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Landmarks of Literary England

The Reverently Guarded Haunts and Homes of Britain's Great Writers Provide Modern Pilgrims with a Rewarding Glimpse of the Past

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With Illustrations by National Geographic Photographer Kathleen Revis

ON a literary pilgrimage to England last summer, I saw with what pride Britons preserve the scenes and traditions of their land as men and women of genius knew them.

Visiting these literary halls of fame—many of them protected by the National Trust *—I came to know the strength and character of English writing anew. Place after place which I saw for the first time seemed strangely familiar. I had seen them before in the pages of favorite books.

Such a pilgrimage could begin only in London. For here, from Chaucer to Churchill, have lived writers whose works stand as towering milestones of the English language.

When my wife, her sister, and I arrived in London that first evening, Big Ben was striking 10. The tones of the historic old clock seemed to be the voice of Britain bidding us welcome (map, page 300).†

Literature Springs to Life

For days we wandered about London visiting literary shrines. The Old Curiosity Shop on Portsmouth Street brought to mind the one Dickens described in his novel: "one of those receptacles for old and curious things which seem to crouch in odd corners of this town . . ." We tarried a long time among its treasures, almost expecting Little Nell or Grandfather Trent to wait on us (page 297).

In Clerkenwell Road we envisaged Oliver Twist picked up by the authorities on a charge of robbery. A few miles away we walked through parts of Limehouse. Though no longer the slum of Thomas Burke's *Limehouse Nights*, it retains much of its mysterious atmosphere. Rain was falling the night we were there, enhancing the eeriness of narrow alleys between buildings such as might have housed the yellow minions of Sax Rohmer's "insidious Dr. Fu Manchu."

Journalists Dine at Cheshire Cheese

On one of our London evenings we dined at the Cheshire Cheese in Wine Office Court, just off Fleet Street. This venerable tavern is pointed out as a haunt of Dr. Samuel Johnson and his protégé Oliver Goldsmith some 200 years ago (page 321).

Johnson compiled his dictionary in a house in Gough Square only a minute's walk from the Cheshire Cheese, and Goldsmith worked on *The Vicar of Wakefield* in a room across the way.

Both Goldsmith and his mentor Johnson were noted for their carelessness in dress.

* See "The Preservation of England's Historic and Scenic Treasures," by Eric Underwood, NATIONAL GEOGRAPHIC MAGAZINE, April, 1945.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE: "A Stroll to London," by Isobel Wylie Hutchison, August, 1950; and "In the London of the New Queen," by H. V. Morton, September, 1953.

"Travelling for Amusement and Instruction": Today's Version of a Dickens Adventure

As in few countries, English writers of every age have come fresh upon their land and have never ceased to wonder at it. Little in the Kingdom remains unsung; much that is gone in fact lives on in fancy. In this series the camera captures scenes immortalized with words.

Above: On its annual stagecoach run, the Coaching Club of London re-creates a scene from *The Pickwick Papers*, Charles Dickens's first novel. Charged by the Pickwick Club to report on the state of the world, Mr. Pickwick set forth in just such a coach to some of the merriest escapades in English literature.

←A workman checks *Red Rover*'s springs at the Burford Bridge stop for tea. The coaching trip from London to Brighton, 63 miles, took 10 hours.

➔London's Old Curiosity Shop, traditionally the one described by Dickens, remains "one of those receptacles for old and curious things which seem to crouch in odd corners of this town." It stands near Lincoln's Inn Fields.

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"To the Leather Bottle . . ."

The sign on this "clean and commodious village ale-house" in Cobham, Kent, shows Mr. Pickwick himself addressing the Pickwick Club.

© Kodachromes by National Geographic Photographer Kathleen Revis

Johnson, for his first visit and dinner with Goldsmith at the venerable inn, outfitted himself in a new suit and freshly powdered periwig.

"Why, sir," Johnson told a friend who praised his unusual smartness, "I hear that Goldsmith, who is a very great sloven, justifies his disregard of cleanliness and decency by quoting my practice, and I am desirous this night to show him a better example."

Fleet Street remains the haunt of journalists, for it is the center of London publishing. As a working reporter there, Edgar Wallace, probably the most prolific writer of mystery stories in England, began his fabulous career. The Cheshire Cheese is crowded at lunch time with newspapermen from the great dailies located near by (page 320).

Rebuilt in 1667 on the site of an older hostelry of the same name, the Cheshire Cheese contains walls and timbers dating from 1350. Shakespeare may have drunk sack there when he was acting on the London stage, and "rare Ben Jonson" no doubt enjoyed many a duel of wits with its jolly company.

Jonathan Swift, Dickens, and Thackeray frequently regaled themselves at the Cheshire Cheese, and Tennyson knew and enjoyed it. In nearly three centuries this gathering place of literati has known few changes. What tales it could tell!

In the neighborhood once stood old Fleet Prison, which like Newgate near by was a dreadful place of incarceration in olden times. Newgate was described by Daniel Defoe in *Moll Flanders*; Fleet Prison has been pictured by later writers of historical novels. In both of these grim structures debtors were held while their friends were raising funds to obtain their release.

Bombs Unearthed Roman Wall

The nursery rhyme,

"Oranges and lemons,"
Say the bells of St. Clement's,

no longer rings true. Gutted by German bombing in World War II, St. Clement Danes Church, where Samuel Johnson and James Boswell used to worship, now stands a shell, only its spire and walls remaining. The famous bells were melted by the bomb-set fire.

Entering the grounds of the Tower of London, which actually is a fortress buttressed by many towers, we expressed interest in an ancient Roman wall.

"It was hidden underneath some buildings the Germans bombed," our guide told us. "Lucky the bomb hit where it did. Visitors can see the Roman ruin now."

Indomitable Britain! Catastrophes are laughed off as blessings in disguise.

The Tower of London, which has been called "the Cradle of the Empire," preserves in its several buildings mementos of much of the history and the literature of Britain. Its site was occupied by Roman fortifications some 19 centuries ago. The White Tower was begun in 1078 by William the Conqueror to control the resentful citizens of London and at the same time to protect them from enemy expeditions coming up the Thames.

Scaffold Awaited Tower Prisoners

After reading Margaret Irwin's *Elizabeth, Captive Princess*, I was particularly interested in Traitors' Gate, to which prisoners of note were brought by water in the time of Henry III and for centuries thereafter. Elizabeth I, suspected of complicity in Wyatt's Rebellion, was haled to Traitors' Gate by her half sister, "Bloody Mary" Tudor, on Palm Sunday, 1554. Angrily declaring she was no traitor, Elizabeth at first refused to step from the boat to the landing, but finally was persuaded to walk through a downpour of rain to shelter in Bell Tower.

Few prisoners ever left the Tower save for the short walk to execution places on Tower Green or Tower Hill. By order of Queen Victoria, the area on Tower Green was paved and marked with a brass plate inscribed: "Site of Ancient Scaffold. On this spot Q. Anne Boleyn was beheaded on 19 May, 1536."

Also beheaded on or near this site were William Hastings in 1483; Margaret, Countess of Salisbury, in 1541; Queen Catherine Howard and Jane, Viscountess Rochford, in 1542; Lady Jane Grey, 1554; and Robert Devereux, Earl of Essex, in 1601.

Shuddering, we climbed a narrow, winding stair in the Bloody Tower. Here in 1483 the young sons of Edward IV were murdered through the treachery of Richard III. For some years doubt was expressed that the children actually were dead; several pretenders, notably Perkin Warbeck, aspired to the throne by claiming royal relationship.

Sir Walter Raleigh suffered almost 13 years of imprisonment in Bloody Tower before he was beheaded in the Old Palace Yard at West-

"He Was Not of an Age, but for All Time": Ben Jonson's Tribute

William Shakespeare lived 52 years in the England of Queen Elizabeth and King James I. He grew up in Stratford on Avon, drifted to London, and entered the theater as a holder of patrons' horses, according to one story. At 28 he was an established playwright; at 33, prosperous enough to buy a home in Stratford. He wrote 38 plays and numerous poems.

Many critics hail Shakespeare as the world's greatest writer. Countless everyday expressions come direct from his plays. Actors consider the roles he created the supreme challenge.

This wooden carving of the poet stands in Hall's Croft, Stratford home of Shakespeare's daughter (page 303).

Kodachromes by National Geographic Photographer Kathleen Revis

"He Was Full of Jests, and Gipes . . . Knaveries, and Mocks": Shakespeare's Portrait of Falstaff

According to the critic Georg Brandes, Falstaff "is one of the brightest and wittiest spirits England has ever produced . . . he has neither soul, nor honour, nor moral sense; but he sins, robs, lies, and boasts, with such splendid exuberance . . . that he seems unfailingly amiable."

So popular was the rotund knight, tradition says, that Shakespeare wrote *The Merry Wives of Windsor* just to gratify Queen Elizabeth's desire to see Falstaff in love.

This bronze statue, representing the dramatist's genius at comedy, sits with figures of Lady Macbeth (tragedy), Hamlet (philosophy), and Prince Hal (history) at Stratford's Shakespeare Memorial Theatre (page 302).

This young cricketer, ready with bat, appears amused at his companion's wit.

© National Geographic Society

minster in 1618. While a prisoner, Raleigh wrote his *History of the World*, first published in 1614.

Wakefield Tower, where Britain's crown jewels are kept, afforded relief from the gruesome Bloody Tower. Outside we saw the ravens which never leave the Tower grounds. One wing of each bird is clipped to prevent its escape.

Ravens first flocked to the White Tower in the time of William the Conqueror to eat surplus food cast out from the kitchens. In the reign of Charles II the superstition arose that, if the ravens were to disappear, the White Tower would topple and the British Empire collapse. Ever since, these ungainly creatures, usually considered birds of ill omen, have been fed and watered daily no matter how strict the food rationing. The old ravens are replaced from time to time by younger ones from the forests.

London contains so many literary landmarks that as we went about I could imagine well-loved stories and poems springing to life all around me. Of particular note is the house on Doughty Street where Dickens lived, now a Dickens museum. Carlyle's residence in Chelsea, long the workshop of the famous author, is open to visitors; Wimpole Street, whence Robert Browning and Elizabeth Barrett eloped, remains aristocratic.

Houses overlooking Hyde Park resemble those described by John Galsworthy as residences of the Forsytes. Still exclusive appeared the Reform Club where Henry James, the brilliant American novelist who later

(Continued on page 307)

301

"This Little World, This Precious Stone . . . This England"

Shakespeare let John of Gaunt speak these shining words in *Richard II*. Map shows the playwright's birthplace and other literary landmarks.

SCOTLAND

Northumberland

South Shields

Newcastle

Sunderland

Carlisle

Jarrow

Made famous by Coleridge Wordsworth and Southey

Lake District

Ullswater

Middlesbrough

Whitby

Robin Hood's Bay

North York Moors

Scarborough

Yorkshire

54°

Oxford

SCALE IN FEET

Worcester College

Called by Hawthorne "the noblest old street in England"

Bodleian Library

Addison's Walk

St Mary's

High St.

Magdalen College

Mitre Hotel

Oriel College

Oriel Street

University College

Pembroke College

Christ Church College

Alice's Shop

Home of the Brontë sisters

Blackpool

Haworth

York

Leeds

Bradford

Preston

Wakefield

Doncaster

Irish Sea

Southport

Manchester

Liverpool

Knutsford

Sheffield

Derwent

Cheshire

Edwinstowe

Chester

Wye

Peak District

Dove

Derbyshire

Sherwood Forest

Dove Dale

Stoke on Trent

Derby

Nottingham

Setting for part of Izaak Walton's "Compleat Angler"

Eyton

Shrewsbury

Shropshire

Leicester

Bridgnorth

Nuneaton

Birmingham

Arbury

Chilvers Coton

Coventry

George Eliot born here

Warwickshire

Warwick

Shakespeare born and buried here

Wilmcote

Worcester

Stratford on Avon

Olney

Bedford

Elstow

Birthplace of John Bunyan

Bedfordshire

Cambridge

Byron, Milton, Pepys, Tennyson, Thackeray and other greats of English Literature attended Cambridge University

Ipswich

Bredon Hill

Bredon

Ashton under Hill

Tewkesbury

Gloucester

Woodstock

Wytham

Oxford

Ayot St Lawrence

Birthplace of Jane Austen

Dorchester

Chaucer's "Canterbury Tales" early English classic

Chalfont St Giles

Steventon

Stoke Poges

London

Southend on Sea

Thames

Reading

Eton

Windsor

Runnymede

Greenwich

The Thames

Gad's Hill Place

Cardiff

Bristol

Cobham

Rochester

Margate

Broadstairs

Canterbury

Bath

City second only to London in literary associations

Leeds Castle

Porlock

Glastonbury (Avalon)

Wiltshire

Identified in Malory's "Morte d'Arthur" as the Camelot of King Arthur

Burford Bridge

Dover

Dunkery Beacon

Bridgwater

Blackmoor Vale

Salisbury

Winchester

Itchen

Kent

Somerset

Shaftesbury

Thomas Hardy's Wessex

Sussex

Battle of Hastings 1066

Dorsetshire

Southampton

A home of William Blake

Brighton

New Forest

Exeter

Lyme Regis

Poole

Bournemouth

Isle of Wight

Portsmouth

Bognor Regis

Hastings

Taunton

Lyme Bay

Weymouth

English Channel

Torquay

Literary ENGLAND

STATUTE MILES

FRANCE

© National Geographic Map
Drawn by Douglas A. Strobel and Victor J. Kelley

← *"At Thy Birth . . . Nature and Fortune Join'd to Make Thee Great"*: **Shakespeare's Birthplace**

Famous writers and actors scrawled their names on the windows and woodwork of this room, a shrine for Stratford pilgrims since Shakespeare's passing. One couplet reads:

In this poor room his spirit first drew breath,
Who guards our English tongue from fear of death.

Jacobean needlework covers the bedstead. Chest dates from Henry VIII's reign; cradle is from the 17th century.

A rush holder hangs from the uneven ceiling: impregnated with tallow, the rush burned like a candle.

➔ A hostess at Hall's Croft examines a facsimile first edition of Shakespeare's plays.

Kodachromes by National Geographic Photographer Kathleen Revis

303

← *"All the World's a Stage"*: **Shakespeare Memorial Theatre on the Avon**

In 1769 David Garrick organized the first Shakespearean festival in Stratford, a model for the play fests held annually ever since. Here geraniums edge the restaurant balcony of the Memorial Theatre, completed in 1932 with funds donated by Shakespeare lovers all over the world. Visitors number some 300,000 yearly.

➔ Avon swans crowd for tidbits within sight of the tower of Holy Trinity Church, where Shakespeare lies buried.

© National Geographic Society

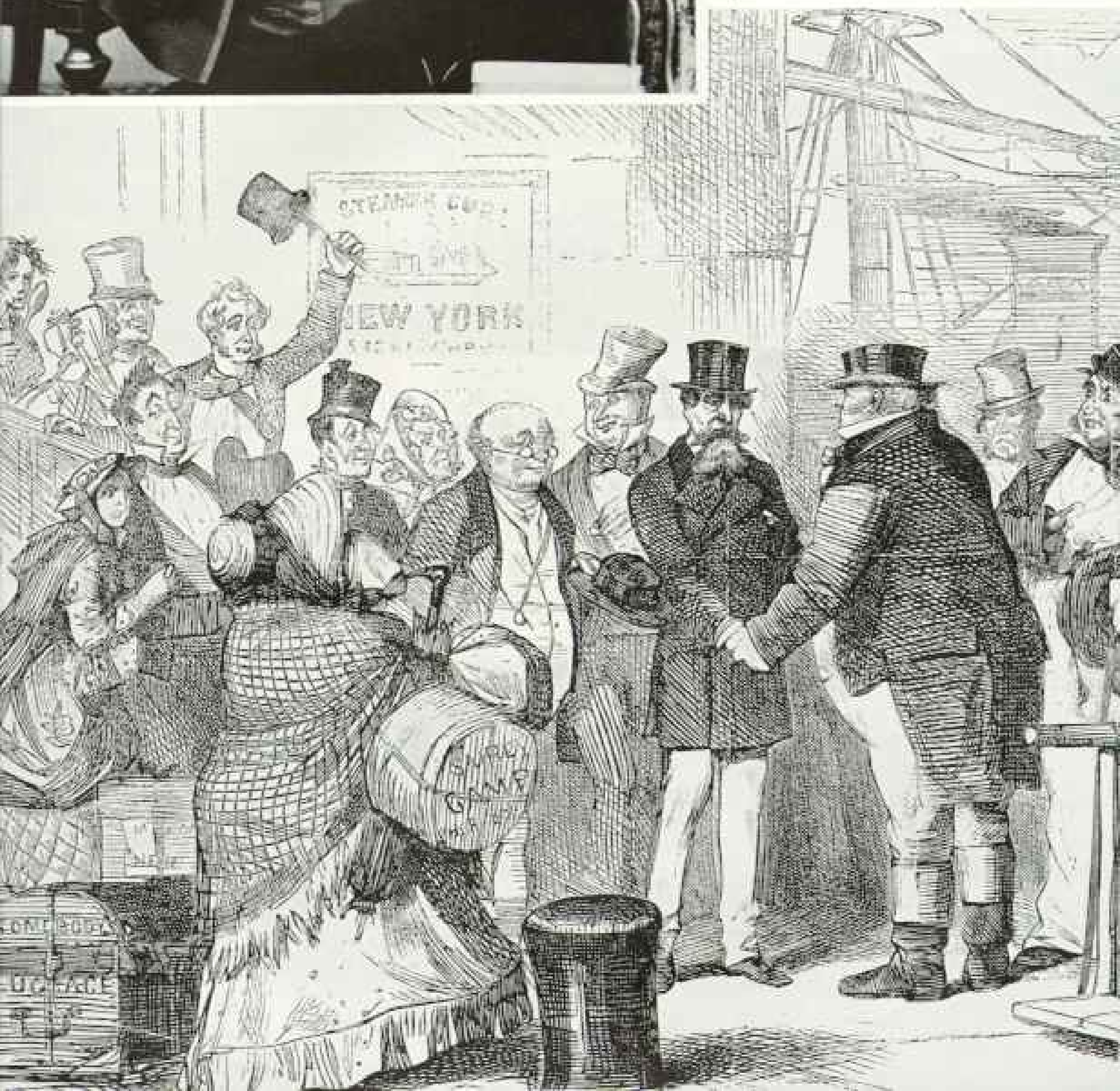
Charles Dickens at Work...

←This picture was made in 1867, when Dickens was 55 and visiting the United States. It reveals him at the pinnacle of success, author of 17 best-selling novels and *American Notes*, an account of his trip to the U. S. 25 years earlier.

The year following his first journey to America, Dickens wrote the most beloved of his stories, *A Christmas Carol*. Working like one obsessed, he "wept and laughed, and wept again, and excited himself in a most extraordinary manner."

Today *A Christmas Carol* ranks as a classic. Reading it aloud on Christmas Eve is a sentimental family ritual across the English-speaking world. Hearing it, children weep and laugh, and weep again.

← Library of Congress ↓ Culver Service



. . . and at His Home

The writer was born in 1812 into a life of poverty. At 12, at a time his father was in prison for debt, he was forced to earn his own living in the drudgery of a warehouse.

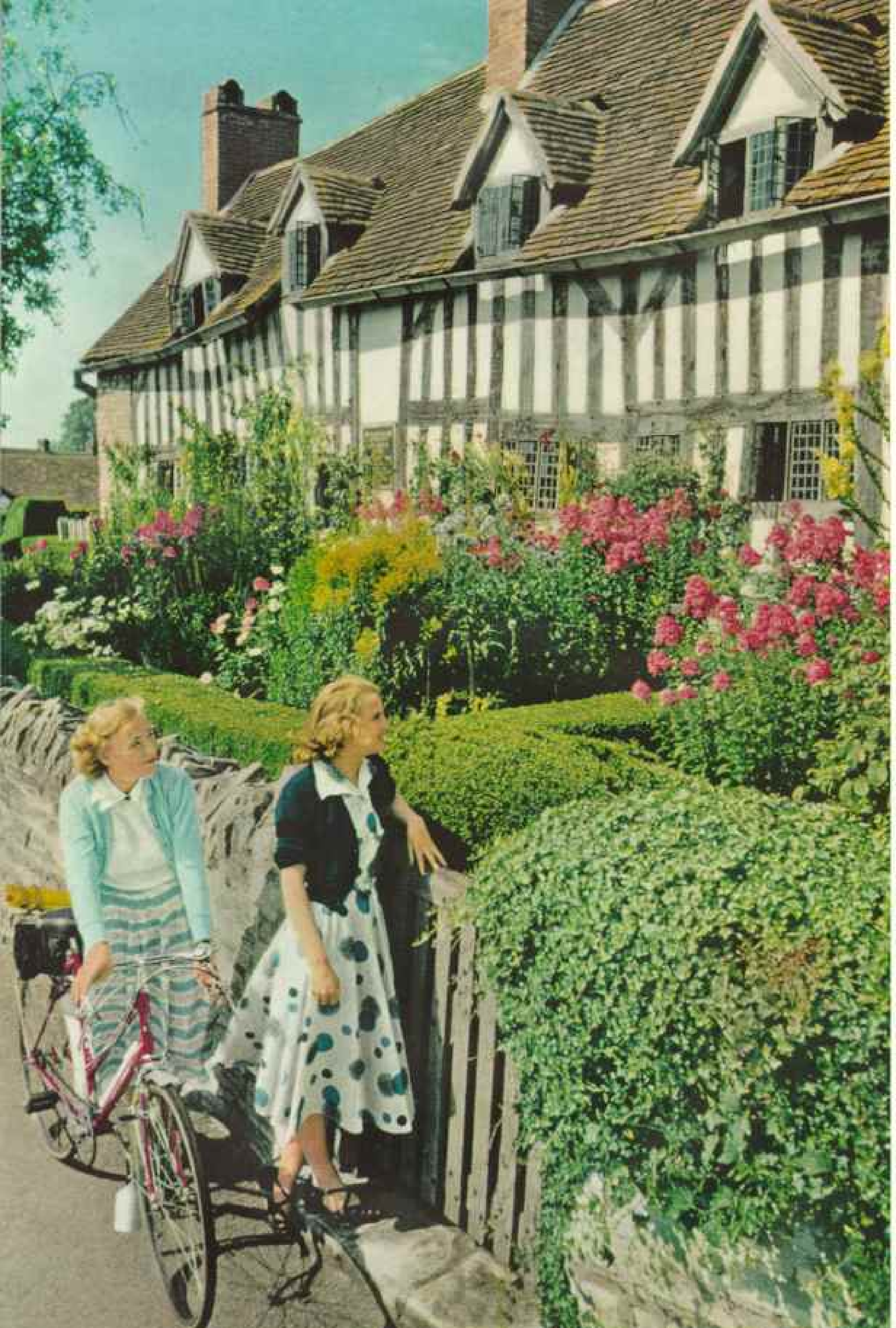
→ Years later, after Dickens had climbed the ladder from office boy, court reporter, and newspaper writer, he realized a childhood dream of owning Gad's Hill Place, a mansion near Rochester.

Here he stands on the porch with daughters Mary (left) and Kate. Seated: Music critic Henry F. Chorley; writer Charles Collins, Kate's husband and brother of Wilkie Collins; and Georgina Hogarth, sister of Mrs. Dickens.

305 Treasures of the Dickens House

← Dickens Characters Bid Their Creator Bon Voyage

England in the person of John Bull shakes Dickens's hand in a *Judy* cartoon commemorating his sailing to Boston in 1867. Micawber stands behind the author. Bespectacled Pickwick crowds near. Sairey Gamp cries into a handkerchief. Captain Cuttle carries a hook in place of a hand. Feeble-witted Barnaby Rudge with his raven (right) grows more melancholy than ever. Oliver Twist (far left) waves a spoon.



became a British subject, lived for years.

By Marble Arch corner we heard a Hyde Park orator harangue bystanders as his predecessors have done for decades. "Don't let married life get you down" seemed to be the theme of his speech.

At the old Savoy Theatre we saw a play sequel to *Little Lord Fauntleroy*. Though the performers were good, my thoughts kept wandering from it to Gilbert and Sullivan, for the Savoy was built for presentation of their light operas. W. S. Gilbert and Sir Arthur Sullivan constantly quarreled while they were operating the playhouse; on one occasion they dissolved their partnership for three years after an argument over the cost of a new carpet.

Shrine for Mystery Story Fans

Like every other mystery story enthusiast, I was curious to see Baker Street, where Sir Arthur Conan Doyle set the lodgings of Sherlock Holmes and Dr. Watson. Here during the Festival of Britain a sitting room was furnished exactly as Holmes had imagined it: groups of Holmes's fans the world over, including the "Baker Street Irregulars," contributed to make it possible. But the exhibit has been discontinued. I had to content myself with a tour of Madame Tussaud's Waxworks near by and later a visit to Scotland Yard, the very fountainhead of real-life detective stories.

To discuss all the famous writers who have lived and worked in London or whose tombs lie in Westminster Abbey would be to write a major part of the history of English literature.

Francis Bacon was born in the Strand, and Milton on Bread Street. In the gardens probably planned by Bacon in Gray's Inn the master diarist Samuel Pepys strolled with his wife. Thackeray's name is connected with Kensington, Swinburne's with Putney. George Eliot died in Chelsea, Defoe's grave lies in Bunhill Fields, and Charles Lamb's memorial stands in Temple Gardens. Lamb lived in Islington; and Keats, whose home is now a show place, in Hampstead.

At Chalfont St. Giles, close to London, is preserved the tiny cottage where Milton, according to some biographers, took refuge from the plague and finished *Paradise Lost* (page 311); Olney, the home of William Cowper, whose rollicking ballad about John Gilpin's ride is better remembered than his serious poems (page 336), is a museum. At the time of our visit the home of George Bernard Shaw at Ayot St. Lawrence near London was exhibited just as it had been when the great Irish playwright lived there.

Swift, Congreve, Steele, Pope, Sheridan, De Quincey, Byron, Charles Reade, Anthony Trollope, and Samuel Butler—to mention a few—worked in London.

Most famous of London writers, however, are Dickens, Shakespeare, and Chaucer. Dickens, who lived in several different houses in the city, wrote *Nicholas Nickleby* and *Oliver Twist* in the house we visited in Doughty Street. At the Globe Theatre, commemorated now by a tablet in the wall of a brewery, Shakespeare saw many of his plays performed. At the Tabard Inn in South London Chaucer set the scene for the beginning of his *Canterbury Tales*.

Modern Pilgrims Drive to Canterbury

Chaucer's pilgrims rode from London toward Canterbury on slow-footed saddle beasts. We made the historic journey more swiftly on Whitsunday in a rented motorcar.

Although our visit was in June, the weather was less springlike than Chaucer's "Aprille." Intermittent showers plagued us. English friends declared the summer of 1954 the coldest and wettest in 25 years.

The inn from which Chaucer's pilgrims set out on their journey has disappeared long since, but we saw many a quaint hostelry like it.

The highway was jammed with traffic—buses carrying London businessmen's clubs, overloaded automobiles of all makes and ages, motorcycles with sidecars literally bulging with women and children, and, of course, swarms of bicycles. The long Whitsunday week end seemingly had enticed half of England out upon the roads.

Page 306

← *"Away . . . to Sweet Beds of Flow'rs!"*
Climbing Roses and Country Posies Frame the Home of Shakespeare's Mother

Shakespeare's enduring love for the Warwickshire countryside of his youth shines through all his works. He is most lyrical when singing about the flowers, fields, and fairies of his native county.

Here at Wilmcote the poet's mother, Mary Arden, lived as a girl. She left as the bride of John Shakespeare to live in Stratford. Shakespeare's Birthplace Trust maintains the old Tudor house and its outbuildings as a museum of Elizabethan farm life.

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Kodachrome by National Geographic Photographer Kathleen Revis

© National Geographic Society

"City of a Dream . . . One of the Quaintest and Quaintest Spots in England . . .

Thus in *Jude the Obscure* Thomas Hardy describes Shaston, the modern Shaftesbury, Dorsetshire. Here schoolgirls pull up steep Gold Hill, believed named for the minters who coined gold for the realm during Saxon days.

309 Kodachrome by National Geographic Photographer Kathleen Revis

. . . Summit of an Almost Perpendicular Scarp, Rising . . . Out of the . . . Vale of Blackmoor"

The buttressed wall once guarded the town's magnificent Abbey, where England's revered King Edward the Martyr was buried. This "fair creation of the great Middle-Age" drew pilgrims from all over Europe.

Like the pilgrims of old, the business clubmen paused frequently for refreshments. A busload was parked in almost every lay-by along the road. What an opportunity, I thought, for a modern Chaucer.

During periods of sunshine we reveled in the incredibly green Kentish scenery—rural England at its best. The lush countryside with its fair farms and scattered thatch roofs looked like a scene from Chaucer.

Hereabouts some of the action of Shakespeare's *Henry IV*, Part One, took place. On a road about two miles from Rochester Sir John Falstaff robbed travelers bearing gifts to Canterbury, and Prince Henry robbed him in turn. To me, fat Falstaff's ever more expansive account of his "valor" is one of the funniest passages in Shakespeare (page 299).

Dickens lived his last years at Gad's Hill Place, hard by the spot where Falstaff fled and left his booty (page 305). In a Swiss chalet in his gardens Dickens was working on *The Mystery of Edwin Drood* just before his fatal seizure. In Rochester we saw the Bull Inn, beloved of Pickwick and Sam Weller.

The Venerable Bede gave the world the

(Continued on page 319)

"Paths of Glory Lead but to the Grave" →

Page 311: Thomas Gray wrote of strolling here one twilight, watching as "now fades the glimmering landscape . . . and all the air a solemn stillness holds." His eyes moved from "yonder ivy-mantled tower," today shorn of greenery, to the "yew-tree's shade," still seen at left. In a mood of melancholy his thoughts turned to the earth where "each in his narrow cell forever laid, the rude Forefathers of the hamlet sleep."

His musings produced the familiar *Elegy Written in a Country Churchyard* (page 322).

Here in Stoke Poges, Buckinghamshire, the author sleeps in his "narrow cell," the tomb beside the end window of Hastings Chapel (center), St. Giles Church.

"Mind and Spirit Remains Invincible"

Opposite, lower: John Milton proved his own words from *Paradise Lost* when he retired in 1665 to this small cottage in Chalfont St. Giles, Buckinghamshire. Disaster had dogged him like a shadow. His years of work as a revolutionary had ended in failure. Past 50, he lived in fear of imprisonment by the Royalists, who had ordered copies of two of his books burned by the hangman. And he was blind.

Fleeing the plague in London, Milton came to St. Giles and found the courage to continue work on his masterpiece, *Paradise Lost*; its companion, *Paradise Regained*, may have been conceived here. The cottage is now a museum.

⚱ Blind Milton dictates to his daughters.

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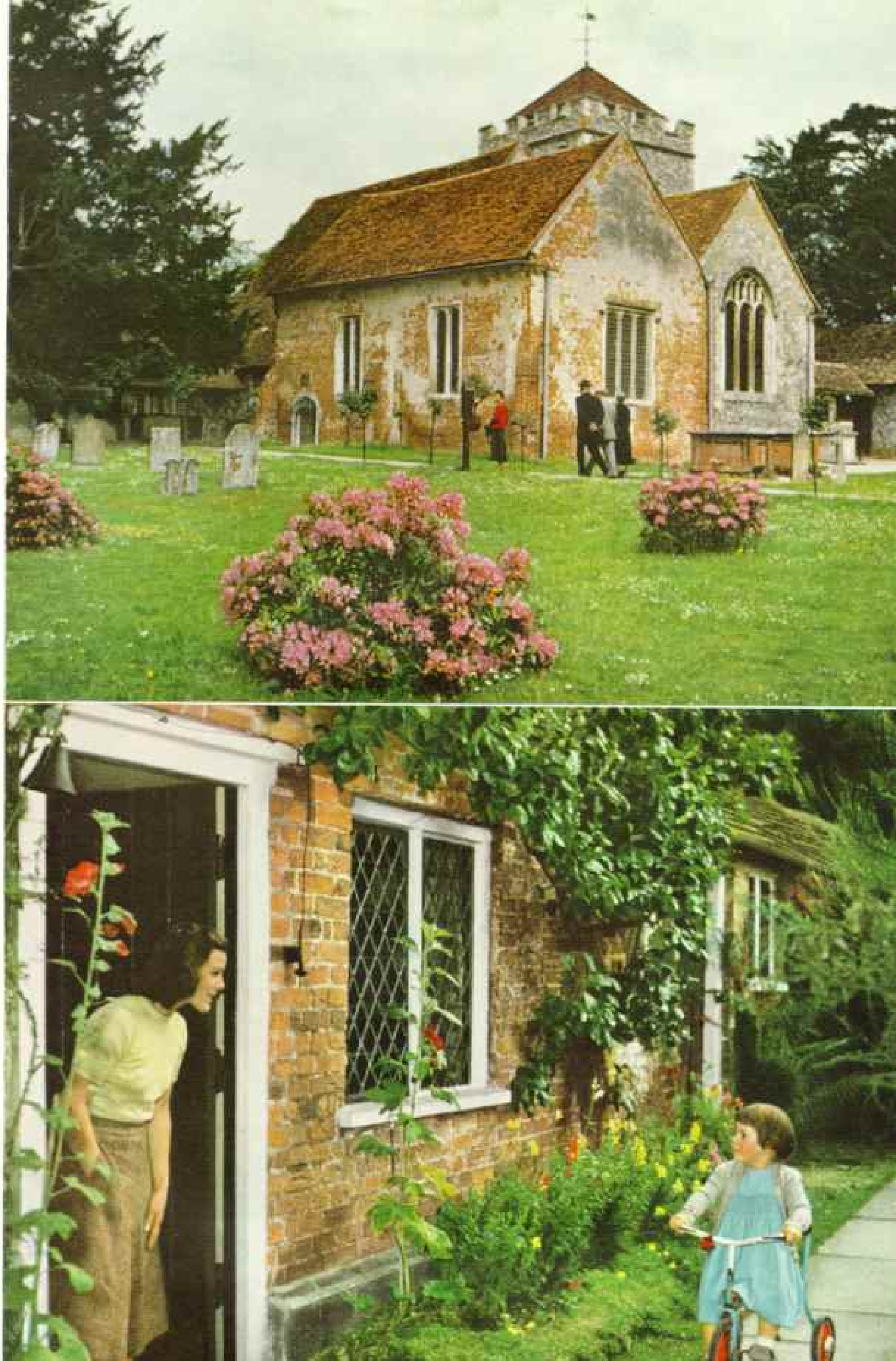
Kodachromes by National Geographic Photographer Kathleen Revis

Courtesy New York Public Library



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312

"We Saw the Long-roofed Chapel of King's College Lift Turrets and Pinnacles . . . High"

Thus wrote Wordsworth after viewing Cambridge University's medieval masterpiece. As students, poets Spenser, Dryden, and Tennyson walked here along the Backs and Lord Byron dived for shillings in the River Cam.

313 © Kodachromes by National Geographic Photographer Kathleen Revis

"For the Spirit and Soul of the Waste Is the Wind"

In his *Evening on the Broads* Algernon Charles Swinburne caught the mood of the Norfolk Broads, a Hollandlike land of lagoon, reed, and fen. Here a skipper makes ready to tie up to the bank of a canal off the River Thurne, northwest of Great Yarmouth.

"Take Choice of All My Library and So Beguile Thy Sorrow"

William Foyle examines a third folio of Shakespeare's plays in his library of rare books, one of the finest private collections in England. Many copies of this edition were burned in London's Great Fire of 1666. This one is valued at $28,000.

315

"From Every Shires ➔ Ende of Engelond, to Caunterbury They Wende"

In *The Canterbury Tales*, Geoffrey Chaucer's pilgrims never quite reached this high-soaring cathedral where Archbishop Thomas à Becket was martyred. But Chaucer himself likely trod Canterbury's streets on his rounds as Clerk of the King's Works.

Here dramatist Christopher Marlowe was born and educated at King's School (opposite page); Joseph Conrad was buried; and T. S. Eliot laid the scene for his play, *Murder in the Cathedral*.

Completed about 1500, the cathedral's Bell Harry Tower looms over Butchery Lane. World War II bombs uncovered Roman ruins near by.

➔Students of Canterbury's King's School mingle at the garden gate. The school claims descent from a 7th-century monastic institution. Staircase dates from Norman days.

Many believe King's School a model for the one David Copperfield attended; Dickens describes it as "a grave building . . . with a learned air."

Kodachromes by National Geographic Photographer Kathleen Revis

←"Maddest Merriest Day . . . I'm to Be Queen o' the May"

Lines from Tennyson's *The May Queen* reflect the spirit of these young dancers celebrating a village fete at Leeds Castle, Kent.

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↑ *"Thou Kill'dst . . . Edward, My Poor Son, at Tewkesbury"*

Thus cried Queen Margaret in Shakespeare's *King Richard the Third*. Edward was slain in the decisive battle of the Wars of the Roses, fought here at Tewkesbury; he lies buried in the Abbey Church (skyline), crowned by one of the finest Norman towers in existence.

Dinah Maria Mulock used the church and the old mill on the Avon (right) in her novel *John Halifax, Gentleman*, so popular in the last half of the 1800's.

← *"Pillars and Arches . . . a Grand Gothic Canopy"*

George Eliot (Mary Ann Evans) spent her girlhood near Arbury estate. In *Scenes from Clerical Life* she tells how this great mansion was transformed in the 18th century from Elizabethan style to one of England's most splendid homes in the Gothic Revival manner.

Here Mrs. FitzRoy Newdegate, whose family acquired Arbury in 1586, sits in the salon. Sir Joshua Reynolds's painting of John the Baptist as a boy hangs at right.

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"That Sweet City with Her Dreaming Spires"

Matthew Arnold wrote thus about Oxford in *Thyrsis*, a poem honoring the memory of his friend and fellow poet, Arthur Hugh Clough. They went to Oxford University together, winning fellowships at Oriel College.

Here on Oriel Street, undergraduates walk past buildings of the college (right), founded in the 1320's. St. Mary's, towering above them, has been used as the University Church for six centuries.

✦ *"Alice Rubbed Her Eyes . . . Was She in a Shop?"*

A mathematics lecturer at Oxford, hiding under the pen name of Lewis Carroll, wrote the fanciful *Alice's Adventures in Wonderland* to entertain a small friend. In the sequel, *Through the Looking-Glass*, Charles Dodgson wove into the story this shop where his little neighbor bought her sweets. He transformed the old lady who kept the store into a sheep knitting with 14 pairs of needles.

The "Cheshire cat" sits by the door at right.

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Kodachromes by National Geographic
Photographer Kathleen Revis

first detailed account of the beginning of Canterbury Cathedral.* Coming from Rome at the head of a missionary band in 597, he records, St. Augustine baptized Ethelbert, King of Kent, and his subjects at Canterbury.

As was the custom, historian Bede wrote in Latin. It remained for Chaucer, through his *Canterbury Tales*, to further the literary usage of the London dialect, from which today's language developed. Thus Chaucer was a father not only of English literature but of the language itself.

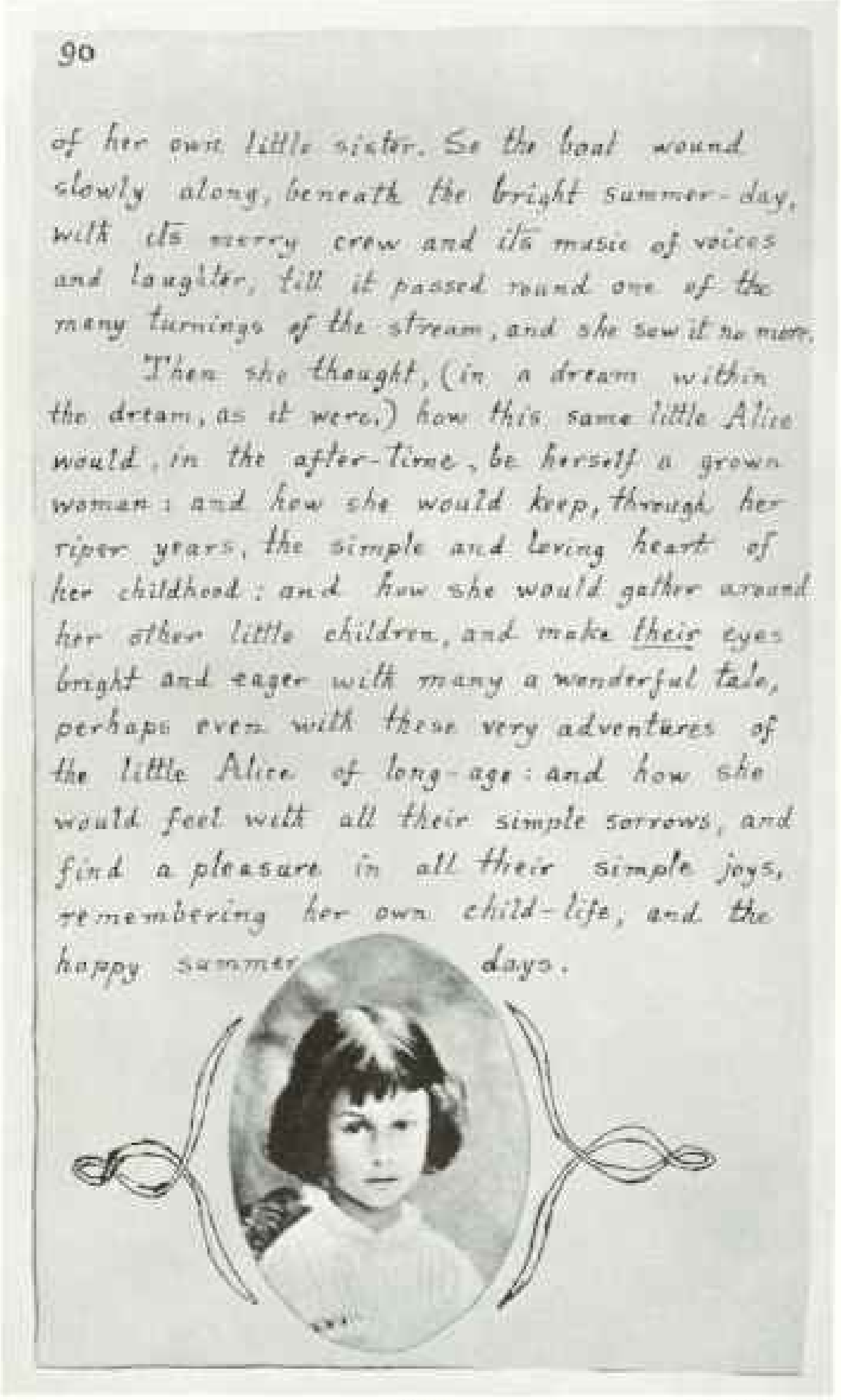
Coming from the hills above Canterbury, we caught sight of the vast Cathedral. Miraculously, it escaped serious damage during the Nazi blitz; Chaucer's pilgrims might recognize it even now.

What vicissitudes Canterbury has suffered! When St. Augustine arrived, it was a village of wattle huts surrounding a church that had probably been built long before by Roman believers. The town grew by 1011 to a substantial ecclesiastical center with a modest cathedral. Then it was burned by Danish raiders, who slew the archbishop. Fire again destroyed nearly all of it in 1067.

In 1066 William the Conqueror had defeated the Saxon King Harold at Senlac, near Hastings, Sussex, 40 miles southwest of Canterbury. Harold was slain in the battle and buried beside the English Channel.

Of the Battle of Hastings, "the marvellous boy," Thomas Chatterton, wrote:

> O Chryste, it is a grief for me to telle,
> How manie a nobil erle and valrous knyghte
> In fyghtynge for Kynge Harrold noblie fell.



319 © British Museum

Alice at 7: the Last Page of Her *Adventures*

Charles Dodgson recited his fantasy to Alice Liddell and her sisters on a boating trip in 1862. Later he reduced the story to writing, called it *Alice's Adventures Under Ground*, and gave it to her. This is a part of the manuscript that sold 66 years later for $74,998. For printing, Dodgson expanded the story under a new title (opposite and page 322).

From France King William had his friend Lanfranc come to be Archbishop of Canterbury. Since that time, with few exceptions, the Archbishop has officiated at the coronation of Britain's rulers. Archbishop Thomas à Becket, a close friend of Henry II until the King and he fell out over the question of control of the Church by the State, was

* See "Cathedrals of England," 16 ills. in gravure from dry-point etchings by Norman Wilkinson, National Geographic Magazine, December, 1939.

320 Kip Ross, National Geographic Staff

St. Paul's Cathedral Looms Above London's "Street of Ink"

Fleet Street got its first printing press in 1501. While still largely residential, it became the haunt of Samuel Johnson, Oliver Goldsmith, Charles Lamb, John Donne, and Izaak Walton. Now most London dailies maintain offices in the area.

murdered in the Cathedral by the King's knights on December 29, 1170. All England, including King Henry, mourned the great churchman, who had been loved because of his unselfish devotion to the poor. His tomb became a popular shrine to which, as Chaucer wrote:

> ...from every shires ende
> Of Engeland, to Caunterbury they wende,
> The holy blisful martir for to seke,
> That hem hath holpen, whan that they were seke.

Castle Tops Cliffs of Dover

Early on a blustery afternoon we came to the famed white cliffs of Dover. Up we went from the waterfront to the top of the steep promontory crowned by Dover Castle. Here, looking out over the Strait of Dover, now bright with sunshine, now darkly shadowed by rain clouds, I recalled bits of Matthew Arnold's night picture, *Dover Beach*, published in 1867:

> ...the cliffs of England stand,
> Glimmering and vast, out in the tranquil bay...
> And we are here as on a darkling plain
> Swept with confused alarms of struggle and flight,
> Where ignorant armies clash by night.

Dover beach and the whole coast of Kent have known the ravages of war for centuries, and the scars of the latest bitter struggle have not yet been

obliterated. One sequence of Sir John Buchan's famous spy story, *The Thirty-nine Steps*, was laid in this area.

The British mined Dover beach in 1940 so that Germans attempting invasion might not reach the headlands from the beach. As I stood looking at the white cliffs and the battered shore line that has defied the fury of enemy bombardments and thousands of storms, an immortal passage from Shakespeare's *Richard II* came to mind:

> This fortress built by Nature for herself
> Against infection and the hand of war,
> This happy breed of men, this little world,
> This precious stone set in the silver sea,
> Which serves it in the office of a wall,
> Or as a moat defensive to a house,
> Against the envy of less happier lands,
> This blessed plot, this earth, this realm, this England

321

Samuel Johnson Looks Down on a Traditional Dining Nook

The Cheshire Cheese, just off Fleet Street, may have inspired Dr. Johnson to exclaim: "No, sir! there is nothing which has yet been contrived by man, by which so much happiness is produced as by a good tavern or inn." The portrait is a copy of one by Sir Joshua Reynolds.

A few days after our Canterbury trip we set out from London for green Warwickshire and the Shakespeare country. This was a true literary pilgrimage, for almost every mile of our leisurely, roundabout journey was rife with romantic associations.

Freedom Born at Runnymede

Driving our little English Ford across a grassy plain on the bank of the Thames, we visited Runnymede. Here in 1215 the barons forced reluctant King John to sign the Magna Carta, which, imposing an epochal check on the tyranny of rulers, eventually became a cornerstone of constitutional government everywhere.* Kipling in his poem *The Reeds of Runnymede* charges Englishmen:

> At Runnymede, at Runnymede,
> Your rights were won at Runnymede! . . .
> Forget not, after all these years,
> The Charter signed at Runnymede.†

We were fortunate in reaching Windsor on a day when, the royal family not being in residence, the state apartments in the castle were open to visitors. Going through the magnificent rooms, I recalled Theodore Bonnet's popular novel, *The Mudlark*, and tried to trace the wanderings of the waterfront waif whom the author described as getting into the forbidden precincts and, after a series of comical adventures, receiving kindly treatment through the intercession of Queen Victoria's Prime Minister, Disraeli.

* See "The British Way," by Sir Evelyn Wrench, NATIONAL GEOGRAPHIC MAGAZINE, April, 1949.

† Quoted by courtesy of the poet's daughter, Mrs. George Bambridge.

At Stoke Poges we visited what is perhaps the best-known cemetery in the English-speaking world (page 311). Here is the scene of Thomas Gray's *Elegy Written in a Country Churchyard*. Gray, a retiring scholar, wrote comparatively little verse; but this masterpiece, completed in 1750, insures him enduring fame. Declining the poet laureateship offered him after the death of Colley Cibber, he later became a professor of history at Cambridge.

As I stood by his grave behind the church chapel, I repeated softly the last stanza of the exquisite Epitaph from his *Elegy*:

> No farther seek his merits to disclose,
> Or draw his frailties from their dread abode,
> (There they alike in trembling hope repose,)
> The bosom of his Father and his God.

Toward evening of a rainy day we came to Oxford, oldest seat of learning in England (page 318).* Of it the poet John Keats wrote in 1817:

"This Oxford, I have no doubt, is the finest city in the world—it is full of old Gothic buildings . . . groves, etc., and is surrounded with more clear streams than ever I saw together."

Colleges Retain Medieval Flavor

Oxford has changed little; its oldest colleges, founded in the 13th century, retain their medieval character, and many of the later ones have been erected in keeping with them.

Late on our first night in Oxford the moon broke clear occasionally, bringing to mind Shelley's poem *The Cloud*:

> That orbèd maiden, with white fire laden,
> Whom mortals call the Moon,
> Glides glimmering o'er my fleece-like floor,
> By the midnight breezes strewn.

At Oxford we rambled from one to another of the colleges, with their perfect lawns and exquisite gardens. Since the academic term was still in progress, we could not visit Shelley's rooms in University College, but we saw the magnificent memorial to this poet, who was expelled after refusing to admit his authorship of a tract on atheism.

The Bodleian Library held us spellbound with its display of old manuscripts. In Pembroke College we climbed the stairs down which needy Samuel Johnson, too proud to accept charity, flung a new pair of shoes given by a fellow student. Addison's Walk near Magdalen College recalled the great essayist Joseph Addison and his *Sir Roger de Coverley Papers*.

Edward Gibbon, considered by many critics the world's greatest historian, attended Magdalen College and continued there the classical studies which led to his monumental *Decline and Fall of the Roman Empire*. Enormously fat, Gibbon had difficulty getting around. Tradition has it that once when he knelt to propose to a lady, he was unable to rise without help.

Alice's Author Disclaimed Her

At Christ Church College a lecturer in mathematics, Charles Lutwidge Dodgson, adopted the pen name of Lewis Carroll for his *Alice's Adventures in Wonderland* and *Through the Looking-Glass*. Both were written to please the little daughter of his dean, Henry George Liddell. Alice's Shop, which the little girl once frequented, is still open for business (page 318). In 1928 the original Alice sold the first manuscript version of *Alice in Wonderland* for $74,998.

A strangely reticent man, Dodgson disclaimed connection with the Lewis Carroll books, although the fact of his authorship was common knowledge. He preferred to rest his reputation as an author on his mathematical treatises.

The old Mitre Hotel, with a history beginning in the 13th century, was a rendezvous of literary lights in the 17th. We had tea in rooms redolent of antiquity. Rules for

(Continued on page 331)

* See "Oxford, Mother of Anglo-Saxon Learning," by E. John Long, National Geographic Magazine, November, 1929.

Page 323

"Blessed Are They That . . . May Enter in Through the Gates into the City"

Massive bronze doors on John Bunyan's meeting-house in Bedford depict scenes from his book, *Pilgrim's Progress*, the allegory of an awakened soul's journey to the Celestial City to meet God.

Twice imprisoned for preaching nonconformist doctrines, Bunyan wrote a portion of *Pilgrim's Progress* in the old, dimly lit Bedford bridge jail. A universal classic, the work has been translated into more than 100 languages.

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↑ *"... To Landward, All Richness, Softness, and Peace; to Seaward, a Waste and Howling Wilderness of Rock and Roller ..."*

Describing the coves of Devon and Cornwall, Charles Kingsley wrote in *Westward Ho!*: "Each has its narrow strip of fertile meadow, its crystal trout-stream winding across and across from one hill-foot to the other ... Its dark rock pools above the tide mark, where the salmon-trout gather in from their Atlantic wanderings, after each autumn flood; its ridge of blown sand, bright with golden trefoil and crimson lady's finger ..."

Amyas Leigh, hero of Kingsley's historical novel, sailed from Appledore (above) to join battle against the Spanish Armada. An Old World charm still pervades this "little white fishing village," as the Devon clergyman-author pictured it. Ships of every age and nation and rig have anchored in the harbor for more than 1,000 years. Here lads help their fishermen-fathers beach a boat as evening approaches.

← A few miles west of Appledore on Barnstaple Bay lies Clovelly, tucked in a cleft of a steep cliff. Kingsley lived here as a youth. Graveyard tombs at a near-by church bear names reminiscent of characters in *Westward Ho!* This is one of England's most famous fishing villages; its steep stone-paved street forms a staircase leading up from the sea. Creepers bower cottage doorways.

→ Youngsters play fearlessly about Clovelly's main street. No cars run here; resident and visitor alike travel on foot.

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Kodachromes by National Geographic Photographer Kathleen Revis

← *"The River Barle . . . Pouring Down in Mighty Floods, from the Melting of the Snow"*

Few novels have so stirred the hearts of English-speaking folk as did Richard Blackmore's *Lorna Doone* when it appeared in 1869. Love, apparently hopeless but finally triumphant, provides the theme.

In a hidden valley in Exmoor young John Ridd meets the beautiful Lorna Doone, held captive by bloodthirsty bandits. Lawyer-schoolmaster Blackmore flavored each page with high suspense in recounting his hero's efforts to rescue the highborn maiden.

Near the River Barle in Somerset, three of the outlaw band accosted Jeremy Stickles, commissioner to the king. "If they do not catch me up, or shoot me, in the course of the first two miles, I may see my home again," Stickles vowed, and in the wild chase that ensued he outraced the villains.

When not in flood, the placid Barle flows gently beneath Tarr Steps, an old stone bridge.

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← *"Making My Sonnet by the Alehouse Fire"*

Poet Robert Southey, taking refuge from a shower, is believed to have sat in this chimney corner of the Ship Inn when he wrote his sonnet on Porlock.

A market town on the north coast of Somerset, Porlock figures prominently in *Lorna Doone*.

"My dear father had been killed by the Doones of Bagworthy, while riding home from Porlock market, on the Saturday evening," relates hero John Ridd.

➔Red deer still roam the hills and vales of Somerset, as they did in the time of Lorna Doone. These hounds, trained to follow the wild stag, await the start of a hunt on Dunkery Beacon. Horseman, known as "the whip," will keep the pack in check.

Kodachromes by National Geographic Photographer Kathleen Revis

↑ *"...Here Are Trees and Bright Green Grass, and Orchards Full of Contentment..."*

In *Lorna Doone*, John Ridd describes his farm home:

"Almost everybody knows, in our part of the world at least, how pleasant and soft the fall of the land is round about Plover's Barrows farm. All above it is strong dark mountain, spread with heath, and desolate, but near our house... Where the valley bends, and the Lynn stream goes along with it, pretty meadows slope their breast, and the sun spreads on the water."

Oare waters in foreground ran beside the farm where Blackmore's hero dwelt. At extreme right the stream meets Badgworthy Water. Sheep and cattle pasture on the slopes. High moors rise in background.

← Badgworthy Water flows by Doone Valley, part of the boundary between Devon and Somerset. Here the Doone clan supposedly lived.

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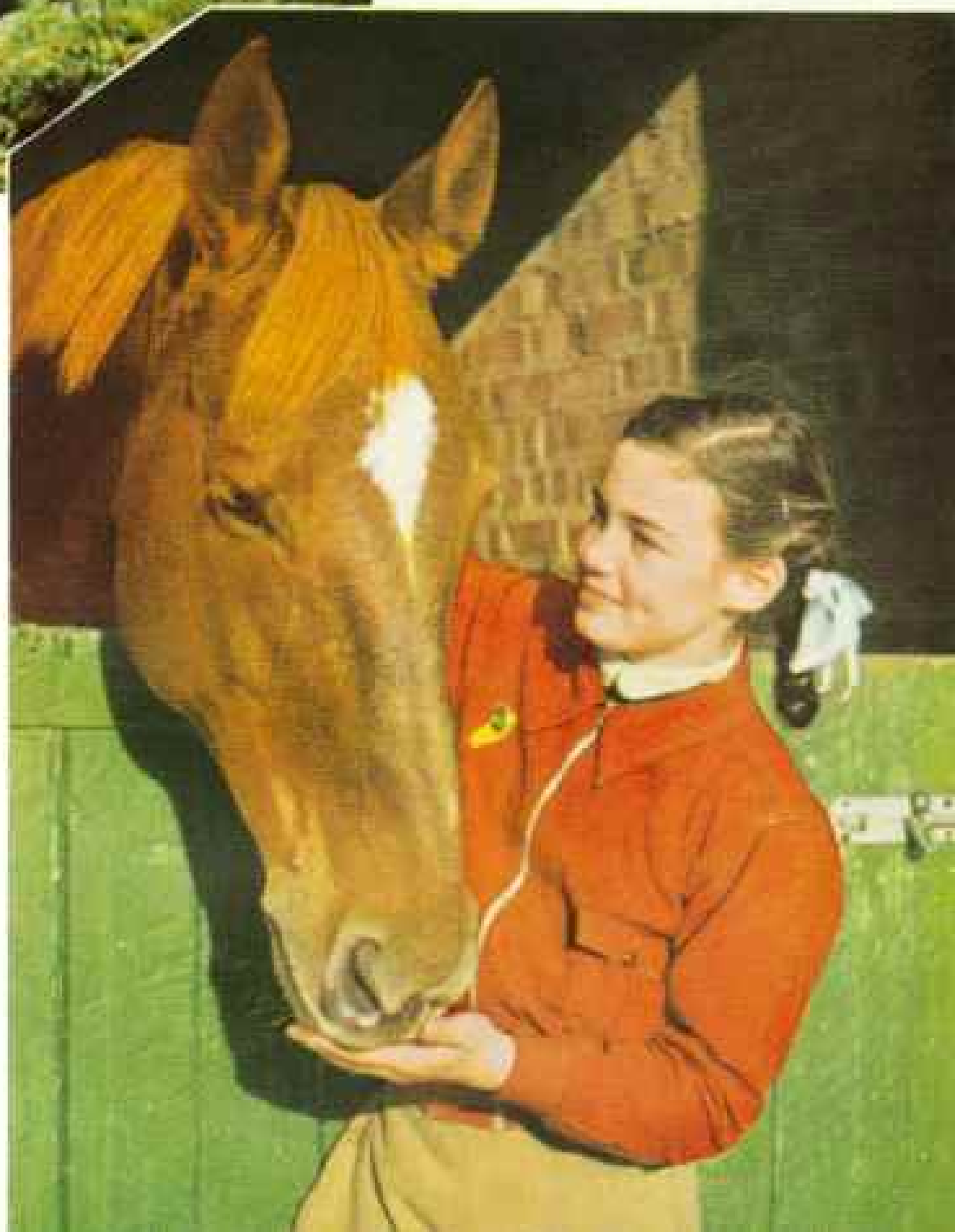
↑ *"A Thing of Beauty Is a Joy Forever"*

Girl with heather suggests John Keats's line.

↓ Velvet rides again: Ann Wilkins of Essex calls to mind the youthful heroine of Enid Bagnold's *National Velvet*.



330

↟ *"Honour to Bold Robin Hood, Sleeping in the Underwood!"* Wrote Poet John Keats

"In merry England in the time of old, when good King Henry the Second ruled the land, there lived within the green glades of Sherwood Forest, near Nottingham Town, a famous outlaw whose name was Robin Hood. No archer ever lived that could speed a gray goose shaft with such skill and cunning as his, nor were there ever such yeomen as the seven-score merry men that roamed with him through the greenwood shades."

Thus begins Howard Pyle's *Merry Adventures of Robin Hood*, collected tales of the legendary bandit who levied toll on the rich and defended the poor.

Today coal mines riddle the once-pastoral country of Nottinghamshire. Major Oak, near Edwinstowe, stands as a lonely survivor of the Sherwood Forest of Robin Hood's time.

← Stout staves clash as members of the Ancient Order of Foresters enact the pleasurable sport of Robin Hood's band.

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Illustrations by National Geographic
Photographer Kathleen Revis

Oxford undergraduates were posted in the halls. Until recent years, students were not permitted to drink at the inn.

Sometimes, despite the rules, they climb over the walls of their yards and go out on the town. We heard of one young man caught in the act who appeared before his dean expecting a severe reprimand. The dean told him with a twinkle, "You needn't have been caught on the barbs on the top of the wall. In my day we used a saddle to cover them!"

Although Oxford is only about two hours' drive from London, it is surrounded by peacefully pastoral country. We detoured to see Wytham, an unspoiled English village of thatched houses dreaming amid charming gardens of old-fashioned flowers. In lush green fields beside clear streams cows grazed "far from the madding crowd."

Morning coffee was served to us in the old Trout Inn on the stripling Thames. A few miles away, at Woodstock, Henry II had kept his "Fair Rosamond" concealed in a vast labyrinth. The legend tells that she was so beautiful that, when her hiding place was found, even the jealous Queen Eleanor was reluctant to punish her. Rosamond died suddenly, however, in 1177. Old romances have it that her royal rival forced her to take poison.

"But 'Twas a Famous Victory"

Blenheim Palace, at Woodstock, given to a Duke of Marlborough in the days of Queen Anne in gratitude for his victory at Blenheim, Bavaria, is occupied by the present duke. I recalled Robert Southey's ironical poem describing the battle:

> 'And everybody praised the Duke,
> Who this great fight did win.'
> 'But what good came of it at last?'
> Quoth little Peterkin.
> 'Why, that I cannot tell,' said he;
> 'But 'twas a famous victory.'

Driving among Warwickshire fields of waving grain (called corn in England), we thought of Shakespeare's song:

> It was a lover and his lass—
> With a hey, and a ho, and a hey nonino—
> That o'er the green cornfield did pass...

For this was Shakespeare country, and much as it must have been in the days of the Bard himself.

The sun smiled for us as we came into Stratford on Avon and took lodgings at the White Swan Hotel, an establishment that was old when William Shakespeare was born. The town has become a crowded tourist resort; so many visitors were in Stratford for the week end that we had to change hotels twice in four days!

Every effort has been made to preserve memories of the great poet. Modern shops add to the effect by masquerading in Shakespearean guise.

Fortunately we obtained tickets for a performance of *A Midsummer Night's Dream* in the Shakespeare Memorial Theatre. The company of young actors spoke the lines so clearly that we caught every word.

Television Antennas on Thatch Roofs

Between acts we strolled on the outdoor balcony of the theater that overlooks the lovely Avon (pages 302-3). Processions of graceful white swans sailed majestically past. At 11 p.m., when the play ended, there was still enough daylight to distinguish objects near by.

One incongruous touch in Stratford was the presence of television antennas on scores of thatch-roofed homes.

In old Holy Trinity Church, which was almost deserted, we paid tribute at the burial place of Shakespeare and his wife. The epitaph for Shakespeare, carved in crude capital letters on a slab, seemed unworthy of the great playwright, though tradition says he selected it himself:

> Good frend for Iesvs sake forbeare,
> To digg the dvst encloased heare:
> Blese be ye man yt spares thes stones,
> And cvrst be he yt moves my bones.

Kept in Trinity Church are registers containing Shakespeare's baptismal and burial records. In this venerable church we felt closer to Shakespeare and his times than in any of the other Stratford memorials. Holy Trinity seemed the most likely spot in which to "lose and neglect the creeping hours of time."

The ancestral home of John Harvard, for whom Harvard University was named, is preserved much as it was centuries ago. Through efforts of the novelist Marie Corelli it has been restored and presented to Harvard University.

Several of Marie Corelli's handwritten manuscripts, among them pages of her *Thelma*, are on display. The old house is on a street near

← *"Hast Thou Seen the Holy Cup, That Joseph Brought of Old to Glastonbury?"*

Page 332: In *Idylls of the King*, Alfred Lord Tennyson (right) sings of the tradition that Joseph of Arimathea introduced Christianity into Britain. Settling at Glastonbury, "he built with wattles from the marsh a little lonely church," and he hid "the cup, the cup itself, from which our Lord drank at the last sad supper with His own."

Later, King Arthur, mortally hurt in battle, dreamed of coming to this sacred spot to "heal me of my grievous wound."

These majestic piers once framed the entrance to the sanctuary of the Abbey of Glastonbury, completed in the 13th century and destroyed after the dissolution of the monasteries in the 1500's. Legend says that King Arthur and Queen Guinevere lie buried before the high altar, now covered by a canopy.

Clerics and laymen make the annual Church of England pilgrimage to the ruins.

© National Geographic Society Kodachrome by Jessie Sharer Burch

"Tom Pearce, Lend Me Your Grey Mare, For I Want for to Go to Widecombe Fair"

Opposite, lower: In "Widecombe Fair," a beloved British folk ballad, a hillsman seeks to borrow Tom Pearce's gray mare to transport some eight worthies, including Uncle Tom Cobleigh, to the fair. Not unnaturally, the junket falls short of success.

From the legend has arisen a tradition. Here a citizen of Widecombe in the Moor plays the part of Cobleigh, a real person of the 18th century. His arrival on "Tom Pearce's mare" gets the annual September fair off to a hilarious start.

Kodachrome by National Geographic Photographer Kathleen Revis

Bettmann Archive

Alfred Lord Tennyson (1809-1892)

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our third lodging place, the Shakespeare Hotel.

The day we left Stratford we rose early and drove out through the gracious countryside. It was easy to see where Shakespeare found the inspiration for his exquisite lyrics:

> Under the greenwood tree
> Who loves to lie with me,
> And turn his merry note
> Unto the sweet bird's throat . . .

The unspoiled landscape was lusciously green, birds sang everywhere, and cozy homes set behind hedgerows in bright gardens entranced us. To me rural England was a constant delight. Every cottager had his glowing flower garden perfectly kept, however small. In the fields, red and white cows waded knee-deep in lush grass. High oak trees that Shakespeare perhaps saw as saplings swayed in the breeze.

At Warwick we saw the massive castle of Richard Neville, "the Kingmaker." This venerable stronghold on a rocky eminence overlooking the Avon has been the scene of a hundred tales of derring-do. Kept as it was long ago, it is open to visitors.*

Another Warwickshire literary landmark is the childhood home, near the little mining village of Chilvers Coton, of Mary Ann Evans, who wrote under the name George Eliot. In later life she used Arbury estate, where she was born, as the "Cheverel Manor" of her book *Scenes from Clerical Life* (page 317).

An Arrow Routs the Sheriff

A book that I read over and over when I was a boy was the American artist-writer Howard Pyle's *Merry Adventures of Robin Hood*. The old ballads from which the Robin Hood tales are gathered claimed my attention later, and the appearance of Robin Hood as Locksley in Scott's *Ivanhoe* was a pleasant surprise.

Researchers can find no real evidence that Robin Hood ever existed. Nevertheless, this

* See "How Warwick Castle Was Photographed in Color," by Maynard Owen Williams, NATIONAL GEOGRAPHIC MAGAZINE, July, 1936.

←*"Time on Thee Lies Lighter Than Music on Men's Ears"*: The Georgian Glory of the Royal Crescent at Bath

Swinburne's *A Ballad of Bath* epitomizes the affection held for this famous spa by a striking number of British writers. No other spot in England, London excepted, has so many literary associations.

Byron's parents married here. In Bath, Sheridan won beautiful Elizabeth Ann Linley and gathered material for one of the finest English comedies, *The Rivals*. The characters in Austen's *Northanger Abbey* experienced "the difficulties and dangers of six weeks' residence in Bath." Daniel Defoe's Moll Flanders, in the book of the same name, found there "good company, that is to say, gay, fine company."

In *The Pickwick Papers* Dickens caused Mr. Pickwick and his friend, Mr. Winkle, to take lodgings in the Royal Crescent, considered by many the finest architectural crescent in the world. Unhappily, Mr. Winkle got locked out one night while wearing his dressing gown. He loped around the Crescent a couple of times, pursued by an irate husband whose wife had glimpsed Winkle in his scandalous attire.

Above: A little family puts baby to bed at No. 5 Royal Crescent, once the home of poet Christopher Anstey, who satirized local society in *The New Bath Guide*.

Page 334, upper: Of Lyme Regis, Jane Austen wrote in *Persuasion*: "The young people were all wild to see Lyme." When the party arrived, they found "the principal street almost hurrying into the water." Walking, they skirted "round the pleasant little bay, which, in the season, is animated with bathing machines and company."

Gone are the bathing machines—wheeled bathhouses driven into the water to provide cover for modest bathers—but children, entranced by sea shells and sailboats, remain to animate this modern scene.

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Kodachromes by National Geographic Photographer Kathleen Revis

daring outlaw who robbed the rich and gave to the poor is very real to me, as are his companions. When we entered Nottingham, I could picture the pompous sheriff standing in his stirrups as he fled home with Little John's arrow lodged in his seat.

We went through the little that is left of Sherwood Forest and saw a tree that legend identifies as the spreading oak under which the merry men in Lincoln green once bivouacked. Whenever our road crossed a brook, I thought of the cudgel bout in which Little John tumbled Robin Hood from a log bridge into the water (page 330).

Lonely Moors Imprisoned the Brontës

As guests of relatives in Sheffield, we made excursions to many other places famed in literature. One gray day we went to Haworth, the home of the Brontë sisters. Our directions were hazy, and we lost our way repeatedly on the lonely Yorkshire moors before we reached the little village. Climbing a steep, cobbled street to a rugged hilltop, we came to the old rectory where the talented sisters, Charlotte, Emily, and Anne, lived with their widowed father (pages 338, 339).

The house has been kept as it was when the Brontës occupied it. From a bedroom we looked out over the old churchyard. I recalled Charlotte Brontë's description of the view: "There have I sat on the low bedstead," she wrote, "my eyes fixed on the window; through which appeared no other landscape than a monotonous stretch of moorland, and a grey church tower rising from the centre of the churchyard, so filled with graves that the rank weeds and coarse grass scarce had room to shoot up between the monuments."

How the desolate surroundings must have affected these sensitive artists! Out on the moor we looked with a feeling almost of trepidation at the house Emily Brontë chose as the original of Mr. Heathcliff's residence,

"Dogs Did Bark, the Children Scream'd, Up Flew the Windows All": John Gilpin's Ride

"Away went Gilpin, neck or nought; away went hat and wig!—He little dreamt, when he set out, of running such a rig! . . . And now, as he went bowing down his reeking head full low, the bottles twain behind his back were shatter'd at a blow." William Cowper, who lived in the shadow of insanity, wrote the poem in 1782. Artist William S. Wright gave this painting to the Cowper Museum, Olney, Buckinghamshire.

Cowper Museum

"On the Idle Hill of Summer Sleepy with the Flow of Streams"

In his most beloved volume, *A Shropshire Lad*, A. E. Housman wrote of life as seen through the eyes of a country boy. He chose the book's title at the suggestion of a friend, although some of the poems actually have their locale in the poet's native Worcestershire.

Later Housman admitted, "Shropshire was our western horizon, which made me feel romantic about it. I do not know the county well . . . and some of my topographical details are . . . imaginary."

Here, beyond the quiet River Avon, rises Bredon Hill, Worcestershire, of which Housman sang:

Here of a Sunday morning
My love and I would lie
And see the coloured counties,
And hear the larks so high
About us in the sky.

To the charge that much of his work was pessimistic, the poet replied:

They say my verse is sad: no wonder;
Its narrow measure spans
Tears of eternity, and sorrow,
Not mine, but man's.

In the village of Bredon, a young lady heeding Housman's call—"'Tis spring; come out to ramble"—pays a visit to her neighbor's Siamese cat.

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Wuthering Heights. "Wuthering," she wrote, is "...a significant provincial adjective, descriptive of the atmospheric tumult to which the station is exposed in stormy weather... one may guess the power of the north wind ...by the excessive slant of a few stunted firs at the end of the house... Happily, the narrow windows are deeply set in the wall, and the corners defended with large jutting stones."

Charlotte has been regarded as the literary giant among the three sisters, though some present-day critics praise Emily as her superior. Anne, whose talents were less than her sisters', is not so well remembered.

A short drive southwest of Sheffield, in the Peak District of Derbyshire, the Rivers Wye, Dove, and Derwent make a fisherman's paradise (page 345). Here are the scenes described in Charles Cotton's addition to Izaak Walton's philosophical book, *The Compleat Angler*. Knutsford in Cheshire is Mrs. Gaskell's *Cranford*. In Liverpool the American novelist Nathaniel Hawthorne served for several years as United States consul.

The Brontë Sisters: Anne, Emily, and Charlotte

Isolated in a moorland parsonage, these young writers discovered imagination's wonderful world. Their brother, Branwell, pictured them; his painting was damaged in storage.

National Portrait Gallery

York Gates Grimly Decorated

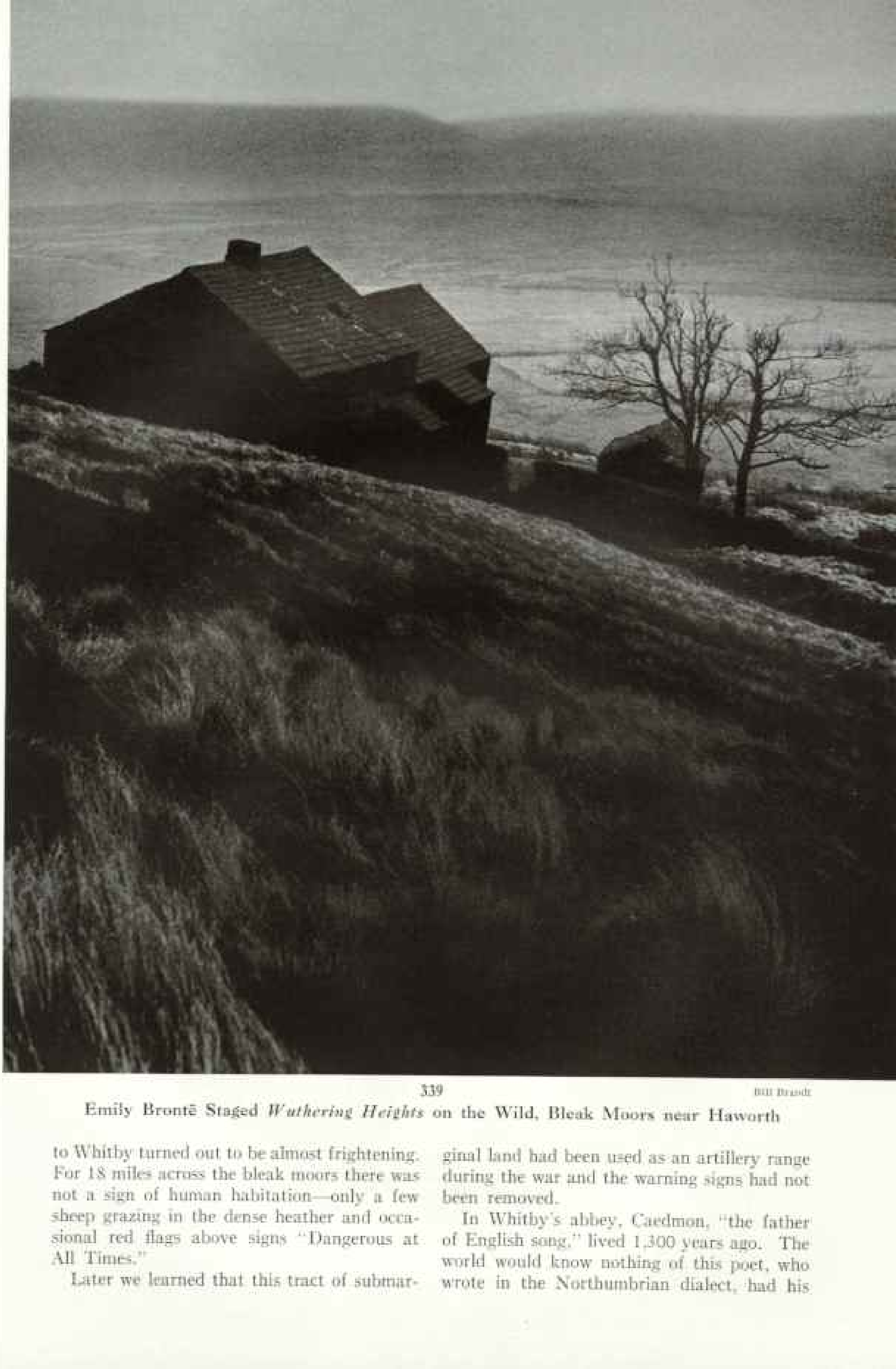
Retracing paths of history, we drove one day to York and thence to Whitby, at the mouth of the River Esk. One of the oldest cities in England, York still retains fragments of the Roman walls that protected it from the arrows of enemy bowmen. When Sir Henry Percy, the Hotspur of Shakespeare's *Henry IV*, was slain at Shrewsbury in 1403, his head was taken to York and displayed on the city's Micklegate Bar.

The head of Edward IV's father, the Duke of York, who was killed in the Battle of Wakefield in 1460, was covered with a mock crown, brought to York, and stuck on a pole above this same gate with its face turned toward the city. In Shakespeare's *Henry VI* Queen Margaret cries:

> Off with his head and set it on York gates!
> So York may overlook the town of York.

From these walls once so gruesomely decorated we went on to York Minster, one of the oldest and finest ecclesiastical edifices in England, and explored the Shambles, an Old World street so narrow that occupants of second-story rooms can almost shake hands with their neighbors across the way.

The drive from York

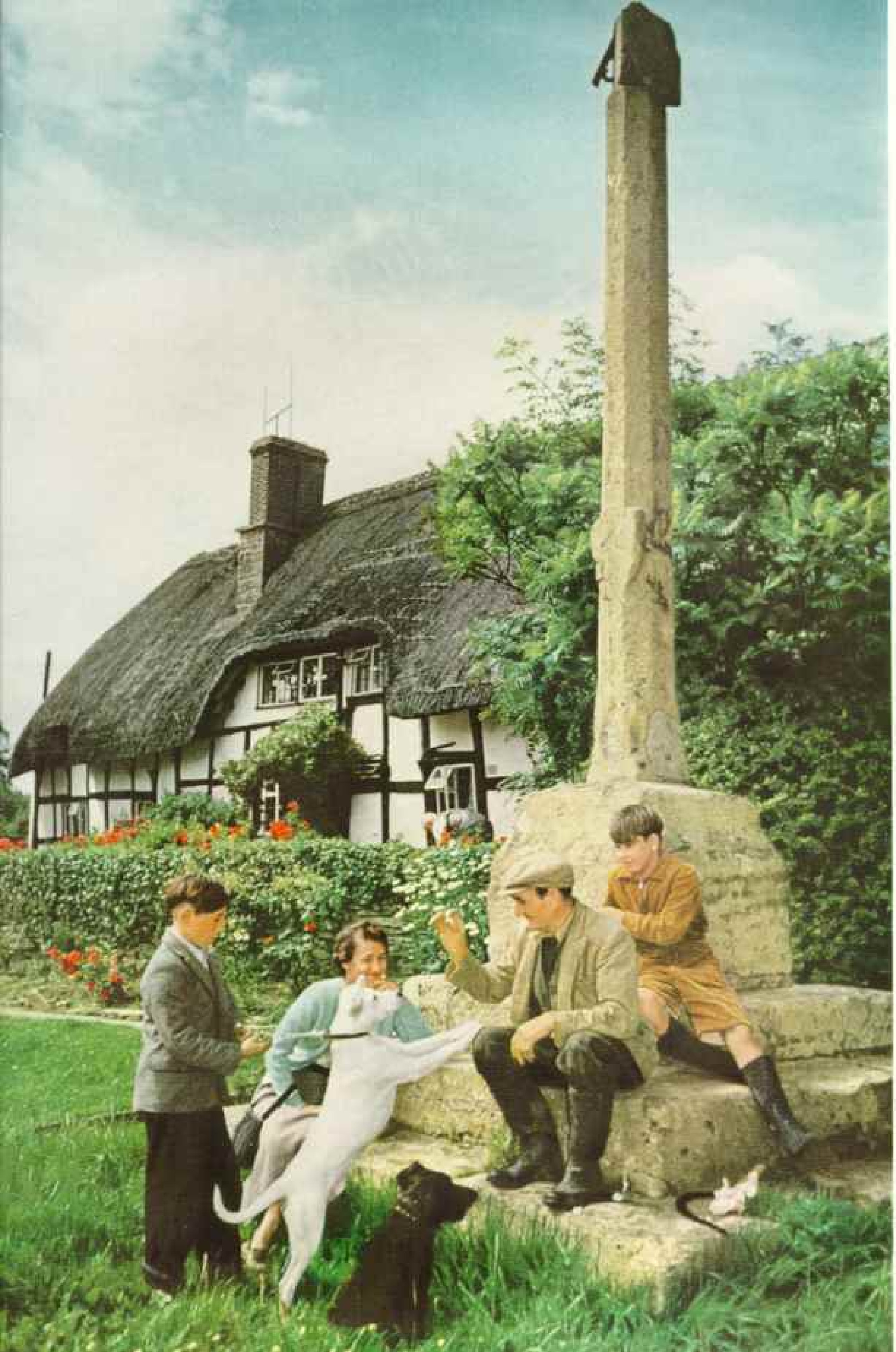


Emily Brontë Staged *Wuthering Heights* on the Wild, Bleak Moors near Haworth

to Whitby turned out to be almost frightening. For 18 miles across the bleak moors there was not a sign of human habitation—only a few sheep grazing in the dense heather and occasional red flags above signs "Dangerous at All Times."

Later we learned that this tract of submarginal land had been used as an artillery range during the war and the warning signs had not been removed.

In Whitby's abbey, Caedmon, "the father of English song," lived 1,300 years ago. The world would know nothing of this poet, who wrote in the Northumbrian dialect, had his



work not been recorded in the Venerable Bede's *Ecclesiastical History of the English Nation*. Bede, born about A. D. 672, lived most of his life at a monastery in Jarrow, 50 miles northwest of Whitby.

On our return journey from Sheffield to London we paused at Elstow to visit the birthplace of John Bunyan, who wrote part of his *Pilgrim's Progress* while in the jail at near-by Bedford (page 323). The ruin of Houghton House, possibly Bunyan's "Palace Beautiful," still stands in Bedfordshire. I recalled Bunyan's words: "Behold there was a very stately palace before him, the name of which was Beautiful, and it stood by the highway-side."

Milton a Controversial Student

Like Oxford, Cambridge University has been the alma mater of many men famed in literature.* Here Samuel Pepys, John Milton, and Lord Byron were educated, and here Erasmus, professor of divinity between 1511 and 1514, worked on his edition of the Greek original of the New Testament and translated it into Latin.

A year later William Tyndale came here from Oxford. His rendering of the New Testament was the first part of the Bible to be printed in English.

The poet John Milton wrote in 1652 of his life at Cambridge:

"There for seven years I studied . . . far from all vice and approved by all good men, even till having taken . . . the Master's degree, and that with praise, I . . . of my own accord went home, leaving . . . a sense of loss among most of the Fellows of my College."

Dr. Samuel Johnson, in his *Lives of the Poets*, records a different story. Milton, he says, was unpopular at Christ's College. "I am ashamed to relate," Johnson writes, "what I fear is true, that Milton was one of the last students in either university that suffered the publick indignity of corporal correction . . . He left the university with no kindness for its institution, alienated either by the injudicious severity of his governors, or his own captious perverseness."

At Trinity College we saw the room where the sportive Byron, we were told, kept a bear. Despite his pranks and wasted hours, Byron published his first volume of verse, *Hours of Idleness*, while yet at Cambridge, and two years later replied to his critics with *English Bards and Scotch Reviewers*.

Cambridge, second in age only to Oxford among British universities, retains a medieval appearance in its colleges. The beauty of its shaven lawns and handsome gardens is enhanced by the Backs on the River Cam, where many of the colleges have boat landings (page 312).

Brighton, the Atlantic City of England, used to be an all-day trip by stagecoach from London (page 296); we drove there one morning in about an hour. I remembered from Thackeray's *Vanity Fair* that Becky Sharp, Amelia Sedley, and their husbands stayed for a while in Brighton before taking ship for France and Waterloo. Of this "London by the Sea" Thackeray wrote:

"But have we any leisure for a description of Brighton? . . . a clean Naples . . . that always looks brisk, gay, and gaudy, like a harlequin's jacket."

The gaudiest thing today in this old seaside resort is the fantastic Royal Pavilion built early in the 19th century by the then Prince of Wales, later King George IV.

Bucks and Corinthians Vied in Dress

During George IV's regency there sprang up rival clubs of young sportsmen who called themselves Bucks and Corinthians. Each tried to outdo the other in dress; their wild extravagance gave rise to the expression, "It takes four tailors to make a man." The saying conveyed no disparagement of the craftsmen, but meant simply that each of the young dandies could keep four tailors busy making his clothes.

Even serious-minded Carlyle took cognizance of the activities of the Bucks and Corinthians; the title of his philosophical *Sartor Resartus* means "The Tailor Patched."

On the coast near Bognor Regis, a few miles west of Brighton, is a home of the

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Page 340

← *"I Loitered o'er Thy Green, Where Humble Happiness Endeared Each Scene"*

In *The Deserted Village* Oliver Goldsmith described a quiet hamlet such as Ashton under Hill. The 600-year-old column, surmounted by a sundial, rises on the village green at the foot of Bredon Hill.

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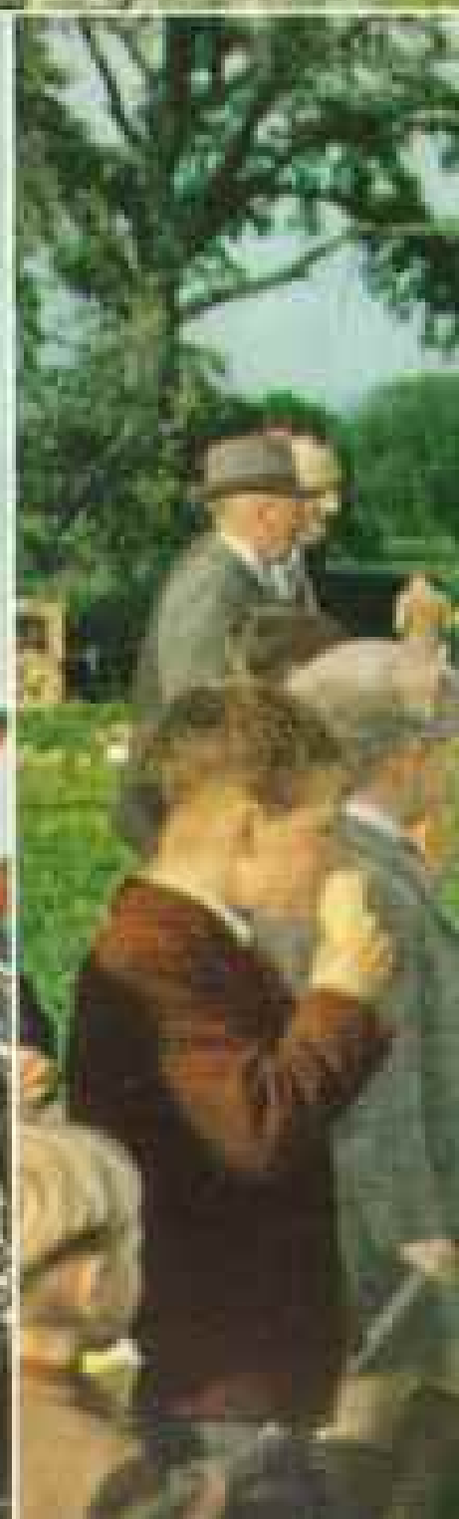
Kodachrome by National Geographic Photographer Kathleen Revis

* See, in the National Geographic Magazine: "A Texan Teaches American History at Cambridge University," by J. Frank Dobie, April, 1946; and "Within the Halls of Cambridge," by Philip Broad, September, 1936.



"Drowsy Beauty of Midsummer . . . Gives Helford River a Strange Enchantment"

To photograph this scene, Miss Revis traveled southward to Cornwall, the sea-washed tail of England. Along the tree-shrouded Helford River she felt a "sense of deep seclusion." Even here at the Porth Navas yacht harbor quiet prevailed.

This remote region gave Daphne du Maurier the setting for her novel, *Frenchman's Creek*, laid "in a century now forgotten, in a time that has left few memories." Then "the river was little known, save to a few mariners" who "found the place . . . a little frightening because of the silence."

In the story the dashing French pirate docked his ship in a Helford tributary near Porth Navas. There he won the love of Dona, the lady of Navron manor.

↓ *"Is My Team Ploughing,*
That I Was Used to Drive
And Hear the Harness Jingle
When I Was Man Alive?"

Thus Housman questions in *A Shropshire Lad* and thus he answers:

Ay, the horses trample,
The harness jingles now:
No change though you lie under
The land you used to plough.

Here in Eyton, Shropshire, bespangled Shire horses prance out for judges in the British Isles Championships for Horse and Tractor Ploughing. This team from Bridgnorth seeks the prize for the smartest rigging after five hours at the plough.

Page 342, lower: A farmer and his team take a bow. Horses wear tasseled ear mufflers to discourage flies.

Quotations above and on page 337 from *The Collected Poems of A. E. Housman*, © 1939, Henry Holt & Company, Inc.

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Kodachromes by National Geographic Photographer Kathleen Revis

erratic poetical genius William Blake. Countless school children have recited his musical "Tiger! Tiger! burning bright."

As we neared Winchester, lines from Tennyson's *Idylls of the King* came to my mind:

> Then rose Elaine and glided thro' the fields,
> And past beneath the weirdly-sculptured gates
> Far up the dim rich city to her kin.

Sir Thomas Malory in his *Morte d'Arthur* identifies Winchester as the mystic city in which Mage Merlin built for King Arthur the mighty hall on the sacred mount of Camelot.

Round Table Hangs at Camelot

Whether built by magic or mortal agency, the Great Hall still stands, and on its courtroom wall hangs a "round table." A Tudor rose painted on the table, possibly during the reign of Henry VIII, casts doubt on its authenticity as the original Round Table of Arthur's court, but some authorities estimate that it is 600 years old. Around its rim are painted the names of the Knights.

From a judge's bench that stands below this table Sir Walter Raleigh was first sentenced to death for treason in 1603.

Although Winchester may not be Camelot, it was once the capital of England and seat of the Saxon kings of Wessex.* Alfred the Great, King Canute, and William the Conqueror all ruled from here, and Saxon kings of more than a thousand years ago are buried in its Cathedral. William the Conqueror had the Domesday Book written at Winchester.

In modern times the city became the "Wintoncester" of Thomas Hardy's Wessex novels. The inimitable novelist Jane Austen, who was born at Steventon, is buried in the Cathedral, as is Izaak Walton. From the little Itchen River the "Compleat Angler" took many a fish, though his book has different settings. W. H. Hudson, the gentle naturalist whose philosophy gave him uncanny mastery over birds and animals and who gained fame with his *Green Mansions*, wrote of Hampshire scenes not far from Winchester.

At Salisbury we visited the Cathedral, an architectural masterpiece with the highest spire in England (page 347). Salisbury was the "Barchester Towers" of Anthony Trollope's novels.

Thomas Hardy portrayed with extraordinary vividness the Dorsetshire country southwest of Salisbury (page 308). In his most powerful novel, *The Return of the Native*, he made desolate "Egdon Heath" the underlying force determining the fate of his characters. "The sombre stretch of rounds and hollows," he wrote, "seemed to rise and meet the evening gloom in pure sympathy, the heath exhaling darkness as rapidly as the heavens precipitated it."

No longer weird, the heath when we saw it had become a proving ground for tractors.

At Plymouth we lodged in a hotel atop the parklike Hoe. Our rooms overlooked the harbor in which the arrival of the Spanish Armada was awaited in 1588. Sir Francis Drake, legend says, was playing at bowls on the green (still in use near our hotel) when he received word of the approach of the enemy. He finished his game before sailing out to meet the Spaniards.†

Near the Barbican, from which the *Mayflower* weighed anchor for America, we went through a house that had sheltered some of the Pilgrim leaders the night before they sailed. In *The Plymouth Adventure*, Ernest Gébler, an Irish writer, gives a picture of the Plymouth of 1620 as revealed by exhaustive research. Although the town was bombed repeatedly in World War II, most places of historic interest remain much as Gébler describes them.

Ponies Graze by Lonely Dartmoor

We drove one gray day across lonely moors, where hundreds of wild ponies roamed, to Princetown. On a height a few miles from grim Dartmoor prison we could look out over the forbidding scene of Conan Doyle's blood-chilling story, *The Hound of the Baskervilles*. I pictured the fearsome dog pursuing an escaped convict among the treacherous bogs and rocky gullies of Dartmoor to the "sheer cliff which overlooked a stone-strewn slope. On its jagged face was spread-eagled . . . a prostrate man . . . the head doubled under him at a horrible angle."

Visitors are invariably amazed that so many dialects can exist in a country as small as

* See "Winchester, England's Early Capital," by Frederick Simpich, NATIONAL GEOGRAPHIC MAGAZINE, January, 1941.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Founders of New England," by Sir Evelyn Wrench, June, 1953, and "Pilgrims Still Stop at Plymouth," by Maynard Owen Williams, July, 1938.

♠ *"Go Thy Way, Little Dove!*
Thou Art the Finest River
That Ever I Saw, and
the Fullest of Fish"

Charles Cotton gives this fisherman's recommendation for the Dove in an addition to *The Compleat Angler* that he wrote for his foster father, Izaak Walton. The two men together often followed Walton's philosophy: "Be quiet and go a-angling."

The sparkling Derbyshire stream with its limestone gorge, known as Dove Dale, has lured more than fishermen.

Dr. Samuel Johnson may have used the dale for the "Happy Valley" of his allegory *Rasselas*; George Eliot called it "Eagledale" in *Adam Bede*. Ruskin found the Dove valley "an alluring first lesson in all that is admirable and beautiful."

In the last century fashionable travelers on donkey back navigated the gorge in silk hats and morning coats. Britain's first national park, opened in 1951, embraces Dove Dale. Here a visitor crosses stepping stones where the river quits the canyon.

➔ Walton might well have approved the technique of this youngster on a stream near Oxford. Fishing with a new pole, he fingers the line like a veteran. The catch: five tiny fish.

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Kodachromes by National Geographic Photographer Kathleen Revis

346

Food-begging Donkeys Roam New Forest Under Protection of the Queen

William the Conqueror claimed Hampshire's New Forest as a royal preserve; today most of it remains uncultivated. The forest provided settings for Frederick Marryat's *The Children of the New Forest*; R. D. Blackmore's *Cradock Nowell*, and Sir Arthur Conan Doyle's historical novel, *The White Company*.

England. Trying to find our way to Ponsanooth, where a college classmate was visiting his boyhood home, I made inquiry of a Cornish countryman near Truro. Neither of us could understand the other. Finally I gave up and got directions at a filling station. Forms of speech seem to change from village to village—Devon, Cornish, Welsh—all equally unintelligible to the visitor's ear.

On the north Cornish coast lies Tintagel Head, site of the ruins of the castle in which legend says King Arthur was born. Everything in the place centers around the fabled king, as does everything in Stratford around Shakespeare. It was as if there were no doubt about the truth of the legend.

Bideford, in north Devon, recalled Charles Kingsley's *Westward Ho!* (pages 324-5). Bideford, Kingsley wrote, "was one of the chief ports of England; it furnished seven ships to fight the Armada . . . And it is to the sea-life and labour of Bideford, and Dartmouth, and Topsham, and Plymouth (then a petty place), and many another little western town, that England owes the foundation of her naval and commercial glory."

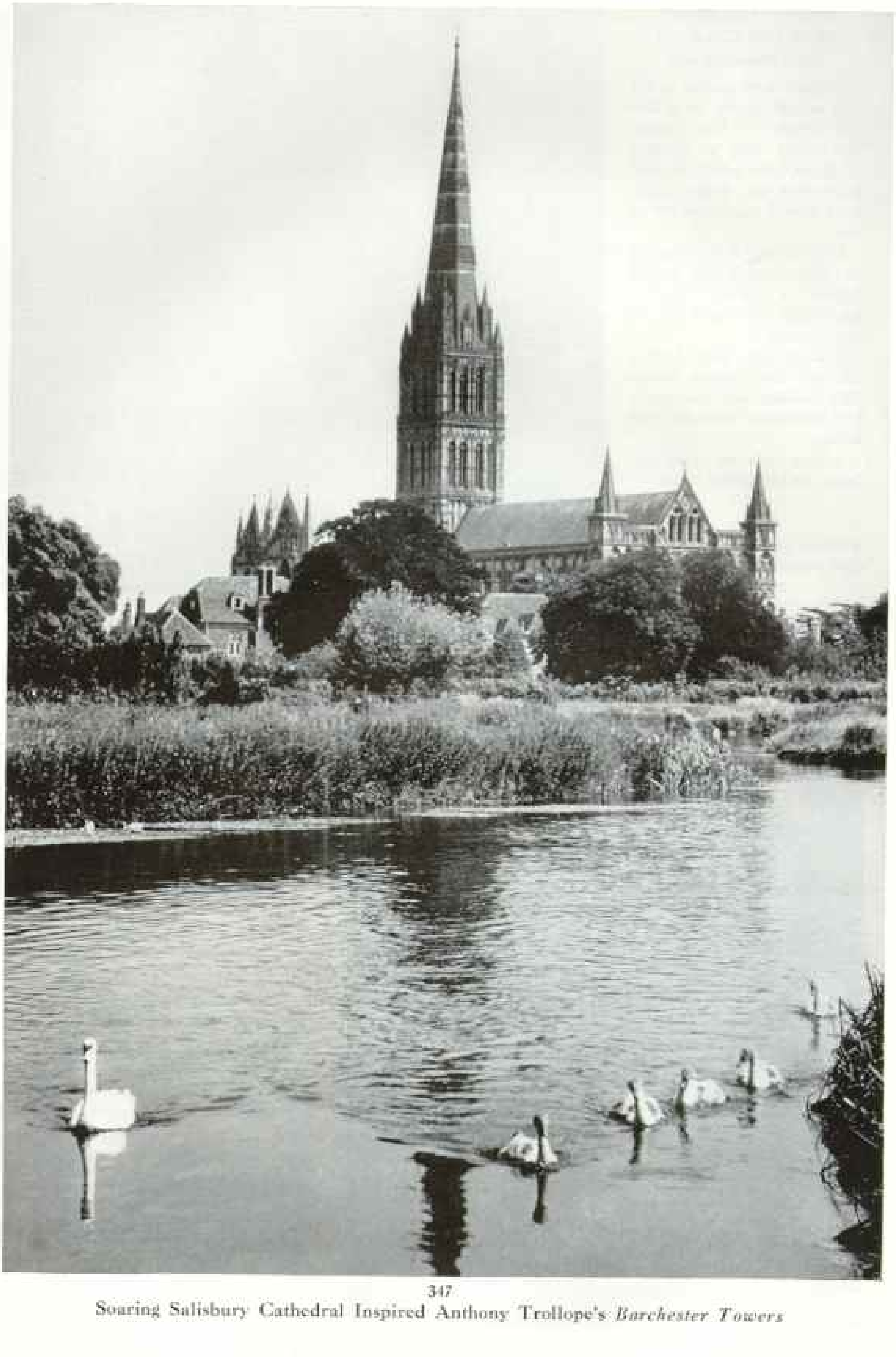
The quaint old town remains as salty as in the time of Francis Drake and the Armada, though it has lost its importance as a port.

In Barnstaple John Gay, author of *The Beggar's Opera*, was born and educated. His masterpiece, popular on the stage for more than two centuries, was shown in the United States two years ago as a motion picture.

Lorna Doone Lives On in Exmoor

Luckily we came to Exmoor and Oare, the glorious Lorna Doone country, before noon of a fine day. R. D. Blackmore, it must be remembered, wrote his famous novel in 1869, and the story took place a couple of centuries before that. Nevertheless, the caretaker of the little Oare Church, where John Ridd and Lorna were married and where Carver Doone wounded Lorna with a shot fired through a window, showed us a broken pane of glass which he jocosely identified as the one shattered by Carver's bullet (pages 326-8).

Coming to Glastonbury, we found the streets crowded with men in clerical garb. The day was the occasion of the annual Church of England pilgrimage to the ruins



347
Soaring Salisbury Cathedral Inspired Anthony Trollope's *Barchester Towers*

Eton's "Dry Bobs" Meet Old Grads on the Cricket Field

Thomas Gray recalled a day such as this in *Ode on a Distant Prospect of Eton College*. "Ah happy hills, ah pleasing shade, ah fields belov'd in vain, where once my careless childhood stray'd a stranger yet to pain!"

Percy Bysshe Shelley headed an Eton insurrection against fagging, a practice requiring lower-form boys to work for upperclassmen.

Eton students each June 4 celebrate their patron George III's birthday with speeches, a boat procession, fireworks, and games.

Rowing boys are called wet bobs; cricketers, dry bobs.

London Times

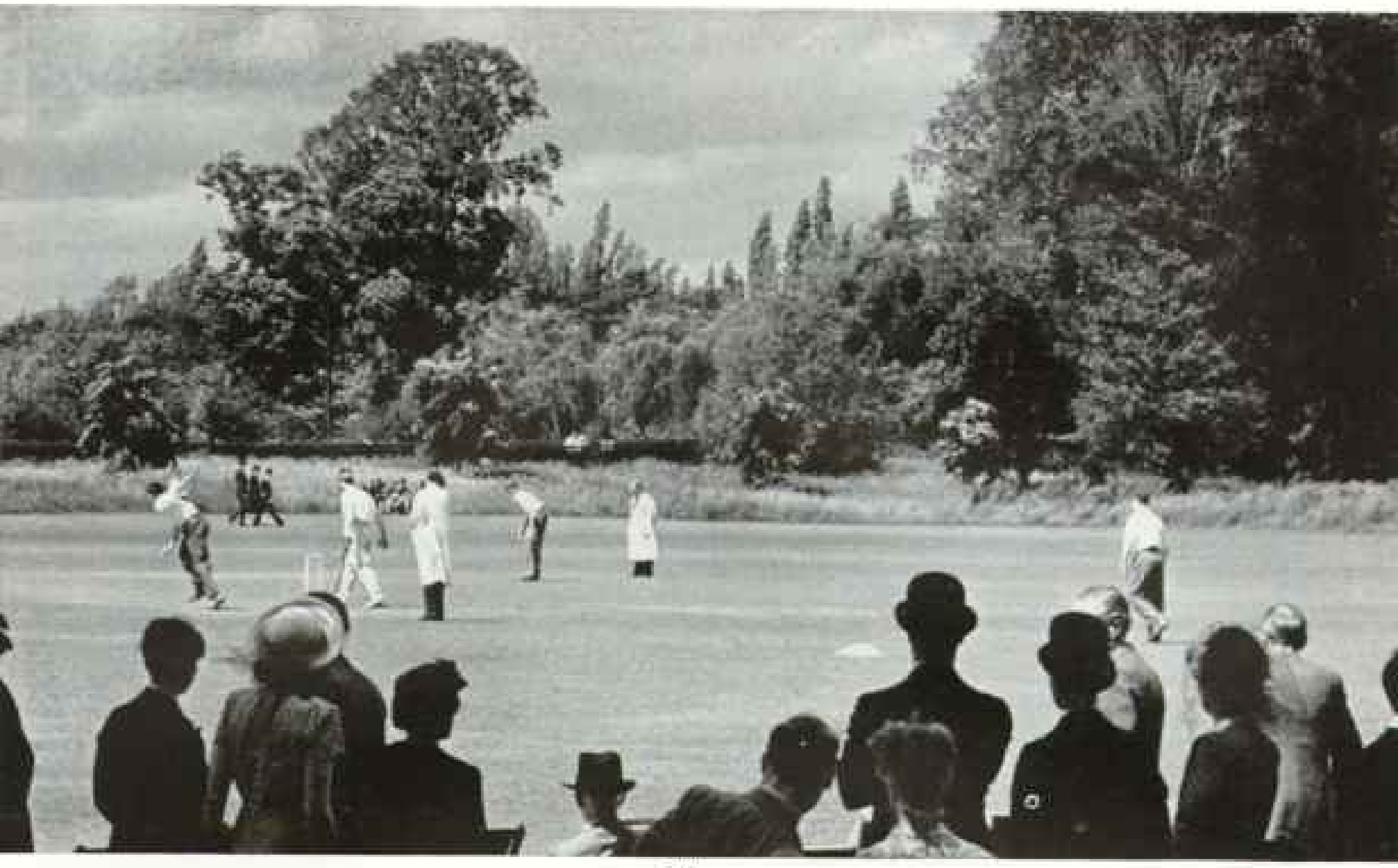
A student in top hat and tail coat watches the play.

Paul Popper Ltd., European

of 13th-century Glastonbury Abbey, which marks the place where Christianity supposedly came to England. Soon after the Crucifixion, legend says, Joseph of Arimathea brought to Glastonbury the Cup of the Last Supper and buried it. He built a church there, the first in England. Where the Cup was hidden, a spring burst forth, the Blood Spring that flows to this day.

Joseph thrust his thorn staff into the ground near the hiding place of the Cup. From it grew the Glastonbury thorn tree. It was hacked down during the Commonwealth, but offshoots, we were told, still flower every year at Christmas, despite the vicissitudes of the years. A shoot from the Glastonbury thorn, planted at St. Albans School for Boys in Washington, D. C., is said to bloom whenever British royalty visits the near-by National Cathedral!

Just in time for evensong at Glastonbury Abbey, we watched a procession of more than 2,000



pilgrims move to an altar set up between the two best preserved parts of the ruin. Bishops, priests, and worshipers, mainly from southern and western England, took part in the ceremony (page 332).

According to legend, Glastonbury was the Avilion or Avalon to which the Lady of the Lake and her black-robed queens bore the dying King Arthur. In very early days, excavators discovered graves believed to be those of King Arthur and his queen.

From Sir Thomas Malory's book, *Morte d'Arthur*, Tennyson took material for his *Idylls of the King*. The Cup supposedly buried at Glastonbury by Joseph of Arimathea was of course the Holy Grail sought by the Knights of the Round Table. Only Galahad actually saw the glorious symbol; Lancelot, most powerful of all the warriors, merely glimpsed it from afar.

In the old Georgian city of Bath we found more literary associations than in any other place in England, London alone excepted. A few doors from our hotel stood one of two Bath homes where Jane Austen lived while finishing her novel, *Northanger Abbey*.

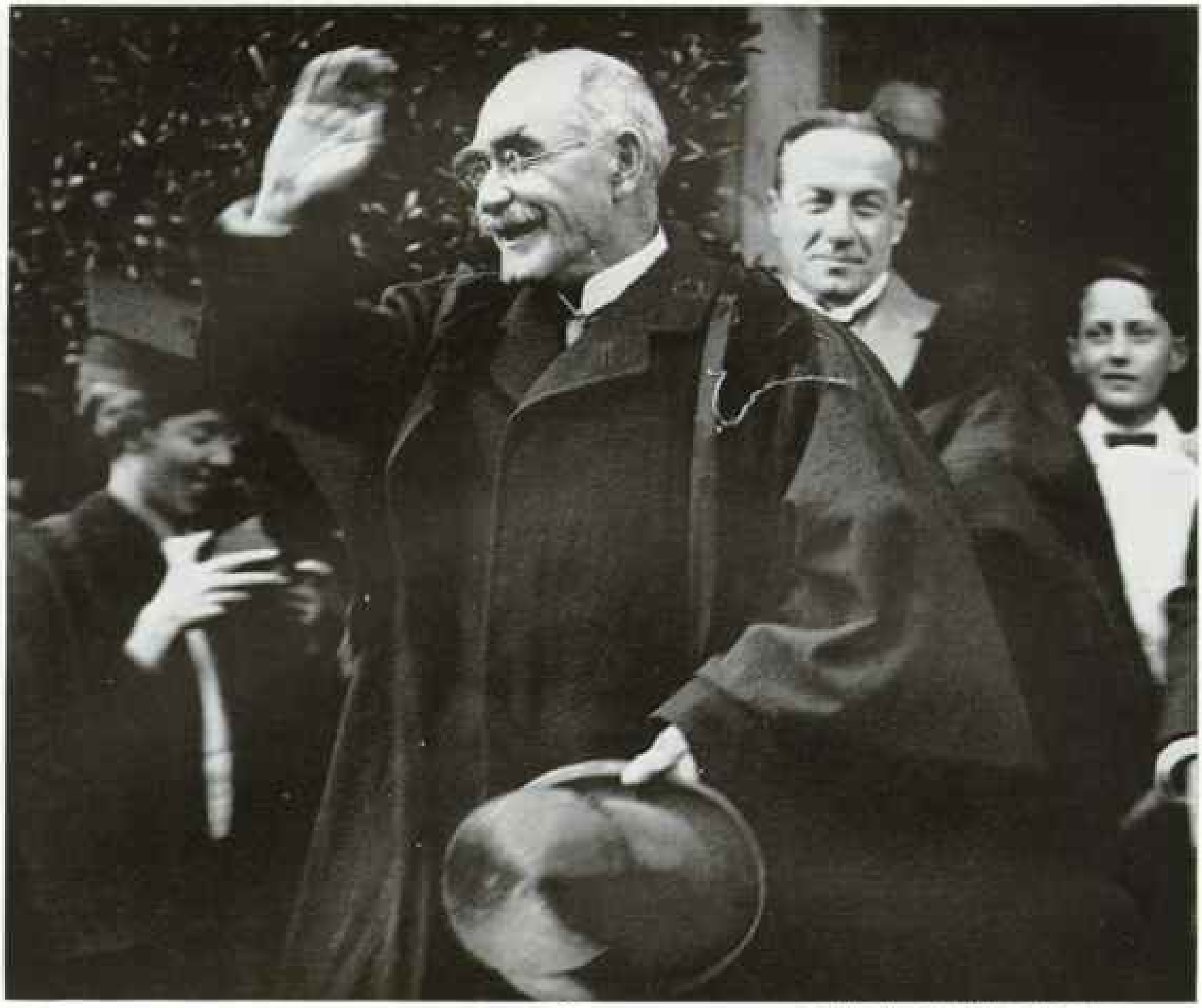
Guided by vivacious William J. Williams, we toured the city from the Roman baths at the bottom of its cuplike location to the heights of its rimming hills. Horace Walpole, the "man of letters," who stayed for a time in Chapel Court, complained of Bath that "In getting out of one's lodgings, one runs one's nose against a hill." We found his statement no less apt today.

In Bath, Sheridan wooed and won lovely Elizabeth Ann Linley, who was singing in the theater. He used some scenes observed in the Grand Pump Room for his *School for Scandal*, and North Parade, across the way, was a setting of *The Rivals*. The artist Gainsborough, who painted Mrs. Sheridan a number of times, also lived in Bath for many years.

Fielding Immortalized a Friend

Ralph Allen and Richard "Beau" Nash were the most important men in early 18th-century Bath, Allen a financier and Nash a leader of the social set. Henry Fielding, a close friend of Ralph Allen, made him the Squire Allworthy of *Tom Jones*, considered by many critics to be the first great novel in English literature. Allen's home on the outskirts of Bath, Prior Park, is now a college.

In North Parade the poet William Wordsworth dwelt in 1841; Oliver Goldsmith, who wrote a life of Beau Nash, also lodged there. The Earl of Chesterfield wrote many of his letters to his son in a house on Pierrepont Street. On the Circus lived an amateur landscape painter who became the "Mr. T."



350 © Holton Press Ltd., Picture Post Library

Rudyard Kipling as an Educator Takes the Cheers of Scottish Students

The University of St. Andrews installed the master storyteller as rector in 1922, fourteen years before his death. Here he is followed by his first cousin, Stanley Baldwin, thrice Prime Minister of Great Britain.

of Tobias Smollett's hilarious novel, *The Expedition of Humphry Clinker*. A few doors away lived the painter Gainsborough.

Mr. Winkle's Predicament

The Royal Crescent, the younger John Wood's masterpiece, considered by many to be the finest architectural crescent in Europe, is rich in literary associations (pages 334, 335). Dickens, Mr. Williams assured us, found accommodation for Mr. Pickwick at Number 4 and set there the adventure of Mr. Winkle and Mrs. Dowler, when the former was left in his dressing gown on the wrong side of the door.

Number 9 is pointed out as the house where Bulwer Lytton, author of *The Last Days of Pompeii*, worked on *The Parisians;* and at Number 15 Sir Percy Blakeney, the Scarlet Pimpernel of Baroness Orczy's popular adventure stories, probably had a hideaway.

The London of Chaucer, Shakespeare, and Dickens had been a perfect place for us to begin our literary pilgrimage. Now in Bath it was time to think of home again.

After a tour of the Lake District, soon to be featured in the NATIONAL GEOGRAPHIC MAGAZINE, we extended our journey into Scotland to visit the haunts of such immortals as Scott, Stevenson, and Burns. But that, as Kipling was wont to say, is another story. Then we bade a reluctant goodbye to this unique land.

It had been a richly rewarding experience, this summer among the shades of Britain's past. For surely no nation has given more freely of its genius to the world of letters, or more lovingly guarded the scenes of its literary triumphs.

For additional material on England, see the NATIONAL GEOGRAPHIC MAGAZINE Cumulative Index, 1899-1954.

This Young Giant, Indonesia

From Sumatra to Celebes and from Bali to Borneo, a New Sense of Urgency Grips the 5-year-old Nation of 3,000 Islands and 79,000,000 People

By Beverley M. Bowie

National Geographic Magazine Staff

With Illustrations by National Geographic Photographer J. Baylor Roberts

EVEN before we could see them, we could hear their laughter. We had been following a straggly dirt road through the highlands of Sumatra above Bukittingi, and as we rounded a clump of sugar cane they came into view—some 60 children gathered on a grassy bank.

They were strung out in a long line from an excavation in the side of a hill, and they were passing rocks along from hand to hand, piling them in a heap beside a shed which had acquired a tin roof but no walls and no floor. They were students and this was a Sunday. Yet they had come together each week end in this way for two months to build their school, and they would continue for another year until it was done.

"In Indonesia," said one of their teachers, "we call this *gotong-rojong*: helping each to help the other."

A nation in knee pants, only five years old last December, Indonesia is relying heavily upon this spirit of mutual cooperation at the village level in its struggle for survival.

By Garuda over the Island Chain

Sixth most populous among the world's nations, and potentially one of the Far East's strongest, the young Republic still staggers under a legacy of economic dislocation and political dissension bequeathed by a decade of enemy occupation, revolution, and civil war. Now, however, it is straightening its back, getting a grip on some of its most urgent problems—especially education—and "helping each to help the other" toward maturity.

In the good company of Joe Roberts, National Geographic staff photographer, I have just traveled more than 10,000 miles the length and breadth of the archipelago, watching Indonesia at work on this vast project of national rejuvenation.*

For two months we were wafted on the wings of Garuda, Indonesia's wide-ranging airline—named, appropriately enough, for the Republic's national bird (page 356). Our travels took us from Timor in the east to Sumatra in the west; where Garuda couldn't go, we penetrated by amphibious plane, jeep, prau, or foot (see the 10-color Map of Southeast Asia, a supplement to this issue).

Inevitably, we explored far more of Indonesia than most Indonesians have ever seen. The people of this new Republic, indeed, are still getting acquainted with their own country and comparing notes at every opportunity on regional manners and aspirations.

No easy job. Their nation is made up of 79 million persons speaking some two-score languages and clustered on 3,000 islands sprawled across the Equator. Superimposed on the United States, Indonesia would reach from the Atlantic to the Pacific.

As Unlike as Cab Drivers and Eskimos

Before we set out, old hands in Djakarta, the capital, warned us: "You won't find one Indonesia but 20 or 30. New York cab drivers have about as much in common with the Eskimos as the Minahassans with the Timorese or the Minangkabaus with the Balinese."

True, up to a point. Yet a few characteristics seemed to us as evident in one part of the archipelago as another.

Indonesians, as a people, are exceptionally graceful, exceptionally polite, exceptionally clean—and in no great hurry.†

Everywhere one gets an overwhelming sense of youth. The roads of Sumatra are as crowded as those of Borneo or Celebes with small armies of boys and girls traveling to and from their teeming schools. Lithe, well-proportioned, and muscular, they walk with heads proudly lifted, as light-footed as dancers

* See "Republican Indonesia Tries Its Wings," by W. Robert Moore, National Geographic Magazine, January, 1951.

† See, in the National Geographic Magazine, "The Face of the Netherlands Indies," 20 illustrations, February, 1946, and "Netherlands Indies: Patchwork of Peoples," 23 illustrations in color, June, 1938, both by Maynard Owen Williams.

353

Fuming Volcano and Hindu Temple Fret Java's Skyline

Above: Hindu princes of the 9th century built the rich Prambanan temple complex near Djokjakarta, on Indonesia's main island of Java. The Dutch began restoration in 1918; the Indonesian Republic continues the work. Elaborate carving decorates this ornate building, one of some 200 lesser structures surrounding a great shrine to Siva. ← Dancers at Surakarta move to the tinkling music of a gamelan orchestra in patterns and gestures stylized centuries ago.

Page 352, upper: Gunung Merapi (Mount of Fire) glowers above rice fields outside Djokjakarta. An eruption in 1954 killed scores.

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—which most of them are. They rarely raise their voices except in laughter and seem never to be out of temper, though when they are, watch out! "Amok," as in running amok, comes from this part of the world, neighboring Malaya.

The most recurrent tableau in the Indonesian scene is of someone bathing. It may be in a roadside ditch, a rice paddy, a mountain stream, a coffee-colored canal, a sluggish mud-brown river. Wherever you find water, you'll find Indonesians in it.

As for their sense of time, they have a word for this, too: *djam karet*, the elastic hour.

This courtesy and this leisureliness are all the more notable when one tries to square them with an uncomfortable fact: Indonesia's monetary standard of living still hovers in the neighborhood of $50 per capita per year.

Perhaps one answer is that in Indonesia's gentle climate such a little goes such a long way. With neither cold nor constant gales to battle, a palm-thatched hut provides reasonable shelter. A sarong and a couple of shirts form a wardrobe. The price of rice is pegged at a tolerable sum, and any small plot will produce bananas, cassava, coconuts, breadfruit, and the like. In a smiling country of two or even three harvests a year, the man on the land doesn't worry too much about budgetary crises.

City Battles Mosquito Menace

Our trip began in Djakarta, which many westerners still know as Batavia (page 358). When Dutch adventurers plunged ashore here in 1619 and founded a trading post, the town touched the Java Sea. Now, with the silting of the rivers, more than a mile of mud flats and fish ponds separate its old red-tiled roofs from the ocean; the new city, chief entry port to Indonesia for air-borne visitors, has spread some 10 miles inland to higher, and somewhat healthier, ground.

As late as 1793, the editor of Lord Macartney's *Journal of the Embassy to China* wrote: "Half the Europeans of all classes who go and settle in Batavia are thought to die before the year is out. Hence, Batavia is like a battlefield or besieged town."

The swamps, canals, and buffalo wallows which bred the deadly anopheles are still capable of producing some three million malaria-carrying mosquitoes per square mile per night, but DDT spraying campaigns are rapidly widening the city's safe residential areas.

If Djakarta remains a battleground, it is chiefly between its 30,000 pedicabs, called *betjaks*, and their chosen quarry, the pedestrian. Propelled by sheer leg-power, adorned with plumes, humming as the wind strikes the rubber bands stretched beneath their seats, and feverishly sounding their bells, the betjak hordes bear down upon street crossers like the chariots of the Assyrians.

Everything Comes to the Front Door

For all that, and despite its monstrous growth to a metropolis of more than 2½ million, Djakarta retains a distinctly rural air. With few high buildings and innumerable avenues of tree-shaded bungalows, it seems a coagulation of crowded kampongs, or villages.

Even down in the sultry business district the swallows fly in and out of the staid banking houses, over the bent heads of the clerks. Barefoot boys shuffle from desk to desk at a plantation pace, bearing trays of tea.

There are shops in Djakarta, plenty of them, but one doesn't have to go to them; sooner or later everything comes to the door. Wandering peddlers, their wares balanced on the ends of bamboo poles, bring not only meat, bean curd, fish, eggs, and vegetables, but pots and pans, furniture, batik cloth, soft drinks, toys, and between-meal snacks. Sitting under a tree outside my room at the Hotel Transaera, an itinerant cobbler resoled my shoes for a few rupiahs.

The mushrooming of the city has, naturally, left it grievously short of housing, as the traveler with no definite hotel reservations will realize as he spends the night on a billiard table or in some broom closet. Most homes are shared by at least two families, and any house left untenanted for long will soon

Page 355

Monsoon Clouds Dwarf a Makassar Prau → Sailing Home from the Java Sea

Old Makassar, chief port of Celebes Island, has sheltered the ships of Portuguese explorers, Netherlands merchants, Arab slave traders, Japanese invaders, and the island's own Buginese pirates. Celebes praus, reminiscent of high-pooped Portuguese caravels, trade through the Indonesian seas for spices, copra, and ebony. With modern freighters and a wide-flung airline, they knit together the archipelago's 3,000 islands.

Seen from Makassar harbor, this ketch-rigged vessel shares the sea with two smaller fishing craft equipped with sails and outriggers.

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356

Crew Members Paint the Hull of an Indonesian Freighter at Tanjung Periuk, Java

Coat of arms of the new nation, the eaglelike, mythical *garuda* rides the bow like a figurehead. Eight feathers in the tail, 17 in the wings stand for August 17, 1945, when Indonesia declared its independence. Crowded Tanjung Periuk is Djakarta's booming modern harbor, soon to be enlarged even further.

be taken over by squatters the government feels reluctant to evict.

To meet the emergency, new, well-planned housing projects like Kebajoran, a suburb of some 7,500 buildings, have been built, and more are on the drawing boards (page 376).

Rice Terraces Clothe Java Hills

From Djakarta eastward to Surabaja our plane traced a course between Java's volcanic spine and the sea. Arrowheaded fish weirs shot out from the muddy shore into the green depths. On the plain beneath, a jigsaw puzzle of glittering paddies surrounded the intermittent tree-girdled kampongs, and against the foothills we could see the rice terraces begin their patient climb.

Surabaja, as we circled over it, seemed another Djakarta but a shade more languid. Originally built, too, around an old trading port, it has spilled over its barriers and spread upriver along the Mas in a maze of red-roofed houses. Beside its intersecting canals sleepy gray carabaos, with rubber shoes tied to their hoofs with wisps of straw, plod serenely before carts with six-foot wheels.

Oil Fever Stirs the Sumatran Jungle

To tap Indonesia's scarcely inventoried wealth of petroleum, American and Dutch crews push their rigs into tiger-infested jungles and build whole towns deep in sultry rain forests (page 375).

This Indonesian team, supervised by an American driller (center) and a French specialist, prepares to shoot a new well near Pakanbaru. A worker loads steel-jacketed bullets into a gun-perforator tool at intervals of about a foot. Lowered to the correct depth in the well, the bullets will be fired electrically, shattering the hard sands and causing oil to flow.

Once the well has been brought in, the derrick will be struck like a circus tent and moved to the next job.

Over the buzzing markets hang bird cages hoisted to the tops of tall poles, safe from discourteous rats, and in between the ever-present betjaks wobble bikes loaded with rattan chairs piled up like Eiffel Towers, yard-long bunches of bananas, or tiered porcelain bowls of soup, rice, and fish.

Perhaps one "statistic" tells a whole story of Surabaja. When the U.S. Information Service there advertised for a typist, it received no applications for weeks. When it called for an artist to make posters, 50 candidates showed up immediately—most of them first-rate!

But our goal lay farther eastward—Timor, half Portuguese, half Indonesian.

Down the long island chain in ancient days the restless peoples of Asia and India had pressed, driving the aborigines before them toward Australia. Timor, last of the Lesser Sundas, represents the petering out of Indo-Javanese and Islamic pressures; here the Papuan—taller, darker, fuzzy-haired, with his heavy nose bridge—has made a stand.*

"There is absolutely nothing to see in Timor," declared our host cheerfully when we reached Kupang, capital of the Indonesian sector.

He was wrong. I shall always remember, for one thing, my accommodations. Taken to what I assumed to be a hotel, I was ushered into a whitewashed room with four wooden bunks, one chair, and one light bulb. I shook hands with a gentleman in pajamas, whom I supposed to be the manager, had some fried

* See "Timor a Key to the Indies," by Stuart St. Clair, NATIONAL GEOGRAPHIC MAGAZINE, September, 1943.

Island Riches Flow Through These Buildings of Indonesia's Capital

Modern Djakarta, which the Dutch called Batavia, bursts at the seams with a population of 2,500,000 people. This is Downtown Plaza. The tile-roofed shed houses police.

↓ The People Greet Their "Veep"

During the Japanese occupation two long-time Indonesian leaders, Soekarno and Hatta, adroitly organized nationalist forces to take over the government when the invaders should leave and before the Dutch could return.

Here Vice President Mohammed Hatta arrives in Djokjakarta, cultural center of Java.

Page 359, lower: President Soekarno patronizes Indonesian arts and crafts; his acquisitions have made an art gallery of the presidential palace in Djakarta.

Soekarno dramatically read Indonesia's Declaration of Independence to his people August 17, 1945, three days after the Japanese surrender to the Allies. Now he serves as interim President, pending national elections.

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Dyes Are Tested for Brightness and Durability in the Textile Institute at Banding

Short of foreign exchange, Indonesia strives to build up home industries. Supervisors for cloth mills all over the country receive training here. This girl dips skeins of cotton into a beaker of hot dye.

bananas and tea, and retired behind my mosquito net.

Next morning I discovered that I was ensconced in the Home for Pregnant Ladies, and that the "manager" was the raja of the neighboring island of Alor, in town for a lung operation.

I remember, too, a conversation later with a local resident as we sat beside Kupang's pair of cracked concrete tennis courts.

"Do you like the hunting, sir?" he asked politely.

"Well, no, not much. Do you?"

"Oh, yes!"

"What do you hunt?"

"Cows."

"Cows! You mean you *shoot* them?"

"But of course I shoot them."

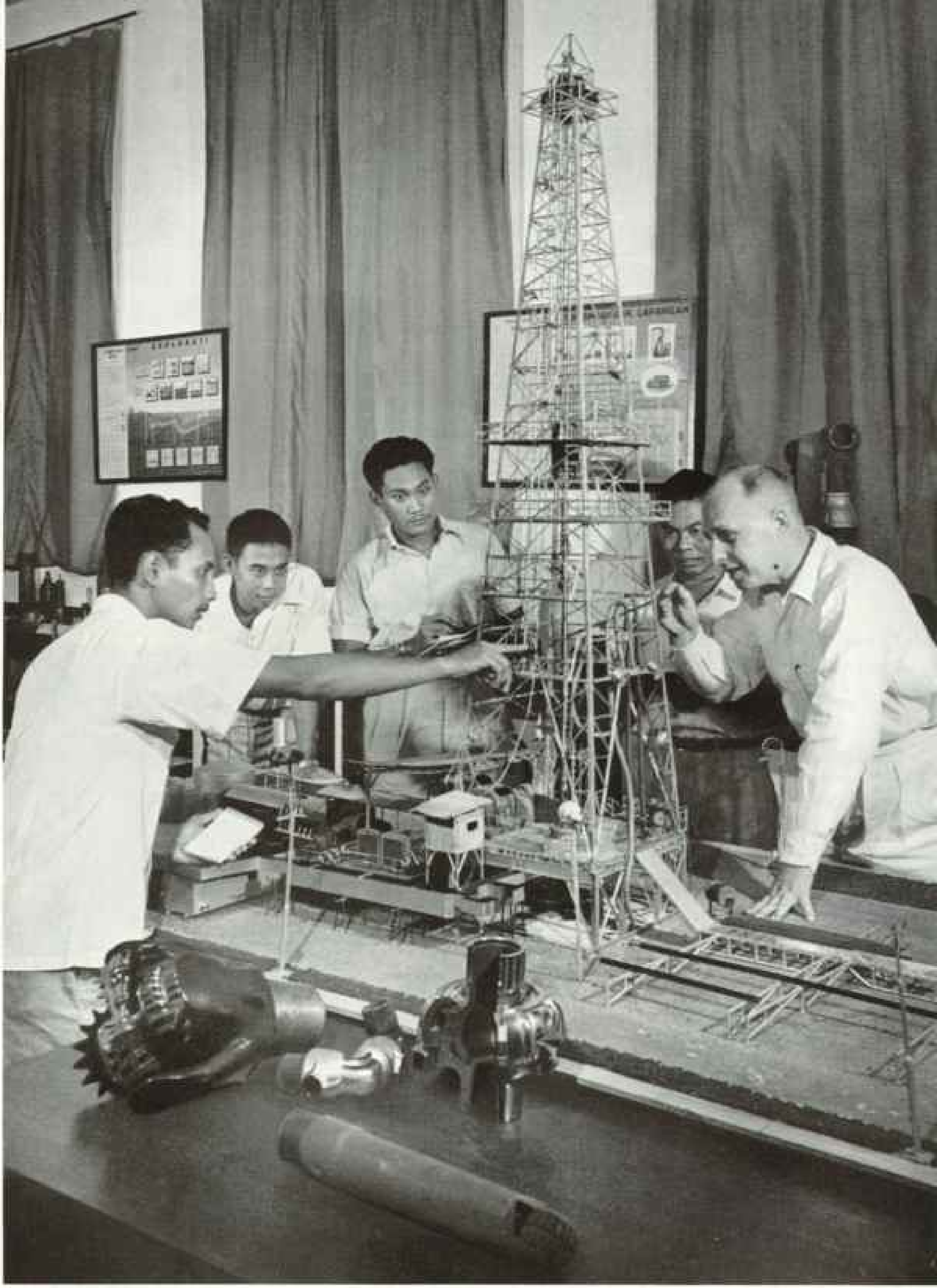
It turned out that he meant wild water-buffalo cows.

The next day, as we drove some 60 miles into the interior toward Bokong, I passed other men after the same game. They were armed with long muzzle-loading flintlocks. This, I readily conceded, was not merely sporting but probably insane. One shot to stop a bovine express train; I would not have felt comfortable with a machine gun.

But the Timorese are clearly a hardy bunch. We saw men toting poles hung with raw meat, others driving herds of domesticated carabaos to market, still others plowing in gangs of 10, each man armed with a stick to turn over the soil.

Up in the hills behind us lived even more primitive types, who wear no clothes at all, sleep under trees, and subsist on a few ears of corn, grubs, and roots. The government now is encouraging some of these isolated mountaineers to come down and live in more compact settlements where they can learn a diversified but simple agriculture.

The west monsoon was exploding jets of spray over the sea wall when our plane took off from Kupang for Makassar, and the few sailing praus offshore heeled over on their



361

Indonesians, Studying a Model Derrick, Learn the Oil Business from a Dutch Instructor

A Shell oil company school at Perabumulih, Sumatra, trains men to discover, recover, and refine petroleum. Last year 24 students were selected by competitive examination out of several hundred applicants. Tools in foreground include a drilling bit (left); coupling (right) has cutaway section to show its construction.

Javanese Experts Help Natural Rubber Fight Its Synthetic Rival

Henry A. Wickham, British plant explorer, carried wild rubber seeds out of the South American jungle and sprouted them in Kew Gardens, London, in 1876. Eighteen seedlings went to the fabulous Botanical Garden at Bogor, Java (pages 364-5).

From those 18 plants grew the Indonesian rubber industry, chief dollar producer for the Republic. One of the original trees still grows, not far from the laboratories in which the Indonesian Rubber Research Institute seeks new uses and improved quality for natural rubber.

◆An institute worker inspects a thin sheet of ribbed rubber. Chemically cured, this sheet neither mildews nor turns rancid. It fetches a higher price than rubber cured the old-fashioned way over a plantation's smoky fires.

◆Other men pour latex into molds to make foam-rubber cushions.

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Photographer J. Baylor Roberts

outriggers, scudding for the harbor. Before long we picked up the green coastline of Flores and swooped low over the famous colored lakes of Mount Mutu (page 373).

These opaque salts-impregnated ponds, set near each other atop a mountain, look like nothing so much as vats of experimental dyes —one iodine in shade, one a light emerald, the last yellowish like split-pea soup.

Bandits Raid Makassar Road

In Celebes, which the Republic has renamed Sulawesi, we became uneasily aware for the first time of Indonesia's security problem. The road to the right of the Makassar airport was unsafe after some six miles; bandits and rebels fighting for "home rule" raided it all too frequently. We took the road to the left, naturally, but even on it we ran into three military check points before we reached the city.

"What do you think they want from us?" asked Joe when we drew up at the first barrier.

"Probably just want to find out if we're pro-Makassar or antimacassar!"

A week or two later dissidents in this area burned more than 6,000 houses in three days of terrorism. And the next month a Garuda planeload of passengers and crew, driving into the city by the same road we had taken, were kidnaped.

In Makassar we drove by the reassuring bulk of old Fort Rotterdam, a fine star-shaped structure with arrowhead bastions and, peeping over its sloping stone walls, a cluster of three-story, steep-gabled Dutch houses.

Along the harbor front flanking the rattan market—Indonesia's largest—we found schooners drawn up, gunwale to gunwale, fit reminders of the maritime skill of the Celebes people.* Before the first Dutch or Portuguese caravels bobbed into these waters, Makassar's great praus were sailing along the Cathay coast to Formosa and west to Madagascar, navigating by the stars with astounding precision.

Blunt-bowed, flush-decked, with a high poop and two long blades lashed to either side of the stern as rudders, the prau is a remarkably able boat. Meals are cooked in a simple sort of palm-thatched hut amidships. A big barrel of water forward of the mainmast, a few Chinese jars of rice and other supplies, a handful of pots and some firewood—these make up the housekeeping arrangements. The crew in their bright sarongs may look like refugees from a Hawaiian hula team, but they know their trade (pages 355 and 367).

I couldn't get to Manado in northern Celebes, but Joe did and brought back many tales of the Minahassan people. Largely Christian, they are well-educated, industrious, vociferously proud of their westernization.†

When the Dutch ruled the Indies, the Minahassans proclaimed their region the "12th Province" of the Netherlands. Coffee, copra, desiccated coconut, and a marked ability at trading earn them a good living. A new $43,000,000 harbor at Bitung with a deep-sea entrance from both north and south, then about half finished, should give their economy a further shot in the arm.

With no direct air route to carry us on from Celebes, we slanted back southwest to Surabaja again and then north over to Bandjarmasin, on the south coast of Borneo (see supplement map).

Britain controls the northern end of Borneo, consisting of Sarawak, Brunei, and North Borneo. The Indonesian part is called Kalimantan. Together, these territories make up one of the world's largest islands and one of the least thoroughly explored. It was easy to see why as we skimmed in across the Java Sea; at 8,000 feet on a bright day the clotted green cauliflower of the jungle treetops spread in a vast blanket to the farthest mountains, broken only by the brown coils of the Barito River and its tributaries.

Busy Boulevard of Water Traffic

Life in Borneo, indeed, is largely river life. Men live on the river, travel on it, bathe in it, die on its banks (page 384).

At Bandjarmasin I stood on one of the many bridges over the Martapura and gazed for hours at this busy boulevard of water traffic. Slim praus hollowed from tree trunks skittered downstream loaded with slabs of rubber, firewood, heaps of green cabbages, rattan, coconuts, charcoal, and geese and chickens. Bigger skiffs with thatched roofs ferried people and cargo from shore to shore.

On sampans built like Noah's ark, Chinese families strung their washing, cooked, played cards. Workmen crawled over the roof of

* See "Seafarers of South Celebes," by G. E. P. Collins, National Geographic Magazine, January, 1945.

† See "Celebes: New Man's Land of the Indies," by Maynard Owen Williams, National Geographic Magazine, July, 1940.

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Cacao-bean Pods Festoon a Tree at Bogor's Agricultural Station

To find which plants grow best in Indonesia, a German botanist started the garden at Bogor in 1817. Around the garden and its laboratories arose a center devoted to problems of agriculture, forestry, animal husbandry, and fisheries.

One such outgrowth is the Indonesian General Agricultural Research Station, counterpart of the United States Agricultural Research Center at Beltsville, Maryland. Among other crops, Bogor's scientists experiment with chocolate-bearing cacao.

↓ A boy tests a giant lily pad in the Bogor gardens.

↑ **Garden Visitors Stroll by a Placid Pool**

Leaves of the *Victoria regia* lily look like platters hammered out of oxidized copper.

365 Kodachromes by National Geographic Photographer J. Baylor Roberts

Fragrant Blossoms and 6-foot Lily Pads All but Hide the Pond's Green Mirror

Orchid and fern, palm and rattan run riot in the rain-soaked soil. Scientists come from afar to study in the Bogor Botanical Garden, which boasts a library, herbarium, and natural-history museum as adjuncts.

a rusty river steamer, slapping on new shingles. In and out among the crisscrossing boats fishermen maneuvered for space to throw their butterfly nets.

At twilight the river took on a different, gentler air. Tiny lamps flickered from the stalls and shops on either bank, and fires glowed on the little praus themselves—floating miniature restaurants they were, with a woman in the stern alternately paddling and tending her skillet.

In the velvet hush of evening the whole town strolled, softly gossiping, laughing, and drinking in the smells of roasting goat meat, fiery *saté* sauce, clove-scented cigarettes, millet cakes, and bananas frying in iron bowls of coconut oil. From behind latticed windows came the tinkle of Chinese music, and from the upper story of a wooden mosque the rumble of Moslems at their evening prayers.

Bandjarmasin and its environs are, in fact, strongly Islamic. At dawn the muezzin's rolling, haunting call to the devoted would awaken me. The rivermen, however, had not waited for this musical alarm clock; looking like mushrooms under their huge conical straw hats, they would be steering their pea-pod craft down the Martapura.

Western Technology on Borneo Oil Fields

Martapura means "Gate to the Diamonds"—found in many of the island's stream beds and panned like gold. But Borneo's 290,000 square miles contain, as well, a good deal of rubber, coal, pepper, and—most important of all—petroleum. In the Indonesian part the oil fields occur around Balikpapan, Sangasanga, and on the island of Tarakan, and are operated by the Bataafsche Petroleum Maatschappij—better known as BPM, a subsidiary of Royal Dutch Shell.

This oil picture is worth looking at for a number of reasons. BPM dominates production in Kalimantan, but in Sumatra it is joined by two American-owned companies, Standard-Vacuum and Caltex Pacific. These three control reserves estimated at more than one billion barrels. The Indonesian government's annual share of the profits is some $60,000,000, a tidy addition to the budget.

But the real story is not financial. It's a heartening example of Western technology meeting Indonesian aspirations halfway.

Take Balikpapan. When the Japanese forces pulled out in 1945, the town and workshops and offices were left in smoking

Prau Crosses a Speedboat's Bow in Surabaja's Outer Harbor →

Page 367: By adding a superstructure to a hull with these lines, builders make the bigger, sturdier prau of Makassar (page 355). Surabaja, long headquarters of the Netherlands East Indies fleet, still ranks as Indonesia's first naval port. Along with the Republic's warships and freighters, swarms of small trading vessels scurry in and out of the old harbor.

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ruin, the refinery towers a heap of tangled scrap, the storage tanks just so many caved-in, crumpled popovers. Today, scarcely ten years later, Balikpapan is operating at full capacity with 4,500 employees handling 2.7 million tons of crude oil a year.

"We had to learn not just to drill and refine and ship oil," said our host, Mr. H. J. Houtman, Balikpapan's genial, pipe-smoking director. "We had to put together a whole society from scratch—from dentists' chairs to slaughter houses, from movie theaters to malaria controls."

He had another problem, too. Years of war and revolution had left many Dutch and many Indonesians with bitter memories. Could they work in harness in the enforced intimacy of a one-industry, company-run town?

Well, they have. I watched Indonesians, Dutch, Eurasians, and Chinese at Balikpapan not only working side by side but playing tennis with each other, swimming, dancing, swapping jokes.

And I saw something even more important: I saw BPM actively pushing its program of "regionalization," by which more and more responsible posts are to be handed over to Indonesians. Already, Europeans at Balikpapan number only about half the staff and a small percentage of the total working force; the figure will drop as the "nationals" gain in experience and training.

This training isn't left to chance, either. W. J. H. Wenselaar, who runs Balikpapan's technical trade school, told me he had 100

(Continued on page 375)

Javanese Girls Package Sugar-coated Quinine Pills →

Quinine no longer ranks as the best weapon against malaria, a mosquito-borne disease that threatens the majority of Indonesians. This Bandung factory has switched part of its production to penicillin and vitamins. While one girl fills bottles, another counts pills automatically by spilling them over a perforated aluminum sheet.

Kodachromes by National Geographic Photographer J. Baylor Roberts

369

Patient Beasts Furrow the Rich Mud of Java

When the plowing is done, women will wade into the muck of the *sawah* and plant rice seedlings by hand.

← Tea Pickers Labor in Waist-high Verdure

Page 368. This tea grows on the Golden Mountain estate south of Bogor.

→ Factories at Surakarta make batik by hand. Wax protects areas where color is not wanted; after dyeing, fabric is boiled to remove the wax. This process may be repeated a dozen times.

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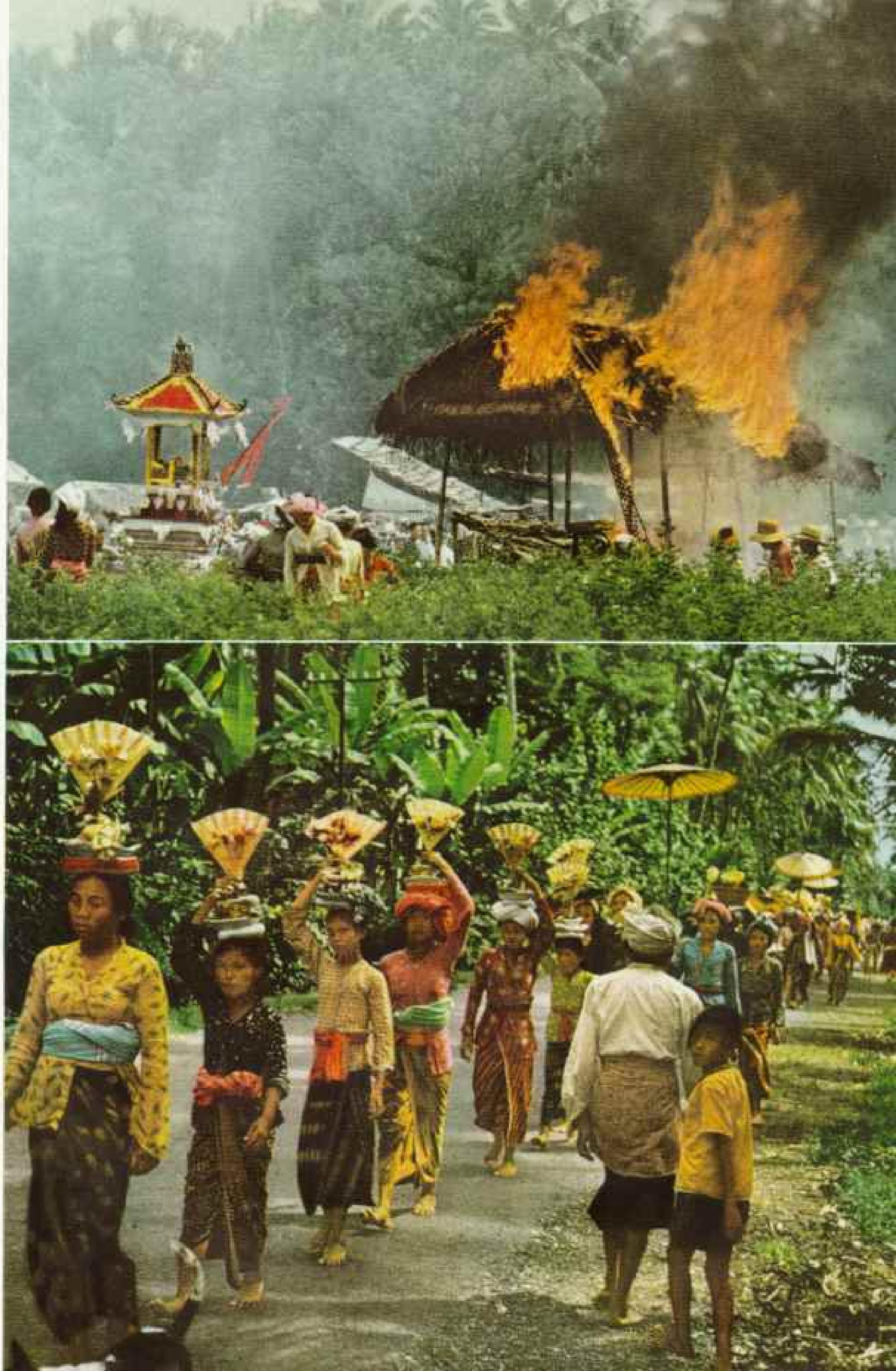
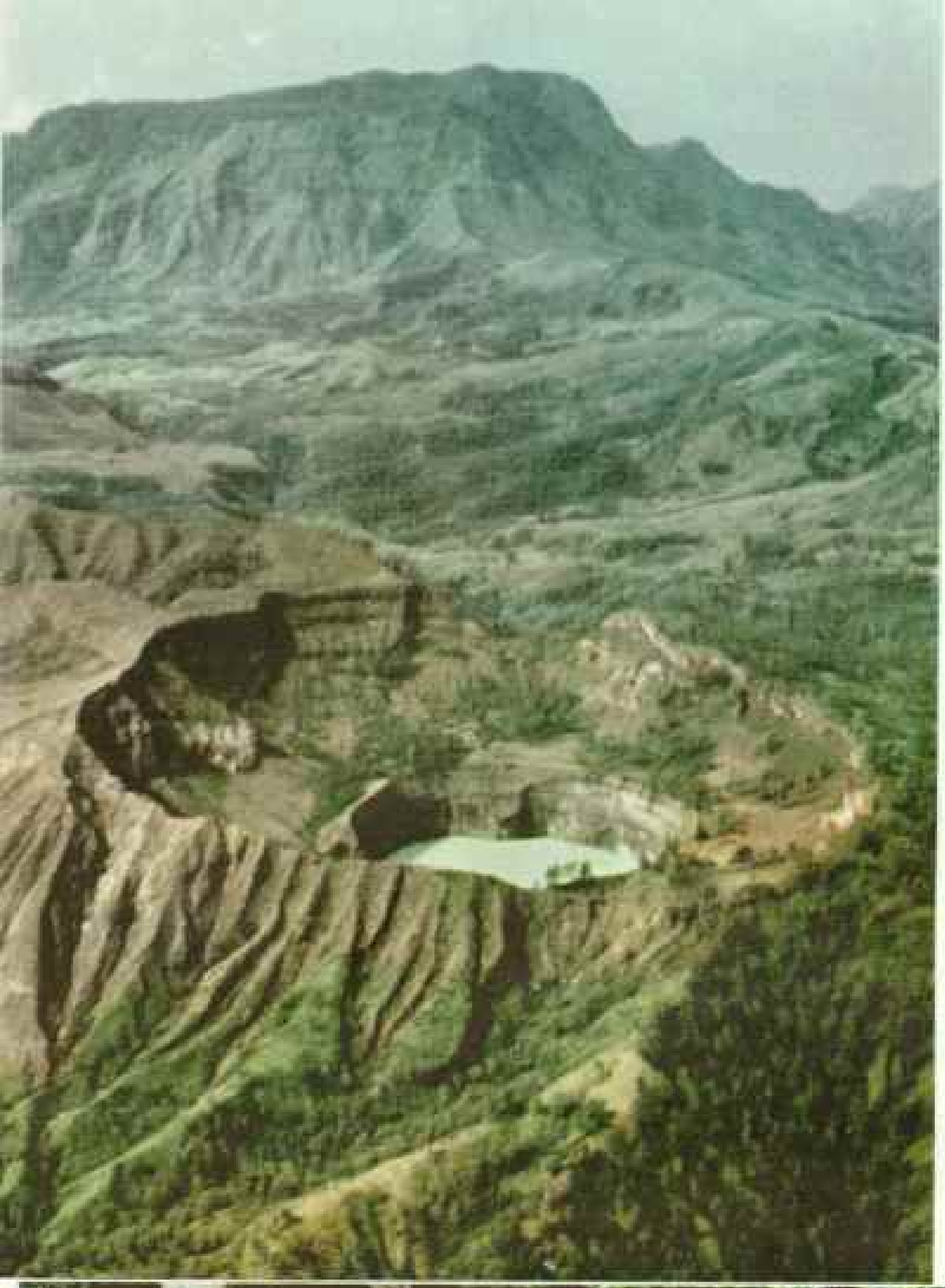
Hindu Balinese Free the Souls of the Departed with a Riotous, Expensive Cremation

Many poor villagers bury their dead until a rich man dies, then share in his costly ceremony. Remains of 1,060 were burned in this cremation near Denpasar. Here pallbearers shoulder a richly caparisoned funeral float. The body in its rough wooden coffin goes into the flames, but every scrap of tinsel and decoration is saved.

➔ Page 371: Women bear food offerings that will be burned on the funeral pyre (upper).





Three Crater Lakes in Color Identify Flores from the Air

The author likens the colored lakes of Mount Mutu to vats of experimental dye. "They aren't very big . . . but they are undeniably weird, staring up at the sky in their flat, quite unrelated colors."

Balinese Cattle Cool Off in a Muddy Brook

Stung by foreigners' tendency to think of Bali as the only beautiful part of Indonesia, the Republic encourages modern ways on the island, while retaining most of its picturesque aspects. But a recent law decrees shirts for Balinese women.

Page 372, lower: This light-hearted group, wearing flat straw hats copied from the velvet headgear of early Portuguese explorers, came over from Roti to work farms near Kupang, Timor.

On Timor's upland savannas roam sturdy ponies and some of Indonesia's largest herds of cattle. Timor men hunt dangerous wild water buffaloes with muzzle-loading flintlock guns. They rank with American cowboys in their skill on horseback.

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Makassar Boy Strips a Flame Tree's Blooms for Sale to a Florist

Gardens from Hawaii to Jamaica and from Florida to South America know the flame tree, or royal poinciana, a native of Madagascar carried around the world in ships.

Village Band Hails a Yankee Tractor

John Muningka, a Celebes farmer, visited the United States in an exchange program arranged by the American and Indonesian governments. Journeying to Wolfeboro, New Hampshire, he so impressed citizens with his desire to help his own people that they arranged to send a gift tractor to his village of Tomohon. Here the tractor arrives, and the band turns out with instruments made from bamboo and sheet metal.

The National Geographic photographer awaited the first tune with trepidation. "The instruments," he reports, "turned out to be so mellow and pleasant, particularly on Western airs, that I asked for encores."

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Kalimantan boys in full-time courses, 140 in a once-a-week follow-up course, and 110 in regular evening classes. In rooms well equipped with modern tools and facilities (many of them designed and built by the students) they learn everything from pipe fitting to electrical welding.

I asked him about work habits. He thought a moment and then said:

"The vital thing is to take the boys seriously. They are always feeling out your mind. If you are honest and straightforward and don't meddle, if you are a father to them but not a patronizing father, then they will accept discipline and work very hard and learn to stand on their own feet. I tell you, I have much satisfaction in these boys. *Ja!*"

Monkeys Whoop over Jungle Camp

In Sumatra, across the Java Sea from Borneo, we saw an American firm tackling the problem of building something out of nothing. Caltex began explorations on a large scale near Pakanbaru in 1935; it found oil four years later, but had to let the Japanese actually bring in the first producing well during the island's occupation. The first teams came back to Pakanbaru in 1949 and found—but let the wife of the operations manager tell how she saw it when she joined her husband a few months later.

"I was fresh from the oil capitals of South America," she said to me with a wry laugh, "and I guess I expected something like that—you know, gay and rather well appointed. I was dressed for it, too: a sheer black frock, white elbow-length gloves, high heels, a cartwheel hat—and two children.

"I got off the plane and took one look at the 'airport'—you remember that shed. Then I was driven down to the wharf and smelled the river and heard the monkeys screeching in the jungle, and I kept telling myself it would be different when the launch reached the camp. It was. It was worse. I just stood there, trying to hold back the tears."

She held them, and held on. Now the Rumbai Camp she lives in could easily pass for a prosperous California suburb.

The monkeys still whoop each morning from the encircling jungle, and huge cicadas, locally termed "buzz bombs," go off like fire sirens under the veranda eaves. But the new houses are spacious, cool, equipped with up-to-date plumbing, refrigerators, and washers. There are schools and a hospital, softball fields and badminton courts, movies, a club, and a commissary. The day Joe Roberts and I arrived, they were christening a beautiful big swimming pool.

Production, backed by an investment of more than $70,000,000, goes forward strongly: it has now reached more than 50,000 barrels daily. It encounters, however, some unique difficulties.

One is roads. In this tropical country, a few score miles from the Equator, Caltex's trucks use snow-tread tires and chains!

"You see, we haven't any gravel, any solid subsoil to build our roads on," the manager of administration and services at Rumbai Camp told me. "We just pound the earth down and impregnate it with oil. When it rains a little, the surface is slick as a hog's back. When it rains hard, we have to rebuild 'em—on the average, about every six weeks!"

Another problem is animals—elephants, pythons, tigers.

"We don't bury our oil pipes around here," the manager said, "and now and again some elephant rips them up. South of here they used to pull down the telephone wires and tangle 'em up like a mess of spaghetti. They liked to scratch their backs against the poles."

Almost a Snake Dinner

As for pythons, a BPM team was out in the bush one night when a shriek brought them tumbling from their tents. They counted noses. One short. Rushing back into a tent on the edge of their bivouac, they found the missing member being crushed on his cot in the coils of a 25-foot python. The snake was already biting the man's head happily in anticipation of a good meal.

One of the party snatched up a machete and whacked the python loose—in time. Perhaps the oddest aspect of the story was its conclusion: the man on the cot went calmly back to sleep that same night!

Pakanbaru, though, has some tales of its own. Just before Joe and I arrived at Rumbai, a tiger had chased an oil-well crew up into the rig. A geologist and a driller happening by in a jeep after sundown heard their yells and investigated. The driller was scanning the tiger's tracks by flashlight when his friend shouted: "Watch out!"

He straightened—and a tawny blur shot past him. The tiger bounded back. The driller cracked it over the nose with his flashlight and gained a few yards back toward

Horace Bristol

Surveyors Scan Djakarta's New Satellite City

An acute shortage of engineers, scientists, and skilled labor hobbles the Republic's ambitious construction plans. Swollen Djakarta has achieved partial relief with the building of suburbs like 7,500-home Kebajoran, reputedly the largest government housing project in Southeast Asia.

the jeep. The tiger came on again, and got the driller's tin helmet in its face. With one more spurt the driller leaped aboard the jeep—which wouldn't start. All he could do was blow the horn frantically until his companion finally revved up the engine and they decamped.

An hour later they were back with a colleague who had a rifle. He located the tiger along the trail to the water hole and shot it.

Sumatra is more than a big outdoor zoo and an oil concession, however. Its nickname is "The Isle of Hope," and that's just what it seems to overcrowded Indonesians.

"Sumatra," said Consul Bill Kelly flatly to me in Medan, "is Indonesia's future. It's more than three times the size of Java, and has only a fourth as many people. It's got everything: coal, oil, rubber, tea, coffee, tobacco, water power, plenty of fertile land—and a vigorous, independent native stock.

"Development won't come overnight, though. There are the same problems here as in the rest of Indonesia: shortage of foreign exchange, pitifully few trained technicians in any field, and insecurity on the big plantations. But come it will. You watch."

I began to think so, too, after visiting a new factory in Medan started by an Indonesian veteran with a government loan. His 600 girls recruited from Batak villages turn out two million T-shirts a year on modern machinery. Amount of the loan: $68,200. Present value of the factory: $333,000.

The Republic of Indonesia, obviously, can do much by her own efforts. And with some of the West's know-how she can make those efforts far more productive.

"Take agriculture," said Ambrose Lewis to me one day as we looked over a tractor station outside Medan—one of 13 which America's Foreign Operations Administration, now renamed International Cooperation Administration, helps to maintain in Indonesia. Lewis, a huge, wide-smiling agricultural engineer, has worked in Sumatra for two years.

"Indonesian farmers thought they were doing pretty well if they got 15 bushels of corn to the acre. Well, FOA has introduced some Central American varieties that increase this yield as much as 300 percent with a small amount of fertilizer. What's more, the new corn is considerably more nourishing.

"Or rice. About a quarter of Java's farmers are using our improved seed and getting 20 to 30 percent higher yields. Now we're trying it out in Sumatra.

"Here's something else to chew on: Every year the rice borer destroys an estimated 25 percent of Indonesia's rice in the paddies.

"The FOA entomologist who came here a year ago found the farmers didn't know what to do about it, and couldn't afford it if they had. Now he's designed insecticide equipment the farmer can make for himself for less than 20 cents, discovered a source of supply in the tons of tobacco dust the cigarette factories were throwing away each year, written two texts on insect control for extension workers, and plans to import Japanese, Indian, and South American parasites to prey on the borer."

Such work goes on unobtrusively, almost beneath the surface of Indonesian life. Starting out from Medan into the Batak highlands around Berastagi and Prapat, we came upon villages seemingly as unscathed by "progress" as any anthropologist could wish. Many of Sumatra's 1,500,000 Bataks have felt the influence of the Lutheran missionaries who pressed up into this savage area in the middle of the 19th century. But in remote pockets, life follows immemorial patterns.

"Beefsteak" in Two Flavors

Our road led up through exquisitely contoured paddies, groves of oil palms and rubber trees, and finally into forests of pine hung with trailing orchids. The mountains above us were wreathed in cloud, but the air after the moist plain seemed fresh and astringent.

In Berastagi, busy with gaily painted, two-wheeled horse carts and loud with the music of carriage bells, we stopped for lunch at a Chinese restaurant whose walls were papered with old issues of a Kansas newspaper.

"Some beefsteak?" asked the proprietor.

Veterans of Indonesia's War for Independence Learn to Assemble Radios

This rehabilitation center at Surakarta not only prepares amputees for a productive life but fits them with ingenious artificial limbs. The student at right grips a radio condenser with a forearm claw.

"Beefsteak! Say, that sounds fine."

"You want chicken beefsteak or pork beefsteak?"

We settled for chicken beefsteak. Not bad, either.

Several miles past Berastagi we followed a winding dirt road to a village nestled beneath a lava-scarred volcano. Some 1,500 Karo Bataks lived here in their huge, stilted, black-thatched houses with the fore-and-aft peaks (page 388). Small pagodalike buildings topped by carved bulls' heads at the four compass points held the bones of Batak chiefs.

Without the palm tree, a village spokesman told me, the Bataks would be lost. Its fibers make their thatch, its juice their liquor and their sugar, its leaves their decorations, its stems their brooms, its branches their ax handles, its trunks their pipes and timbers.

While a horde of small boys wearing their sarongs toga-fashion followed Joe about with clamorous curiosity, I climbed up onto one of the threshing platforms and watched the women of the village pounding their rice in hollowed trunk troughs and winnowing it by tossing it on trays and letting the wind blow the chaff away.

Over on the porch of one hut I could see a blind boy sitting, wild-haired and grinning, as he spun yarn from a great heap of sisal and sang quietly to himself. An old man took the yarn, tied three strands to a pole in the yard, and skillfully plaited it into rope.

Snapshots Reveal Batak "Progress"

I wondered whether any aspect of life had changed here for 300 years. And then I made my way up a series of ladders into the pitch-black, musty interior of one of the houses. A crone chewing a plug of *serih*, a mixture of nuts, leaves, and lime, opened a sort of loop-hole under the eaves, and I could discern an open hearth with a cat dozing in the ashes, a few pots, a few sleeping mats—and some snapshots tacked to the wall.

I looked at them closely, and the woman pointed at herself and said proudly, "*Anak-anak*. Children. Mine."

Possibly, I thought, things *are* changing a little more than first meets the eye. For the pictures showed a girl and boy in Western dress seated in a snappy, chrome-resplendent, late-model convertible!

From Medan we flew to Padang on Sumatra's west coast, with the pilot obligingly dropping down over Lake Toba to give us another view of Prapat, the resort in which we had passed a pleasant day and night.

Scenically, Toba can stand up to Lake Maggiore or any of Europe's noted watering places. Its great 1,700-foot-deep lake covers more than 685 square miles and has an island in it of almost 250 square miles. Red-roofed cottages and resthouses are set down along the shore amid a profusion of poinsettias, crepe myrtle, and bougainvillea (page 386). Fishermen skim about in slender praus, angling for the big golden carp which Toba produces, and an occasional aquaplaner adds an incongruous touch.

Middle Class Emerging in Padang

Padang, capital of the Minangkabaus, gave us an immediate impression of vigor and high morale. This Islamic people has equipped Indonesia with some of its sturdiest and most progressive leaders—men like the late Hadji Agus Salim (The Grand Old Man of Indonesia), Vice President Mohammed Hatta (page 358), and Soetan Sjahrir. Their region is one of the few in which a native middle class seems to be emerging, confident of its capacity to compete with the ubiquitous Chinese.

With none of the usual torpor which envelops Indonesia's smaller airports, Minangkabau merchants assailed us as soon as we got off the plane with offers of old krises, spears, snakeskins, and tiger pelts complete with toothy, grinning skulls. On the streets we missed for the first time the bell-clanging, Chinese-owned betjak; instead, *bendis* jogged along, pulled by tiny pomponed horses considerably outweighed by their passengers.

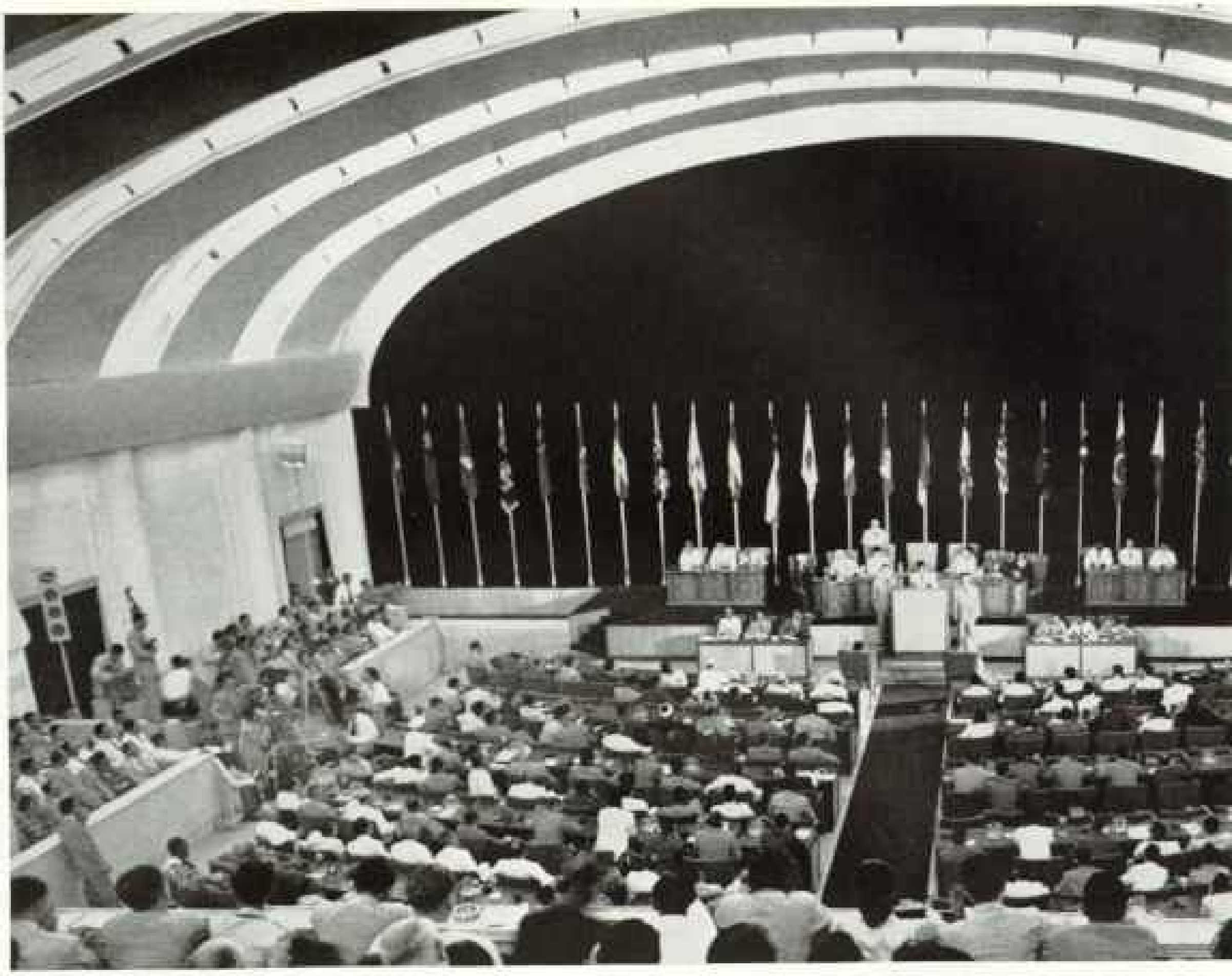
We passed up these charming little jaunting cars, however, for a Chevrolet able to get us up the 60-mile stretch of highway to old Fort de Kock, now called Bukittingi. Some 3,000 feet high, this town is situated among some of the handsomest valleys of the archipelago—and some of the wettest. We had a rare break in seeing the sun several times in our three days there; rare, for Mount Singgalang a few miles away has hung up an indicative record: it gets 320 days of rain a year, with a mean relative humidity of 93 percent!

Despite this damp reception, Bukittingi has other things to offer a visitor. Among them are its richly carved, saddle-backed houses with overlapping roofs; its great communal *balai*, or council chambers, to which the villagers are summoned by thumps on a 20-foot

379 George Rodger, Magnum

Balinese Dancer Spins into the Sash of Her Temple Costume

Dancing in Bali is as much a part of day-by-day life as religion. Those who reach the peak of artistry are excused from other work. Arrayed in brocades stiff with gold, her hair crowned with a jeweled helmet and her face dusted chalk white, this girl will look like a flower but dance like a flame.



drum made of a tree trunk; and its pools.

I lost count, but I am reasonably sure that the Minangkabaus have more swimming pools per capita than even the Californians; the route down to Padang is lined on both sides with rectangular concrete tanks used impartially for breeding fish and for bathing.

Cradle of Javanese Culture

The first visitor to the Surakarta and Djokjakarta region of Java that we know much about was a chap called Pithecanthropus, a rather simple-minded prehistoric cousin of ours related to the Neanderthal family on one side and some apes on the other. He left a few bones, discovered by a Dutch scientist in 1891-92, but no journal, diary, or other observations.

I have been to this area more recently and can at least relate how it struck me. It would be too much to say that it hasn't changed since Pithecanthropus checked in, some 500,000 years ago; but certainly it possesses, more than any other section of Indonesia I saw, an air of serene antiquity.

Here are the gray monuments of an ages-old civilization: the Buddhist temples of Borobudur and Mendut, the magnificent Hindu shrines of Prambanan (page 353). Here, too, as Indonesians rarely tire of pointing out to foreigners, is the cradle of Javanese culture —the center of the shadow-puppet plays, the *wayang* dances (page 352), the gong, drum, and flute music of the gamelan.

Ironically, Djokjakarta, a city of some 295,000 people, is known today as much for its modern, democratic sultan as for its archaic glories. Hamangku Buwono IX, a vigorous man in his early 40's, is still guarded by men with wooden spears and approached by his courtiers almost on their elbows. He keeps some 300 dancers and female relatives in quarters to which he alone has access, and has his tea and cigarettes brought to him under a vast yellow umbrella.

Yet this same man defied the Japanese occupation forces, worked for Indonesian independence, sends his children to public school, drives his own car (with a perfectly ordinary license number), changes his own tires, and spends a great share of his time on measures for economic reconstruction.

Bandung Conference Shows the Flags of 29 Asian and African Nations

In an unprecedented assemblage, delegates of countries from Liberia to Japan met April 18, 1955, in Java's most modern city. Christians, Buddhists, Moslems, Hindus, and Communists sat down together and discussed economic and political problems. Here Indonesia's President Soekarno presides (page 359).

Nitzia Deskalo

Few men in Indonesia have as high a public reputation.

In neighboring Surakarta, also known as Solo, I visited the *kraton* or palace of a sultan whose tenure of office seemed a good deal less assured. Paku Buwono XII (Nail of the Universe) must await the decision of a newly elected Parliament as to whether he shall retain his kingly role or discard it for some less lucrative profession. "Sultans," as one citizen remarked to me somberly, "are very expensive."

Mirrors hung everywhere in Paku Buwono's palace, to remind one to look into his soul and purify it. I looked, and found in myself a keen appreciation of what Paku Buwono might be giving up.

For one thing, there's the drowsy peace in his courtyards. His reception rooms have no doors, not even walls; blue-tiled and spacious, they open out onto shady quadrangles of neatly swept sand. The tinkle of gamelan music drifted across to me from one quarter, the murmur of girls rehearsing the wayang from another.

In the library scholars sitting on mats pored over old stories of the Madjapahit period depicted on strips of coconut fiber. In the museum an attendant carefully dusted the sultan's two dozen golden arrows, his fully caparisoned wooden horses, his collection of masks; outside, beneath a slender tree, a sentry dozed beside a musket taller than he.

I looked in, later, on a puppet-maker's shop across a brook on the outskirts of Surakarta. The proprietor's eyes looked a bit bloodshot; he not only manipulates his puppets against their lamp-lit screen but supplies the running narrative for their adventures, drawn from Indo-Javanese legend. The night before, it turned out, he had been reciting from 11 p.m. till 6 in the morning!

Batik Makers Wax and Dip

Another distinctive Surakarta industry is batik making. In a labyrinthine "factory" of stone-floored rooms heavy with the smell of hot wax and wood fires, about 100 men and women were making the dyed and printed *kain* worn as sarongs by most Indonesians.

Except for the use of chemical dyes now imported from Germany, Japan, and the United States, the process can have changed little for centuries. In essence, it calls for stamping on the cloth by hand, in squares, the design it is to have, waxing those parts that are not to be dyed, dipping in the dye, and then removing the wax. Each piece of batik may have to be rewaxed and dipped 12 to 15 times and takes at least 10 days to finish (page 369).

I walked through the shop with a sense of having slipped back into the Middle Ages. Groups of four and five women squatted around each little stove, using the same pot of wax. Men selected stamps from long racks, bent over their cloth, and sang snatches of wayang. Other workers fed the boilers with logs and plunged their steaming bundles into the hot vats. Everyone seemed bathed in brown dye; the very air seemed brown.

I had saved Bali for the last. Many Indonesians are chagrined at the lopsided adulation which this one island out of their 3,000

has received from foreigners. I can give them no comfort. Honesty compels me to record that if, by some mistake in schedules, I should ever arrive in heaven, it will seem, after Bali, a distinct disappointment.*

Naturally, those who do not particularly care for a landscape as poetic and softly modeled as Tahiti's or a people for whom art and religion, inextricably entwined, contain the whole terror and beauty of life, will be quite unmoved by Bali. They would be quite unmoved by heaven, too.

Stone Demons Guard Author's Cottage

My cottage was on the beach below Sanur, southeast of Denpasar. It was roofed with *alang-alang* grass, walled with palm mats, and floored with bamboo strips through which the sea breeze blew gently at night. Above me nodded coconut palms; around me grew a mildly controlled riot of tropical flowers which we called a garden. Here and there along the coral paths stood small stone gods and friendly demons with scarlet hibiscus tucked behind their ears.

Before dawn I would be wakened by the laughter of fishermen going past by lantern light on their way to the reefs. A little later there would be the splash of early bathers, and then I would see the girl who each morning padded silently about with a tray of little offerings, refreshing the flowers and leaving gifts before our household shrines.

Presently the light, swift notes of the bamboo *ting klik* would tell me that one of the boys had abandoned the making of breakfast for a moment to try to recapture a tune he had heard the night before.

By day I would sometimes watch Bali's painters and sculptors at work. At Ubud, in a bare studio beside a rocky, fern-draped gorge, men like Dewa Njoman Lepet and Ida Bagus Made would sit for hours on the floor before their easels, quiet, contemplative, and yet amused, creating their vivid, crowded canvases of village life.

Bali's sculpture, you might say, owes its vitality to its mortality: the soft *paras* stone of which the temple gods and bas-reliefs are made crumbles before long, and each generation must renew its heritage—not merely stand back and admire the old masters. This is responsible, too, for some strange anomalies. On many a seemingly timeless wall one can find carvings of airplanes and motorcycles.

Often on these expeditions I would encounter a procession. It might be a village taking its deities down to the sea for ritual purification or it might be a great festival of the rice goddess, such as we saw once at Ubud.

Down the mountain wove in single file a chain of more than 600 men and women and children, a rivulet of color. Little boys came first, carrying tall, thin banners of white and red, shaped like goose quills. Their sisters followed, on their heads sheaves of rice decked out with flowers. The women next, with larger offerings, and then the men wielding two-handed swords and spears, guarding the arklike shrines of the gods themselves, and last the benevolent, comic figures of the tiger and the bull, monsters of papier mache.

As the gongs and drums crashed, the parade wound along a steep path and then across a swaying 40-foot-high bamboo bridge. Beyond lay an exquisite temple set at the confluence of two rivers, upon an island of emerald turf and lofty trees. There may be lovelier places to worship. I just don't happen to have seen them.

Music and Dance Typify Bali

Evenings, we would often dine under an arbor by the sea, and, if we were celebrating, listen to a *barong* group beating out its strong, masculine music on gongs and drums. Later we might walk or ride in the moonlight to some village which would be holding a *ketjak* or a *djoged* dance. It was at such a small kampong—Saba—that I first saw Ida Bagus Oka perform.

We had been the guests of Anak Agung Gde Raka, younger son of a local prince, at a "rice-table" in his compound. It was his group which was to dance, and after we had finished our coffee we could watch him help to make up his dancers.

Their dressing room was a small open porch, their light a gasoline lantern hanging from a pillar. Anak Agung would take a girl's grave little face in one of his big hands and with the other darken the eyebrow line, using a palm twig dipped in diluted charcoal.

We had picked up Ida Bagus Oka, a slight unimpressive youth in slacks and a blue shirt, in his own village and brought him with us to Saba. Now we saw him gradually transform himself before our eyes into a splendid

(Continued on page 391)

* See "Bali and Points East," by Maynard Owen Williams, National Geographic Magazine, March, 1939.

Borneo Children Learn with Pencil and Slate

Indonesia sprang to statehood in the atomic age with few knowing how to read or write.

Before tackling the school problem, the Republic had to create a common language based on Malay to replace the 40 tongues, the alien Dutch, and the overly simple "market Malay" with which the people communicated. Many Indonesians now speak the new language, but textbooks are scarce.

In spite of language troubles and the shortage of teachers, children like these in Pontianak swarm to schools by the millions.

Solemn Faces Greet → Teacher at Recess

A generation ago this girl would have been lucky to get a few years of elementary schooling. In her early teens, custom would have returned her to the home and marriage. Now she may pursue her education, along with her brothers, as far as her talents will take her.

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Kodachromes by National Geographic Photographer J. Baylor Roberts

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Pontianak Has a Borneo-style Traffic Jam. Chinese Dominate Canal Commerce

To Pontianak's amphibious people, this watery street serves as swimming pool, fish pond, highway, and theater with an ever-changing cast. Its daily music is the cry of fried-food vendors, the outraged shriek of thwarted boatmen, the whine of Chinese phonographs, and, in the early morning, the whisper of dripping paddles.

Sway-backed Roofs Rise to Twin Peaks Beside Blue Lake Toba

Eleven and a half million people, including more than a million Batak tribesmen, live on Sumatra, sixth largest of the world's islands. Even so, the Republic encourages immigration from more densely populated Java.

Less than 100 years ago Sumatra's pagan Bataks ate their enemies alive. Lutheran missionaries penetrated their upland fastnesses and converted many.

This Christianized village on the shore of scenic Lake Toba in north-central Sumatra boasts one house with a metal roof. It stands out smooth and red from its thatched neighbors. Small granaries wear metal roofs in brown and white stripes.

Page 387, lower: Mother carries baby in the fold of a *kain* worn toga fashion.

Shaggy Houses Look Like Covered Wagons

Several families share each musty, gloomy dwelling. People reach their quarters by ladders. Livestock, including water buffaloes, dwell in the Bataks' ground-level "basements."

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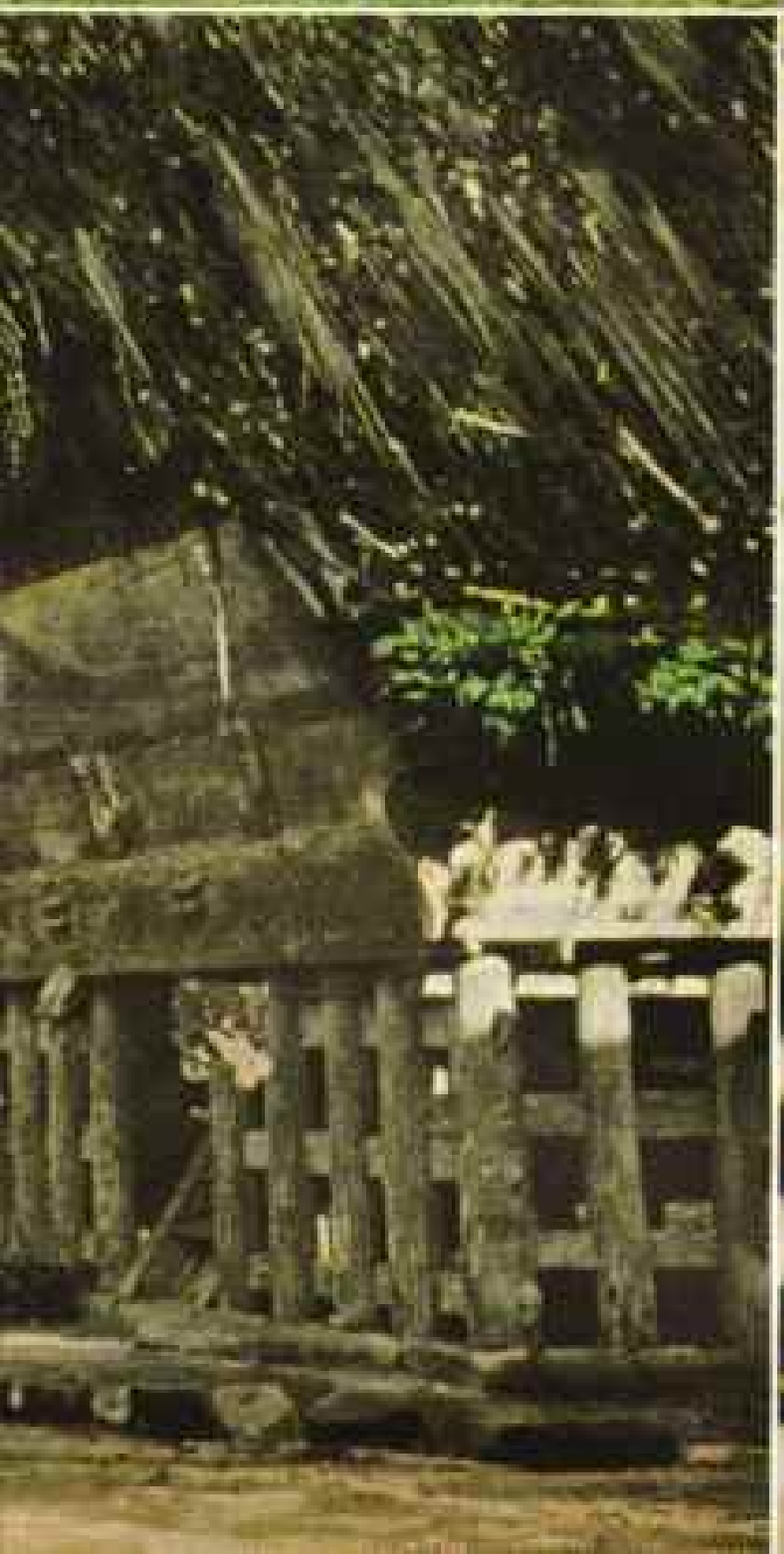
Kodachromes by Walter Meayers Edwards (above) and J. Baylor Roberts
National Geographic Staff



Top-heavy Batak Homes Slumber at the Foot of Mount Sinabung

Batak architecture varies in detail from village to village, but knife-edged roofs remain basically the same.

Page 388, lower: Only 35 miles from Sinabung, booming Medan takes pride in a new concrete-and-steel stadium dedicated to the men who died in Indonesia's struggle for independence from the Dutch.

↓ Always Room for More Aboard a Sumatra Bus

In a valley at the north end of Lake Toba rests the tiny community of Haranggaol. Every Monday is market day, when the Bataks come down from the hills to trade. Here a homebound group packs the bus with the day's purchases. The Haranggaol village cooperative made the simple, sturdy furniture piled on the roof.

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Photographs by J. Baylor Roberts (left), Walter Meayers Edwards (opposite below), and Leonard J. Grant, National Geographic Staff

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Kodachrome by National Geographic Photographer J. Baylor Roberts

Sumatran Dancers in Medan Perform Malay Figures in the Sultan of Deli's Throne Room

Indonesia wonders what to do with 300 sultans, anachronisms in republican times. Most of them live in decreasing splendor on government grants. Though respected and affluent, Deli's sultan wields no real power today.

creature of gold and green and scarlet damask.

But the true metamorphosis took place only as he began to dance. The youth was gone; the mature, utterly controlled artist stood in his place before the temple. "An artist to his finger tips"—we use the phrase only as a metaphor. Here it meant just that: Oka's fingers were alive, quivering, electric with tension and power.

When Pavlova, after a recital, was asked once what her dance had meant, she replied: "If I could have said it, do you suppose I should have danced it?" I cannot tell you what Ida Bagus Oka's dance "meant." You would have to see it yourself to understand it —and to believe it. I can only tell you he seemed that night a vivid, incandescent moth who fluttered very close indeed to the heart of absolute beauty.

So, too, with Bali itself. Its gay cockfights, its raucous cremations (pages 370-371), its fantastic trance dancing, its tranquil life of paddy and kampong and temple —these cannot be satisfactorily exported in words or even pictures. They must be experienced. How long they will be there to experience before Bali succumbs to the subtle erosion of tourism is anybody's guess. The time that remains is precious.

Wartime Effects Still Oppressive

When that global gadabout Marco Polo first glimpsed Indonesia, he wrote of Java, with his usual enthusiasm: "The treasure of this Island is so great as to be past telling."

Yet, 663 years later, Indonesia struggles along on a woefully meager per-capita income. Five years of independence have not seen the standard of living rise much beyond prewar levels. Why?

In the words of former Finance Minister Dr. Sumitro Djojohadikusumo, "Too many don't realize that years of Japanese occupation, internal strife, two military actions, disruption of productive output, disintegration of authority, social dislocations, and all that these things entail, cannot fail to make their effects felt for years and years to come."

The statistics bear him out. Under Japanese occupation, for instance, with Dutch managers and overseers in prison, output of rubber fell to about 20 percent, coffee almost to 30 percent, tea down to 5 percent.

Again, think of a field very closely related to the nation's ability to work: its health. In east Java alone 50 percent shiver through at least one malaria attack a year. Nearly 2½ million suffer from tuberculosis, and 600,000 are blind—mainly from trachoma.

What kind of medical force has Indonesia to cope with this situation? About one doctor for every 57,000 people!

This same shortage of trained personnel runs right through the economy—lawyers, engineers, agronomists, teachers, plumbers, electricians. You name it, and they haven't it. The plans for Indonesia's reconstruction and progress are mostly down on paper now, and they are good plans. The problem is, who is going to carry them out, and when?

All Indonesia Goes to School

Perhaps the most important fact about Indonesia, however, is that it wants so desperately to learn. For every tale of inefficiency and muddling I picked up in my rounds—and you can hear as many as you have patience to absorb—I can recall people I met around Indonesia who were doing their level best, against great odds, to help themselves and their country to grow and mature.

I think of my friend Haroun el-Raschid, former Chief Justice of Sumatra, now serving as head of a law school he founded in Padang with five other teachers. His monthly salary would not suffice to purchase one automobile tire. I think of a high-school boy I met in Surakarta, who studies in the morning and then teaches in the afternoon.

It is through the efforts of such people that Indonesia has cut its illiteracy from about 93 to 45 percent and hopes (optimistically, perhaps) to eliminate it by 1961. It has raised the number of primary schools from 18,000 in 1940 to 32,000 today, its high schools from 144 to 2,700, its student body from 2 million to more than 8 million. Textbooks, laboratory equipment, teachers are still pitiably short, and classes may be held in nipa-thatched huts. But the achievement remains impressive (page 383).

On the medical front, I recall a Kalimantan doctor whose practice covers a jungle territory with some 300,000 people in it; to reach the northern sector he has to go upriver by outboard motor for six hours.

With untrained nurses, no anesthetist, no X-ray, an old Australian army cot for an operating table, and a kerosene lamp to see by, no sheets on the beds and a charcoal hearth for a kitchen, this man carries on with growing effectiveness.

Walter Meayers Edwards, National Geographic Staff

Bonneted Backseat Driver Takes a Dim View of Things on a Sumatra Plantation

Rice powder protects this child's face against the sun. Her parents, chatting with the wife of a company official, work for one of Indonesia's "Big Four" tobacco firms. Sumatran leaf is favored for cigar wrappers.

By prewar standards especially, the lot of a foreigner in nationalistic Indonesia is not enviable, and many have left. I like to remember one Dutch friend of mine, however, who is staying on. In the prime of life, his eyesight has begun to fail. Yet he works all day for a government agency—and then gives his evenings to teaching the Indonesians who will eventually replace him.

Time All-important to Indonesia

In some parts of Indonesia, if you ask a man in the paddies how far it is to a certain town, he will calculate it by the number of pots of rice you will have to cook. He may well have seen a watch, but time in the Western sense is still a bit unreal to him.

Among a great many Indonesians, however, an awareness of what time means to their young Republic is becoming increasingly sharp. They know that independence by itself is no simple panacea. They know that, while their economy rests on the solid foundation of a fertile soil, its business superstructure is still rickety, and that its shoring up must begin now, before it is too late.

An industrialist in Medan said to me:

"We are making progress. Our export and import trade is in balance at last. But to conquer our chief problems will take us 25 years, maybe a hundred. What I ask myself is, will the world give us even five?"

That was the question uppermost in my mind as I left Indonesia. At the Kemajoran airport the flags of the 29 countries which had attended the historic Asian-African Conference in Bandung were still flapping from their newly erected masts (page 380). One of them was the blood-red banner of Communist China, whose armed legions are poised now above strife-torn Viet Nam and whose shadow falls across Thailand, Malaya, and the rich archipelago beyond them.

"*Selamat djalan!*" my friends called after me. "Good fortune in going!"

I gave the conventional rejoinder: "*Selamat tinggal!* Good fortune in remaining."

I hope they will have it.

New National Geographic Map Spotlights an Asian Arena of Strife and Change

WORLD attention focuses sharply, these days, on a region travelers once dismissed as "the unchanging East." Postwar upheavals, crowded into a dynamic decade, have made nonsense of this phrase and altered the whole face of the Orient. As new nations have won their independence and old boundaries have been summarily redrawn, place names have been transformed with bewildering rapidity.

Now a timely new National Geographic Society map presents in ten colors the whole vast area between China and Australia, where East and West meet. It portrays the southeast corner of Asia, stretching its long peninsular toe down into the South China Sea, and beyond it the land-and-water world of the fabled Indies of old, now the new Republic of Indonesia (page 351).

Over all hangs Communist China, with coveted Formosa and the United States island base of Okinawa facing it only minutes away as the jet-propelled airplane flies.

Names Alter as New States Arise

Many another name in the news appears on the 34-by-29-inch map, "Southeast Asia," up to date and ideal for following developments in this important area. It goes, as a supplement to this issue, to member-families the world over. Big lithographic presses have poured out an edition of 2,205,000 copies.*

In Indochina the map shows the cease-fire line of July 22, 1954, which divides the strife-torn coastal state of Viet Nam into Communist-dominated north and non-Communist south. With French influence diminishing in Indochina, the port town of Tourane is now called Da Nang, and Hanoi's Rouge River is labeled Hong Ha.

In Indonesia, once the Netherlands Indies, the capital city of Batavia has acquired the name Djakarta; Buitenzorg has reverted to Bogor, Fort de Kock to Bukittingi.

Only in the Philippines does the West seem to have scored a point: Pambujan Sur has been renamed General MacArthur!

For veterans of World War II who remember the jungle airstrips, the deadly low-profile invasion beaches, the battles with unseen ships at night, a re-encounter with such names as Myitkyina, Okinawa, Leyte Gulf, Biak, and Bataan will stir sharp memories. To those who have picked up the story at a later date, places like Dien Bien Phu, Matsu, and Quemoy may ring a louder bell.

Beneath the record of these transitory events the new map records certain fundamental facts of this wide watery area. Here lies some of earth's most rugged topography, subject to frequent and violent earthquakes. Volcanoes stud the island arcs. Plunging off the eastern flank of Mindanao is the Philippine Trench; its deepest part is less than two miles wide but 6½ miles deep. If lofty Everest could be squeezed into it, the mountain's summit would rest a mile under water.

What the map cannot easily record is perhaps the most important item of all: the people. In the past 150 years the population of Southeast Asia and its islands, after centuries of virtual equilibrium, has skyrocketed. One writer estimates that in 1800 the entire area contained only 10 million people. Now Indonesians alone number 79 million.

The size of some of the great Asian metropolises on the map will surprise many readers. Djakarta has 2,500,000 inhabitants; a new census soon may reveal even more. Singapore has 1,125,000, while refugee-packed Hong Kong cares for 2,250,000. Near-by Canton shelters 1,500,000. No recent tally has been made in these cities; all figures are estimates.

Youthful Republics Dot the Map

Of the newly independent nations which dot the map, the Philippine Islands provide one of the happier examples of transition from territorial dependency to full self-rule. They achieved free status on July 4, 1946.

India became a republic within the British Commonwealth of Nations on January 26, 1950; neighboring Pakistan followed on November 2, 1953. Burma achieved complete independence on January 4, 1948. Indonesia received freedom from the Netherlands on December 28, 1949, and the independence of the Associated States of Viet Nam, Cambodia, and Laos was recognized by the French Government on July 3, 1953.

* Members may obtain additional copies of the Map of Southeast Asia (and of all standard maps published by The Society) by writing to the National Geographic Society, Washington 6, D. C. Prices, in the United States and elsewhere, 50¢ each on paper; $1 on fabric. **Indexes to place names, available for this and most other maps, 25¢ each.** All remittances payable in U. S. funds. Postpaid.

The Kiwi, New Zealand's Wonder Bird

By Ron J. Anderson

"IMPOSSIBLE!" insisted British scientists in 1813 when they first learned of New Zealand's unique bird, the flightless kiwi. The creature had been discovered at Dusky Sound by Captain Barclay, of the ship *Providence*. Only when the skin itself was exhibited in Lord Derby's museum would skeptics admit the existence of this strange inhabitant of the antipodes.

Little wonder that Britain's men of science at first considered the report in a class with stories of the mythical mermaid and unicorn. Who had ever heard of a bird with whiskers like a cat's and with nostrils at the tip of its long, curved beak? Where else lived a bird that burrows like a groundhog and lays an egg equal to a quarter of its own weight? Who, indeed, had seen a bird with no tail and with useless inch-long wings hidden beneath a coat of silky, hairlike feathers?

And yet, they finally admitted, there it was. *Apteryx australis*, they decided to call the surprising creature. The first name means "wingless."

Kiwi Lays King-size Egg

When I held a plump, soft-feathered kiwi in my hands, it was hard to realize that the little bird is a distant relative of the ostrich, the emu, and the cassowary. A natural wonder rivaling Australia's duck-billed platypus, the shy kiwi differs almost as much from its flightless relatives as it does from birds in general.

For its size, the kiwi lays the largest egg known; a four-pound bird may lay a one-pound egg (page 398). An ostrich egg of the same proportion would send a scale close to the 75-pound mark. Questions soon brought to light other notable features of the timid bird I held in my arms: its rarity, and the fact that the male incubates the huge egg, then turns the chick loose to fend for itself.

One reason for the survival of the flightless kiwi in primeval New Zealand was plain to see the moment I set the bird on the ground. It raced away on sturdy clawed feet. And yet it can move as silently as a rat, Mr. F. Donald Robson told me. Mr. Robson, former curator of the Hawke's Bay Acclimatisation Society's game farm, was the first to breed kiwis successfully in captivity.

Shy *Apteryx* Hunts at Night

The kiwi's senses of hearing and scent are exceptionally keen; perhaps this is Nature's compensation for the bird's poor eyesight. The nocturnal kiwi's dark-adapted eyes appear to see only a foot or so in daylight, perhaps six feet at night.

The tip of the long bill, in addition to bearing the nostrils, is a sensitive organ of touch. Both senses are apparently used in locating food.

After dark in kiwi country, a camper will occasionally hear the shrill cry, "kee-wee," that gives the bird its name. As the kiwi rambles through the dense beds of ferns that are its usual habitat, making a continual snuffling sound, it scratches away forest litter with its sharp claws. From time to time it drives its long flexible bill into soft earth and rotted logs in search of worms and grubs.

I have often watched kiwis as they hunted for earthworms. The search begins as the bird taps the ground to find a burrow. Then, using its bill as a workman uses a crowbar, the kiwi sets to work enlarging the entrance. Once the bird has made a funnel-like opening, it pushes its bill in and takes a firm grip on the luckless worm.

On many occasions I have seen the bird, still holding the worm, lean back and remain in the same position without moving a feather. Eventually persistence triumphs and the kiwi, with another steady pull, draws the worm from the burrow.

Besides grubs and earthworms, the kiwi's menu includes snails, insects, and berries picked from low bushes.

Page 394

◂ **An Aroused Kiwi Can Strike Like a Fighting Cock**

The flightless, tailless bird has rudimentary wings hidden under hairlike feathers. Whiskers sprout in front of beady eyes. The kiwi is the only bird with nostrils at the tip of its bill.

One of the few live kiwis ever seen in the United States, Belle arrived at the San Diego, California, Zoological Garden last December (pages 396, 397). Here she pecks the arm of the zoo's curator of birds.

Belle is a North Island brown kiwi (*Apteryx australis mantelli*). Three other forms exist: the large gray kiwi (*Apteryx haastii*), the little gray kiwi (*Apteryx owenii*), and the South Island kiwi (*Apteryx australis australis*).

Milton Heman

The use of kiwi-feather cloaks by the aborigines of New Zealand helped to push this amazing creature to the brink of extinction. The handsome cloaks, many of which are still in existence, were made by weaving soft, hairlike kiwi feathers into a base of dressed flax fibers. Europeans obtained examples only with great difficulty, but one was sent as a present to England's Queen Victoria.

Slaughtered for Pies and Pipestems

The aborigines were not wholly to blame for the near-extermination of the strange New Zealand bird. Early settlers, gold seekers, and bushmen harried them with dogs in the daytime and with blazing torches at night. Great numbers of the defenseless creatures were slaughtered for food during the 19th century. Kiwi pie became a favorite dish. Leg bones were ideal pipestems; and the soft skins provided warm caps and dainty feathered muffs for the women of colonial New Zealand.

I learned about the long effort to breed kiwis in captivity on a recent visit to the Hawke's Bay Acclimatisation Society's game farm at Greenmeadows, near Napier. The story began more than 25 years ago; a workman, bending over a woodbin in a plant near Napier, was amazed to find the space occupied by an adult male kiwi. Carefully handled by its captor, the bird eventually found sanctuary at the game farm.

Belle Samples Earthworms in Her California Home

Few New Zealanders have seen the kiwi in its native state. The timid creature usually hides by day in a burrow, a hole beneath the roots of a tree, or in a hollow. Maoris called it "the hidden bird" and believed it under the special protection of Tane, god of the forest.

Belle, the San Diego Zoo's prized import, likes to tunnel in peat moss. The first time she disappeared, zoo officials feared she had escaped or had been stolen. They searched for 90 minutes, probing inch by inch through the cage, before they discovered Belle 18 inches deep in the moss.

The bird ranks as one of the park's star attractions. She requires much sleep during the day, and her health and diet get close attention. Belle's bill-of-fare includes dried biscuits, soaked raisins, fresh grapes, beetles, berries, and 600 earthworms —about eight ounces a day.

Belle is named in honor of Mrs. Belle Benchley, retired director of the San Diego Zoo. Close ties exist between the Auckland and San Diego Zoos; they have exchanged many gifts.

Milton Herman

397 © Whites Aviation, Ltd.

New Zealanders Bid Farewell to Belle, Auckland's Gift to the United States

Auckland officials here deliver Belle to Miss Olwyn Jackson of Pan American World Airways for the flight across the Pacific to San Diego. The pampered passenger stood the trip well.

For six years the kiwi remained at the farm, lonely and aloof. Then there was placed in Mr. Robson's care a scorched and pathetic bundle of feathers that was a two-months-old female kiwi. The chick had come out of the forest at Tangoio, fleeing a brush fire.

"The female was four years old when she began to lay," Mr. Robson told me. "In 1943 she laid four eggs, all infertile. In 1944 she produced three more. But bad luck trailed us; the embryos died in the shells."

Then success came. The game farm's 18-year-old male kiwi celebrated the end of World War II by hatching two eggs.

"When it emerged from the shell," Mr. Robson recalls, "the chick that ultimately survived was black and weighed about half a pound."

Once out of the nest, the chick began to eat enormous quantities of worms, which it dug up for itself. At one month it weighed three-quarters of a pound and could eat about 800 small worms in 24 hours.

The most unusual residents of the game farm during recent years have been two kiwis with artificial legs. One, having lost a leg in an opossum trap, was fitted by Mr. Robson with a cleverly constructed substitute of bamboo and rubber. The bird was soon able to move about quickly, if a little clumsily.

Not long after the death of the world's first peg-legged kiwi, another opossum-trap victim was brought to the farm and fitted with an artificial leg. Unfortunately, "Peg-leg Pete II" swallowed a pin and died after about a year at the farm.

In 1951 the game farm's kiwis escaped from their enclosure. Only a few of the birds were recovered. Today Mr. K. E. Francis, who

carries on as chief ranger and curator of the Hawke's Bay game farm, is attempting to continue Mr. Robson's researches with three remaining birds, all North Island kiwis.

Extinction Still Threatens

Though the game farm's kiwi population has dwindled, it would be a far greater tragedy if the wild remnant of this once numerous tribe were to disappear. The kiwi is difficult to observe in its native haunts, and it is impossible to say definitely whether or not it is holding its own. Experts like Mr. Robson think hopefully that the battle to save the shy bird has been won. But others, among them Mr. Francis, take a more pessimistic view.

"The kiwi is steadily diminishing," he says. "Stoats, ferrets, rats, house cats gone wild, and bush fires so far have not heard of our 'stringent protective measures.' As cultivation advances, the last strongholds of the kiwi are slowly shrinking."

Unless a way can be found to protect its thinning ranks, this unique bird may one day join the extinct dodo, great auk, and passenger pigeon, casualties of man's encroaching civilization. Meanwhile, the kiwi's picture, if not its person, greets New Zealanders every day; the islanders have honored their "national bird" by placing its likeness on coins and postage stamps.

For an account of another strange inhabitant, the takahe, see, in the NATIONAL GEOGRAPHIC MAGAZINE: "Finding an 'Extinct' New Zealand Bird," by R. V. Francis Smith, March, 1952. Other articles featuring the odd wildlife of the antipodes include: "New Zealand, Pocket Wonder World," by Howell Walker, April, 1952; "New Zealand 'Down Under,'" by W. Robert Moore, February, 1936; and "Australia's Patchwork Creature, the Platypus," by Charles H. Holmes, August, 1939.

Kiwi's Five-inch, One-pound Egg Would Put Any Hen to Shame

Although kiwi and chicken are about the same size, the kiwi's product weighs eight times as much. The bird usually lays but one or two a year. Only the male sits on the eggs during the 75-day incubation.

Ross J. Anderson

Escalante: Utah's River of Arches

A Pack Trip Through Little-known Canyons of the Western United States Reveals Spectacular Formations Carved by Frost, Wind, and Water

By W. Robert Moore

National Geographic Magazine Staff

With Illustrations from Photographs by the Author

BRILLIANT sandstone cliffs wheeled past the window of our banking plane like a color movie film that had suddenly jumped its sprockets. The scene straightened again and our vision settled on a wide arched window in a sheer cliff. Again and again we repeated the performance and each time saw another arch or natural bridge.

Skillfully Harlon W. Bement, Director of the Utah State Aeronautics Commission, maneuvered his small plane over the red landscape so we could look into the deep, twisting canyons of the lower Escalante River in southern Utah. We were only a few miles north of the junction of the Escalante with the sweeping Colorado (map, page 401).*

During our flight over the river and its side canyons—Coyote, Willow, Soda, and Davis Gulches—we saw eight natural arches and bridges hewn by frost, water, and wind in the flaming Navajo sandstone.

Flying alone earlier in the year, Bement had spotted one of the arches. Later he had gone back to explore the area more carefully and had located the others.

"No one in Salt Lake City quite believed me when I told about the arches," he said. "Only Burnett Hendryx and a few persons in Escalante seemed to know anything about them. That's why I wrote to the National Geographic Society."

Plane Flight Inspires Canyon Trek

Now Hendryx, who manages the Cameron Hotel in Panguitch, Utah, Dr. Arthur Crawford, of the Utah Geological and Mineralogical Survey, University of Utah, and I were flying with Bement to photograph these formations from the air. Later we would make a pack trip to examine them at close range.

It is understandable that few persons other than the cattlemen who have pastured herds along the Escalante know anything about the river or its natural arches. The canyons are accessible only on horseback or afoot. The nearest town is Escalante, 45 miles away.

To picture the Escalante River from the air, loosely interlock your fingers and look at the backs of your hands. Like the curving line made by your joined fingers, the stream twists and turns snakelike through the eroded Navajo sandstone (page 402).

The river threads a harsh land, a wilderness of eroded slickrock and patches of sandy desert where little more than scrub brush and prickly pear thrive. It is one of the emptiest places in all Utah. Among the few trees are cottonwoods, alders, and scrub oaks in canyon bottoms.

Desert Trip Begins in Rain

"You can expect perfect weather in September—clear blue skies with perhaps a few Kodachrome clouds," Burnett Hendryx had said when we arranged our pack trip into the Escalante.

Yet on the mid-September morning when we drove east from Panguitch, the wipers on our jeep station wagon strove vainly to brush away the rain.

"It won't last long," Burnett said reassuringly. "It seldom does."

But rain blurred the landscape as we passed the fantastically eroded cliffs of Bryce Canyon National Park. It continued to rain while we ate lunch in Escalante, and skies still dripped as we headed south.

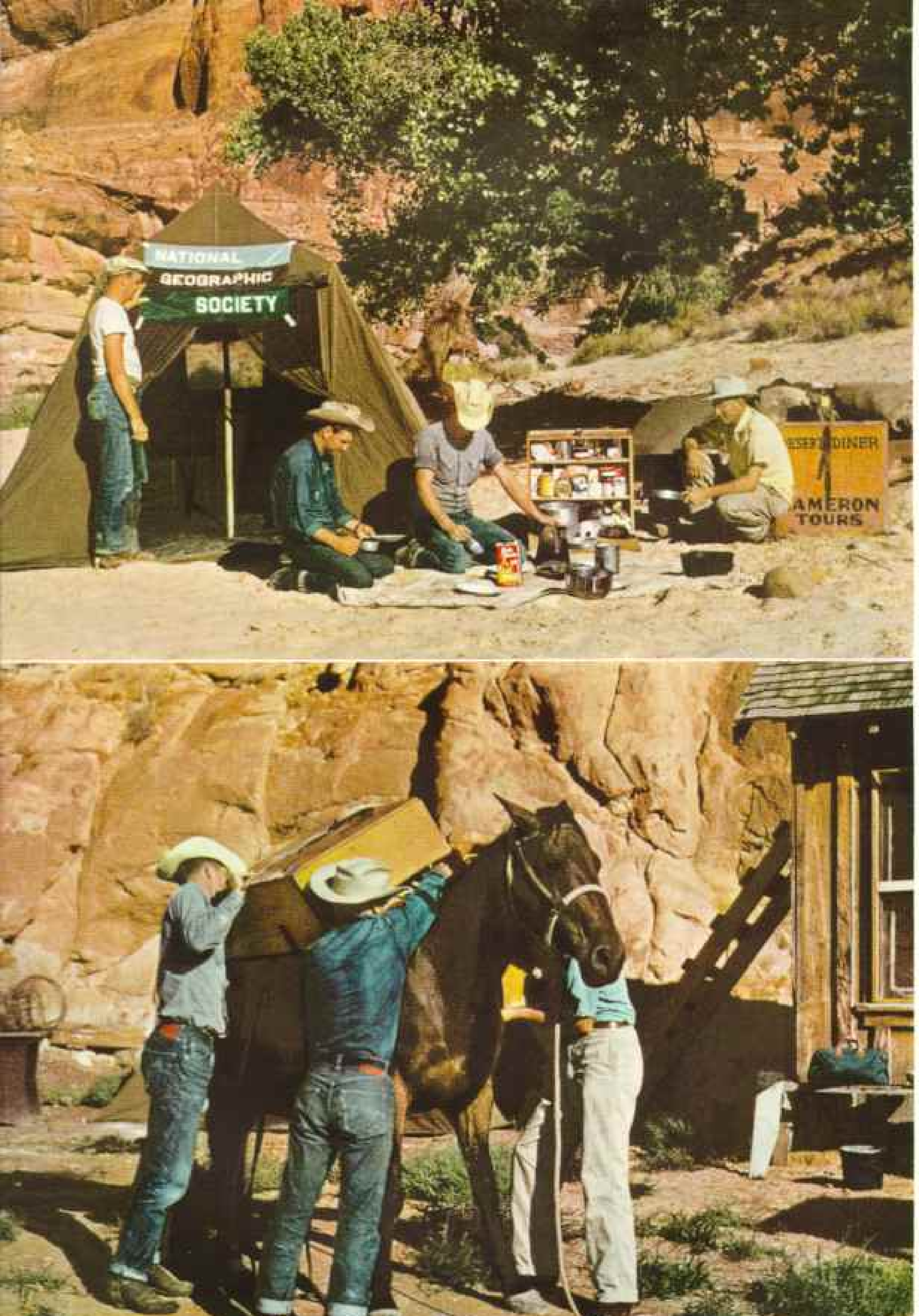
"Too bad we made a mistake and thought this was sunny September," my son Bob commented.

A few miles on, three feet of muddy water surged through Harris Wash, which normally is only a gravelly streak across the desert. We looked discouraged, but Burnett smiled.

"It will clear," he said.

I cocked an eye at the scudding clouds and thought of flash floods and hidden quicksands in the narrow canyons.

*See "First Motor Sortie into Escalante Land," by Jack Breed, National Geographic Magazine, September, 1949.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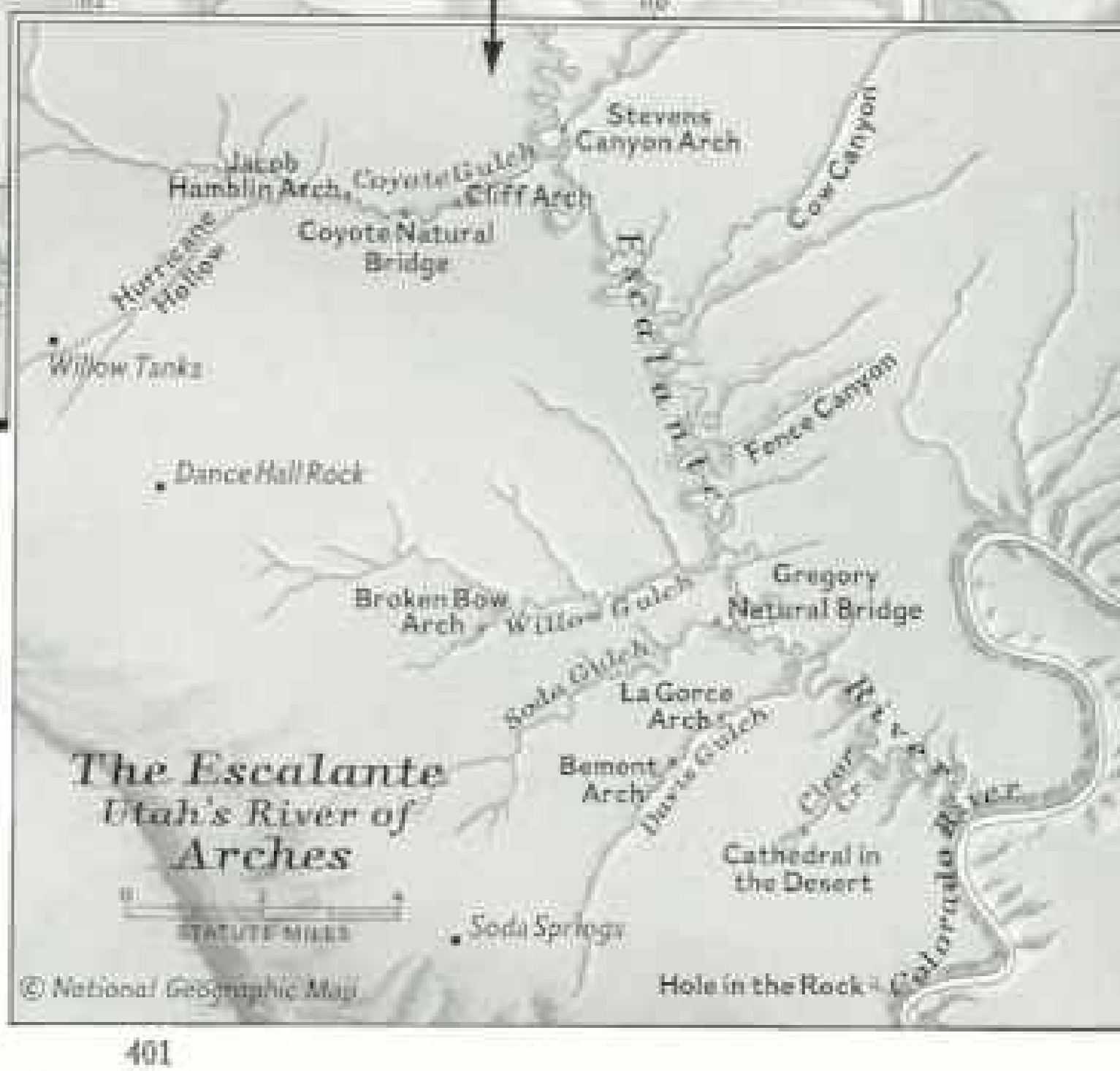

The Escalante Cuts a Twisting Path Across Southern Utah

A tributary of the Colorado, the stream passes through a desert; one town, Escalante, lies along its main course.

←Page 400, upper: Burnett Hendryx (right) does the cooking at the Desert Diner. Others are the author's son, Bob Moore (standing), and Jerry Roundy and McKay Bailey, Escalante cattlemen.

Lower: The Desert Diner goes aboard a pack horse at Willow Tanks.

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Half an hour later the rain stopped, the sun peeked through a rift in the clouds, and the stream level started dropping fast. We crossed in a splay of water and mud and rode on to Willow Tanks, 46 miles southeast of Escalante, with a double rainbow arching the sky.

Near Willow Tanks lies Dance Hall Rock, an outcrop of red sandstone eroded into an amphitheater. Here, in the winter of 1879, a band of about 250 Mormon pioneers halted briefly on their dramatic desert trek across southeastern Utah to the San Juan Valley.*

Here they danced. But at the rim of the Colorado, 15 miles southeast, the pioneers spent wearisome weeks in the snow blasting a slit in the cliff, still known as Hole in the Rock, through which to let down their wagons and horses. Seeing the hole now, one wonders how the trekkers made the precipitous descent to the Colorado, for the rock chute appears more like a goat path than a wagon passage.

Willow Tanks, like Dance Hall Rock, is a red splotch in the desert. Here an outcrop forms nearly a full circle of walls around a narrow depression. Cattleman Rex Whittaker of Circleville, who holds range rights here, has fenced the hollow into a corral. A spring, piped into tanks, affords a supply of water. Here, too, is a rude cabin, built against the cliff side.

"All the comforts of home," Bob commented, as he surveyed the rusty kitchen range and a sagging iron cot in the cabin.

"If She's A-smoking . . ."

Burnett had arranged for our two wranglers, McKay Bailey and Jerry Roundy of Escalante, to meet us at Willow Tanks with saddle horses and pack animals. We were still unloading the jeep when they arrived. With them came Brownie, an energetic, tail-wagging cattle dog, who immediately adopted me as a friend.

"What a ride!" Jerry complained, tenderly

* See "Desert River Through Navajo Land," by Alfred M. Bailey, and "Utah's Arches of Stone," by Jack Breed, National Geographic Magazine, August, 1947.

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Canyon Spurs Stretch Across Coyote Gulch Like the Paws of a Mighty Sphinx

Endless looping of this tributary of the Escalante left these interlocking tines of rock. So sharp are the kinks that the river can travel half a mile yet be only 50 yards from where it started.

403

Kodachrome by Harlow W. Rennie

Slickrock—Bare and Eroded Sandstone—Offers Slim Hospitality to Struggling Vegetation

Scraggly cottonwood, scrub oak, tamarisk, and scanty patches of grass grow in the deep, rocky trenches. Jacob Hamblin Arch, concealed in this air view, pierces the long arm of rock at center (page 410).

stomping to unlimber his lame legs when he swung off his horse. I agreed. They had come more than 40 miles in one day, much of the trip in the rain.

"It's just that this is the first time I've been on a horse since I went into the Navy," he explained. "It's a little rough shifting from the deck of an aircraft carrier to the deck of a horse."

"You haven't lived until you've eaten my cooking," Burnett said as he worked over the kettles on the smoking stove. "And after you have . . ." The clank of pots drowned out the rest of his statement.

Despite his slogan—"If she's a-smoking, she's a-cooking; if she's black she's done"—Burnett turned out excellent meals (page 400). Our only worry was overeating.

All that night at Willow, thunder crashed over the near-by Kaiparowits Plateau, and lightning flared. More rain came down. But next morning the sun rose bright.

We loaded our gear on the pack horses. My photographic equipment went into the pack bags of Cook, a reliable old mule. Burnett was proud of the cases he had designed to carry all the food on one horse. The Desert Diner, he had labeled his handiwork. Later we dubbed it the Dandy Sandy Diner.

Canyon Alcoves Magnify Sounds

Striking east across the desert, we rode into Hurricane Hollow, a depression which deepens into a twisting sheer-walled canyon leading into Coyote Gulch.

I tried to identify some of the scraggy desert growth along the way.

"Is this horse brush?" I asked McKay, indicating a dark-green bush.

"No, that's not even good rabbit brush," was his answer. Among cowboys, I learned, vegetation is classed as horse brush or rabbit brush, depending upon whether or not the stock will eat it.

As we rode, Brownie romped far and wide, chasing chipmunks and lizards and sending jack rabbits bounding. Our path dropped deeper and deeper into the red sandstone. At the junction of Hurricane with Coyote Gulch the canyon walls towered more than 200 feet above our heads. Coyote's winding trench, too, became progressively deeper. At many of its sharp bends the stream has hewn broad alcoves, their roofs reaching far out over the canyon. Some are remarkable sounding boards; our voices seemed magnified, and stones clattering under the horses' hoofs sounded like small avalanches.

A short distance downstream we rounded a sharp bend and abruptly faced the first of the canyon arches. It looked to us as if a giant had thrust a fist through the rock wall to provide a peephole through which he might view the canyon beyond.

Actually the arch is formed by a long tongue of rock about which the stream has made a sharp loop. Erosion has undercut both sides of this tongue, forming deeply set alcoves. In the thinnest part of this rock wall a hole has broken through.

Arch Named for Mormon Scout

The window of the arch is dwarfed by the massive bulk of rock overhead. Yet it is no small hole. Burnett and my son Bob scrambled up the high pile of talus that lies at its base and measured its width. It is nearly 170 feet across. Its height, measured by range finder and by plotting elevation angles, is more than 90 feet.

Though the arch is officially unnamed, the few persons who have seen it have called it Jacob Hamblin Arch, after an early Mormon scout. Hamblin himself probably never saw it, but it is appropriate that some such landmark should bear his name (pages 403 and 410).

Often spoken of as the "Mormon Leatherstocking," Hamblin was a pioneer route finder through southeastern Utah who spent years as a missionary to the Indians. In 1871 he led a party for Maj. John Wesley Powell's second survey expedition down the Colorado. On this trip Hamblin is credited by some with having traversed part of the Escalante River chasm. Whether in this canyon or another, quicksand and fallen rocks stopped him from following the stream all the way to its outlet.

At one of the kinks in the Coyote, a short distance downstream from Jacob Hamblin Arch, we saw what remained of the pedestal

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Page 405

Cliff Arch Hangs Like a Jug Handle ➔ Against the Wall of Coyote Gulch

Smallest of the eight Escalante arches that have been measured, this opening is approximately 40 feet wide by 45 feet high. The arch ring varies from 15 to 35 feet in thickness. Here two members of the party explore the steep cliff face for a way to reach the opening; lacking a rope, they had to give up only 50 feet below their goal.

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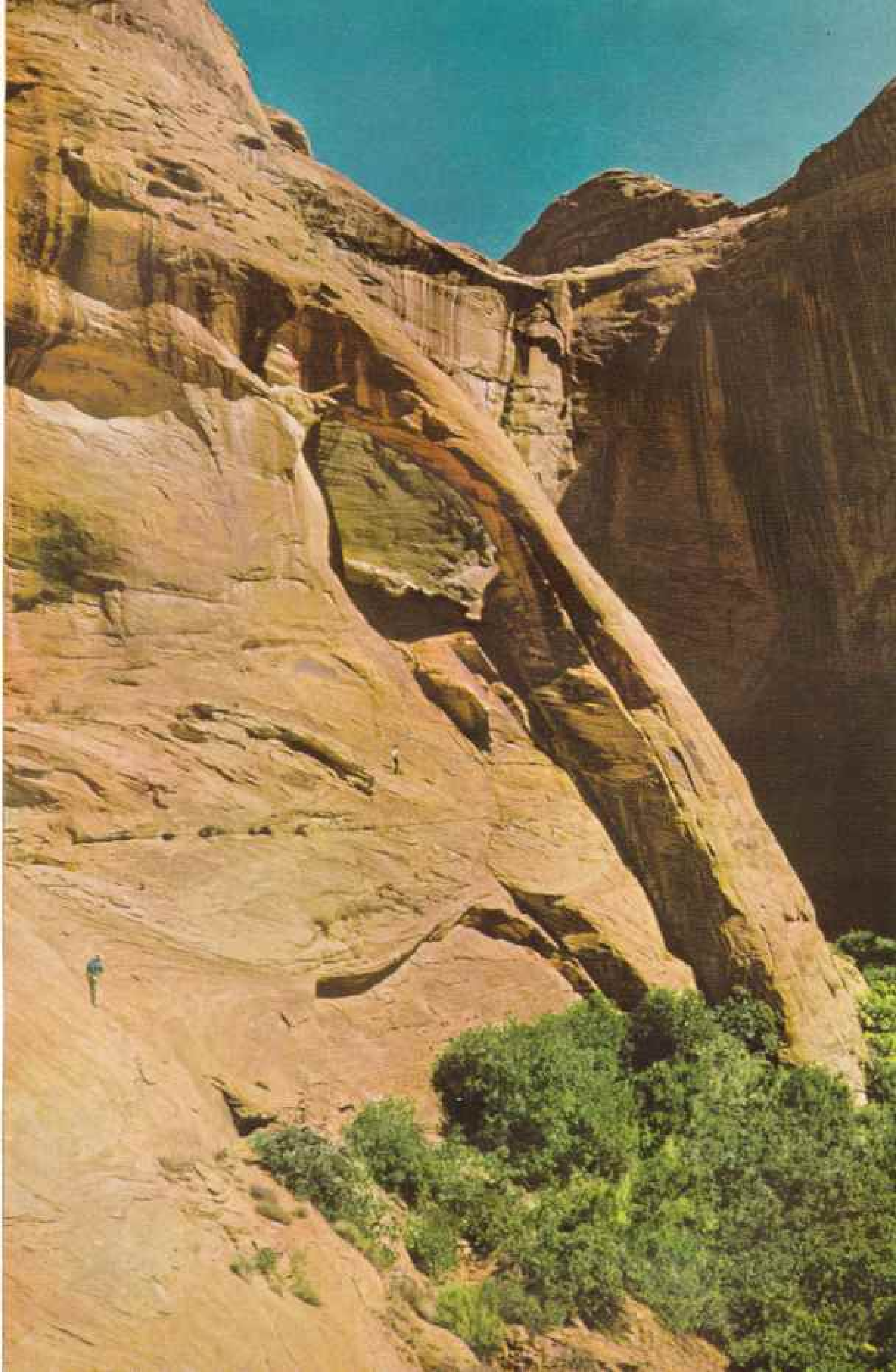
Kodachrome by W. Robert Moore, National Geographic Staff



and the broken arm of a once mighty arch that had collapsed. As time is measured in geological formations, it had fallen only recently, for the broken edges were little eroded. Numerous large rocks that once formed its span lay strewn over the talus slopes and on the canyon floor.

Farther along we came to the second archway, a natural bridge spanning the stream. A spur of sandstone shaped like an Indian club lies athwart the river bed. Under this the Coyote has dug a passage 68 feet wide and 38 feet high, a tiny opening compared with the thickness of the rock itself.

Though small as Escalante arches go, this bridge is interesting in its own way. Nature appears to have been undecided just how to fashion it. Around the opening is an arching band of rock more resistant to erosion than the upper parts of the wall, giving it the appearance of a huge culvert thrust through the spur.

We camped for the night on a sandy flat just around the bend from Coyote Natural Bridge. Spoiled by city life for camping under the open sky, I lay awake in my sleeping bag listening to the clank of the bell on our lead mule and the snorting of the hobbled horses grazing among the bushes. The sounds seemed louder than the many noises of a city. A full moon shone like a searchlight in my eyes.

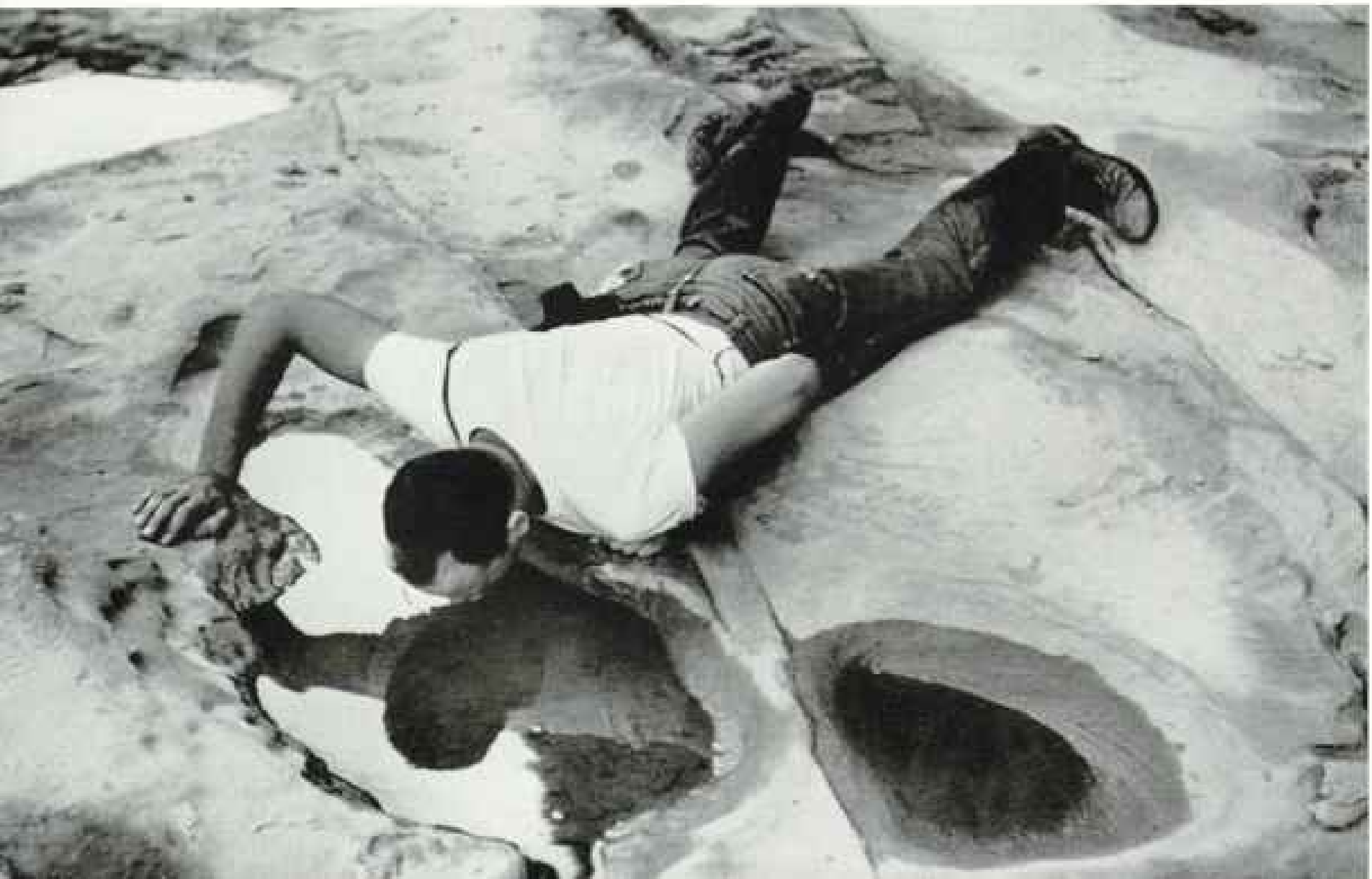
Next morning, just below Coyote Natural

406

↑ **A Long-forgotten Indian Painted These Bold Symbols in Davis Gulch**

The artist used the wall of a deeply cut alcove as his canvas, thus preserving his pictographs from destruction by wind and water. On similar high ledges Indians built stone and adobe granaries.

↓ The Escalante River always runs mud-red; not even the horses would drink from it. The party sought side streams, springs, and rain-water pools like these for its water supply. Sandstone surfaces throughout the area are humped and pitted from uneven erosion.



Bridge, we had our first experience with quicksand. Jerry was riding ahead, leading the pack horse carrying the Desert Diner. He crossed the stream with little difficulty, but the pack horse suddenly sank nearly to his belly in the watery sand. The beast lunged furiously, stumbled, fell, and rolled over. There was a clatter of dishes and cans.

Jerry grabbed the lead rope as the frightened horse scrambled to his feet and tried to bolt with one of the cases of food dangling by his hoofs. Thereafter we drank cocoa laced with flour and ate pan biscuits flecked with coffee.

Stiff Climb to Reach Escalante

Coyote's third arch hangs like a jug handle high on a cliff wall (page 405). On either side the cliff drops away so sharply that only an expert rock climber could reach the opening without the aid of a rope.

Bob quickly found out its hazards. Edging along the sloping wall, he was forced to stop 30 feet below his objective, though he actually reached a spot directly underneath the ceiling of the arch.

The arch ring itself varies from 15 to 35 feet in thickness and encloses an opening about 40 feet wide by 45 feet high. We named it Cliff Arch because of the unusual manner in which the bandlike buttress clings against the canyon wall.

Near the outlet of Coyote Gulch into the main canyon of the Escalante, quicksands barred our way. Leading our horses, we had to climb a steep sand slope to reach a high rock shelf.

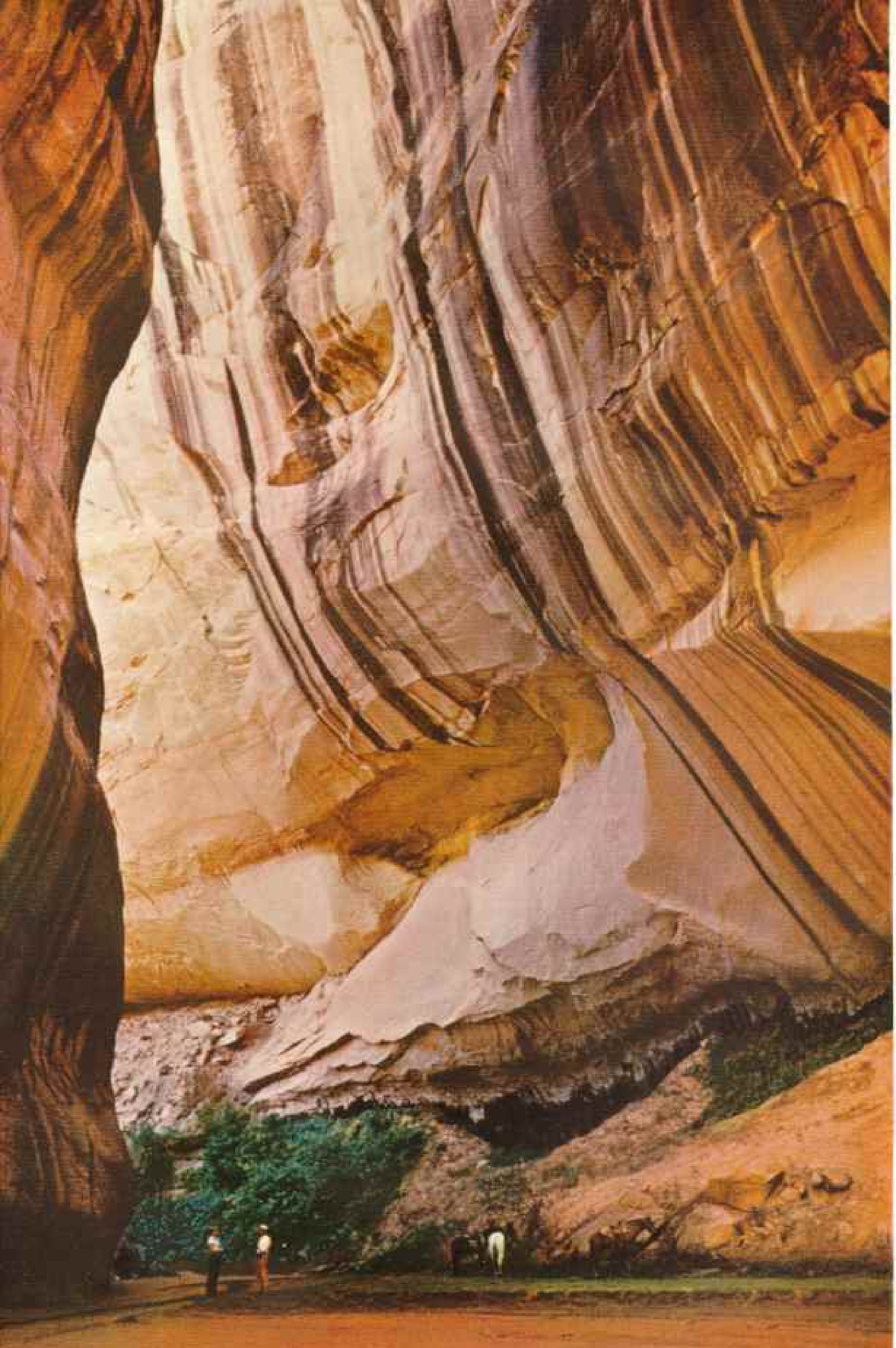
And what a climb! The sand was soft and slid beneath every footstep. It was almost like treading in a bin of flour. To add to my difficulties, my horse often hung back or suddenly lunged against me.

To Brownie, the dog, it was play. He raced up and down the slope as if to lend encouragement. I needed it. By the time I reached the shelf my feet seemed ponderously heavy and I gasped for breath. But the spectacular view from a jutting cliff made me forget fatigue.

Below us lay the narrow gash of the Coyote's confluence with a sweeping curve of broader Escalante Canyon, through which flowed the silt-red river. Beyond, a little more than half a mile away, reared a high transverse cliff wall through which the majestic opening of Stevens Canyon Arch breaks like a gigantic picture window (pages 422 and 424).

Through the ages the elements have chipped and flaked that red sandstone wall; it has become a thin slab standing some 800 feet above a sharp bend in the Escalante. On the opposite side from which we saw it the walls sheer away to the mouth of Stevens Canyon.

Burnett had seen the arch before and said it might be possible to get a horse up into the opening. When we explored Escalante Canyon to find a place to mount the wall, he abandoned the idea. He and Bob, however, managed to pick a circuitous way up



the fractures and talus slopes and measure the width of the arch.

Brownie went along, enjoying the adventure. He bounded easily up the cliffs; later I photographed him, a tiny dot in the vast opening of the arch, while Burnett and Bob gingerly climbed the rocks on hands and knees. Brownie was first down to the canyon again, tail-wagging his triumph.

Returning, Bob admitted he had never been more frightened in his life than when he stood on a sharp incline of rock in the opening with his back against the knife-edge vertical wall.

Stevens Arch Is Escalante's Largest

The bold skyline opening at Stevens Canyon is the largest of the Escalante arches. As accurately as Burnett and Bob could measure, it stretches 225 feet across by nearly 160 feet high. The arch ring of red sandstone above it is about 125 feet thick, making the total arch height some 285 feet above the floor of the aperture. In both size and position it rivals any of the known Western arches except peerless Rainbow (map, page 401). Sipapu Bridge, though having a wider span, is not so high.

We stopped for the night on a tamarisk-covered sand flat a short way downstream. Though we encountered few insects on most of the trip, this Escalante camp buzzed with mosquitoes and gnats. I covered my face against them and the moonlight.

"It isn't the mosquitoes, but that big street lamp that bothers me," Bob said.

The next morning we started early in order to reach Soda Gulch; it would be our longest day's ride.

Threading along the main river, we forded the stream so many times that I soon lost count of the crossings. Because of the rains three days before, the river ran well above its usual autumn level.

"A few years ago we had a flood here," McKay said. "A 12-foot wall of water came rolling down the canyon!"

The Escalante River always runs mud-red. Now it was muddier than usual. Not even the horses would drink from it. We sought side streams, rain-water pools, and springs for our water supply (page 406).

It is a spectacular route, this kinking path down the Escalante. In places we had to travel a quarter-mile or more to get around bends where the river has turned back on itself and left intervening walls no more than a few score yards in thickness. Ages hence, these walls may crumble and break through to form new arches.

Elsewhere we passed sheer cliffs as vertical, it seemed, as if hewn to a plumb line. In many places the black lustrous gloss of desert varnish streaked and patterned the cliff faces (opposite). Above us rose pillars, towers, and huge monoliths that the river has left isolated by cutting off sharp bends and shifting its course.

Herds Pasture in Wilderness Canyons

Before reaching Fence Canyon, Bob spied a small arch in the cliffs of a side ravine. From a distance its window appeared to be only 20 or 30 feet across. Access to it was cluttered by brush and a chaos of boulders, so we left it for later visitors.

Despite the difficulty of getting into the Escalante, cattlemen for years have driven small herds into the canyon to pasture on its grass- and bush-covered sand flats and side ravines.

Earlier in the season McKay had brought in 50 head of cattle. We found part of the herd in Fence Canyon. The grazing there was thin, so McKay and Jerry went to round them up and drive them farther downstream.

Mindful of his duty, Brownie went along. All was well at first, but suddenly one of the half-wild beasts, a cow with a calf, turned on Brownie and charged. Trapped in a tangle of bushes, he could not escape. She caught him with one of her horns, and McKay had to end the dog's life with a pistol shot. To me, some of the lightheartedness of the trek vanished with the echoes that reverberated in the canyon depths.

Downstream, past the mouth of Willow

Page 408

← **Vaulted Walls Above Clear Creek Form "Cathedral in the Desert"**

Rock sides of this box canyon converge overhead, almost shutting off the sky to create a cavernlike room. Off the picture at right, Clear Creek canyon ends in a horseshoe curve. There the creek cascades in a tiny stream down the wall face, with a murmur like a vesper hymn.

Desert varnish, a lustrous patina of iron and manganese oxides, streaks and stains the walls. The floor is carpeted with moss and large patches of quicksand; the author sank to his calves while making this photograph.

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Kodachrome by W. Robert Moore, National Geographic Staff

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410

Like a Picture Window, Jacob Hamblin Arch Frames a Bend in Coyote Gulch

Pack horses follow the sharply twisting stream, which hollowed this deep alcove. Sometimes rain turns the slender creek into a romping, abrasive torrent. The window measures some 170 feet across by 90 feet high.

411

Kodachrome by Barnett A. Hendrix

Dwarfed to Ant Size, a Man Labors Up a Steep Mound of Rubble

Jacob Hamblin, after whom the arch was named, served as scout and Mormon missionary in southeastern Utah. In 1871 he led a party for Maj. John Wesley Powell's second survey expedition down the Colorado.

Gulch, Soda Gulch appears as a narrow slit in the west wall of Escalante gorge. Only a few hundred yards upstream in its tortuous canyon stands Gregory Natural Bridge; its massive arm of sandstone, dwarfed by surrounding cliffs, spans the slender stream (page 417).

We measured the height of the bridge itself and found it to be 180 feet above stream level. The aperture is some 75 feet high and has a span of 177 feet.

Bridge Named for Noted Scholar

Though cattleman Allen Cameron, Burnett's father-in-law, had camped under the arch in 1918, its discovery was not announced until 1940, when Norman D. Nevills, of Mexican Hat, named it and placed a register at one end of the arch. I was the fiftieth person to sign it; some signatures had been repeated several times.

The bridge bears the name of the late Dr. Herbert E. Gregory, former Yale professor, Government geologist, and for 17 years director of the Bernice Bishop Museum in Honolulu. Dr. Gregory wrote on such far-ranging subjects as the Navajo country, North American geology, and the geography of Europe. He was also author of a comprehensive article on Australia in the NATIONAL GEOGRAPHIC MAGAZINE.*

Shortly before reaching a camp site where Soda Gulch and the Escalante join, our pack mule, Cook, fell afoul of quicksand. Riding behind him, I saw his hind legs suddenly sink. His pack bags, carrying my gear, dropped half out of sight in the water. My cameras were in watertight cases; not so my clothes. When Cook finally scrambled to solid footing, the bags dripped like a fountain.

In camp I hung one soggy bag and part of its contents on a stump a few feet from the campfire. Bob fed the fire better than he had planned. A few moments later I turned around to find bag, towels, and stump a bright pillar of flame.

Clear Creek, beyond Davis Gulch, deserves its name, for the water flowing in its trench is champagne-clear. The canyon path, however, is cluttered by growths of tamarisk, rough scrub oak, and cottonwood.

Though shortest of the Escalante's main tributaries, Clear Creek canyon is one of its most dramatic. As we rounded a bend, the walls seemed suddenly to fold together high above our heads. We found ourselves in a cavernous cul-de-sac, the canyon's end.

The grotto is open to the sky only through a narrow slit that ages ago was the stream's

* See "Lonely Australia: The Unique Continent," December, 1916.

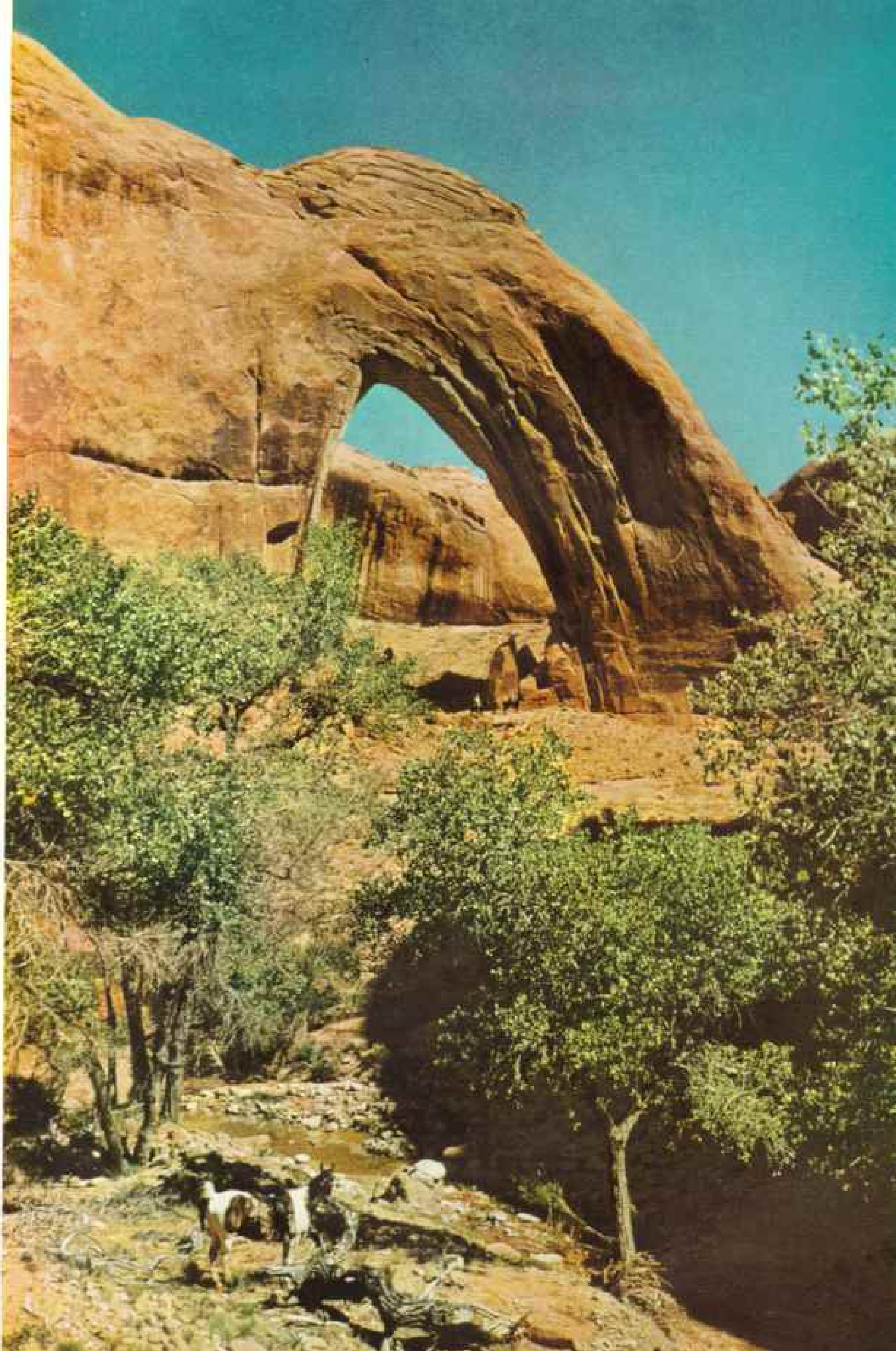
Broken Bow Projects → Like a Flying Buttress in Willow Gulch

Page 413: The formation takes its name from an Indian weapon found near by, not from its shape. The stream that gouged the deep canyon seems puny now as it meanders far below the 94-by-100 foot opening (page 416).

← The Author Picks a Rough Bed for Measuring Broken Bow

Mr. Moore sights through a range finder, one of the instruments he carried for determining distances. Where direct measurement was impossible, the party also used level and transit to calculate the dimensions of formations. Distances estimated by eye were usually far in error.

© National Geographic Society
Kodachrome by W. Robert Moore, National Geographic Staff, and (left) Robert H. Moore



groove. The water that enters it now cascades down an almost vertical slit in the rock to a pool on the cavern floor. Part of the outflow into the creek apparently stems from a spring at the bottom of the pool.

Mrs. Howd Veater, whose brother-in-law formerly held range rights in the canyons, suggested a name for this chasm—"Cathedral in the Desert." It is as large as a good-sized cathedral, and streaks of stain give its walls the appearance of being draped with long slender pennons (page 408).

Before we got back to our camp near Davis Gulch a brisk wind had risen, blowing a sand blast along the canyon. Grit stung our faces and put an edge on our teeth. By dark, however, the wind dropped, and we ate dinner with only a minimum dusting of sand.

Paint Streaks Mark "Highway"

To speed up the meal, McKay and Bob volunteered to bake biscuits over the coals while Burnett prepared the rest of the dinner. A few moments later our biscuitmakers chorused, "If they're a-smoking, they're a-cooking; if they're black they're done." They were charcoal black on the bottom!

Within both Davis Gulch and Willow Gulch, whose outlets we had passed, lie other arches. But to reach them we had to climb out of Escalante Canyon, cross the desert, and descend again into the gulches.

There are relatively few exits from the Escalante. One is near Davis, but it is not easy. First we had to follow a zigzag path up a sand slope, a trail so steep that the pack horses refused time and again to start up it. Above this, the path mounts a narrow, sharply tilted ledge of slickrock in which cowboys have blasted and chipped a few crude footholds (page 420).

Even when we had negotiated that precipitous incline, there were sand slopes and slickrock so steep that we had to climb afoot, leading our horses.

Over part of the desert, too, the trail was no boulevard. But it is a highway, or at least Burnett called it that. As proof he pointed to a bright aluminum house trailer parked at the base of a rocky hillock.

The trailer was brought here as shelter for a U. S. Geological Survey employee while he made an extended study of the water heights and sediment carried in the Escalante.

"To get that trailer here, the Government built the cheapest highway in history," Burnett said, with a twinkle in his eye. "Seven miles with a gallon of paint!"

We followed part of the "highway." On the slickrock short streaks of white paint marked the path over which men had managed to drive jeeps and drag the trailer.

"The trail into Davis is easy to find," McKay's father had told us. "Just keep a lookout for a pile of rocks."

We found rocks everywhere. We rode across acres of rocky land and got lost among ledges and cliffs. Finally we found a tiny mound of small stones. They marked no apparent path, but McKay knew where to go and led us to the verge of Davis Gulch.

"This spot is tricky," he said, dismounting. "We had a horse do a two-and-a-half gainer off the cliff here, and once a pack mule landed in the cottonwood trees below. So take it easy."

We half walked, half slid into the canyon. By the foot of the cliff, poles enclose a small corral. Near here, a few years ago, a wild bull turned back an exploring party. Later he was killed; his hide still hangs on the corral fence.

Davis Gulch also holds a mystery. In 1934 Everett Ruess, a young poet-artist, vanished into the Escalante canyons. Early in the next year his two half-starved pack burros were found at this corral. These animals, and a few enigmatic inscriptions, "Nemo 1934," on the cliff walls, are all that have ever been found.

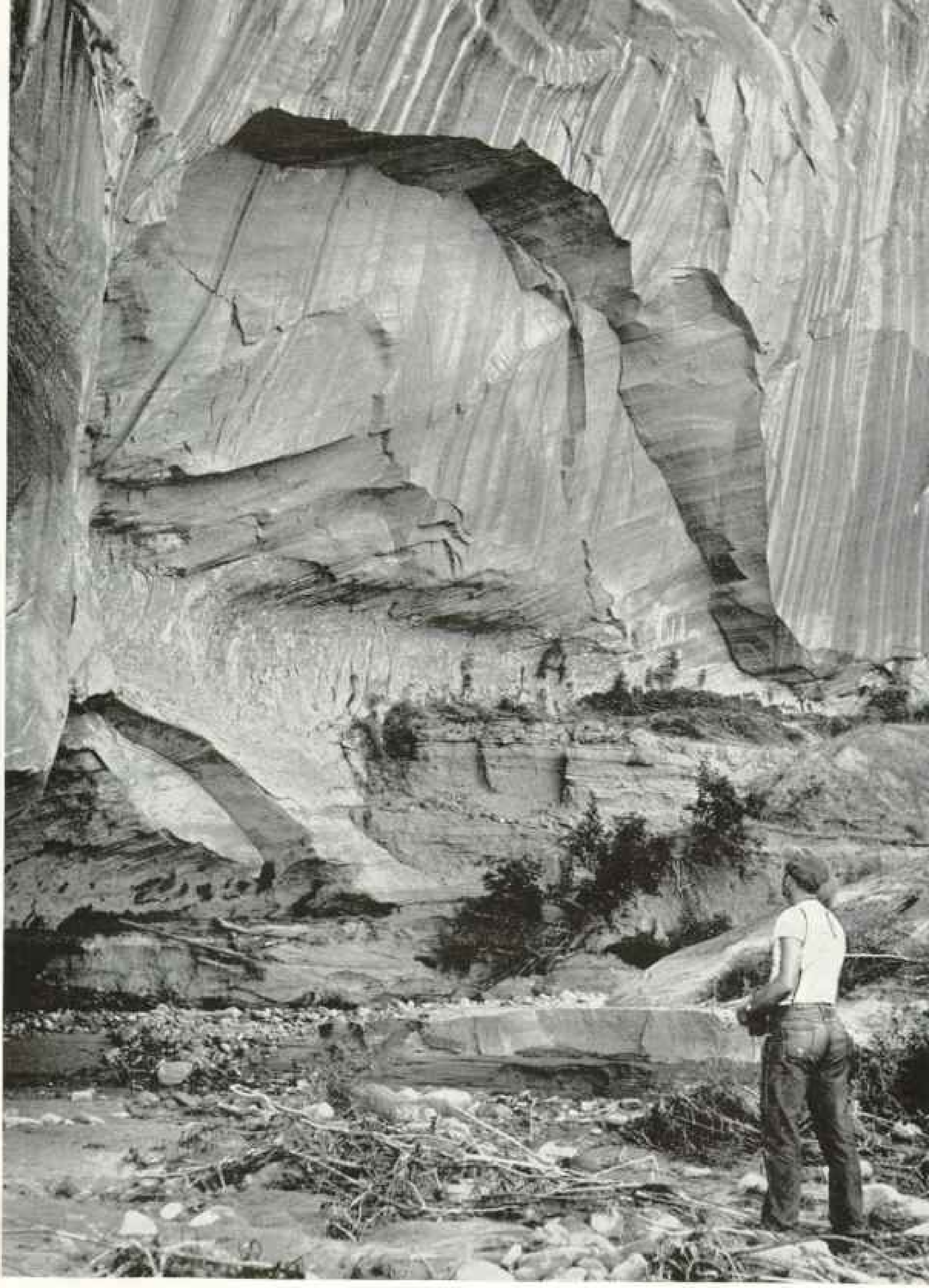
Canyons Once Occupied by Indians

Mounting a sand slope deep in the canyon, we came upon an alcove whose walls once served as canvas for a primitive Indian artist. After centuries, the long row of pictographs he painted in white on the red sandstone remains almost completely intact (page 406).

In similar alcoves we found remnants of rude houses. Indians once stored food in these structures of stone and mud.

Strewn about one cluster of houses lay stone mortars, or metates, used by the ancient Indians to grind corn. We also found a mano, or oval stone, with which they did the grinding.

Studying aerial photographs, we decided we had entered Davis Gulch between its two arches. Neither McKay nor Jerry had seen them, nor had Burnett, except from the air. We started downstream, but found so many beaver dams and other obstacles barring the



415

Chiseling with Water, Frost, and Wind, Nature Starts Sculpturing a New Arch

This Soda Gulch wall reveals how some arches form. Scouring streams undercut the walls and leave them thin; water seepage helps dislodge rock slabs until a hole breaks through.

path that we could ride no farther. After camping and eating lunch, Burnett, Bob, and I went on afoot while McKay and Jerry napped in the shadow of a cliff.

Here, in lower Davis, the river has been a bold sculptor. It has twisted in a sharp loop, leaving an intervening rock wall several hundred yards long. Both sides are deeply undercut by wide alcoves, and a window has broken through the center. The window itself is more than 100 feet wide and more than 75 feet high, yet it is small compared with the width and height of the colossal beam of rock above it.

Earlier, when Harlon Bement had flown us over the Escalante region, he also had circled Butler Valley, southeast of Bryce Canyon National Park, to show us Grosvenor Arch. It had been named in 1948 by Jack Breed and his companions for Dr. Gilbert Grosvenor, then President of the National Geographic Society and Editor of its Magazine, and now, since his retirement, Chairman of The Society's Board of Trustees.

"One of the Escalante arches should bear the name of The Society's new President, because of his many years in geographic work and his personal interest in this trip," Burnett had suggested.

So to us this hitherto unnamed arch in lower Davis canyon became La Gorce Arch for Dr. John Oliver La Gorce, now Editor of the NATIONAL GEOGRAPHIC MAGAZINE (pages 418, 419).

Arch Shaped Like an Elephant's Trunk

Near a bend below La Gorce Arch we gained one of the most memorable views of the entire trip. On our left, as we looked back, towered an almost vertical wall, its straight sides soaring hundreds of feet above us. On our right rose the curved ceiling of a gigantic alcove hewn into the wall of the narrow canyon. Where we stood, the chasm was in shadow, but beyond the arch opening the afternoon sunshine struck the rock, making it glow like living flame. The reflected light flooded the alcove and canyon walls, suffusing them with a golden red.

Next morning we rode past beaver dams and through the brush to Davis's upper arch, an elephantine trunk of rock extending from the left cliff face. We found the opening to be 100 feet across by 80 feet high, with the trunklike arch ring between 100 and 200 feet thick. Atop this sandstone trunk rears a large rock knob, like the decorative boss worn by an Indian elephant on parade.

"Why not Bement Arch?" I suggested.

Certainly no person has been more enthusiastic in bringing the arches to outside attention. And few persons have keener interest than he in the scenic attractions of his State. Harlon Bement has flown up and down over Utah time and time again, exploring its little-known canyons, searching its desert areas, and photographing its weird rock formations. So Bement Arch it became.

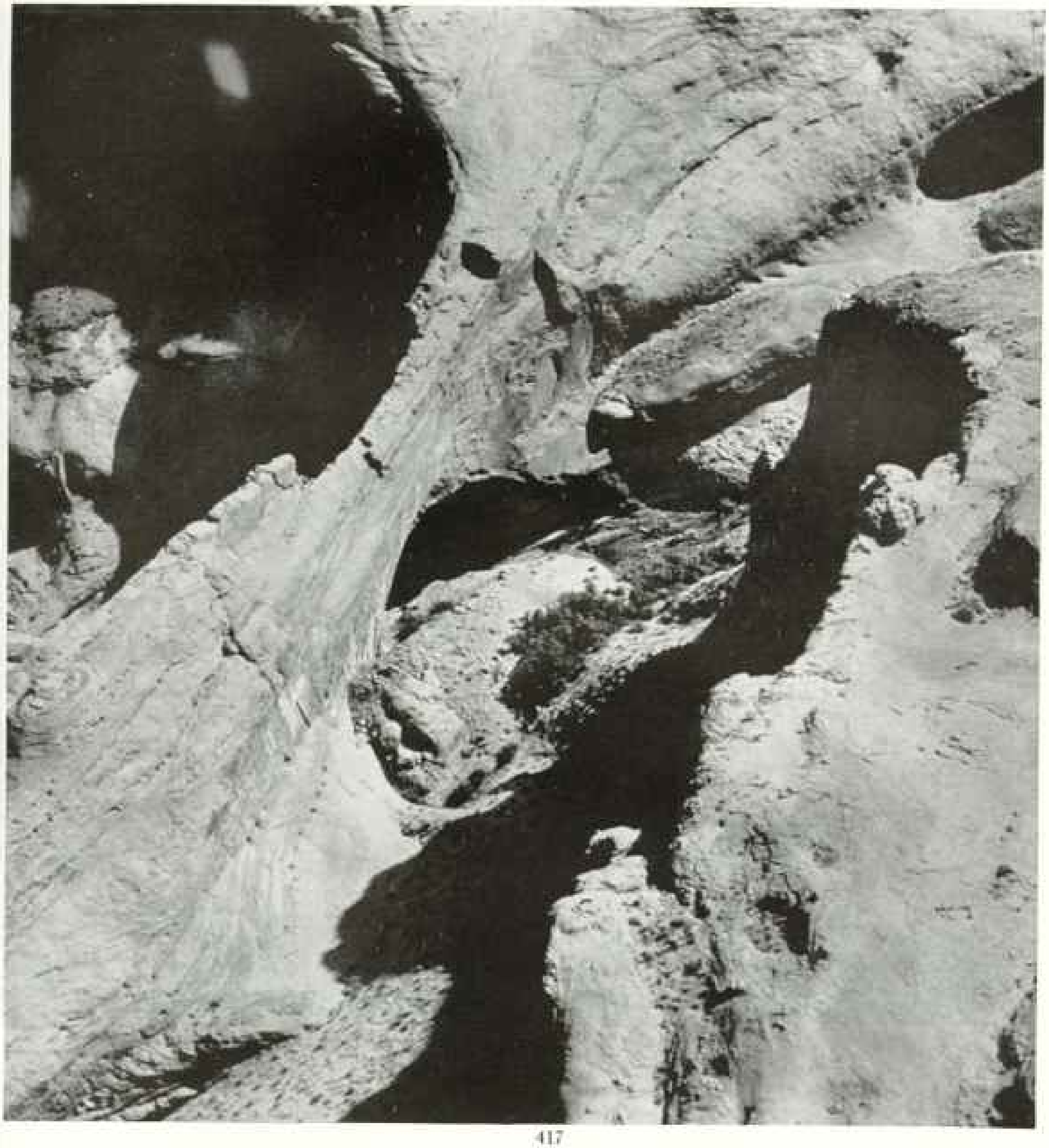
Willow Gulch, with its Broken Bow Arch, lies north of Davis and Soda Gulches. Accessible from the desert road out of Escalante, it will probably attract more visitors than any of the other formations.

We found the ride into Willow less difficult than had been our other canyon treks. Gail Bailey, McKay's father, rode with us to see if he could take his cattle from the Escalante through this route.

Broken Bow Arch occupies a striking position in a broadened section of the canyon. Some distance before reaching it we topped a sandy hillock and could see the formation looming boldly above the stream bed (p. 413).

Like Bement Arch, Broken Bow projects conspicuously from the left wall of the canyon. The arch gains its name from a broken Indian bow found near its base; oddly enough, its shape reminds one of a bow bent nearly double.

Scrambling across the boulders strewing the floor of the arch, Burnett and McKay stretched the steel tape across the opening. Its width was 94 feet. The range finder recorded its height as almost exactly 100 feet.



417

Near the Outlet of Its Winding Canyon, Soda Gulch Stream Hewed This Natural Bridge

A few cattlemen had known the bridge for years, but not until 1940 was it named for Dr. Herbert E. Gregory, noted geologist. The rock span, overshadowed by surrounding cliffs, rears 180 feet. Its opening astride the stream measures 177 feet across by about 75 feet high (page 412).

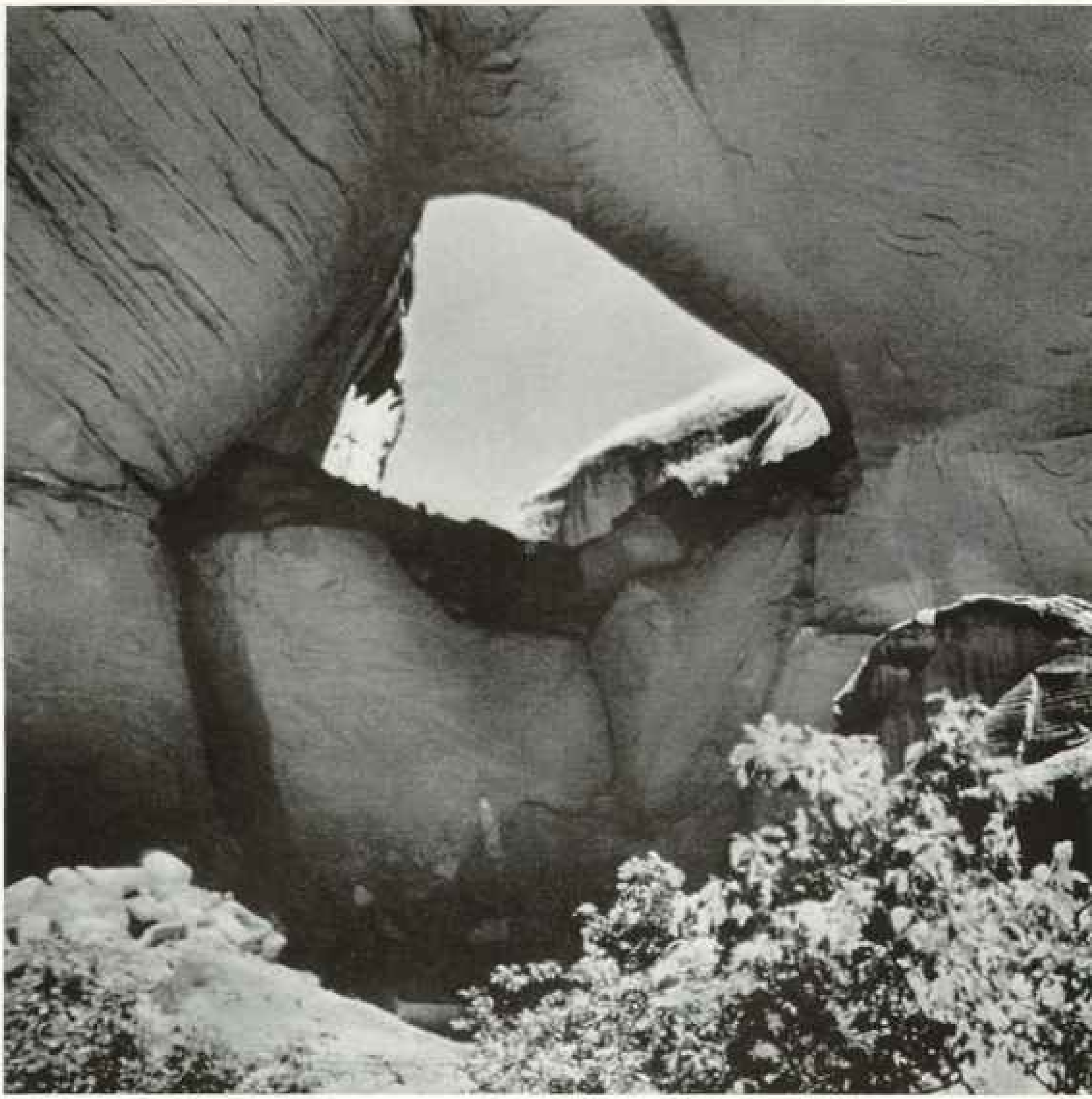
The arch ring above is roughly 70 feet in thickness, thus making the total arch height approximately 170 feet.

Downstream from Broken Bow the gorge narrows in places to only a few feet. In one of these narrows lay a huge boulder, blocking the passage so cattle could not get through. McKay had brought along some dynamite to blast it out of the way. He and Jerry set the charge—20 sticks.

"There's enough there to blow out the walls of the canyon," McKay's father insisted.

We retreated around two bends of the canyon to await the blast. The explosion came like a sharp blow, and a shower of stones on the canyon walls echoed like the popping of machine-gun fire. The boulder was a barrier no longer.

We explored the narrow stream bed for some distance, seeking possible quicksand beds



418

Burnett A. Hendryx

♠La Goree Arch, Named for The Society's President, Highlights a Bend in Davis Gulch

This window, 100 feet wide by some 75 feet high, punctures a tremendous arm of rock deeply undercut into large alcoves on both sides. Dr. John Oliver La Gorce, Editor of the National Geographic Magazine, took a keen personal interest in the survey of these little-known formations. Grosvenor Arch, named in 1948 for Dr. Gilbert Grosvenor, then President of The Society, stands only 50 miles to the west; its double span towers 152 feet (page 416).

➔ Page 419: Late afternoon sunlight sets aflame the canyon walls framing La Goree Arch. From this downstream side an intervening mound of talus, fallen from the overhanging rock ceiling, conceals the lower part of the window. The rock beam above is so massive that it dwarfs the size of the opening.

© National Geographic Society

Kodachrome by Robert B. Moore

that might trap the cattle, but found no serious hazards.

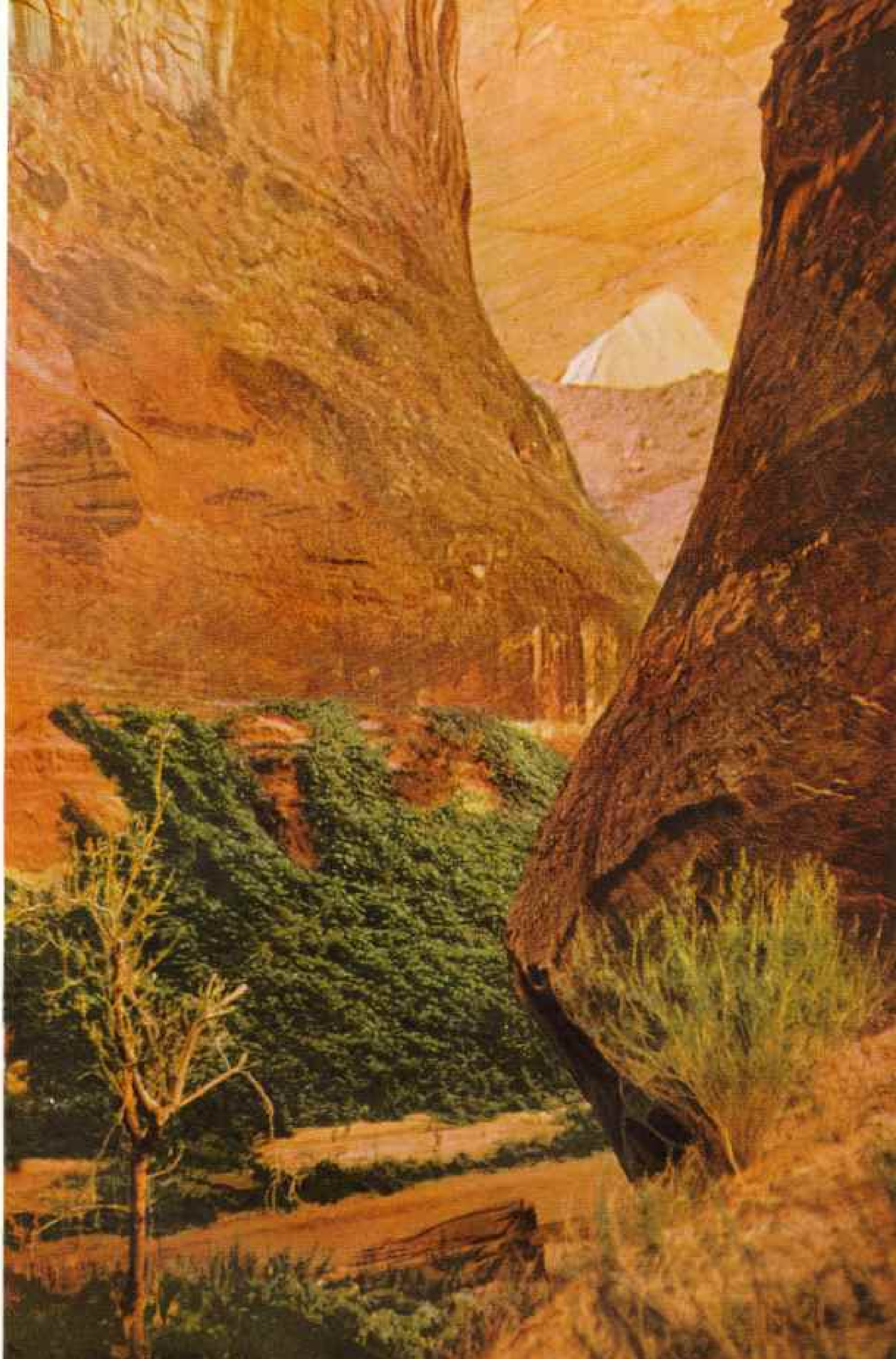
Returning again to Broken Bow, I halted to make one last photograph of the arch before leaving the canyon.

"It's good to be among the very few who have seen all 10 arches in the Escalante," Burnett remarked.

"Ten arches?" I said innocently.

"Yes, the eight natural ones, plus Moore's two fallen arches—the ones you've complained about during the climbs!"

The aches I had experienced on the trip, I admitted, would soon be forgotten, but not the awesome canyons and spectacular formations we had seen—the arches, bridges, and skyscraper pinnacles sculptured through the ages in Escalante's glowing sandstone.



Horses Clamber Up a Tortuous Trail from the Escalante

Only two or three side gulches and this precipitous path near Davis Gulch afford access by horse to the main canyon.

Leaving the river at Davis Gulch, the party first had to ascend a zigzag path up a high sand slope, then climb this narrow, tilting slickrock ridge. Frequently the men had to dismount and lead their horses, for the animals refused time and again to attempt the hazardous trail.

The passage (left) where the pack mule enters has been dynamited open. Cowboys have chipped and blasted footholds on the ridge.

Author Sees Escalante by Air Before Making His Pack Trip

Harlon W. Bement, Director of the Utah State Aeronautics Commission (on wing), first brought the arches to the National Geographic Society's attention. With him are red-shirted Burnett Hendryx and Dr. Arthur Crawford, of the Utah Geological and Mineralogical Survey. The four men flew over the arch country in this Beechcraft Bonanza.

During reconnaissance flights the plane landed for refueling here at Goulding Trading Post, in Monument Valley.

Page 421, below: Cattlemen round up Herefords at Little Red Rock, a natural corral southeast of Escalante. Willow Tanks and Sofa Springs camps have similar rock-walled enclosures.

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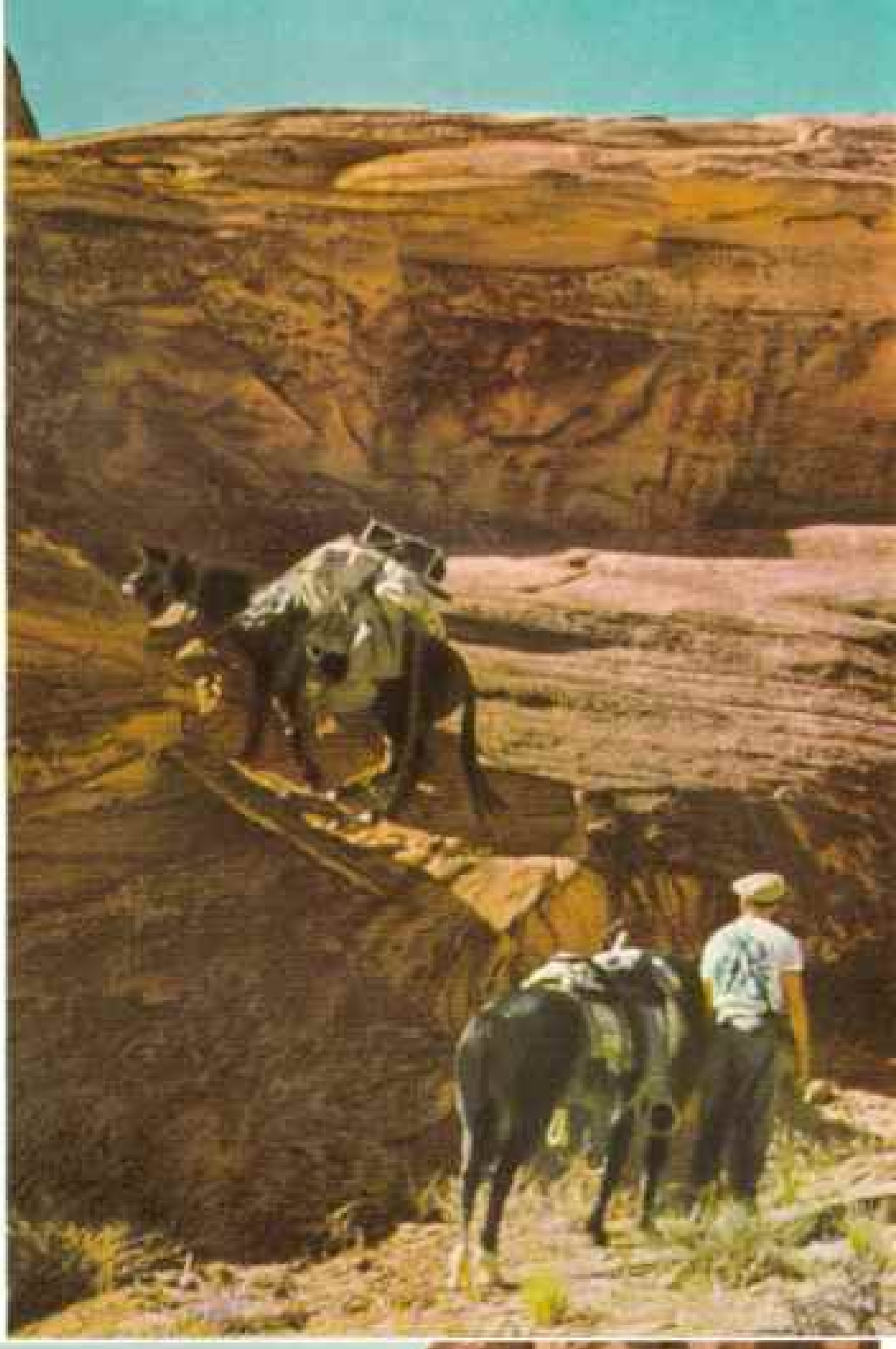
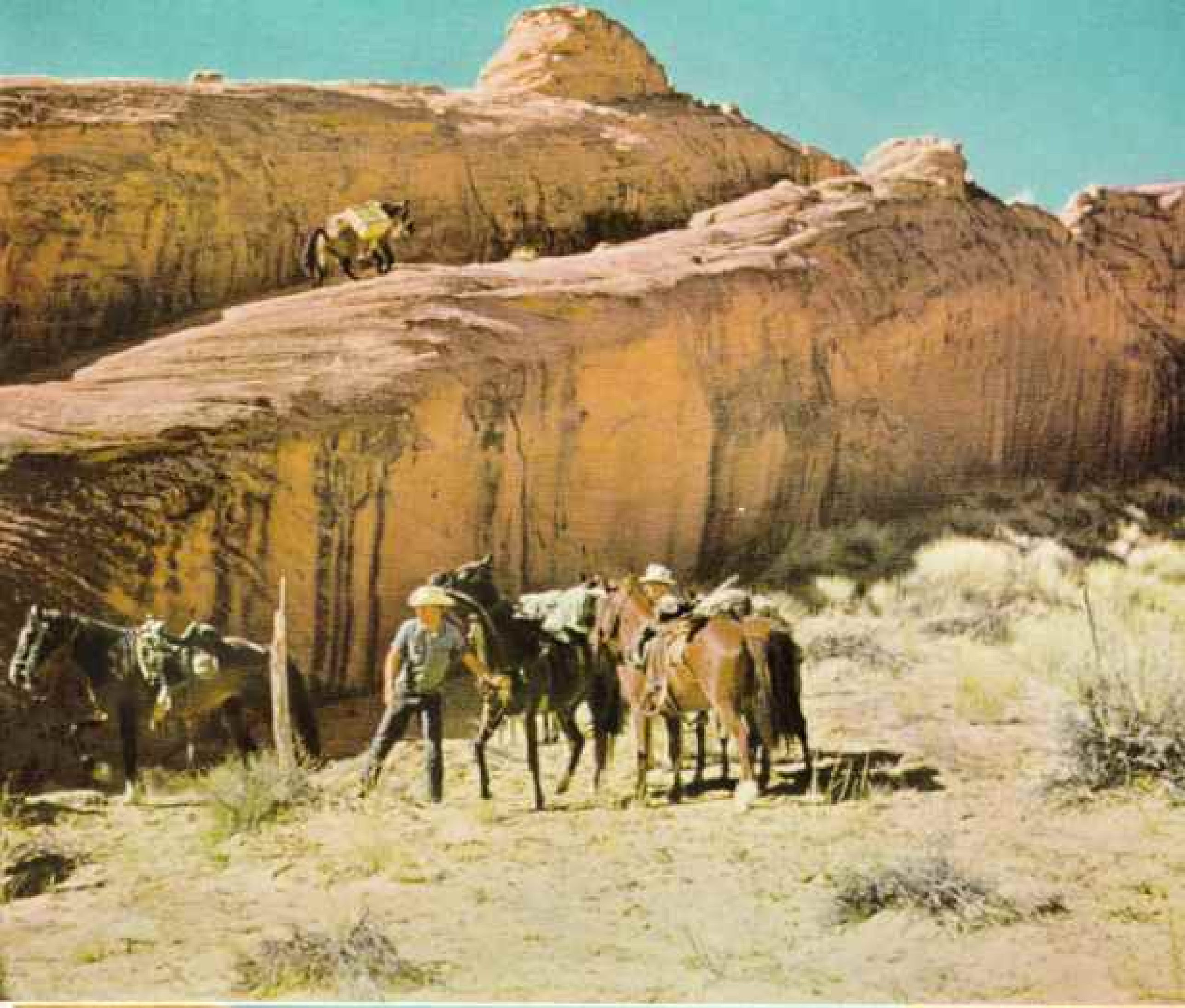
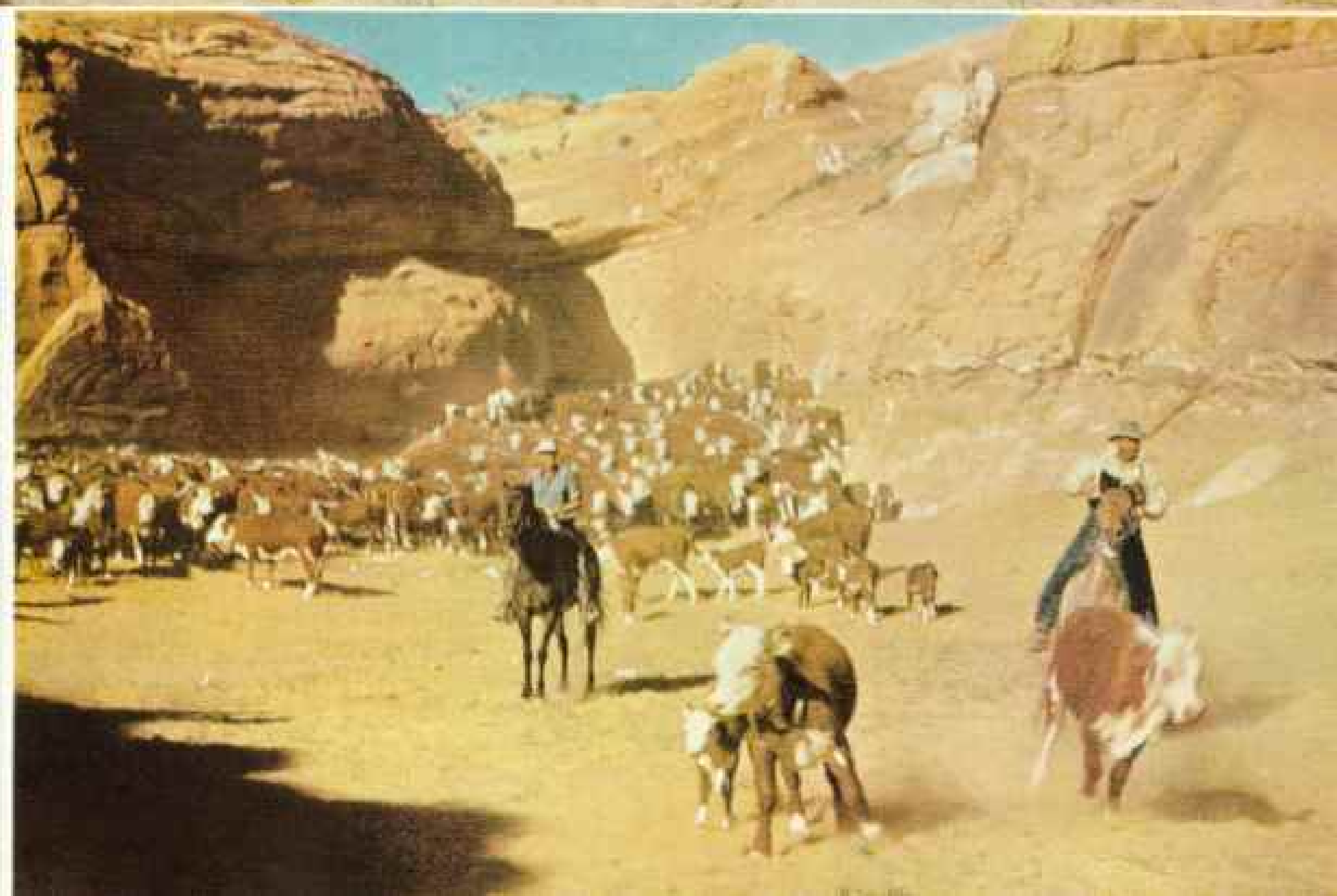
Enlargements by W. Robert Moore, National Geographic staff, and J. Kenneth Reid (opposite below)







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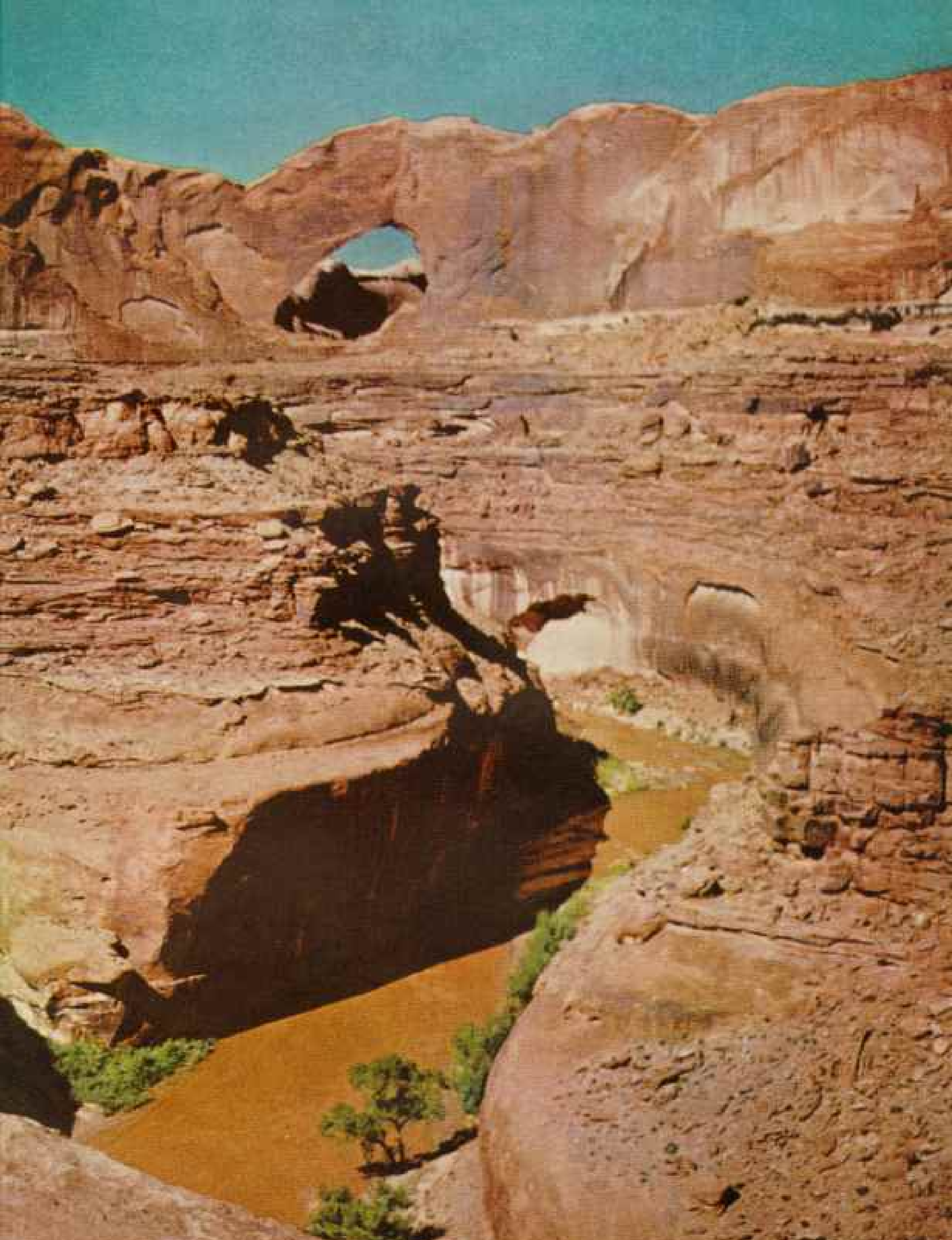
An Eye-catching View of Escalante's Largest Arch Rewards a Breathless Climb

Quicksands in the Coyote (left) forced the party to detour over this rock shelf to reach the Escalante Canyon (right). The mud-stained river, digging ever deeper, flows 500 feet below the arch half a mile away.



Kodachrome by W. Robert Moore, National Geographic Staff

Stevens Canyon Arch: A Giant's Peephole in a Sandstone Fortress

Except for Rainbow and Sipapu natural bridges, no known arch in the United States surpasses this one in size (page 424). Near the river bed two new alcoves have been undercut in the canyon wall.

© National Geographic Society

Men Appear as Lilliputians in the Yawning Span of Stevens Canyon Arch

By crawling up cliff fractures on hands and knees, Burnett Hendrys and Bob Moore (right) reached the inside of the arch. They hold a line across the opening, which measures about 225 feet wide by 160 feet high.

425 (Color transparency by W. Robert Moore, National Geographic Staff)

Cleavage Has Shorn Away the Wall Face as if with a Giant Ax

Strong winds buffet the author's son on his knife-edge perch; walls sheer away on either side to Stevens Canyon and the Escalante, 580 feet below. "I was never more frightened in my life," he later admitted.

© National Geographic Society

Direct Natural Color Photograph by E. C. Slipher

Green Patches Splotch the Red Face of Mars

From Bloemfontein, South Africa, the National Geographic–Lowell Observatory Mars Expedition last summer took 20,000 photographs of the planet on which life as we know it is most likely to exist. Here Mars, inverted as the astronomer sees it in a telescope, reveals springtime details of its southern hemisphere; the planet appears 7,700 times larger than to the unaided eye.

Across 40,000,000 miles of space, the south polar cap (top) gleams blue-white in sunlight. Icy-blue clouds hover above the north polar cap, tilted from sight at the bottom. Millions of acres show green because, Dr. Slipher believes, a scanty water supply melting from the poles quickens some form of vegetation. Vast reddish-ocher areas are dusty desert.

←The polar cap dwindles in spring and summer, and from it spreads a great "wave of darkness" as the patches intensify in hue.

E. C. Slipher

New Light on the Changing Face of Mars

A Huge Green Area Almost the Size of Texas Appears in Photographs Made by the National Geographic Society–Lowell Observatory Mars Expedition to South Africa

By E. C. Slipher

Astronomer, Lowell Observatory, Flagstaff, Arizona, and Leader of the 1954 National Geographic Society–Lowell Expedition

USUALLY an expedition to Africa aims at big-game hunting, missionary work, or exploration. In the spring of last year, however, one set out for Bloemfontein, South Africa, on the strange mission of exploring another world.

This other world was the planet Mars, which would spin closer to the earth that summer than it had done for 13 years—a mere 39,800,000 miles away on July 2, 1954 (see diagrams, page 430).*

To Africa for a Grandstand Seat

With the coordinating aid of the new International Mars Committee, scientists in many countries seized the chance to renew their attack on stubborn secrets of our red-and-green-faced neighbor. For example, they were eager to learn more about the amazing changes which sweep across its face continually, and particularly what causes vast areas to turn blue-green in Martian summer.

To us of Lowell Observatory, this chance was particularly appealing, for Mars has been a favorite target of our telescopes since the days of our founder, Percival Lowell. He advanced the theory that the faint lines called *canali* by their Italian discoverer are strips of vegetation along watercourses, and that the planet is being irrigated from the melting ice-caps by intelligent beings struggling to keep alive on a dying planet.

But to make full use of this golden chance to gain more information, we needed a grandstand seat in the Southern Hemisphere. Mars would lie so far south during the crucial months that the great telescopes of the Northern Hemisphere would be able to observe it for only a short period each night and at a low elevation above the horizon, where turbulence of the earth's air interferes with what astronomers call "seeing."

Fortunately, the University of Michigan made available to us its excellent 27-inch refracting telescope, the largest in the Southern Hemisphere, at its observatory's southern branch, Lamont-Hussey Observatory in Bloemfontein, South Africa. Here Mars would appear almost overhead each night, and we would have the longest and best possible type of seeing, through the shortest path of clear, dry South African air.

Greatly impressed by these prospects, the Lowell Observatory brought the matter to the attention of the National Geographic Society, whose generous assistance to worthwhile projects is widely known. The officials of The Society quickly recognized the need and the scientific importance of such an undertaking and agreed to sponsor, jointly with us, a six-month expedition to Bloemfontein for intensive study of the planet.

In our conferences with The Society's officers and Research Committee, it was agreed that the most valuable contribution to knowledge of Mars would be a complete and continuous set of photographs taken during the five best months of the opposition in at least three colors—blue, yellow-green, and red.

Blue Filter Reveals Martian Clouds

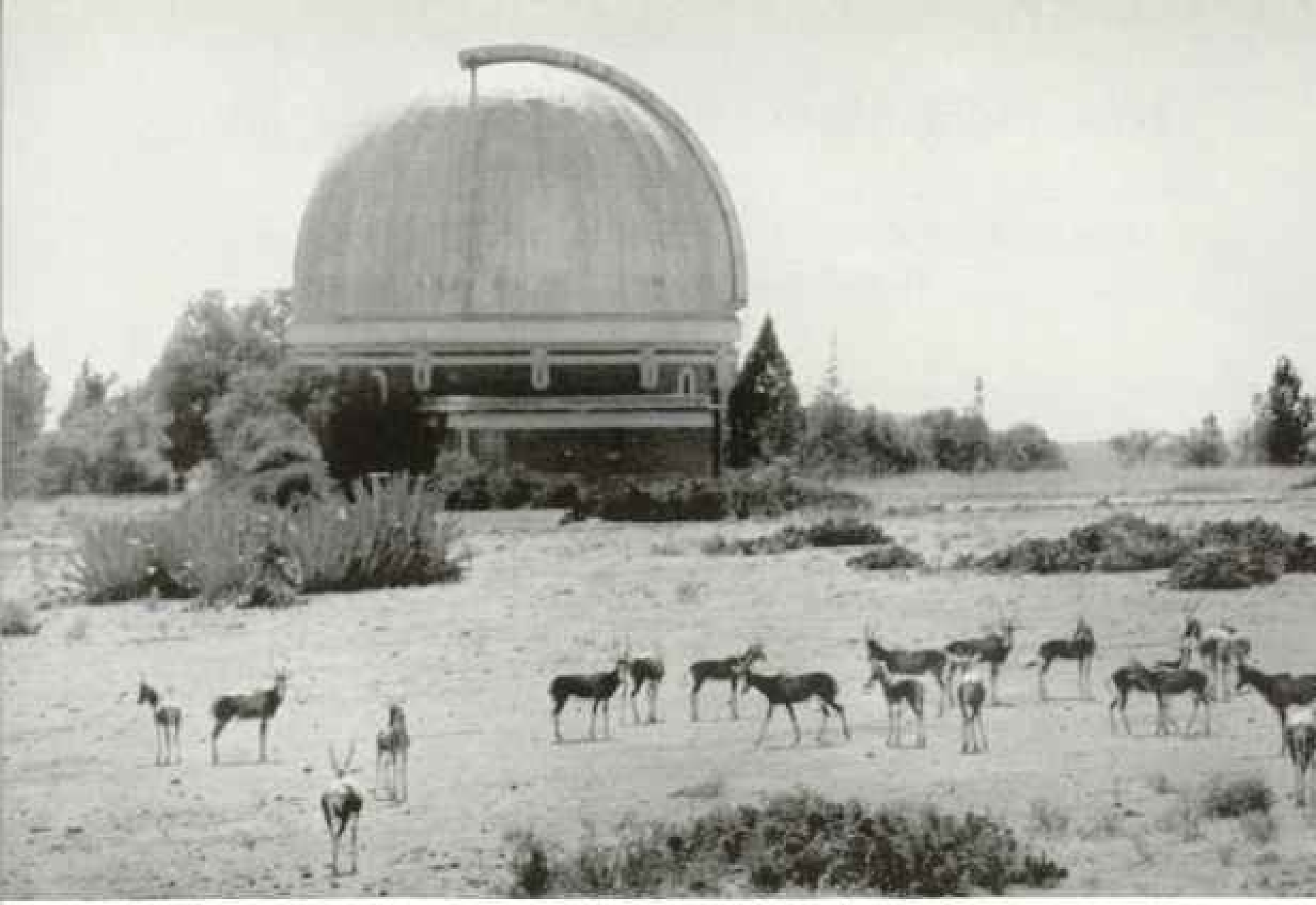
Photographers well know that by the use of various colored filters they can reveal different aspects of a landscape or sky and penetrate haze. We applied the same techniques in probing the nature of Mars. Blue-filter photographs best reveal the planet's clouds, for instance, while a red filter helps us detect changes in the blue-green regions.

Carefully calibrated photographs, we hoped, would give us more accurate knowledge of the size and shape of Mars, known to be about 4,220 miles in diameter, or roughly half that of the earth.

The program called for special types of plates, filters, cameras, and lenses—all of which were either built or adapted at the Lowell Observatory in Flagstaff to fit the Lamont-Hussey telescope.

We shipped our heavy supplies from Flag-

*See "News of the Universe," by F. Barrows Colton, National Geographic Magazine, July, 1939.



428 Raymond Gnaz, Friend Newspapers Ltd.

Antelopelike Blesboks Graze the Grounds of Lamont-Hussey Observatory at Bloemfontein
From this giant dome, the National Geographic–Lowell Observatory expedition trained a telescope on Mars from May to September, 1954. Dry, clear air and high elevation offered a grandstand view.

staff in February, and early in April Mrs. Slipher and I left New York by air for South Africa, via Europe. In three and a half days we reached Bloemfontein—14,000 miles in 38 flying hours.

When you first land in a foreign country, it is heart-warming indeed to have someone bound forward with a warm welcome and offers of assistance. Such was our reception in South Africa, where we found the people cherishing a deep regard for the United States.

Observatory's Dome Overlooks City

Bloemfontein, which means "Fountain of Flowers," lies at 4,560 feet on the Orange Free State Plateau.

Dominating the prosperous agricultural community of 120,000, the Lamont-Hussey Observatory stands on Naval Hill at an altitude of 4,888 feet and about three miles from the center of the city. Its dome, like a bald head in a swimming pool, can be seen from miles out across the veld. This and the Boyden Station of Harvard College Observatory, 12 miles northeast at Mazelspoort, make the Bloemfontein region a noted center of astronomical observation.

Despite our pleasant reception, we met with a dreadful shock. Instead of finding that our equipment had arrived, we held cablegrams informing us that through a misunderstanding the invaluable shipment still rested on the docks in New York.

In answer to our urgent pleas, the shipping company managed to swing our instruments onto a ship leaving New York immediately. Even so, they would not arrive in Cape Town until May 6.

Perhaps it was well that we did have extra time to repair the telescope, which had not been in use for many months. Lightning had surged through the metal dome and wrecked the electrical circuits.

Fortunately, a friend was on hand to help us. Dr. R. A. Rossiter, who supervised much of the erection of the telescope and observed with it for more than a quarter of a century, came out of retirement and generously volunteered to lead the way in placing the observatory again in splendid operating condition.

No man helped us more with countless necessary arrangements than Dr. A. C. Hoffman, director of the National Museum at Bloemfontein. Through his efforts as well

as those of many Government and railroad officials, our instruments were whisked from the ship at Cape Town to the observatory in 24 hours.

One day after the arrival of our equipment all adaptations to the telescope were complete and we were ready for action. These preparations were greatly facilitated by the assistance of Mr. G. E. Burton, engineer at the Mazelspoort observatory, which extended its wholehearted cooperation throughout the project.

Irish Astronomer Joins Expedition

Three days earlier, by previous arrangement, Mr. A. P. Fitzgerald, O.B.E., an official of the Government of Northern Ireland, enthusiastic amateur astronomer, and a leader in the Irish Astronomical Society, Belfast, joined the expedition as guest astronomer.

On leave from his Government post, this genial gentleman and good companion timed and recorded thousands of camera clicks, as well as type of plate, color filter, quality of seeing, and shutter speed. Also greatly appreciated was his expert brewing of tea during the long night vigils.

For assistance in operating the 56-ton dome, its telescope, and other equipment, I had the able services of Mr. Petrus J. J. Franzsen for most of the time and those of Mr. T. J. Adendorff and Mr. Everet Steyn for shorter periods.

To our delight, weather conditions proved exceptionally favorable. In a period of 128 days we had only five or six nights when clouds prevented photography.

Every night we would cram ourselves into our little French car and drive up the hill where herds of springboks and blesboks grazed without concern in the game preserve around the observatory (opposite).

Wrapped in heavy overcoats and scarves as insulation against the keen night air, we directed the telescope at the blazing planet, set the clockwork going so as to keep the great magnifying glass on its objective despite the spin of the earth, and carefully scanned the distant planet for visible changes of its countenance. Perched on a packing box, we often peered for hours to capture details too faint and fleeting to be caught by cameras through earth's rippling atmosphere.

If the quality of the photographic seeing promised useful results, we would bring up plate holders, attach the long, tubelike cameras in place of the eyepiece, and make highly enlarged color photographs in at least blue, green, and red light. Sometimes orange and other color filters would be used in conjunction with emulsions prepared to register a specific wave length of light.

By using a movable plate carriage, we were able to make a whole series of candid-camera shots of Mars on a single plate. Since this method eliminated the necessity of stopping to change plates, it offered a reasonable chance of catching some clear, sharp pictures at a time when the earth's atmosphere paused in its perpetual rippling across the field of the powerful telescope. These moments could best be caught when the observer watched through the guide telescope and snapped the exposure at the right instant (below).

Shortly after our observations began, we discovered that a new dark area of consider-

Hand on Camera Release, the Author Aims the 27-inch Refractor at Mars

Dr. Slipher peers through the guide telescope. Movable holder at bottom of the tubelike camera makes a series of images without a change of plates.

Tyrone Spencer, Black Star

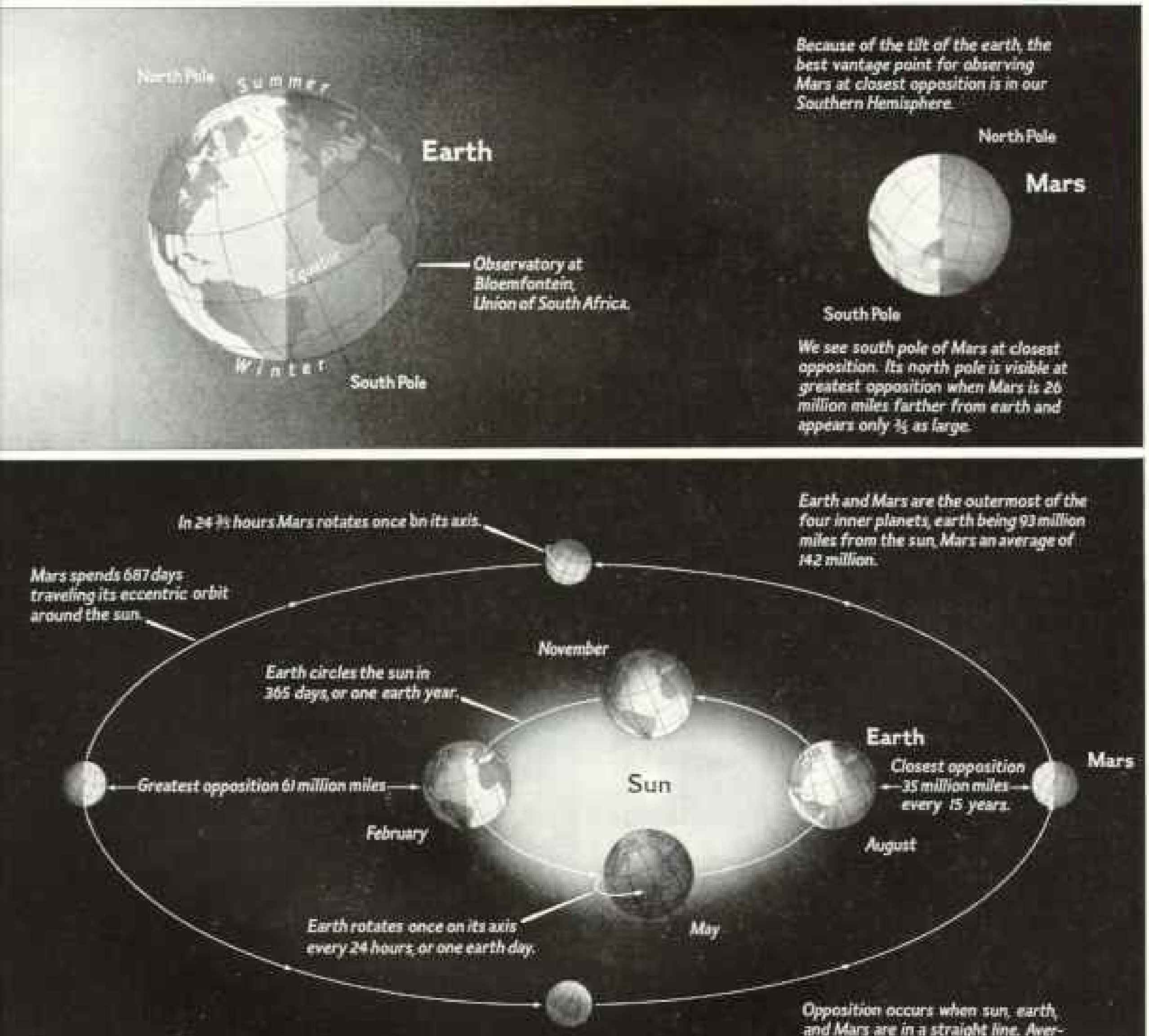
able size had appeared in the desert regions of Mars. A 1939 photograph had given an earlier hint of its development (pages 432, 433). It appeared to have the same blue-green tint as previously known dark areas.

The newly discovered marking covered an irregular area of approximately 200,000 square miles—a little less than the size of Texas. Its center lay in Martian longitude 235 degrees and latitude 20 degrees north, near where the great Thoth Canal joins the Aquae Calidae. This wholly unexpected modification represents the greatest change observed in the geography of the planet since its surface was first mapped 125 years ago.

Like all the other dark regions of Mars, the new area was not uniform in appearance, but was ribbed and striated with structural details very difficult to single out because they were fused together like several pencil lines smudged over by one's finger. I thought the striations running through the area were where known "canals" had been seen in the past, but I could not be certain.

This discovery is of particular significance, because never before has a new dark patch appeared except as an outgrowth or extension of an existing dark area.

Every 15 Years Earth and Mars Whirl Within 35 Million Miles of Each Other



The remarkable transformation indicates that the division between desert and dark areas is not necessarily a fixed or permanent one, but that one may change to the other at any time. This in turn hints that the deserts and dark areas on Mars are neither dependent upon nor directly related to any particular type of topography or surface material or of land elevation.

Green Areas Betoken Martian Life

Apparently a vast area of desert can spring into sudden fertility, if in fact—as we believe—the darkening is due to the growth of plant life. Like vegetation on earth, these green areas turn gray, brown, or red when the Martian fall and winter come.

Biologists suggest that this life may be akin to lichens, which flourish even on our mountaintops. To shed further light on the subject, efforts may soon be made to grow such plants in the laboratory under the physical and chemical conditions that are thought to exist on Mars.

Such green areas bear eloquent testimony to the fact that Mars is not a dead world. In fact, all the various Martian markings betoken that it is a living planet, that life of some sort exists there. If this were not so, the winds of Mars would long ago have scattered the dust and sands everywhere, rendering the whole surface the same uniform tint. Obviously it is the growing of something on, or out of, the surface which prevents Mars from becoming featureless forever.

It will be most interesting and instructive to see what this new marking will look like when Mars comes into even closer opposition—35,300,000 miles—in 1956.

To the accompaniment of our clicking cameras, the night of 1954's closest opposition came and went on July 2. Two days later some of our English friends called us and exploded firecrackers over the phone to remind us it was the Fourth of July. Often we felt we were living in two worlds—our own familiar planet, and that ruddy distant one with which we rendezvoused each night.

Although Mars and the earth were now rapidly drawing apart, we continued our observations well into September, when our target became too small for useful studies. By that date more than 20,000 photographs had been obtained, most of them of such splendid quality that even preliminary study has added substantially to our knowledge.

Our blue photographs showed an entirely new feature, or at least one that has never before been recognized. This was the existence of a series of faint atmospheric belts across the face of the planet. These belts, less distinct than those of Jupiter and Saturn,

Through Different Filters Mars Presents a Changing Face to the Camera

Just as a photographer uses color filters to penetrate atmospheric haze and reveal the landscape, the astronomer corrects his telescope camera to analyze the atmosphere and terrain of Mars.

Left: The red filter sweeps away a cloak of purple haze and shows a dark, vast expanse thought to be vegetation made possible by moisture unlocked from the polar snow caps. Light areas are dust-covered desert. Center: Blue filter, which emphasizes atmosphere, gives a clear view of the south polar cap, here inverted to the top position. Sunset darkens the disc's left margin; day breaks on the Martian right. Noon, at the middle of the globe, lifts haze, revealing portions of the landscape. Right: Orange filter, piercing fog on another face of Mars, discloses blue-green patches. The blade of the hatchetlike dark area straddling the equator represents zero longitude, a line chosen arbitrarily like earth's Greenwich meridian.

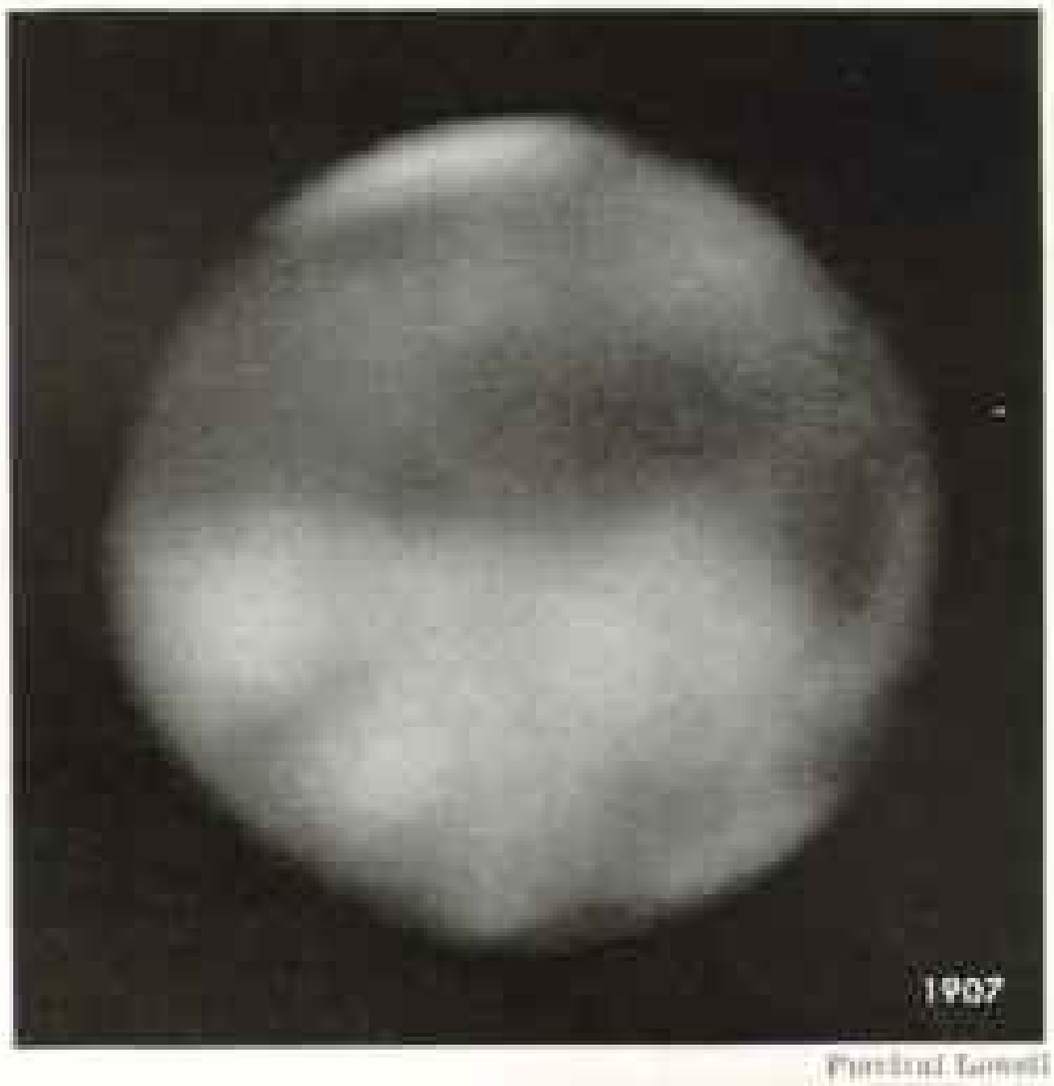
E. C. Slipher

Baffling Lines Scratch the Red Planet; Are They the Work of an Intelligence?

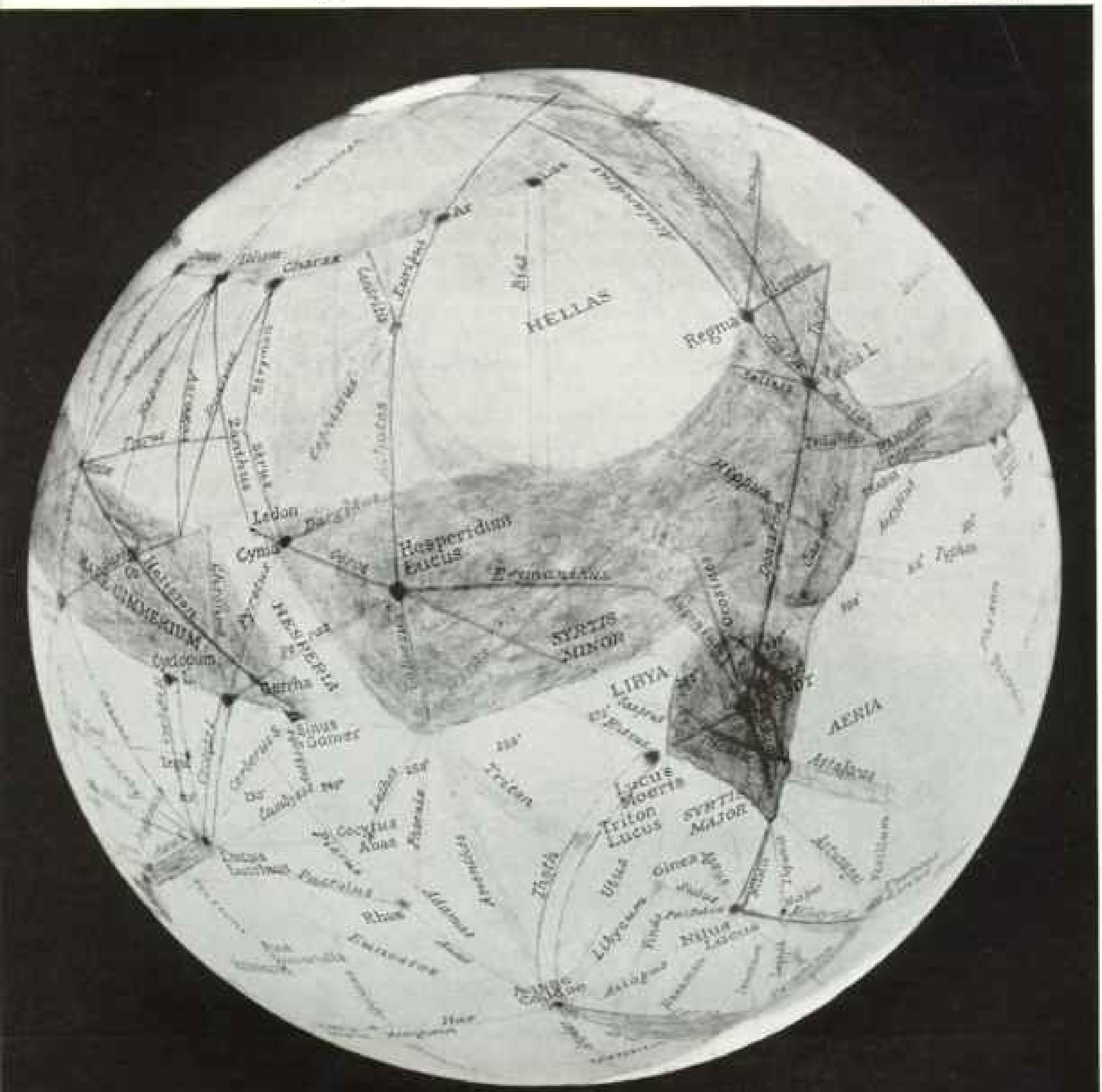
On this globe Prof. Percival Lowell recorded his visual observations during an opposition. He was convinced that the long lines were strips of vegetation bordering canals that led water from melting polar caps to dusty central regions. Such structures, he reasoned, indicated a race of intelligent beings.

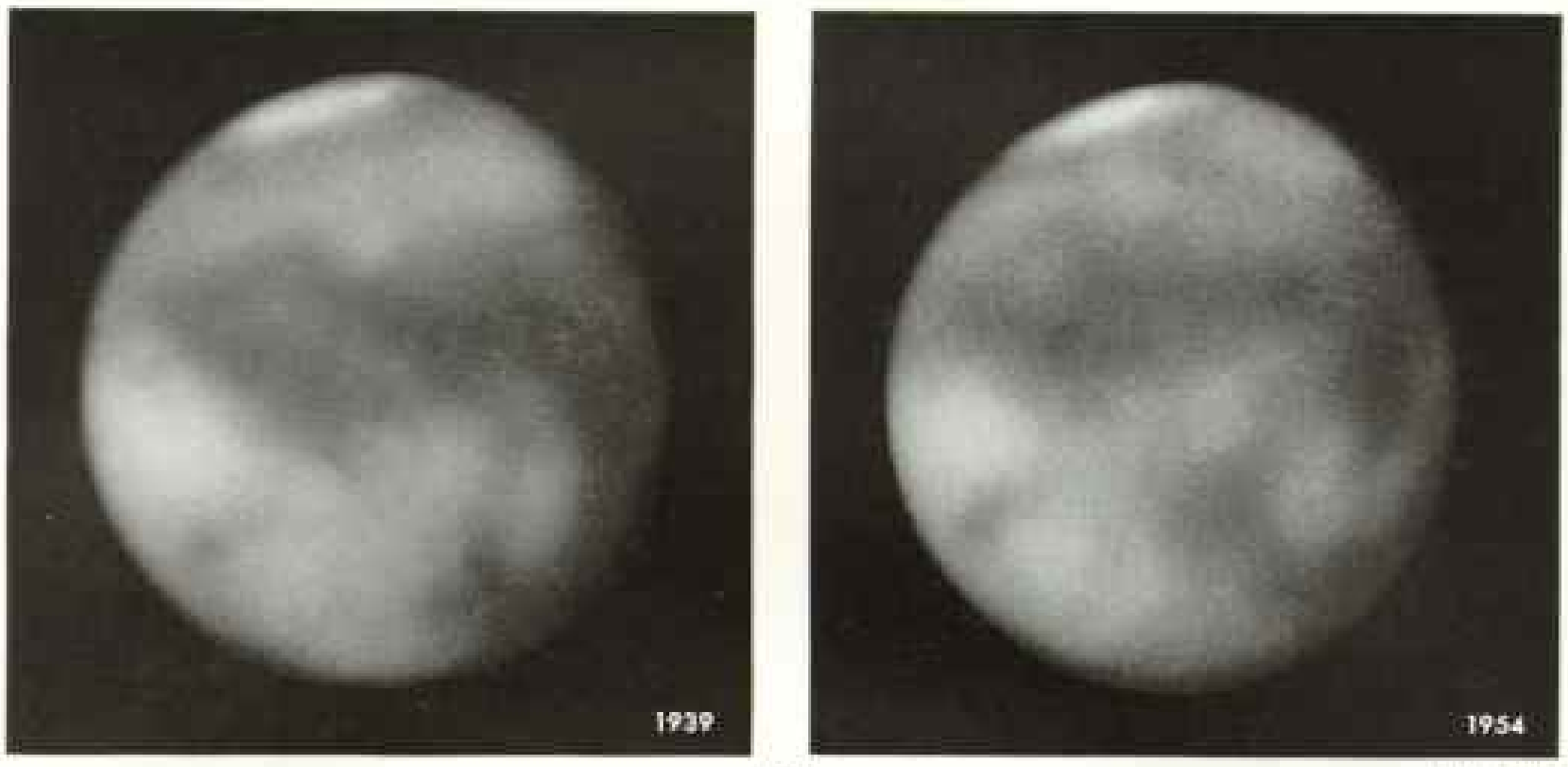
Many astronomers now feel sure the large dark areas represent vegetation. The canallike network could reflect 50-mile-wide bands of plant life growing in old river valleys. However, the lines do not meander; some shoot out like arrows for 1,500 miles. Unlike true rivers, they sometimes intersect.

This face of the globe reveals the planet's largest green tracts. Syrtis Major, the dark peninsulalike wedge, has remained almost unchanged since it was first described by the Dutch astronomer Christian Huygens in 1659. Aquatic names are relics of the days when the green spots on Mars were mistaken for seas.



Percival Lowell





A Gallery of Mars Portraits Reveals a Texas-size Green Patch Sprouting from the Desert

Dark areas are permanent features of the Martian scene. In the past they have varied only in size and intensity. In 1954, however, the author witnessed the growth of a new dark patch, indicating that such areas could spring up anywhere in the desert.

Mars in 1907 (opposite page) showed the lower hemisphere largely desert (white space), its moisture locked in the polar icecap. A 1939 picture (left, above) revealed a burgeoning of the Thoth Canal (lower right), together with the extension of a green area, never seen before, across the equator into the desert. By 1954 (right) the new green area covered some 200,000 square miles.

showed a remarkable tendency to follow the latitude circles, being generally parallel to the equator of Mars. They also showed a strong resemblance to the lines-of-flow maps constructed, from temperature measurements and drift of clouds, to represent the circulation of the atmosphere of Mars (page 434).

Photographs made through the blue filter also revealed blue-white cloud patches, which kept appearing and disappearing about the Martian north pole as its autumn began.

The prevalence of clouds around the winter pole, and their behavior in the color-filter photographs, suggest that they are composed of fine ice crystals resembling those making up the cirrus clouds that float high in the earth's atmosphere. The Martian clouds may be a source of frozen water, which may descend to the polar caps in the form of hoarfrost.

As if Mars wished to display its weather to us, brilliant blue-white clouds appeared in other latitudes during May and June. So changeable were they that the face of the planet was visibly altered from one night to another.

Some of the yellow-filter photographs revealed large opaque "yellow clouds" that moved across the face of Mars; they were also visible to the naked eye. These transitory clouds seem to be at least partly made up of dust.

Probably the most amazing property of the Martian atmosphere is the so-called "violet haze," which is so opaque to short wave lengths of light as to blot out completely all the surface features except the polar caps in the blue photographs.

Stranger still, at another time its opaque property may disappear for a few days, and the blue photographs then will register the familiar surface features almost as distinctly as in yellow light. These clearings come on rather suddenly, are not sensible to the eye, and generally last for only a few days.

Several instances of this "blue clearing" have been recorded photographically at Flagstaff and elsewhere at past oppositions, and most of them occurred at or near the date of opposition. The blue clearing this year was appreciable, but, for some unknown reason, was much less typical than expected.

Little, if Any, Oxygen on Mars

What makes the atmosphere of Mars more opaque to blue light than is the earth's atmosphere, and what happens to cause it to become temporarily transparent? These are baffling questions to which, as yet, we have no satisfactory answers.

Because Mars has far less mass than the earth, its force of gravity is much feebler. This fact, one of the inexorable laws of physics, constantly operates to denude the planet of

Mars for the First Time Reveals Atmospheric Belts Like Jupiter's

Saturn and Jupiter are noted for their conspicuous belts of clouds. Astronomers did not expect Mars to show such an effect because its atmosphere is so thin. Members of the South Africa expedition were surprised, therefore, when the planet assumed this aspect. The new feature appeared for several nights in blue photographs and then vanished. Here the cloud bands parallel the equator; at times they angled obliquely.

This picture, made by the National Geographic-Lowell expedition, reveals a blue-white canopy hovering over the north pole (at bottom of globe). Apparently it is composed of fine ice crystals like those in cirrus clouds floating high above earth. Such clouds may contain the water that descends in the form of hoarfrost to form the icecaps on the Martian poles.

This wintry view shows the south polar cap stretching across 5,000 miles. A proportionate ice sheet in our Antarctic would touch South America.

Mile-deep ice like Greenland's is impossible on Mars because the planet lacks water. Martian polar caps appear to be only inches thick. Like those on earth, they wax in winter, wane in summer.

E. C. Slipher

its atmosphere. Already much water vapor and oxygen have been lost. In fact, it appears well established that very little, if indeed any, oxygen remains. In contrast, the heavier gases have remained, and there is more carbon dioxide in the Martian atmosphere than on earth.

The exact atmospheric pressure on Mars is not known, but we estimate that it is about one-tenth that of the earth near the ground, or less than that at the top of Mount Everest. Mountain climbers well know that, as they ascend, the air thins and water boils at a lower temperature. On Mars it would boil at only 86° Fahrenheit, but no temperatures quite that high have thus far been recorded.

We make such measurements with a vacuum thermocouple, which can measure, by means of the telescope, the heat of a candle forty miles or more away.

South Polar Cap Unusually Large

About noon near the Martian equator the temperature sometimes rises to 70° or 80° Fahrenheit—like a summer day in the United States. In contrast, it may reach minus 95° Fahrenheit at night, and near the winter pole it stays far below zero day and night.

The Martian day is very nearly the same length as ours—only 37 minutes longer. On the other hand, the seasons on Mars are nearly twice as long as ours. Otherwise they come and go much as they do on earth.

Most conspicuous of the constantly varying features of Mars, and quite likely the key to all its changes, are the white caps covering the planet's poles. These polar snows of Mars are frozen water, but pitifully thin, probably only a few inches in thickness and certainly not more than a few feet, compared to the thousands of feet of ice which cover Antarctica and most of frozen Greenland.

When our South African observations began, the Martian south polar cap was just emerging from its long winter night, crowning the inverted image of Mars in our telescope with a jaunty spring hat.

Larger than usual, the glistening bonnet was about 3,000 miles wide, and it extended over 80 degrees of latitude, covering an area greater than that of the United States.

If a similar expanse had reached up to the same latitude on earth, we would have experienced an almost antarctic climate in Bloemfontein.

For a time the south polar cap was partially obscured by haze and clouds, but after the first day of the Martian spring the ice fields became clear and the entire cap started to shrink.

As the south pole warmed, fissures meandered across the face, suggesting the cracked patterns in a dried-up stream bed. Green fringes seemed to form along the irregular edge of the thin, retreating ice sheet.

By the time we had completed our observations, the south polar bonnet had shriveled under the rays of the summer sun to the relative size of a skullcap, while the smaller north

polar cap, tipped from our view, was going into winter. Sometimes the south cap disappears completely.

Meanwhile, with the coming of the Martian spring the great green areas had begun to appear, splotching the red desert surface of Mars. This dramatic intensification spreads from the poles in what has been called a "wave of darkness," reaching the equator by the middle of spring.

Most of these dark patches are located in the southern hemisphere, where the greatest supply of available water exists, since the north polar cap does not melt down to the same extent during its summer.

That these dark areas are vegetation and that the change in color is somehow connected with release of water from the melting, shrinking polar icecap is no longer seriously doubted by most observers of the mysterious planet.

Professor Lowell believed that the so-called canals of Mars played a part in this watering process.

Camera Confirms Existence of "Canals"

Many astronomers have doubted the existence of these canals simply because they had never seen them during the normal course of their observations. Sometimes we were accused of drawing our Martian maps in the laboratory. There was one lady, however, who said that she could easily understand the faint lines on the face of Mars, but she thought it most remarkable that we could read their names (chart, page 432).

Most astronomers now agree on the existence, if not the nature, of this strange network of faint lines which interlace the green areas

Bloemfontein Honor Students Get a Close-up of Martian Mysteries

As a reward for excellent marks, members of Central High "A" Club received an invitation to the observatory. Here Dr. Slipher peers through the big telescope's eyepiece. One student uses the guide telescope.

Die Volksblad

and the desert regions as well. They do not meander like normal stream drainage. One runs for 1,500 miles without a bend—half the distance across the United States. Sometimes one canal will run right through another, something no sensible river would do.

Generally these delicate lines are hard to catch in photographs, but enough have been photographed successfully through the years not only to prove their reality but also to demonstrate that they change in intensity. On page 432 the 1907 photograph fails to show clearly the Thoth Canal, but in the one we made in South Africa in 1954 (page 433) it stands out with an intensity and size rivaling almost any marking on the face of Mars.

Many Theories "Explain" Markings

So mystifying are the Martian markings that many theories have been advanced to explain them. To me they suggest lines of vegetation along watercourses. Some believe, with Professor Lowell, that they are of artificial design. Others believe they may be fault lines along upheaved blocks of the planet's crust.

One of the most recent hypotheses is that advanced by Mr. Clyde W. Tombaugh, discoverer of the planet Pluto, who observed at the Lowell Observatory during our absence in Africa. He thinks that Mars may have been hit by giant meteorites or asteroids (an idea closely resembling the asteroidal bombardment theory published by Prof. J. Joly, Dublin, in 1897), and that the canals may be lines of primitive vegetation that found favorable conditions in the shattered rocks along the resulting fractures.

Dr. Dean B. McLaughlin, astronomy professor at the University of Michigan, has recently published the theory that the dark markings consist of dust from volcanoes situated at the points of funnel-shaped "bays," which has been blown into the familiar features we observe, the canals being neat windrows of volcanic ashes and the whole made more visible each spring as the Martian winds increase—a theory that recalls the *Explanation of the Surface of the Planet Mars*, published in Zurich in 1909 by Mr. Adrian Baumann.

But the absolute immobility of the dark markings of Mars, and the striking waxing and waning of certain individual features, are characteristics of the geography of Mars that are very difficult to explain by the volcanic-dust theory. And, too, one wonders why the Martian winds do not continually erase these markings of volcanic ashes by covering them with yellow dust from the surrounding deserts.

The meteorite-cracking theory and the faulting theory presuppose a brittle crust and hence a molten, metallic heart and volcanic activity such as our earth has undergone. So does the volcanic-dust theory. We have no evidence as yet that Mars has undergone volcanism.

Some studies indicate that volcanism can take place only in planets above a certain size. Mars is a borderline case. That is one reason we made such a careful series of calibrated photographs, from which we are trying to determine the size of Mars with greater exactness.

To me, the best hypothesis still seems to be that the green areas represent vegetation able to grow through the yellow dust deposited upon it from time to time.

In the light of our present knowledge, it appears that in Mars we are enabled to foresee what will overtake the earth in the fullness of time.

Dust Covers the Face of Mars

An arid waste, a vast Sahara, desertlike beyond our comprehension, covers five-eighths of the red planet. Tests in 1954 showed that much of its surface is covered with dust.

So scarce is water that over the greater part of the planet there is none to quicken vegetation. Only in the blue-green areas, which respond to the advent of Martian summer and the release of moisture from the melting snow, do we see a gradual darkening in hue.

All that has been learned about Mars bears out what we might suspect from the planet's smaller size—that we behold a world in a sad state of decrepitude, still able to support a struggling form of vegetation but nearing the end of its planetary life.

INDEX FOR JANUARY-JUNE, 1955, VOLUME READY

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The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus. By dating the ruins of vast communal dwellings in that region, The Society's researches solved secrets that had puzzled historians for 300 years.

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On November 11, 1935, the stratosphere flight of the world's largest balloon, *Explorer II*, sponsored by The Society and the U. S. Army Air Corps, reached a world-record altitude of 72,395 feet. Capts. Albert W. Stevens and Orvil A. Anderson took aloft a ton of scientific instruments and obtained results of extraordinary value.

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A Greek cargo ship sunk in the Mediterranean 2,200 years ago was found in 1952 and is being excavated by the National Geographic Society-Calypso Marine Archeological Expedition led by Capt. J.-Y. Cousteau of the French Navy.

The National Geographic Society and the Royal Ontario Museum in 1951 explored and measured newly found Chubb meteor crater, 11,500 feet in diameter, in northern Quebec.

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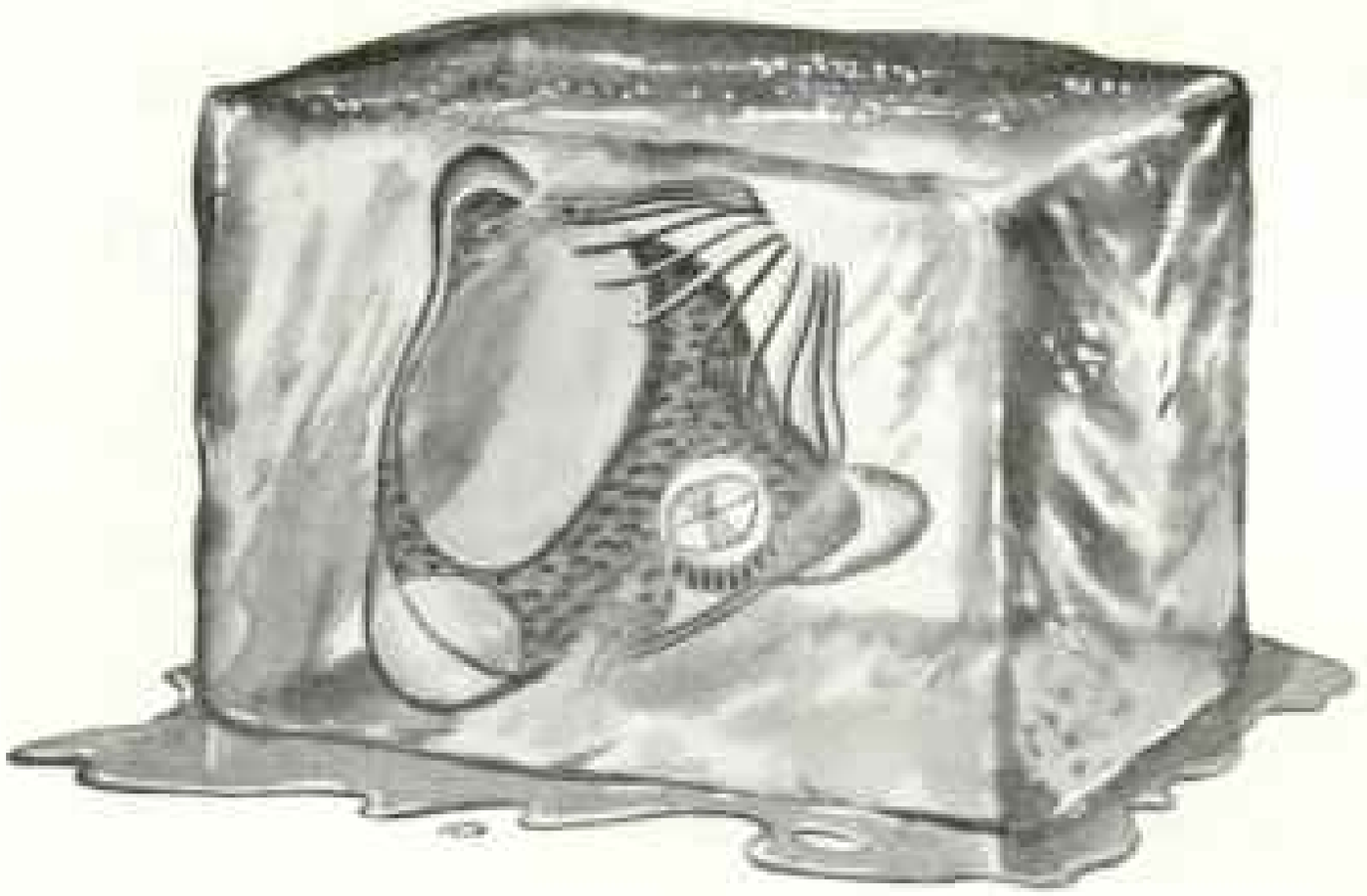

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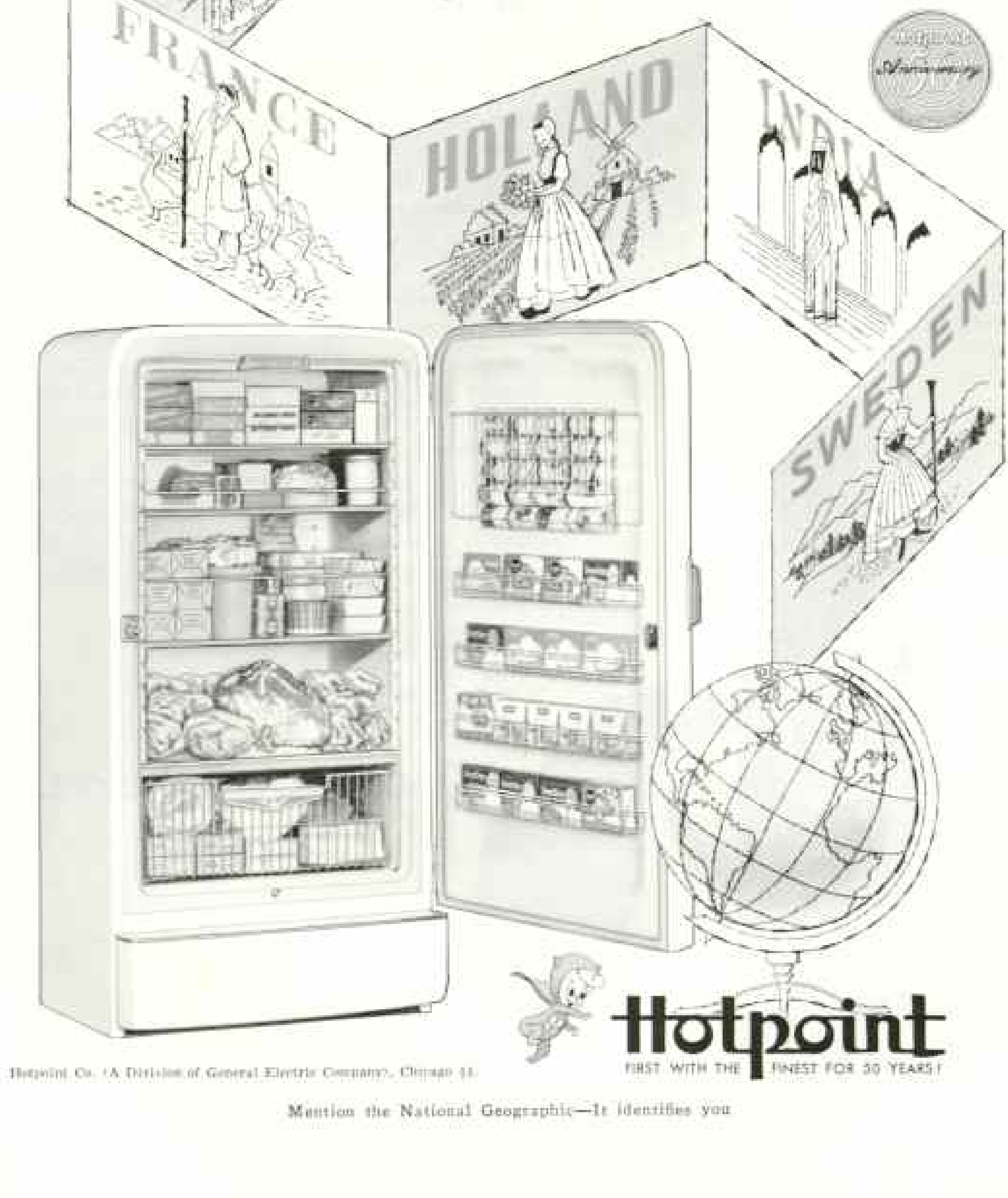

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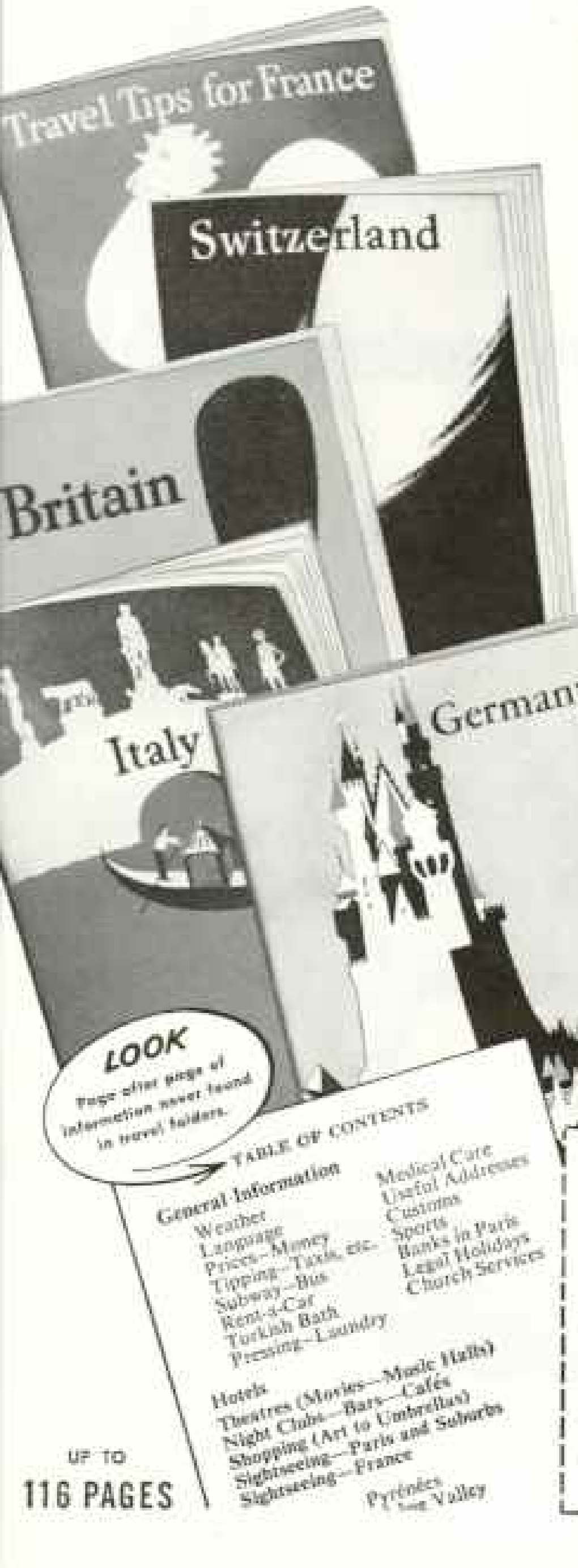

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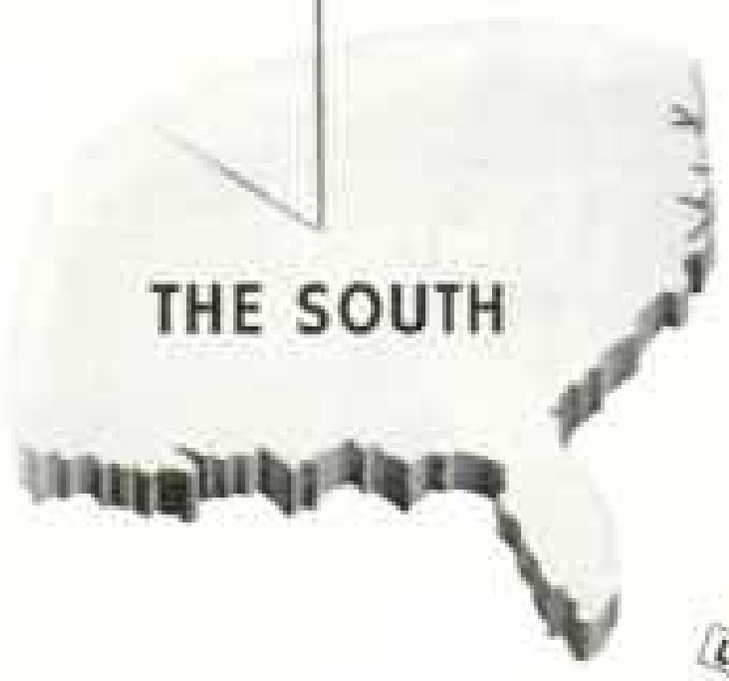

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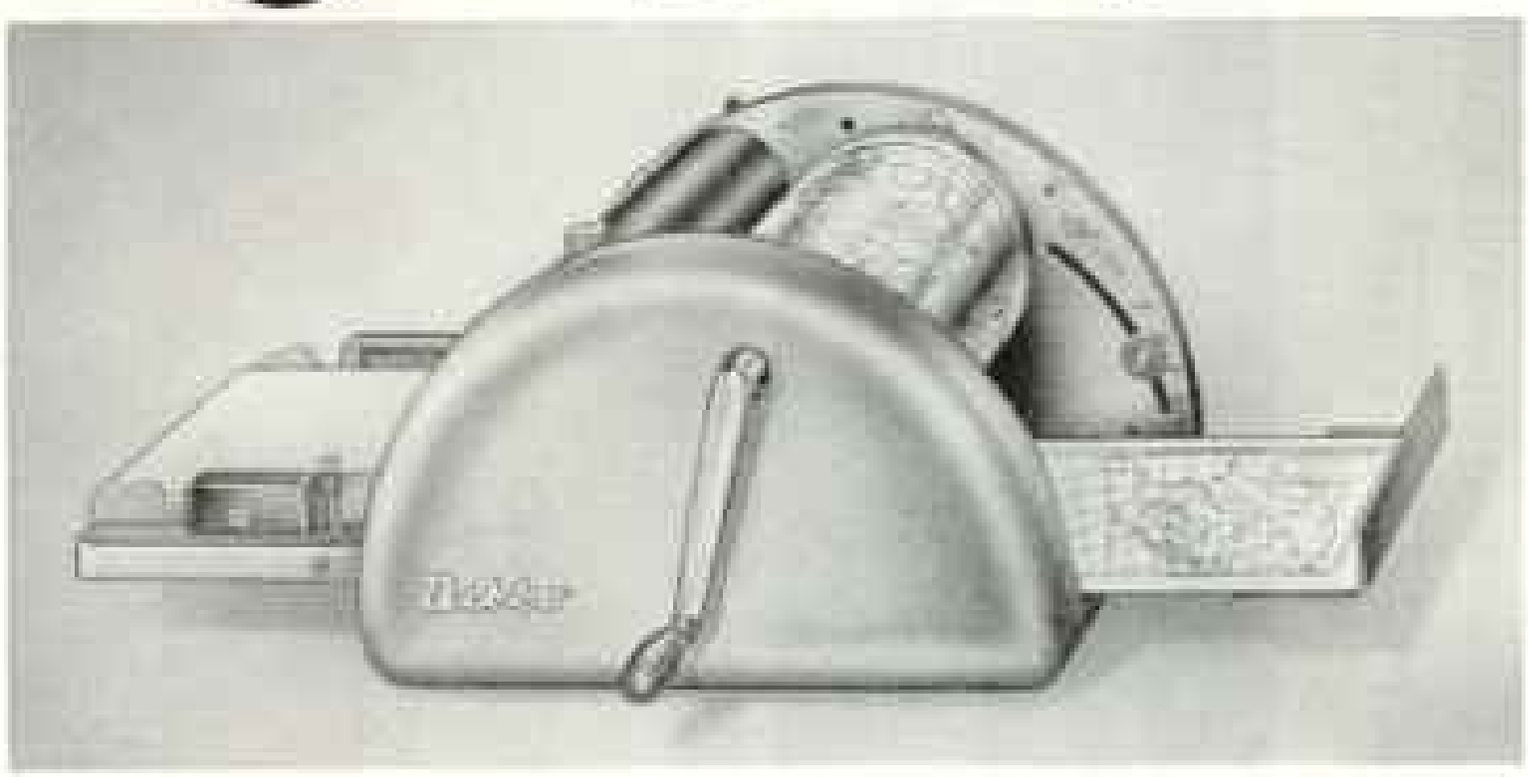

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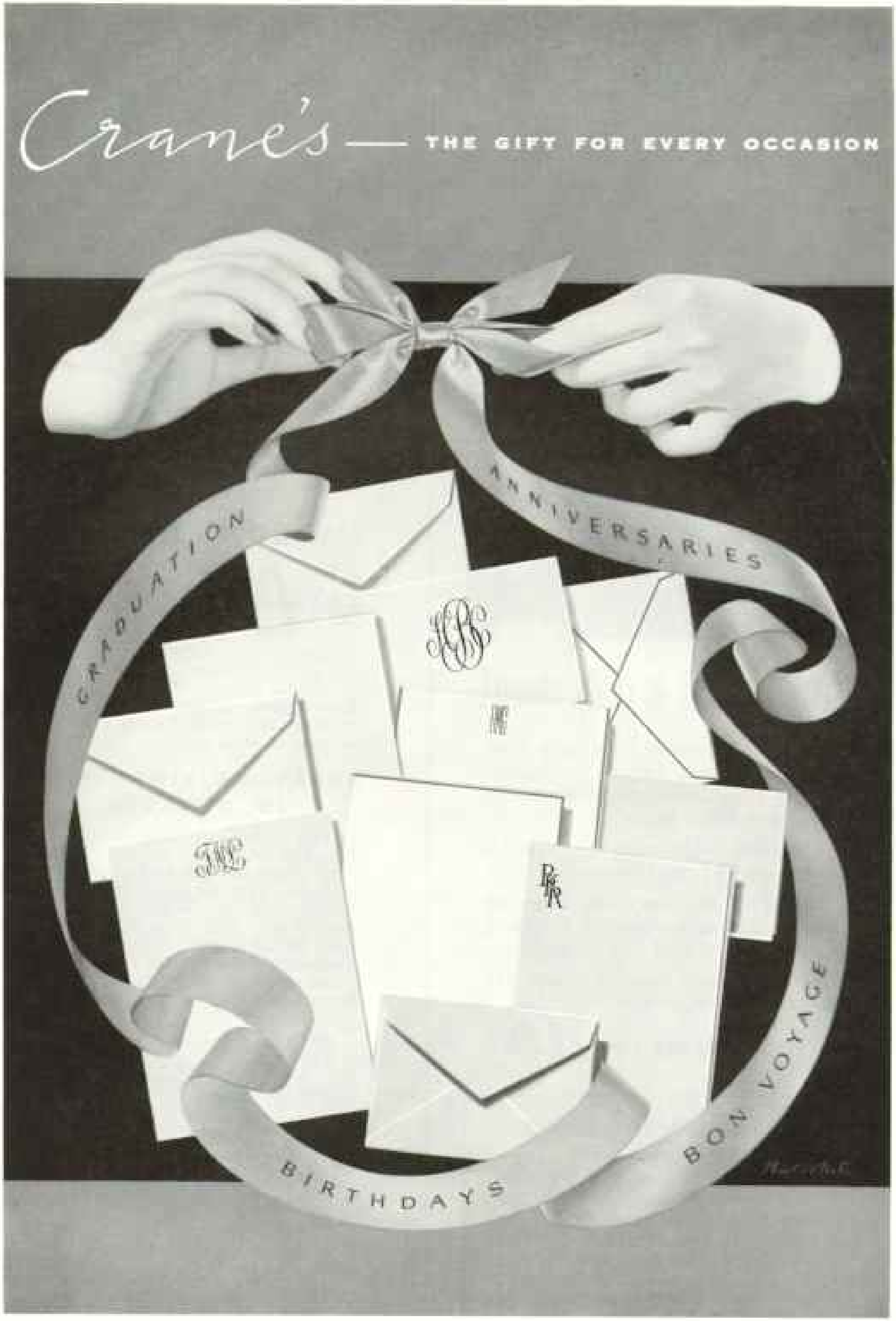

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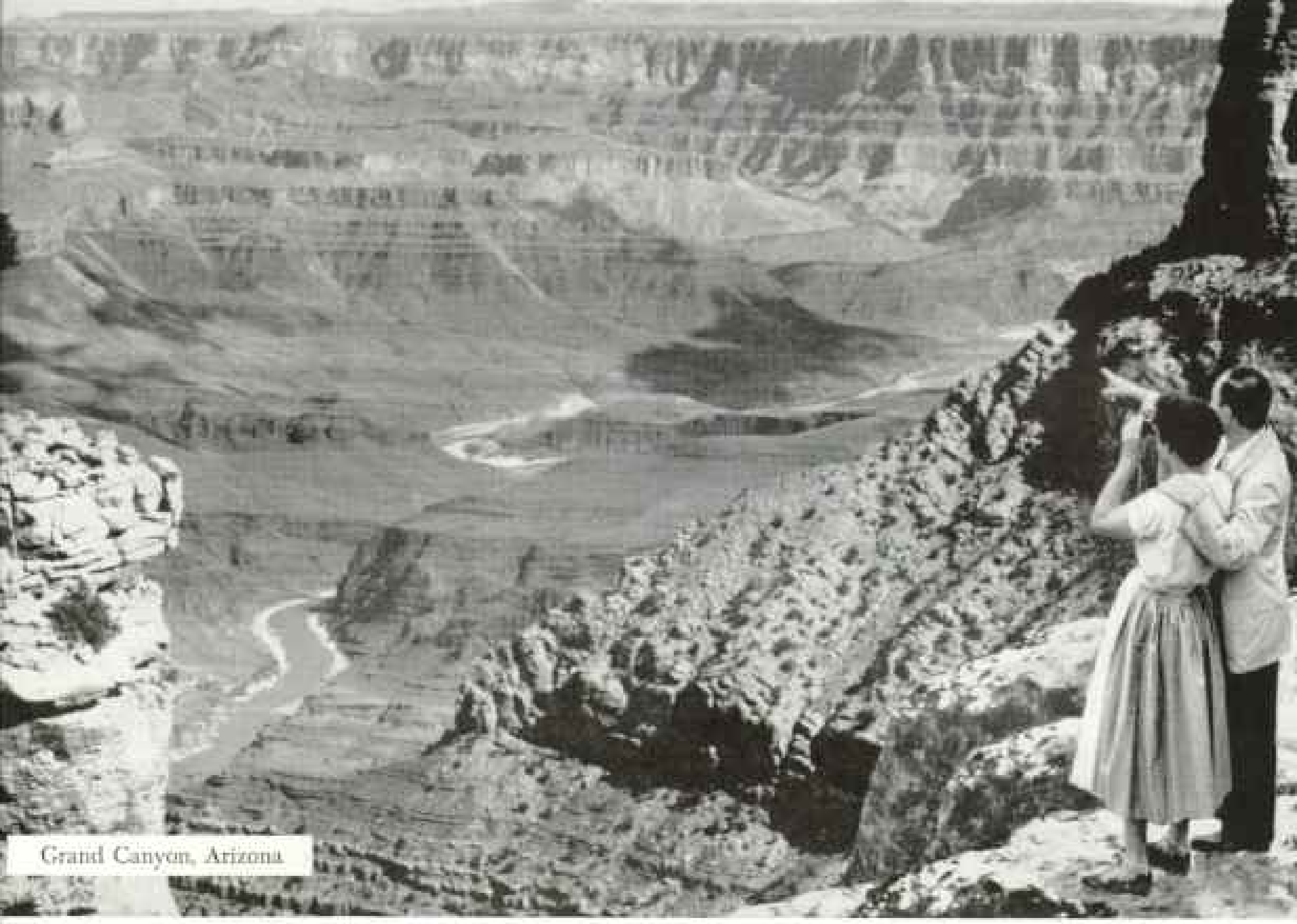

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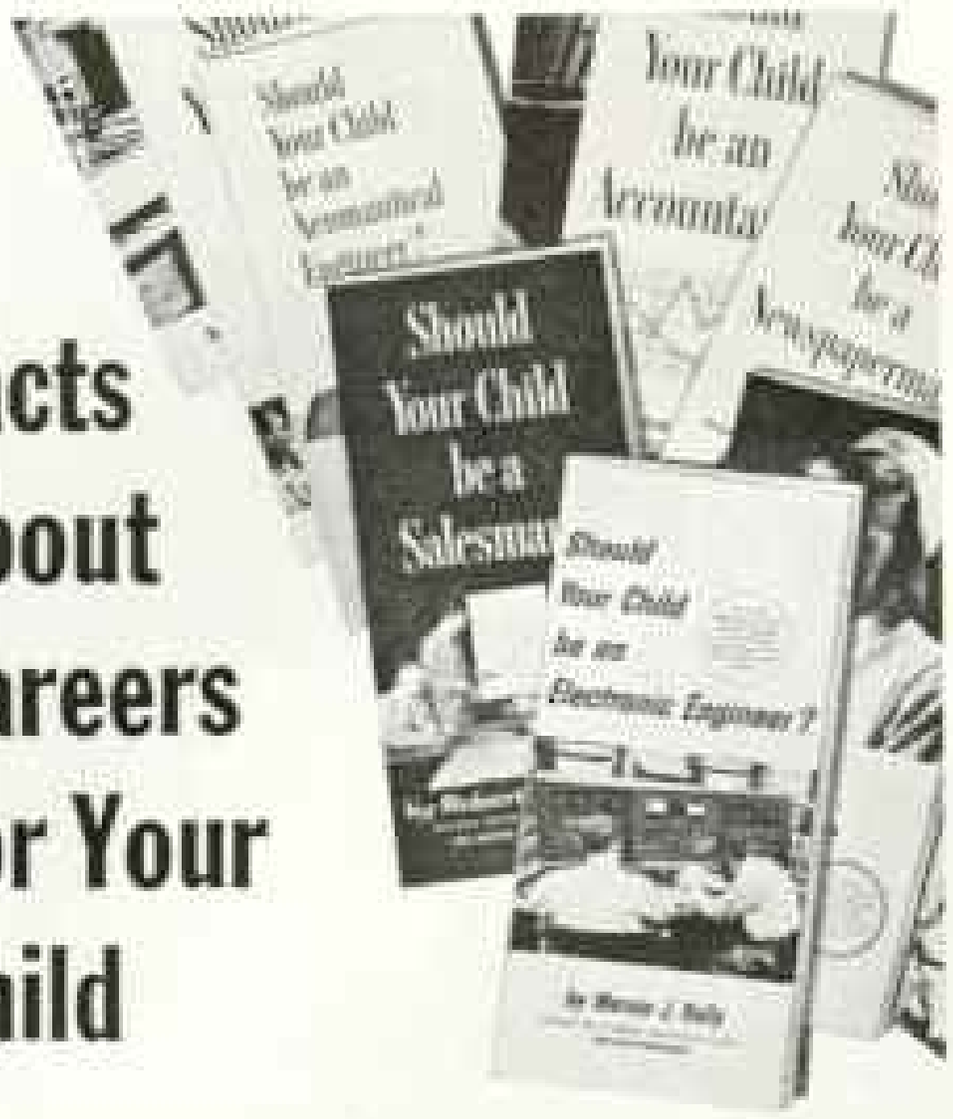

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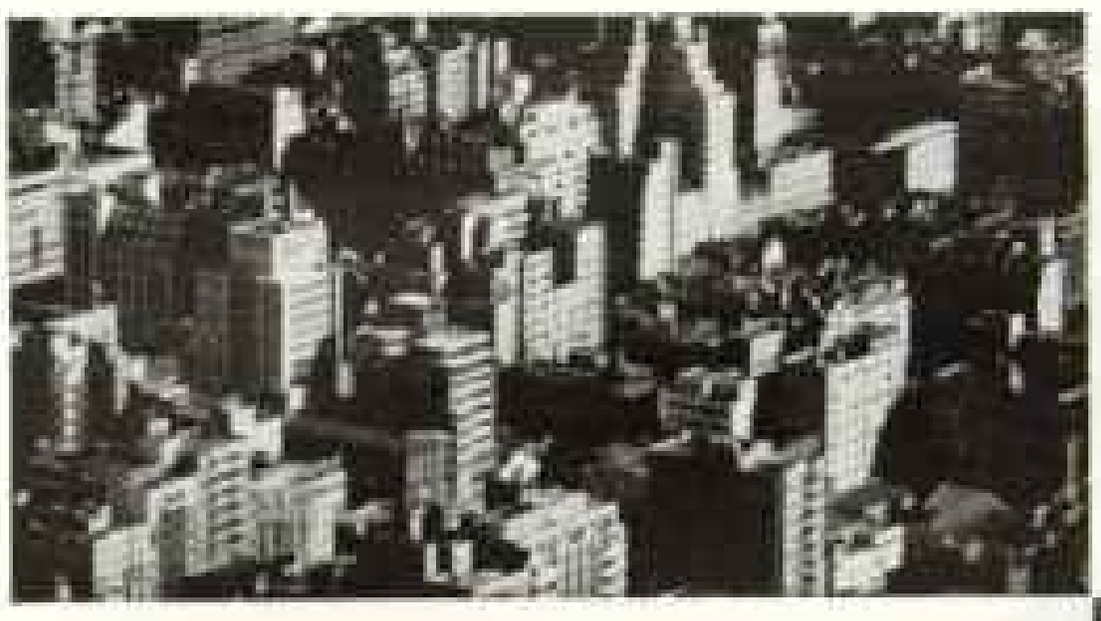

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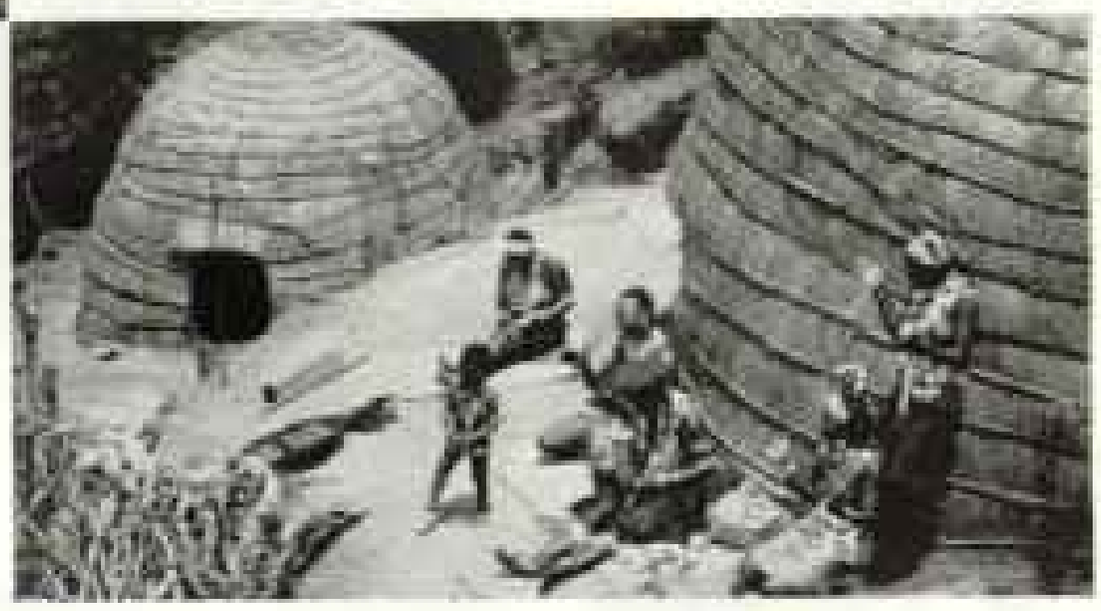

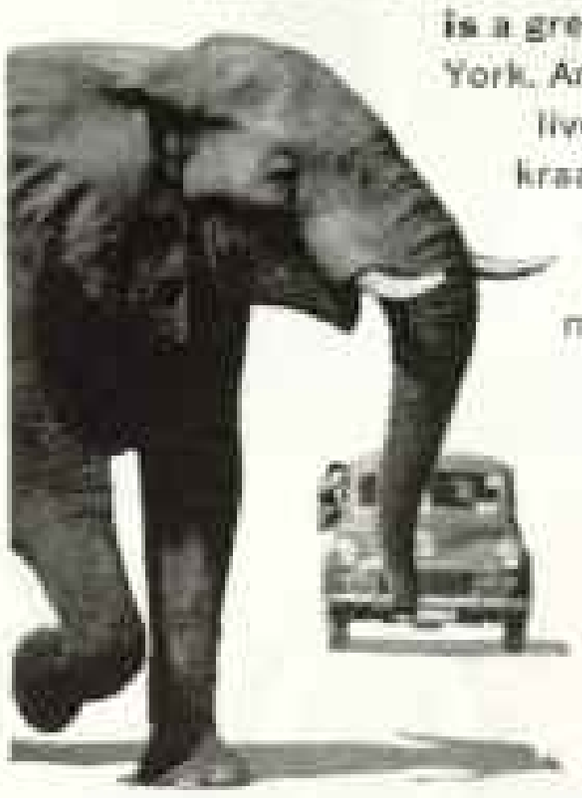

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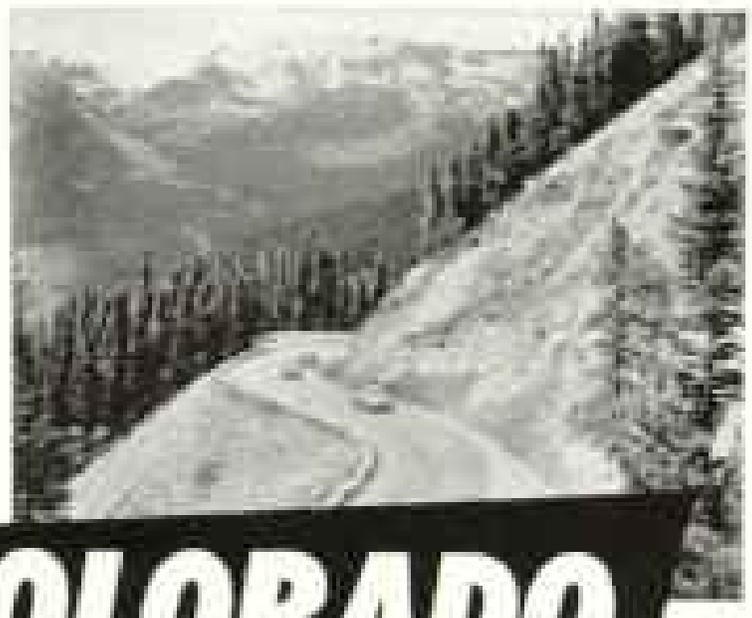

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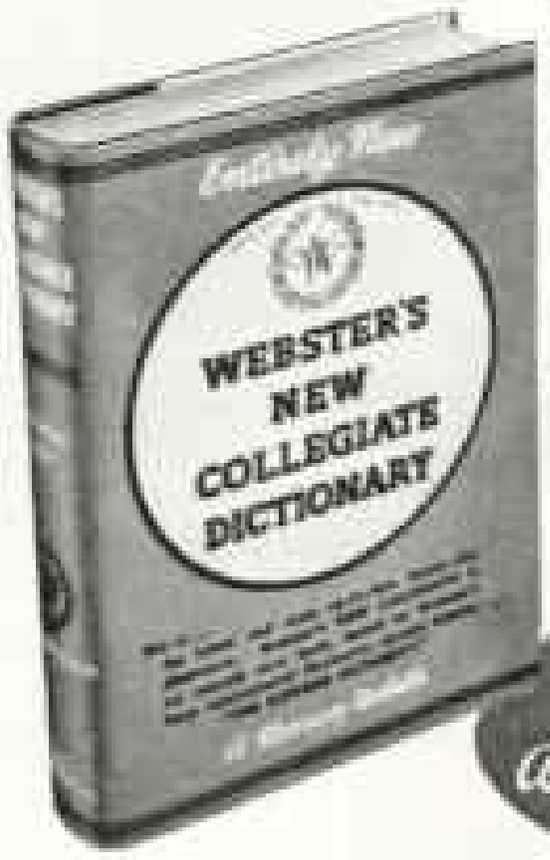

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Fortunately, there is something all parents can do to make sure their children are ready for school. They can include a medical check-up on the list of ahead-of-school preparations. A check-up may be the means of correcting unsuspected defects of vision, hearing, posture or general health. Sometimes these defects are at least partially responsible for low grades or emotional troubles.

The physician who has known your child over the years is best qualified to give pre-school medical check-ups because he has a *complete* picture of the child's health. He will also be alert to minor troubles which parents might not notice. Impairments that can be corrected now may avoid more serious trouble later on.

For the child just starting school, it is important that his immunizations against communicable diseases are up to date. In addition to making your child immune to smallpox, diphtheria, whooping cough and tetanus, medical authorities now advise that vaccine lessens your child's chances of getting polio. It is wise to discuss a definite immunization program with your doctor . . . including "booster doses" to renew immunity . . . well before school opens.

During the teen years, when the growing-up process imposes considerable mental and physical stresses, health check-ups are especially needed. Many problems, including those associated with growth and emotional adjustment, often require expert attention. In addition, changes in diet or in habits of play, or sleep, or exercise may be made for the child's benefit.

If medical examinations are not a part of your youngster's preparation for school, why not start them now . . . and continue them throughout the school years? Parents who do so will have the satisfaction of knowing that their child has been given one of the best safeguards for health and happiness during this and future years in school.

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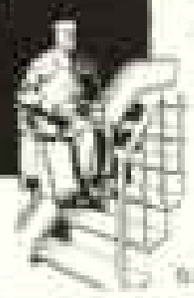

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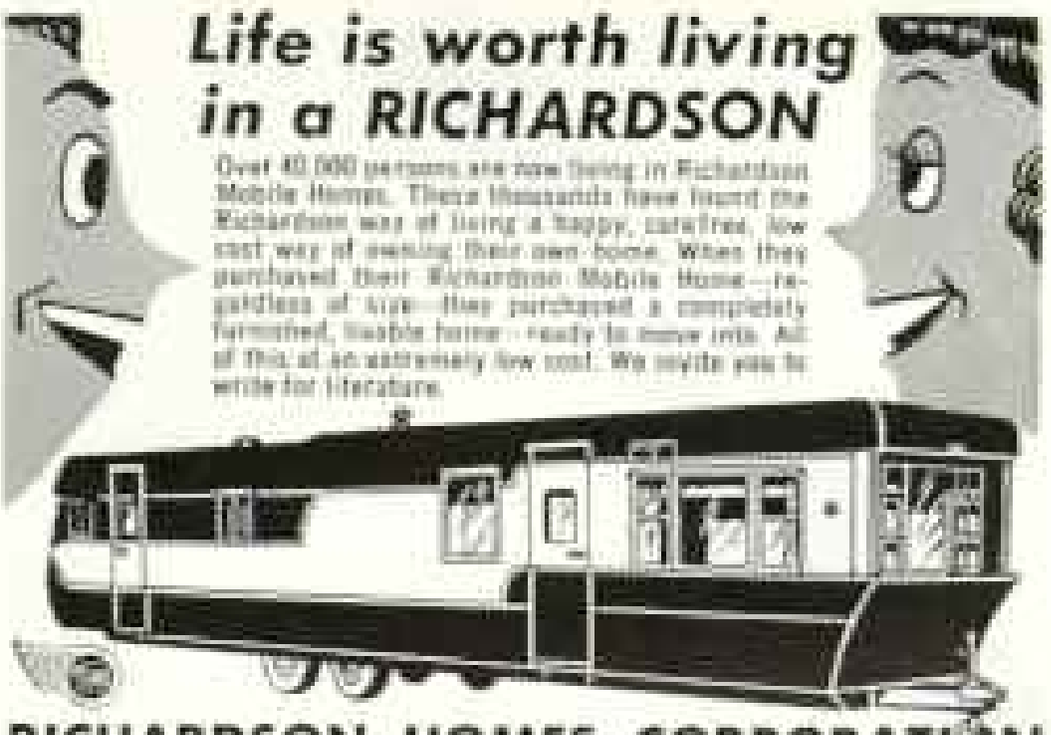

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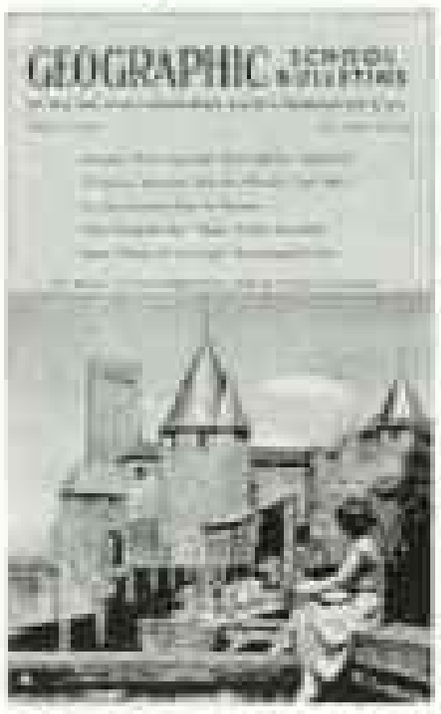

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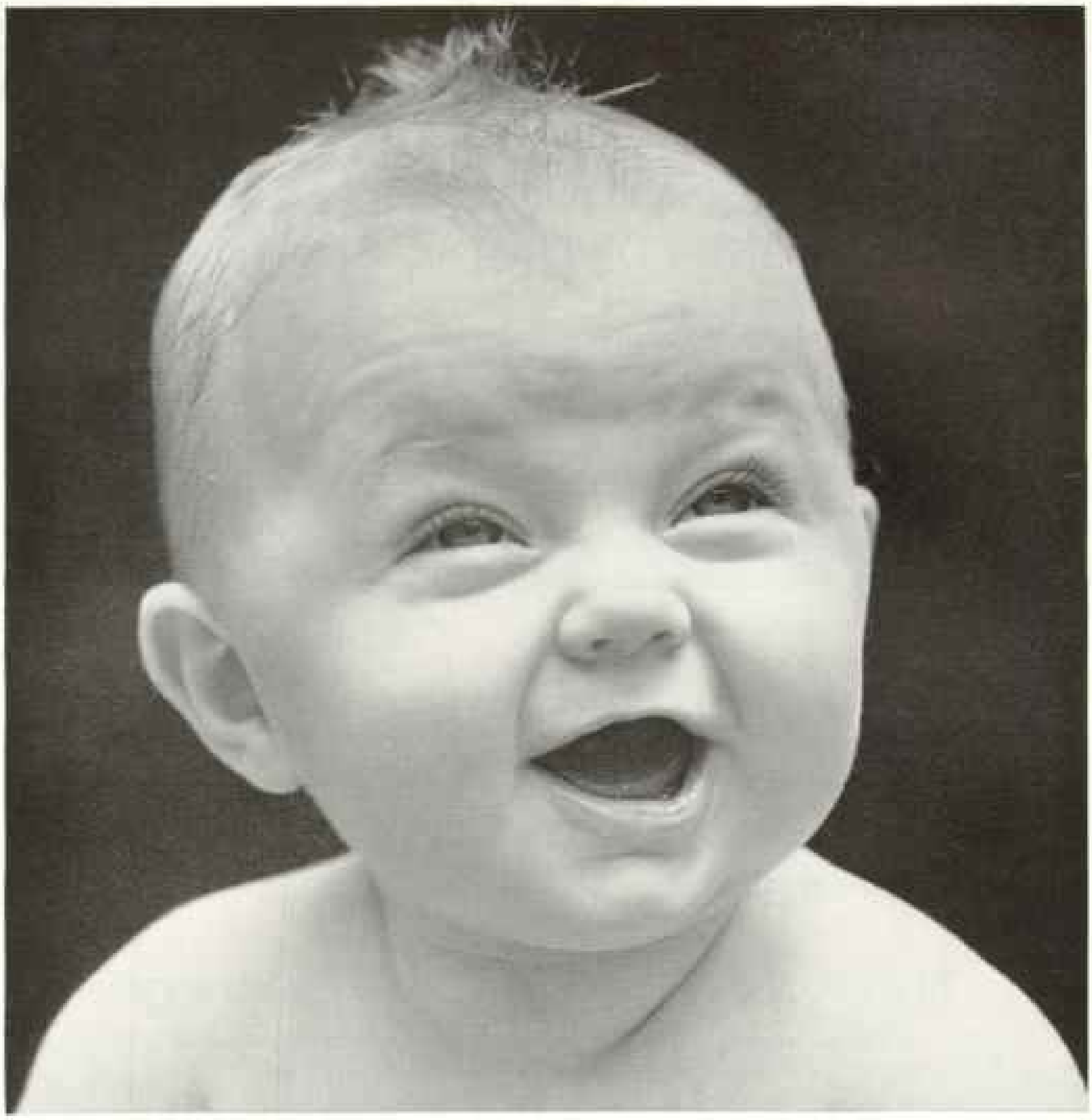

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