the spring crocus. The ancients used saffron as a perfume and dye and as in modicines. Various people est it as a condiment; Hindus employ the pirment to make forebead marks. In families Kashmiris have enten the bulbs.



's Hand-pick the Stigmas of 75,000 Flowers, Three Stigmas to Each Blossom For a Pound of Quality Saffron, Sorter

Some This ancient spice is among the costliest, Wholesale price is about \$32 a pound. Last year the United States took 17,000 pounds, Most of it went into drugs, was used to flavor and color foods. Cakes baked with saffron show a rich golden tint. A little goes a long way,



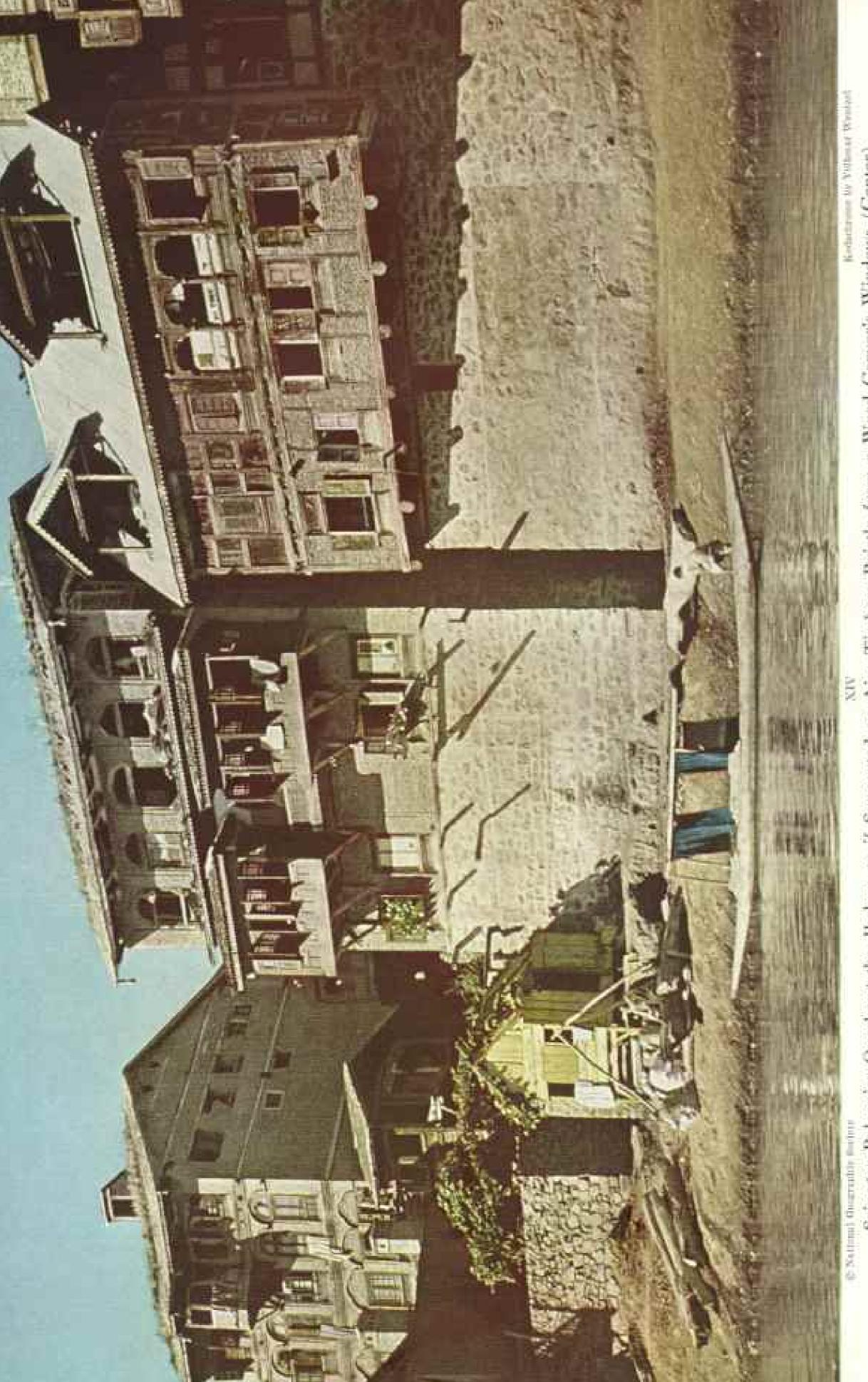
@ National Geographic Borbery

At Autumn Harvest, Farmers, Pickers, and Buyers Swarm in Pampur's Saffron Market Homer sang of the "saffron morn," Solomon of "spikenard and saffron," Greeks periumed theaters with saffron, a royal color; Romans tossed it in Nero's path. England once cultivated the plant at Saffron Walden.

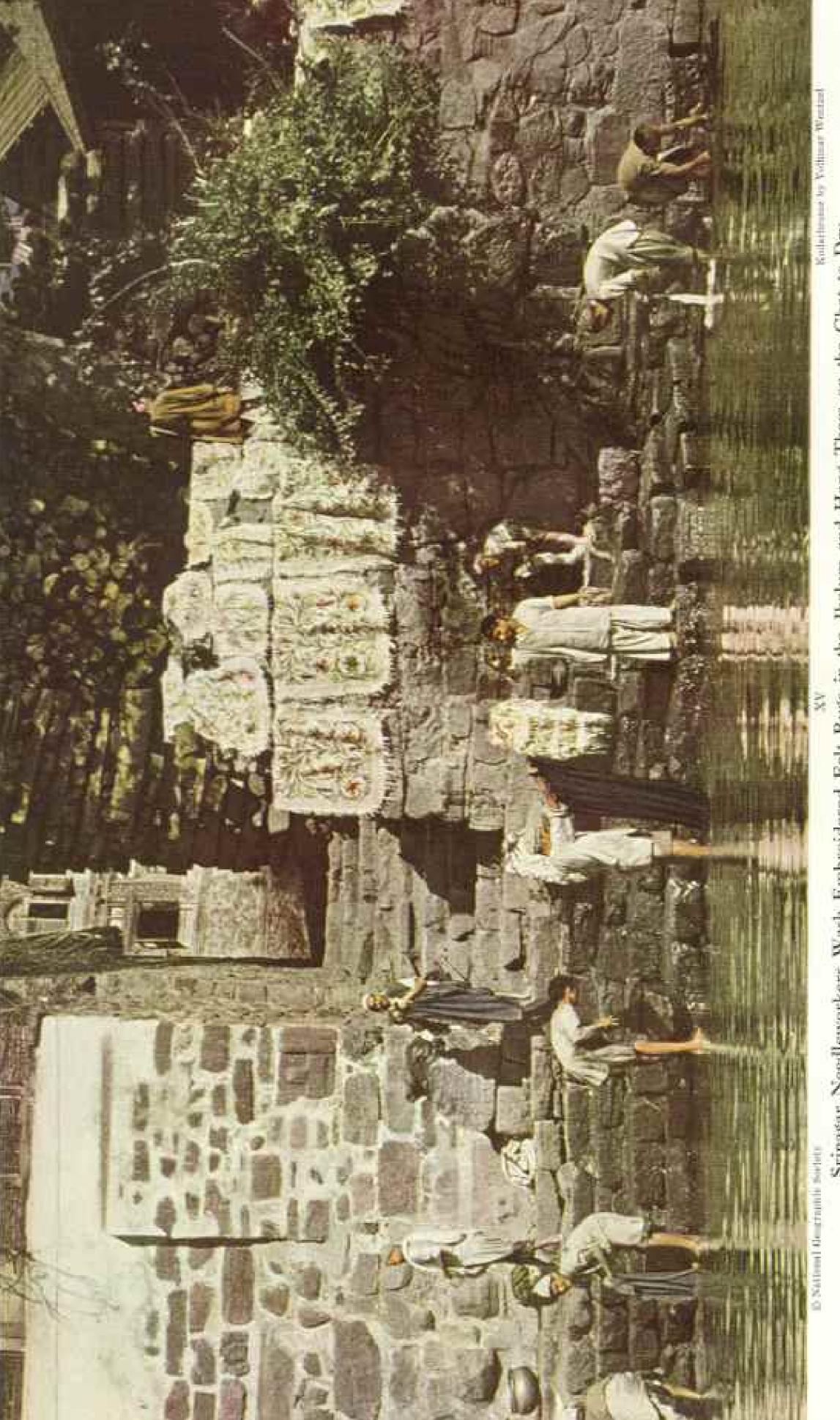


Kedachrome by Volkmar Westpot

The Breeze from Saffron Gardens Is Heavy with a Delicious, Overpowering Scent Pampur's sod roofs, sealed with mud, are shaggy with grass. Elsewhere Kashmir travelers have observed sheep and goats grazing on less tilted roofs. Some housetops appear aflame with tulips and popples (Plate XIV).



Timbers Bristle from a Wood Carver's Windows (Center) Srinagar Balconies Overhung the Jhelum as

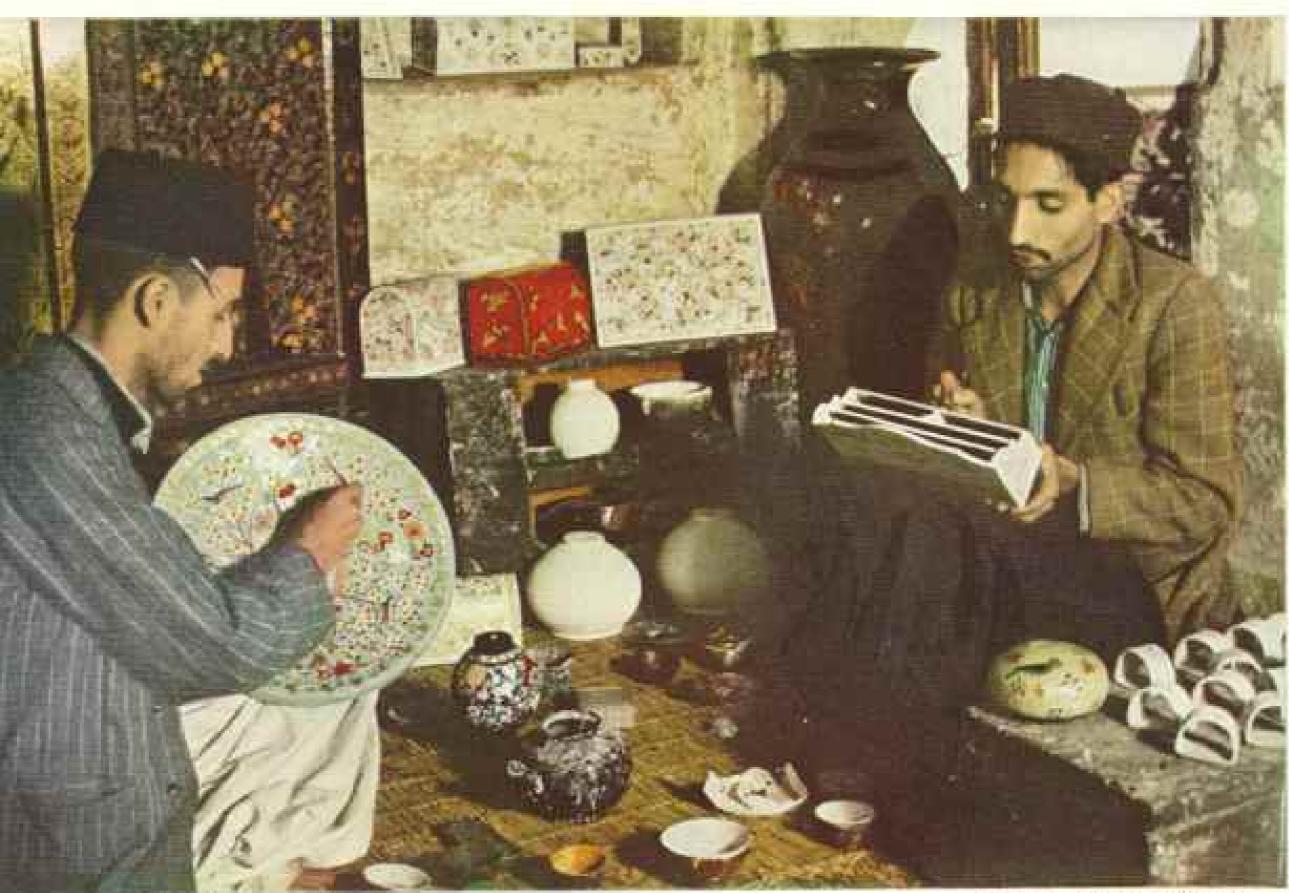


Srinagar Needleworkers Wash Embroidered Felt Rugs in the Jhelum and Hang Them on the Ghat to Dry

Kashmir's shawl industry is but a memory. Many of its workers passed to the carpet trade. As undecorated felt, these suimdake came hundreds of miles by ponyback from Yarkand, The Jhelum is everybody's washtub; fish, brass gods, garments, teeth, and bodies are scoured up and down the stream.



Rug Weavers Specialize in Patterns Handed Down from Generation to Generation



© National Desgraphic Josephy

Medichiness by Voltena) Westard.

Lacquerers Paint Designs So Intricate that Some Brushes Contain Only Three Hairs Wood and papier-mache are the materials of these artists. Powdered stone pigments come from the Himalayas.

On a relatively modern scale, however, is the silk factory in the city's outskirts. A wall encloses the factory buildings, which appear old but well-kept. Close by is a plantation of mulberry trees whose leaves are transformed into silk through the alchemy of silkworms.

In this factory I saw women workers for the first time in Kashmir. Dozens were squatting on their haunches around piles of cocoons, some of which were bright golden yellow, others almost white. The chattering of the women made a constant guttural gabble, but they proved shy when asked to pose.

Some had earrings so heavy that they were suspended from the whole ear instead of just the lobe. They were voluminous dresses of printed cotton cloth, but the long, flowing sleeves did not seem to interfere as their hands flew in sorting the cocouns.

Much silk for parachutes came from here-Kashmir's chief contribution to the war effort. Machines help turn the gossamer strands into skeins like hanks of beautiful hair, some golden and others platinum blond, and finally into silken cloth which may grace some maharaja's wife or a woman of fashion in America.

A Floating Six-room House

In almost incredible contrast to the teeming life of the Old Town is the beauty that
blossoms along Dal Lake. Going from a dingy
handicraft factory with oiled-paper windows
to a luxurious houseboat and the glorious
gardens of the Moguls was like emerging suddenly into another world.

Many houseboats on the Jhelum are owned by retired British civil servants and businessmen, who thus solve the problem presented by the fact that under Kashmiri law they cannot own real estate.

One which I visited proved to be a floating six-room house, complete with all the comforts of home, including a fireplace. Its owner, a gracious Swiss-English gentleman, bad noticed the National Geographic Society car and promptly invited me to tea, explaining that he had been a member of The Society for many years.

Boarding a shikara on the Bund, I gave the "taxi" paddler the address of the boat, which was moored on the opposite bank of the river.

As we approached, a sliding door moved noiselessly open and I stepped directly into a living room fit for a maharaja.

Actually, my host and hostess explained, the boat had belonged to a raja. When one of his wives died aboard, he decided that the boat was bad luck and sold it cheap. The beautifully paneled living room was now a happy wedding of East and West, with an English tea cozy and a Kashmiri samovar side by side (Plate IX).

Electricity was wired aboard, but water had to be carried from shore. Some of the native boatmen, incidentally, drink water from the river. Why it does not kill them I do not know.

In keeping with the leisurely pace of life on a Jhelum River houseboat is its "engine" men with long punting poles who plant the poles firmly on the river bottom and push, walking slowly toward the stern along walkways on the boat's "topside."

Thus propelled, the floating homes occasionally get a change of scene, poking themselves slowly along the river and canals to Dal Lake like some deliberate, aquatic daddy longlegs.

At Dal Gate, which controls the flow of water, many bouseboats are moored and about a hundred shikara boys lie in wait for tourist prey. One can go around this lake of delight either by boat or by road, and the pleasure gardens of the Moguls are now public parks, open to all. On the shore is the present Maharaja's palace, which sits back from the lake in walled seclusion.

From three sides snowy mountains look down on orchards of quince trees, fields of brilliant yellow mustard, bright flowers, and placid lake (Plate II). In July and August the lotus in bloom lends its delicate pink to the still waters. At sunset the scene is overpowering, with mountains, lake, and trees all melting together in a haze of purples and blues,

"Floating Fields" Sometimes Stolen

On the surface of the lake are "floating fields," aquatic plants on which earth and vegetable matter have accumulated, where melons and vegetables are grown. Occasionally complaint is heard that someone has stolen one of the fields, for it is entirely possible to tow them away with boats by night.

But the crowning glories of this lake, only five miles long and less than two miles wide, are the justly famous pleasure gardens, like miniature, highly formal Edens.

Great gardeners, the Moguls placed their personal versions of Paradise by the lake and made fullest use of the streams coming down from the snowy mountain backdrop. The clear, sweet life streams of the gardens flow through the pavilions and other buildings, pause in reflecting pools, then cascade down to other levels. In the days of the Moguls colored lamps glowed behind the waterfalls.

On tiny islands within the larger reflect-



A Srinagar Craftsman in Horn-rim Glasses Sits at His Loom, Weaving a Wall Piece

"Pashmina," the sign on the wall, refers to his material. Pashm, the soft undercoat of mountain-raised goats, is woven into delicate fabrics called pashmina. Pashmina helped make the Kashmir shawls famous. Now it goes into rugs, together sometimes with inferior substitutes. This elderly weaver shows a sample of his art (lower right). He works from a paper pattern on his loom. Each bobbin holds a change of color in the pattern (page 528).

ing pools the Moguls and their ladies sat amid fountains which kept the air cool their own air-conditioning system. Surrounded by walls of playing water, they could forget the heat of the plains.

All the gardens are more or less alike, differing only in size and coloring, like gems. All are symmetrical and formal, with carefully trimmed trees and hedges, and beds of brilliant flowers. The sensuous Moguls chose flowers for harmony of scent as well as color.

Smallest, but most appealing to me, was the little Chashma-i-Shahi, or "Royal Spring," which draws its sustenance from a spring on a slope above the lake. It was probably created by the Mogul emperor Shah Jahan,

Nishat Bagh, laid out by Emperor Jahangir's prime minister, well merits its name, meaning "Garden of Gladness."

But the most famous of all is the Shalimar

Bagh, created by Jahangir for his beloved wife, the famous Nur Mahal, "Light of the Palace," It has a magnificent black-marble pavillon, built later by Shah Jahan. Part of this garden was reserved for the court ladies and was called "Abode of Love," Now electric light, a happy anachronism, enhances Shalimar's charms.

"Where Are You Now?"

Here, fittingly enough, I had my first and only sight of a girl worthy of the poets' praise of the beauty of Kashmiri women. It was Sunday and the park was full of people. As I sought new camera angles, a veil was suddenly drawn aside and I found myself drowning in the depths of the largest and darkest eyes I had ever seen.

The owner of the eyes was a strikingly beautiful Moslem girl with a baby sitting on her shoulders. Long lashes dropped, but



With Soulful Eyes a Nomad Regards Her White Buffalo Calf

Gujar tribesmen and their buffaloes are lifelong partners in the Kashmir milk business. When spring melts the Himalayan snows, off they go together to the heights, where the Gujars live in crude temporary homes like Indian wigwams. A buffalo cow calves at four to five years and yields milk the next eight months. From it the Gujars make butter, which is converted into ghee, the clarified butter oil of India. In the Liddar Valley, where the photographer encountered this pair, he sampled buffalo "cottage cheese" (page 549).

there was a trace of a smile and I nerved myself to ask, in sign language, if I might make a picture.

She nodded consent, but as I peered through the finder I saw that she was gone. Looking up, I saw my picture rapidly departing. A stern-looking Moslem man had appeared from nowhere and was physically propelling her away.

Never more appropriate seemed Laurence Hope's Kashmiri Song, with its sad note of frustration:

Pale hands I loved, beside the Shalimar, Where are you now? Who lies beneath your spell?

Whom do you lead on Rapture's roadway, far, Before you agenise them in farewell?

Pale hands, pink-tipped, like letus buds that float On those cool waters where we used to dwell. I would have rather felt you round my throat, Crushing out life, than waving me farewell!* But since a photographer's frustration is hardly comparable to that of a lover, I did not pursue the matter further, preferring not to have any hands, paie or otherwise, "round my throat, crushing out life."

Hitchhikers, Even in Kashmir

Bountiful crops as well as ornamental trees and flowers grow on the well-watered slopes between the mountains and the lake.

One day, as I was passing the Shalimar Bagh by car, four men and a woman stopped me. Moslem farmer folk, they were trying to hitchhike to the city to sell several bags of walnuts they had grown. Kashmiri walnuts are superb and are exported widely.

When I offered to buy them, the delegation promptly sold me the whole load for

* From Complete Love Lyrics, by Laurence Hope. Copyright, 1902, 1909, by Dodd, Mead & Company, Reprinted by permission.



Doctor's Large Needle Brings a Wince of Pain, but It's Better than Cholera

Cholera, acourge of Kashmir, breaks out every few years. The great epidemic of 1892, which reached Great Britain and the United States, took the lives of 11,700 Kashmiris. Entire villages were ruined, farming areas were abandoned, and all business was stopped. Now the State tries to wipe out the pestilence with inoculations. These Srinagar boys volunteered. By contaminating food and drink, the housefly (on forehead) spreads the cholera microorganism.

one rupee (about 35 cents). The nuts filled two 5-gallon gasoline cans.

These simple farmers did not haggle; In fact, the five seemed pleased at their "bargain." The price apparently was at least as high as they would have received at market, and the chance encounter saved them the trouble of going to town.

From Srinagar we sallied forth in our ambulance to see the outlying countryside,

For such trips the Kashmiri who can afford it usually travels by bus, since his country has only 20 miles of railroad—the short line into Jammu from the Punjab.

A typical bus consists of an American chassis on which a wooden body has been built.

Each bus is divided into first-, second-, and third-class sections. The first, up near the driver, has seats for only three or four persons. The other sections are larger but progressively more crowded, so that back in the "steerage" the passengers are frequently packed in so tight that they form a solid mass.

As we passed through a small village on the way to the temple at Martand (Plate III), we suddenly encountered two Moslems swinging long swords wildly over their heads, while behind them pranced male dancers dressed as women. This somewhat alarming demonstration proved to be only a wedding procession, with the bride and groom riding in a boxlike contrivance suspended on long poles borne by their friends.

When the gay wedding party noticed my camera, there was such a rush to get into the pictures that I was practically mobbed. We did not linger, since the festive spirit was a bit too high for comfort,

Many country folk along our route were harvesting and drying saffron flowers, which paint the fields with purple and fill the breeze with their perfume. Hundreds of hands were

extracting the flower parts which yield saffron, much in demand as a condiment and as a yellow pigment for Hindu forehead marks (Plates X-XIII).

On another trip we followed the Jhelum downstream from Srinagar to the point where it widens into Wular Lake. Although only about 6 by 15 miles, this is the largest permanent natural fresh-water lake in India, Seasonal floods expand it considerably. Shallow and fringed with reedy marshes, it seems a remnant of the great lake which legend says once covered the Vale of Kashmir (page 524).

Waterfowl abound, and here the Maharaja and his friends shoot hundreds of ducks. I saw the score sheet of one such hunt. The Maharaja bagged the most, and the scores of the others descended strictly in the order

of their rank.

In a pasture on the outskirts of Srinagar Mohammedans were celebrating a religious festival. The celebration had all the gaiety of a county fair in the United States, except that at the hour for prayer all the fun would suddenly stop, the crowd would form into two large kneeling groups, and all would bow low to the ground. Then the festivities would start again.

Here I saw a traveling beauty shop—a man with a stick of antimony who gave the celebrants, of either sex, a dab or two of dark shadow under each eye for a couple of coppers. Perfume was heavy on the air. wore their newest and best clothes, and women, and children, too, were loaded with elaborate jewelry (Plate I).

On our next trip we headed for the beckoning mountains. Driving east from Srinagar to Pahlgam, we hit the trail on foot to Arau, and there hired ponies and camping equipment for the trek to Kolahoi Glacier, on the slopes of the Matterhorn-like mountain of the

same name.

Striped and Dotted Sheep

We were not alone, for the people of India flock to such resorts, just as New Yorkers on vacation hie to the Catskills and Adirondacks. The little wayfarers' cabin at Arau, where we spent the first night, was packed with Sikhs, Hindus, Mohammedans, and English, and suddenly I heard the unmistakable accents of another American. He proved to be a teacher from Forman Christian College in Lahore, who was taking his Indian students on a tour,

As we rode up the pretty alpine valleys on our hired ponies, we sighted the strangestlooking sheep I had ever seen. Broad bands and dots of red, or red and blue, made them

look like circus freaks. These marks, however, were merely the painted brands applied by the Chopans, or shepherds, a nomadic mountain people.

Also at high altitudes live two other tribes of herdsmen, the Gujars and Bakarwals. Those I saw were sturdy people, shy but frank, honest, and hospitable. From them the inhabitants of the Vale get much of their milk and wool (pages 527 and 547).

Some of the Bakarwals served us cheese, using a leaf as a dish. It tasted good, somewhat like cottage cheese. The men were bearded and patriarchal in appearance. The women were large-featured and not uncomely, with braided hair, little round caps, and silver jewelry. They were wholly different from the people I had seen thus far in Kashmir.

Above timber line we ran into rain and snow, and by the time we reached the glacier we were all soaking wet and panting from the altitude. In the big ice cave at the glacier's base we partially regained our breath. I think we were all glad when a broken strap on one of my Kashmiri sandals gave a good excuse for not going farther.

Leaving the Vale by the Back Door

Among the beauties of the Kashmir mountains are the lofty margs, or grassy alpine meadows. At Gulmarg, a popular resort, part of the marg has been transformed into a golf course. So arresting are the peaks in the background that it must be almost impossible to keep one's eye on the ball,

The lofty snow-covered ranges in the distance loomed like a challenge. My car was temporarily out of commission with a shredded fan belt. Why not climb farther into the Himalayas, where no wheels could move, anyway, and trek into "Little Tibet"-Ladakh, as different from the fruitful Vale as if they were on two different planets?

Thus it came about that I left the Vale

by its back, or eastern, door,

A vulcanizing job on our fan belt carried us the 40 miles from Srinagar to Sonamarg. "Meadow of Gold," at more than 8,500 feet, which was as far as the motor road went. There we loaded ourselves and equipment on six ponies.

There, too, we met our first Ladakhis, Tibetans who might have stepped straight out of the pages of Lost Horizon. They were felt boots, homespun woolen robes, and little hats which looked as if they had been thrown on their heads from a distance (Plate I).

It was bitter cold and our hands were numb as we strapped the loads on the ponies next morning. The first rays of the sun had not



Srinagar Carvers, Who Never Heard of Power Saws and Lathes, Do All Work by Hand With primitive tools this man and his apprentice create the most delicate designs, many of them in hard black walnut. They turn out beautiful furniture, decorative screens, and handsome boxes.

yet penetrated the valley, but they played on the high, snow-covered peaks, outlining them in delicate pastel shades.

Mohammed led the way through fields and forests covered with hoarfrost, upon which the sun soon shimmered with an effect like thousands of little mirrors.

After about nine miles the valley seemed to come to a dead end. But Mohammed pointed high to the northeast, and above the timber line I saw a narrow trail hugging the steep mountainside. This was the approach to the Zoji La, gateway to the Tibetan plateau.

Amarnath Cave Sacred to Siva

For several hundred miles in this direction the Zoji La (la in Tibetan means "pass") is the only gap in the great snowy Himalayan wall. The summit of the pass itself is at 11,580 feet, whereas the surrounding peaks average 18,000.

But Ram, the Hindu, was looking southward.

"Over there," he said, "is the cave of Amarnath," the legendary abode of our Lord Siva, the Destroyer and Re-creator. Since remote times thousands of Hindu pilgrims have wound their way annually to worship Siva, who is there incarnate in a block of ice. The sacred cave might be compared to the Mecca of the Mohammedans."

With our hearts pumping heavily we toiled upward. The road now was a narrow path which clung to a precarious mountainside. Except for a few pretty silver birches, all vegetation had ceased.

In this dead world we looked like some unfortunate band of beings who had been marooned on the moon or on some uninhabitable planet.

This other-worldly effect was heightened by a small caravan of Tibetans who met us as we rounded a sharp turn. The leader was a wizened old character in a long dirty coat of homespun wool. Over this hung one long pigtail and a series of cloth amulets strung around his neck. A floppy cap was jauntily perched on his head. He gave us a cheerful greeting.

Shortly before we reached the summit we paused for a last glimpse into the rich green Sind Valley, which wound its way thousands of feet below.

What a prize this Vale of Kashmir must have seemed to the rough, dirty, hard-as-nails Mongol hordes coming south from the cold heart of central Asia! And no wonder their descendants and heirs, the Moguls, sought earthly paradise in this air-conditioned Vale! †

*See "Pilgrimage to Amernath, Himalayan Shrine of the Hindu Faith." by Louise Ahl Jessop, National Geographic Magazine, November, 1921.

† For additional articles on India, see "NATIONAL GEOGRAPHIC MAGAZINE Cumulative Index, \$809-1947,"

Down Mark Twain's River on a Raft

By REX E. HIERONYMUS

A TRIP down the Mississippi River on a homemade raft is one of boyhood's most cherished dreams. This is the story of two boys whose fathers turned that dream into 1,400 miles of reality.

I might as well confess right now that we two fathers, Tom Roth and I, felt the lure of the big river as strongly as our sons. We shared with Tom's 12-year-old Tommy and my 15-year-old Dick the conviction that a vagabond river journey was the peak of adventure (page 554).

We would ride the river on a raft—did not those prototypes of all adventurous Mississippi travelers. Tom Sawyer and Huck Finn, sail a raft? All right, we four would build our own craft and fare forth,

If we ever need concrete reminder of our adventure, Tommy has the 12-inch bronze propeller which pushed our floating magic carpet down the river from Chicago to New Orleans. And Dick has the brass-mounted mahogany steering wheel he and I made in a basement workshop to guide our craft on the long voyage (map, page 553).

The boys' confidence in our ability to design and build the raft and then navigate her from Chicago to New Orleans was a challenge,

For a time war delayed us, but shortly after V-J Day we began work on designs for the raft and plans for the trip, and undertook serious study of charts and pilot rules.

Shipbuilding in a Basement

Early in January, 1946, we started actual construction of the raft, dubbed the Meanco by the boys, short for their ambitious name for our outfit—the Mississippi Exploration and Navigation Company!

For six months Tom Roth's basement in suburban Western Springs, Illinois, was a beehive of cutting, fitting, threading, tapping, and painting, until one evening in early June we sat back on our heels and surveyed with pride the unorthodox conveyance that was to be our home on the month-long journey.

In licensing us, the Coast Guard dignified the raft as a "power-driven open boat, more than 15 and less than 26 feet long," and issued us the number 39-E-344, authorizing us to traverse the inland waterways and entitling us to service through locks, the raising or swinging of interfering bridges, all Coast Guard information services, etc. But their official language fell far short of conveying any picture of what the *Meanco* was really like.

Properly she could be described as a doublepontoon catamaran raft, powered by an outboard motor. The frame and deck were constructed on two parallel pontoon floats, eight feet apart (page 557). Each pontoon consisted of five 55-gallon steel oil drums, the front and rear drum of each side assembly being provided with a welded cone of heavier steel to streamline the floats and provide additional buoyancy.

The drums were not welded solidly together, but were fastened rigidly into wood and steel saddles to which the tanks were secured by steel straps. Total buoyancy of the pontoons was 5,028 pounds.

Our power plant was a 22-horsepower outboard motor mounted toward the rear, midway between the two pontoons; for steering we set a conventional wheel forward.

We secured an olive-drab tent to the deck and stowed a duffel locker and two cots inside to provide three bunks; the fourth was atop the icebox locker.

Pontoons Carry Fuel and Water

Fuel was carried in one of the 55-gallon drums, water for washing, etc., in the corresponding drum on the opposite side. Drinking water we carried in containers on deck.

For cooking while under way we used a special double-walled, steel oven-stove, heated by exhaust gas from the motor. We cooked on a gasoline camp stove or over a campfire when we were ashore.

The Meanco was 10 feet wide by 21 feet long, her deck space 10 by 15 feet. Clearance, including the flag mast, was 11 feet 3 inches. She was neatly and durably painted, pontoons and below-deck gear in aluminum and green, and deck and superstructure battleship gray with a gay trim of Chinese red.

Tom and I were confident our raft was sufficiently shipshape and river-worthy to assure our primary aim: the construction of a craft that was in keeping with the adventurous spirit of our trip, but one in which our boys would not be exposed to needless danger or discomfort.

The Meanco Sets Sail

On the cool June morning when we proudly launched the raft in the canal near Summit, Illinois, our assurance was justified. Easily she floated, to the astonishment of bystanders who audibly doubted that anything that peculiar looking would float.



Old Man River Gives Up a 44-inch, 50-pound Mississippi Channel Catfish: Off St. Louis

In the early afternoon of June 29, fully provisioned and shipshape, the raft was ready to go. Tom Roth, Tommy, Dick, and I, with a friend who was going along about 100 miles "just for the ride," waved to family and friends gathered to bid us bon voyage.

With Dick at the helm and Tommy breaking out the flag, we dropped slowly down the canal. New Orleans lay 1,400 miles, a whole

month, ahead.

Boys Anxious to Steer

Quickly our days shook down into a routine of navigation, cooking, making up for the night, etc. At first the boys were eager to do all the steering, alternating every half-hour.

Later the novelty wore off, and we rotated duties, establishing one-hour shifts for the three duty positions—helmsman, navigator, and chief engineer—with the fourth man off duty, free to watch the passing shores or snooze in the tent shade (page 564).

We used the motor always when under way, except during lunch and while fishing for catfish. Then we would drift along, free to enjoy food and companionship, giving only "look-

out" attention to navigation.

Though equipped with lights and signals for sailing at night in case of emergency, we chose to sail only during daylight hours; we didn't want to miss anything interesting by sailing past it in the dark,

Evenings we swam, and after supper the galley was the scene of many a "jam" session, during which Tom and I became really acquainted with our sons in an intimacy for which we had seemed never to have enough time in the hubbub of city life.

We shared the indescribable beauty of dusk and nightfall in cove or bayou where, tied up off the sailing channel for the night, we went to sleep to the cries of whippoorwills and

hoot owls (page 562).

There was the awakening call of the cardinals at dawn, when the dew on our blankets and on the whole raft was heavy as from a gentle rain. Then a dip in the river lasted until the delicious smell of wood smoke, mingled with the aroma of bacon and eggs and coffee, got us out of the water and into our clothes in a burry.

On down the Illinois River we sailed, mile by mile—Peoria, Havana, Beardstown, Montezuma. At 1:10 p. m. on July 5 we cleared Mason Island and Island No. 526 and sailed out onto the broad bosom of the Mississippi!

That night we tied up at Grafton, Illinois (page 555), planning to buck the big river on the morrow. We were six days, 313 miles from bome, right on the button at the





Chicago Tribine

Chicago's Huck Finn and Tom Sawyer Join Their Fathers on a Raft Adventure

Water, water everywhere, but not for drinking. At Summit, Illinois, the voyagers load their own on the eve of their departure. Ahead of them lie 27 days of lazy drifting on 1,400 miles of waterways. Their outboard motor served them all the way to New Orleans, but the propeller's shear pin snapped when 200 feet from the final landing (page 574). Rex E. Hieronymus, the author (right), and Tom Roth face their sons, Tommy Roth (left), 12 years old, and Dick Hieronymus, 15.

52-miles-a-day average we had hoped for.

It was hazy as we swung out into the Mississippi next morning, visibility only a mile and a half and the channel so wide we had difficulty reading the navigation markers ashore. At one o'clock we picked up the muddy Missouri on our starboard side.

The gradual merging of the two streams was an interesting sight; for a distance of six or seven miles we could see huge blotchy swirls rolling about in the clear water of the Mississippi as the waters of the two rivers intermingled. In an hour or so the whole river was turbid and soiled, as it was to be all the way to the Gulf.*

Room for 314 Meancos

We had a thrill at the big Mississippi Lock and Dam No. 26 at Alton, Illinois. We expected to be put through the smaller of the two locks, but the lock keeper had heard about us and paid us the honor of putting us through the big basin, 600 feet long and 110 feet wide.

While the lock chamber was emptying, I calculated there was room in there for 314 rafts the size of the Meanco. We really rattled around.

We had been warned about the treacherous current near the Chain of Rocks Bridge above St. Louis. Tommy was at the helm as we approached it, Tom checking on the charts.

Young Tommy brought the Meanco through the eddies like a veteran, and soon we were anchored off Market Street at St. Louis.†

"Taming the Outlaw Missouri River," by Frederick Simpich, November, 1945; and "Trailing History Down the Big Muddy," by Lewis R. Freeman, July, 1938.

† See, in the NATIONAL GROGRAPHIC MAGAZINE, by Frederick Simpich, "These Missourians," March, 1946; and "Missouri, Mother of the West," April, 1923.



Charage Aerial Servey Co.

Where the Illinois (Right) Joins the Main Stream, the Mississippi Is Still Clear Water

Twenty-three miles below the confluence, the Missouri empties its chocolate current, and thereafter the Father of Waters is a muddy yellow. Here clashing currents have dumped silt, forming five wooded islands, one partly cleared for farming. On the right, Highway 100 leads through Grafton, Illinois.

St. Louis friends came abourd to visit and later took us ashore for a delicious steak dinner. That night abourd the old showboat Golden Rod we saw a performance of "The Drunkard," that perennial favorite of showboat audiences.

Chester, Illinois, and Cape Girardeau, Missouri, provided us anchorage on succeeding nights. Down we dropped toward Cairo, Illinois, where the Ohio joins the Mississippi, at the beginning of what is called the Lower Mississippi River. At that point we would be 530 miles from home.

The serene, uneventful days became a cause of complaint to the boys; they pined for some outright excitement.

"Shucks," said Tommy, "there's nothin' to it. I thought there would be some big waves or sumpin'."

"Don't worry, son," said his father. "We aren't to New Orleans yet."

The river was higher than normal for the time of year, about 15 feet above mean low water. Above Dogtooth Bend, 150 miles below St. Louis, where the river is about a mile across, there is a wide turn, and the sailing line of the dredged channel follows the outside bank. Tom was steering.

"Hey, Rex," he called, "the river's pretty high. What say we cut across over the towhead? It'll save a couple of miles."

According to the charts, there were sandbars and towheads in the bend at low water, but, with the river at 15-foot stage, we should clear them easily, I agreed. Our pontoons drew only about a foot and a half of water, though the propeller extended another foot below them. Tom veered her to port and we started across the cutoff.

Suddenly we felt the propeller chewing sand, and, before we could move, Meanco lurched to a stop. We were aground!

Our position wasn't good: nearly two tons of raft rammed on a hard sandbar in the middle of the Mississippi River half a mile from shore—no place to lighten ship.



Res R. Hieronymus

Dick and Tommy Nail Down the Deck. Each Hammer Stroke Brings Adventure Closer

Here the rait, her parts built in a basement, is assembled on the bank of a canal near the boys' home. Western Springs, a suburb of Chicago. "Will she float?" skeptical bystanders asked. For answer, the boys pointed to the two pontson floats, each composed of five steel oil drums. Buoyancy was 5,028 pounds.

"Well," I mourned in self-condemnation, "this needn't have happened if I had been swinging the lead."

"How'd you like to spend your vacation right here, Tommy?" asked his father.

"You and your short cuts!" his son came back.

Tom and I went overboard, shin-deep in the turbid water, and soon discovered that the sand bottom was really hard. Even though relieved of our weight, the raft was stationary as a rock.

"Isn't this some river?" exploded Tom in disgust. "A mile wide and only 12 inches deep!"

Downstream ahead of us the water was even more shallow; therefore, to float the raft we should have to work her back upstream against the swift current. The boys came over the side to add their efforts to ours, but even the four of us couldn't budge her. The only way we could get off the bar was to lighten the raft.

River Falling 5 Inches in 24 Hours

The man at the gauging station had told us that the river level was falling about five inches in 24 hours. That meant we had to get the Meanco affoat before nightfall.

"This situation calls for a lemonade," hinted Tom. "Coming up," Tommy replied.

Over the cool drinks Tom and I figured that we probably should have to lighten the raft by at least 1,200 pounds to free her.

There was not much we wanted to jettison outright—only about 365 pounds of fuel and water.

To make the necessary weight, we decided to tie to the raft all the things that would float and not be ruined in the water, and to heave them over.

In addition, we emptied the ice locker, plugged the drain, set it afloat, and then put the things back in it as a raft. Out on the sandbar went the two 5-volt car batteries and the old Dodge electric starter-generator. Not only did their going help lighten ship, but they served to anchor some of our possessions.

It was a 2-hour job to get all the stuff off the raft, but by noon we were ready to try shoving her off.

To break the suction of the pontoons on the bottom, we bounced each corner of the raft. With a saucepan and a pike pole we cleared the sand from around the propeller and scoured out a groove upstream for it.

These preparations ended, Tom and I took positions at the forward ends of the two pontoons, ready to heave. Dick and Tommy stood by to start the motor, using the pull cord, since our electrical system was now "on the bottom."



BLEK E. Hieromymun

Built Catamaran-fashion, Meanco Straddles Two Floats the Size of One-man Submarines

This "power-driven open boat" had Coast Guard authorization to pass through all locks and swinging bridges. She is stoutly constructed (page 351). Neither storm nor shoal nor 7-foot wave made much of a dent. Decked with tent and lawn chairs, she here pursues her vagabond life, at anchor off Missouri.

Dick yanked the cord and the motor caught. Tommy threw the compression lever, set the spark, and gave it full throttle; then both jumped off to push. With the motor roaring, we heaved, yawing and bouncing in unison,

4-Man Power Moves the Meanco

Gradually, inch by inch, the raft crept upstream. Heaving and pushing with renewed vigor, we got her in motion again, and were fully affoat when we had pushed her 30 feet.

The boys climbed back aboard.

Tom and I trailed the raft until we were wading waist-deep, then swung aboard, cast the anchor upstream, and killed the motor. We were free, bot as firecrackers, bedraggled, and thoroughly "bushed," but masters of the situation again.

We reclaimed our gear by towing the floatables back to the raft and wrestling them aboard-tent and bedding, cots and chairs. The ice locker looked for all the world like a floating coffin. Finally we dredged up the starter and batteries.

Reloaded, though not reorganized, we cranked up and worked back into the main channel. A mile or so downstream we anchored at a pleasant wooded place, prepared lunch, and fell to.

Our misadventure brought home to us forcibly that we were not masters of the art

Mark Twain described in Life on the Mississippi-judging depth of water by surface appearance. Indeed, we never did attain proficiency in this delicate judgment.

After getting everything shipshape, we dropped on down the river and at 3 p. m. sailed under the Cairo-Mississippi River Bridge, rounded Cairo Point Light, and turned up the Ohio River to dock at the landing for supplies.

Near the Cairo-Ohio River Bridge we became aware of ominous thunderheads piling up in the Ohio Valley to the northeast. We debated the wisdom of turning back around the point where we could lie protected under the peninsula on which Cairo stands.

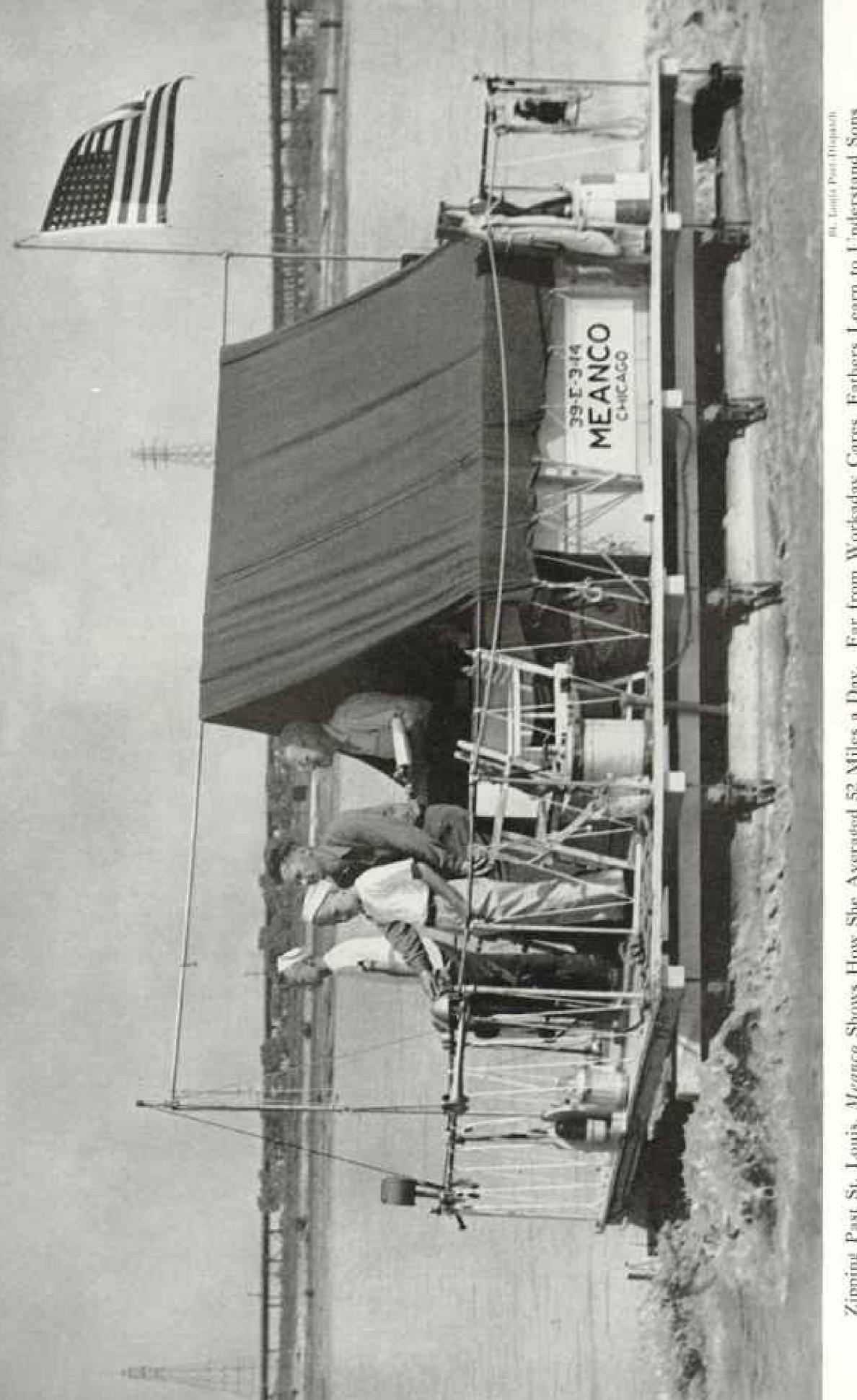
"We can't run away from every little blow." Tom objected. So we cruised on up the Ohio, looking for the wharf.

Meanco Rides Out a Storm

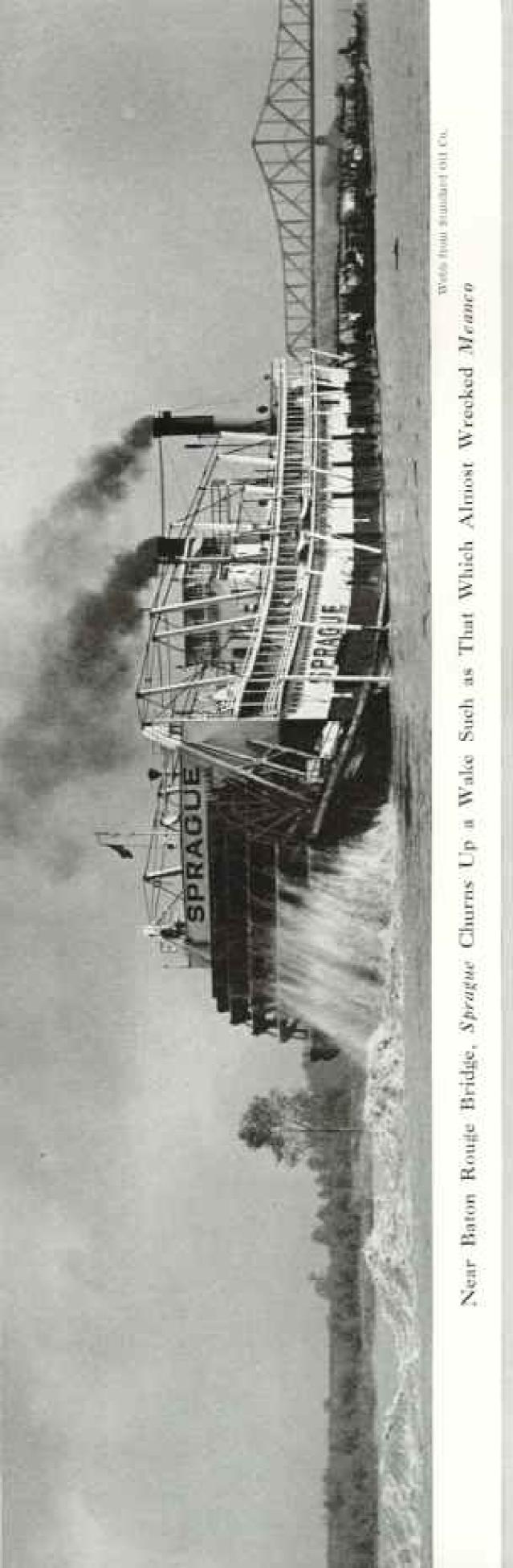
We were well beyond the center of town and had passed the gauging station when the first gusts hit us, kicking up whitecaps. Waves four and five feet high followed.

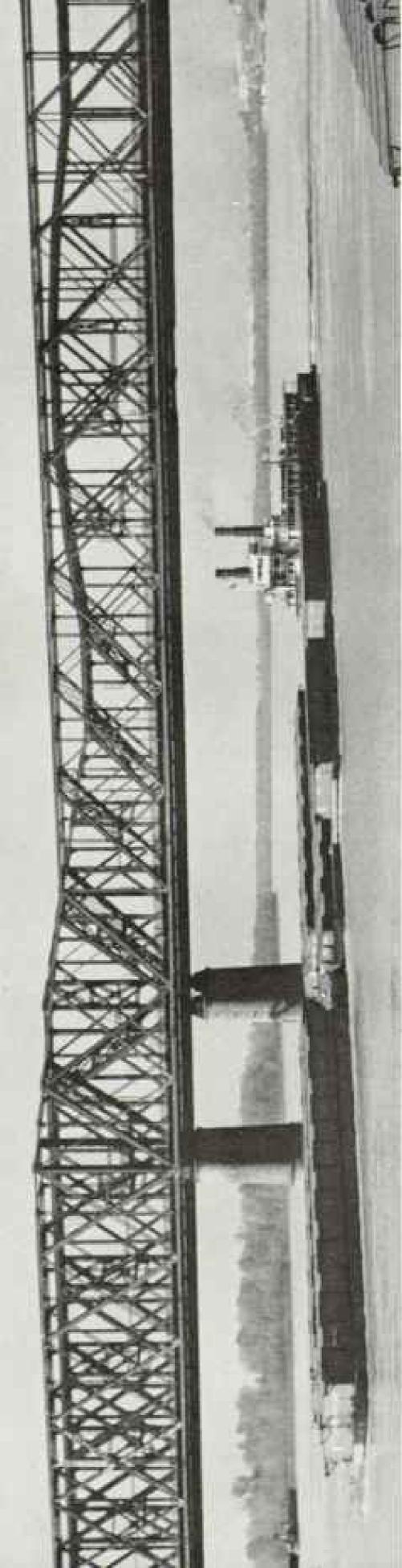
We made the boys don their life preservers. and had them check the tent ties and latch the front covers together, leaving only the three-cornered helmsman's lookout.

When the rain and high wind really hit us, the raft bounced like a cork. It was almost



Zipping Past St. Louis, Meanco Shows How She Averaged 52 Miles a Day. Far from Workaday Cares, Fathers Learn to Understand Sons Meanto's name stands for Mississippi Exploration and Navigation Company. Her erew calls to mind the American flatboat men who, before the days of steam-boats, floated downsiver to New Orleans on raits loaded with tobacco, fruit, fors, grain, flour, hams, and whisky.





Perms Jacobs from Times Library A Towboat Shoves Its Barges Beneath Parallel Highway and Railroad Bridges Linking Memphis (Right) to Arkansas



One afternoon in 1958 a steamer's captuin caw the whichwind's approach off Kentucky. Seiring his camera, he made this exposure. The storm center missed his ship by 100 yards. Meanco, surviving a storm-swept river, learned the next day that she had ridden out a near-tormado (page 562).



Through Sereen Mesh Representing Flooded Woodlands, an Engineer Roads a Gauge On a Miniature Mississippi, Whose Waters Flow

Following the disastrous overflow of 1927, the U. S. Waterwaya Experiment Station was established at Vicksburg, Mississippi, to test control devices. This 1,035-foot scale model represents a 600-mile channel. Its Lillipotian day is only five and a half minutes. One cubic foot of water does the work of 1,500,000. Metal labyrinths reproduce the retarding effect of withows and other trees. At Clinton, near Jackson, Mississippi, work is proceeding on a 31-State model of the entire Mississippi Basin.



Hea R. Hiermannon

Meanco Moors to a Dead Tree; the Boys Finish Breakfast, School Seems For Away Three nights out of Chicago, the raft berthed in this Illinois River backwater, safe from the peril of passing boats. Her passengers drifted to sleep to the cries of whippoorwills and owls (page 553).

impossible to see 50 feet ahead. The Meanco pitched so hard that her propeller was out of the water and the motor racing free about a third of the time.

Suddenly we realized that we were losing headway against the combined forces of the wind, waves, and current and were in danger of being smashed into the barges tied up along the levee.

We threw out the anchor, hoping it would hold us against the strong drag. It slowed our drift enough to enable Tom at the wheel to warp Meanco shoreward.

We were now about 10 yards off the rock levee and about 30 yards upstream from the nearest barge. Relentlessly we were being pushed into a pile-up on one or the other.

The waves were breaking so high on the levee that we couldn't see its formation. We were soaked both by the waves and by drenching rain.

Tom and I, trying to decide what to do, had to shout to be heard above the shrieking wind. Tom ducked out from under the tent and Dick took a firm grip on the wheel. "Just try to hold her offshore!" we shouted.

We stationed Tommy at the motor to kill it when we signaled, or to kill it anyway, signal or no signal, if we started bouncing on the foot of the levee.

Beaching the Ruft

Five yards off the levee, we noticed a gravel roadway coming down to the water, about 10 yards astern. We decided to try beaching the raft there; at least, the road should provide secure footbold.

Tom grabbed a forward line, and each of us seized a pike pole and by sign language told Dick to warp her in toward shore. As we swung in over the roadway, we signaled Tommy to cut the motor, and Tom and I jumped off onto the levee, slithering around in the waves as we tried to gain a foothold on rocks we couldn't see.

Safely ashore, Tom took the line ahead and secured it around a rock, while I sank my pole into the fender timber along the side of



Bosckam from Wandard Ull Co

"Towboat" Is a Misnomer; the Jack Rathbone Pushes Her Train of Oil Barges

As in Mark Twain's day, the Mississippi is again a mighty highway. Gulf coast oil and sulphur are shoved as far as the Twin Cities, Chicago, and Pittsburgh. One record-breaking tow contained enough oil to fill a tank-car train ten miles long. In his little glass house, Pilot Decareaux takes a sight on the jack staff 650 (set ahead and guides his tow through shifty, tortuous channels. Where the least miscalculation would bring disaster, he has to estimate current, wind force, and drift. In uncertain waters a deck hand still heaves the sounding line overboard and sings back, "Mark twain!" (12 feet).

the raft in an effort to hold her over the roadway and off the rocks. With Tom fending her off aft, the craft seemed out of danger for the moment.

Tommy and Dick, uninstructed, but aware of the danger of smashing the propeller, had tipped the motor and latched the drive shaft up out of harm's way. They were good sailors.

The wind had lessened a bit, and we were holding our own until the anchor dragged a few feet more and the port aft pontoon began to pound on the causeway. I shouted and signaled to the boys to move forward. That would lighten the aft end a little and decrease the pounding.

Dick and Tommy started to obey, then engaged in what appeared to be an argument. Instead of going forward, they both jumped into the surf and fought their way to us through the churning water, spluttering and stumbling, looking like a couple of halfdrowned cardinals in their red life jackets.

Dick grabbed the pike pole with me and Tommy with his dad, and the four of us were able to ease her off so that she was no longer pounding.

There we stayed for a half-hour, until the storm spent its fury and the river began to quiet down.

No Damage Done

The boys chucked their life preservers and went up on the levee to explore while Tom and I inspected the pontoons for damage. There were a few dents but no holes. We had come off lucky.

Just how lucky we didn't know until next morning. While rounding up provisions and gasoline in Cairo, we learned that tornadic winds had struck the afternoon before. The



Reg E. Histoneymus.

Ten Days from Home, Tommy Dozes While Dick Steers. The Novelty Is Wearing Off

At first the boys were so eager to take the wheel that they alternated each half-bour; but when routine settled in they shared a one-bour shift. Three duty positions—belmsman, navigator, and engineer—left the fourth hand free to watch the passing shore or catch forty winks (page 553).

wind was estimated to have attained a velocity of 60 miles an hour, with gusts up to 80 miles.

We preened ourselves at this news.

"And people said the Meanco couldn't weather a storm!" Tommy exclaimed, "They didn't know we were old raft builders."

The day had been a full one, what with going aground and then bucking the storm, Dinner was ready in record time, and we were soon in bed.

Next morning we left Cairo at 7 o'clock and breakfasted on the way down the river. That day we touched four different States— Illinois, Kentucky, Missouri, and Tennessee.

"Swell way to study geography," Tommy commented.

"Swell way to go south," said his father.
"No cops, no arguments, and no crumpled fenders!"

The River Yields No Wrecks

While we were planning the trip, the boys had talked eagerly of finding old wrecked steamboats on which they could conduct salvage operations. But they finally came to the sorrowful conclusion that wrecks disappear in a hurry. We had not sighted a single one.

Souvenir hunting deteriorated into a sharpeyed search for interesting items in the debris that floated along with us. There was an abundance of that, But the flotsam mostly consisted of fence posts, planks, stumps, and trees, with an occasional chicken coop or barn door, and at rare intervals the carcass of a bapless animal.

Rivermen Warn of Stern-wheeler Sprague

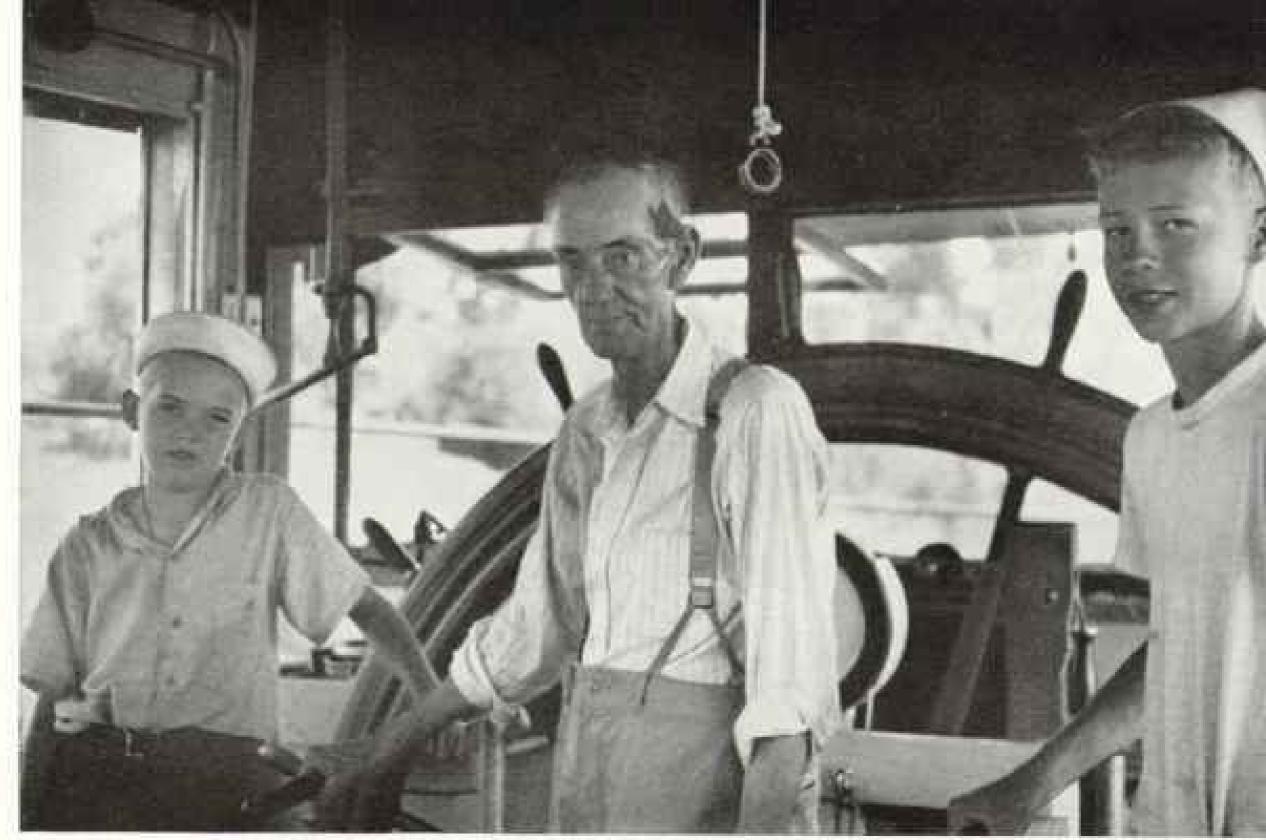
In several ports we were invited by the rivermen to come aboard and look over their craft. We enjoyed inspecting the Diesel tugs, paddle-wheel boats, and river ferries (opposite page), and returned the courtesy by inviting the pilots and engineers to come aboard the Meanco.

They regaled us with tales of their river experiences and warned us of pitfalls ahead. They advised us to stay away from the paddle wash of the big craft, all mentioning particularly the Sprague as the leviathan of the river and direfully predicting that we might easily capsize in her wake.

"What's she like?" the boys asked.

"Boy, she's the biggest stern-wheeler ever built! She's got over 2,500 horsepower and her wheel's at least 36 feet through and more than 36 feet wide. She's the biggest thing on the river and she sure musses it up when she goes through. You stay away from the Sprague!"

We had learned that for equal size and power the paddle-wheel boats kicked up much rougher water than the modern propeller boats,



Bex T. Historiani

Off Helena, Arkansas, Captain Hill Welcomes the Boys Aboard the Ferry A. C. Jaynes

As most rivermen were just as curious about Meanco as its crew was about their Diesel tugs and paddle-wheel boats, visits were exchanged frequently. Captain Hill, leading an inspection of his pilothouse, shows how steering is controlled by steam power. His old 5-foot wheel is reserved for emergencies.

and that stern-wheelers are much worse than side-wheelers.

We had met both types and learned how to take their wash without getting bounced around too badly. We weren't particularly worried about them, but we did decide to watch out for the *Sprague* and give her a wide berth.

The pilots cautioned us about the sudden violent storms that blew up this time of year. After our experience at Cairo, vivid in our memories, we knew these croakers of disaster weren't talking idly. But we were all convinced that none of them appreciated the sturdiness of the Meanco.

"Look Out for the Eddies!"

Invariably the old pilots got around to the subject of the eddies. Three particularly fearsome spots were the ones most often mentioned.

"Look out for the eddies at Yellow Bend, Arkansas. Last year a 30-foot powerboat was lost there."

"You don't have to worry about the river, except to stay out of the eddies where the chute joins the channel below Island No. 35. Boys, I've seen big tree trunks caught in the whirlpools, stickin' up 10 feet out of the water and spinnin' round like a top."

"If you're smart, you'll cut in close to the

east bank at Mile 883 (above Head of Passes), where the short cut comes out from behind the towhead and against the bank. That place is always mean, and if you hit it right after a big boat has gone by, it'll tear them gol-durned tanks right off your bottom like they was only glued there!"

"Yeah?" was Dick's answer to this gloomy forecast.

"Sez you!" Tommy added.

The boys had bolted up the steel straps which held the oil drums in place and took the remark as a reflection on their work.

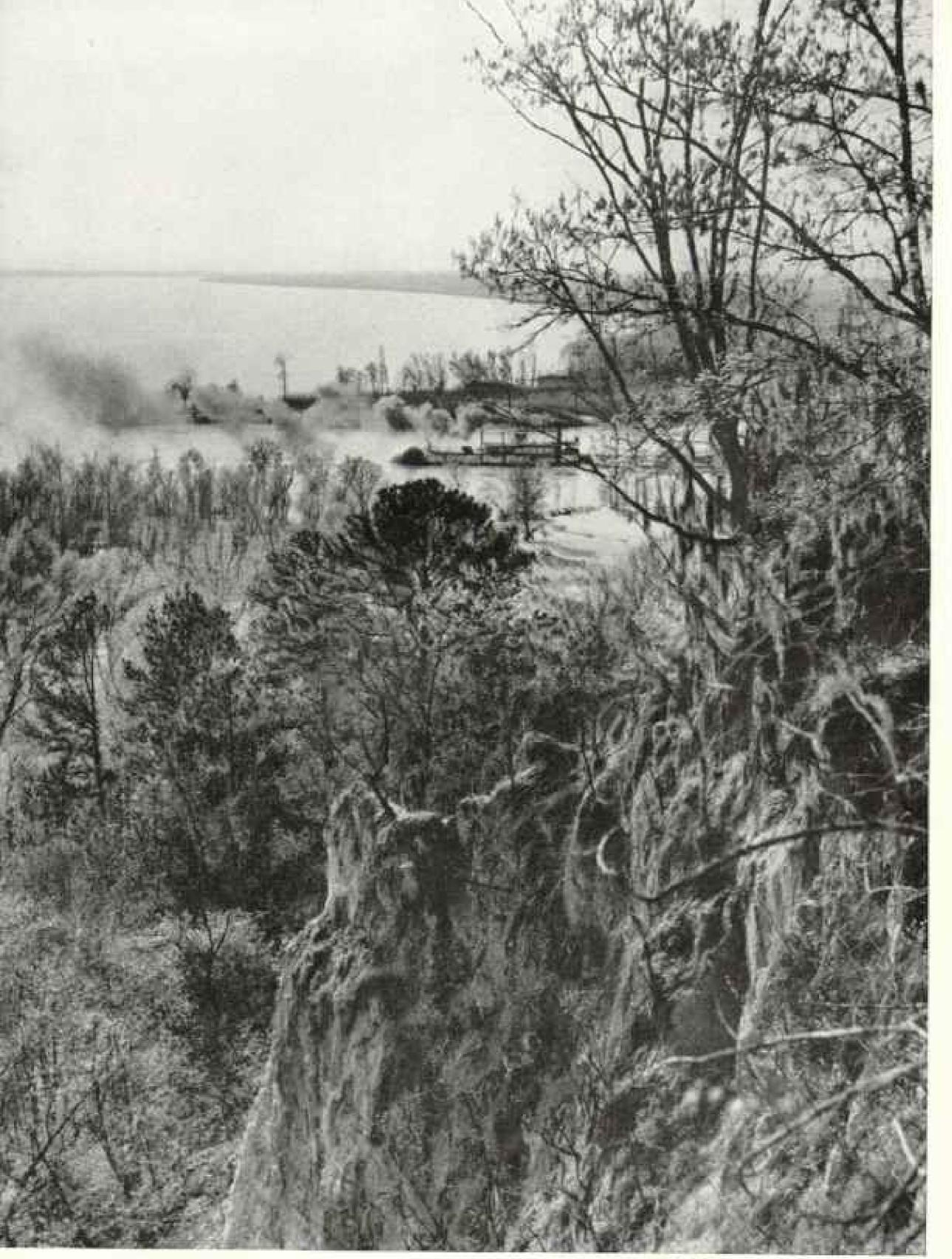
Much to Tom's disgust, I really worried over the eddies.

"Oh, let him worry," said Dick. "Dad's our official worrier, and it isn't costing us anything."

Before noon on July 11, as we neared Marr Towhead, Tom was steering, Tommy and I preparing lunch, and Dick navigating.

Tom saw the smoke of a steamer ahead and, thinking the tug would hold to the channel, proposed to cut back of the towhead. The water appeared to be open in the cutoff, but, vividly remembering our experience of going aground, Tom asked Dick to take soundings,

Presently the water became too shallow for safety, and Tom turned back and resumed the main channel. The big tugboat, pushing



Staff Phonographer J. Barlow Roberts

A Weirdly Eroded Loess Bluff, Festooned in Moss, Overlooks the River above Natchez

A deposit of wind-blown silt, the cliff forms a natural lever from Vicksburg almost to Baten Rouge. Across from it, the flat Louisiana bank has to be diked up. Here a towboat heads into Giles Cutoff, an artificial channel which has shortened the Mississippi 11 miles by eliminating Marengo Bend (left). Lately, both ends of the bend have silted up, forming an oxbow lake.



Webt-from Hundard Oil Ca.

"Big Mamma's" 37-foot Wheel Spanks the Mississippi. An Engineer Cheeks Her Bearings

Sprague, largest of towboats, began her career in 1907. During a flood she rescued a lever load of despairing people. Once she pushed a tow of 56 coal boats, a 7-acre unit longer than the Queen Mary. Entering the oil trade, she became known as the "only pipe line running lengthwise of the Mississippi." Now she is prepared to turn over her job to younger, twin-screw Diesel craft. Her whistle, willed to a new passenger vessel, will keep her memory fresh. In a narrow channel "Big Mamma's" casende of water almost swamped Meance (page 572).

eight barges, had turned and was proceeding up the chute. I brought the glasses to bear on the big stern-wheeler, thinking it might be the Sprague. But it was the Jason, throwing a beautiful waterfall from the paddle wheel.

As we cleared the towhead we saw another tug with barges approaching, and we faced the double problem of dodging the wash from the *Jason* while passing the second tug. I really started to worry in earnest.

For one thing, there were bluffs at the

bend, indicating deep water and swift current. At this point the main channel and the cutoff chute reunited. That might be tricky. And a big boat had just passed. Suddenly the circumstances struck me as familiar.

Caught at Mile 883

"Dick," I yelled to our navigator of the moment, "what mile are we?"

"We just cleared Point Pleasant Mud Light a minute ago," he replied. "Mile 884.2. By



Ber E. Hierogenia

Three Vagabond Raftsmen Perch on a Navigation Marker

Crescent Light, on the Louisiana shore, is typical of hundreds maintained along the Mississippi, more than one to each mile. By keeping his sights lined up on a light, a pilot sticks to the main channel at night. Here the figure 147.8 refers to the number of miles above Head of Passes, where, 95 miles below New Orleans, the Mississippi splits into three mouths.

the way, Dad, here's a note on the margin in your handwriting—'Look out for the eddies at Mile 883."

Anxiously I went forward with Tom, scanning the surface of the water ahead.

"Tom, I don't like the looks of this. The water's still rough from the Jason and we're channeled by that other tug. Look at that water out there." I pointed to the churning current. "This is Mile 883, you know, where that pilot said it was treacherous."

Tom scanned the river. "Nothing to it," he replied. "It's just a little choppy from the Jason and the wind."

Indeed, it didn't look too formidable. I

turned to get on with lunch. Suddenly Tom let out a frantic yell.

"Look out!" he shouted. "Hang on, everybody!"

As I turned to look for the cause of his warning, the raft gave a wild lurch and the only thing I could see was a sheet of water coming chest-high at Tom as he stood at the helm.

As it struck, I was thrown to my knees, waist-deep in water. Our lovely lunch, pan and all, went over-board, and a miscellaneous assortment of deck chairs, pike poles, and gear swirled around me.

We pitched like a cork in a washing machine as wave after wave broke over the deck, and we reared and came down on each crest as if we were hitting bottom. Water can be pretty hard when a hig chunk of it hits a couple tons of raft.

Again we were lucky, for, though everything was thoroughly soaked and our lunch lost, no damage had been done. In a minute we were on an even keel again, and Tom was quartering the stern waves of the passing tug.

Instead of cutting the motor and drifting during lunch as we usually did, we tied up at a sandy, pleasant spot shown on the map with frank ambiguity as "Riddles Point or Ruddles Point" and rustled up a campfire.

Meanco Clears the Halfway Mark

The potatoes, which had been baking in the stove, had come through safely. In addition, we broiled about a dozen wieners over the fire and sandwiched them in buns, added a can of corn, tomato salad, coffee and milk, and dessert of fresh oranges Waldorf. A light lunch!

At 3:45 on July 12 we cleared Gold Dust

Bar Light at Mile 796.9—halfway mark of our trip. The crew cheered, albeit a bit weakly, for in all four minds was the thought that half of our voyage was done.

As the days and the miles dropped behind, we took time out occasionally for relaxation and sight-seeing ashore, pausing at Memphis, Helena, and Greenville.**

We spent an afternoon tramping over the
battlefield at Vicksburg, and visited the
U. S. Waterways Experiment Station, of the
U. S. Army Engineers,
near by. Here are
made the models of the
Mississippi used in the
study of flood control.†

At Baton Rouge we received mail from home and went through the Louisiana State Capitol.

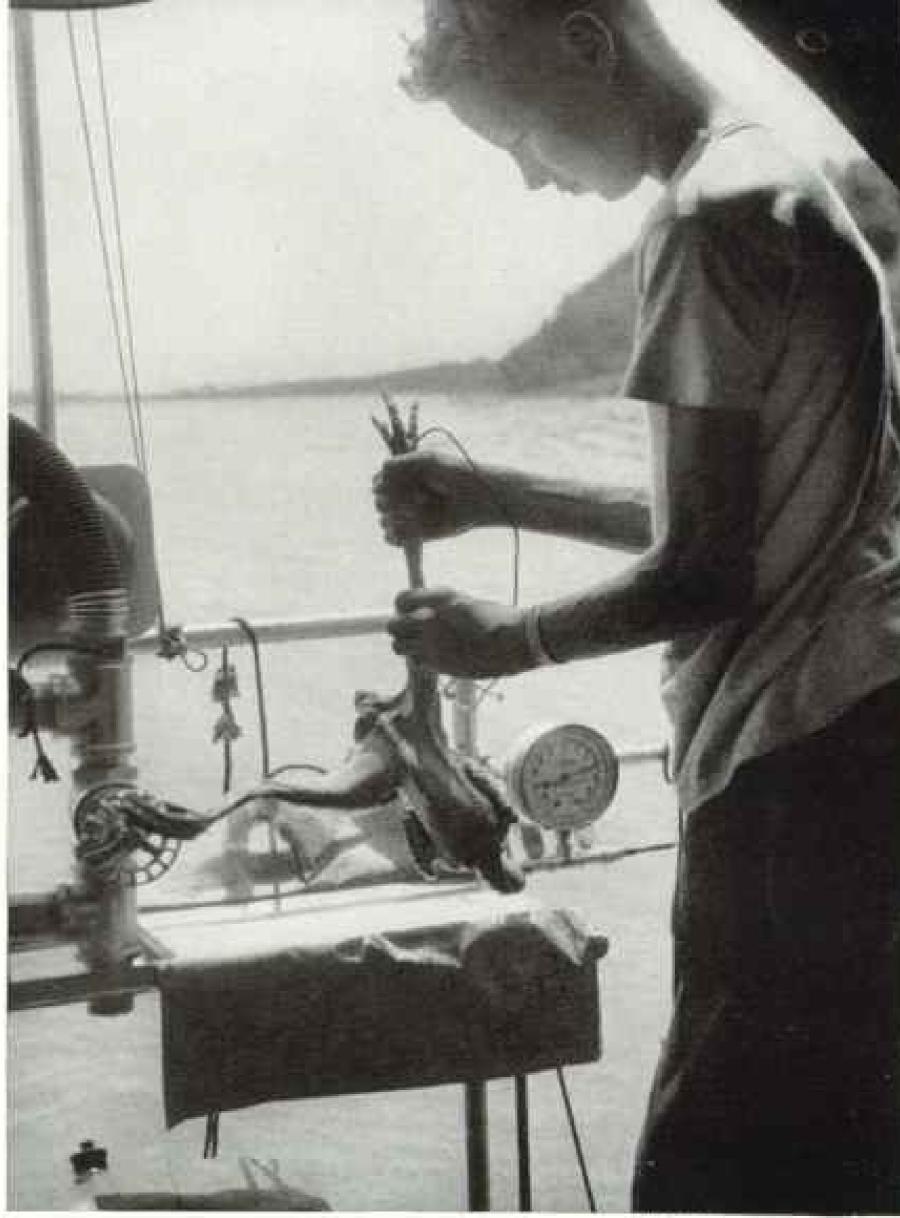
Near Mile 675 we moored for the night in OK Bend, near the fishing camp of a soft-spoken Englishman named Avery Thomason. At Evan Hall Landing, Mile 178.5, we stopped near Carl Arnt's extensive fishing establishment. One had heard of us on the radio, the other had read about us in the

Donaldsonville, Louisiana, weekly; both came over to our mooring for a visit and pressed us to stay with them for a few days.

Gifts of Chicken "Fresh off the Hoof"

Though their habitations were modest, they were fine, hospitable gentlemen who made us gifts of catfish and chickens, "fresh off the hoof," and wished us well,

Mr. Thomason showed us several duckbill cats he had caught. This is the American paddlefish (*Polyodon spathula*), not a catfish at all. The beak end of this odd-looking creature, a wide spoon bill about one-half as long as the main body, looks like one of Nature's mistakes.



Reg K. Hierarman

It's Diek's Turn to Cook; He Plucks a Fowl

Appetites never flagged aboard Meanco. She had many of the comforts of a kitchen, including an icebox. Motor exhaust gases heated the galley stove. Campfire and gasoline stove did the work ashore. Here the raft appears off Donaldsonville, Louisiana.

"The mandible resembles that of the Australian platypus," Mr. Thomason explained, by way of apology no doubt.

"It's the strangest-looking thing I've ever seen in my life," I said.

*See, in the National Geographic Magazine, "Highlights of the Volunteer State," by Leonard C. Roy. May, 1939; "Arkansas Rolls Up Its Sleeves," by Frederick Simpich, September, 1946; and "Machines Come to Mississippi," by J. R. Hildebrand, September, 1937.

T Sec. in the National Geographic Magazine, by Frederick Simpich, "Great Mississippi Flood of 1927," September, 1927; and "Men Against the Rivers," June, 1937.

‡ See "Australia's Patchwork Creature, the Platypus," by Charles H. Holmes, NAYJONAL GEOGRAPHIC MAGAZINE, August, 1939.



Brandon Road Lock at Joliet, Illinois, Lifts Gulf-to-Chicago Barges 34 Feet
Only flatlands separate Mississippi and St. Lawrence drainage areas. The canalized Illinois Waterway, emptying
Lake Michigan water into the Mississippi, unites them. Here the Des Plaines forms part of that system.



@ Chicago Aerial Survey Co.

Water in the Turning Basin Backs Up above Town Before Cascading over the Spillway
By impounding water, in drought times the dam helps maintain a 9-foot channel the year round. During
wartime this waterway floated Lakes-built warcraft Guliward. Meanco passed through the 600-foot lock.

The duckbill cat, limp in my hands, seemed to cast a reproachful eye at me. Just then Mr. Thomason's gaze wandered to the Meanco. Both Mr. Platypus and Mr. Thomason very likely were thinking the same thing about the Meanco, but if so, each was too polite to mention it.

We nosed upstream a few miles into some of the tributary streams: the St. Francis, the White (which Dick and I had fished in the Ozarks), the Arkansas, and the Atchafalaya, that river with the unpronounceable name, which doesn't know whether to flow downstream or upstream, toward the Mississippi

or away from it.

On the afternoon of July 21 we went into the upper end of Deer Park Bend at Mile 342 for our night mooring. This bayou used to be a huge bend or loop in the main channel. In 1933 a cutoff was dredged across the neck of the bend, shortening the sailing channel about 13 miles. This artificial short cut, Glasscock Cutoff, is about four miles long and rather narrow.

Next morning we re-entered the main river about 9 o'clock and started down the cutoff. It was raining lightly and the visibility was about a mile. A half-mile into the cutoff we observed a big tow and barges approaching from downstream.

"She's a big one," said Tom.
"A stern-wheeler," I added.

"Pushing a big tow," Dick contributed.

"And she's coming pretty fast," Tommy finished.

Tom and I hastily consulted the chart and observed that the sailing line was shown to be toward the east bank. Presumably a big craft like this one would follow the official channel; we elected to pass her on our starboard side, as was proper. We proposed to split the difference and pass midway between the approaching vessel and our right bank.

The Sprague, at Last

As we approached, we saw that her wheel was as high as her third deck and was throwing a terrific cascade of water. We made the boys don their life preservers and placed ours near at hand.

Tom was at the wheel, and I stationed myself at the motor, to coax it along if it chose to malinger.

As we met the modest bow wave thrown out from the front barges of the long tow, we saw the name of the big stern-wheeler. It was the Sprague.

"One thousand miles in which to meet her, and here we are, dead upon her in a narrow channel!" I groaned. Then her stern wave hit us. The Meanco pitched and rolled, with water pouring over her deck and the motor alternately groaning and screaming as the propeller was lifted clear of the water.

Tom at the wheel hopefully searched for quieter patches of water as we bucked waves six or seven feet high and water swept over our deck. Loose gear surged at the ties with which we now kept it secured. The boys, even on their perches atop the lockers, were drenched, but enjoying themselves hugely.

River Goes Hog-wild

Tom took the Meanco back and forth across the river, part of the time heading upstream, dodging the mountainous waves. But they didn't continue as orthodox waves; when the back action of the waves crashing the banks met the original sequence of crests, they weren't waves any more. The whole surface of the river went hog-wild, surging and churning as if possessed.

I clutched the rail with one hand and the throttle with the other, following Tom's signals to "open her wide" or to "hold her down." We both were so busy that we hardly

got a look at the Sprague.

The river was rough for nearly an hour after her passing, but by midafternoon Tom and I had our vitals swallowed down where they belonged. Now we knew what the rivermen had been talking about when they warned us of the Sprague.

That afternoon I examined the charts and found that the cutoff where we met her, a quarter of a mile wide, is one of the narrowest places on the river between Cairo and the

Gulf!

Later I checked on the size of the Sprague. Owned for more than 20 years by Standard Oil of New Jersey, she was built in Dubuque, Iowa, in 1902. Her paddle wheel is 37 feet in diameter and 40 feet wide, and her engines are 2,600 horsepower. She is the largest and most powerful stern-wheeler ever built for any inland waters (pages 559, 567).

By all who know her and her prodigious feats, she is affectionately called "Big Mamma." On an upstream trip she may shove as many as 10 big barges, the whole assembly actually exceeding the liner Queen

Mary in length.

The Sprague does well to labor heartbreakingly at her tasks, because she is on her way out. Already many of her picturesque sister craft have gone to whatever port old steamboats go to, the junkyard most likely.

She is a symbol of passing splendor, for the Diesel men claim that a 2,000-horsepower, twin-screw Diesel tug can outpull her. Inevitably, the Diesels will drive all the paddle-wheel boats from the river.

We met many of these Diesel tugs, and, while they are solid and impressive, they lack the grandeur and dimensions of the old twinstack stern-wheelers, of which the Sprague is a lonely though majestic survivor.

After the experience with the Sprague, I never worried about meeting ocean-going vessels below Baton Rouge. Their waves might be higher, but they would be farther apart and there would be more room in which to avoid them.

Subsequently we did meet an ocean-going tanker below Baton Rouge, We figured her to be about 10,000 tons, though she was too far away for us to identify her.

She kicked up big waves, all right, but they were big in all dimensions—long, rolling, gentle waves, far enough apart to insure our craft against bridging them. We coasted gently down one wave, across the trough, then labored up the hill of the next.

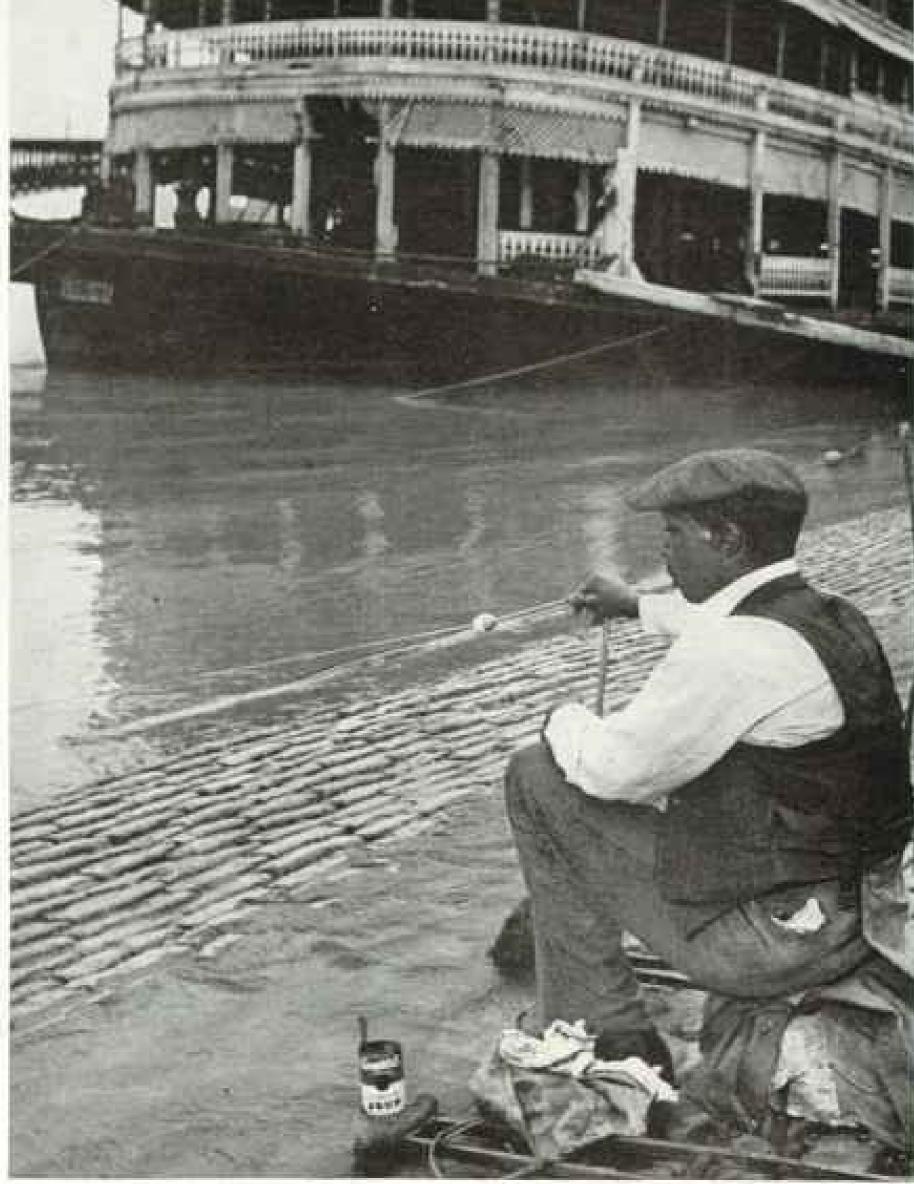
Tom, ensconced in the deck chair, feet on the rail, smiled a broad smile of approval of this elegant sensation.

"Here's the type of water this baby was made for," said be.

Lust Night Abourd

Twenty-seven miles above New Orleans we passed our last night aboard. A mile below us a modern ocean tanker rode high at anchor off the Shell Oil Company's docks. After we had found our mooring, we cruised down to look her over, and as we sailed around her towering bulk, her officers invited us aboard.

They showed us all over the ship, the Nike,



Staff Phitugrapher Bobert F. Stano

A Mississippi Relic Crumbles on the St. Louis Water Front

A sight of this vanished glory calls to mind the days when stately packets held challenge races on the river. They were celebrated for their fine food, watermelon parties, poker games, moonlight dances, and shipboard romances. Railroad competition drove them off the river. Now the 285-foot Delta Queen is preparing to revive old times with a Cincinnati-New Orleans schedule.

out of Göteborg, Sweden, a 12,500-ton Diesel ship built in 1939. After our tour of inspection, her second officer and first engineer accompanied us down the ladder and aboard the Meanco, where they signed our map chart.

About noon on Friday, July 26, we passed under the great Huey P. Long Bridge and into the New Orleans harbor.* Our destination was the Allen Boat Co., where on Sunday the Meanco was to be offered for sale to the highest bidder.

*See, in the National Geographic Magazine, "Louisiana, Land of Perpetual Romance," by Ralph A. Graves, April, 1930; and "Louisiana Trades with the World," by Frederick Simpich, December, 1947.



AP from Press Ass'm

A Levee That Held a Bayou Breaks under the Punch of a Tropical Hurricane

With knowledge gained through research at U. S. Waterways Experiment Stations, the Army Corps of Engineers has tamed the Lower Mississippi so well that it has not experienced a main-line lever break in 21 years. However, tributary rivers still get out of hand at their mouths. This lever gave way when the September, 1947, hurricane struck New Orleans. A residential area east of the city was flooded.

About a mile from our destination Tom suddenly said;

"Rex, I'll bet we're making some sort of record, 1,400 miles on one shear pin!" (A shear pin acts as a mechanical fuse, giving way if the propeller strikes a snag, thus tending to prevent the propeller's breaking.)

I agreed that it probably would be a record. Workmen on barges near the Allen Boat Co, saw us coming down the canal and stood up to wave and cheer our arrival.

"The Fleet's In!"

Each of us assumed his best nautical air as Tom brought Meanco smartly around to berth her in the slip.

About 200 feet from the dock, as we were trying to make a seamanlike finish to our journey, the engine suddenly went free and raced madly. Our speed slackened dismally as Dick jumped to kill the screaming motor. Another mighty cheer, this time of the Bronx variety, went up from the men on the barges.

At the moment of our triumphal entry, the shear pin had given way!

Chagrined at this anticlimax, Tom and I installed a new pin, and at 2:20 p.m. the Meanco pulled into the dock. Journey's end at last.

"The fleet's in!" we wired our families,

Behind us lay 1,400 miles, nearly a month, of leisurely travel on the storied river. We were healthy and brown as Indians; none of us had had a minute's illness.

We had a treasury of memories of starry nights in the bayous and bright mornings on the murmurous river, of fun and excitement and companionship.

Most of all, Tom Roth and I treasure the companionship with our sons. We dare to hope that the boys will never think of the voyage of the Meanco without warm memories of their dads,

NATIONAL GEOGRAPHIC SOCIETY

GEOGRAPHIC ADMINISTRATION BUILDING

SIXTEENTH AND M STREETS NORTHWEST, WASHINGTON 6, D. C.

GILBERT GROSVENOR, President ROBERT V. FLEMING, Treasurer HERBERT A. POOLE, Assistant Treasurer LVMAN J. BRIGGS, Chairman, Research Committee ALEXANDER WETMORE, Vice-Chairman, Research Committee JOHN OLIVER LA GORCE, Vice-President THOMAS W. McKNEW, Secretary VERNON H. BREWSTER, Assistant Secretary MELVIN M. PAYNE, Assistant Secretary KURTZ M. HANSON, Assistant Secretary

EXECUTIVE STAFF OF THE NATIONAL GROGRAPHIC MAGAZINE

GILBERT GROSVENOR, EDITOR

JOHN OLIVER LA GORCE, Associate Editor

J. R. HILDERRAND
Assistant Editor

MELVILLE RELL GROSVENOR
Amietant Editor

JAMES M. DARLEY Chief Cartographer

NEWMAN BUMSTEAD Research Cartographer

CHARLES E. RIDDIFORD : Cartographic Staff

WELLMAN CHAMBERLIN Curtographic Staff

HAYMOND W. WELCH Director of Advertising

GILBERT G. LA GORCE.
Assistant Director of Advertising

CHARLES EVANS HUGHES Firmerly Chief Justice of the United States

WALTER S. GIFFORD President American Telephone and Telegraph Co.

WILLIAM V. PRATT Admiral U. S. Navy, Retired

LVMAN J. BRIGGS Director National Bureau of Standards, Retired

EMORY S. LAND
Vice Admiral Construction Corps,
12. S. Navy, Register; President,
Air Transport Association

GEORGE R. PUTNAM Commissioner of Lighthouses, Retired

L. O. COLBERT Rear Admiral, Director U. S. Const. and Geodetic Survey

FRANKLIN L. FISHER Chief Illustrations Division. National Geographic Magazine FREDERICK SIMPICH

LEO A. BORAH. Editorial Staff.

FREDERICK G. VOSBURGH
Editorial Staff

LEONARD C. ROY Chief of School Service

WILLIAM IL NICHOLAS Editorial Staff

F. BARROWS COLTON Foliaterial Staff.

INEX B. RVAN Research Amintant

GEORGE CROSSETTE Research Assistant FRANKLIN L. FISHER-Chief Illustrations Division

MAYNARD OWEN WILLIAMS Chief Foreign Editorial Stuff

> W. ROBERT MOORE Foreign Editorial Staff

LUIS MARDEN Foreign Editorial Staff

EDWIN L. WISHERD Chief Photographic Laboratory

WALTER MEAYERS EDWARDS

K1P 8008\$ Illustrations Division

MASON SUTHERLAND Editorial Staff

BOARD OF TRUSTEES

ROBERT V. FLEMING President and Chairman of the Board, Rates National Bank

General of the Army, Retired Formerly Commanding General U. S. Army Air Forces

LIEROV A. LINCOLN President Metropolitan Life Insurance Company

JUAN T. TRIPPE President Pan American Airways

Special Agricultural Explorer, U. S. Department of Agriculture

ALEXANDER WETMORE Secretary Smithsonian Institution

GILBERT GROSVENOR Editor of National Geographic

MELVILLE BELL GROSVENOR Assistant Editor, National Geographic Magazine JOHN J. PERSHING General of the Armies of The United States

CHARLES F. KETTERING President General Motors Research Corporation

CHARLES G. DAWES
Formerly Vice-President
of the United States

ELISHA HANSON Luwyer and Naturalist

Chairman of the Board Chesapeaks and Potomac Telephone Companies

> ERNEST E. NORRIS President Southern Railway System

JOHN OLIVER LA GORCE Associate Editor of the National Geographic Magazine

> J. R. HILDEBKAND Assistant Editor, National Geographic Magazine

ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

To carry out the purposes for which it was lounded sixty yours ago, the National Geographic Society publishes this Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

Acticles and photographs are desired. For material The Magazine uses generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made. The Society has sponsored more than top scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus erussed the Atlantic. By duting the raise of the wast communal dwellings in that region. The Society's researches solved secrets that had pazzled historians for three hundred years.

In Mexico, The Society and the Smithsonian Institution, January 16, 1939, discovered the eldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 241 h. c. (Spinden Correlation). It antistates by 200 years anything heritafore dated in America, and reveals a great center of early American culture, previously unknown. On November 11, 1935, in a flight sponsored jointly by the National Geographic Society and the U.S. Army Air Corps, the world's largest balloon, Explorer II, ascended to the world stitude record of 72, just feet. Capt. Albert W. Stevens and Capt. Ovel A. Anderson took about in the goodola nearly a ton of scientific matraments, and obtained results of extraordinary value.

The National Geographic Society-U. S. Army Air Forces Expedition, from a camp in southern Brazil, photographed and observed the solar eclipse of 1947. This was the seventh expedition of The Society to observe a total eclipse of the sun.

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,028 feet was attained.

The Society granted \$25,000, and in addition \$75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequous trees in the Giant Forest of Sequola National Park of California were thereby saved for the American people.

One of the societ's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Valous by Brackford Washbarn while exploring for The Society and the Harvard Institute of Exploration, 1938.



Who's the "champ" in your family?

GRANDFATHER? Has he always been your hero—eversines you were a youngster? You'll be his favorite grandchild when you give him a fine Hamilton timepiece like the distinguished Doxald (below).

MOTHER? Do you love her, not because she's your mother, but because she's such a wonderful companion? Tell her so with the most precious gift you could give her—an exquisite woman's Hamilton like those shown below.

SON? Has he suddenly grown up into a man? Send him into the world with a gift he will treasure all his years—an accurate Hamilton such as the Exrow (below).

DAD? Are you proud when people say you take after him? He'll be proud to wear the fine American watch created by skilled American craftsmen—a smart Hamilton like the Kink (below).

When that special occasion rolls around—a hierbiday, an anniversary, or a wedding;—remember your loved one with a faithfully precise mun's or unman's Hamilton. Every watch has the finest hair-spring over developed: Hamilton Elinvar Extra.

Since 1592 America's only manufacturer of fine fulljeweled watches exclusively. Priced from \$32.23 to \$5,000



LEFT TO RIGHT: Donally - 19 jewels, 14K natural gold case, Medallion movement.*

A-4-17 jewels, 14K natural or white gold case (other distinctive diamond-set watches in gold and platinum); Enva-17 jewels, 14K gold-filled case; Kiva-17 jewels, 14K natural gold case; a striking new style note in thin, round-case watches; Grava-17 jewels, 14K natural or white gold case, Medallion movement;* Shanna-17 jewels, 14K gold-filled case; Eavan-17 jewels, 10K gold-filled case, Hamilton's experience making railroad watches assures greatest accouncy in every grade. Send for FREE folder and recenting booklet. What Makes a Fine Watch Fine?" Hamilton Watch Co., Dept. C.S. Lancaster, Penna.

*The "Medallion" is the forest movement counted by Humilton's skilled unitchinakers

Hamilton OF RAMEDOND RECORDER



For an extra vacation thrill ... ride the Denver Zephyr

What's your vacation pleasure? Whether it's riding, hiking, fishing, golfing, sight-seeing or just lazing, you'll enjoy it most in this vacationland of mountains, forests, lakes and streams. Mile-high Denver and its mountain parks... picturesque Colorado Springs... majestic Pikes Peak... breath-taking Rocky Mountain National-Estes Park... they're waiting for you in all their western splendor.

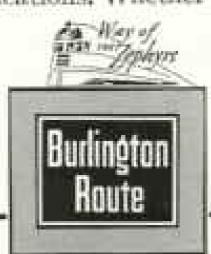
Speed to Colorado In Air-Conditioned Luxury

Ride either the famous streamlined DENVER ZEPHYR which glides you from

Chicago to Colorado just overnight—or the popular Exposition Flyer. Your vacation rest and relaxation begin the minute you board either of these luxurious, air-conditioned trains. There's speedy service from St. Louis, too. And there's no extra fare on any Burlington train.

Mail the coupon for complete information about Colorado vacations. Whether

you travel independently or join a congenial Escorted Tour, you'll find it pays to "Go Burlington."



I		li.								100	20	D4				4.0	-	-0.0		752	-125	24.70	
d	100	riei	-	 *	100	-	-		H N	٠N	٨.	Α.	IL	C	0	U	P	0	N	T	0	D	P
i	w		3.0																				

BURL	INGT	ONI	KWART	BUKEAU	
	diam'r.	1000	建设设置 第二人	Action in the second	Sample and a series

Dept. 808, 547 W. Jackson Blvd., Chicaga 6, Illinois

I am interested in a vacation in Colorful Colorado this summer. Please send me complete information.

NAME

CITY ZONE STATE

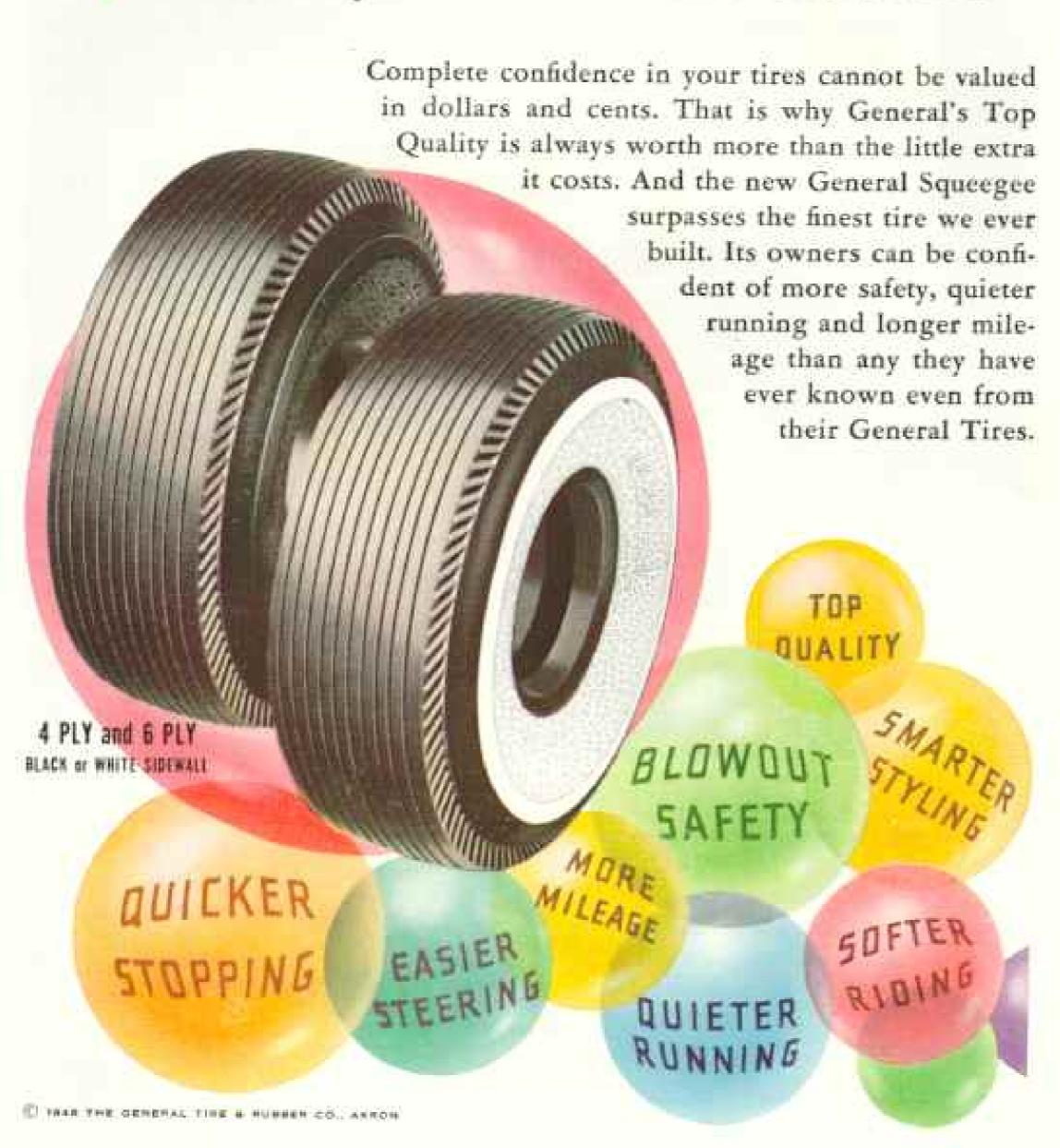
☐ Students please check here

If you are interested in other Western Vacutionlands, please check here;

Yellowstone
Glacier
Black Hills
California
Pacific Northwest



Worth many times the little extra cost



You'll Enget!

BERMUDA is languid hours on powdery pink sands . . . and dreamy carriage rides in the magic moonlight. Bermuda is happy days on rolling fairways...exhilarating days under billowing sails. Bermuda is a riot of flowers, a fairyland of colours, a semi-tropical paradise where there's enough happiness in a moment to fill a memory.

A Bermuda Cove

You can come to Bermuda swiftly by plane . . . or leisurely by boat. There is an ample choice of fine hotel and guest house accommodations, but advance reservations will assure you what you want.

In planning your trip to Bermuda, your Travel Agent will give you experienced help and complete service—at no cost to you.

EVERYTHING IS BETTER IN

Germuda

FOR NEW ILLUSTRATED BOOKLET, write The Bermuda Trade Development Board, Hamilton, Bermuda, or 620 Fifth Avenue, New York 20, N.Y.

Most advanced of today's refrigerators



The 1948 (S) Refrigerator-Home Freezer Combination

The two-door refrigerator offers important advantages...plus famed G-E dependability!

I've convenience, efficiency, and economy, this great, new refrigerator offers you more than any "two-temperature," one-door refrigerator.

No waste of cold in the freezer when you open the refrigerator door! No condensation and dripping into the refrigerator from the freezer compartment.

And, of course, you get the very important advantage of famed General Electric dependability. This great refrigerator is equipped with the G-E sealed-in refrigerating system—airtight, oiltight, and unmatched for dependable performance.

See the General Electric Refrigerator and Home Freezer Combination at your retailer's. General Electric Company, Bridgeport 2, Conn.



The upper compartment is a Home Freezer

--separately refrigerated and insulated

with its own separate door!

ZERO STORAGE: For quick-freezing foods and ice cubes, and for dependable, long-time storage of up to 53 pounds of frozen foods. This compartment will provide zero temperature at all times. And zero temperature is very important in keeping frozen foods.

The following "Timetable" shows practical storage periods for maintaining high quality of frozen vegetables, fruits, and meat at different temperatures:

0°..up to 12 months 15°..up to 1 month 10°..up to 3 months 20°..1 to 2 weeks



The lower compartment is a Space Maker refrigerator—separately refrigerated and insulated, with its own separate door. No defrosting!

FRESH-FOOD STORAGE: Gives you 6.7 cubic feet of storage space for fresh foods. (This is practically as much refrigerated fresh-food storage space as in an ordinary 8-cubic-foot refrigerator.) Never needs defresting. Keeps the temperature and humidity just right at all times. No need to cover dishes in the refrigerator!

More than 1,700,000 refrigerators in service ten years or longer





Daily flights...."Galden Comet" extra fore all-sleeper flight every Friday. Apply to your TRAVEL AGENT or French National Airline, Dept. G. 683 Fifth Ave., New York 22, 415 Boylston St., Boston 16, 37 S. Wabash Ave., Chicago 3, 510 West 6th St., Los Angeles 14.

"My secretary and I just adopted the Dictaphone twins!"



My fovorite—the Dictaphone Electronic Dictating Machine—makes dictation a relaxation! All I do is sit back and think out loud. The electronic mike catches every word . . . even a whisper!

Dictaphone Electronic Dictation spells easier operation, clearer recording—in short, perfection!



That's for me! It's the new Electronic Transcriber — latest addition to our famous Dietaphone family . . . kin to the Dietaphone Electronic Dietating Machine. Now I breeze through transcription clostronically.

This transcriber has so many advantages: Three radio-like dials regulate volume, tone and speed

DICTAPHONE

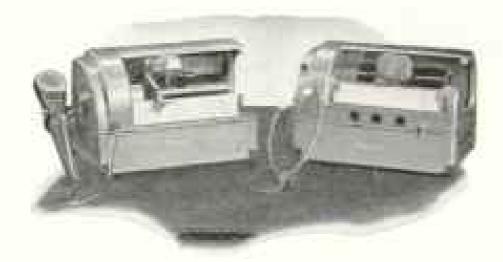
Electronic Dictation

The word DICTAPHONE is the registered trademark of Dictaphone Corporation, makers of Electrusic dictating machines and other sound-recording and reproducing equipment bearing and trade-mark.



separately, bring me any dictator's voice the way I want to hear it! . . . A new headest, light as a whisper, with its thin electric cord instead of the old rubber tube.

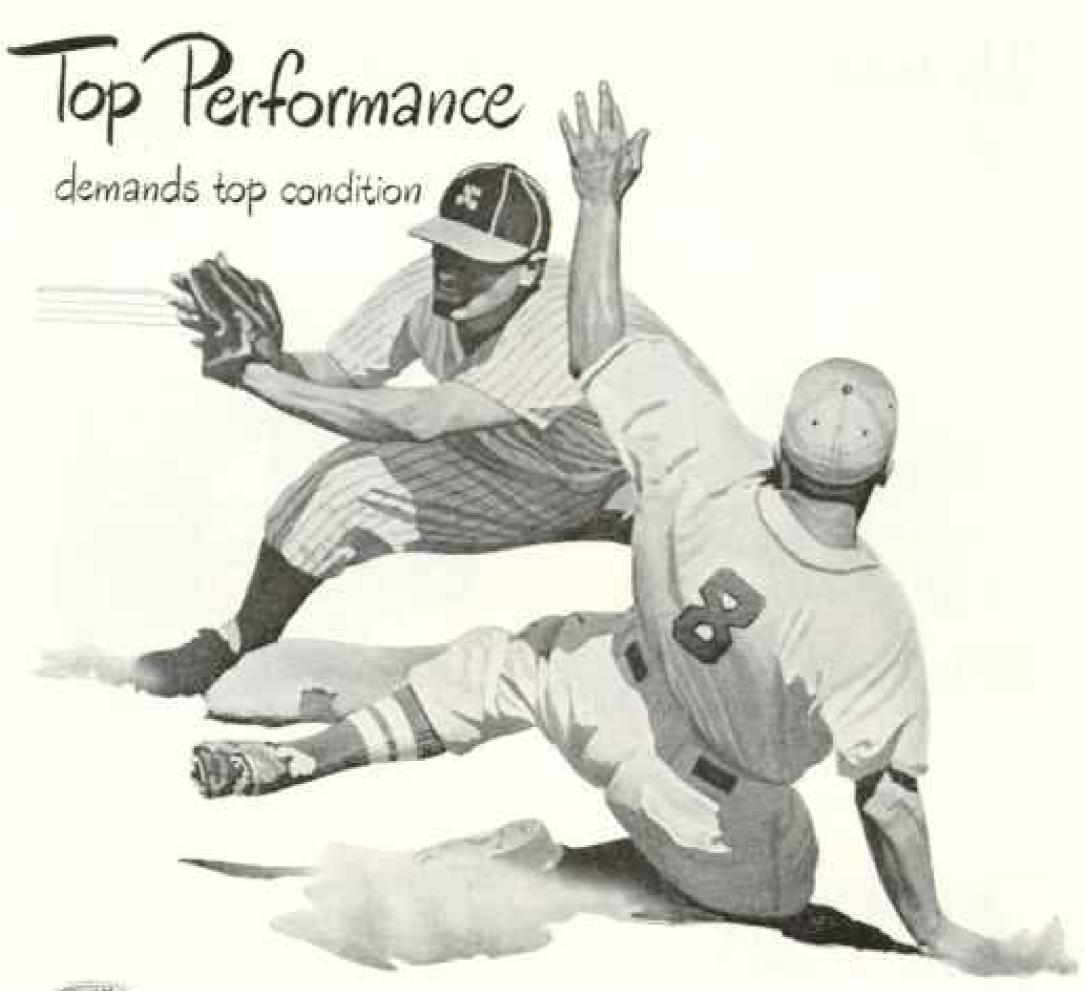
Every convenience I need for ease, speed and comfort is built right into the machine. I'm sold on Dictaphone Electronic Transcription!

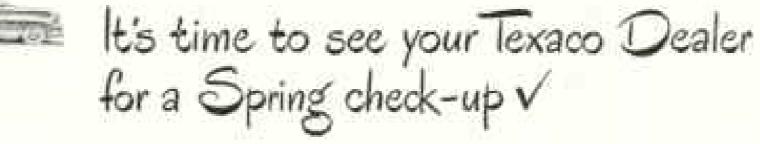


The Dictaphone Twins

For an eye-opening, ear-opening demonstration, call your local Dictaphone Representative. Let him show you how the Twins can save you time and money. Or just mail the coupon below.

Dietaphone Corporati 420 Lexington Avenu D Please send me des D Please demonstrate	c, New York 17, N. Y. criptive literature.
Nome	
Company	
Address	
City	State

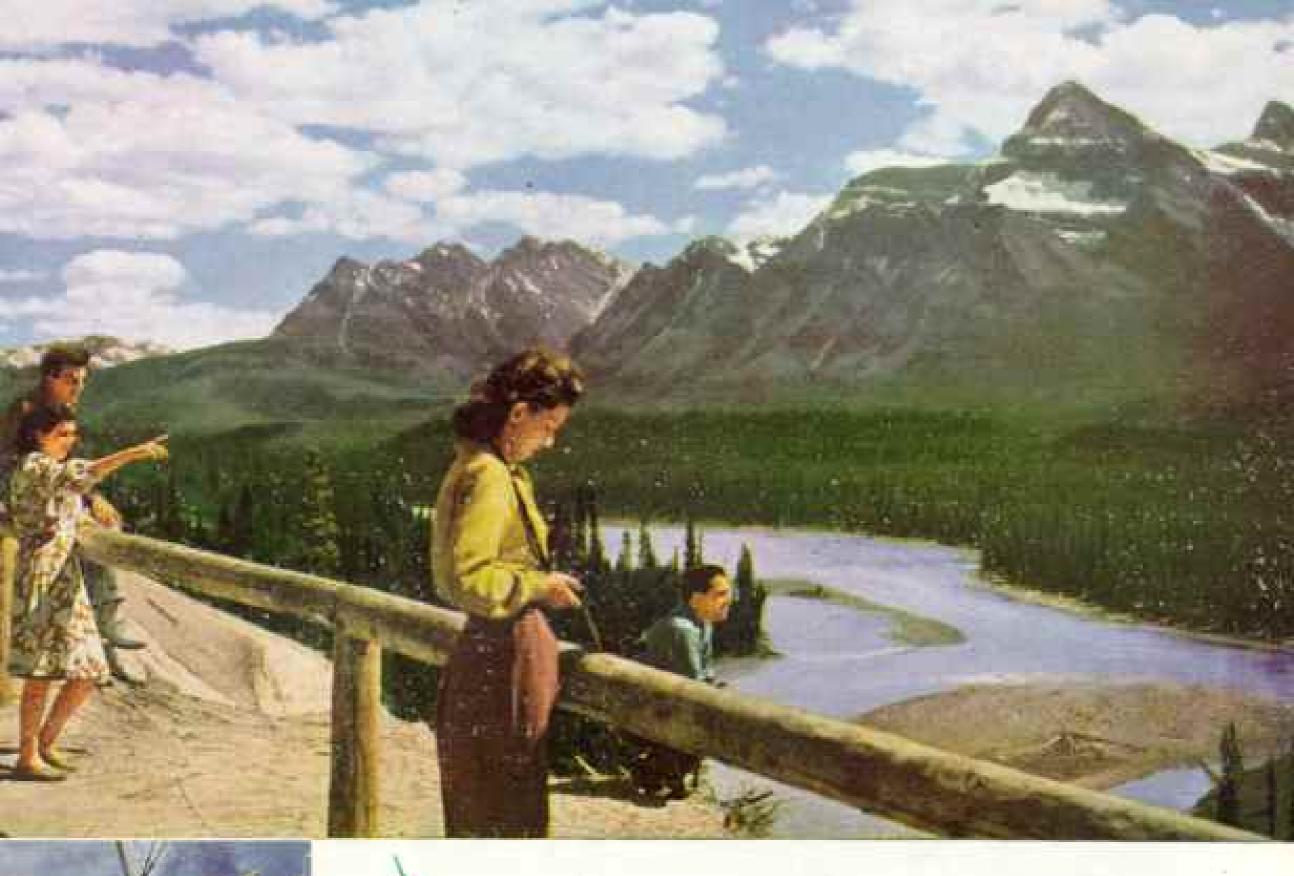


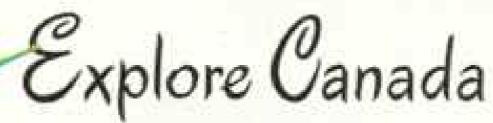


- ✓ He will check your spark plugs, battery, tires, Flush radiator, Make complete under-car inspection.
- ✓ He will lubricate chassis with long-lasting MARFAK, the tough lubricant that gives you "cushiony" driving. He'll protect gears with proper Spring grade of Texaco transmission and differential lubricants.
- ✓ For more gas-miles, power, economy, he'll fill the crankcase with HAVOLINE, the modern motor oil, CLEANS as it lubricates.
- √ For power-to-spare, get Texaco 5KY CHIEF gasoline, the luxury fuel for those who want the best—or Texaco FIRE-CHIEF, the motor fuel for utmost power at regular gasoline prices.

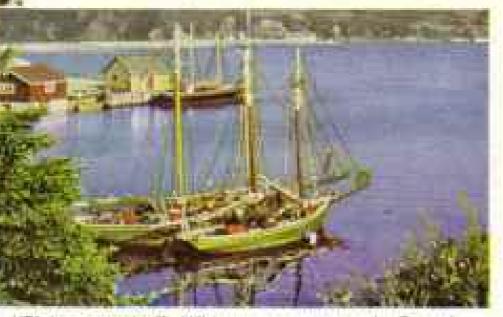
THE TEXAS COMPANY TEXACO DEALERS IN ALL 48 STATES







A million square miles of vacation country —calling you north of the border to play.



Wherever you roam in Canada, Nature smiles her prettiest for your camera.



Authentic native crafts add zest to your shopping and gift-hunting. Stores are well stocked again.

Say "Hello again!" to the friends you've made, the favourite spots you've learned to love on previous trips to Canada. Or see it all for the first time . . . Either way. you'll find exciting new things to do-mountain trailriding or big-city sightseeing-family fun on friendly beaches or watching wild life in a horizon-bounded National Park. And don't forget-your dollar buys more vacation in Canada. Come along this year! For illustrated literature, write:

Canadian Government Travel Bureau, Department of Trade and Commerce, Ottawa, Canada.

Mr. Him. C. D. HOWE Minister

Cruise Canada's cousts. her storied waterways. while you relax to the rhythm of shipboard life.

Here's a carefree holiday.

for your whale family.

D. LEO DOLAN Director

NO PASSPORT NEEDED

CANADA

Vacations Unlimited

CANADIAN GOVERNMENT TRAVEL BUREAU OTTAWA CANADA

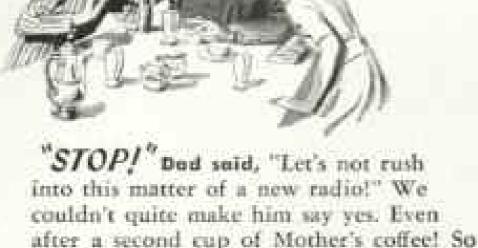
Please send me your illustrated book. "Conada, Vacations Unlimited"-(Please Frint)

2,483

Name

Street and No.

Town: State: Mother was tickled pink that Dad had the last word!



Mother waited a few days. Then-"unex-

of a store that sells Stromberg-Carlson!

pectedly"-we all found ourselves in front



"LOOK!" Mother said, "Have you ever seen such exquisite cabinets! Tom dear, can't you imagine that lovely Hepplewhite in our living room!" I could see Dad was beginning to weaken. He's rather proud of his appreciation of fine furniture.



"HEPPLEWHITE"... For the living room. FM-AM radio-phonograph combination in authentic 18th century design. Automatic record changer with automatic stop. Hand-rubbed mahogany vencers.

"LISTEN! said Dad, as he tuned in an FM station.
"That's so true to life, I feel I could shake hands with the maestro!" Then we heard some Strauss records and a few standard broadcasts.

Next thing we knew, Dad was telling as that what we needed most was a new Stromberg-Carlson! "Tom," said Mother, "I've never been so happy—to let you have the last word!"

See the difference hear the difference

Visit your Stromberg-Carlson dealer-listed in the classified pages of your 'phone book.

Radio-phonograph combinations from \$199.50 to \$625.00—Table models from \$34.95. (Slightly higher in South and West.) Also, brilliant new television in console and radio-phonograph models.

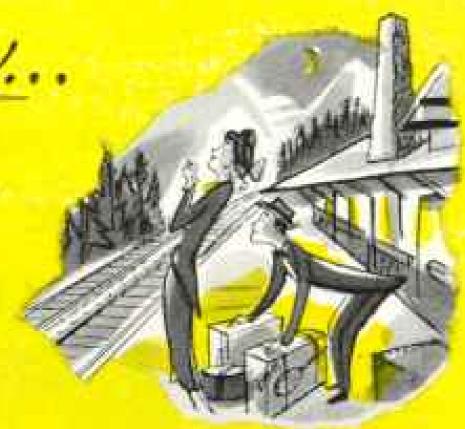
*STOP!_LOOK!_and LISTEN!... THERE IS NOTHING FINER THAN A

STROMBERG-CARLSON

© 1948, Stromburg-Carlian Company, Rachester 3, N. Y. — In Canada, Stromburg-Carlian Co., Ltd., Toronto Radios, Radio-Phonographs, FM and Julevisian - Saund Engineers, Industrial and Intercommunication Systems - Interbooks and Switchbaurgs

Canadian Pacific knew... BANFF WOULD BE A HONEYMOON HAVEN!

THAT SMART CANADIAN PACIFIC travel agent knew we'd find honeymoon happiness at Banff in the heart of the Canadian Rockies! He planned our trip, and I'm sure no one ever rode in such comfort or enjoyed such special service! But everything about Canadian Pacific is special!



a paradise surrounded on all sides by huge mountain peaks. You've dreamed of luxury ... but this is in! A mile-high golf course, two pools, tennis, fishing, riding!



Banff. Farther on, Emerald Lake glitters in the mountain sun.

The Columbia Icefields are fantastic! And even deep in the Rockies, Canadian Pacific pumpers you with modern, comfortable hotels and lodges and that special Canadian Pacific service.

SPECIAL is the word for all Canadian Pacific service, whether it's in one of their twenty coast-to-coast hotels and lodges or over their 17,000 miles of rail. This is the world's most gracious travel system. Get to know its advantages in time for your next trip.

Canadian Pacific

SPANS THE WORLD

Ask Canadian Pacific or your local agent about hotel, steamship or rail reservations.

Railways - Steamships - Air Lines - Hotels

Communications • Express

it's Centennial year in Worderful WISCONSIN

With lightning paw, Mr. Bruin 'scooped' his tasty fish dinners from Wisconsin's myriad lakes and streams... world-famed fishing waters preserved for your enjoyment today by Wisconsin's unsurpassed wildlife and forest conservation program.





Thrills galore await you this Centennial year in Wonderful Wisconsin. Choose your own vacation fun . . . fish, swim, canoe . . . golf, ride, hike . . . visit famed scenic, historic spots . . . enjoy Wisconsin's 7,500 lakes, 10,000 miles of rushing streams, forests, wildlife, ideal summer climate. Accommodations for every taste and budget . . . thrifty cabins to luxurious hotels.



Centennial year offers for and epost for the whole family in Wonderful Wisconsin, heart of the beautiful Blue Water Laker area.

Send for Free Booklet

WISCONSIN CONSERVATION DEPT. Recreational Div., State Office Bidg. Rm. 75, Madison 2, Wisconsin

NAME	
ADDRESS	
PINO	CTATE .





WHEARY . THE NAME TO REMEMBER IN LUGGAGE

IN THE HAND OF

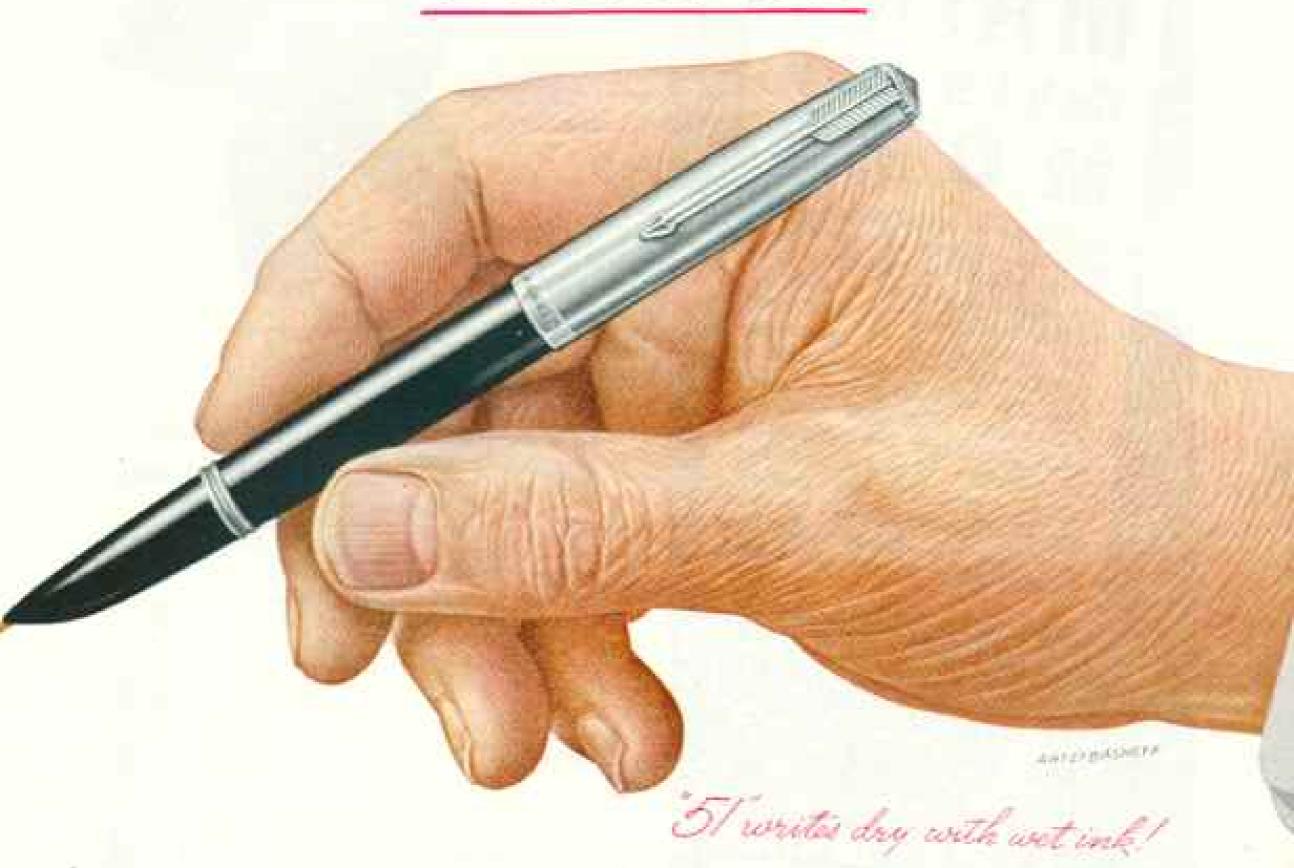


Vilhjalmur Styansav

Vilhjalmur Stefansson, world-famous scientlet and explorer, who has contributed much to our knowledge of the northern polar regions. He is editor of the popular book, "Great Adventures and Explorations."

World's most wanted pen..

Parker 51"



NORTH—south—east—west—Parker "51" is the preferred writing instrument.

77 surveys in 29 countries proclaim its popularity. Even in far-off Sydney, Australia, for example, the preference for Parker exceeded that of the next three leading makes combined!

Here is a pen of simple, unspoiled beauty. Precision-made from cap to point. You choose from a wide range of individualized custom points. Each starts on the instant — glides

Only the "51" is designed for satisfactory use

with new Parker Superchrome—the super-brilliant, super-permanent ink that dries as it writes!

See the "51" today. An ideal gift for birthdays and anniversaries. Choice of distinctive colors. Individual "51" Pens (including the new demi-size), \$12.50; \$15.00. Pencils, \$5.00; \$7.50. Sets, \$17.50 to \$80.00. The Parker Pen Company, Janesville, Wis., U.S.A., and Toronto, Can.



Brilliant Binocular Performance

For a bright elose-up view, sharply defined, you'll choose the postwar Bausch & Lomb Zephyr-Light binocular. Before you buy any binocular, read the new 32-page Bausch & Lomb catalog. It tells what qualities to look for in a binocular, how to choose one best suited to your own needs. Free on request, Bausch & Lomb Optical Company, 282-Q Lomb Park, Rochester 2, N.Y.







OFFERS FEATURES FOUND IN NO OTHER POWER MOWER

The unmatched handling ease, operating efficiency, and extended service of today's Eclipse mowers are the result of over 45 years engineering and production experience devoted exclusively to Lawn Mowers.

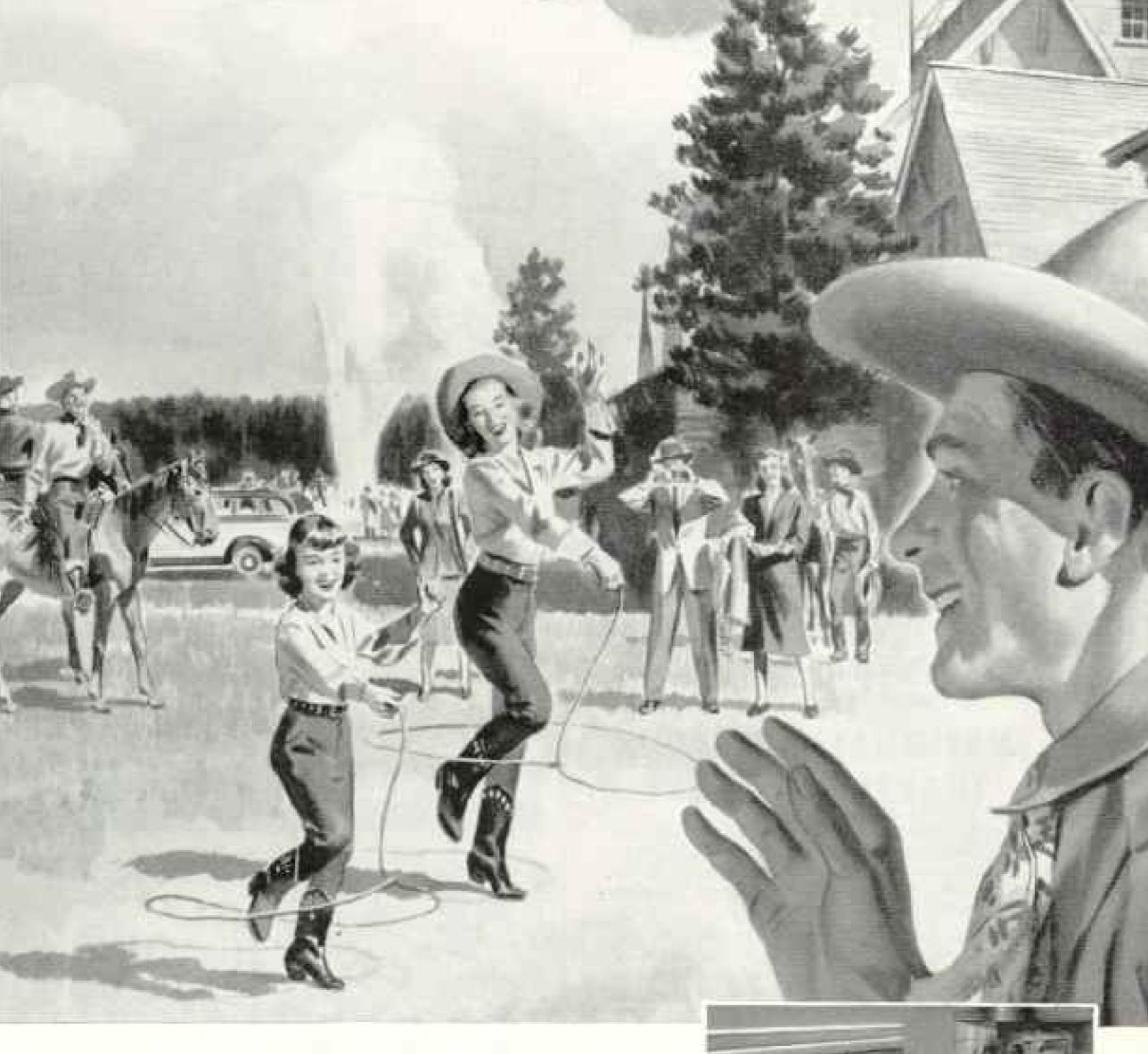
For an entirely new concept of effortless, economical motorized mowing, join the thousands of owners who endorse the outstanding and exclusive features of an Eclipse power mower.

Pawer Driven Wheels Positive Action Clutch
Pawer Driven Sharpener Power Driven Reel
Natural Grip all-steel handle Easy Starting
Convenient Adjustment Finger Tip Control
Heavy Duty Reel Weather Resistant finish
Rugged Puncture Proof Tires Tempered Knife

THE ECLIPSE LAWN MOWER CO.
1004 Ruilrand Street Prophetstown, III.



HAND AND POWER MODELS



Round up of summer fun ...

Yellowstone Park, Montana Rockies and the Olympian Hiawatha

I'shouldn't be news that beautiful and mysterious Yellowstone is an all-American vacation attraction. Nor that dude ranchers and fishermen can find their earthly paradise in the nearby Montana Rockies.

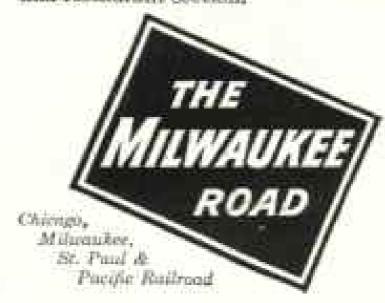
But maybe it is news that you can go at low cost on The Milwaukee Road's Olympian Hiawatha. Only one night en route from Chicago. There are standard Pullmans with rooms and berths, unique Touralux sleepers combining new comfort with economy, also reclining chair coaches. All passengers are welcome in the diner and in the Tip Top Grill with its snack section and cocktail lounge.

* Plan from Free Vacation Literature

For picture-crammed folders giving information on Yellowstone and Montana vacations, write to H. Sengstacken, Passenger Traffic Manager, The Milwaukee Road, 806 Union Station, Chicago 6, Ill.



Typical of the de luxe equipment on the Olympian Hiawarna is the striking Tip Top Grill car with its smart cocktail lounge and restaurant section.





your signature means CASH around the world...on

NATIONAL CITY BANK TRAVELERS CHECKS

In Lima, Peru; in Lima, Ohio; in Lima, Spain...
wherever travelers go or commerce is possible,
NC8 Travelers Checks, bearing the name of the
National City Bank of New York, are accepted
cheerfully at sight...just like cash.

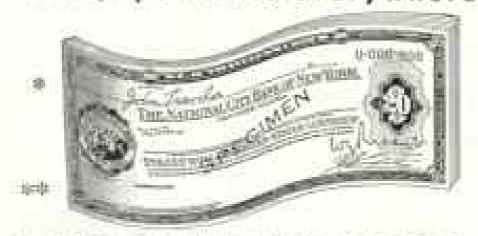
You can use them to pay for any purchase, any service... anywhere. For the name of America's greatest world-wide bank on your travelers checks assures immediate recognition and courteous attention.

And no one can tamper with your truvel funds ... here's why ... You sign(*) your name on the checks when you buy them. This makes them your personal, individual money—as safe as in a bank vault. When you wish to spend them you sign(**) them a second time. If lost or stolen, uncounter-signed, you get a full refund.

Ask for them at your bank ... in denominations of \$10,520, \$50 and \$100. Cost 75° for each \$100.

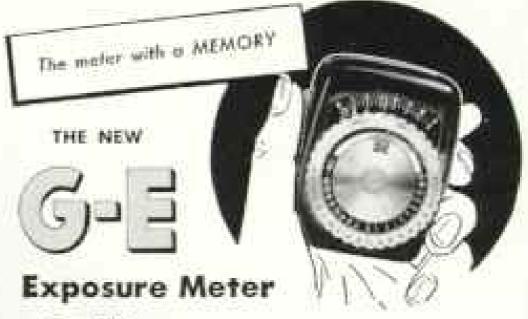
NATIONAL CITY BANK TRAVELERS CHECKS

safe, spendable everywhere



BACKED BY AMERICA'S GREATEST WORLD-WIDE BANK

Munifer Federal Dignett Insurance Corporation



Type PR-1

Only G-E gives you all these advantages . . .

• Easy to use—gives correct camera settings in 5 seconds for better movies, stills, color • Extra help for tricky scenes • Precision built • Automatic shift for bright light or dim • Sturdy, lightweight, vest-pocket size • At photo dealers everywhere. General Electric Company, Schenectody 5, N. Y. \$32.50*

ALSO famous Type DW-56 meter... a big value at \$19.95*

*In states where Pair Trade Contracts are in effect; includes Pederal Tax.





	Buildings, Toranto 2, Onterio
Bet, Road AV	te promphlet "Ontano, Your Best Varietic op, and Where to Stay in Ontana"
Name	
Name	

Your family will thrill to Magnavox



There is magic in Magnavox . . . magic that means better living for every member of your family. For Magnavox opens new horizons of musical enjoyment . . . brings realism and perfection of tone to your favorite programs and records. Fourteen handsome models are priced from \$187 to the incomparable Windsor Imperial (shown above) at \$850. See how beautiful Magnavox looks . . . how well it performs in your own home. Ask your dealer to deliver one today (his name is in the classified telephone directory). The Magnavox Company, Fort Wayne 4, Indiana.

the magnificent Magnavox
radio-phonograph

Bea 4 me - Park at Yellowstone Park

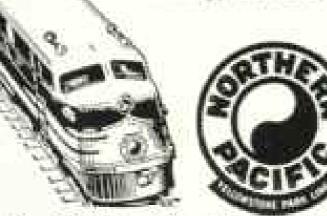


Should you go to YELLOWSTONE?

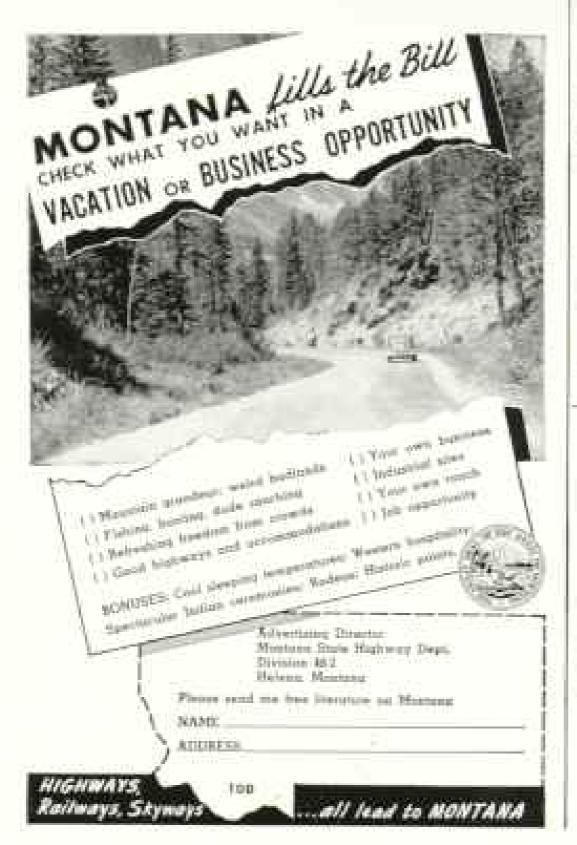
That depends on whether you'd enjoy spectacular Old Faithful Geyser, the incomparable Grand Canyon, the famous Yellowstone bears, and scores of other autonishing sights in a mountain wilderness.

Best way to go: by train—and a ticket on the streamlined NORTH COAST LIMITED insures accommodations at Yellowstone's fine hotels. Make Yellowstone your destination or include it conveniently on a trip to or from the Pacific coast.

> For free booklet on Yellowstone or information on travel anywhere in the West, write right now to E. E. Nelson, 300 Northern Pacific Railway, St. Paul I, Minn.



MAIN STREET OF THE NORTHWEST





Outstanding among cultural institutions is the Enoch Pratt Free Library.

Outstanding among hotels is the

Sheraton Beluedere

BOTH ARE IN BALTIMORE

HOT SPRINGS MATIONAL PARK, Arkansas



Adington Hotel & Baths

A most evaluation of diministration at America's most popular Spa. Complete histolicuse facilities. Curative hos waters, owned and recommended by the U. S. Ger's for

arrhrims, high blood persons, heart disorders, etc. Golf, riding Butter, seemic highways. Zemful climate of the pine clad Oracle footbills. Coising for epicures. For illustrated helder, address.

W. L. CHESTER, General Manager

NO OTHER SPA OFFERS SO MUCH



lo de mostina



Dual-Temp Home Fracter really quickfreezes at 15° below zero. Stores up to 78 lbs. of frozen food safely for months. A freezer right in your refrigerator!



Dual-Temp Moist Cold Compartment never requires defrosting! Righ humidity keeps food fresh and moist without covering dishes. More room for foods!



Dual-Temp Storliump kills germs...helps preserve food langer.



Duck-Tomp Moistrol . . . the drip tray that automatically empties itself. Many more outstanding features . . . see Dual-Temp at your Admiral dealer, today,



Admiral Electric Range

America's most beautiful electric range with simplified automatic cooking. Just 2 controls to set ... cooks while you're away! Large, flexible oven provides 17 different rack positions. Flex-O-Heat "no-skip" controls give the exact amount of heat needed. See it today!

Hamiral

DUAL-TEMP

Refrigerators

Performance proved in over 200,000 kitchens!



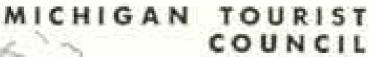
there's vacation fun. That's why you'll love Michigan. Here, where 11,037 crystal-clear inland lakes reflect sunny blue skies, and each pleasant hour is tempered by air-conditioned breezes from five Great Lakes, you'll find reasons aplenty for

a Michigan vacation. Every glorious minute is heaped with fun. There's swimming, sailing, golfing, and fishing. Everywhere in Michigan



you'll find a host of invigorating sports for all. And Michigan's many fine hotels, inns,

and secluded resorts offer varied facilities for every vacation budget-with hospitality and good fellowship the speciality of every house. Mail the coupon below for your free. illustrated folder.



Room 11, Capital Bidg. Lansing 1, Mich.

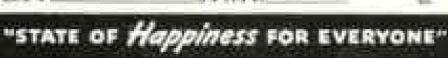


Please said me your free, illustrated folder en-nitled "Here's Your Michigan!"

NAME.STREET

CITY.

STATE



"The Supreme Authority

in courts, schools, homes, newspapers and Government offices

The Merriam-

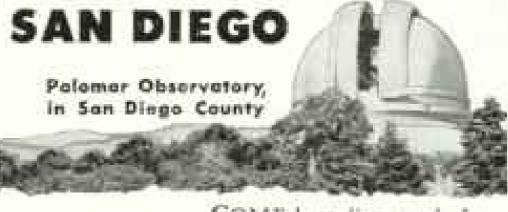


You may have had to wait for a copy of WEBSTER'S NEW IN-TERNATIONAL DIC-TIONARY, Second Edition. However, more and more empire are reaching your dealer. See him now. The MERRIAM-Webster contains 3,350 pages, illustrations for 17,000 terms, and a total of 600 non entries -122,000 more than any other dictionary. It is the only unabridged dictionary completely revised and rewritten in three decades. G. & C. Merriam Co., Springfield 2, Mass.

Buy Give a Dook Certificates at Your Bookseller

WEBSTER'S NEW INTERNATIONAL **DICTIONARY** - Second Edition

(Plan now to visit





OLD MEXICO

The cuisine and customs of Old Mexico only minutes ascay. It's a thrilling part of your San Diego stay, No passport or currency problems.

COME here direct and plan to stay. Vacation on a cooling bay with miles of wide, sandy beaches and the blue Pacific for your playground. Come where California's history began. See more of the real California-out-of-doors, yet have a modern city to enjoy. Spend less time getting places and get more hours of real vacarion pleasure. San Diego offers the kind of trip all your family can enjoy.

Accommodations of ull types, Reservations advisable. Ask your Travel Agent,

♦ For Information write: Son Diego-California Club, Dept. 18, 499 W. Broadway, See Diego I, California

> ian Viego WHERE CALIFORNIA BEGAN

On your S.P. Trip See twice as much for the same rail fare



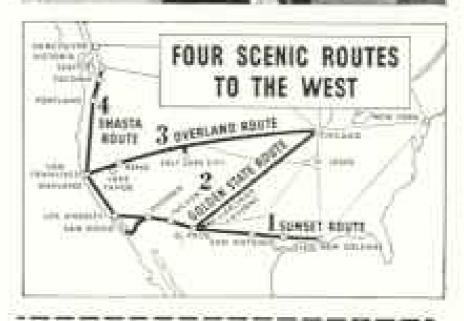
On a Southern Pacific roundtrip ticket west, you can use any two of our Four Scenic Routes—travel through a different part of the United States each way. You actually see twice as much as you would by going and returning on the same route—for no extra rail fare from most eastern and mid-western places.

Going, try the Overland Route across mid-continent to San Francisco. Cross Great Salt Lake. See Reno, the High Sierra, Lake Tahoe. (Route of the streamliner City of San Francisco, the San Francisco Overland, the Gold Coast.) Returning, travel the Golden State Route—low-altitude way from Los Angeles to Chicago. The New Golden State streamliner and the Imperial are at your service. See Southern California, Palm Springs, Arizona, El Paso (Carlsbad Caverns National Park).

Southern Pacific's other two routes are: Sunset Route, via New Orleans and the Old South; Shasta Route, through the Pacific Northwest. (See map.)

Remember, when making your trip plans, that you can have any two Southern Pacific routes for the price of one. Mail the coupon for free guidebook.





L. C. Ioas, Dept. NT-# 310 So. Michigan Ave., Chicago 4, Illinois Please send me, free, your guidebook, "How to See Twice as Much on Your Trip to California".

Name	
Address	
City & Zone	State



Bendíx Radio

Visit any Bendix Radio dealer, play just 3 records with exclusive Hush-O-Matic . . . listen just five minutes to brilliant Bendix FM and AM, and prove for yourself that no other instrument at any price matches this patrician radio-phonograph.

(BUXDLX BUSBO) BENDIX KADIO DIVISION OF Baltimore 4, Maryland



BORDIX: AVIATION COMPORATION



name in power-lawn-mowers

" MOTO - MOWER"

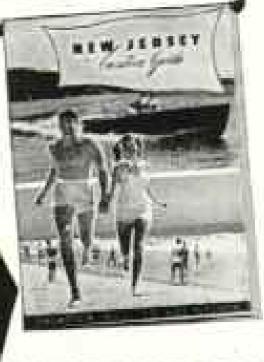
Why push a hand mawer when you can drive a "Moto-Mower" . . , builders of quality power mowers for twenty-nine years . . , write for literature and the name of the nearest dealer . . . a MOTO-MOWER is worth insisting upon . . .

... sizes 19" to 71". 7he MOTO-MOWER DETROIT 1, MICHIGAN Company

fun-filled hours "VACATION HOST TO THE NATION"

Here's complete information on seashore, mountain and lake resarts, to help you plan a better vacation.

GUIDE

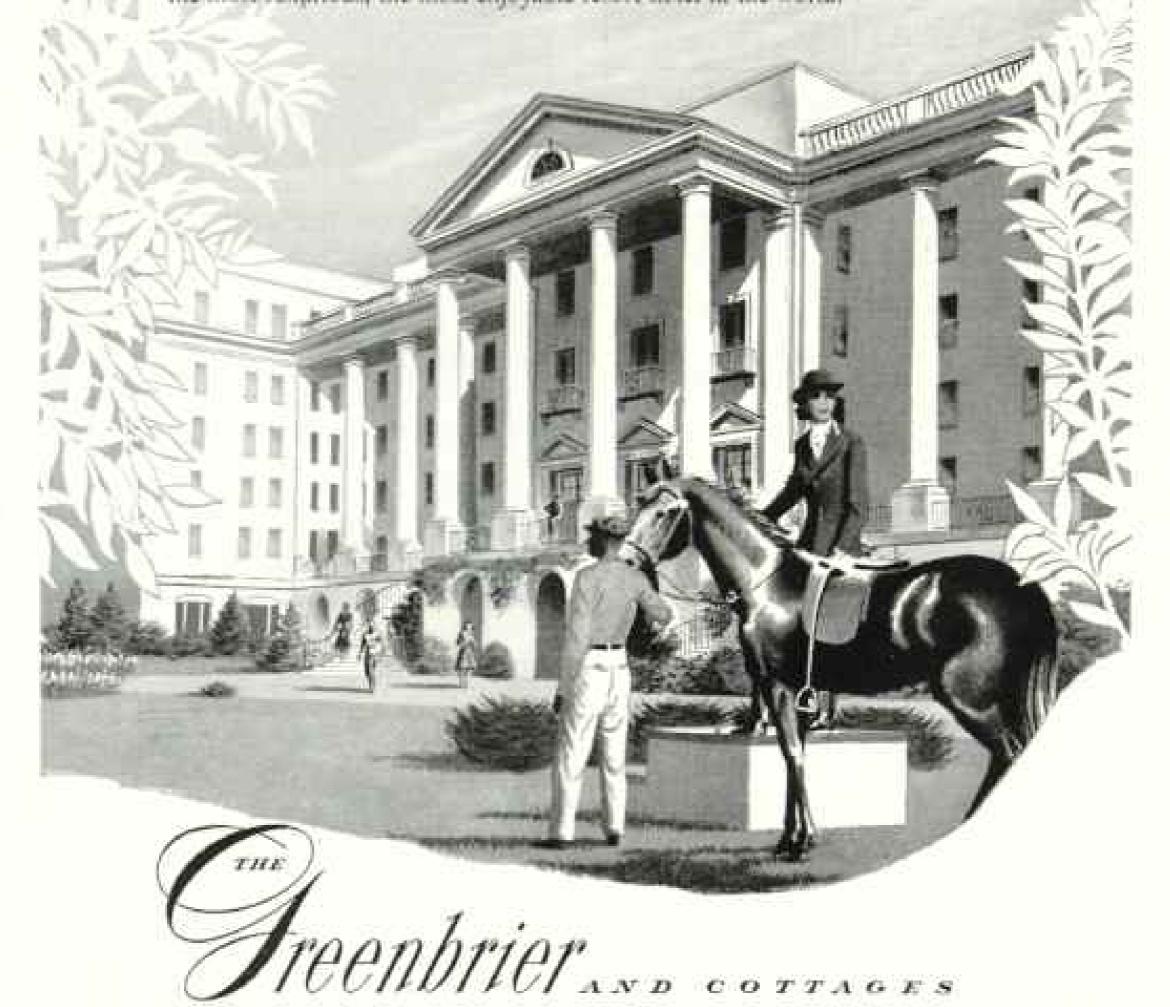


NEW JERSEY COUNCIL,
DEFARTMENT OF ECONOMIC DEVELOPMENT,
Box 106 STATE HOUSE, TRENTON 7, N. J.
Send me 32-page VACATION GUIDE.
NAME
ADDRESS
CITYSTATE

A wonderful new Greenbrier will open April 19th

ON APRIL 19TH, The Greenbrier will again open its welcoming doors. You'll recognize the familiar façade, but not the interior, for The Greenbrier has been completely restyled and redecorated... its hospitable personality persists but each of its guest rooms, suites, cottages and public rooms has been given individual creative treatment by the noted Dorothy Draper.

Visit The Greenbrier, enjoy its unparalleled social and sports facilities. You will appreciate that no effort has been spared to make The Greenbrier the most luxurious, the most enjoyable resort hotel in the world.



WHITE SULPHUR SPRINGS, WEST VIRGINIA

Fort Necessity, Near Farmington, Fayette County built in 1754. George Washington commanded troops here during French and Indian Wars,



THE "every American" VACATION ...

Every American will find much of the root source of his own state's culture . . . tradition . . . and character in Pennsylvania.

Here the trails of your country's destiny are blazed eternally. The homes of pioneers . . . the old forts . . . the scenes of decisive battles . . . the paths pounded deep and smooth by our Colonial and Western expansion-reach out to your pride in America.

Decide to vacation in Pennsylvania. You will have a stimulating time.

Here, for your vacation pleasure, are more improved roads . . . metropolitan cities . . . small towns . . . thrilling historic shrines . . . more quaint folkways and traditional foods to delight you than in any other state in the nation. Here are vast State Parks and forest areas . . . natural wonders . . . famous resorts ... fine fishing and hunting ... good living. You will enjoy Pennsylvania-the easiest State to see in the nation-the easiest State in which "to see the nation." If You Drive, Drive Safely,

PENNSYLVANIA FOR A "NATIONAL"

DEPARTMENT OF COMMERCE HARRISBURG, PA. JAMES H. DUFF, Governor

VACATION

ORUS J. MATTHEWS, Secretary of Commerce Pensuylvania Department of Commerce, Harrisburg, Pa. Pinuse send me, free, maps and literature about Pennsylvania's vacation highlights. Dept. N-11-48.

Name		_
Addren		
Gitt	Stete	

NORWOOD irector BETTER BECAUSE OF THE PRINCIPLE EMPLOYED ACCURATE EXPOSURE **EVERY TIME**

You get better pictures when you use a Norwood Director for it gives you the correct exposure at once by measuring all incident light falling on the subject. Perfect for any picture with any samera-anywhere. A must for color. See your photographic dealer. Write for illustrated booklet, "Correct Exposure."

AMERICAN BOLEX COMPANY, INC. 521 FIFTH AVENUE NEW YORK 17, N. Y.







CHICAGO ROLLER SKATE CO. Leading Mir. of Rink Skates for over 40 Years 4408 W. Lake St., Chicago 24, III.

New Revolution in Hearing Aids



AT LAST—your opportunity to discover how much a hearing aid can mean in your life... without embarrassment or inconvenience, without exposing yourself to high pressure salesmen, without risking a penny!

All made possible by this improved kind of hearing aid that needs no "fitting." Because it employs
Zenith's "Full-Range Audio" principle, designed
to amplify the full range of sounds covered by the
instrument. Thus you, yourself, can instantly select
the particular range that enables you to hear best
in different surroundings—with Zenith's Fingertip
Control! The correctness of this principle was recently confirmed in U.S. Government-sponsored
research at Harvard University.

Revolutionary Money-Back Trial

Because the Zenith "75" needs no "fitting"—is so advanced in performance—it is the only hearing nid that comes to you by mail with this sensational guarantee;

Wear it at home, at work, at movies, anywhere. COM-PARE ITS QUALITY, PERFORMANCE, OPERATING ECONOMY (less than Ir per hour battery cost) with that of ANY other hearing aid. If the Zenith "75" does not excel on ALL counts... if it isn't better than you ever dreamed ANY hearing ald could be . . . return it within ten days of receipt and get your \$75 back in full!

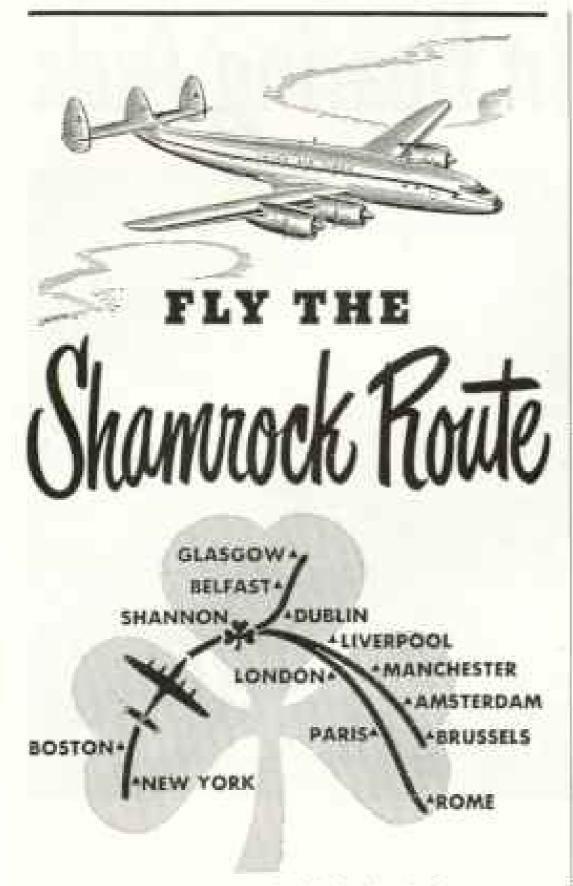
And because it comes to you by mail, the Zenith "75" also saves you over \$100! If its price had to include "fitting," middlemen's profits and high sales commissions, this top quality hearing aid would have to sell for \$195, instead of \$75. So do as tens of thousands have already done. Order your Zenith "75" and find new happiness, new zest for living. You owe it to your family, friends and business associates. Use the convenient coupon below.

Look only to your doctor for advice on your ears and bearing



BY THE MAKERS OF THE WORLD-FAMOUS ZENITH RADIOS

	MAIL	TH15	co	UPON	1 10	DAY-	200200000
Zeutti	Startin C	Darp., He	artiur.	Aid Div	istom. L	npt. No	-6X
may re	oclase c P' Hear turn it v 1 Juli	here of t ing Ald. cithin te	nomey If I w	order fo n not e after rec	e sin+ ampleta eigs and	ty deligh	ded I
AT 88 F	rat or 61 ne east oute sem- nith *71	t me Tree		ets, succ		new time courters. mbout th	
Name							
addres	-				L.,		
CHE.					State		-

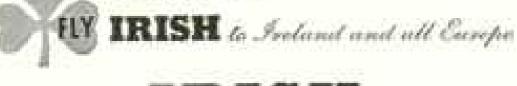


CUCH SERVICE! Such food! Such comof fort! . . . when you take the famous Shamrock Route to Ireland and the capitals of Europe.

And the planes! Great, new Constellations, the latest models of the powerful, veteran transatlantic airliner.

"Shamrock" flights leave at convenient hours on Mondays, Wednesdays and Fridays from New York-and on Mondays and Wednesdays from Boston.

For reservations and information, see your travel agent, or Irish Air Lines office . . . in New York, 33 East 50th Street, Eldorado 5-4002-in Boston, Hotel Statler, HAncock 6-6530.



IRISH AIR LINES

Aeriinte Eireann

Aer Lingus

Leven Fine Reds



Can be made from this excellent set. Jamellike tallocating buildle of politiced aluminous and valuet, unbereal cork flycasting grip, # clender-turned red sections of furtions, Tivel.

theld fragmention after, MARGE langed and ground points make firm, taut rods. Net. an compress in this gives compartment or tackle box.

Midner av needed, 4'8" or 3'9" burn red; 4'8" needling red; 3'8" fly action stell 5'9" med arthur weak fish red; I' fix or light burn your 7' suconing red. Fine marabalag and panel finishing finals production. Each red satrice iver serial number—is negletered. Not said its started. Order with confidence from this ad. Settsfaction assured of incorp. refunded. Two-year guarantee. Price: \$56.

FURTHER INFORMATION FROM KARGE & SON, Brockport 3, N. Y.

FOR Complete USE WHIRLWIND POWER MOWERS

Rutney-arythe, suction-lift cutting principle sure gross and weeds of ony height, matted or upright. Mulchiffes clippings into fine humus for turf. Trims up class to abstructions and under low shoubbery. Cuts on forward and backward travel. Ask your dealer for a demonstration! Address GED-4



Model 24, obeve. Alvo nemilable 31. and 20-lines models.

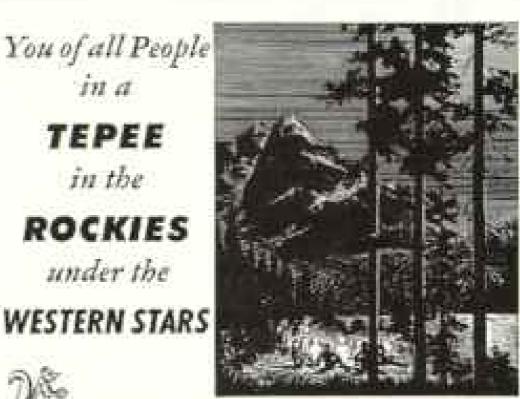
OF SE RECHARDS

You of all People in a

> TEPEE in the

ROCKIES

under the



Camp "like a king" in Colorado's unspolled wilderness-everything furnished-We do dil the "dirty work," furnish your equipment: tepes, sleeping bug. gir-mattress, hot water, fishing license, rod, reel, borses! Halnbow trout, historic trails, wild flowers, cow ponies to ride, comp cookery (fresh vegetables, milk)-or just local Garden of Gods, Continental Divide, Aspen ski lift, Glenwood swimming pool, Mt. Holy Cross, ghost towns. No extra charges; no tips. Companionship, fireside songs, stories. (C) 1944

Reserve now! June 12-September 24. Start Wed, or Sat, Colo. 5pgs, for 3-4-6-7 or 10 days all expense. (Low as \$7.80 a day.) Registered nurse.

Starilte Car Alta Vista I				
Please	rand co	or fals	linez :	
Marina				

Address

Eight and Minte City

AUTHORIZED TRAVEL AGENTS EVERYWHERE



BCA Laboratories" "Chamber of Silence"-proving ground of total quality in radio and television instruments,

Ever hear SILENCE?

You walk into an eerie room. The door swings shut and you're wrapped in a silence so complete that it's an effort to listen. Sound in this vault-like cavern is reduced to the minimum of hearing.

But even silence has a sound of its own. Faintly you hear a subdued hiss; sometimes a soft hum. Scientists have suggested this may be the "noise" of molecules hitting the eardrums. Others wonder if it is caused by the coursing of the body's bloodstream.

When account a scientists at RCA Laboratories want to study the actual voice of an instrument, they take it to this room. What they hear then is the instrument itself – and only the instrument. They get a true measure of performance.

Information gained here is part of such advances as: The "Golden Throat" tone system found only in RCA Victor radius and Victoria radio-phonographs . . . superb sound systems for television . . . the true-to-life quality of RCA Victor records...high-fidelity microphones, clear voices for motion pictures, public address systems, and interoffice communications.

Research at BCA Laboratories moves along many paths. Advanced scientific thinking is part of any product bearing the names RCA, or RCA Victor.

When in Hadio City, New York, be once to see the radio, television and electronic wonders at BCA Exhibition Hall, 56 West 49th Street, Free admission, Badio Corporation of America, BCA Building, Radio City, N. Y. 20,



RADIO CORPORATION of AMERICA

Glorious New Your STARS Really SHINE Beauty

from your Kodachrome Slides



300 watt Brilliant Illumination plus many added features

Your 35mm, Kodachrome shots spring to life with antazing richness! All colors are more brilliant, more sharply defined. Black and whites are crisper, and more contrasty, too. The reason is the special Ampro Condenser design that delivers maximum illumination from 300-watt lamp. Other Ampro features include: Self-Centering Slide Carrier that positions each slide accurately and maintains hair-line focus—Coated Lens—Condenser Unit easily removable for cleaning—handsome Lift-Off Case. Ask for demonstration at better photographic and department stores in your locality!

SEND FOR FREE CIRCULAR

On Amprostide Projector Madel 30-A with details and prices. If you are interested in sound motion pictures, send 10 cents for 16-page booklet, "The Amezing Story of Sound Motion Pictures." Dramatically illustrates how sound films are made.

Ampro Corporation • Chicago 18, III.

A General Precision Equipment
Corporation Subsidiary
In CANADA:
Interpolate Industries Limited, 1155 Bay Street, Toronte

Send the free circular on Amprovide Model 30-A Projector.

I enclose like for a capy of the illustrated backlet.

"The American Sincy of Sound Austral Patence."

Address State

[7] Ampre Smith

Mant Frejector

Send information on

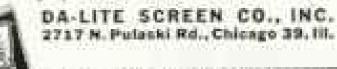
Ampro Idmini

Silent Projector



Da-Lite's multi-layer Pyroxylin-faced, Crystal-Beaded fabric makes all pictures—movies or slides—"come to life" with sparkling brilliance. Built right by pioneers who have led in screen improvements for 39 years. Priced below 10 years ago.

Weite for new FREE book on Da-Lite Servens, (4t sizes); bus projection data and size charts.



WORLD'S LARGEST SELLING SCREENS SINCE 1909



The Uncrowded Vacation Land of 10,000 Lakes

Every inch the Chief



Yes, Little Chief, our Chief measures up to the name!

For it is the all-Pullman, extra-fare, transcontinental streamliner (along with the daily Super Chief) that is famous among discriminating travelers for smooth-riding speed, roomy comfort, and delicious Fred Harvey meals.

The Chief provides daily service between Chicago and Los Angeles, Chicago and Phoenix, Chicago and San Diego.

In conjunction with the New York Central 20th Century Limited, the Pennsylvania Broadway Limited, and Baltimore & Ohio Capitol Limited, it provides daily Pullman service between New York and Los Angeles, and between Washington and Los Angeles without changing cars.

SANTA FE SYSTEM LINES . . Serving the West and Southwest

T. B. Gallaher, General Passenger Traffic Manager, Chicago 4

William and I have always looked and planned ahead together, both for ourselves and the children. Buying our home . . . William's insurance

program . . . our wills . . . all our plans for the future we worked out as a family. So it was natural for us to buy a family monument, too and it's wonderful to know that it's the one each of us would have chosen - because we chose it together."

More and more people are choosing their family monument before the need arises. And more and more people are choosing Rock of Ages because they know its beauty will last for generations to come Every Rock of Ages Family Monument is backed by a signed guarantee to you, your heirs or descendants.

> HOW TO CHOOSE A FAMILY MOSUMENT, at large illustrated book is available without charge or obligation. Samply write to Ruck of Ages, Burre, Vermont. Or ask for a cupy from the Rock of Ages Dealer in your community. You'll find his name in the Classified Section of the Telephone Directory.

chose it together"

MANY THOUGHTFUL PROPLE choose their family cometery plot before the need arises. In this way they gain the great satisfaction of knowing that all the members of the family are in harmonious approval regarding this important choice—the family resting place.

ROCK of AGES

"because we

BARRE GRANITE FAMILY MONUMENTS

ASK YOUR DEALER FOR PROOF OF PERMANENCE IN ANY CEMETERY LOOK FOR THE NOCK OF AGES REAL; IT IDENTIFIES ALL ROCK OF AGES MONUMENTS



Exciting 1948 New Hampshire Vacation Kit

Fill out this handy coupon and receive a fascinating pictorial preview of summertime New Hampshire. Then . . . choose your spot to swim, fish, golf or just relax! There's a sandy beach, a pinescented, mountain forest or a quiet, secluded lake "made-to-order" for you in New Hampshire.



In New York visit the N. H. Information Bureau, 10 Rockefeller Plaza

State Planning & Development Commission. 241 Capital Street, Concient, N. H. Send me FREE the 1948 N. H. Vacarion Kir, containing illustrated backlets, maps and other valuable information.

Do you miss words? Do voices sametimes sound indictional Maybe your "event HEARsome" is limited? To expand it, by a .

ONE-CASE

Thousands of people use Paravox, now, to expand electrically the "usual HEARsane" (that illistance beyond which normal conversation tends to become unintelligible). Try one. Discover truth of better hearing. Paravox clearly increases sounds. One year "an-the-spot" service guarantee.

Write for FREE facts about your "ward HEARsone"

Accepted by the Coxxvil on Physical Medicine, American Medical Association PARAPHONE HEARING AID, INC. 2011C E. 4th St. CLEVELAND 15, OHIO

* FOR THOSE WHO CANNOT OR SHOULD NOT CLIMB STAIRS



Sedgwick Stait strain is heart

strain. Safeguard your health. Don't climb. Rests upstairs on a Seilawick. Electric or hand power. Easily and quickly installed. Moderate cost. Docnors recommend.

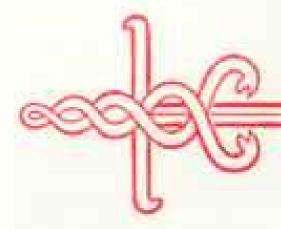


Write for illustrated bunkler

SELIGWICK MACHINE WORKS, 137 W.15 ST., NEW YORK

ELEVATORS AND STAIR-TRAVELORS

3 lines of defense against CANCER



YOU are the first line of defense!

Alertness is your job. It's up to you to note cancer's warnings early, while chances of cure are best. That's why you, and everyone, should learn cancer's "danger signals" (they are listed below),

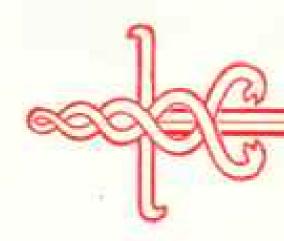
and tell your doctor at once if any of these warnings appear. Sometimes cancer gives no warning, so it's also wise to have a thorough medical examination at least once a year.



The second line of defense is diagnosis!

This is your doctor's job. The "danger signals" are NOT sure signs of cancer, so it's up to your doctor to find out their cause. In many cases the doctor may advise further examination at a cancer clinic or hospital, or by a specialist. If he does, don't be alarmed.

The chances are you don't have cancer. For example, out of 654 women who visited one clinic because most of them had suspicious symptoms, 605 or 92½ per cent were found to be completely free of cancer!



The third line of defense is treatment!

There are still no drugs, no pills, no "sure cures" for cancer. The only treatments that have been successful are surgery, which removes the cancer, and radiation, which destroys it. Success often depends upon starting treatment early. Medical experience shows that the chances of effecting a cure are much greater when proper treatment begins in the early stages of the disease.

These are cancer's "danger signals"

Any unexplained lump or thickening, especially in the breast.
 Any irregular or unexplained bleeding.
 A sore that does not heal, particularly about the mouth, tongue, or lips.
 Noticeable changes in the color or size of a mole or wart.
 Loss of appetite or continued unexplained indigestion.
 Any persistent change in normal elimination.
 Any persistent hourseness or unexplained cough.

To learn more about protecting yourself from cancer, write for Metropolitan's free booklet, 48-N "There's Something YOU Can Do About Cancer." DOSTRIGHT THES - HETBOADLINAS LIFE HEISHIGE DOSTROOP

Metropolitan Life Insurance Company

(A MUTUAL COMPANY)

Frederick II. Ecler, CHAIRMAN OF THE BOARD

Leroy A. Lineoln, russituster

I Maissess Ave., New York 10, N. Y.





The Musaphanic above above is the Berkeley Square

Oflow finer than ever ... with the

lifetime Musaphonic Diamond Reproducer

"Unmatched in performance"... has long been the critical judgment of Musaphonic. Now this incomparable radio-phonograph achieves an even higher standard of perfection with its new, genuine Diamond Reproducer—warranted for the life of the Musaphonic itself.

Today, more than ever, Musaphonic is the instrument worthy of the world's greatest music. With it, all the original beauty of your priceless recordings is yours to command for countless tomorrows. Every masterful movement . . . every

you in all its wondrous concert-hall realism.

Through the carefully voiced twin speakers of your Musaphonic comes genuine FM radio with its virtually static-free reception. You hear standard radio and short-wave broadcasts, too, in new clarity and depth of tone.

Your dealer will show you a wide variety of distinguished period or contemporary cabinets to grace any setting, any decor. Place an order now for the Musaphonic of your choice. Add precious hours to the years of glorious listening that are in store for you. General Electric Company, Electronics Park, Syracuse, New York.





Whoever you are, whatever you do, wherever you may be-



when you think of refreshment, think of Coca-Cola



For Coca-Cola makes any pause the pause that refreshes and ice-cold Coca-Cola is everywhere



Double Reward

from Kodachrome Film in your miniature camera



Projection: your projected

Kodachrome transparencies are the "show window" of color photography.

Prints: your Kodachrome Prints are fine examples of full-color printing.

> YOU enter into closer partnership with the world around you when you load your miniature camera with Kodachrome Film...

> Great experiences are ahead. Turn your exposed film in to your Kodak dealer, and back come your transparencies, finished without extra charge. Project them on your screen —big, brilliant, alive with color...

> And, you can also order full-color Kodachrome Prints at small cost —in the popular SX size (actual size shown here) or in larger or smaller sizes. See what admiration they arouse—when you show them to your friends.

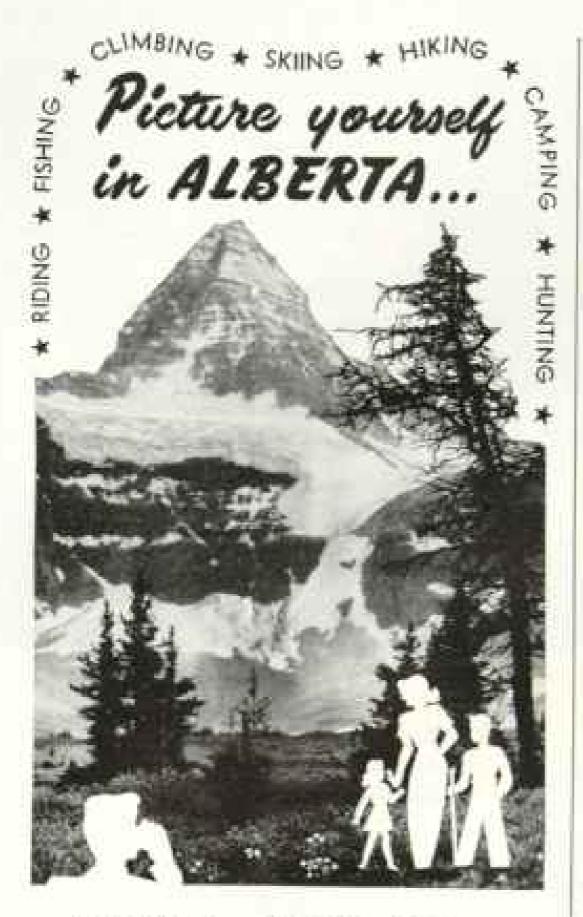
Here's a pleasure that's yours for the taking—full-color pictures with Kodachrome Film...

> EASTMAN KODAK COMPANY ROCHESTER 4, N. Y.

> > "Kodak" is a trade-mark

KODACHROME

Kodak



PLAN NOW... Remember Forever Your Holiday of a Lifetime in ALBERTA... in '48.

YOU owe it to yourself — to climb to the top of a mountain and turn your face to the wind . . . to swing into a Western saddle and follow a lary prairie trail . . . to fish, sail, swim, galf or hunt where the sun is brighter and the days are longer . . . and then to sleep, wonderfully relaxed, in the coal of pine-scented oir.



Alberta's the place: '48's the year! Come by plane, train, bus or motor over new hardsurfaced highways....

But Come!

	H. PULDING, IN, ALBERTA	H. G1	lumining.
Place send on sorforpetiable	f me illustrated tites heliding in Alberta	wtore that will h	l help me plan
NAME			
ADDREIS			
CITY	STA	11	

THE MASTER KEY TO

Geographic Knowledge

NATIONAL GEOGRAPHIC MAGAZINE Cumulative Index, 1899-1947

THE treasure house of authentic information in your NATIONAL GEOGRAPHIC MAGAZINES from 1899 through 1947 is opened for you by the new NATIONAL GEOGRAPHIC MAGAZINE Cumulative Index, 1899-1946, with its accompanying supplement for 1947. It contains 22,000 references to topical headings, places, nature subjects, authors, titles, maps, and pictures. Also included is a history of the National Geographic Society and its Magazine by Gilbert Grosvenor, with 80 illustrations.

Whether you have only a few back numbers of the NATIONAL GEOGRAPHIC or all 588 of them from 1899 through 1947, this Index will enable you instantly to select and locate all published material on the subjects in which you are interested. The Magazine and Index together are the equivalent of a pictorial atlas, gazetteer, and comprehensive encyclopedia of world geography.

Indispensable in homes, schools, and libraries, the National Geographic Magazine Cumulative Index is made available at less than cost as one of The Society's educational services. Blue cloth covers; 814 pages; 7 x 10 inches. \$2.50 in the United States and elsewhere. Postage is prepaid.

National Ge Dept. D-Y,	ographic Socie Washington 6,	D. C.				_1948
of the new lative Inde	find \$ NATIONAL () c, 1899-1946, nated States (EOGRAI complete	with	1947	Suppl	copies Cuma- exsent.
Name			-	11111		
Address						
				mall.		
	- OBTAINA	BLE ON	LY FR	OM-		

NATIONAL GEOGRAPHIC SOCIETY
Dept. D-Y, Washington 5, D. C.



UNION PACIFIC RAILROAD

Hard of the Daily Strommliners

Diame region)

Street

City



STANDARD PACKAGE

200 Note Sheets (size 6 x 7) and 100 Envelopes. All neatly printed with your name and address. Pure white rog content bond paper! ... \$700



ENVELOPES ONLY 200 Envelopes as above (no sheets). Printed with name and address \$100

DELUXE PACKAGE

125 long style sheets (6% x 10%) and 125 long style envelopes, all of hearier weight paper. Neatly printed with your name and address ... \$200

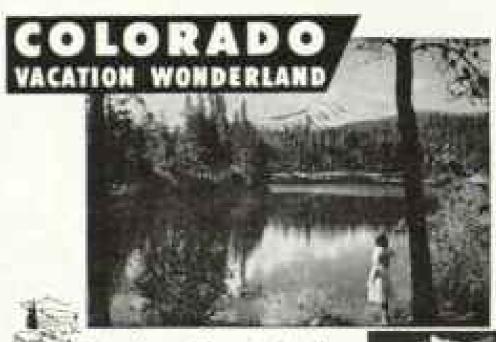
Send money with order. Order in quantities as shown above (no "split" orders). West of Denver, Colo., and in U. S. Possessions add 10% to prices. We pay postage. Satisfaction guaranteed.

THE AMERICAN STATIONERY CO. 300 PARK AVENUE, PERU, INDIANA

AMERICAN

PROTECTION in EVERY kind of weather! "BRONCO PROTECTION opnins! roin, dust, wind. Increases BIKE" speed — cuts wind resistence. Height adjust-WINDSHIELD oble. Finished in red or blue behed enamel, Reat your \$495 bike dealer mayable agrun to match. Finast warkmonship, highest quality materials. Worthy of any hike.

BOSTON 15, MASS.



Vacation with your family amid the peace of the silent hills and lovely green valleys of the Colorado Rockies. Splendid highways. Sky-reaching peaks and primeval forests, 8,000 miles of snow-fed trout streams. Old West rodeos, historic ghost towns, cliff dwellings. Cool, invigorating

days, nights cool enough for blankets.



COLORADO PUBLIC RELATIONS 241 State Capitol Building, Denvey, Colorado

Please send information churked below:

- 1 40-Page Vacution Booklet.
- Descriptive Highway Map

Name

diddress

AMERICA'S 704 VACATION LAND



IT HAPPENS 150 TIMES A DAY IN CHICAGO

A measure of the railroads' high preference for General Motors Diesel locomotives can be found in Chicago, hub of the nation's railways.

There, high-speed mainline passenger trains arrive or depart behind a General Motors Diesel 150 times every day.

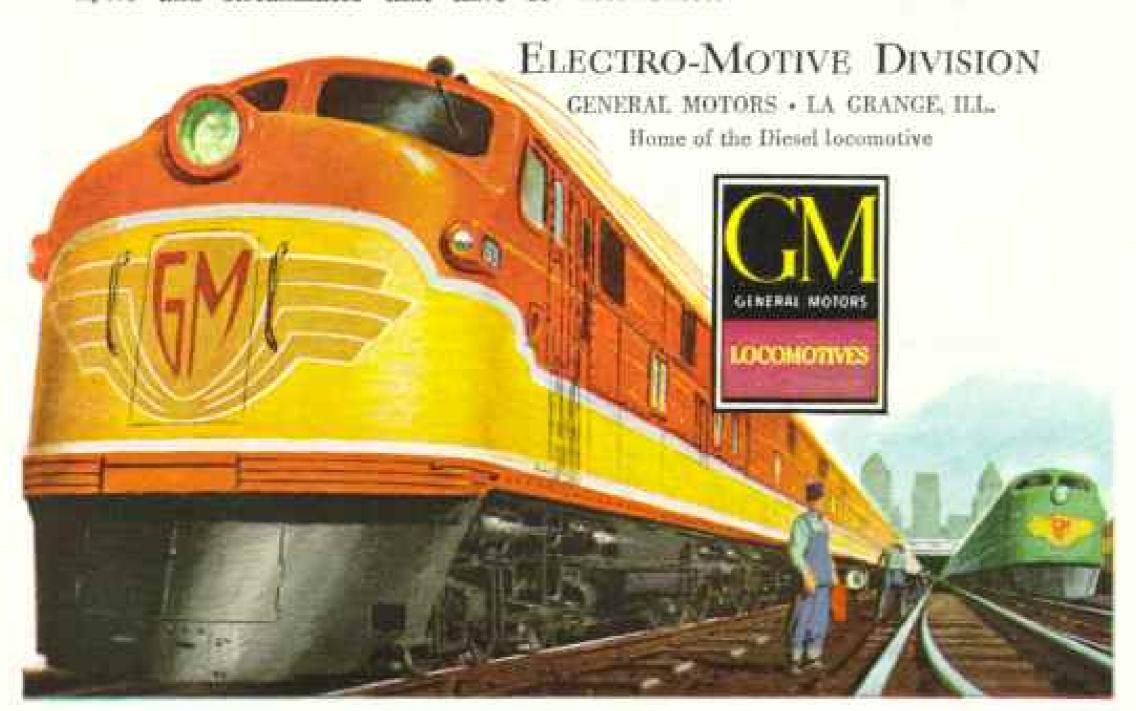
Similarly an array of General Motors Diesel-powered trains arrives and departs every day at Washington, Denver, Kansas City, St. Louis, New Orleans, Seattle, Miami, Atlanta, Los Angeles, Minneapolis-St. Paul, Jacksonville, Omaha — in fact at almost every large railroad terminal in the country.

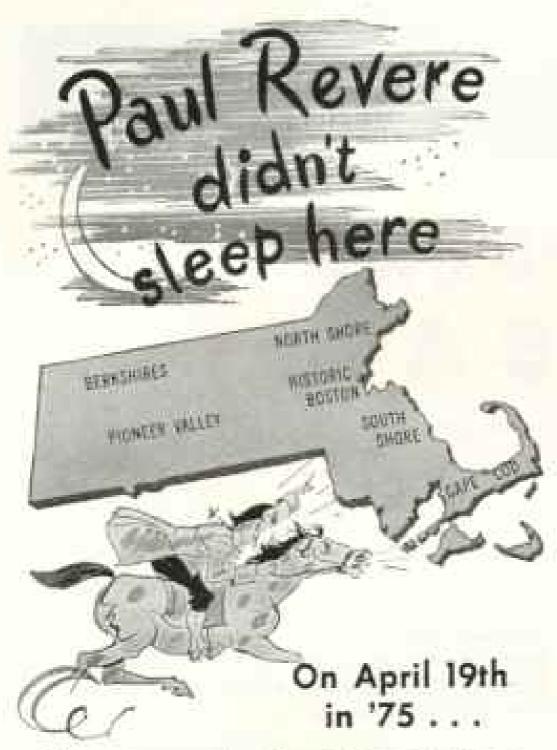
These General Motors Diesel-powered trains include more than 150 of America's most famous "name" trains — the fast flyers and streamliners that have so greatly increased railway travel.

Such overwhelming endorsement by leading railroads is based on operating experience covering more than one and one-half billion passenger train car-miles piled up behind these locomotives since General Motors pioneered the Diesel mainline locomotives in 1934.

This experience has demonstrated that General Motors Diesels maintain faster, more regular "on time" schedules, cost less to operate, require less maintenance and service and have a far longer useful life than any other type of locomotive.

All of which explains why General Motors is now the world's largest builder of locomotives, and why smart travelers say "the best trains follow General Motors locomotives!"





He went around waking other people up ... to make history. Today Massachusetts makes vacation history . . . for this is

a Pacation THE YEAR THE YEAR TOUND

From the sandy Cape to the racky headlands of Glaucester... westward to Pianeer Valley and the Berkshires, is scenic splendor... history... a vacation paradise...

 FOR SPORT—swimming, salling, fishing, tennis, galf, riding at its best.



FOR SCENIC CHARM
 AND RELAXATION

Colonial charm . . . a gracious welcome set in natural beauty.

FOR HISTORIC LORE
 The cradle of American history, yours to enjoy.



For free vacation booklet write to MASS. DEV. & IND. COMMISSION, DEFT. NA. STATE HOUSE, BOSTON, MASS.



GEOGRAPHIC MAPS

Timely Aids to Education

NATIONAL Geographic Maps are invaluable for home or school in following the swiftly moving events of our postwar world. Because the National Geographic Society's spelling is followed by major press associations, all place names in today's news are easily found on these ten-color, legible, large-scale charts. • MAP INDEXES, available for maps marked with an asterisk (*) in the order blank, make easy the location of names on corresponding maps and describe the areas covered.
• MAP FILE: Bound like a book, 7% x 10% inches, the 10 pockets of this file will hold 20 folded paper maps or 10 paper maps with indexes.

National Geographic Socie Dept. D-Y, Washington 6,	Б. с.		1948
Please send me items indi	cated belo		
• Standard size snaps			
come on either paper or linen. "Indexes are avail- able for Maps marked	Paper Maps Sor such in	Linen Maps \$1 each in	Indexes
with saterials." All items are sent postage prepaid.	U.S. & Past. Klackture The each	Elembers \$1,25 mode	Exemples SRt and
Africa*			1111
Arctic Regions			1
Asia and Adjacent Areas*			
Atlantic Ocean			- 1
Australia*			
Bible Lands*,			
British Isles			.1
Canada, Alessa, Graeutuni *			
China*			
Classical Lands of Medit.*			
Countries of the Caribbeatt			
S. & W. Hemispheres			X
Europe & Mediterraneau*	1		
Europe and Rear East" (Bondaries best, 1, 1991)	المريا		
Hurope and Near East discrementation Potant 1940.	- 1		X
Central Europe & Medit.*			-
Theater of War in Europe, Africa, & Western Asia*			
Germany & Approaches* India & Burma*			
Indian Ocean			3
Japan & Adjacent Regions of Ania & Pacific Ocean* Japan & Kucea in detail*			
Japan & Kucea in detail*			-
North America*			
No. & So. Hemispheres*			
Pacific & Bay of Bengale	-		
Pacific Ocean* With 12 labora Insets.			
Philippines*			
South America*		1	-
Southeast Asia*			
The World*			-
U.S.S.R. (Russia)* United States-1940*			-
The state of the s			
United States-1946*			-
Northeast United States*	1		1 - 21
Nurthwest United States	-	-5-	1
South Central U. S.*			
Southeast United States*			
Southwest United States	1		X .

I in columns above indicates them is NUT available. Paper maps are folded for conveyment filling. Then maps come radial.

Also copies of Map File # \$2.50 htt. f. & Post | dermhers, \$2.7%.

I enclose remittance of S. payable in U. S. funds.

(WRITE NAME AND ADDRESS IN MARGIN BELOW)



HOW LONG IS A 300 MILE TRIP ?

Suppose you have to travel some 300 miles or so, overnight.

If you're cramped and uncomfortable—or worried about getting there—that trip can seem like three thousand.

But look how easily those miles slip away when you go Pullman.



 From the moment you get on the train your trip is made more pleasant by the attentive Pullman porter who is proud of his art in serving you.



 When you slip between the erisp, clean sheets of that big, soft Pullman bed you're off to dreams and up next morning in one easy operation.



 You have practically all the comforts and conveniences of home. You can shave and dress right on the train. That helps you look your best.



4. You're completely refreshed when you arrive —on dependable railroad schedules—right in town, convenient to everything. How long is your 300 mile trip? Just long enough for you to appreciate how convenient and comfortable it is to go Pullman.... so short you'll want to do it again and again.

Go Pullman

The way to make I love you last a million years



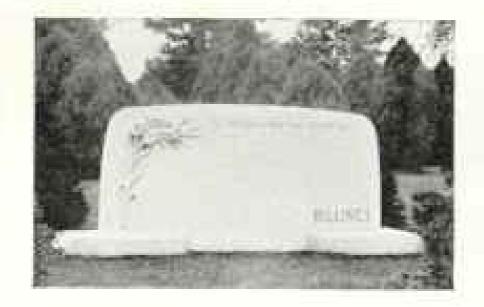
Someone has said that there's so little time to say, "I love you"
... which, of course, is only partly true. A family monument,
chosen by the family well in advance of need, can say, "I love
you" with inspiration and dignity, to every member of your
family, born and unborn, through the immeasurable years.

You'll find pre-need counsel you can depend on where your monument dealer displays the Scal of the Barre Guild, and points it out to you, etched inconspicnously, on actual monuments. This Scal is your guarantee of superior quality, design and craftsmanship, backed by the entire monument industry in Barre, Vt.,

"Granite Center of the World". "MONU-MENT IDEAS" — free — 16 pages profusely illustrated, with more than 40 monument suggestions. Address: Barre Guild, Desk NA-2, Barre, Vermont.

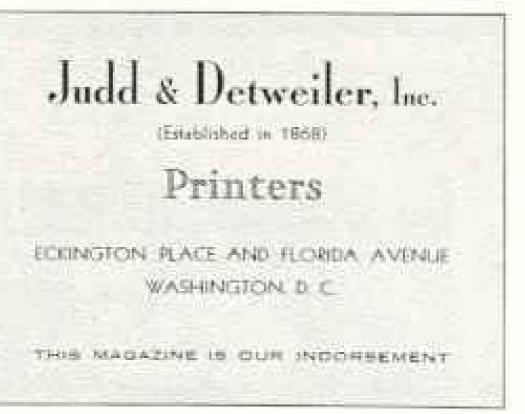
One Family's Answer - This plat of ground, forever theirs - where the living, and those yet to live, may stund impired - where those who have passed by any rest in beauty and in peace.





等於今年中華 等等於今天中共中共中共中共中共中共中共中共中共中共中共中共中共中共







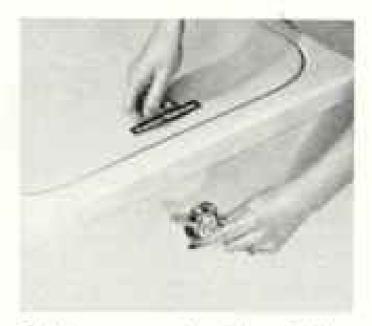


Automatic General Electric Dishwasher saves hours of kitchen drudgery!
 Washes dishes sparkling clean. They dry in their own heat!

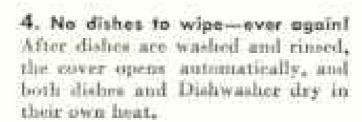


1. A day's dishes done like magic! The G-E Dishwasher will wash a whole day's dishes for a family of four at one time. Separate racks hold chins, glasses, silver safely. Dishwasher takes pots and pans, too!





2. No more rough, red honds! You never touch dishwater. Just turn the switch and the Dishwasher takes over — sustematically washing and rinsing dishes in water hotter than your hands can stand.



NOTE: The Dislowasher is available in a simplete sink, or as a separate individual appliance for installation in your new or present kitchen. General Electric Company, Bridgeport 2, Conn.



3. Gives you now hours of freedom! You're no longer a slave to a dishpan. All by itself, the Dishwasher hygienically cleans and rinnes each piece cleaner than by hand. Safely, too—only the water moves.



DOES THE DISHES BY ITSELF



Girls' Schools

ASHLEY HALL ACCREDITED college properties by a strong poor of historic Boutherst culture. Established depts, of music and act. Mild climate, year round soldeer spects; riding, pool. Dramatical Lower school. Write for rations. Mary Vardrine McBee, L.H.D., Prin., Box N. Charleston 15, 5.C.

AVERETT Accumurate Junior College for girls, emphasizing liberal arts. Masis, art, speech and gramatics, ascretarial, medical accretarial, physical education, between sensences. Modern buildings. 19th year. Dichweed. Catalog. Cartis Bishop, Litt.D., President, Box N., Daovilla, Virginia.

CHAPEL HILL SCHOOL Grand 16-18.
College Proposetion and General Courses. Experienced faculty. Becall chases. Ast, music, dramatics.
Typing. Sports and openal activities. Country life with entranal setvantages of near-by Booton. Mrs...
Robert C. Rounds, Principal, Wattham, Manu-

DEAN JUNIOR COLLEGE

Limital arts and semi-perfectional course. Herne et., med, next, fanh, design, art, int. dee, ser'l, miss. Music, dramatics, speech. Sports, Modernto rats. Placement service. Capalog. Write W. R. Garner, President, Franklin, Muss.

EDGEWOOD PARK Accommission Colvanced sources in sulfural and practical arts, fine arts, recretarial science, real solute, medical acet, home scommiss, dramatics. Contains design, interior desugation, thereforedisting, kindergratum. Sports-riding. Box N, Briscolitt Manor, N. Y.

FAIRFAX HALL Standard secredited work. 2 years endings. 4 years high action. Secretarial, Liberal Arts. Masse, Free Arts. In Scalin Shenaminah Valley. Spacious prounds. Happy social life. All operis. Private static. Pack Wan. B. Gates, M.A., Pres., Box N-84, Park Station, Waynesboro, Va.

GREENBRIER COLLEGE For girls, endings prep and two years standard college work, Penneled ISE, Art, Music, Dramatic Art, Secretarial, Exceptional secial and remestional advantages, Modern fireproof durmitary. Address: French W. Thompson, Pres., Dept. N.B., Lewisburg, W. Va.

GRIER SCHOOL IN THE Alleghander, Arteriolited Callege Presscration and General Courses, Henry atmosphere forgirla 12 is, Music, Art, Typing, Exceptional rating, Winter and teams special 1900 acres, Gyrn, pool, 55th year: Accessible New York, Washington, Cabbles, Thos. C. Grier, Head, Bex 44, Tyrune, Pages, Page

KINGSWOOD-CRANBROOK

Roaminio studente-grades 5-12; day grades 5-12; Callego prop; general sources, 10 acres on lake near Detroit, Unarnal appartmettes in acts, hamforefus, sciences. Music, desmattes, sports, typics. Soc., 156 Cranbrook Rd., Bloomfield Hills, Mich.

LASELL JUNIOR COLLEGE Temper from Boston. Liberal arts, see'l, pre-professional, tomices, retail fraining, design. Art, minut, designation. Complete athletic program including golf, riding, skiing. Catring. Baymond G. Wann, Pres., 123 Woodland Rd., Auburndale, Mass.

LINDEN HALL Juneau College and School or Girls. Contorshand Vacational. Maple. Home Economics, Secretarial Studies. Fine and Compercial Art. Dramatic Art. Proparatory and General Courses. Heantiful Campies. All Sports. Miding. Swimming Fool. Moderate Tuition. B. R. Herne, D.D., Son 64, Litter, Pa.

PENN HALL JR. COLLEGE

5-TH. College; 4-yr. Prep. Assembled, Masie, Art. Dynna. Howe Ec., Morrhandeing, El. Jackyallem, Medical Ans't, Secretarial. Buth connects every room. Swimming pool, Sparty. Eding. Trips. Sectal life. Catalog. - Box W. Chambersburg, Pa.

SOUTHERN SEMINARY

For Si yes, one of America's famous schools for girls and yearing women. Accredited Junior College and High School. All sports. Dishor smill estimating pool. Hilling. Catalog. Margaret Durham Robey, Pres., Box 204, Buene Vista, Va.

WALNUT HILL PREFERENCE and general courses. Superior scholartic training. Music, art. Gountry life on Hsere sumpant! miles from Boston. All sports, riding, skiling. Founded 1996. Hester R. Davies, Principal, 20 Highland Street, Natick, Mass.

WARRENTON COUNTRY WashSCHOOL ington. Thorough college preparation. General course. Music, art,
spects, riling. Haustiful gardens. Outdoor theatre,
Farm swant by achost. Gradus 1-12. Miss Lia
M. Bealigny, Prin., Box 14, Warranton, Va.

Boys' Schools

ADIRONDACK-FLORIDA

PREFARES for all relieges. Buys 12-18 spend the apring mut full near Lake Placid; winter in Goronat Grove, Fin. Limited sproliment. Work program for such boy. Ewemming, salling, fiching, termis. Eut. 180. D. Pierre G. Comeron, Hdm., Onchiota, N.Y.

ADMIRAL FARRAGUT

Two separate schools: Toms River, N.J.: St. Peters-burg, Fra. Prepares for all colleges, and gav't scadewites. Jr. School. Bound academic program. Navy routine. Summer camp. Specify catalog. Admiral Farragut Academy, Bus. L. Toms River, N. J.

ARMY AND NAVY ACADEMY

Full T arminolist. Laguist impositately on the season sumine south of Los Argeles. Year round surfaports. A successful guidance program. Summer Lang. Write for regular satisfaces or camp folders Gol. W. C. Atkinson, Box N. Carlahad, Colit.

A UGUSTA

Country Issuation in famous Shenandon's Vatley of Virginia. Prepares for all Universities, West Point and Assupplie. Able facsity of experienced teachers. R. O. T. C. Beautiful gyanassium, indust swimming pool. All sports. Fully accredited. Sath session, Cataring.

> Address all communications to Culonol Ches. 5. Roller, Jr., Box N, Fort Deliance, Va.

Capacity enrollment last vegr.

AVON OLD FARMS

SCHOOL FOR BOYS
ACCEPTING ENROLLMENTS

SEPTEMBER SESSION 1948

AVON, Bax N. CONNECTICUT

BOLLES

On Branfild St. Islan River
Accentrated preparation for sullages, Grades 6-12. Naval or military training. Highest Navy rating. Small classes. All sports. Year-round polf, tends. Small. Band. Outdoor swimming pool, gymnasigm. Burness school. Outdoor.

Registrar, Bux 5037-N, Jocksonville, Flurida.

BORDENTOWN MILITARY

FULLY newedited. College preparatory. Business and general courses. Containeding veineral of college entrance. ECIL. Reparanght how to study. Junior school. Sied year. Summer mession. College. Registrar, Sox 654, Bordentawn, New Jersey.

ASTLE HEIGHTS.

Frequention for College and Government Ameditains. Justice College, Jewist Scient in regarding plant. Bein tamplet to small and inspired to enterly and inspired to enterly for R. C. T. C. II students buildings. Shore here is multistive every due. Ordinar specific may recent. Endowed. Swimming poor, golf, aristing. Some

Col. H. N. Armstrong, Pres., Lebonos, Tonn. (Near Nashville)

COLUMBIA MILITARY | 2 minimum.

ACADEMY Gov't. Figily America, R. O. T. C.

Academica, Jr. Sebool. New 100,000 gym. Athletical
awtinizing, good, horsesmanning, 10 piece tiend. Himse
mer mention. Catalog. Dept. N. Columbia, Tenn.

CULVER MILITARY ACADEMY

on Lake Maxinhochee. Emphasis on physical, intellectual, mutal stamica. High embastic standards. Thereigh presenting for college. Three EOTC units.—Artillety, Carairy, Infantry, Band. All sports. Cutang. 48 Pershing Ave., Cutver, test.

DARLINGTON SCHOOL FOR

BOYS Fig.1.7 accredited. Individualistic instruction—bighest standards. Christian character developed. In funthills, Lockout Mr. curum Spacts. Dury form. For estalog, address: C. N. Wilcox, Ph.O., President, Sume, Go.

FISHBURNE MILITARY SCHOOL

Accumityen college prop complicating academic exectiones, exectiones, afficients, social programs. Individual guidanes. West Department HOTC. Highest goo't rating. Catalog and viewheek. Col. Morgan H. Hudgins, Box N.S. Waynesborn, Va.

FLORIDA MILITARY ACADEMY

Our of the entstanding schools of the South. Fully accredited. R. C. T. C. Separate Junior School. Recreating contact on Gulf of Similar. All incipalve rate. Limited curoliment. Col. Wafter S. Moodela, President, Sox 1, St. Petersburg, Florida.

FORK UNION

MILITARY

Christes I-T). Superate blogs, gym.

Electron of the college being the college being

Dr. J. C. Wicker, Bax 364, Furk Union, Va.

GEORGIA MILITARY ACADEMY

* with from Atlanta. Winter and Summer School. Prop School-Janier Callege-Separate Junior School-R. O. T. C. - Arbathan. Accredited, Moderate rates. Write for catalog to Col. W. N. Browster, Press, College Park, Ga.

FREENBRIER MILITARY SCHOOL Also SUMMER CAMP 137th Year, Fully Americally Letter Sullings. Whith School, Product Sullings. Trains for headerstrip. Secretly.

13.7th Valar, Pully accredited Lower School, High School, Parties School, Parties School, High School, Parties School, Markett School, Parties School, Markett School, Parties School, Markett School, Parties School, Markett School, Parties School, Parties

HOWE MILITARY SCHOOL

Training perms Americans for leadership. ROTC. Assemblies college preparatory, business courses. Summer many. Junior school. Sports. Episcopal. Est. 1881. Catalog. Burrett B. Bouton, M.A., Sept., 948 Academy Place, Home, Indiana.

KEMPER MILITARY SCHOOL

High Section and Junder College, 198th year, Accessified education with military training, Horre, Small element. Varied sultural programs, Sports for all, Swimming pool. New stadium, Calofog, Cal. A. M. Hitch, 1948 Third St., Honoville, Mrs.

KENTUCKY MILITARY A school.
INSTITUTE for home in Ploride. Preparation for college under ideal dimatter conditions all year. Under Private Military
fethod in America. For illustrated estalog, address:
Col. C. B. Hichmand, Pres., Box N, Lyndon, Ky.

LA SALLE MILITARY ACADEMY
FORESTOR Catholic military
school under Christian Brothers. Accredited college preparation, Grades 1-12, final classes. Senior
HOTC. Beautiful 160-acre cumpus, 456s year,
53 miles from New York City. Colong. Bex 6,
Oakdale, Long Island, N. Y.

LEICESTER JUNIOR COLLEGE

Frequence of the Days, terminal reliege course in these Ashainistration. Limited enrollment: Sports. high-widness gathanes toward business ownership or transportant. Planement bureau. Write: H. E. Brown, Press., Leicouter Jr. College, Leicouter, Mann.

MANLIUS Acchetered endline propuratory, and sits grade; turbotal assistance included. Mültary training develope initiative, starractor, fitness. EDTC. Prepares for Gov't Amidetajes. Sidlags. All sports. 7 athletic Selds. Gelf. 123-acre samples. Visitory servense. Catalog Director of Admissions, Box 448, Monlins, N.Y.

MASSANUTTEN MILITARY

ACADEMY R.O.T.C. Streems acholaratify and leadership. Distinguished remarks by graduates. Operates Camp Lapton for Beys 5 to 14, July Angust, For extaluge and Spirit, achieves Box N.G., Woodstock, Virginia.

MERCERSBURG ACADEMY

Titodicticis preparation for leading colleges. Grades 9-10. Satisfier sension. Beautiful 500-may composite wit. Washington. 5 pissing fields, gym. pool. Victors weavene. 110th year. Cutolog. Charles 5. Toppetts, Ph.D., Box N. Mercerchurg, Pa.

THE MILFORD SCHOOL FAROUR for the tearbiling for ever thirty overs. Individual attention in were omall classes. Optional accelerated program for notice attodents. Separate lower action. Features achieve and comp opens July 6. William

MISSOURI MILITARY ACADEMY

D. Paarson, Headmanter, Milford, Conn.

Wen ye. Fully accredited. R.O.T.C. Individualized matruetion tenches boy line to Study. Complete guidance program perparas for ficture. All aportal athlesis fields, 256 as. campus. Hidney. Catalog. Cot. C. R. Stribling, 948 Main St., Mexico, Mo.

MORGAN PARK MILITARY

Complete development of every log. Fully annual thed entities prep. High anademic standards. BOTC. Sports. 15 miles from Chicago's advantages. Lower School. Title year. Catalog. Cot. Sandford Sellers. Jrs. Box 748, Morgan Park, Chicago 43, RL

NEW YORK MILITARY ACADEMY

NEW YORK OF DISTINCTION

Highest War Dept. Impaction Rating

ACADEMY Renowned for character-building, physical development and high

scholastic standing. Graduates are destined for leadership in all walks of life. Catalog. Address 22 Academy Ave., Cornwall-on-Hudson, N. Y.

NORTHWESTERN MILITARY

AND NAVAL ACADEMY Tressoons sellings preparation. ROTC Bighest gov't rating. All sports. Sailheats, motor bests. On Lake Geneva. It makes from Chicago. Sammer camp. With your Catalog 54 Lake Shace Shace Road, Lake Geneva, Wis.

OHIO MILITARY INSTITUTE

Businstead the best in nuar boy Large Furthy, small charge. Lower School for Younger (loys, 117th year, Cartiffes to Callegue, High, bestbild legation Mane, agarts, new armory, Write: Col. A. M. Hanshew, Box NG, College Hill, Cincinnati 24, Ohio.

ONARGA MILITARY SCHOOL

Springton College Preparation. Accredited without syams. Tearlies How to Study. Business Courses. Voesthand Guidance. Character first! Ages II-18. New gran and roof, 55 miles S. of Chicago, Endowed. Catalog. Col. L. W. Bittinger, Bus W. Onarga, III.

EDUCATIONAL TROUBLE SHOOTERS



Each Student a Class. College prep, general adposition. Our lasts (i) discover summer of stillentities; (ii) derive individualized program to avercome difficulties; (i) make up lost time. Not everyone needs Oxford, but he who needs us, needs us hadly. E. E. Enight, Hdm. Fornity 22, Enrolment M. 41 prore.

Oxford Academy, Bax GDN-95, Pleasantville, New Jersey,

PEDDIE Bors fine-sughly prepared for callege School. Small classes, individual guidance. Public epaiding course required. Sports. Gyra, playing fields golf, pool. Educate. Supering Section. Brothes NYC. Strif year. Calaing. Wilbour E. Saundera, Headmaster, Sox 4-N, Hightstown, N. J.

Perkskill on Hudson, N. Y.

PENNSYLVANIA MILITARY

FULLY accredited college projectation. Also 6th grade. Small classes. Guntaine program. ROTC. Highest Was Department rating. All majoreportenestimming and riding. 127th year. Catalog. Write C. R. Moll, Dept. 5, Chester. Ponns.

PERKIOMEN SCHOOL

Tirn Year. Bays taught how to study. Thorough, individualized instruction is small classes. Grades 9-12, and post grad. Accredited. 39-acre compus. Summer sension. Catalogue. Athert E. Rogers, Box 648, Pannahurg, Ps. (poor Allentown).

RANDOLPH-MACON MILITARY
ACADEMY Eth Year. At northern entrance
Sleige through intereses etudy mathods. Pirapeoul
hulldings. Limited superity. Write for notalog.
Col. John C. Briggs, Prin., Box E. Front Boyal, Va.

ROOSEVELT MILITARY ACAD-

EMY "Burneau of Mee." How-to-study tanglet. Small chooses. Dully betoring. Fully Accordited. High School: Jr. Belicol. Gustanus Dags. Agres 10-13. All spaces: Builting. Moderate rule. Cutaling: Col. Glen G. Millihan, Box G. Alodo, III.

RIVERSIDE

MILITARY ACADEMY

FULLY ACCREDITED preparation for all endleges. Also First Graduate and Junior Callege. Reparate school for younger buys. Economical, all-locinstve rate.

III GHEST efficial Arms rating. Constant amountains with expected famility, all living in name buildings and enting at same tables with cadets. Weekly reports. Progress SHARAN-TENTS.

INCROVED health and interest through two complete school plants: Fall and lipring in Georgia mountainer Winter at Hollywood tour Miamo, Florida.

For illustrated Catalog, address:

GENERAL SANDY BEAVER, President

FALL & SPRING IN BILLE RIDIGS MODIFICATIONS

ST. JOHN'S MILITARY ACCRETATION
ACADEMY in Windows to be a latent of failure.
Canalism 8-12. Balanced program.
Espellant fairulty. Einforg. and f. rifle markemanishing.
stalling. Winter sports. Plying. Summer Reselvet. 54th
pr. Catalog. 1346 DeKayen Hall, Delafield, Win.

SAINT THOMAS MILITARY

ACADEMY Military training combined with superior college properation in Catholic environment. Individual guidance. Pool, gum. Sports. Bourding, day. Cathley. Very Rev. V. J. Flyon, Box 2, St. Paul L. Minn.

ACADEMY ROTC. Small slaves been seen by the grant been to study. Summer seesing. Private mountable domain in summer reservings. Sparts. Gym. peol. Medicate ents. Sixtyr. Cotalist Gen. C. R. Allie, Box N. Sewanee, Tens.

SHATTUCK SCHOOL MILLIPEDTE.
Fearnfeel Isia Episcopal. Bays' college-prep. Graden
8-12. Master-etudent satis 1-3. MT-EOTC. Jawports.
Gelf curren, trap aboot, tabaggan slide, ski-tower,
pool. 500 acres. Summer school-curry. Cataling.
Donald Henning, D.D., 485 Shumway Hall.

STAUNTON MILITARY ACADEMY

* Distinguished anademic record, Successfully prepares for unliege.

* Fully accredited. Business courses available. Thorough military

* training develops going, self-ruli-* none. HOTC unit, Acmy's highest ruting. Complete athletic grageam, * Superior health record. Separate

★ Superior braith record. Separate Jr. Schimt. Visitors welcame. Cat-★alag: Supt., Box D. Staunton, Va.

TENNESSEE MILITARY PARFARER toperformed institute legal 10% of graduates outrost universality teachers (men only). This year, Extending teachers (men only), This year, This

TEXAS * MILITARY COLLEGE

• HIGH SCHOOL AND JR. COLLEGE.

• SMALL CLASSES; INDIVIDUAL ATTEN-TION.

• NIGHTLY TUTOR-ING BY QUALIFIED INSTRUCTORS. • ATHLETICS FOR

Credits transferable. Catalog and Viewhook on request.

SUPERINTENDENT, 20 STONEWALL JACK-SON HOAD, TERRELL, TEXAS

MILITARY ACADEMY VALLEY Forge grade Valley are fonders in Peace as they were in War. Coll. Pred. and Jr.

Pages as they were in Pages as they were in War. Coll. Fres. and Jr. Coll. Ages 12-20. Small personalized classes; guidence and lesting bureau; resting close. Distinguished faculty. All variety poets, switzening. Inframetal attributes for all. 36 modern trepcoof initiatings. Maturized Field Artillery. Cavatry 75 horses. Unfanter, Band, Br. R.O.T.C. Schoop.

Box M. Wayne, Pa.

TODD SCHOOL AND CAMP

Brews at Dr. 100th year. Astrodited indishinal College Preparation. Study imp. Creative Astrotics from Aciation to Journalism. Friendly unvisationent. Hidding. Hour from Chicago. Catalog. Roger Hill, Princ. Box G. Woodstuck, Hillingia.

WENTWORTH MILITARY ACADEMY
Separate Tyear College, Senior ROTE, C.A.A. France,
All aerivelited. Heart of America. Large Com.,
Indeed pool. All Sports. Hiding. Marismussing.
Country Chris. Businest School. Cetalog. Col. J.,
M. Sellers, 848 Wash. Place, Lexington, Mr.,

WESTERN MILITARY ACADEMY

Hunah servedited training prepares for any sallege. Grades v. 12. Begs tanged how to study. Personal attention. DOTC. Highest gov't rating. Sports. Edsing. Fool, gyen. 76th yr. Near St. Louis. Catalog. Col. H. L. Jackson, Pres., Box N-4, Atten, 10.

WILLISTON ACADEMY UNDER ALL educational appartunities for been at modest cost. Economical wear half a million. Graduates regularly accepted by all materia millions. Maderia graduation, we terminal peopl. Repartir Janior School. A. V. Galbratth, Headmoster, Sex 21, Easthumpton, Mass.

WORCESTER ACADEMY

DIFFERNATIONALLY-Engines prop. school for look, the 1994. Sound properation for entirely and for life. Well-integrated physical adjustice program. Leftoy A. Campbell, Ph.D., Heudmonter, 95 Providence Street, Worsester 4, Mana.

CosEd Schools

DEAN ACADEMY GRADUE TO LOW TO DEPART OF THE COLgeneral courses. Mosse, dramatics, speech, vadio tech., art. Homelike atmosphere. Campus life. Sports. Direct H. H. to Howlon, New York City. Moderate rate. Sind year. Write for entalog. W. R. Garner, Headmaster, Franklin, Mans.

Home Study

CALVERT "SCHOOL-AT-HOME"

Kindergarten through 5th grade. Sound schooling for your child wherever you live. No teaching experience required. Transfer to other schools, often with advanced standing. Daily lessons, books, supplies provided. Valuable advisory service. Start any time. Send for Catalog.

CALVERT SCHOOL 34-E TUSCANY ROAD, BALTIMORE 10, MD.

Camps

ADIRONDACK WOODCRAFT

CAMPS SELECTED book, 1-10. S divisions. On private labe of miles north of Utien. Cables. 30 crafts. Cance and burse trips. Fee last, riding, malberns. Riflery. Booker. Wm. H. Abbott. Dir., Box 237-N. Fayetteville, N. Y.

AQUATIC FRATILITIES Water Sports for Blow 10 thru 10. Private lake in Derivatives at East Oile, Main. Halling, surf-learly Ing., canocing, swimming by nationally known obaches. Also usual land agents. Marters equipment. Confortable extins. Charles H. Soully, Dir., Apt. 5, 31 Park Ave., New York 16.

CAMP ARROWHEAD

Howe 6-14 have grand summer in pine woods on Rehoboth Buy. Bougalows, excellent equipment. Craises in electorist waters. Sufficients. Bult water pool. Edding, Sching, site, suffix. Nume. Inclusive for Lt. Cul. Halph I. Sasso, R.F.D., Lawes, Del.

BROWN LEDGE MALLETT'E Bay, Varlinghand's fisset ramps." Dally ridling for all girls incinded in fee! Against many, swiling, gail, dramatics, No "extras." Untains. (Giv. age.) "Complete and different comp." Mr. and Mrs. H. E. Brown, Leicenter Jr. Cut., Box Q, Leicenter, Mans.

CULVER SUMMER SCHOOLS

on Lake Maxinkuckee. Eight weeks of Cultur training in meatiness, sourtesy, promptness. Exceptional facilities. All sports. These comps. Naval and Crealey (boys 14-18); Weightenft 110-14). Separate estalogs. 49 Lake Shore Ava., Culver, Ind.

FARRAGUT NAVAL CAMP

A summation of adventure on Torns River for hore 1-17, Outters, slouge, matheats. Craise on 151-71, "LCL" 52 activities. Swimming, backettall, tennis, 2 gyms. Academic programs. Catalog. Farragut Noval Camp. Box LC, Torns River, N. J.

LEN-A-PE Contant, nowboy, magistan, normally, the natural lake in Freedom year N. T. C. and Phile. Bays 4-18. Excellent food and care. Biding, saling, squagharing, tentis, arisingly, squagharing, tentis, arisingly, squagharing, tentis, arisingly, starter, Adult rains marky, freshold, David E. Keiser, 7733 Mill Road, Philadelphia 17, Pennsylvania. Phone Melrose 1882.

OGONTZ WHITE MOUNTAIN Camp for Girls. rate groups. Tel arros on monatale bias. Hautie enhine. Swimming, stilling, eanseing, aquaptaning: formand trail riding tenns, booker militart, crafts, music, dramatics, True, Tutering, finitlet, Abby A. Sutherland, Box 600, Ogontz School P. O., Pa.

OWAISSA "Camp or Harrows." High Arthritles burlade ciding, borseshows, water sports, termin, archury, crafts, dramatics, ourdoor weaking. etc. Billing incl. in few Senior, Junior, and Nursery Camps and Commoner Training, 23rd year, Catalog. Mrs. O. G. Passon, 9 Rugby Road, Bryn Mawr, Pa.

PASSUMPSIC

AKE Fidries, Edy, Vt. Happy nummer for bugs 5-1% Hilling, sailing, tennis, shop, riflery, wonders?; Conne, Overnight trips, Juge groups. Superior staff. Bill year. Mr. and Mrs. David G. Starry, 4620 Drammond Ave., Chevy Chase 15, Wash., D. C.

PERRY-MANSFIELD CAMPS

STRAMBOAT SPRINGS, Colorado, Western camp for girls in three age groups. In Hill Intern. 11-14 and fir. 10-2. Horseleack riding, mark trips, swimming, terms, drama, descu, art. Exploring. Pertia G. Mansfield, 216 E. 70th St., N.Y. 21, PLS-2820.

QUANSET SAllersu campo, atth year, Learn beautiful, safe Pleasant Bay, Biding, eventuring, termis, erufts, archivey, cumoring, salfing trips. Jage groups, excelledly mosen girls, 6 to 18 yrs. Also Adult Sailing School, June and Sept. Booklet - Interview. Mr. F. N. Hammatt, So. Orleans, Massachusetts.



Sports and recreational camp for hoys 9-18, spensored by 5t. John's Military Academy. Mature staff, fine equipment, modern sanitation, excellent meals. Trained nurses, physician. n weeks' term. Academic work. Parent guest house. Catalog.

N-134 DeKoven Hall, Delaticid, Win. * *

SUSQUEHANNA Nova 8-16. Mountain New Milford, Pa. 10th year, 775 acres. Daily sidling, complete course in horsemanning. Fine lake swimming. All other sports. Builded leader for each t boys. Personal development our aim. Busklet. Robert T. Smith, New Milford, Pennsylvania.

Colleges for Women

CHRISTIAN COLLEGE ACCREMENTED and Conservatory (A.A. dogree). Terminal, transfer, pre-sureer marnes. Music, Art. Drama, Secre-

terial, Nersing, Int. Dec., Cestume Design, Herne Ment. All sports, pool, Fifth year, Curolon James C. Miller, Ph.D., Pres., Box D. Columbia, Mo.

LINDENWOOD COLLEGE

B.M. degrees, Aerredited, Senior College, Also 2-91. Junior College. Moderated curriculum property for elvir unit social londership. Special work in source, art. Sports. New St. Legis, Cololog. President, Box 248, St. Charles, Missouri.

MARYWOOD COLLEGE

Carnot, and only on the control of t Accredited by Middle Stytes Association. Cutaing. Marywood Callege, Box E, Scranton, Pa.

CosEd Colleges

COE COLLEGE One of the lending meemantey. A.H., B.M. degrans. Emphasis on liberal arts and morie. Located in residence district of charming, small city. Dormitories, ample buildings and campus. Cood. Write Begistrar, Bax 148, Ceder Mapids, lows.



INTER-AMERICAN

Coun junior college: Liberal arts and pre-professional subjects. Easiness administration, M-lingual accretarial, junior ensentive. A.A. degree 16-week intensified Spanleh and Portuguese language enterse. Summer term. Cutaing.

Registrar, Dept. P. 137 Caral Way, Caral Gables, Fla.

Vocational

BOSTON UNIVERSITY COLLEGE of unation for Warmen; Surgrout, 4-yr, degree essurise in physical education, dance, health, recruition, sports, plegulotherapy. Durms. N. H. ramp. 67th year fundagus. George K. Makechnie, Doon, 31 Everett St., Combridge 38, Massachusetts.



Executive Forutarial course leads to R.S.S. degree in only 2 years. Superior bedinical training. cultural subjects. Also 1-ye, dipluma Boe'l, 2-ye. this Arbuis, and Arc ting degree enumes. Adademis structurels of a centur college. Dorms on campus. 22 halidings. Cood. 800; year. Providence, New York, Boston phormant, Register early, Catalog. Enrollment Secretary, Providence 6, R. L.

INDIANA TECHNICAL COLLEGE

Asen, Chemical, Civil Electrical Mempirical Statio engineering. Desiting, byr. Low suts. Each board. Demond for gradantes. Exter June, Sept., Dec., March Cobroy, 148 E. Washington Styd., Ft. Wayne 2, Ind.

KANSAS CITY ART INSTITUTE

Courtains professional instruction is all branches of fine and applied arts. If new studios. All buildings resdernized, Latest equipment, Dermituries, Descriptions, Summer School, Carbony, Dept. 1348, K. C. Art Institute, K. C. 2, Mo.

KATHARINE GIBBS OFFETENBLE GIBBS ing for high school, prevents school graduates, college woman, Resident facilities, Catalog, Assistant Denn. 90 Martherough St., Boston 16; 55 E. Superior St., Chicago 11; 230 Park Ave., New York 17; 155 Angell St., Providence 6,

PRACTICAL TECHNICAL TRAINING

Specialize in 6 months to 3 years Electrical engineering [B.S. Degree]; Radioand Electronics; Electrotechnics; Metrigeration, Air Conditioning; Welding, 1,538 students now enrolled from 48 states, II oversees countries. Faculty of 77 specialists. Terms start Jan., Apr., July, Sept. Write for Photo Story.

SCHOOL OF ENGINEERING Founded: A Technical Institute Dept. N.4 North Broadway, Milwoukse T. Wis.

TRI-STATE COLLEGE IL B. DRGREE Civil, Electrical, Mechanical, Chemical, Accomagtical, Radio Engineering; Bio. Admin., Acct. and Secretarial Belomen, Graduates successful, 64th year. Ester Sept., Jun., Murrh, June. Write for entaing. 1448 College Ave., Angela, Indiana.

"DUES: Annual membership in United States. \$4.00! Canada, \$5.00! abmad, \$5.00. Life memberghip, \$100 U.S. lunds, Remitmaces aboutd be payable to National Geographic Society. Remittances from outside of continental United States and Canada abould be made by New York druft or international money order.

RECOMMENDATION FOR MEMBERSHIP

IN THE

NATIONAL GEOGRAPHIC SOCIETY

* The Membership Dues, Which Are for the Calendar Year, Include Subscription to the National Geographic Magazine

	, National Geographic Society, d M Streets Northwest, Washington 6, D, C,:
I nominate	
Occupation	(This information is important for the securds)
Address	
	for membership in The Society





ARDMORE BOOKGASES

Of Lasting Beauty

Made of selected, thoroughly seasoned walnut, in natural or mahogany finish. Popular size for home or office. 3 adjustable shelves. Holds 75 to 100 books. 42" high, 24" wide, 10%" deep. Harmonizes with other furnishings. Beautiful craftsmanship. See your local dealer or



write Globe-Wernicke Co., Norwood, Cincinnati 12, Obio.





HOW MUCH ARE YOU MISSING?

 Are you getting the most out of your life...your business? Or are you handicapped needlessly because of FAULTY HEARING?

Thousands of the deafened now enjoy NEW HEAR-ING HAPPINESS—thanks to Western Electric's two new all-in-one hearing aids, designed by the famed Bell Telephone Laboratories.

See and hear them at your local Western Electric Hearing Aid dealer's (address in Classified Telephone Directory). Or send coupon today for valuable free booklets.



Model 65—Specially designed for those with moderate hearing loss. All-in-one, compact, convenient, economical.

Super 66—The ideal hearing aid for the severely deafened. All-in-one; gives extra power, superb fidelity.



Western Electric Hearing Aids

THE ONLY HEARING AIDS
DESIGNED BY BELL TELEPHONE LABORATORIES

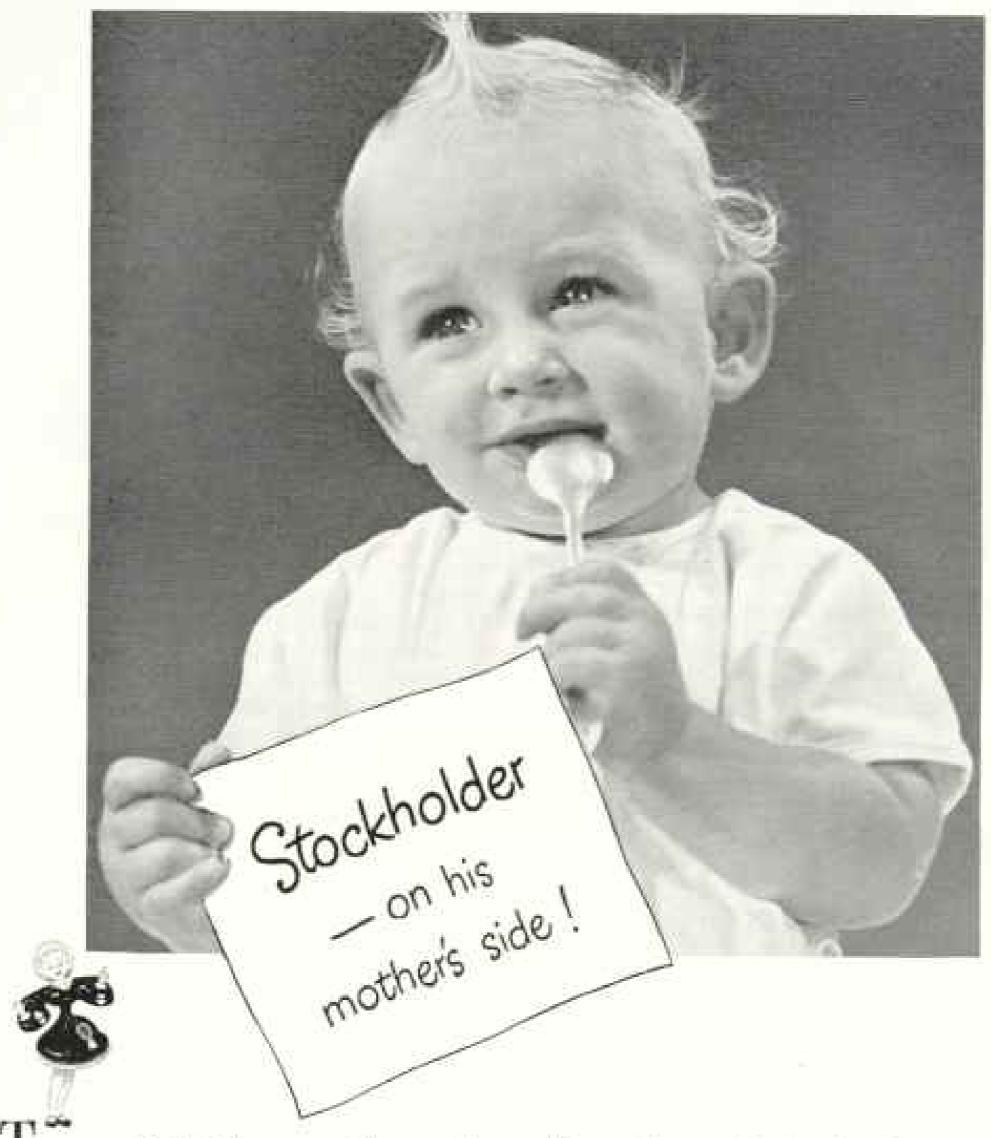
FREE! N	MAIL THIS	COUPON	TODAY
---------	-----------	--------	-------

WESTERN ELECTRIC, Dept. 380-N4 195 Broodway, New York 7, N. Y.

Send me free booklet about two new all-in-one Western Electric Hearing Aids plus "Modern Science and Your Hearing."

SCIENCE MINI 1		
Name	I I CONTRACTOR OF THE STREET	
Address		
City		
Zone	State	

Distributed or U.S. A, by Grayter Electric Co.; in Carcella by Northern Electric Co.; Ltd.; in other countries by Westres Corporation.



Its cute little fellow wasn't born with a silver spoon in his mouth but his mother is a stockholder just the same.

For she's one of the thousands and thousands of mothers — young and old — among the 390,000 women who are stockholders of the American Telephone and Telegraph Company. They outnumber the men!

They are women in all walks of life. The majority give their occupation as "house-wife." Many others are teachers, nurses, stenographers, clerks and sales people.

Tens of thousands of girls and women who work for the Telephone Companies either own A. T. & T. stock or are buying it out of wages.

No other stock is so widely held by so many people all over America—and there are more stockholders now than ever before. The total exceeds 723,000.

So you can see that this is a business that is owned by the people. It was built by the savings of the many, rather than the wealth of the few.

BELL TELEPHONE SYSTEM

GRACE LINE

Cruises to the Caribbean and South Umerica



Spacious public lounges . . . every room outside, each with private bath . . . light, airy dining rooms with roll-back domes . . . large outdoor tiled maintained pools . . . attractive clubs with fine orchestras . . . features of the Santa Rosa and Santa Paula

12-DAY DE LUXE CRUISES on the splendid Santa Rosa and Santa Paula, specially built for tropical cruising... visiting Curacao, a little bit of old Holland set down in the Caribbean, famous for its fascinating shops... La Guaira, port for Caracas, Venezuela's picturesque capital, and starting point of "The Grand Tour of the Andex"... Puerto Cabello... Cartagena, Colombia, oldest walled city in the western hemisphere and one of the leading 16th century "Treasure Ports" of the conquistadores, Sailings from New York every Friday.

16 TO 18 DAY "CASUAL CRUISES" to Cartagena and Barranquilla, Colombia, and Maracaibo, Venezuela, by new, air-conditioned cargo-passenger "Santas"... all outside rooms, each with private bath... outdoor tiled swimming pools... complete facilities for comfort and relaxation... weekly sailings from New York.





GRACE LINE

10 Hanover Square, New York Agents and offices in all principal cities

23 MODERN "SANTAS" SERVE THE AMERICAS