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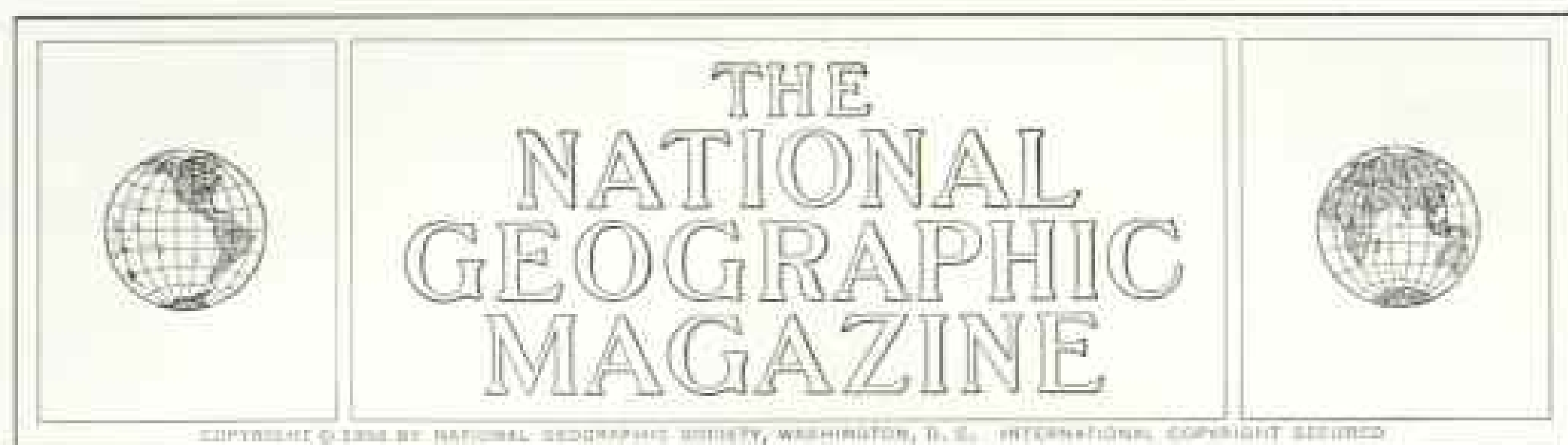
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W. E. GARRETT

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New York State's New Main Street 567

Following the Historic Water-level Route, the Thruway Booms
Travel and Business Between the Sea and the Great Lakes

BY MATT C. McDADE

National Geographic Magazine Staff

THE Empire State has a brand-new main street. The world's longest toll highway unwinds twin ribbons of concrete from the doorstep of New York City to Buffalo.

Linking cities and elm-shaded villages along its 427-mile path, the New York State Thruway blazes a fresh trail through the pastoral trade corridor that helped make the old Dutch colony the wealthiest and most populous of States.

Pathway of Pioneers

From the very beginning of the Nation the Hudson and Mohawk River Valleys have borne men and goods between salt water and the continent's heartland (map, page 575).

Indian moccasins thumped softly on sun-dappled footpaths. Settlers' wagons creaked and bumped over log turnpikes. Then gaily painted canal packets glided into newly sprouted towns to the cry of "Low bridge, everybody down!" Canal boats yielded to iron horses and good but narrow roads. Now, speeding to and fro on a billion-dollar triumph of engineering, cars, trucks, and buses hum a modern tempo.

I explored this passage in tawny autumn weather, tracing its course among blue-green mountains, legend-haunted valleys, lakes, and meandering rivers. Before me unfolded a vast panorama of the Empire State in cross section, from the towers of Manhattan to the torrents of Niagara, from cows and contentment to bustle and smoke, from Revolutionary battle-

fields to the newest thing in radar and rockets.

Cities loom alongside and then are gone, for the Thruway skirts every traffic trap. Yet 53 great sweeping "interchanges" at intervals ranging from half a mile to 27 miles give ready access to main cities, towns, and linking roads (page 592).

Surprising to me was the fact that on the main traffic artery serving a State of more than 16 million people one of the principal problems is the presence of jaywalking deer. "Deer Crossing" signs warn motorists at many points. Especially at dawn or dusk, a dainty white-tailed buck or doe comes peering at headlights, picking its slender-legged way down to a stream to drink, or bouncing—with white flag high—across one of the biggest and busiest roads on earth.

Key to All Upstate New York

Leaving downtown Manhattan at dawn, I rolled into the Thruway tollgate at Yonkers an hour later. An attendant in a blue-gray uniform leaned from his booth and smiled a friendly good morning.

"District of Columbia tags, I see. Where are you heading, sir?" he asked.

"Buffalo. End of the line."

"Good trip," he said. "You should make it in eight hours, easy, not counting time out for lunch or rest stops."

I knew he was right; on this super-road you count a mile for every minute—if you're in a hurry. But this time I wouldn't see Buffalo



Twin Ribbons of Concrete Speed Cars and Trucks Through the Mohawk Valley

The new billion-dollar New York State Thruway follows trails blazed by Iroquois Indians. Here it nears the center of the Empire State. Fertile dairy farms carpet the valley, once the bed of a glacial river.



Oil Barge and Tug on the Erie Canal Plod West out of Smoke-veiled Utica

Once New York's canals monopolized transportation from sea to the Great Lakes. They lost much of their business, first to railroads, then to highways, but 100 tugs still push 4½ million tons of cargo a year.

in eight hours, or even 80, for I planned to use the Thruway not as a speedway but as the key to New York State. Drums of history echo on every mile, and only an hour or so off the Thruway lie such beguiling vacation lands as the Catskills, the Adirondacks, the "Leatherstocking Country" of James Fenimore Cooper, the Finger Lakes, Watkins Glen, and the Genesee. Right now, driving up the Hudson toward Albany, I was in the world of Washington Irving.

Sleepy Hollow Wakes Up

In early days the Hudson River was the only highway in the colony of New Netherland, and Albany was considered the edge of the universe.

"A prudent Dutch burgher," Washington Irving wrote, "would talk of such a voyage for months and even years before hand; and never undertook it without putting his affairs in order, making his will, and having prayers said for him in the Low Dutch churches."

It is with a feeling of shock, as if waking from Rip Van Winkle's dream, that a visitor steps from the world of Washington Irving into the bustling Westchester County of today.

"Estates and careful zoning safeguard its charm," a county official told me, "but the Thruway has jolted Sleepy Hollow into wide-eyed wakefulness."

Typical of the new developments nurtured by the Thruway is a huge and dazzling shopping center I had seen in Yonkers. Above the ultramodern shops looms a medical center with glazed blue-brick walls. Within that single park-and-shop cluster I could have bought a winter wardrobe, stocked a week's supply of groceries, and submitted to an appendectomy—all without moving my car.

In contrast, not far away stands the elegant pink-brick manor house in which the patrician Philipse family entertained the gentry in colonial times.

"Tradition has it," visitors are told, "that young George Washington came here to court Mary Philipse. Whether there was a romance or not—and people in Yonkers like to think there *was*—she married another."

Farther up the river, at Tarrytown, I came to a onetime wilderness trading post known as Philipse Castle. Two-foot-thick stone walls, 273 years old, stand as soundly as if laid yesterday. The castle was the home and office of Frederick Philipse, first lord of a manor that covered nearly all of Westches-

ter County. Gun ports in the walls give mute evidence that the castle served as a fortress, too, against river pirates and unpredictable Indians.

But the main reason I turned off the Thruway and tarried a bit at Tarrytown was to visit the home of Washington Irving and the setting of *The Legend of Sleepy Hollow*.

A warm remembrance of Irving's delightful tales steals upon one at Sunnyside, the writer's home. Here he put down roots after living abroad for years and writing the stories that have forever cloaked the Hudson Valley in romantic lore. The charming little mansion nestles against a riverside hill, its mellow stucco walls held in the green embrace of ivy brought from Sir Walter Scott's Abbotsford. Near by is a covered spring. Irving always said that a Dutch housewife smuggled it from Holland in a churn to be sure that her family would have good water in America.

Not far from Old Dutch Church I found a simple gravestone bearing only the author's name and dates, 1783-1859.

Despite the raw wounds of Thruway construction, walled and wooded estates helped preserve the drowsy influence that seemed to hang over the place where schoolmaster Ichabod Crane and rustic playboy Brom Bones vied for the plump hand of Katrina Van Tassel.

I walked downhill to "Headless Horseman Bridge," near the site of Ichabod Crane's wild flight from a Halloween goblin. Darkly shrouded, carrying a pumpkin on his pommel, Brom Bones gave Ichabod the fright of his life. The schoolmaster never again showed his lean face in Sleepy Hollow.

Back on the Thruway's broad white magic carpet of concrete, I crossed the Hudson River's lakelike Tappan Zee on a new toll

(Continued on page 576)

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Eastbound Drivers Get Starting Tickets → at Buffalo's Entrance to the Thruway

As each vehicle glides up to a tollbooth at gate 50, a uniformed collector notes its type and the number of its axles. He feeds these facts into a classifying machine that turns out an identifying ticket. When this card is surrendered at an exit, a computing machine figures the toll; the rate for passenger cars is 1½ cents a mile; an annual pass costs \$20.

At a legal 60 miles an hour most of the way, the drive from Buffalo to New York City can be made in less than eight hours—477 miles without a traffic light or grade crossing.

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Robert F. Nixon, National Geographic Staff

NEW YORK STATE THRUWAY





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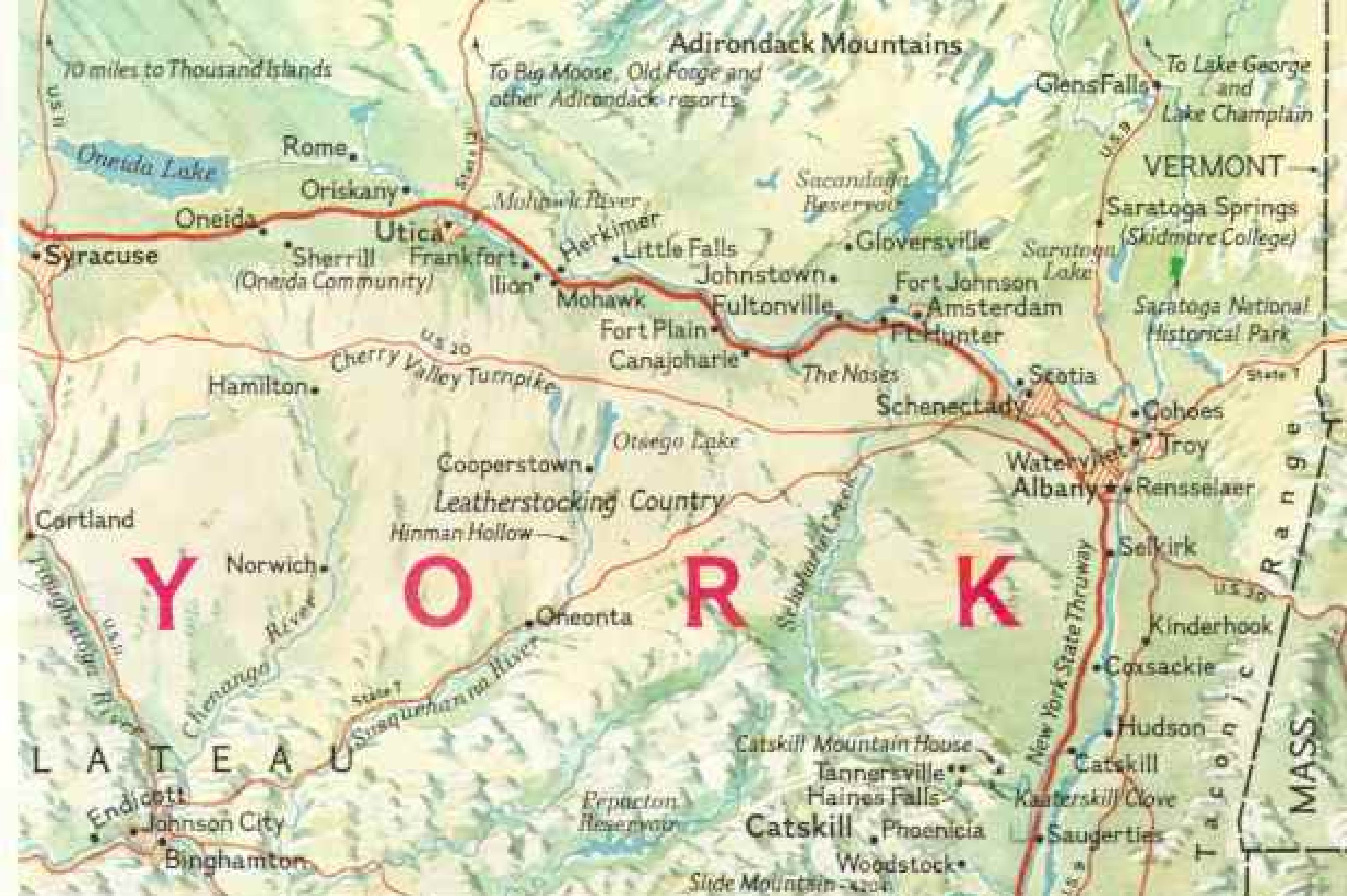
Honeycombs of Dazzling Light Banish Darkness from the Canyons of New York
Needle-capped Chrysler Building, Manhattan Island's second tallest, rises 1,046 feet. Queensboro Bridge casts a beaded strand of lamps above the East River and Welfare Island, with its three hospitals.



United Nations' Glass-paneled Home Blazes on Its Strip of International Soil

Slaughterhouses once jammed most of the 18-acre riverside site that John D. Rockefeller, Jr., bought and presented to the United Nations in 1947. Residential Queens spreads a tapestry of lights on Long Island, across the river.





↑ Canal and Superhighway Follow History's Water-level Route

← Almost three miles long, this \$60,000,000 bridge carries the Thruway across the Hudson and past distant Tarrytown. Its lofty span rests on eight watertight enissons, some the size of half a city block, sunk on the riverbed.

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Thruway Trooper Radios an SOS for Stranded Motorists near Canandaigua

A detail of 138 State police patrols the expressway 24 hours a day. In 1955 the troopers helped 21,518 drivers in distress. Toll ticket instructs motorists: "Park disabled vehicles on right shoulder. For Thruway assistance, day or night, tie white cloth on left door handle and wait."

bridge built by the New York State Thruway Authority (page 575).

Suburbs vanish abruptly at Suffern, and I found myself climbing into the wildly picturesque Ramapo Mountains.

Soon, tempted again, I left the Thruway and followed a highway dug into cliffs of the hauntingly beautiful Hudson Highlands to West Point. There Gothic masses of granite seemed to well with impregnable strength from the earth itself (page 581).

Founded in 1802 on a fortified site chosen by George Washington, the United States Military Academy is not only the oldest permanent military post in the Nation but its oldest engineering school. Said one of its sons 61 years ago: "West Point is built on a rock, and that rock is mathematics."

The genius of an early superintendent, Sylvanus Thayer, set the pattern of West Point education. Cadets spend only two hours a week during the academic year learning military know-how. The emphasis is on a well-rounded background in arts and sciences.

Over the years the long gray line of cadet graduates has grown to some 21,000 officers, among them many great Americans. As I observed the superbly fit members of the corps, I could not help but wonder whether tomorrow's Robert E. Lee, John J. Pershing, or Dwight D. Eisenhower walked among them.*

Where Washington Refused a Crown

Majestic Storm King Mountain guards the northern entrance to the Hudson Highlands. Farther upriver at Newburgh stands a farmhouse where George and Martha Washington lived for 16 uneasy months before the Revolutionary War officially ended in 1783.

At Jonathan Hasbrouck House, Washington received guests in an unusual chamber with seven doors and a single window. Logs lay on an open hearth against the wall. A chimney opening at ceiling level sucked up the smoke.

While living here the future first President

* See "The Making of a West Pointer," by Howell Walker, NATIONAL GEOGRAPHIC MAGAZINE, May, 1952.



sternly rejected a proposal that he become king. And here he evolved principles of union and statehood that became cherished traditions in the new Republic.

I drove to near-by Temple Hill and climbed the knoll where Washington calmed angry officers threatening revolt over pay. Fumbling for his spectacles, he made a poignant and perhaps decisive remark, "Gentlemen . . . I have not only grown gray, but almost blind, in the service of my country." Shamed by the realization of their commander's personal sacrifice, the soldiers pledged their loyalty.

From this hill, the site of the Continental Army's last encampment, soldiers marched away to their homes. Now it is known as the "Birthplace of the Republic."

Crosses on Doors Bar Witches

Northward up the river history speaks from other venerable houses, from pioneer settlements, and from monumented battlefields (page 595).*

Where Dutch, English, French, and German settlers once wrestled with primeval stumps, their descendants punch time clocks in throbbing industrial plants and laboratories. But the past is never far away.

At New Paltz I walked the tree-lined

"Street of the Huguenots" on a ridge high above the Walkill River. Here the heads of 12 families of French Protestant refugees tilled their land in common and governed the growing community so wisely that no one ever appealed a decision.

I paused before a 1712 cottage with the honorable sag of age. It was the home of pioneer Abraham Hasbrouck, and has been occupied in recent years by the Evers family.

Miss Elisabeth Evers invited me in. We climbed down into a cavernous cellar kitchen where colonial youths gathered at night to pit fighting cocks. I asked about odd cross marks on iron door latches.

"To keep witches out," she replied, smiling.

"Come with me across the street," Miss Evers said suddenly. "I'll show you my favorite view."

We climbed on a wall above the fertile flats of the Walkill. Beyond the valley the Shawangunk Mountains rise in dreamy splendor, crowned by glacier-made lakes. Some 25 miles away we could see the blue stair-stepped barrier of the Catskill Mountains.

In the Walkill bottom land corn lay plastered against wet soil.

"Indians warned the first settlers not to build down there," Miss Evers said, "because the river overflowed once a year."

Senate House Survived Enemy Fire

I drove to Kingston, briefly the capital of old New York State, and walked across a narrow park to the Senate House. Meeting at times in this low limestone house of Wessel Ten Broeck, New York's founding fathers in 1777 adopted the first State constitution in Kingston, held the first general election, and proclaimed a first-generation Irishman—George Clinton—as their first Governor.

Here the first popularly elected senate met, and John Jay convened the first State court.

Tides of war forced State officials to leave in haste, but the stone walls survived enemy torches that charred the settlement.

On the other side of the Hudson at Poughkeepsie, I entered the sequestered campus of Vassar College. I had never seen so many bicycles. They lay in huddles before Main Building and every ivied hall. Classes changed. I was suddenly caught in a swirl of young women in Bermuda shorts, who bore down upon their wheels and pedaled away furiously (page 583).

Ninety-five years ago Poughkeepsie brewer

* See "The Mighty Hudson," by Albert W. Atwood, NATIONAL GEOGRAPHIC MAGAZINE, July, 1948.



A Precision Team on Dart Lake Lifts Skis in Salute at 23 Miles an Hour

A French invention, water skiing is one of the fastest growing sports in the United States. These girls give three shows a day for summer guests at Dart Lake Club, near Big Moose in the Adirondacks.

Matthew Vassar founded a college where young ladies could learn to dissect a frog as well as bake a cherry pie. Twentieth-century Vassar keeps his tradition high. A course in conservation is among recent innovations. This specialized field, involving zoology, geology, ecology, land use, and wildlife and plant management, is not one in which I should expect to find a Vassar girl, but a college official said it has been unusually popular.

Even a day at Vassar gives the impression that serious scholastic intent lies behind the pretty, scrubbed faces of students. Not long ago two juniors reported to a science conference on "Thermal Diffuse X-ray Scattering as a Function of Temperature."

Temples of Industry and Research

At Poughkeepsie I had my first view of the fabulous temples of industry and research that abound in the Thruway corridor.

A modern version of the ancient abacus held me in wonder at the Poughkeepsie plant of International Business Machines Corporation. Sitting casually at the control console, an engineer tested a new Electronic Data Processing Machine. Computing units began to hum, and panels of bulbs flickered like fireflies. In one second the machine totaled up 40,000 ten-digit figures!

Far and away the most visited national historic shrine in the New York countryside is the home of Franklin D. Roosevelt at Hyde Park. As many as 516,000 pilgrims have stopped here in a single year to pay tribute to Mr. Roosevelt, twice Governor of the State and the only man elected four times to the Presidency of the United States.

Like most visitors, I was delighted with the cheerfully informal furnishings and knickknacks in the Roosevelt family mansion. So unlike a museum is the shrine that I half expected to hear a familiar voice boom, "My friends!"

Four years before his death in 1945, the President laid the cornerstone of the Franklin D. Roosevelt Library. It is a national treasury of FDR documents. At the time of my visit cases held 73,469 cubic feet of manuscripts, books, and printed material.

Lost in thoughts of this Hudson Valley squire's imprint on history, I stood silently near his white-marble monument in the rose garden—an appropriate resting place, for the Dutch name Roosevelt means "rose field."

Just as the shadow of FDR casts a spell

upon Hyde Park, that of the first President born under the Flag of the United States lingers over Kinderhook, 45 miles northward. Martin Van Buren, born a truck farmer's son in 1782, also made his way to the White House via the governor's mansion. At a Kinderhook residence called the House of History, the "Little Magician" talked strategy with friends and toasted political victories. Defeated for re-election in 1840, he retired to the Van Ness estate near Kinderhook.

As tides flow endlessly up and down the brackish Hudson, the nostalgic past mingles with the present. Mushrooms sprout in dark, dank warehouses no longer used in Cox-sackie for the river's winter crop of ice. Old-timers in Saugerties still lament the junking in 1920 of the *Mary Powell*, queen of the 19th-century river boats. In Catskill budding artists seek the studio of Thomas Cole, one of the first and most distinguished members of the group of painters who became famous as the Hudson River School.

Thruway gates lead to these tranquil settlements on the river. The same gates funnel vacationists to the marvelously wild Catskill Mountains. This "Land of the Sky" is a world apart, full of enchantment.

Touring the Catskills, I became perplexed by seeming anomalies: the gentle summits of mountains, only one of which rises above 4,200 feet; the violently steep, rocky slopes of valleys; and the virtual absence of lakes.

"That is because the Catskills are not true mountains at all, in the sense of having been folded from the earth," State geologist John G. Broughton explained to me. "They are the remains of a broad plateau, now cut to pieces by swift streams."

Land of Rip Van Winkle

Near Haines Falls I followed a stony trail to the ruins of Catskill Mountain House, a 19th-century show place on a high wind-blown ledge. The incomparable view from here attracted two beloved creations of New York writers, the pioneer scout Natty Bumppo and Rip Van Winkle.

In *The Pioneers* James Fenimore Cooper, the first great American novelist, brought his far-ranging scout to this escarpment.

"What did you see?" Natty was asked.

"Creation!" he cried. "All creation, lad."

I gazed in wonder on reaching the vantage point. My eyes traced some 70 miles of the Hudson. On the valley floor snug villages and



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"Van Winkle" and "Wolf" Doze in the Catskills

"The great error in Rip's composition was an insuperable aversion to all kinds of profitable labour," Washington Irving wrote. "To escape from the labour of the farm and the clamour of his wife," Irving's hero sometimes took gun in hand, strolled into the woods, and shared the "contents of his wallet with Wolf."

On one of these excursions Rip quaffed too heartily and slept for 20 years. Waking, he found his fowling piece rust-encrusted and worm-eaten.

Summer visitors to Rip's Retreat, a Haines Falls resort that capitalizes on the story, may meet this costumed gentleman on mountain paths or find him asleep at the legendary site of Van Winkle's nap.

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Robert F. Harlan,
National Geographic Staff





Cadets Meet Girls at Battle Monument

West Point's Battle Monument, a 46-foot shaft ringed by stone spheres, carries the names of 2,230 Union officers and men of the Regular Army killed during the Civil War. Southerners call it "a monument to Confederate marksmanship." Here plebes are sworn into the corps. Freighter steams down the Hudson from Albany.

↓ Masked Man Tests Apples in Thin Air

Apples breathe. To slow down respiration and keep them from passing their prime in prolonged storage, New York orchardists put some in hibernation for out-of-season sale at premium prices. This new storage technique originated in England; Cornell University developed it for American use.

Paul Kurtz checks apples and atmospheric conditions in this cold-storage room at Sanford Orchards, near New Paltz. He wears a mask because oxygen has been drastically lowered and carbon dioxide increased to retard respiration of the fruit. McIntosh apples in his hand remain crisp and fresh from September through May.

B. Anthony Stewart,
National Geographic Staff

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farms and copses wove a carpet in myriad shades of soft green and autumn brown.

On this ledge Washington Irving's lazy, lovable Rip hunted squirrels the day he met the ghostly crew of Henry Hudson's *Half Moon*, shared their potent brew, and slept 20 years (page 580).

I drove through 550,000-acre Catskill Park in bright sunshine, swinging southwest to Phoenicia in skiing country and east to Woodstock, an art colony.

There I was initiated into the casual life of the Catskills.

Searching out a motel on the tumbling Saw Kill, I found this note on the office door: "Back at 9 p.m. Go in, register, and take a key." I followed instructions. Neither that night nor early next day did I encounter the owners. Ready to leave, I stowed luggage in the car, returned to the office, and stood uncertainly at the desk. At last I noticed a glass jar that held coins for daily newspapers. I was stuffing the \$5 rental fee into it when the proprietor came in, sleepy-eyed and grinning.

"My wife and I hardly ever get away from here," he explained. "Last night we decided to take in a movie and let the motel take care of itself."

Albany, Hub of the Empire State

Leaving behind the lazy blue grandeur of the Catskills and central Hudson Valley, I found Albany glowing before me at dusk, its terraced canyons of brick and stone climbing from the busy deep-water port to "Capitol Hill" (page 585). Here and there a crowstep gable hints of Dutch ancestry.

Despite its sea mood, for the flags of many nations fly from ships at dock, the city pulses to the heartbeat of politics. The careers of former Governors Martin Van Buren, Grover Cleveland, Theodore Roosevelt, Charles Evans Hughes, Alfred E. Smith, Franklin D. Roosevelt, and Thomas E. Dewey have made Albany conspicuous in national affairs for many years.

It was during Mr. Dewey's administration that the Thruway, a years-old dream of many persistent and dedicated men, was finally transformed from blueprints into a four-to-six-lane expressway.

I called on the incumbent Governor, the Honorable Averell Harriman. Mr. Harriman in December, 1955, dedicated the new bridge across the lower Hudson, signaling comple-

tion of the last major portion of the Thruway.

As we were introduced, he said, "I am delighted to meet you. I have read the NATIONAL GEOGRAPHIC since I was a boy."

Water Highway to the West

Seated in his small private office off the mahogany-and-leather-paneled executive chamber in the capitol, we talked of the Empire State and its unexcelled development: Indian trails, corduroy roads, the fabulous, empire-building Erie Canal, splendid port facilities of New York City, railroads, the Thruway.

We talked, too, of nature's generous gift: a convenient water-level route through the great wall of the Appalachian Mountains.

"Trade came our way," Governor Harriman said. "Trade begot merchants, shippers, bankers, brokers, insurance men, manufacturers. We were able to provide services to the rest of the United States and the world—services that we have been developing over the years.

"We attracted skilled labor from all over the world. One skill, of course, generates another. Ingenuity grows out of opportunity."

The Governor paused. "Perhaps more so than most States, we are an authentic cross section of American life. Businesses range from small farms to industries that are among the country's largest. Our people come from all religious and racial backgrounds. As a melting pot, we've had the advantage of immigrants' enthusiasm and vigor."

When our talk ended, I strolled through the sumptuous chambers of the capitol. This

(Continued on page 591)

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Yale Sweaters Above Bermuda Shorts? → This Is Vassar!

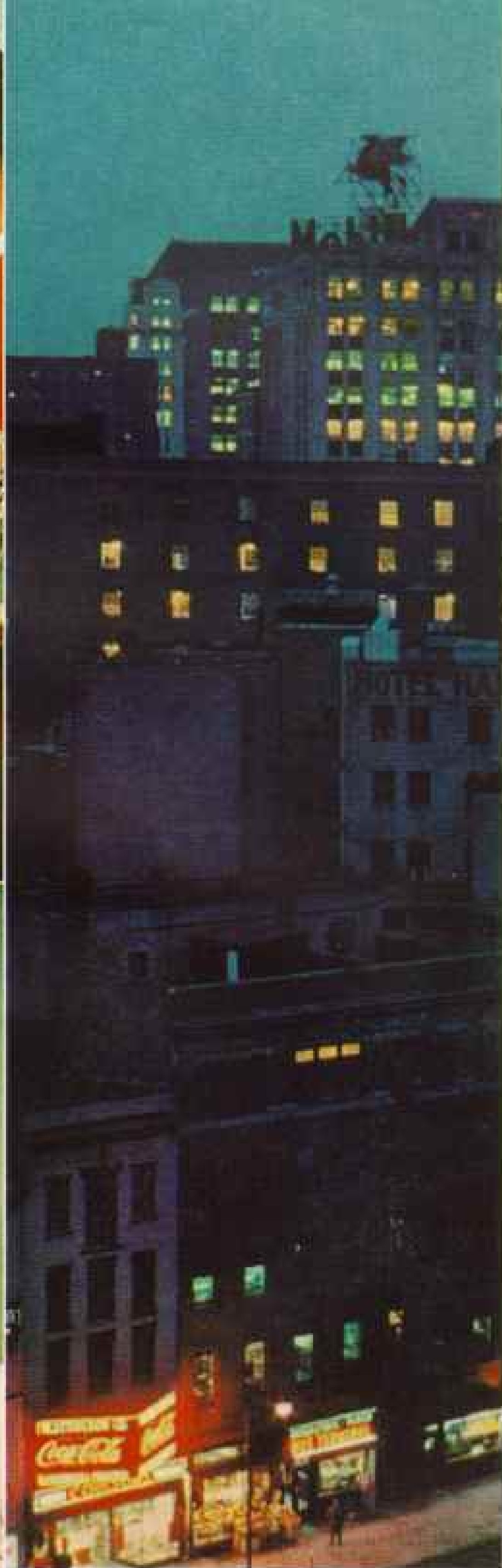
Prized trophies are varsity-lettered sweaters from any of the leading male colleges.

During the college year Poughkeepsie blossoms with some 1,400 pedal-pushing young ladies. In ivied brick walls they confirm the premise of a Poughkeepsie brewer, Matthew Vassar, who held that "woman . . . should have the same right as man to intellectual culture and development." To back his theory, he founded the girls' college in 1861.

Generations have proved Mr. Vassar's point. One member of the class of 1956 is daughter, granddaughter, and great-granddaughter of Vassar graduates.

Each class displays its distinctive color—red, blue, green, or yellow—in clothing, books, and bicycle tags. These girls gather at Thompson Memorial Library.

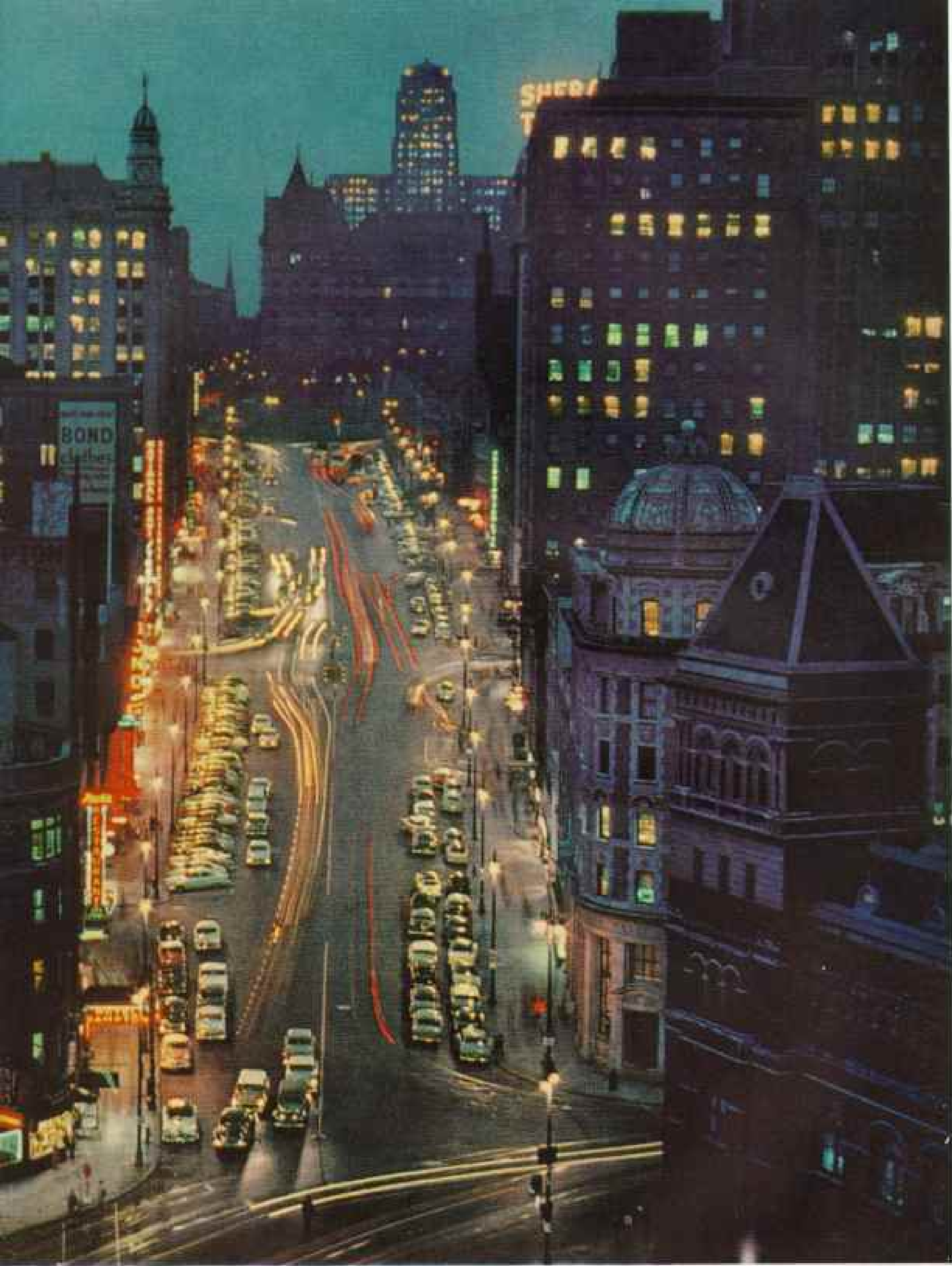




← Tomorrow's Shirts Take Shape

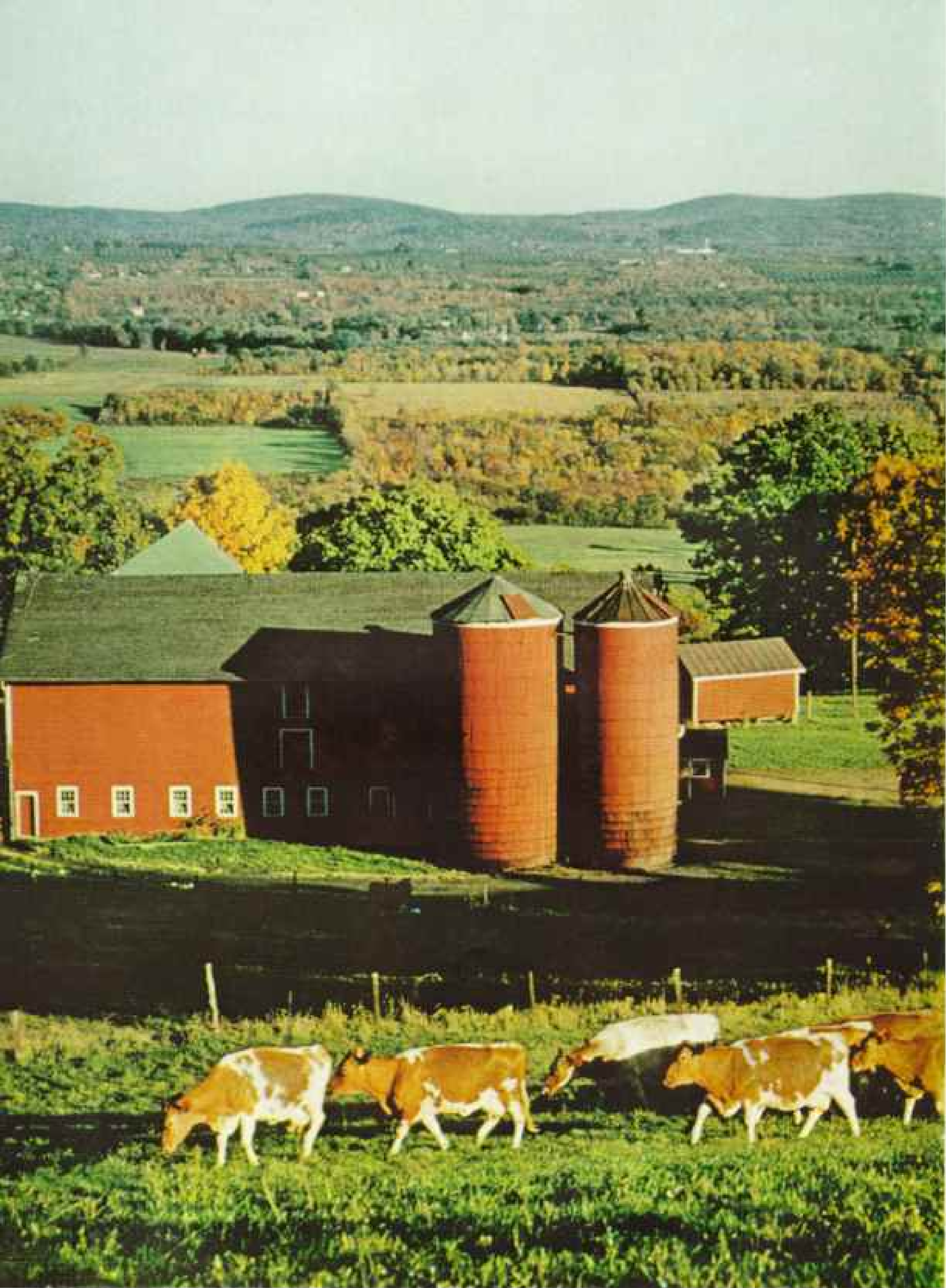
Yesterday's styles hang on the wall at Cluett, Peabody & Company, Inc., Troy.

Above: A Rensselaer architectural class in Troy studies a model of a night club.



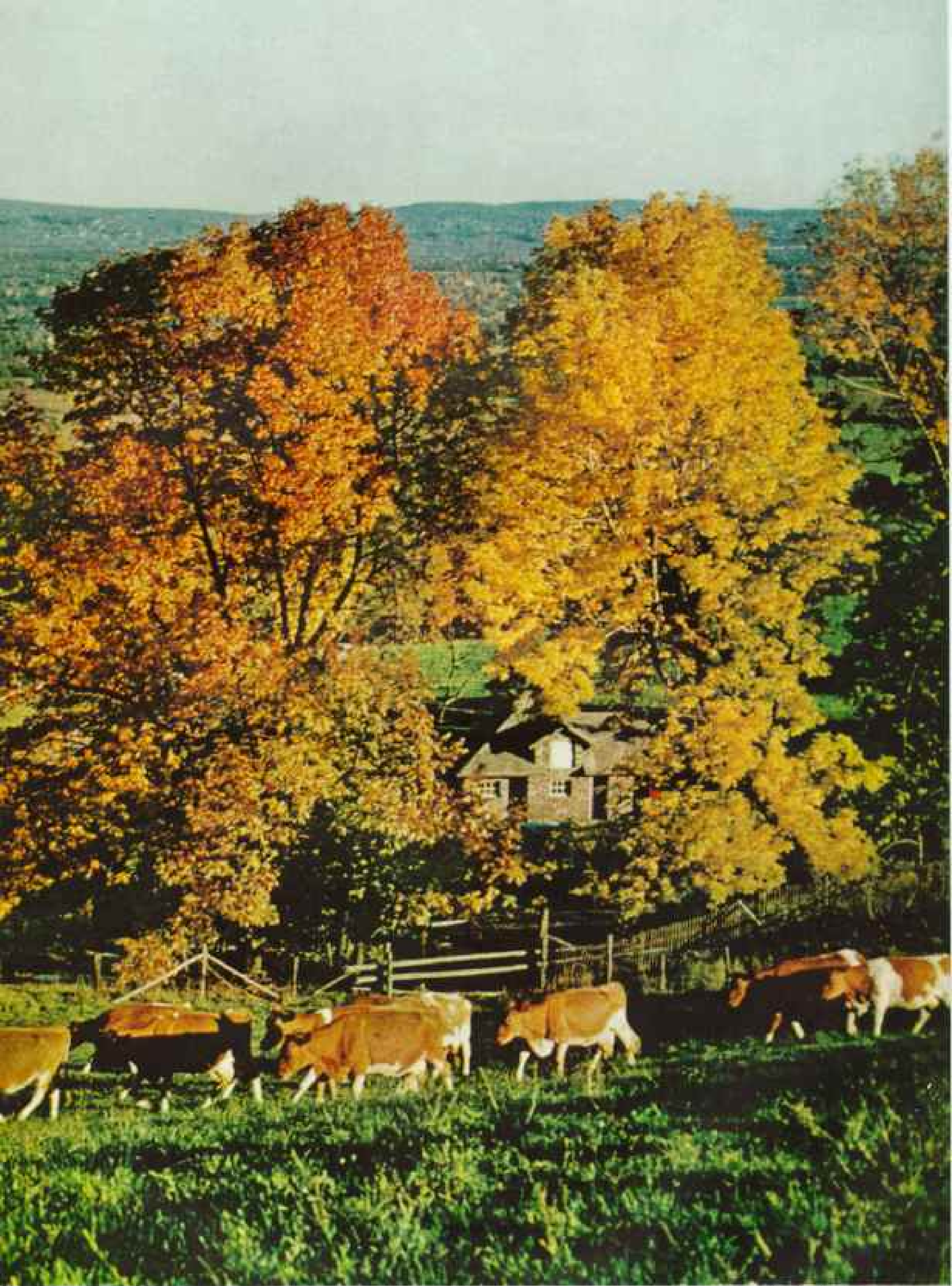
State Street, Albany's Great White Way, Climbs to the State Capitol

Dutch merchants in 1614 built a trading post near this spot. Settlers arrived a decade later, and the State government moved here in 1797. During the westward migrations of the 1790's, hundreds of wagons a day creaked up State Street. Robert Fulton's pioneer steamship, the *Clermont*, paddled up the Hudson to Albany in 1807. The granite capitol covers three acres; lights of the 34-story State Office Building glow behind it.



Afternoon Milking Over, Guernsey Cows Stroll to Pasture past Golden Foliage

This peaceful country was a savage wilderness when Dutch traders established a trading post about 1615, soon after Henry Hudson's discovery voyage up the river that bears his name. Indian wars continued for years.



Kleinekill Farm's Fat Red Silos Stand in Ulster County's Rich Dairyland

Despite manufacturing's giant strides, agriculture remains the State's largest industry. As a dairy producer, New York takes second rank only to Wisconsin. Milk accounts for almost half the revenue of its farmers.



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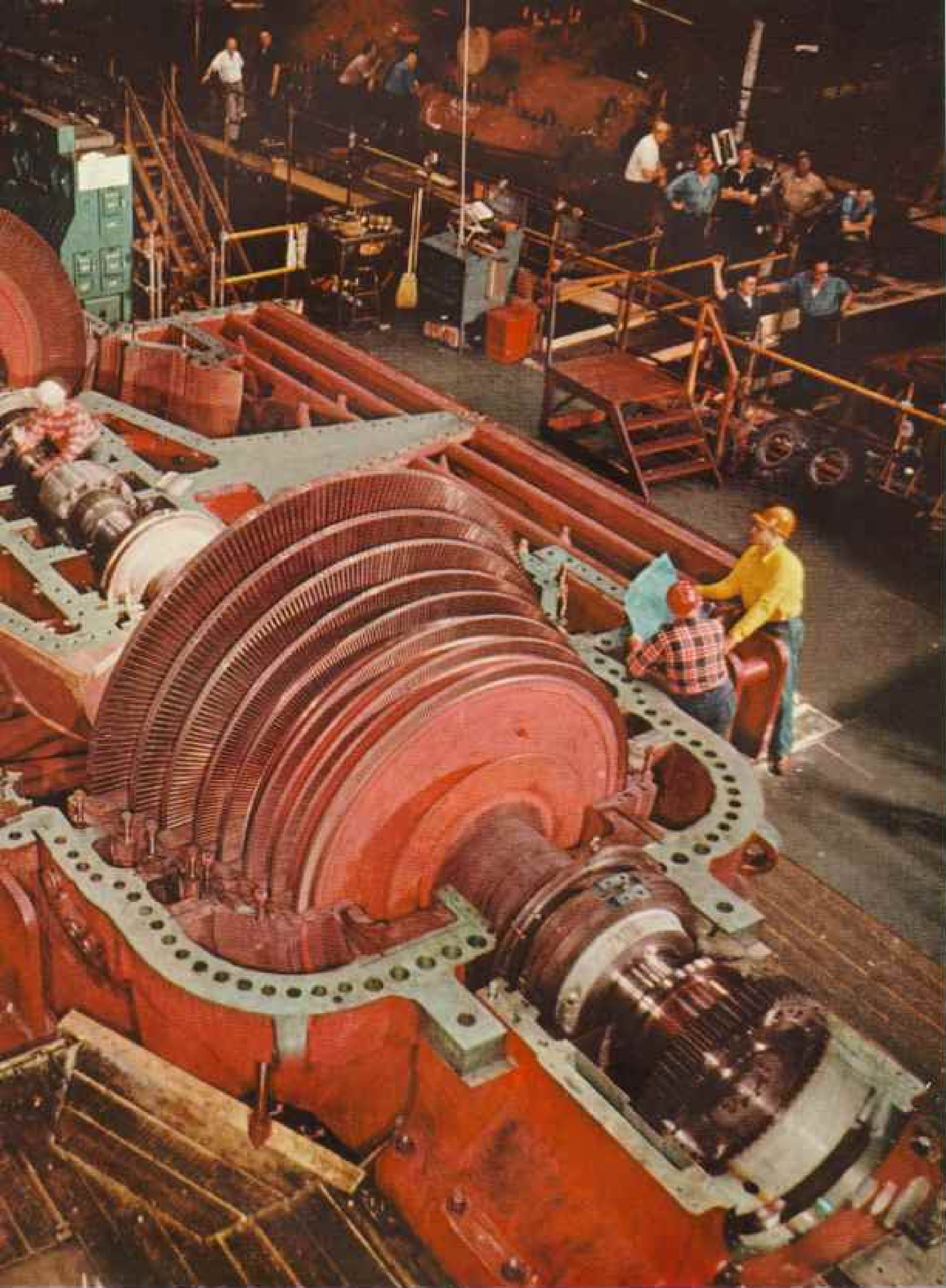
Signs Shout "Danger" in a "Hot" Cell

General Electric Company engineers expose various substances to intense radiation in Knolls Atomic Power Laboratory, Schenectady. Their question: "Will this material stand up?" Here a mechanical hand slips a metal cylinder into a tank. Glass and concrete shield the man from radioactivity. The laboratory is operated for the Atomic Energy Commission. ⚡ Using one finger, Ken Hunter jockeys the steel claw, which holds a piece of red plastic.

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Robert P. Simon, National Geographic Staff





General Electric Assembles a Steam Turbine Packing the Muscle Power of 4,500,000 Men

This is one of five machines built in Schenectady to serve an AEC project near Portsmouth, Ohio. Steam hits rotor blades at 1,000 miles an hour. Rows of wheels, spinning at supersonic speed, turn an electric generator.



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↑ Babe Ruth's 60th-home-run Bat of 1927 Thrills Boys in Baseball's Hall of Fame

Plaques on the wall of the Cooperstown museum show Eddie Collins, Napoleon Lajoie, and the first baseball commissioner, Kenesaw Mountain Landis. Lou Gehrig's first-baseman's mitt helped him set a record of 2,130 consecutive games, never since equaled.

↓ Skidmore College Girls Pour a Cup of Saratoga Springs Mineral Water

Mohawk Indians, who summered at the springs long before the settlers arrived, knew the healthful value of the waters. As owner of the springs, New York State puts its official seal (right) on two million bottles of water sold each year.



chateaulike building, costing nearly \$25,000,000, grew slowly over a period of 32 years. Like the dissimilar natures of the people it serves, the state house is a harmonious composite of many architectural styles. For more than 75 years it has seen the enactment of all State laws; here, too, the Thruway Authority was born in 1950.

The undertaking was audacious. When 135 miles of connections with turnpikes in neighboring States are completed, the entire Thruway system will have cost \$962,600,000.

Wanted: 500 Million Dollars

I drove to the headquarters of the Thruway Authority and called on a soft-spoken engineer who has directed the agency since its inception.

Taxes build free roads, but Thruway chairman Bertram D. Tallamy had to find another way to finance the State's biggest single public-works project. At the end of a campaign led by Mr. Tallamy, voters overwhelmingly approved the State's backing 500 million dollars of Thruway bonds to start construction.

The Authority bought a route that crossed 13,700 individual pieces of property. Although the road knives across some of the most varied and difficult terrain underlying turnpikes in the United States, 150 prime contractors completed most of the 427-mile main trunk, nearly 500 miles of access roads, and 507 bridges in three years!

Mr. Tallamy's eyes light up at the mention of the numerous headaches. And the cures.

"We had to carry the road across Montezuma Marsh, a Federal wildlife refuge north of Cayuga Lake," Mr. Tallamy said. "Beneath the deep surface muck lies a bed of marl—not unlike stiff tooth paste. We built dikes on either side of the route, pumped the channel dry, and dug the muck from the marl. A roadbed of gravel, stones, and clay was planted one to three feet higher than the desired road level to allow for settling."

Mr. Tallamy chuckled. "Naturalists were afraid the work would disturb wildlife. But, actually, animals and birds took great interest in the bulldozers and scoops. Egrets watched like sidewalk superintendents."

As a feat of engineering the Thruway ranks with the old Erie Canal, affectionately known as "Clinton's Ditch."

De Witt Clinton's men invented tools and construction methods. Tough, brawling Irishmen fresh from peat bogs swung picks and

trundled barrows. Stone locks to lift boats across the State were fitted without mortar.

Cannons heralded the canal opening in 1825. Packets ferried tens of thousands of settlers to virgin lands; barges glided east with golden harvests. Cities sprang up. Before railroads ended mule teams on the towpaths, the "ditch" fulfilled George Washington's prophecy that New York State would become the "seat of Empire."

Like the Indian trails of old, the Thruway pivots westward at Albany and spans a sandy plateau to dip into the Mohawk Valley.

Factory smoke has long since replaced the flickering council fires of the Iroquois Confederacy. But the warlike Mohawk, Oneida, Onondaga, Cayuga, and Seneca tribes are not forgotten.

In Schenectady I read of a snowy night more than 250 years ago. Indians, creeping inside the stockade, committed cruelties that "no Penn can write nor Tongue expresse." Though wounded, tough Symon Schermerhorn escaped and hastened to Albany to warn other settlers.

A little later I fell into conversation with a genial State patrolman.

"Did you grow up in the valley?" I asked.

"Sure did," he said. "And my folks before me. My name is Lynn Schermerhorn. One of my ancestors—'Old Symon' Schermerhorn—lived through the Schenectady massacre."

Union College, founded at Schenectady in 1795, is the second oldest in the State (after Columbia University).

Here Giant General Electric Was Born

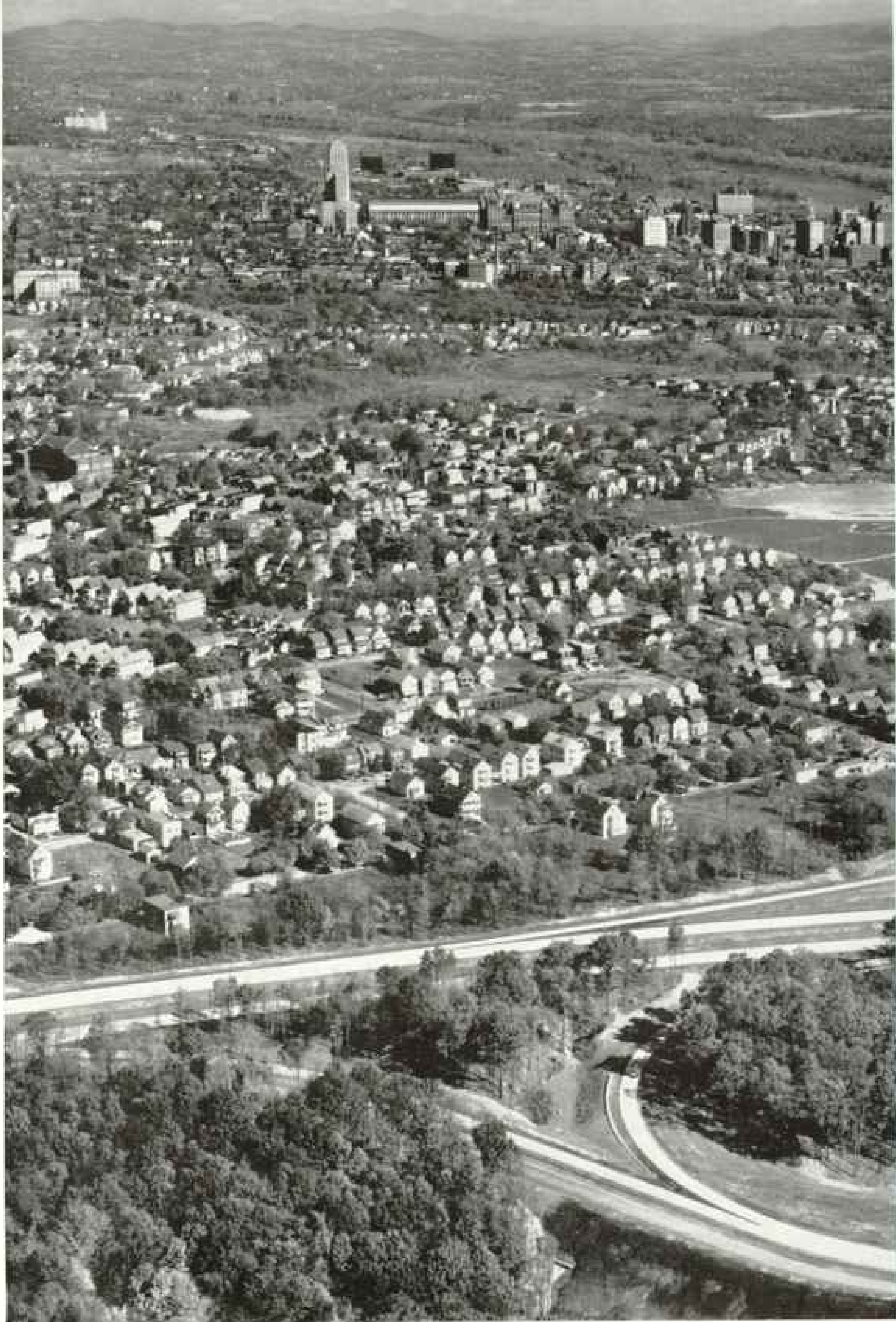
A throbbing city within the city is the parent plant of the great General Electric Company. The Schenectady Works, one of 138 G-E plants in the United States, numbers more than 240 structures (page 589).

G-E's extensive laboratories ramble over the greensward of a riverside estate, "The Knolls." I was taken to the laboratory which has actually succeeded in making diamonds.

"Like to see some?" a scientist asked.

The glittering crystals are little larger than grains of sand, but their manufacture represents more than a century of trial and research. The formula for man-made diamonds: Subject carbon to heat of 5,000° F. in a press with a punch of 1,500,000 pounds a square inch. Earth exerts roughly the same pressure—240 miles below the surface!

Pushing westward on the Thruway, I ex-





ploded cities and villages born on the canal and linked anew by the expressway. Businessmen welcome the new economic lifeline to faraway markets. Superimposed on the old trade corridor are new warehouses, garages, shopping centers, and suburban industrial plants that resemble college campuses.

Where the Thruway penetrates a particularly narrow part of the Mohawk Valley, it bisects the heart of Fultonville. The peaceful village wears a lively new look. As a Thruway exit point, it has become an important gateway to the glove-making cities of Johnstown and Gloversville, the Adirondacks, and the Shrine of Our Lady of Martyrs at Auriesville.*

But Fultonville's future seemed far from rosy when Thruway engineers decided they could not avoid bulldozing a path straight through the business district.

Mayor George Snyder and village trustees Henry Lorentzen and Arnold Francisco tried to persuade neighbors that the road offered the village a chance to recover its former prosperity as a canal port.

"Some people refused to budge until they saw the bulldozers coming," Lorentzen told me. "I must admit we spent two miserable summers while the road was being built."

Before construction scars healed, Fultonville began to lift its own face. Wreckers knocked down old homes and dingy shops; new structures rose. Owners of undisturbed buildings spruced them up. Taxes fell when new properties appeared on assessment rolls. Best of all, the village debt was retired.

"Now," said Lorentzen, with the smile of a man absolved, "almost everyone admits that the threat of doom was a blessing in disguise."

Taking Kinks Out of a River

I was riding on west with my State Trooper friend, Lynn Schermerhorn, when we neared a sheer divide between the rocky humps of two mountains fancifully called Big Nose and Little Nose. Lynn braked the police car.

"Look!" he said. "There's the whole story of New York State."

It was indeed. As if threading the eye of a huge needle were the canalized Mohawk River, the bed of the old Erie Canal, three tracks of the New York Central, two pre-Thruway roads, and the four-lane divided expressway we were riding. Hardly an extra cowpath could have squeezed through the defile.

"Notice how straight the river is here?"

Lynn asked. "It didn't use to be that way. That's where engineers took a kink out of the old Mohawk to make room for the Thruway."

In no less than five places we found the canalized Mohawk straightened and naked of the feathery willows that screen its banks. All told, Thruway engineers relocated five miles of channel.

Baseball's Official Home Town

At Herkimer I veered south into the rolling Leatherstocking Country of James Fenimore Cooper. Big highroads bypassed Coopers-town, leaving his boyhood village on Otsego Lake to a life of repose. But Cooper's tales of the American frontier carried its name afar.

Legions of visitors roam the elm-mantled village and its environs summer and winter among three memorable mirrors of the American heritage. Two are operated by the New York State Historical Association: Farmers' Museum, where craftsmen relive pioneer life, and Fenimore House, with its superb collection of folk art and Cooper memorabilia. The third is the National Baseball Hall of Fame and Museum.

I strolled to Doubleday Field, traditional birthplace of baseball. Near by, with pleasant memories of boyhood sand-lot games, I visited the Baseball Hall of Fame and Museum to pore over the rarest trophies of the American national sport (page 590).

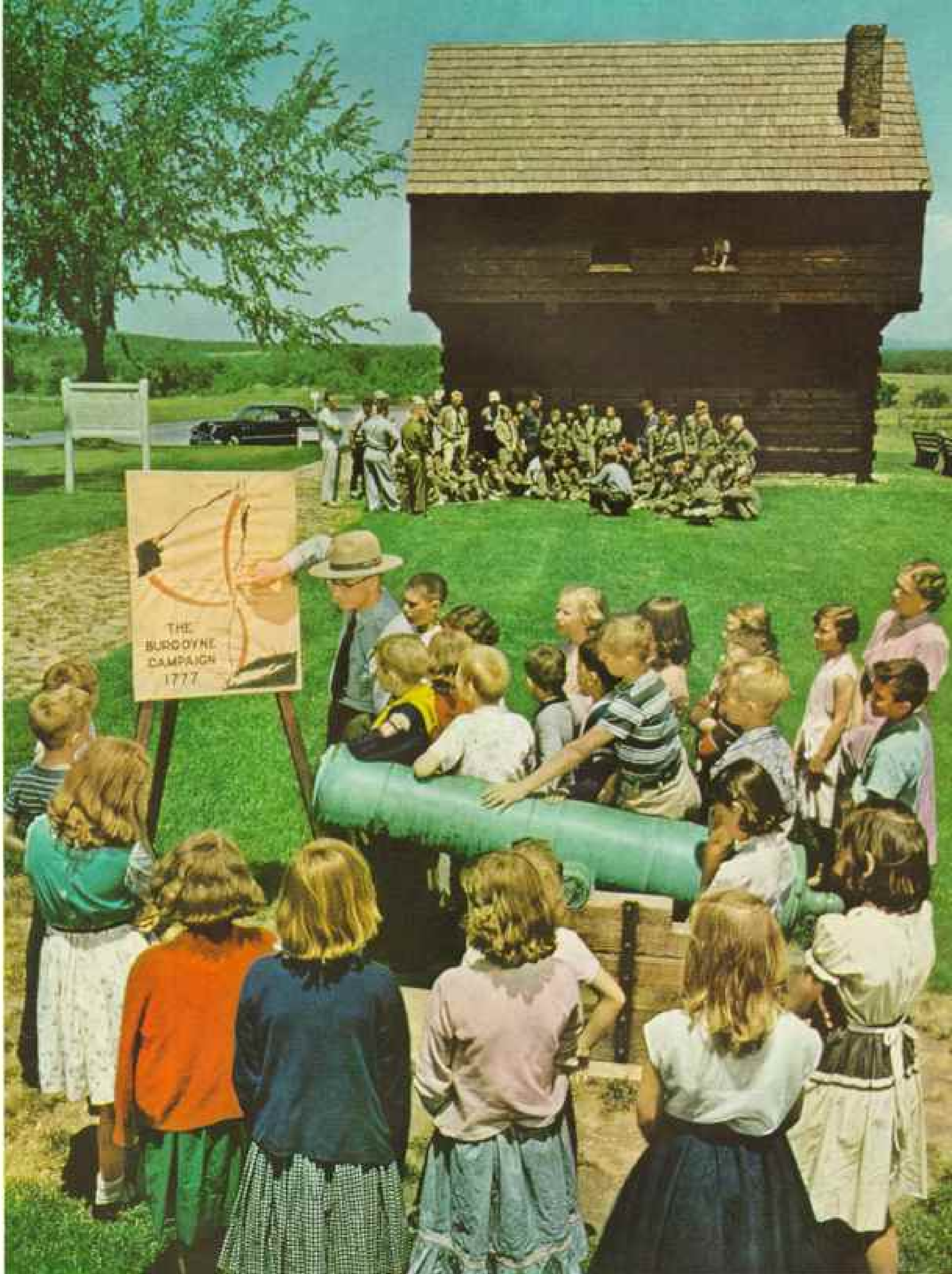
Personal belongings of Babe Ruth, the New York Yankees' immortal "Sultan of Swat," put a ball-sized lump in my throat. Along with three awestruck boys and two black-robed nuns, I peered into the Babe's glass-protected metal locker from Yankee Stadium. Inside were his famous No. 3 uniform, his worn fielding gloves, shoes, and cap.

Past trim white frame houses, I drove to Farmers' Museum on the west shore of Otsego Lake. In a cavernous stone dairy barn I fingered apple parers, mangles, treadmill churns, and other crude implements devised by pioneer husbands.

A path meanders from the barn to the Village Crossroads, where a country store, schoolhouse, smithy, and other early shops from near-by villages have been painstakingly re-erected. With other fascinated museum visitors, I watched a blacksmith pound a horse-shoe at his glowing forge. Printer Harry S.

(Continued on page 603)

* See "Drums to Dynamos on the Mohawk," by Frederick G. Vossburgh, NATIONAL GEOGRAPHIC MAGAZINE, July, 1947.



Here the Battles of Saratoga, Fought in 1777, Saved the American Revolution

Park historian Herbert Olson points out General Burgoyne's plan of attack to visiting school children. A captured cannon adds silent evidence to the invaders' defeat. Boy Scouts hear a lecture beneath a simulated fort. This national historical park lies some 30 miles from Thruway exits at Albany and Schenectady.



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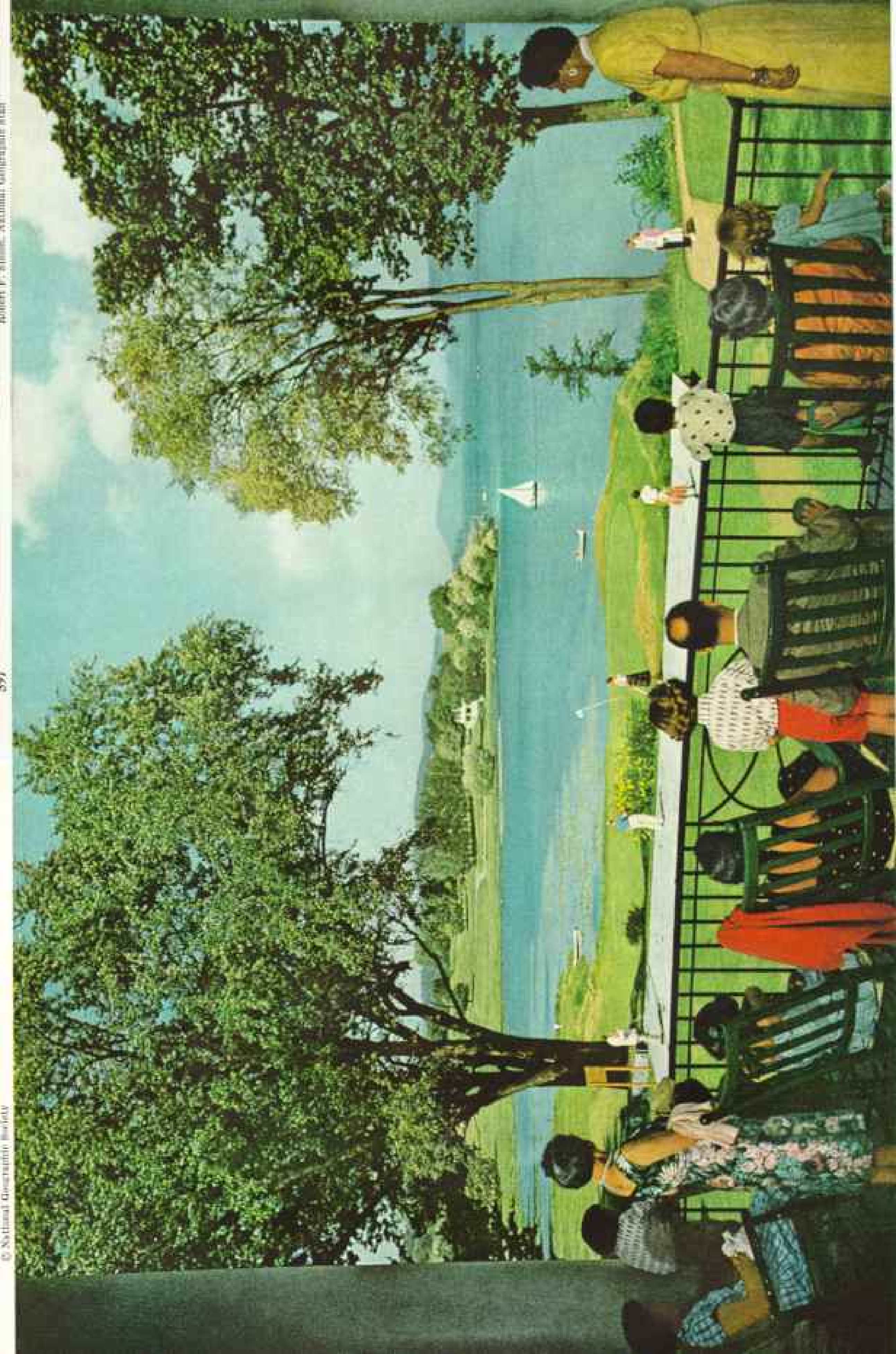
↑ **Changing Classes at Syracuse University March past Domed Hendricks Chapel**

Booming Syracuse ranks among the Nation's largest, privately endowed schools. The 52-acre main campus is known as Piety Hill. To it some 9,000 students come from 63 nations. John Crouse College of Fine Arts (right background) has stood since 1889; chimas in its tower ring the call to classes.

↓ **Hotel Guests Watch Shuffleboard, Golf, and Boating from a Veranda Overlooking Otsego Lake**

James Fennimore Cooper, who lived beyond the wooded point, termed Otsego "a bed of the pure mountain atmosphere." His stories refer to the lake as "Glimmerglass." Otsego gives birth to the Susquehanna River. Revolutionary troops dammed and then released lake water to carry their bateaux downstream.

B. Anthony Stewart, National Geographic Staff



Cornell, at Ithaca, Stands Far Above Cayuga's Waters

Founder Ezra Cornell pledged "an institution where any person can find instruction in any subject." Today 9,500 students take courses in everything from the arts and sciences to hotel administration.

Each school morning the University Library's 173-foot clock tower rings out the "Jenny McGraw Rag." Students named the air for the donor of nine bells that pealed on the university's opening day in 1868.

→Page 599, lower: Cornell fraternities celebrate Spring Day by launching flower-decked "battleships" on Beebe Lake and capsizing one another.

↓ Dog at Cornell Works a Treadmill Churn

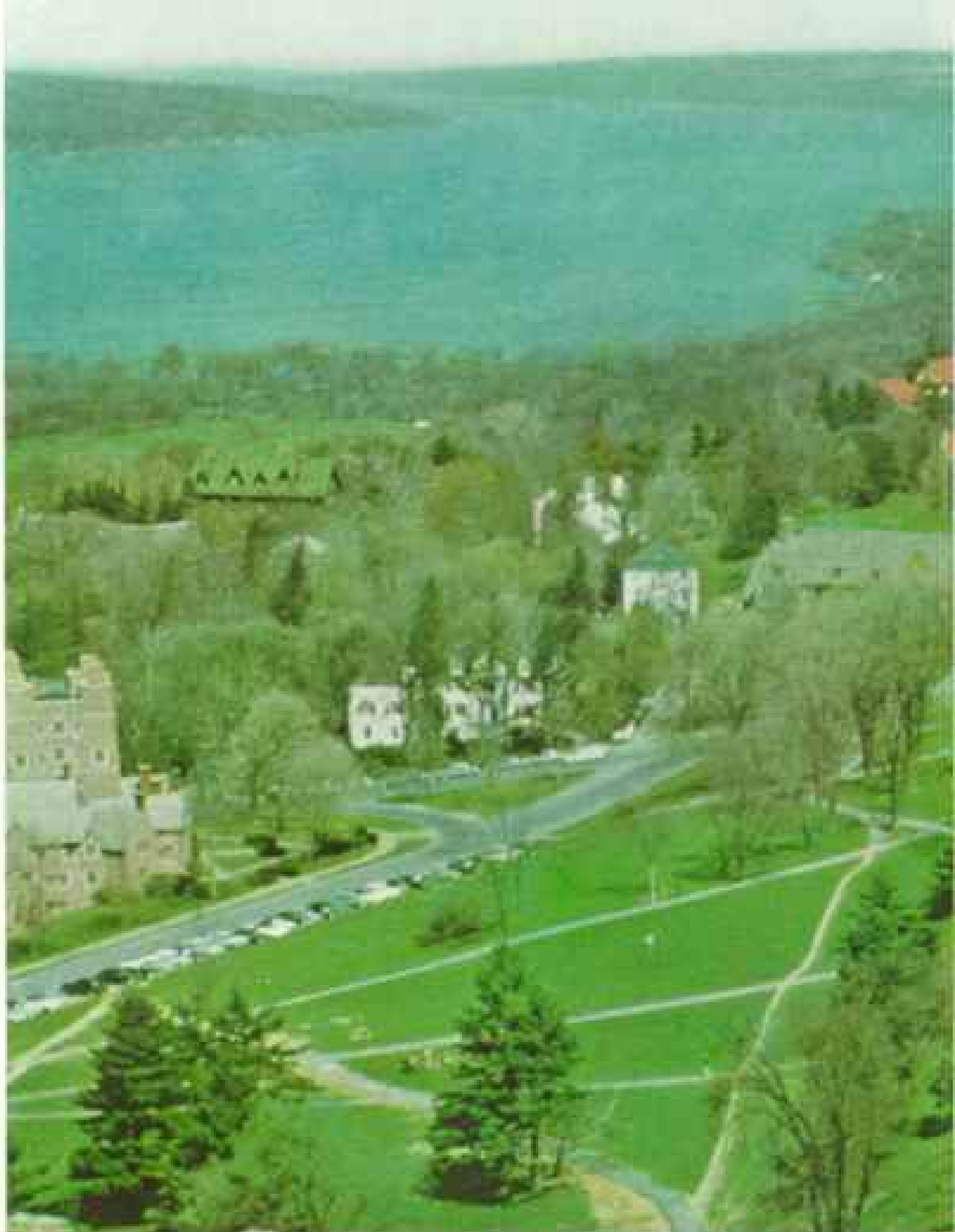
Many diseases, foods, and some emotional reactions are common to man and his best friend. To learn more about humans, university scientists study the relationship of exercise to diet in aging dogs.

Here Mike, a 12-year-old Dalmatian, gets a workout. Pioneer dairymen used dogs and goats to turn similar machines.

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Illustrations by R. Anthony Stewart,
National Geographic Staff

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Shequaga Falls Cascades down a Rocky Stairway to the Village of Montour Falls

Almost as high as Niagara, Shequaga trips down a 156-foot ledge, eddies around a pool, and flows into a creek. Legend says the Indian orator Red Jacket pitted his vocal powers against the fall's thunder. Here Catherine Montour, a Canadian captive who became matriarch of a Seneca clan, founded an Indian settlement.



Morning Sun Fires Autumn's Bright Canopy. Everyone Loves to Burn Leaves

To please his southern bride-to-be, one William Jackson followed plantation style in building his home around 1840. Today two families share the house. Says Mrs. Teresa Eaton, who airs the yellow spread on the left, "The waterfall is beautiful at any time of year. Every morning when I get up I watch it from my kitchen window."



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B. Anthony Blustein, National Geographic Staff

↑ **Quick Dip Gives a Satiny Coat of Red Wax to Molded Candles**

Robert Melcher applies the color. Will & Baumer candles, made in Syracuse, flicker all over the world. Rear Admiral Richard E. Byrd carried them to North and South Poles. The company, by official appointment, dips pure beeswax candles for Vatican City.

↓ **Anne Weis Paints a Band of Gold on Syracuse China**

Baked 70 to 90 hours in temperatures ranging up to 2,200°F., these cups, plates, and bowls wear a glaze harder than steel. Gold is applied as the plate spins on a turntable at Onondaga Pottery Company, Syracuse. A new firing will fuse the metal to the glaze.



Newell, working a creaky hand press, handed me an inky copy of the *Otsego Herald* containing news of 1816. A fading ledger in the doctor's office showed these fees: 25 cents to pull a tooth; \$1.25 to deliver a baby; and \$5 for an amputation.

Bump Tavern, a drovers' inn from the Catskills, looks as if it had always stood at the Crossroads. Inside I talked to a slim woman spinning flax into linen yarn.

How Spinsters Got Their Name

"A skilled craftswoman could spin two skeins, or 2,400 yards, a day," she said. "When a woman became that proficient, she qualified as a spinster and could hire out. Only the young unmarried girls had time to work outside the home; so gradually all unattached women became known as spinsters."

At the edge of the village a tabby darted past and through a cathole in the front door of a red farmhouse. Built at Hinman Hollow about 1797, the homestead was moved to Farmers' Museum complete with its lilac tree.

Hostesses work in the farmhouse as if it were home. They bake, churn, wash, dip candles, press cheeses, and keep open fires crackling in kitchen and parlor. They use no utensils or recipes unknown before 1825.

The wonderful fragrance of baking lured me to the kitchen, where strings of dried apples, herbs, corn, and diced puffballs dangle like necklaces from dark, heavy beams. A woman in calico opened a big black kettle hanging from a crane over the fire. I peeped in, sniffing appreciatively at a shallow pan of dough resting on a trivet inside. She tested it with a straw.

"Fresh apple cake," said Mrs. Phoebe Schaeffer. "It'll be done soon. Care to taste it?"

The first bite led to more. When I had sampled the cake adequately, we retired to the parlor and took turns chunking the fire. Sunlight filtered through yellow homespun curtains. I walked to the window and looked across green slopes to glittering Otsego Lake. Autumn leaves spread a shawl of bronze and russet on distant hills. Puffs of cloud hung like smoke signals in the sky.

"My idea of heaven," said Mrs. Schaeffer, "is Cooperstown in October."

I returned to the Mohawk Valley, savoring afresh the beautiful views I first saw with the descendant of old Symon Schermerhorn. Unlike the majestic Hudson, the Mohawk is an

intimate and very gentle valley (page 568). Plump cattle graze on checkerboard fields. From Schenectady to Utica, the valley's largest city and gateway to the central Adirondacks, industrial communities nest contentedly beside the workaday river. I saw pungent wools from many nations emerge as luxurious rugs at Mohawk Carpet Mills, Inc., in Amsterdam. My clothing carried the scent of peppermint from Beech-Nut Packing Company's chewing-gum plant at Canajoharie.

In Rome I watched rolls of glossy metal spinning from presses of Revere Copper and Brass, Inc. My guide in the silverware plant of Oneida, Ltd., at Sherrill, founded by the Oneida Community, picked up a newly made fork and said, "This is the Sheraton pattern. My father designed it 50 years ago."

The tranquil beauty of the industrial valley belies its past, for settlers suffered cruelly during the French and Indian War and fought off Indians, British, and Tories in the Revolution. Along the Thruway stand sturdy fortresslike churches built by pioneers, and at Fort Johnson and Johnstown are the pre-Revolutionary mansions of Sir William Johnson, superintendent of Indian affairs. The brick home of Gen. Nicholas Herkimer overlooks the river near Little Falls. A somber stone shaft on Oriskany battlefield commemorates his victory over the redcoats and their allies in 1777.

Syracuse: "Thruway Show Window"

Driving west, I found Syracuse growing out to meet the Thruway, which is credited with stimulating a 50-million-dollar building boom in the city.

Checking into a downtown hotel, I pressed through a crowded lobby where everyone seemed in a hurry. Businessmen carrying bulging briefcases mingled with rawboned youths up from the farm for the State Fair. For me, the 109th annual exposition was unforgettable; among other things I witnessed the scrambling of 6,000 eggs simultaneously in the "world's largest frying pan."

With a representative of General Electric Company, National Geographic photographer Robert F. Sisson and I drove to the company's modern "Systems Center" of the Heavy Military Electronic Equipment Department along the Thruway. There powerful radar, designed to detect planes at great heights, put on a fascinating display (page 609).

Syracuse is famed as the home of G-E



Spectators Take a Balcony Seat on the "Grand Canyon of the East"

When glacial deposits ages ago diverted the Genesee River, its waters cut this spectacular gorge in beds of shale. Sculpture of the canyon continues even today. Buffalo philanthropist William Pryor Letchworth, who loved the defile, donated land to preserve it. Purchases and gifts have expanded the park to 13,348 acres.



Genesee River Swings Around a Wide Bend in Letchworth State Park

Rising in northern Pennsylvania, the Genesee winds north like a green ribbon across the Empire State. Roads and trails follow whimsical curves along 17 miles of the Genesee Gorge. These vacationists enjoy the view from the canyon's brink, here 300 feet high. Autumn turns the park's many hardwoods crimson and gold.

electronic products, Solvay chemicals, Carrier air conditioning, and Onondaga china (page 602), but it is many other things, too. It is the chimes of Syracuse University, growing rapidly on its lofty perch above the city (page 596). It is school children clambering about Salt Museum on Onondaga Lake and shooting imaginary guns from the brown palisades of Fort Ste. Marie de Ganantaha. It is prosperous matrons of central New York shopping for finery in the dignified hush of a South Salina Street department store.

Out of Glacial Ice, an Arcadia

Beyond Syracuse the Thruway rolls across the rich, black soil of the lake plains. Southward, the glacier-made Finger Lakes splay out among sheltering hills in long blue digits.*

Indian names of the lakes twist the tongue and delight the ear: Skaneateles, Owasco, Cayuga, Seneca, Keuka, and Canandaigua, among others. The far-flung Arcadia of singularly beautiful gorges, glens, waterfalls, and tilting vineyards challenges the feet.

Waterfalls are too numerous to count. Taughannock, among the loftiest east of the Rocky Mountains, plunges 215 feet. Shequaga gushes from a ledge above the main street of Montour Falls (page 600).

A winding trail with 784 steps leads visitors through popular Watkins Glen where the ceaseless canticle of falls pervades the gorge. It is as if nature had carved the intricate interior of a great Gothic cathedral, 1½ miles long, in a stone mountainside. I passed through numerous grottoes and ducked behind shimmering curtains of water, emerging at last on a sun-washed ledge hundreds of feet higher than the entrance.

With a local boatman I took a brief ride on Seneca Lake. The Indians for whom the lake is named believed supernatural drums spoke from its depths to send them to war. "I hear the 'death drums,'" said my skipper, "—whenever natural gas is escaping from rifts in the lake bed."

Farther south at Corning, 20th-century craftsmen use the simple tools of ancients to produce some of the world's finest crystal.

I drove to Corning Glass Works nearly a century after Amory Houghton moved his small Brooklyn glass factory to Corning village. His great-grandsons operate the vast glassmaking enterprise today.

Dramatic showmanship introduces visitors to Corning Glass Center. With a throng, I

stepped into a dusky blue foyer where a 200-inch-high disk of glass glows like an enormous harvest moon. The awe-inspiring object is the twin of a mirror cast for the telescope at Palomar Observatory.† No larger piece of glass has ever been cast.

We stood, fascinated, behind a guardrail in the Steuben Factory at the Center. "Gaffers," or master blowers, were gently spinning and shaping taffylike globs of molten glass into candlesticks of a tall, delicate Steuben pattern that I had often admired. None of the gaffers needed more than his eyes and calipers to check dimensions (opposite page).

Passing onto a ramp, I pressed against a glass partition to watch a copper-wheel engraver. The middle-aged artisan worked intently at his lathe, glancing frequently at a stylized drawing he was translating freehand to a heavy vase. He pressed the crystal against the wheel, jockeying it swiftly and surely to cut the shallow design.

"You're watching the dean of them all," the guide said. "He is Joseph Libisch, a Hungarian who has worked here for years. He engraved the Eisenhower Cup and Merry-Go-Round Bowl."

Wedding Gift for Queen Elizabeth

The Eisenhower Cup, bearing designs symbolic of the President's career, was given to him by Cabinet members on the first anniversary of his inauguration. The Merry-Go-Round Bowl, depicting a carousel, was former President and Mrs. Harry S. Truman's wedding gift to Queen Elizabeth II.

Heading north from Corning, I roamed a region endowed with classical place names, basking in rustic enchantment, and sprinkled with spots of historic interest. Dr. Alexander Graham Bell's Aerial Experiment Association built and flew pioneer aircraft at Hammondsport on Keuka Lake.** In glens near Ithaca, the first "Hollywood," actress Pearl White braved all manner of perils before silent-movie cameras. Celebrated sons of the Finger Lakes include John D. Rockefeller and Millard Fillmore, 13th President of the United States.

At Canandaigua I visited the courtroom

* See "Fruitful Shores of the Finger Lakes," by Howell Walker, NATIONAL GEOGRAPHIC MAGAZINE, May, 1941.

† See "Mapping the Unknown Universe," by F. Burrows Colton, NATIONAL GEOGRAPHIC MAGAZINE, September, 1950.

** See "Alexander Graham Bell Museum: Tribute to Genius," by The Honourable Jean Lesage, NATIONAL GEOGRAPHIC MAGAZINE, August, 1956.



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† Craftsman in Corning Fashions a Pitcher

Using tools and benches little changed in 20 centuries, blowers at Corning Glass Works create every piece of famed Steuben crystal by hand.

This artisan, known as a gaffer, pinches the neck of a hot bubble formed on the blowing iron. Since the piece cools quickly, he reheats it frequently in the gas-burning furnace (center), known to the trade as a glory hole. Tinted Pyrex shield protects his eyes from the glow of 1,800° F. heat. The girl, a Corning inspector, contrasts the finished ware, a wide-lipped pitcher, with the gaffer's unshaped crystal.

→ In this collection Corning transmitted the drawings of Oriental artists to Steuben glass.

The tall vase embodies a design by Hussein Amin Bikar, an Egyptian. Entitled "Bread," it shows a woman bearing a trough of dough. The vase is admired by Monica Boheman, daughter of the Swedish Ambassador, Erik Boheman, whose country is renowned for its superb glassware.

Other designs are by Burmese, Chinese, and Ceylonese artists.

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Photographs by B. Anthony Stewart,
(above), Volkmar Weitzel and
Donald McBeth, National
Geographic Staff



where square-jawed Susan B. Anthony faced trial for the crime of voting at a time when women had not been granted suffrage. She was fined \$100 but refused to pay a cent.

On my way to Rochester I stopped at Newark to visit a renowned garden and to meet Eugene S. Boerner, who holds more patents on roses—70 at last count—than any other horticulturist in history (page 611).*

A Bed of 35,000 Rosebushes

Even with frost in the air, thousands of blossoms glazed the 17-acre park. This garden is the show window of Jackson & Perkins Company, one of the world's largest rose growers. The 35,000 display plants are merely a nosegay, however, compared to the 8,000,000 commercial cuttings set out each year.

Gene invited me to the greenhouses. A pollen brush jutted from his sport shirt pocket. He stopped now and then to pick a seed-packed "apple" from a promising roselet.

"It takes five to ten years to develop a new hybrid rose," Gene said. "Out of 10,000 seedlings we get perhaps three roses worthy of being introduced."

"How do you go about naming a rose?"

Gene laughed. "Well, we try to express its personality and characteristics."

A rose by any other name may smell as sweet, but it won't necessarily sell as well. Through bitter experience, the company has found that a rose named for a politician may follow him into obscurity.

In Rochester I soon discovered that the name of George Eastman is still heard on all sides. People often speak of him as if he were alive. Unquestionably, despite the city's large-scale production of scientific equipment and men's quality clothing, it is a small black box with a magic eye that has carried Rochester's fame around the world.†

The Eastman Kodak Company has sold 40 million box cameras since 1888. Its weekly production of paper for photographic prints would cover a sidewalk from Rochester to New Orleans. Each year its spools wind 800,000 miles of movie camera film—enough to loop 32 times around the world!

At the entrance to Kodak Park I was asked to give up matches to reduce the fire hazard. Then I entered a 570-acre manufacturing city that is constantly scrubbed lest a speck of dust mar film and freckle a film star's nose.

A pretty girl took my hand and led me into a dark room. I saw no one but heard

the voices of her colleagues, who spool film in almost total darkness—day after day. Some other employees, to test cameras, spend their workdays outdoors snapping pictures.

The hundreds of products that stream from Kodak Park, Camera Works, and Hawk-Eye optical plant in Rochester range from cameras that snap 3,000 pictures a second to special film that can record scientific data outside the atmosphere or photograph the earth from rockets more than a hundred miles up.

Many are the tangible reminders of Mr. Eastman and his open-handed generosity. Outstanding among his gifts to the city are the Eastman Theater and School of Music and a museum of photography at George Eastman House.

The city reflects the civic awareness of Mr. Eastman and fellow philanthropists. Conservative, church-going, and industrious, Rochesterians support good music, good museums, and good schools.

South of Rochester the Thruway spans the Genesee River. It flows through the heart of a pleasant valley with hills undulating to the horizon in a quilted pattern of orchards, meadows, and grainfields.

The bay of foxhounds echoes with the cough of tractors in this farming valley. I drove to Geneseo before dawn one frosty morning to see the opening meet of the Genesee Valley Hunt, one of the oldest in the United States. A field of 75 riders in

(Continued on page 615)

* See "Patent Plants Enrich Our World," by Orville H. Kneen, NATIONAL GEOGRAPHIC MAGAZINE, March, 1948.

† See "Eastman of Rochester: Photographic Pioneer," by Allan C. Fisher, Jr., NATIONAL GEOGRAPHIC MAGAZINE, September, 1954.

Giant Radar Housed in Fabric Igloo → Detects Bombers Stratosphere High

Supported by 13 tons of total air pressure, the elastic bag gives weather protection to height-finder radar under test at Syracuse. Similar U. S. Air Force stations do guard duty across North America's icy roof, where they withstand winds up to 125 miles an hour.

The camerallike feed horn (right) fires a multi-million-watt beam at the concave antenna (left) which sweeps the sky as with an invisible searchlight. Waves reflected back from aircraft pinpoint their position. Rubberized glass fabric forming the dome's skin offers no metallic interference.

Photographer Sisson stands beside a scaffold strung with unconnected fluorescent tubes. The beam's impulse is powerful enough to set them aglow.

Robert F. Sisson, National Geographic Staff





Master Botanist Taps → Pollen to Hybridize Roses Like These

The rose's petaled face appears on ancient coins, frescoes, and textiles. Greek poetess Sappho bestowed its enduring title, "Queen of Flowers." Pliny, 1,900 years ago, listed 32 remedies from the rose. It is New York's official flower.

→Page 611: Every rose has male and female organs. To develop a hybrid, gardeners brush pollen from the stamen of one blossom onto the pistils of another.

Eugene S. Boerner, director of research for Jackson & Perkins Company in Newark, New York, makes thousands of crosses to produce one rose worthy of a name. His labeled tins preserve pollen; pots hold new seedlings.

←Golden Masterpiece, one of Mr. Boerner's creations, is the largest yellow rose. Its petals stretch 5 to 6½ inches. This flower has Persian forebears.

↓Coral-red Spartan, another Boerner patent, bears clusters of blossoms on a single stem. A relatively new strain, the floribunda rose is gaining wide popularity.

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D. Anthony Stewart,
National Geographic Staff

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Buffalo's Main Avenues Radiate Like Spokes from Its Hub, Niagara Square

Hotel Statler (extreme left) replaces the home of President Millard Fillmore. Marble obelisk honors President William McKinley, who was slain by an anarchist's bullet while visiting the city in 1901. His successor, Theodore Roosevelt, took the oath of office in Buffalo. Grover Cleveland, another President, served as mayor in 1881-82.



New York State Building and the Seven-story U. S. Courthouse Border the Plaza

Joseph Ellicott in 1803 designed Buffalo after the National Capital. Like Washington, D. C., the town was set afire in the War of 1812. Rising from ashes, it became a trade pivot between Great Lakes and Atlantic. A 36-foot statue of Liberty lifts her torch atop Liberty Bank. Octagonal tower on left is the Electric Building.



colonial blue and buff gathered in annual tradition on the east lawn of a rambling manor house, "The Homestead."

I visited this ancestral mansion as a guest of William P. Wadsworth, whose forefathers helped open the land of the Seneca Indians after the Revolutionary War. I passed a restful night in the high-post cherry bed of Gen. William Wadsworth, a hero in the War of 1812. Next morning, while dressing, I saw a pale doe and two fawns browsing on the Homestead lawn.

Down the valley the green Genesee is endlessly sculpturing a serpentine gorge known as the "Grand Canyon of the East" (page 604). The river already has burrowed nearly 600 feet into layers of shale and sandstone, opening a 17-mile fissure as sinuous and scaly as a dinosaur's tail.

Valedictory to a Nation

With a State official I visited this gorge in Letchworth State Park and also made a pilgrimage to the statue of Mary Jemison, a white girl kidnaped and reared by Indians. Twice married to warriors, she wielded a gentle and restraining power among the red men.

Near the statue stand a Seneca council house and a log cabin that Mary herself built in a fertile valley now part of the park. Within the long-house walls descendants of Mary, of the Mohawk warrior Joseph Brant, of Cornplanter, Red Jacket, and other Iroquois notables kindled their last council fire in 1872.

"Our fathers loved their nation and were proud of its renown," Brant's grandson told the last conclave. "But both have passed away forever. Follow the sun in its course from the Hudson to Niagara, and you will see palefaces as thick as leaves in the wood, but only here and there a solitary Iroquois."

Near the end of my Thruway journey I

detoured at Batavia, a producer of agricultural machinery, to visit the Hawley Poultry and Stock Farms.

Although 29th in size and first in commerce and industry, New York stands high among farming States. Farmers till more than half of its 47,944 square miles of land. Their output ranks the State first in onions, kraut cabbage, and Concord grapes; second in milk, apples, and maple sirup; fourth in vegetables.

Youthful Steve Hawley swung down from a hay mower. He quickly convinced me that life on a modern New York farm is complex.

Steve and his brother Warren specialize in breeding pedigreed hens. "It's so complicated," Steve said, "that I take the records to Cornell University and have them transferred to I.B.M. punch cards. Otherwise, the hens would be dead before I figured out what to do with them!"

It's a long way from Batavia to Steve's alma mater at Ithaca (page 598), but Steve doesn't mind. He flies to the southern tip of Cayuga Lake in the family's light plane.

Buffalo, First in Flour

The Thruway runs head-on into the mushrooming suburbs of Buffalo. A spur will speed traffic through the jungle of industrial plants to the State's most awe-inspiring show place, Niagara Falls.

Radar, mechanical brains, man-made diamonds, and the other wonders of the Thruway corridor were driven from my thoughts as I beheld the spectacle of 58 million gallons of frothy green water thundering each minute into Niagara Gorge (page 616).

Buffalo could not help but be big, and it is developing new brawn (page 612). Second city of New York State, the muscular giant on Lake Erie straddles the axis of highways, railroads, shipping lines, air lanes, and the modern Erie Canal. Nearly half of all United States residents and some 60 percent of Canada's population live within 500 miles.

Buffalo mills more wheat than any other U. S. city. Bethlehem Steel's Lackawanna plant is one of the Nation's largest steel mills. Each year Buffalo factories disgorge a billion dollars' worth of goods ranging from pig iron and jukeboxes to hand-tooled furniture reproductions for Colonial Williamsburg, Virginia.

Bell Aircraft Corporation invited photographer Sisson and me to watch a rocket test. Protected by bulletproof windows and boiler plate, we stood in a shed hard by an open

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★ Kodacolor Prints Dry on a Heated Drum in Kodak Park, Rochester

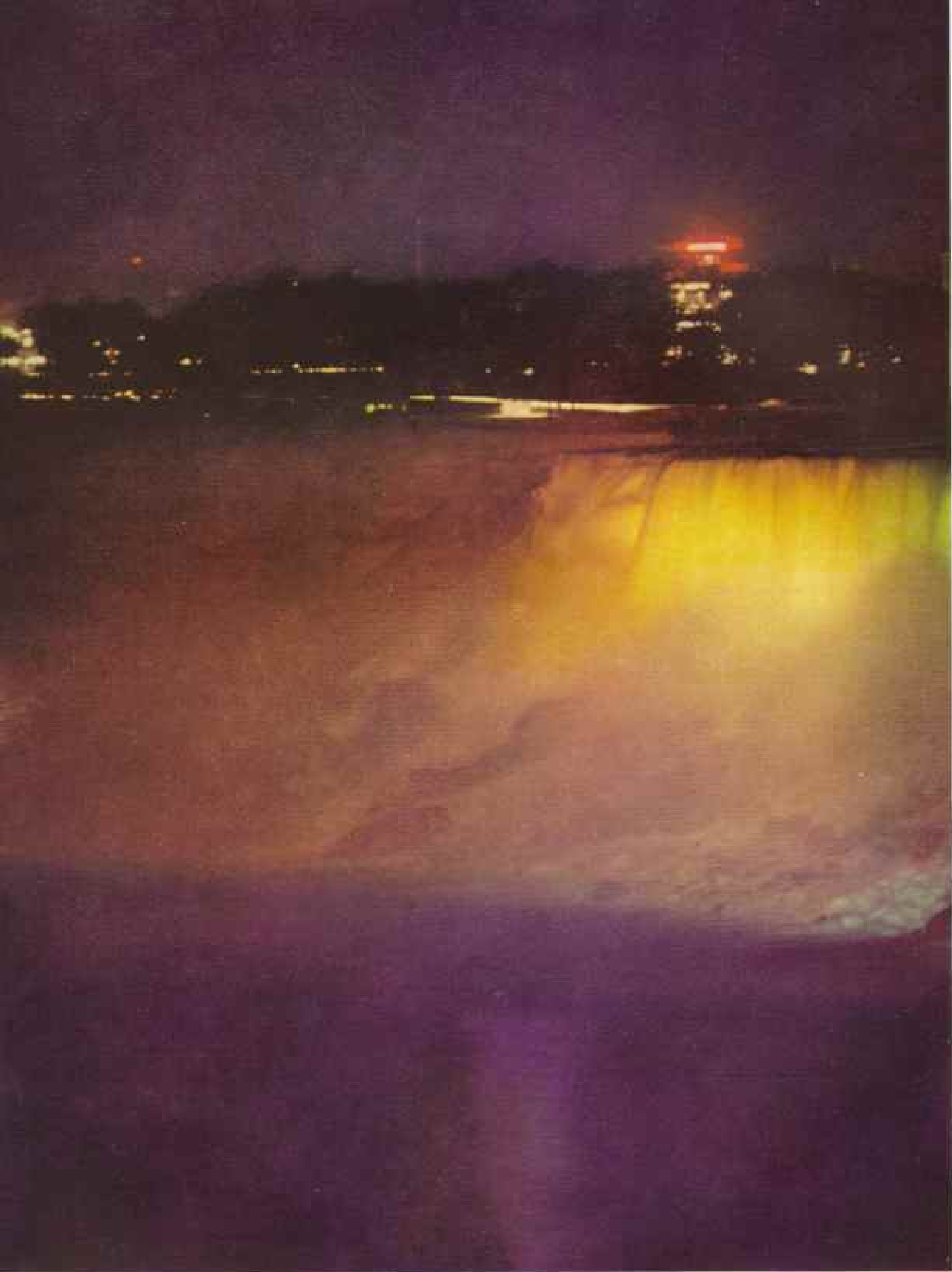
"You press the button, we do the rest," George Eastman told his customers when the first Kodak box camera went on the market in 1888.

Eastman scientists are working toward the day when amateurs can process color film as quickly and simply as they now develop black and white.

Drying pictures, submitted by a customer, are finished in triplicate as a routine check on quality. They flow from an electronic printer. Robert W. Nimitz, a rewind operator, here splices two sections of a roll.

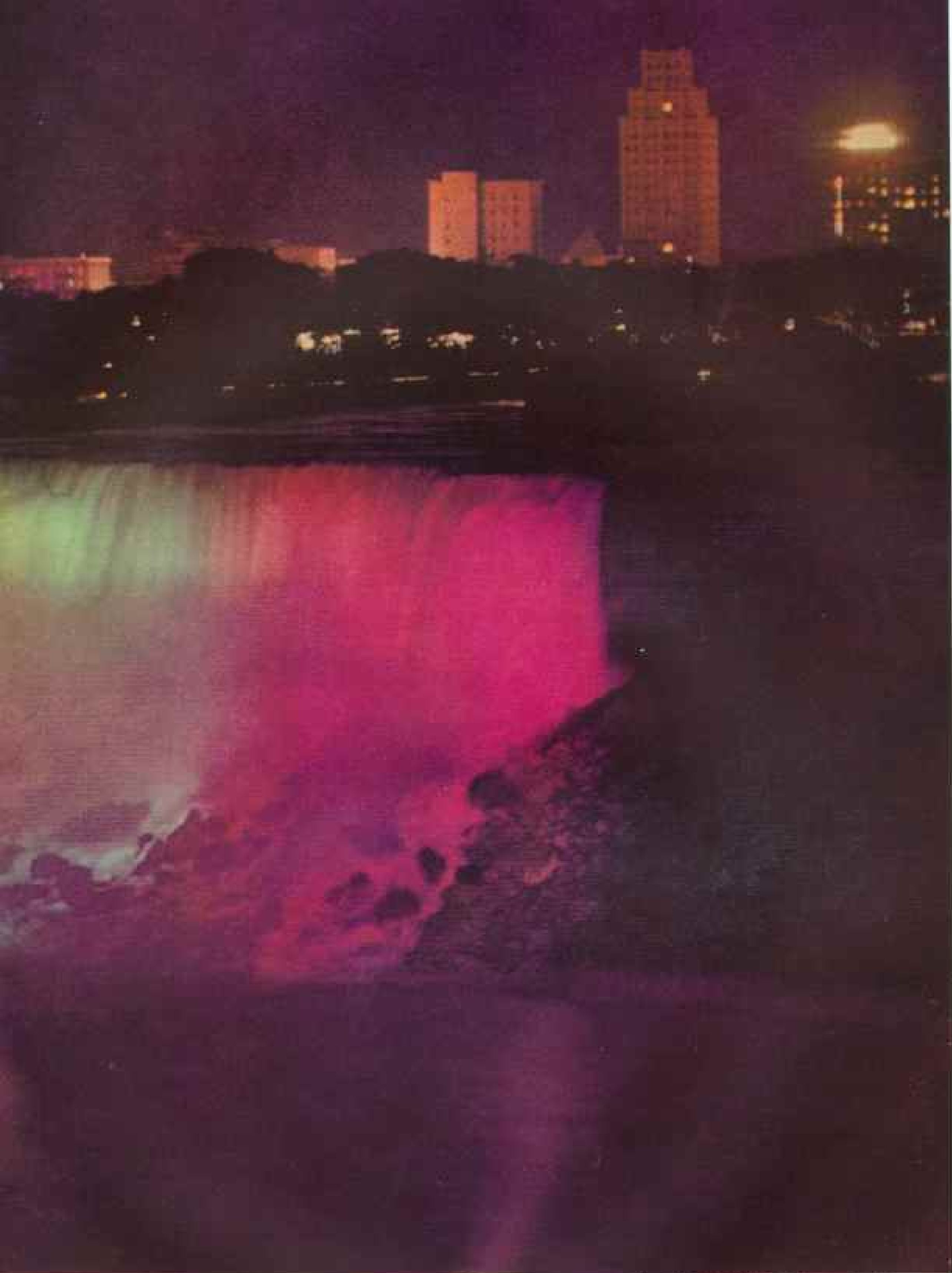
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Robert F. Sisson and Donald McBein, National Geographic Staff



Floodlights with 1,440,000,000 Candlepower Turn Night to Dawn at Niagara Falls

Unfurling a curtain of water one thousand feet wide, Niagara River thunders over the 165-foot ledge of American Falls. In 1954 a cave-in dropped 185,000 tons of rock from its shoulder (left). Goat Island (right) separates the American Falls from its wider and more rapidly receding Canadian cousin, Horseshoe Falls.



Skyscrapers Tower over a City Built by Honeymooners' Dollars and Water's Work

Wrote Abraham Lincoln, a visitor in 1848: "Older than the first man, Niagara is strong and fresh today as ten thousand years ago." This bountiful power makes Niagara Falls, New York, an electrochemical center. The 18-story United Office Building dwarfs its neighbors but does not outshine Hotel Niagara (right).



A Radar Car Clocks Speeds on the Thruway near Batavia

A transmitter-receiver mounted on the patrol car's trunk beams a constant microwave at vehicles approaching from the rear. As each object comes within range, the signal bounces back, changing wave length in proportion to the speed of the target. The meter above the dashboard indicates miles per hour.

concrete cell where a rocket lay locked in a cradle. The loudspeaker intoned, "There will be a test in Cell D-Dog immediately." A siren began to wail.

A deafening blast engulfed our hut, and a funnel of flame spewed from the test cell. Yellow, diamond-shaped shock waves pulsed in the rocket's exhaust, the visible indication of supersonic flow. In one brief moment we stood on the threshold of the unknown, for mounting knowledge from such tests is leading mankind toward adventures in space.*

Next day Bob and I put on safety glasses to tour an automatized factory that the Ford Motor Company proudly calls the world's most modern stamping plant. Mechanical gargantuas cut clattering stacks of automobile parts destined to be speeded by truck and train to Ford's assembly plant near Suffern.

Nobody appreciates the Thruway more than the truckers, a hardy breed of men reminiscent of yesteryear's canallers. I rode east with one on a huge tractor-trailer truck carrying 38,000 pounds of trichlorethylene, a cleaning chemical, from a Niagara Falls electrochemical plant to a consignee in New Jersey. The driver called his tractor "Old Girl."

As we roared through the murky, rainy night at a steady 50 miles an hour, the limit

for trucks, it occurred to me that the Thruway is a superb modern counterpart of the Appian Way. It took 68 years—20 times as long—to complete that 412-mile road from Rome to the heel of the Italian boot. Just as wagons rumbling over its lava pavement sustained the power of the Roman Empire for centuries, so the Thruway adds to the wealth and well-being of the Empire State—and the Nation as a whole.

At midnight and again at 4:30 a.m., the trucker and I stopped at Thruway restaurants to drink mugs of steaming coffee.

The Suffern tollgates loomed ahead of us at 7:30 a.m. Our time from Buffalo was four hours better than we could have made on the old cross-State roads.

"Good trip?" asked the toll collector. He took the trucker's ticket and a \$20 bill, returned 45 cents in change.

"You know it," the trucker said.

The driver of a car behind tapped his horn. Though the day was young, traffic was getting heavy on New York State's new main street.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Space Satellites, Tools of Earth Research," by Heinz Haber, April, 1956; and "Aviation Medicine on the Threshold of Space," by Allan C. Fisher, Jr., August, 1955.

Washington's National Gallery of Art Celebrates Its 15th Birthday
with an Exhibit of 121 Masterpieces from the Kress Collection

BY JOHN WALKER

Director, National Gallery of Art, Smithsonian Institution

WHEN Andrew W. Mellon gave his collection of masterpieces to the Nation and provided the funds to build a National Gallery of Art in Washington, D. C., he envisioned an art museum second to none in the world, one which would rank with the famous galleries in Paris, London, Berlin, Florence, and Madrid.

But to many a skeptic this seemed highly unlikely, at least in the foreseeable future. Paintings of the highest quality by the great masters were hard to get, and becoming harder; too many were already permanently anchored in collections from which no amount of money could pry them loose.

And yet, in 15 years, Mr. Mellon's dream has been realized. Over the past decade and a half the gallery has received a series of magnificent acquisitions. Many of these have been described in previous NATIONAL GEOGRAPHIC articles.*

Beauty from a Chain Store Fortune

This year, to celebrate the 15th anniversary of the opening of the gallery, the Samuel H. Kress Foundation arranged an exhibition of 121 masterpieces of painting and sculpture acquired during the past five years. On the following pages, 22 of the "new" old masters from the Kress Collection are reproduced in color. Some have been presented to the gallery as gifts; others are still on loan.

It is fascinating to think that a vast chain of stores, built to sell practical things—spoons, shelf paper, thread—at low prices, has been the source of gifts of beauty which can never be valued at any price.

But this great collection owes its origin to something beyond money: A conviction in the minds of two hardheaded men of affairs, Samuel H. Kress and Rush H. Kress, that works of art enrich and give meaning to human life.

It is this conviction, shared by such benefactors as Mr. Mellon, Joseph E. Widener, Chester Dale, Lessing J. Rosenwald, and many others, that has made possible the growth of the National Gallery of Art.

A number of paintings in the Kress Collection once were owned by prominent men. The seal of Charles I of England, for example, still appears on the back of the portrait of the Doge Gritti by Titian, purchased from the famous Czernin Collection in Vienna (page 639). The royal catalogue listed it:

"Duke Grettie, of Venice, with his right hand holding his robes. Bought by the King, half figure so big as life, in a black wooden gilded frame."

Perhaps Charles saw in the stern, implacable face of the Venetian those traits of character he himself lacked. Titian has dowered Gritti with a grim and ruthless personality and made him a symbol of the power of the galleys that, under the patronage of St. Mark, caused Venice to be honored and feared along the trade routes of the world for several centuries.

The hand with which the doge grasps his flowing cape may be based upon the hand of Moses in the famous statue by Michelangelo in Rome. A Venetian sculptor, Jacopo Sansovino, is believed to have brought a cast of this hand to Venice, where Titian probably studied its massive power to help him create an image of uncompromising majesty, the archetype of an imperious ruler.

Portrait Suggests an Effete Court

The spirit of uncompromising majesty, but not its power, characterized the court of Charles I. Among the new Kress acquisitions is a portrait of Charles's wife, Queen Henrietta Maria, by Sir Anthony Van Dyck (page 656). The suave elegance of this canvas speaks the difference between the vigor of the Venetian Republic under her great doges and the effeteness sapping the strength of the English monarchy three centuries ago.

Standing beside the queen is her dwarf, Jeffery Hudson. He was one of the bravest

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Your National Gallery of Art After 10 Years," January, 1952, and "American Masters in the National Gallery," September, 1948, both by John Walker; and "Old Masters in a New National Gallery," by Ruth Q. McBride, July, 1940.



JACOPO TINTORETTO (1518-1594), Venetian • *The Conversion of Saint Paul* (Acts 9: 3-6)

With this turbulent canvas the NATIONAL GEOGRAPHIC MAGAZINE introduces 22 paintings from the Kress Collection, displayed this year to celebrate the 15th anniversary of the National Gallery of Art of the Smithsonian Institution, Washington, D. C. These old masters, chiefly from the prolific Renaissance period, are part of 121 works of art recently acquired by the Samuel H. Kress Foundation, most of which will remain permanently in the gallery.

Experts deem "The Conversion of Saint Paul" one of the ten most interesting paintings ever to come to the United States.



Horses Plunge and Men Flee in Terror Before the Thunderous Voice of the Lord

Tintoretto's chaotic scene, filled with violent and swirling movement, amply justifies the description of the artist as having "the most terrible imagination in the history of painting." Here he captures the full intensity of the moment when the Lord cried, "Saul, Saul, why persecutest thou me?" A furiously swift craftsman, Tintoretto is thought to have painted this eight-foot canvas in a few days. He left many details apparently unfinished.

Scripture makes no mention of cavalry accompanying Saul as he journeyed to Damascus to stamp out the Christians.

men of the royal household. Insulted by a courtier, he insisted on a duel. When his opponent appeared with a toy pistol, the dwarf turned this mocking gesture into a grim joke by shooting him through the heart.

Hudson's devotion to his queen was legendary, but their first meeting was a bit odd. At a dinner given by the Duke of Buckingham he was brought to the table in a pie.

Sixteenth-century Venice had its frivolous side, too, but this is not apparent in Tintoretto's group portrait of the Mocenigos, a grave scene of family solidarity (page 632).

A strange feature of this painting, almost

14 feet wide, is that not all the faces are painted on one piece of canvas. Probably the sitters, busy with their civic duties, could not spare the time to pose in the master's studio. Nor could Tintoretto easily carry such a big canvas to their palaces.

An Unusual Method of Painting

His solution was to paint several heads—of the two young men on the right, the doge's wife, and the elderly nobleman standing on the left—on separate small canvases. Then he relied on glue to keep the family together. The bodies were painted in later.

X Ray Peers Through Pigment to Wood Grain Beneath

The art detective finds X ray his most potent weapon. It reveals hidden alterations, overpainting, and individual brushstrokes that may lead to identification of the artist. Here, in Memling's "Presentation in the Temple," painted on wood, the heads of the two girls show whiter than most of the other portraits. They are evidently painted with a higher concentration of lead white, impervious to X rays. For this and other reasons, some believe that these heads were the work of another hand (page 625).

National Gallery of Art

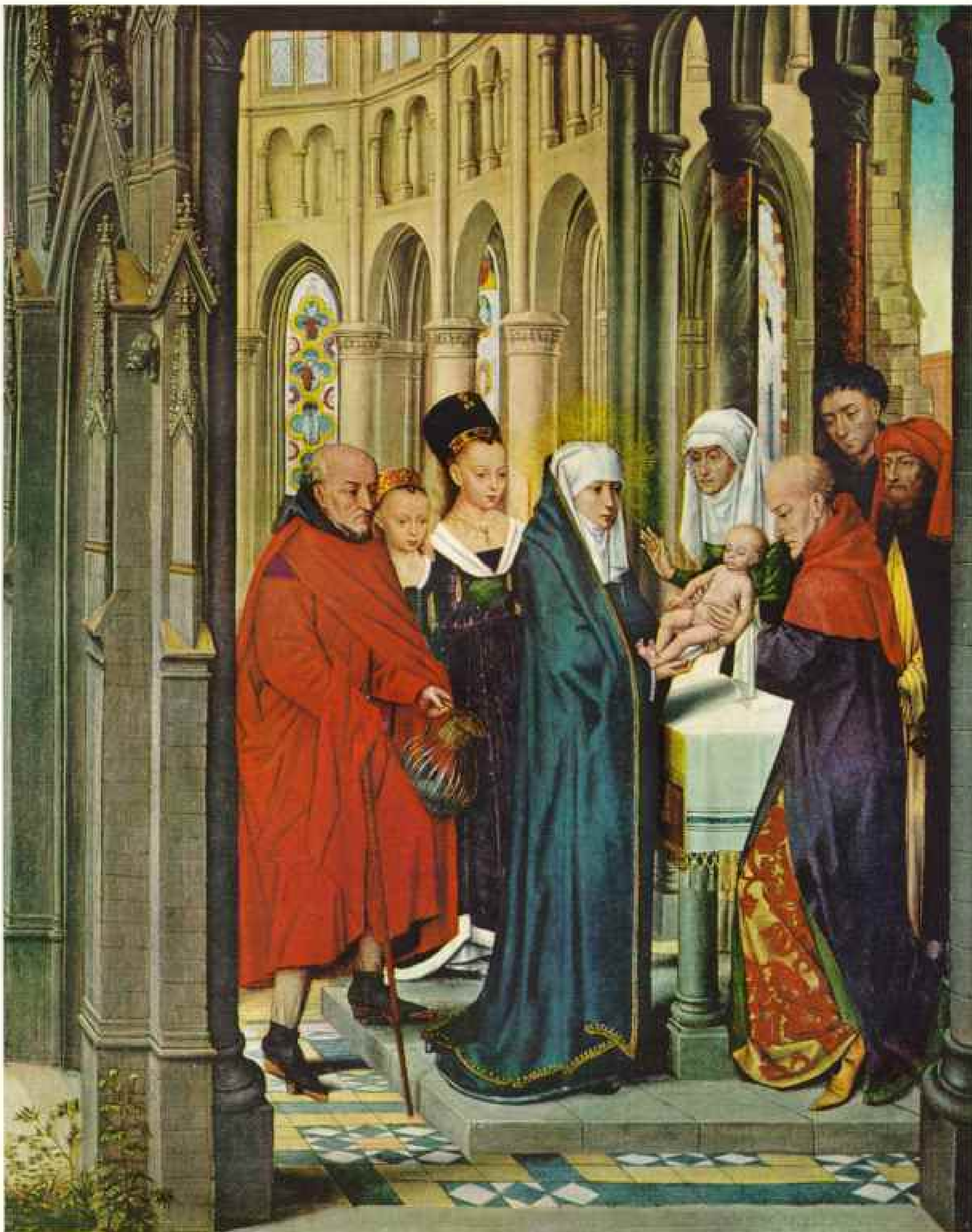


Perhaps this procedure has contributed to the sense of isolation we feel in all the figures. Each person is wrapped in his own somber thoughts. The only note of humor appears in the young boys portrayed as rather depressed angels, one playing a viol, the other a lute.

The same sense of austere discipline is conveyed in a second Titian portrait, that of Vincenzo Capello, Admiral of Venice (page 658). The light reflected from his steel breastplate glitters with a dazzling brilliance; his baton betokens his high office. Like Othello he seems to say, "I have done the state some service, and they know't."

Titian here, as in his portrait of Gritti, has given his sitter that enlargement of personality which is a hallmark of great Renaissance portraiture.

How much our concept of historic personages depends upon the artists who portrayed them! Compared to Napoleon, men like Gritti and Capello were insignificant. Yet no one who painted the emperor was able to give him an appearance of



HANS MEMLING (1430?-1494), Flemish • *The Presentation in the Temple* (Luke 2: 22-24)

Remarkably preserved after five centuries, this panel from a portable altarpiece glows with the luminous colors of oil paints, developed in Flanders just before Memling was born. In a medieval cathedral, Simeon, "a man in Jerusalem," takes the baby Jesus from Mary; Joseph carries two caged doves for sacrifice. No one can identify the girls, but their Irish, delicate faces are very like those in portraits by Rogier van der Weyden, Memling's teacher.

authority, of human grandeur. Perhaps Napoleon lived too late. The available artists were incapable of creating an image commensurate with his achievement. Jacques-Louis David tried, but has managed merely to supply a mass of external trappings (page 647).

The emperor's uniform combines details pertinent to the chasseurs and the grenadiers of his famous Imperial Guard. He wears the insignia of the Legion of Honor, which he created. Beneath the table is a copy of Plutarch's Lives. The manuscript of the Code Napoléon is on the desk. The pen and scattered papers, the candles burning to their sockets, and the clock pointing to a quarter past four, all indicate that the emperor has just finished a hard night's work.

Just as the portrait of Gritti probably held a special significance for Charles I, so this portrait of Napoleon, a masterpiece of political propaganda, must have had its own meaning to another Briton, the Duke of Hamilton. This eccentric peer believed himself to be the rightful heir to the throne of Scotland. He wished to have in his house full-length portraits of the rulers of Europe, and, though Napoleon had been for years the archenemy of his country, the duke had no hesitation in commissioning David to paint the emperor.

The portrait is dated 1812, the year the imperial armies were freezing during the retreat from Moscow, but it is believed to have been ordered in 1810, when English troops were fighting Napoleon in Portugal.

Portraits Speak Louder than Words

In looking at these great portraits one is reminded of something Robert Louis Stevenson once said about Sir Henry Raeburn's work: "These portraits are racier than many anecdotes and more complete than many a volume of sententious memoirs." The statement is certainly applicable to Botticelli's portrait of Giuliano de' Medici (page 635). He was the younger brother of Lorenzo the Magnificent, whose benevolent tyranny made Florence a second Athens. Giuliano was himself a favorite of that circle of poets, artists, and scholars who wrote one of the most glorious pages in the history of Western culture.

All Italy was shocked in 1478 when the 25-year-old prince was stabbed to death in the Cathedral of Florence. This may well have been the most sacrilegious murder ever committed, for the conspirators' signal for their onslaught was the bell ringing at the

elevation of the Host; they knew that at that moment all would bow their heads in reverence. Lorenzo de' Medici was wounded in the neck and escaped, but Giuliano died at the foot of the high altar (page 634).

Whether Botticelli painted his friend posthumously or shortly before the murder is disputed. Nor can we be sure of the meaning of the turtledove perching on a dead branch on the window sill. The symbolism itself is clear: The widowed turtledove remains faithful to its mate and will alight only on a blighted tree. But does this symbolism apply to Giuliano's passionate devotion to Simonetta Vespucci, possibly the model for the central figure in Botticelli's "Birth of Venus," who had died two years earlier? Or is it a symbol of Lorenzo's ceaseless mourning for his brother?

Clouet's Beautiful Mystery Woman

All the portraits mentioned so far can be definitely identified, but this is not true of one of the greatest works of French art to come to America. In the case of this masterpiece, one of two paintings signed by François Clouet, we can rely only on tradition for the suggestion that it represents Diane de Poitiers, one of the most remarkable women in French history (page 642).

Married at 15, Diane later became the mistress of Henry II, 20 years her junior.

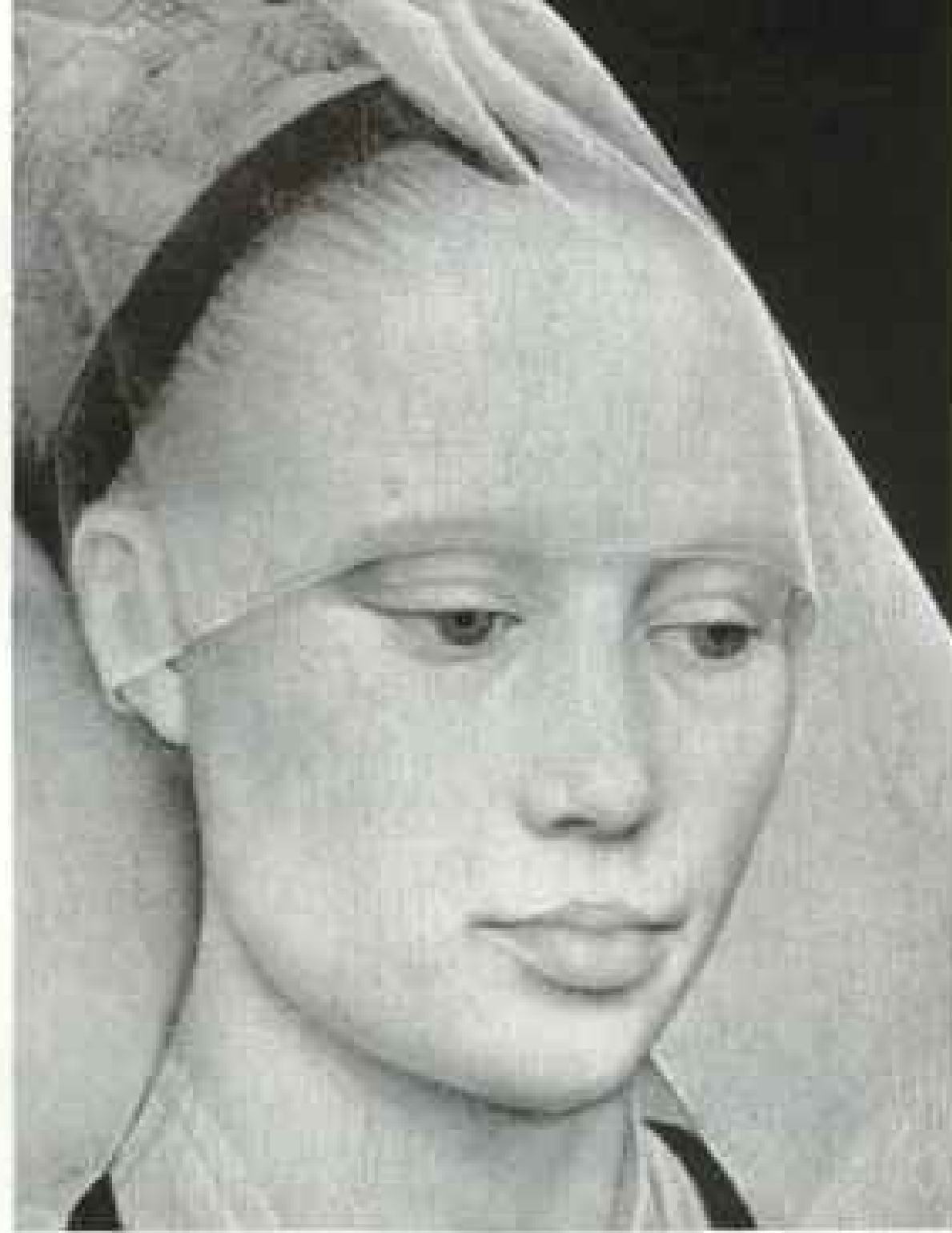
Every morning she rose at six and rode horseback for two or three hours. She never used cosmetics; yet, according to the Venetian ambassador, she looked at least 15 to 20 years younger than she was. Another account added, "Her neck was full and her shoulders well rounded; her mouth, tight-lipped and drawn in, seemed made not to be kissed but to keep a secret; no softness, nor voluptuousness; the air of a Roman Juno added to the gravity of a Venetian patrician."

Some said she dominated Henry II through a magic ring—possibly the ring in the portrait. According to others she fascinated him with tales of knight errantry and battles.

This portrait's setting may seem unusual, but Clouet made it popular at the court of Fontainebleau. The curtains are drawn back, and Diane sits in her bath without embarrassment at the intrusion. But one must remember that during the Renaissance a bath was not the private affair it is today. It was a luxury to be enjoyed to the utmost, and companionship added to the pleasure. Diane is



© National Gallery, London



National Gallery of Art

Art Detectives Ponder the Question: Did the Same Master Paint These Four Heads?

A signature on an old painting is not always a guarantee of the artist's identity; all too often names have been forged to make pictures more salable. But other clues may reveal the master's identity as surely as fingerprints betray the thief. The peculiar curve of a line, quality of brushwork, choice of a background, treatment of facial details—these to the skilled eye are the certain handwriting of the painter.

Even the layman can quickly learn to recognize the intense blues and long, attenuated figures of El Greco, the rough, swirling technique of Tintoretto, or the short, patterned brush strokes of Van Gogh.

Sometimes differences in "handwriting" suggest that two painters worked on one picture, as in "The Judgment of Paris" (page 650) or Memling's "Presentation in the Temple" (page 623). The two young faces in the Memling altarpiece (below, enlarged) seem alien to the others in the picture, but they bear a striking resemblance to two portraits by Rogier van der Weyden (above, shown reduced and reversed to make comparison easier). Similarities of nose, mouth, jaw, and eye lead some experts to believe that Memling's teacher painted the two lower heads.

National Gallery of Art





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♣ **ALBRECHT ALTDORFER (1490?-1538), German • The Fall of Man**

Christianity and mythology have both an allegory on evil in this small triptych. The artist shows the beginning of sin, when Adam and Eve ate from the tree of knowledge, and the consequences. Left: "Bartholomew, with wine, confuses the senses of man. Right: "The impious Mars upsets the world."

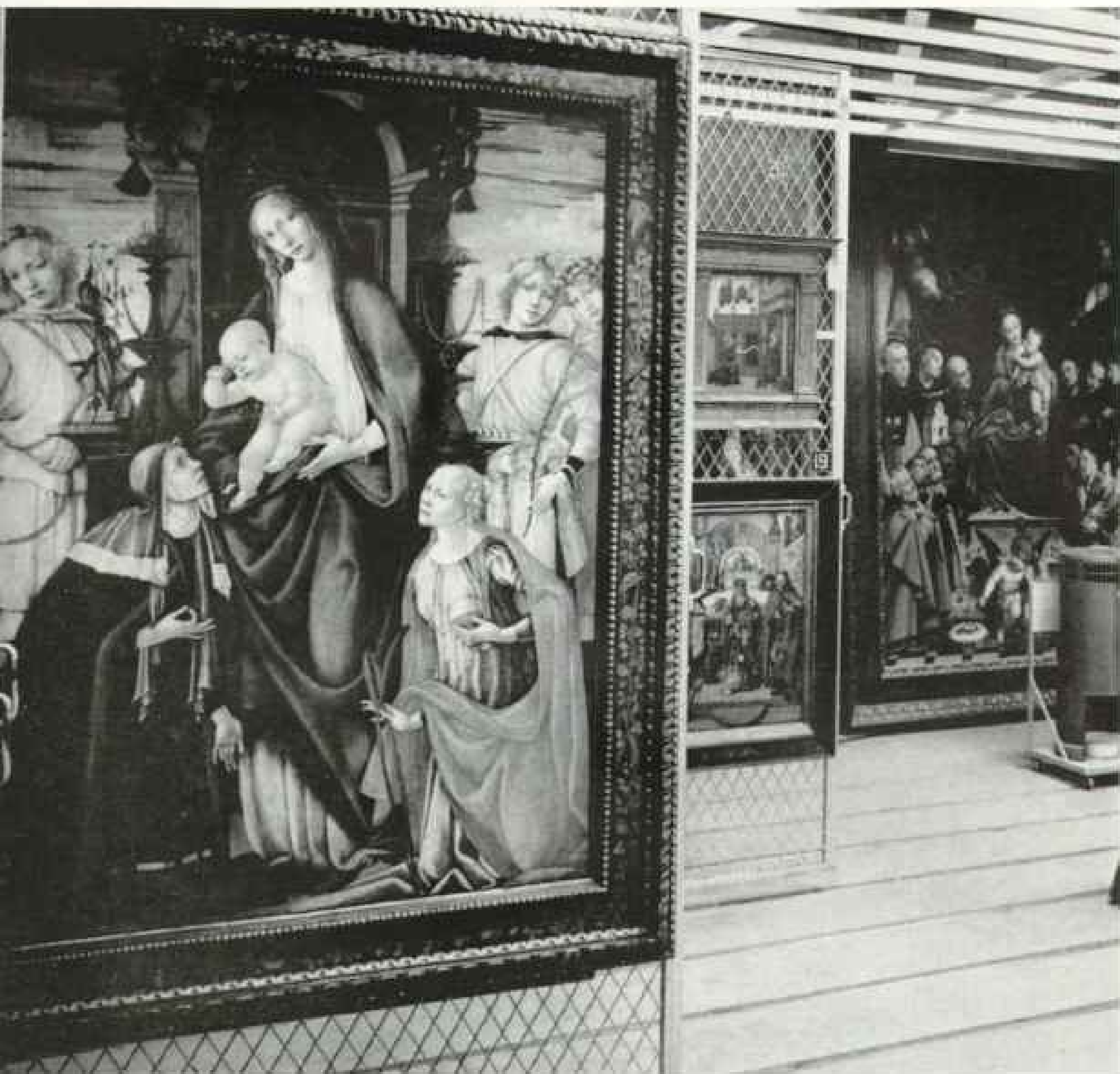
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♣ **ST. BARTHOLOMEW MASTER (c. 1500), German • Baptism of Christ**

A painter known only as the Master of the St. Bartholomew Altar portrayed this scene of John baptizing Christ. A scroll descending from God carries in Latin the words from Matthew 3:17: "This is my beloved Son, in whom I am well pleased." Fourteen saints bear their identifying symbols.

National Gallery of Art (Renaissance Collection)





surrounded by children and servants. A little boy reaches for fruit, a baby is suckled by a wet nurse. In the background a maid is ready to replenish the bath with water, probably perfumed. Beyond the maid is a chair with a tapestried back showing a unicorn, ancient symbol of chastity.

The fascination of paintings comes partly from the way they entrap the past. They catch in the mirror of art the reflection of a vanished life, often surprising us with the continuity of human nature and the sameness of human activity. Lucas van Leyden, for example, has given us a glimpse of a card game that must have been played a few years after the discovery of America (page 653).

Yet how timeless is the psychology of these players! Note that even in the 16th century there were kibitzers. The lady on the left, I imagine, has failed to draw the card she needs. She points ruefully at the pack. The man on the right holds an ace, a powerful card in any century. He leans forward excitedly and wagers 11 golden guilders that his hand cannot be beaten. The betting has been steep, and the fattish man next to him, in obvious anxiety, consults a friend.

Attention, however, is focused on the cool lady in the center who calls the bet. Taking no chances, she places her cards face down on the table and slowly counts out her money. If there is a poker player among my readers,



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♣ A King's Ransom in Art Treasures Hangs in This Mountain Storehouse

At Huckleberry Hill, in the Pocono Mountains, the Kress Foundation maintains a superbly equipped laboratory for restoration of aged and damaged masterpieces. In its air-conditioned storeroom paintings hang on sliding screens. Mario Modestini, the foundation's chief curator and conservator, checks to see that the preferred 70-degree temperature and 50-percent humidity do not vary significantly.

→ Restoration is an incredibly complex and sensitive work, calling for skills of the historian, chemist, radiologist, and detective as well as the artist.

Here a Kress Foundation expert studies a 15th-century Italian panel under a binocular microscope. With solvent and scalpel he patiently shaves away the disfiguring work of an earlier restorer.

McNamara, Washington Post

he will recognize her look, detached and confident, and he will know that the feverish gentleman is doomed to lose.

This glimpse of Dutch bourgeois life in the 16th century is closer to us, more understandable, than a vision of the pastimes of the French aristocracy some 200 years later. Fragonard in "The Swing" portrays an alien world, but he convinces us of its enchantment (page 654). It is a summer afternoon. One almost feels the breeze blowing the clouds across the countryside. Insects hum and birds call among the tall trees. Water splashes in a fountain. A young woman looks through a telescope. A shaft of sunshine falls like a spotlight on the girl in the swing and on her companions seated below her.

Fragonard Portrays Idyllic Nature

If one purpose of art is to represent the desirable life, then Fragonard has caught an aspect of that life, the suggestion of an enchanted world where no one grows old and pleasure is without ennui. His paintings let idyllic nature and the unthinking happiness of a carefree nobility exert their magic.

But life has more serious facets, and it is these that the supreme artistic achievements convey. Many of the new paintings in the Kress Collection indicate ways of expressing man's spiritual experiences. Titian and Tintoretto, for example, show the impact of divine





CIMA DA CONEGLIANO (1497-1517 or '18), Venetian • *Saint Helena*

So fresh and vivid are the pigments of this jewel-like picture, reduced here to about half size, that it might have been painted years ago instead of centuries. The cross refers to the legend that Helena, mother of Constantine the Great, discovered Christ's Cross buried near Jerusalem in the year 326. Italian hill towns fill the landscape.

revelation on two devout men, St. John and St. Paul.

In Titian's painting St. John the Evangelist is shown on the island of Patmos at a moment that transformed his life (page 636). The Book of Revelation describes it thus: "I was in the Spirit on the Lord's day, and heard behind me a great voice, as of a trumpet, Saying, I am Alpha and Omega, the first and the last: and, What thou seest, write in a book, and send it unto the seven churches which are in Asia . . . And I turned to see the voice that spake with me."

This ecstatic union between the human and the divine is witnessed only by the eagle, the symbol of St. John, and by the angels surrounding God the Father. Originally this painting formed the central decoration of the ceiling of the Scuola di San Giovanni Evangelista. Today it is the only ceiling painting by Titian outside Venice.

Awesome Power Converts St. Paul

The lonely communion between God and the Evangelist, which Titian shows, differs from the chaotic rout surrounding St. Paul's conversion as depicted by Tintoretto (page 620). The story of the transformation of Paul's life is told in the Acts of the Apostles. When Saul, as he was called, was on his way to Damascus to persecute the Christians, "Suddenly there shined round about him a light from heaven: And he fell to the earth, and heard a voice saying unto him, Saul, Saul, why persecutest thou me? . . . And the men which journeyed with him stood speechless, hearing a voice but seeing no man."

From this bare statement Tintoretto's imagination has constructed a burning image of the power of God. St. Paul lies stunned. His horse plunges away to the right. A stricken rider on a rearing charger is carried off to the left. On a bridge a horseman struggles to hold aloft his strange banners, which whip in the wind coming out of the dark cloud. The ghostly faces of drowning legionnaires who clutch at the manes of their terrified steeds; the spectral boatmen guiding their craft through the blinding spindrift, all contrast with the calm figure of Christ appearing in the storm cloud in the upper left.

This painting shows an incredible speed of execution, the primed canvas itself being used for the neutral tones and the figures sketched on it without change of a brush stroke. No wonder that Tintoretto is a hero to modern

artists. For he was, as Giorgio Vasari said, "extravagant, capricious, quick and determined, with the most terrific imagination in the history of painting."

Paolo Veronese, a contemporary of Tintoretto, was a less frantic, less passionate artist. But he was one of the most brilliant decorators who ever lived. Often his subjects were only an excuse for the display of his decorative powers. He loved rich brocades, the complexities of linear and aerial perspective, the thrust and counterthrust of moving, gesticulating bodies. So interested did he become in these formal aspects of art that he grew indifferent to the content of his scenes and, under censorship from the Inquisition, barely escaped jail.

However, in "Rebecca at the Well," a late work, he followed closely the Biblical account (page 637). He depicts accurately how Abraham's old servant recognizes the young woman destined to be Abraham's daughter-in-law. Genesis 24 tells us that Abraham's messenger "made his camels to kneel down without the city by a well of water at the time of the evening, even the time that women go out to draw water."

Veronese responded to the poetic mood of this passage with one of his most beautiful nocturnes. The distant city is already veiled in twilight, and the last rays of the setting sun fall on the young Rebecca as she accepts the jewels of her betrothal.

El Greco Portrays Christ in Temple

"Christ Cleansing the Temple" by El Greco, an early work, perhaps the first he ever signed, reflects the influence of Titian, Tintoretto, and Veronese (page 633). It was painted when the young Greek had barely arrived in Venice, and on this canvas he signs himself Dominico Theotocópuli, his real name. Then he adds, perhaps to give himself confidence, the name of his birthplace, Crete.

There is still much in this picture that reminds us of El Greco's probable training as an icon painter: the small size of the picture, the use of wood instead of canvas, the enamel-like impasto, and the deep bronzed colors with less glazing than the Venetians customarily used.

But there are also borrowings from Venetian paintings. The pose of the half-nude woman, lying on the ground with her arm behind her head, was copied from the sleeping Ariadne in Titian's early "Bacchanal,"



↑ **TINTORETTO** • *Doge Alvis Mocenigo . . . Madonna and Child*

In 1573 the Doge of Venice commissioned this 14-foot portrait of himself (kneeling), wife, brother, and nephews. Four heads, painted separately, are glared on.

↓ **EL GRECO** (1541–1614), Spanish • *Christ Cleansing the Temple*

This panel, believed to be the artist's earliest signed work, was painted in Italy before he went to Spain. Semi-nude figures may be symbols of paganism.





634 National Gallery of Art. (Kress Collection, loan)

Assassins, Frozen in Bronze, Strike Down a Medici

In 1478 members of the Pazzi family of Florence conspired with other enemies of the Medici brothers to assassinate them and seize the city (page 624). Lorenzo escaped and the plot failed, but Giuliano was stabbed to death in the cathedral, as pictured on this Renaissance medal. Giuliano's portrait (opposite) may have been painted posthumously.



now in the Prado Museum in Madrid. Or perhaps both Titian and El Greco derived their figure from a common model, possibly some piece of Roman sculpture. These voluptuous females, on the other hand, seem closer to Paolo Veronese.

But more than Titian or Veronese it was Tintoretto who inspired the young painter from Crete. Tintoretto's influence appears in the turbulent and agitated grouping of the figures and in a tendency toward mannered elongations; this tendency was to become more marked in El Greco's later work.

Paintings Show Artist's Development

When he painted this picture he was still feeling his way forward, still forming a vocabulary in which he later expressed the anguished mysticism of the Spanish Counter Reformation. Luckily the gallery can show several stages in the development of this mannered genius. His middle period, after his arrival in Spain, is represented by five paintings, including, among the recent Kress acquisitions, a beautiful "Holy Family."

According to an inventory made for El Greco's heirs, two other canvases, now in the National Gallery, were actually in his studio at the time of the artist's death, one a "St. Jerome" in the Chester Dale Collection and the other the "Laocoön" in the Kress Collection (page 644). Both paintings are unfinished. Perhaps El Greco worked on them the day he died.

Spain in the 16th century was something of an artistic vacuum that attracted artists

(Continued on page 643)



TITIAN (1477?-1576), Venetian •
*Saint John the Evangelist
on Pátmos* (Revelation 1: 9-20)

When the plague cut Titian down at the age of 99, he had been painting vigorously for more than 80 years. From his workshop on the Grand Canal had poured a prodigious volume of masterpieces on a multitude of subjects. In his day Titian completely dominated the art of Venice. Dead, he has exerted a powerful influence on Western art even to the present day.

Born Vittorio Vecelli, the artist early dropped his father's name. He worked with the Bellinis and Giorgione, then set up his own studio independent of any single patron. He made a fortune; men of the highest rank came to him and paid his stiffest fees.

This artist's majestic painting of St. John depicts the Evangelist in exile on the Aegean tale of Pátmos, beholding the beauteous burst- ing with the vision of the Apocalypse, which he set forth in Revelation. At his feet are an eagle, symbol of the highest inspiration, and a book, both attributes of the saint.

Originally this painting decorated the ceiling of a guildhall in Venice. Early in the last century critics lost track of the painting, and it was known only through engravings until its rediscovery about 15 years ago in a private collection in Turin.

In the National Gallery "Saint John" is placed again on a ceiling, elaborately lighted and protected against damage in a specially adapted room.

Titian's tricks of perspective in a picture designed for viewing from below make the central character appear to fall backward when seen horizontally.

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National Gallery of Art (Kress Collection, loan)



PAOLO VERONESE (1528-1588), Venetian • *Rebecca at the Well* (Genesis 24)

Paolo Cariani took his painting name, Veronese, from the north Italian town of Verona, where he was born. However, his career is intimately associated with Venice, where he became the leading rival of Titian and Tintoretto. Veronese's large altarpieces and lush paintings decorated many a villa, palace, and church. On occasion they caused trouble with the Inquisition because of too-imaginative handling of Biblical themes. "Rebecca at the Well" shows Abraham's ever-overlooked wife for Isaac in Mesopotamia. Arriving at the well outside Nahar, the eventer looked for a maiden who would give him drink and voluntarily water his camels. When the beautiful Rebecca fulfilled these requirements, he knew she was the chosen one and gave her bracelets and a golden earring. The servant staves handing up the jewelry is not mentioned in Genesis. Veronese never saw a Mesopotamian town or a camel. He has portrayed the scene in his native region; the people wear Venetian garb of the 16th century, and the copper water pails are a type still used in northern Italy.

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National Gallery of Art (Kenan Collection)





TITIAN • Vincenzo Capello

Titian was one of the most sought-after portraitists of his time; popes and crowned heads eagerly commissioned his services. Emperor Charles V of the Holy Roman Empire knighted the artist and conferred on him the title of count.

Admiral Capello's portrait in gleaming armor calls to mind that in the 15th and early 16th centuries Venice was at the peak of its glory as a sea power, with colonies in Greece and Asia Minor. The haton identifies the commander of the Venetian fleet, a rank Capello held five times. Although Titian shows the sea lord as a heroic and stalwart figure, the history of Capello's campaigns against the Turks is one of failure because of the intense jealousy of other Italian cities.

This painting was once attributed to Tintoretto.



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National Gallery of Art (Kress Collection, loan)

TITIAN • Doge Andrea Gritti

This portrait bears the artist's signature, TITIANVS F. F., the *T* standing for *titianus* (knight) and the *F* for *fecit* (made it). The imperious portrait powerfully reveals the artist's magical sense of color and psychological insight into his subjects. It was once owned by England's Charles I.

The patrician Andrea Gritti, whose palace is today one of the luxury hotels of Venice, served the Republic as diplomat, military commander, and art patron, and as doge, or chief executive, from 1523 to 1538. Here he wears the *corno*, or horned cap, of the doge and the linen undercap that always covered his head as a mark of dignity. Critics believe that Titian based the hand on Michelangelo's statue of Moses in Rome.

ORAZIO GENTILESCHI
(1565?-1609?)

Florentine •

Saint Cecilia and an Angel

Cecilia is the patron saint of music and musicians. Legend relates that in the 3d century she heard angels singing and transcribed the notes. Finding other instruments inadequate, she is said to have invented the pipe organ to pour forth the heavenly sounds. She is usually pictured playing, singing, or listening to music. Her special attribute is the organ.

Martyred for her faith, Cecilia inspired many a master-piece of art, including paintings by Raphael and Rubens, music by Handel, an ode by Dryden, and the "Secunde Nomme Tale" by Chaucer.

The model for Gentileschi's tender portrait is believed to have been his daughter, Artemisia, who became a well-known painter in her own right.

In his "Saint Cecilia" Gentileschi employed the bold modeling in light and shade so popular in 17th-century Italy. Painters then believed that these pigments were not adequate to express the luminosity of the real world unless they used sharp contrasts between light and dark.

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National Gallery of Art
(Hress Collection, Loan)



JEAN VAN DER HAMEN
Y LEON (1590-1631)

Spanish • Still Life

Folklore of ancient Greece tells of an artist who painted grapes so realistically that birds came down to peck at them.

Centuries later artists again used in super-realistic painting to fool the public. Matsys, in the 1500's, depicted a bee so artfully that a fellow artist tried to brush it from the canvas. Such painting came to be called *trompe-l'œil*, meaning "deceiving the eye."

Van der Hamen's "Still Life" is a noteworthy example of this realistic art, especially because of the near photographic accuracy of the cup of water. To paint a transparent object filled with light-refracting liquid was considered a formidable test of skill in the 17th century, especially in the Netherlands, where the microscope and telescope had recently been invented.

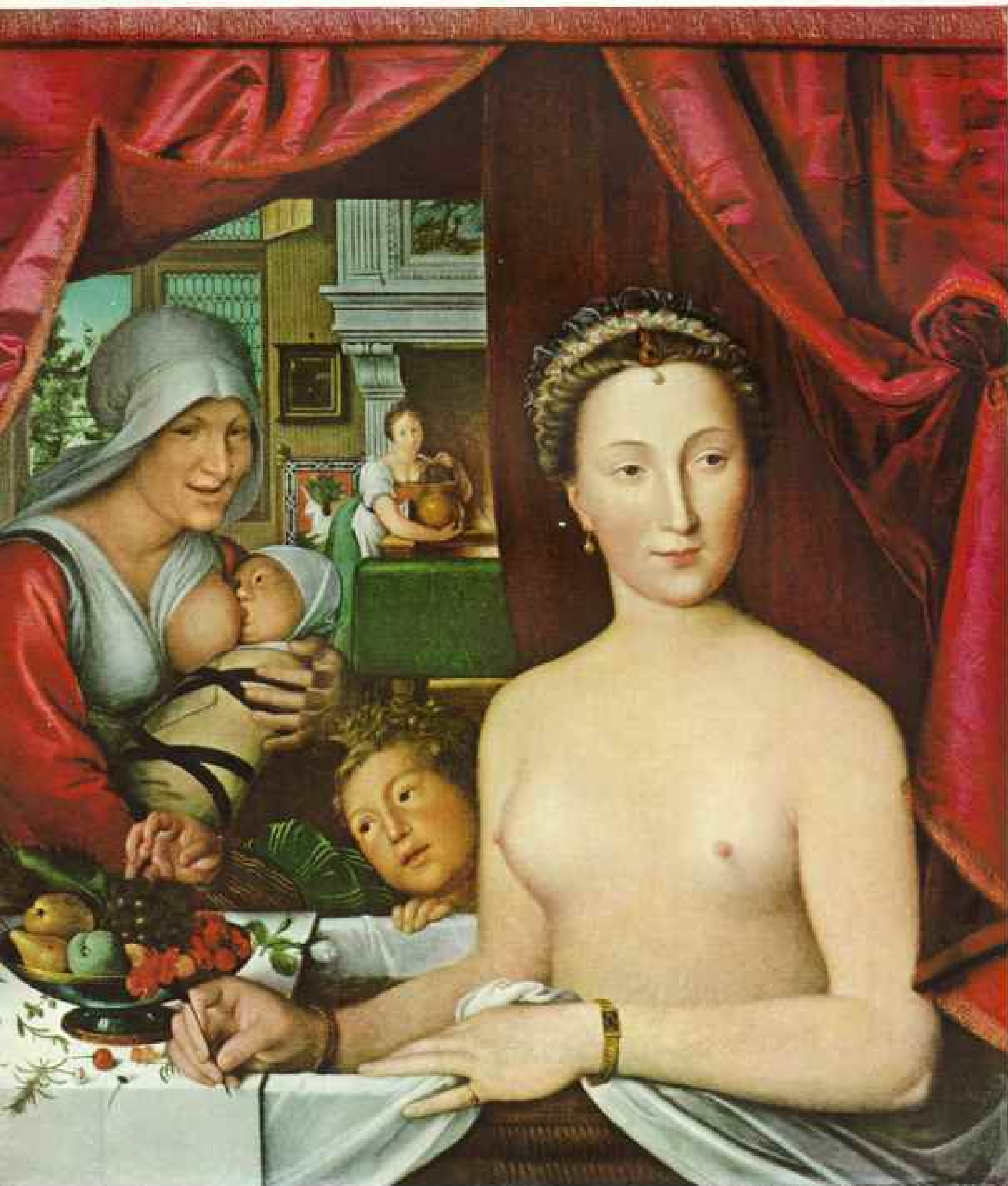
The entire picture is a prolonged technical exercise in handling problems of refraction and widely varying textures and surfaces.

Although the artist grew up in Spain, his painter-father came from Brussels.

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National Gallery of Art
(Kress Collection, Jan)





FRANÇOIS CLOUET (1505?-1572), French • *Diane de Poitiers (7)*

Only two signed pictures by Clouet exist. A curator of the Louvre terms this portrait of a lady in her bath—probably Diane de Poitiers—“one of the chief masterpieces of French art.” For breathtaking beauty of color, unbelievably exquisite texture of the heavy silk curtains, and warm flesh tones, the painting is virtually unsurpassed to this day.

Diane, royal favorite of France's Henry II, was a haughty, cold-hearted lady of fortune, as Clouet's brush so skillfully suggests. She rose early each morning to bathe in icy water and ride horseback; she disdained cosmetics and seldom changed her expression. She used the King's infatuation to dominate the French court and amass personal wealth until Henry's death, when Catherine de' Medici, the lawful queen, threw her out.

Ironically, the unicorn and carnation, symbols of chastity and pure love, decorate the picture. The nurse with suckling infant, the maid with her jug, and the still life forecast painting styles popular a century later.

from other countries. El Greco, for example, went there from Crete via Italy, and scores of painters arrived from northern countries.

Of these, Juan de Flandes, court painter to Queen Isabella, was among the most distinguished. As his nickname indicates, his birthplace was Flanders, but he became thoroughly assimilated to his adopted country. He shows the Spanish fondness for subdued and delicate tones that was later to distinguish Velazquez's palette.

His Madonna is a richly appareled queen in adoration before Her Child (page 648). The etiquette of the Spanish court is suggested by the role of St. Joseph, who, seated apart, is relegated to the position of gentleman in waiting.

Germans Mixed Realism with Fantasy

Each region of Europe has stamped its character on the works of art it has produced. The colder climate of the Rhineland and the reforming zeal of the Lutherans produced a German style of fascinating exaggerations, bizarre combinations of realism and fantasy, and passionate expressionism.

The Kress Collection contains important works of the great German painters of the 16th century, Altdorfer, Cranach, Strigel, Baldung, Dürer, Grünewald, and Holbein, as well as examples of earlier anonymous artists. These masterpieces, added to the German paintings given by others, put the National Gallery in a unique position among museums outside Germany. Two of these pictures are reproduced in color: "The Fall of Man" by Albrecht Altdorfer and "The Baptism of Christ" by the Master of the St. Bartholomew Altar.

Altdorfer's panel has that element of the extravagant I have mentioned (page 626). Its inspiration can be traced to a fantastic contemporary of Altdorfer, the great alchemist Paracelsus, who taught that man's character is influenced by the stars. On the wings of the triptych, Bacchus and Mars stand for pernicious influences from the stars, stimulating gluttony and drunkenness, anger and murder.

But no such influence would have existed had it not been for the sin of Adam and Eve, whose figures now stand side by side but once were separate panels enclosing other parts of the painting. Thus mythology and Christianity are fused in the crucible of alchemy, a strange intellectual exercise typically German.

The charm of this painting, however, as in

so many German works of art, lies in a certain grotesqueness, a naive whimsicality. Adam and Eve eye each other dubiously in a lush forest full of half-glimpsed animals. Out of the foliage the serpent scowls at his victims with a spare apple in his yellow fangs. In the left panel Bacchus is shown as a pink old man swinging on a ring of clouds. In one hand he holds his symbol, the grapevine; with the other he pours wine over a crowd of men. The revelers stumble around, raising their arms to the obesely cherubic god above.

In the companion panel on the right equally naked men are drunk with blood instead of wine. They wound and kill each other. Above them seated on another ring of clouds is Mars, the cause of their belligerence. Altdorfer's painting is an evangelical poster intended to show the wages of sin, but with the consoling thought that sin is predestined by the stars.

"The Baptism of Christ," painted a few years earlier by the Master of the St. Bartholomew Altar, lacks these pagan themes, but it has also an element of the bizarre (page 627). Fourteen saints and God the Father form a heavenly audience watching the scene below. This is an unusual representation in Christian art, but it has a particular meaning. When 14 saints are shown together in this way, they may usually be interpreted as the Holy Helpers, whose assistance could be invoked in dire emergencies. However, only three of the saints shown here are usually included among the Holy Helpers.

Style Identifies Nameless Artist

The saints can be easily identified, but the name of the artist is unknown. His work, however, is familiar to art historians, who have recognized his individual style in a number of paintings and have coined his sobriquet from the most important of these, the great altarpiece dedicated to St. Bartholomew in the Church of St. Columba in Cologne. He was evidently one of the best craftsmen of his time, for his work has lasted marvelously well.

Thus in the case of some paintings we can identify the artistic personality of the painter, but we cannot discover his name. In other cases we can point to several known painters who might have executed the picture, but we cannot be sure which one was responsible.

Without genuine signatures or positive documents, experts must depend for their ascriptions on a system developed only during the



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National Gallery of Art (Kress Collection)

Cleaning Reveals a Hidden Face in El Greco's "Laocoön"

Some modest artist undertook to improve this painting, uncompleted at El Greco's death, by draping the nudes and covering up a background figure (detail above). Recent cleaning removed 12 layers of varnish and overpainting and restored to the canvas its unfinished but brilliant splendor (below).



past hundred years. The method is based on the assumption that paintings disclose a "handwriting," revealed in the brushwork, in the draughtsmanship, and in the details most mechanically and repetitiously executed (the drawing of a hand, an ear, a mouth, or an eye, for example).

This method often fails when applied to a picture by a young painter strongly influenced by a more mature artist. This explains our difficulty in attributing work to the young Leonardo da Vinci. A case in point is the "Madonna and Child with a Pomegranate" (page 649). We have labeled it Circle of Verrocchio, possibly Leonardo.

Among all the new Kress acquisitions there is nothing more beautiful than this exquisite and jewel-like panel. Who, one wonders, but a genius like Leonardo could have painted with such delicacy the winding Arno flowing between the Tuscan hills toward Pisa and the sea? Who else could have modeled so subtly the features of the Madonna, drawn so exquisitely the strands of Her golden blonde hair?

Yet how can one be sure? There is much in the picture that suggests Lorenzo di Credi, a fellow pupil with Leonardo in the workshop of Verrocchio, or Verrocchio himself. Unless our model, like Pygmalion's Galatea, can by some magic come to life and tell us who recorded her youth and beauty, we seem destined to content ourselves with the present label, tantalizing as it is.

Two Artists or One?

This problem of attribution grows even more complicated when it seems possible that two artists have worked on one picture. Among the most beautiful and best preserved Flemish Primitives is "The Presentation in the Temple," which the Kress Foundation recently acquired from the Czernin Collection in Vienna (page 623). This panel is now generally ascribed to the youthful Hans Memling, working in the studio of Rogier van der Weyden.

However, the two enchanting children in the scene look different from Memling's typical portraits, as a Belgian critic, Hulin de Loo, first pointed out. They are more delicately painted and convey a greater sense of form than the other figures. Were they, as De Loo insists, painted by Rogier van der Weyden, and thus an addition by the older master to his pupil's panel?

I have placed on one plate two portraits of young women by Rogier van der Weyden

and below them detail photographs showing the two children in "The Presentation in the Temple" (page 625). I leave it to my readers, who in this matter are as qualified as art critics, to say whether or not the four look like elder and younger sisters, or perhaps mothers and daughters. It does not follow from this, of course, that all these portraits are by the same hand; but if you see a family resemblance, you will probably agree with Hulin de Loo rather than with those critics who believe the picture to be entirely by Memling.

It is not unusual among old masters to find two artists working on one painting. Today we think of artistic expression in terms of individual genius; with each painter creating in splendid isolation. This has not always been the procedure.

In the past an order would be received for the representation of a certain scene, subject matter usually being specified by the patron. The senior partner would then prepare a sketch to guide his assistants, and under his general direction much of the work was apportioned among apprentices. A great atelier, such as Rubens directed, had specialists for drapery, animals, landscapes, architecture, and even various kinds of figures.

Paris Picks His Favorite

An example of less close cooperation is "The Judgment of Paris" by Nicolò dell' Abate and Denys Calvaert (page 650). The style of Nicolò, a landscape specialist, is clearly seen in the background and in some of the smaller figures, those that form almost an integral part of the landscape. But the central group, of Paris offering the prize for beauty to one of the three goddesses, is painted



A 15th-century Altar Panel Gets a New Lease on Life

Bungling restorers have ruined more pictures than have wars and revolutions. But experts can perform miracles with pictures that are dim and dirty, blistered, cracked, and flaking. After cleaning away layers of old varnish and overpaint, artists replace lost pigments, as a Kress Foundation restorer does with this work by the Spaniard Fernando Gallegos. One mark—a cannonball hole in an adjoining panel—will be left untouched.

with a heavier touch. It is believed to have been added many years later by Calvaert, a Flemish artist working in Italy.

We have no document to support the hypothesis of this dual authorship; but, on the basis of style and the pictorial handwriting of these two painters, the supposition seems likely.

I hope I am not leaving the impression that the label is more important than the painting. My purpose is the opposite. The technique of the attribution of pictures is still imprecise and subjective. The name on the label often is no more than a signpost pointing to a time, a place, and a probable personality. It re-

cords an enlightened guess; but its accuracy or error does not affect the fact that someone saw a vision and recorded its splendor for us; and it is this vision, rather than the label, that is significant.

The more experience you bring to a work of art, the better are the chances that it will speak to you. A painting not only demonstrates the genius of a painter, it challenges the intelligence and education of the spectator.

Various pictures demand various capacities. For example, the "Still Life" by Juan van der Hamen y Leon, like many modern paintings, is a purely visual challenge (page 641). A trained eye enjoys the sensitive balance of the composition; the organization of light falling on the various objects; the almost contrapuntal arrangement of voids and solids, of curves and rectangles; and the skillful translation into paint of the different textures of the fruit and the confections, the jars and the boxes. But there is no appeal to the imagination, and the objects represented carry no overtones of meaning.

Critics Frowned on Still Life

Perhaps this is why 17th-century writers on aesthetics placed still-life painting near the bottom of their hierarchy of artistic values.

According to these critics, still life is out-ranked by landscape, which, as represented in the 17th century, usually made a greater demand on the spectator's culture. Pieter Jansz. Saenredam's painting of the Church of Santa Maria della Febbre, for instance, is not only a sunlit Italian scene but also a lesson in historic change (page 652). The structure in the background is what is left of a Roman civic building. Centuries later Christians turned this vast pile of masonry into a church. The obelisk probably was imported from Egypt and erected in the Eternal City as a symbol of majesty and power.

To the educated collector of the 17th century this scene was a reminder of ancient grandeur. Perhaps, shivering in the damp fogs of the Netherlands, he also would have felt an imaginary shaft of warm sunlight from the hot and dusty transalpine scene. A large colony of Dutch painters lived in Rome at that time and made a good living by sending back to Holland nostalgic views of sun-baked classic ruins. But Saenredam never went to Rome. He painted the picture from a drawing made by his fellow countryman, Marten van Heemskerck.

At the top of the ladder of artistic significance critics then placed religious and historic subjects. These, they felt, made the greatest demand on the spectator's knowledge.

We, on the other hand, look at art with different eyes. For example, St. Cecilia by Orazio Gentileschi is to us merely a picture of a charming young girl playing the organ (page 640). We enjoy the painting because it seems to preserve a moment of actuality. The scene touches us with a certain tender and simple realism.

Artist's Daughter Posed as Saint

To know that the girl is probably Artemisia Gentileschi, the artist's daughter, who was to become one of the most distinguished of women painters, adds a certain interest. But the story, so important to the 17th-century critic, we care little about. The picture would appeal to us just as much, perhaps more, if the youth holding the music did not have wings. The fact that he is an angel and that the picture is after all more than a glimpse of 17th-century life, we tend to ignore.

And yet I feel that this lack of knowledge somewhat impoverishes our appreciation, that the story does enrich our artistic experience. Gentileschi's painting has much more meaning when we know that it relates to the vision

(Continued on page 655)

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JACQUES-LOUIS DAVID (1748-1825) → *French • Napoleon in His Study*

Napoleon thought of himself as a Roman emperor come to bring order to the world. Not a lawyer, he nevertheless turned his energies to a reorganization of French law by drafting the Code Napoleon, still in effect today.

Here the emperor's official painter, David, shows the ruler after a night's work on the code, with the candles burned almost to their sockets and the clock marking the late hour. This shameless piece of flattery reportedly moved the dictator to say, "You have understood me, David: by night I work for the welfare of my subjects, and by day for their glory."

The man who nearly conquered all Europe wears the epaulettes of a general on a uniform combining features of his two favorite regiments, the chasseurs and the grenadiers of the Imperial Guard. He carries the red ribbon and silver cross of the Legion of Honor, instituted by him.

Empire-style furniture, popularized during Napoleon's time, reflects the great interest of that day in classical Egypt and Rome, spurred by the excavations at Pompeii and by Napoleon's own campaigns in Egypt. The bee, Napoleon's favored trademark, decorates the chair cushion.

The artist carried the classical idea so far as to sign this 1812 painting in Latin, IVD. CV DAVID OPVS, meaning "the work of Louis David."



LWB DAVID



JUAN DE FLANDES (active 1496–1519?), Hispano-Flemish • *The Nativity*

Sixteenth-century painters often wandered from place to place seeking commissions; the names of many are unknown. Juan de Flandes was simply a Spanish nickname, meaning John of Flanders, for an artist who served as court painter to Queen Isabella.

This panel, which telescopes the manger scene with distant shepherds hearing the good news, once decorated the high altar of the parish church of San Lázaro in Spain's Palencia Province. The owl is a symbol for Christ.



LEONARDO (?) (about 1473), Florentine • *Madonna and Child with a Pomegranate*

So many painters of first rank worked in Florence in the last half of the 15th century that critics are often baffled in trying to identify specific paintings of the masters taught by Andrea del Verrocchio. Many believe that this gem, shown slightly enlarged, is the work of Leonardo da Vinci. If so, it may well be his earliest preserved painting. One story relates that he carried it in his tunic as a sample to show to pope and prince.

The hand-held red pomegranate, barely visible against the red dress, symbolizes the unity of the church.





NICOLO' DELL' ABATE
AND DENYS CALVAERT

(mid-16th century)

School of Bologna •

The Judgment of Paris

Scores of artists have made this classical scene familiar. Paris, a shepherd on the slopes of Mount Ida, judges whether Minerva (left), Venus, or Juno shall have the coveted golden apple signifying supreme beauty. Each goddess tries to bribe him: Minerva offers glory and renown in war, Juno power. But Paris chooses Venus and receives as reward the hand of Helen of Troy, thus sowing the seeds of the Trojan War, in which he loses his life.

River god at left may be the father of Oenone, the nymph Paris forsakes to marry Helen. Mercury (winged hat) and the infant Cupid add mythological flavor; so does the huntress Diana (extreme right), who aims her bow at an unsuspecting stag.

Experts detect the hands of two artists. Nicolo' dell' Abate seems to have painted the smaller figures, the landscape, and the fantastic buildings in the 1540's. Denys Calvaert is thought to have added the main group some 30 years later, after Nicolo's death.

A woman and a child riding a donkey—suggestive of the Flight into Egypt—appear below the tree at right.

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National Gallery of Art
(Kress Collection, loan)



LUCAS VAN LEYDEN
(1494-1533), Dutch •

The Card Players

Lucas van Leyden is often considered the father of Dutch genre painting, which dealt with everyday subjects rather than the grand themes of religion and mythology. He was even better known in his day as an engraver, ranking second only to Dürer.

After a few details in this early 16th-century scene, and it might be a hand of poker with the inevitable kibitzers.

The players' fine clothing makes clear that they are well-to-do; the common people had neither the leisure nor the money. Golden guilders on the table are the size of United States double eagles. At today's gold prices the pot would be worth more than \$1,000.

Although Europe has had playing cards since the 14th century, history offers few details about games in the artist's day. Modern poker, developed in the United States, goes back to the game *poque*, which the French introduced into Louisiana. The game in progress here may be a forerunner of *poque*.

Backs of early playing cards were often left undecorated because of fear of cheating.

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National Gallery of Art
(Green Collection, Loan)





JEAN HONORE FRAGONARD (1732-1806), French • *The Swing*

Just before the French Revolution the aristocracy turned from the formality of Versailles palace life to the pursuit of pleasure in nature. It became the custom to build pastoral paradises filled with transplanted trees, artificial brooks, and temples of love. There the elite dallied away the summer days, often as not playing at being shepherds and shepherdesses.

No one captured the airy frivolity of this life better than Fragonard. Here, in what the author has described as "an enchanted garden where no one grows old and pleasure is without end," the artist shows nobility playing with two currently popular toys, telescope and swing. The exaggerated landscape combines features of France and Italy.

which, according to legend, was sent the husband of the young St. Cecilia to prove her claim to angelic protection and win respect for her vow of chastity.

St. Cecilia is the patron saint of musicians, and legend credits her with an important invention. Because the musical instruments of her time were inadequate to convey the sound of the angelic voices she heard, she developed the pipe organ and ordained that it be consecrated to God. St. Cecilia suffered martyrdom in Rome in the third century.

Seeking the True Cross

In the same way, I believe a knowledge of the story of St. Helena enhances our enjoyment of the small panel dedicated to her by Cima da Conegliano (page 630).

Unfortunately, only one spectator in a hundred remembers that St. Helena was the mother of the first Christian emperor, Constantine. She made a pilgrimage to the Holy Land and found, tradition says, the cross on which Christ was crucified; among the foundations of a temple of Venus, built over the spot to obliterate Christian reverence for the sacred mount, she found three crosses.

Uncertain which was the Cross of Christ, St. Helena sent for a sick person and identified the true Cross through its healing power. Two iron nails found at the same place were sent back to Constantinople, where the emperor made one into a bit for his horse and had the other set into his helmet.

The Cross, among the holiest relics of the Christian world, was divided into myriad pieces and dispersed throughout Christendom; innumerable cures are credited to its miraculous powers. Possibly this little panel was intended for an altar where one of these fragments was preserved.

These overtones of meaning are too frequently lost on the average visitor, but even without them he can delight in the wonderful preservation of this fragile panel, now more than 450 years old. Hardly a touch of the original paint has been lost. The verdure of the meadows, the warm light on walls and towers, the sparkling stream, all have been preserved for our enjoyment.

It seems almost a miracle that a fragile object marked with designs in delicate and often perishable pigments should last more than a few years. Too much light, too much moisture, too much dryness, too much heat or cold, one careless move by a thoughtless

spectator, even the dirty hand of a child can cause much damage. When one adds to these everyday hazards the destructions of floods, fires, lootings, bombings, and attempted restorations, the fact of survival becomes even more a happy accident of fate.

One reason why paintings do survive is, of course, that they have often been owned by families who have treasured them as objects precious beyond belief. When disasters have threatened, the protection of these heirlooms has taken precedence over life itself.

Rarely, however, do we find old paintings in perfect condition. The beauty of many of those shown today has been marred by the wear and tear of ages: canvases torn, panels cracking, paint flecking off. To restore the tissue of a work of art is an unbelievably delicate surgical operation. The Samuel H. Kress Foundation maintains at Huckleberry Hill, its property in the Pocono Mountains, what might be called a hospital for paintings, one of the most superbly equipped in the world. It is directed by a great restorer, Mario Modestini, and staffed by half a dozen assistants (pages 629 and 644-5). Ailing patients are diagnosed and restored to health in a way that would have seemed impossible a few years ago.

Paintings Age Like People

Old age affects paintings much as it does human beings. Both tend to grow a bit worn and feeble with extreme age. Gothic pictures are, in terms of human life, roughly the equivalent of octogenarians; Renaissance paintings, septuagenarians. However, they can be rejuvenated by cleaning and revarnishing.

Cleaning is one of the most delicate operations possible on a work of art, and inexpert cleaning has probably ruined more paintings than wars and revolutions. Aided by a stereoscopic microscope, the modern picture surgeon must distinguish precisely where discolored varnish ends and paint begins. Using solvents, he must clean away only this dirty varnish and overpainting, leaving the original pigments intact. If he is successful, the picture emerges inch by inch, like a reinvigorated human regaining health and beauty.

But will these restored pictures soon again become cracked, blistered, and discolored? I believe not. An important development of our time makes me confident that our paintings now have a greatly increased life expectancy. It is air conditioning.



SIR ANTHONY VAN DYKE (1599-1641), *Flemish* • *Queen Henrietta Maria with Her Dwarf*
Jeffrey Hudson, perfectly formed in miniature, was presented to Charles I's queen in a pin. Witty and brave, he became her confidential ambassador. Here, with Her Majesty's monkey Pug, he is shown at the age of 14.



Houdon's Bust of Cagliostro Portrays One of History's Most Remarkable Rogues

Giuseppe Balsamo, 18th-century confidence man, quack doctor, hypnotist, and rouse, styled himself the Count of Cagliostro. Repeatedly exposed as an impostor and expelled from cities all over Europe, he left behind a trail of broken hearts, forged documents, and bankrupt accounts of those who believed in his schemes for making gold through alchemy. Condemned by the Inquisition as a heretic, he died in prison in 1795. Jean-Antoine Houdon, the finest portrait sculptor of his day, has represented the "Count" as a dreamer and poet, for the artist, like thousands of others, was duped by the famous faker. Here Lester Cooke, of the National Gallery's curatorial staff, relates the tale of Cagliostro to a rapt audience.

The support on which a picture is painted, usually either canvas or wood, is not inert. When the atmosphere is humid it stretches or swells; when it is dry, the reverse occurs. This movement causes the paint surface, which is relatively inelastic, to crack and blister, and eventually to detach itself and flake away. However, air conditioning can stabilize humidity and reduce the movement of the support to almost nothing.

Humidity Control Saves Great Art

The National Gallery is the largest completely air-conditioned art museum in the world. Pictures after a time become acclimated to this stable atmosphere, and the amount of restoration required is far less than it is in any other gallery of comparable size. Thus science aids in preserving these irreplaceable treasures in the National Gallery.

I do not believe that I, or any other museum director, will have the privilege of writing an article like this again. These accessions to our national wealth, which the NATIONAL GEOGRAPHIC MAGAZINE has recorded on several occasions, cannot be a continuing series. The laws of supply and demand do not hold in the art world. Works of art of the quality of the new Kress acquisitions are becoming constantly more rare, and short of some terrible catastrophe most of the great art treasures of the world have found permanent resting places.

We, in this country, have every reason to be proud and grateful that, thanks to the foundation created by Mr. Samuel H. Kress and Mr. Rush H. Kress, and to the gallery's many other donors, such a generous share of this unique heritage of great art has fallen to our lot.

An Italian Town Revives a Romantic Legend of the Middle Ages,
in Which Suitors Played Chess for the Hand of a Lady Fair

BY ALEXANDER TAYLOR

With Illustrations from Photographs by the Author

THE cause of the trouble was, of course, a girl, and the whole town of Marostica in northern Italy was mightily upset.

The story, as outlined in a leaflet from Marostica, began like this: "For love of the lady Lionora, young daughter of the Lord of the Castle, the noble sirs Vieri and Rinaldo had challenged each other to a duel to the death. But Seigneur Parisio, Lord of the Castle, forbade the duel on pain of decapitation, and ordered that the dispute be settled instead on the Great Field before the castle, in the noble game of chess, with living pieces. . . ."

Backstage in the 15th Century

I had heard of chess with living pieces before, but this legend of a centuries-old contest for love intrigued me especially. When I learned it was to be the theme of a festive revival of medieval pageantry, I made a trip to Marostica in the rich farm country where the Venetian plain meets the foothills of the Alps.

Getting off the train from Vicenza, I imagined I had stepped back into the 15th century. The town square was noisily astir with knights in armor and ladies in gay silks and velvets. As I walked through an archway into the plaza, a man-at-arms clanked past, clad from chin to heel in chain mail, a cross-bow over his shoulder.

Near by I found the pageant headquarters. I had not waited long before a tall man in shirt sleeves bowed to me and said in English:

"I am Mirko Vucetich, artistic director of our festival. And this is Signor Boschetti, our tireless committee president."

"Bah!" said Boschetti, laughing. "I do the talking; he does the work. It was he who gave form to our legend and breathed life into it. He wrote the script. Now he oversees costumes and sets, plans the moves of 300 people, and teaches them to act. We have only a few professionals in the cast.

"As if all that weren't enough, Vucetich plays the role of Master of the Field himself. That puts him right in the middle of everything, where he can shout orders without step-

ping out of character. It also lets him cut a handsome figure on one of the *carabinieri's* best horses."

"The carabinieri?" I asked. "Aren't they the national military police?"

"Yes," Boschetti replied. "The Minister of Defense gave permission for a dozen men and their horses to take part. It requires a horse trained to parades and bands to stand quietly on our chessboard, with heralds blowing trumpets every few minutes."

"And who finally wins Lionora?" I asked.

"Vieri di Vallonara wins her. To make sure, we have the rivals replay a classic chess game of which we know the outcome. This year it's a game played by Adolf Anderssen and Jean Dufresne at Berlin in 1852."

Since I cannot speak Italian, Signor Boschetti introduced me to a smiling girl named Liliana, who would be my guide and interpreter. With her I walked out into the square again, where under a cloudless sky several thousand spectators were filling grandstands and the windows of buildings.

Near by a crowd swarmed around a small covered wagon. It was drawn by four donkeys, and several of the people in it were in

(Continued on page 667)

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Living Chessmen Dot a Giant Board → in the Square of Marostica, Italy

Tradition says a vexing problem faced the lord of Marostica centuries ago. Two noblemen seeking the hand of his daughter were prepared to fight a duel. To avoid bloodshed, the lord decreed that the rivals play a chess game, with living pieces moving over marked-off squares on the Great Field fronting his castle. The victor, he promised, should marry his daughter.

In 1954 and 1955 townspeople enacted a pageant based on the romantic legend. Here several thousand watch the '55 performance. The jealous rivals compete over a regulation chessboard on the dais in foreground (page 661). Chessmen in medieval garb repeat the moves of the suitors.

Ruins of an 11th-century castle crown the hill. Fortified walls on the slopes link town and stronghold. The towered building facing the square once served as an armory.





Rivals Begin Play; → Tension Mounts

The story of the living chess game places the opponents in the governor's castle. To keep the public informed of the play, citizens acted out every move in the square.

In the modern enactment the small board is set up outdoors. A herald shouts each move, and living pieces duplicate the maneuvers on the square.

Here Elvio Strada (left), an automobile mechanic, acts the part of Rinaldo, who moves the black pieces. Alessandro Dinale, who works in a pottery, portrays the victorious Vieri, with the white men. Lionora, the winner's prize, sits at Rinaldo's left.

← A cast of nearly 300 participated in the pageant. Except for professionals in the major speaking roles, all were amateurs. Sergio Tofano and Ave Ninchi, both veterans of the Italian stage, portray the lord of Marostica and his sister-in-law.

Marostica's legend was bolstered by an 18th-century discovery of chessboardlike slabs of stone under the plaza's paving.

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← Black Queen Advances into White Territory

Since the legend tells no details of the game itself, contestants re-enacted a famous game played by Anderssen and Dufresne at Berlin in 1852.

Spectators followed the moves closely. Shouts of "Bravo!" and "No! No!" rang out. When White lost both knights, a rook, and his queen in quick succession, Black assumed a confident look.

But suddenly a white bishop streaked diagonally four squares and threatened Black's king. "Checkmate!" roared the herald. The game was ended; White was victorious.

Pawns (left) dress as halberdiers. Trainbearers attend kings and queens. Rooks (center) are castle towers surmounted by crossbow artillery. Pages roll them across the board (page 663).

Costumed in doublet and hose, an Italian cameraman moves in for a close-up of the black queen. To film the pageant, he agreed to dress "in harmony."



↑ Master of the Field and Honor Guard Parade the Square
Mounted knights are *carabinieri*, Italian military police.

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↓ Helmeted Crossbowmen and Castlelike Rooks Pass in Review
Spectators crowd windows and balconies flanking the plaza.

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Human Chess Pieces Take Their Places at Night Rehearsal in the Floodlighted Square

Living chess is not new. Henry IV reportedly witnessed a chess masquerade in 1407. Mohammed, Sultan of Granada, and Don John of Austria, last of the crusaders, are believed to have played it. During this century Prague, Paris, Vienna, and Chicago have staged live matches.



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Square-cut Castle Worthy of a Shakespearean Setting Serves as the Backdrop

Marostica predates ancient Roman times. Medieval lords warred over the town. One conqueror, Can Grande della Scala of Verona, built the castle in 1311. Napoleon fought an important battle on the outskirts of Marostica in 1796. Today the battlemented fortress functions as the town hall.



Gallant Knight Aids Fair Lady with Zipper Trouble

Modern Marosticans rented costumes in Renaissance styles and rehearsed for weeks on the grounds of the upper castle (page 659). They spared no effort to re-create the medieval spirit and setting of their legend.

According to tradition, Marostica's living chess game was intended to demonstrate that disputes could be settled without bloodshed.

↓ Playing in the castle ruins, these youngsters stumbled across costumes and helmets and tried them on for size.

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blackface, whooping and cavorting. Others of the troupe danced about the wagon in long, cone-shaped masks.

"That's the wandering *commedia dell'arte* company," said Liliانا. "They add to the festivities, just as they did in Renaissance days. When they put on plays, they make up the dialogue as they go along; only outlines of the plots are written down."

Noblemen Take Their Ancestors' Roles

I noticed four stunningly costumed girls gazing down from a gallery (page 668).

"And who are they?" I inquired.

"They're noblewomen from Venice and Rome. We have some young noblemen in the cast, too. They're playing the roles of ambassadors from Venice, Padova, Treviso, Vicenza, Bassano, and Ferrara. Their ancestors were ambassadors to Marostica in the days we are re-creating now."

Bugles blared and drums beat a tattoo. Some 25 or 30 halberdiers and crossbowmen were marching into the square. We ran to a spot near the dais set up for Governor Parisio and his court. It stood before a turreted castle, now the town hall (page 664).

Gleaming in armor on a splendid black horse, Master of the Field Vucetich rode majestically into the square, an ugly scar painted across his face (page 662). Archers and pikemen slogged alongside, followed by knights on prancing horses. They took places flanking the dais.

A moment later pages, flag-bearers, heralds, and men-at-arms sallied forth from the castle. Now the noble family emerged among pages and ladies in waiting. Governor Parisio led to the dais his sister-in-law, Prudenzia, and his young sister, Oldrada (in real life, said Liliانا, she's a secretary). With them came the lovely Lionora (a cafe owner's daughter).

A murmur ran through the crowd: the principals in the feud were coming forward. Through gates at opposite sides of the castle Vieri and Rinaldo stalked proudly into the square. Behind them paraded their squires and retinues of haughty partisans.

Next came the townsfolk. One after another, representatives of the medieval guilds strode forward with their standard-bearers, splendid in raiment of scarlet, silver, and gold. I recognized potters, dyers, bakers, and the straw-hat makers.

An exultant blast of trumpets, and a historian in green, black, and gold stepped out

and began to read from a parchment scroll.

"He's announcing Parisio's edict forbidding the duel and ordering the chess game," Liliانا explained. "He's also warning the spectators not to indulge in loud jokes or whistling."

Trumpets sounded once more, and in marched the white chessmen. Four pawns dressed as halberdiers preceded the king and queen, who moved ahead hand-in-hand.

"Don't you think the white queen is beautiful?" Liliانا asked me. "She's a midwife. The king works in a dental laboratory."

Then the black cohorts trooped in—the king, I heard, was a pottery molder, and the queen was a doctor of law. They joined the white pieces in massed ranks. With one voice, the chessmen shouted "Viva Lion!"—a battle cry of the armies of the Venetian Republic, which once dominated Marostica. Then they took places on the huge chessboard.

At an order from Parisio, pages brought a table, chairs, and a chessboard of conventional size. The rival suitors advanced. Lionora, holding a black pawn concealed in one hand and a white one in the other, offered them to Rinaldo. He chose black.

Sitting down at the board and bending over it with an air of intense concentration, Vieri and Rinaldo made their moves (page 661). At each decision the herald bellowed commands to the living pieces. They shifted accordingly, while now and then chess fans in the audience responded with shouts of "Bravo!" or "No, no!"

White, losing both knights and a rook in rather quick succession, sacrificed his queen, too. The pretty midwife paced sadly off to join the rest of Black's prisoners.

Rinaldo smirked confidently. But suddenly a white bishop darted across the marble board and threatened Black's king. The crowd gasped; the king was trapped. He retreated in desperation, his last faithful knight fell, and "Checkmate!" roared the herald.*

Loser Wins a Wife as Consolation

The two contestants arose and solemnly shook hands. Then Parisio formally betrothed Lionora to the victorious Vieri and offered Rinaldo a consolation prize: the hand of Parisio's sister, Oldrada. Rinaldo accepted with good grace.

The chess pieces and men-at-arms formed ranks and were about to march off. Suddenly

* For the moves in this brilliant game see "Chess," in *Encyclopaedia Britannica*, 11th Edition (1911).



Italian Noblewomen Lend a Regal Beauty to the Pageant

These young ladies are descendants of Italian families prominent in the Middle Ages, when the chess spectacle supposedly originated. Left to right, they are Countess Ludovica Spinardi of Rome; Countess Carla Nani Mocenigo and Countess Maria Pia Barozzi, both of Venice; and Marchioness Nicoletta Persichetti of Rome. Countess Barozzi was voted the most beautiful participant in the 1955 pageant.

the *commedia dell'arte* players exploded into the square. They had come to beg permission of Parisio to replay the chess game according to their own notions.

The governor assented, and the burlesque began. Blackfaced boys and the long-beaked, masked clowns beat each other about the ears with bladders in a stirring if unorthodox version of the noble game. It ended as abruptly as it had commenced. One of the players seized the mock Lionora, threw her over his shoulder, and raced off with her—noisily pursued by the others.

Chorus Echoes Down Five Centuries

Crossbowmen and halberdiers began to bawl a martial ditty at the top of their lungs.

"The old song of the Marostican soldiers," Liliانا explained. "We've kept the original lyrics from the archaic Italian."

As the soldiers sang, the Master of the Field led all the participants in the play in a final march past. They circled the square three

times, to thunderous applause, and disappeared into the castle. The afternoon sun lit up their retreating ranks in a last burst of medieval splendor.

Later, Liliانا joined me for a cup of frothy *cappuccino* coffee at a cafe where the lady Lionora was taking orders.

I asked Liliانا how it felt to live in a setting so heavily marked by the past.

"Marostica is hardly more than a village," she answered after a while. "But history, important history, has washed over it for more than 2,000 years. Our buildings alone would be enough to remind us of the great stream of Italian culture. But we aren't solemn about it.

"Take our chess game. It brings to life a legend of our old days: about settling a dangerous dispute without bloodshed. This story has a lot of meaning for today. But we simply enjoy doing it. We have a lot of fun, and we feel that all this pageantry out of the past really belongs to us."

Vanished Mystery Men of Hudson Bay

An Expedition Co-sponsored by the National Geographic Society

Unclears Moldering Bones and Tools That Link Stone Age

Eskimos to a European Culture of 8,000 Years Ago

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BY HENRY B. COLLINS

Anthropologist, Smithsonian Institution

"AH-EE!" shouted Pangiyuk. "Ah-ee! Ah-ee!" Ten yelping huskies veered left of an open crack in the frozen sea, but too late to prevent our lurching sled from dropping a runner over the edge. Bundles of tents, arctic clothing, rifles, and rations for two months teetered precariously as we scrambled to right the sled and save its cargo from an icy plunge to the bottom of Hudson Bay.

It was June of 1954, and we were headed for a bleak headland on Southampton Island in northernmost Hudson Bay (map, page 677). There had dwelt the Sadlermiuts, a strange and primitive breed of Eskimos whose men wore bearskin pants and did their hair in coconut-size knots atop their heads.

Stone Age Overlaps 20th Century

While most Eskimos took up the ways and weapons of white men, leaping in a few decades from Stone Age to 20th century, the shy and suspicious Sadlermiuts stayed apart and persisted in chipping stone implements. All they got from the white man was disease, probably typhus or typhoid, which wiped them out in 1902-03 (page 672).

Here, too, on Southampton Island once lived people who may have been the forebears of the Sadlermiuts. These, the mysterious Dorset Eskimos, disappeared centuries earlier, leaving only the merest traces.

Dorset culture is today the outstanding problem of Eskimo archeology. Though it once extended from Newfoundland to Greenland and was the basic Eskimo culture throughout the central and eastern Arctic, we know very little about it; in many respects it remains as puzzling and mysterious today as when it was discovered 32 years ago.

A summer-long study of Sadlermiut houses—tumbles of rock and sod—and the site of a Dorset village would, I hoped, fit another piece or two into the perplexing puzzle: Where did the Eskimos come from?

Sponsored by the National Geographic Society, the Smithsonian Institution, and the National Museum of Canada, the expedition

consisted of William E. Taylor, Jr., of the museum, J. Norman Emerson of the University of Toronto, photographer Eugene Ostroff, and myself.

A Royal Canadian Air Force plane picked us up in Montreal, touched down in Churchill for arctic camping equipment kindly loaned by the U. S. Quartermaster Corps, and then winged us across ice-strewn Hudson Bay to Southampton Island. At Coral Harbour, the island's trading center, A. T. Swaffield of the Hudson's Bay Company took us to his home and called in an Eskimo for advice on how our expedition could best reach Native Point, our proposed campsite 40 miles to the southeast.

Pangiyuk, our consultant, like most of Southampton's present-day population of 240, descends from Aivilik Eskimos who came from the mainland shortly after the turn of the century to work with whalers (page 676).

Summer Buoys Eskimo Spirits

In winter the Southampton Aiviliks trap the arctic fox and hunt seal, walrus, and polar bear on the frozen sea. These are months of hard work, bitter cold, and endless night.

The coming of summer gives the Eskimo a zest, a rebirth of spirit that takes him around the clock with only three or four hours of sleep. Endless sunny days run one into another—with no darkness.

Pangiyuk's face beamed with the joy of summer's return as we sat around Swaffield's kitchen table talking and drinking coffee.

Not enough of the island's melting snow remained to make overland sled travel possible. So, although the sea ice would break up any day now and cracks were turning daily into open leads, we decided to gamble on its holding together long enough for the beeline over-ice trip to Native Point. Pangiyuk agreed to take us.

Next morning, Pangiyuk reappeared with three other Eskimos and four sleds, each pulled by eight to ten yapping huskies. Seeing the men lash rowboats atop the sleds and

pile our tents and supplies in them, one might have wondered for a moment if Pangiyuk thought the odds of the gamble too great.

Actually, the boats served a double purpose. In spring, as the ice melts, large expanses of water, sometimes six inches deep, form on its surface. Were it not for the protection of the boats, the cargo, piled on the low, flat sleds, would quickly be saturated as the runners knife through the surface water.

Then, too, there is the ever-present danger of an ice floe—the one you are traveling on—leaving the pack and heading to sea in an offshore wind. In the past many an Eskimo, forlorn and helpless, has stood beside his panting team watching the two-foot lead they just crossed open up suddenly to a hundred feet. A rowboat would have saved him from a lonely death at sea.

Eight-year-old Blonde Interprets

One of the brightest spots at Coral Harbour was the little blonde head of Lily Jewel Swaffield, eight-year-old daughter of the Hudson's Bay Company manager. Arctic-born, she was as much a child of the North as any of her Eskimo playmates. She spoke their language with a perfection that comes only to those who learn it as infants.

As Lily Jewel bounced about, I got her to put an occasional question to Pangiyuk. When she repeated his answer to me in English, I patted her head and said, "Good little *Innuit*. Eh, Pangiyuk?" and the big Innuit (Eskimo) beamed with pleasure at the child's knowledge of his language.

We left Lily Jewel and her entourage of little Eskimos waving goodbye on the beach. Men and dogs struggled together to drag the sleds over the rough shore ice. Then the dogs took control.

But dog sledding is not just a matter of shouting "mush" and ki-yi-ing off at a steady run. "Mush" is a white man's word that no Eskimo ever uses, and the driver does as much work as any of his dogs. Rarely did Pangiyuk ride more than three minutes without hopping off to pull our sled around a hummock, or to save it by inches from toppling its load through a crack in the ice.

When Pangiyuk did ride, he sat, whip in hand, on the front of the sled, talking constantly to his dogs. One minute he would direct them to the right of an obstacle with "Wo-ah! Wo-ah!" and then in the opposite direction with "Ah-ee!"

Above the din of dogs and drivers rose the strumming of Norman Emerson's guitar and his melodious vocalizing of "Carry Me Back to Old Virginny," to the delight of Killigpalik, his driver, and the other Eskimos.

The sleds barely spanned some of the wider leads, and crossing them required the combined efforts of drivers and passengers, while the dogs swam. In clear going the huskies jogged along at five miles an hour, but their average was much less. With the bright Arctic night ahead, all of us agreed that we would push through to Native Point even if it took us until breakfast.

Suddenly the drivers uttered soft, guttural commands which meant "Hush, a seal!" Instantly the dogs stopped yapping.

Napayuk had sighted a seal half a mile ahead, a single black spot on the white expanse. Off went the dogs at a terrific pace toward the seal, but with the silence of ghosts. And not a sound did they utter when the sleds halted 300 yards from the quarry. The panting animals, ears pricked up, stood alert in their traces watching the seal basking beside its breathing hole. They knew that if the seal was bagged they would eat at the end of the trip. Should they frighten it by barking, they would go hungry.

Eskimo's Acting Fools a Seal

Mike Bruce, one of our Eskimo drivers, went ahead alone to stalk the seal by an old tried-and-true method. Crouching as low as he could, he ran and walked toward the seal, stopping when the animal raised its head to look around. As the distance narrowed, he lay down on the ice and pulled himself along.

This was the crucial moment, when Mike must employ all his skill to imitate the appearance and movements of his quarry. When the seal looked up, the hunter would lie flat, feet together and head down, and then slowly raise his head to look around just as the seal did.

Through the binoculars Mike looked exactly like a big seal, and the seal himself must have thought so, too, for he let Mike get close enough for an easy rifle shot.

No sooner did the bullet reach its mark and the seal roll over than the dogs resumed their barking—no need for silence now—and lunged ahead. Had Mike's bullet failed to connect, the seal would have plopped into his breathing hole, and the dogs would have trudged on without interest. But now they



Canadian Girl and Eskimo Boy Are Playmates at Coral Harbour

Eight-year-old Lily Jewel Swaffield, daughter of a trading-post manager, speaks Eskimo as fluently as English. Discarded magazines paper the wall in this Alivilik house.

strained at their harness and yelped in frenzied anticipation of a meal at journey's end.

At 5 a.m. we reached Native Point. The dogs finished the 14-hour run with a spurt, savagely gulped their chunks of seal meat, and settled down to a well-deserved rest. We lost no time pitching a tent and zipping ourselves into sleeping bags.

But for me, dead tired though I was, sleep would not come. Thoughts of the virgin archeological site only a stone's throw from the tent raced through my aching head. After an hour of sleeplessness, I ate a couple of aspirin tablets and a pilot biscuit and left my snoring companions for a look about.

In all my years of Eskimo archeology I had never seen anything to compare with the ruins that lay before me.* Some 90

semisubterranean dwellings, the largest aggregation of old Eskimo house ruins in the Canadian Arctic, spread over a 30-acre expanse. Jumbles of stone from walls and roofs filled the sunken interiors and entrance passages of the best preserved houses. Of others, only slight depressions in the grassy terrain remained.

Skulls and bones of animals eaten by the Sadlerniuts, mostly seals, caribou, and walruses, littered the ground outside the ruins (page 685). Hundreds of stone cairns and meat caches stood near the site and ranged about it for miles around.

More than 100 human burials dotted the

* See "Exploring Frozen Fragments of American History," by Henry B. Collins, Jr., NATIONAL GEOGRAPHIC MAGAZINE, May, 1939.



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↑ Bleached Skull Guards a Lonely Eskimo Grave

Disease introduced by a trading ship wiped out the last of the Sadlermiut Eskimos on Southampton Island in 1902-03.

In 1954-55 expeditions sponsored by the National Geographic Society, Smithsonian Institution, National Museum of Canada, and American Philosophical Society established kinship between Sadlermiuts and Dorsets, an earlier Arctic people. Excavation revealed 2,000-year-old Dorset tools amazingly similar to those used by Stone Age man in Europe.

Norman Emerson (left) and author Henry Collins inspect a burial at Native Point, Southampton Island.

← Lemmings entering crevices in this tomb stole small bones.

→ Page 673: Four dog teams whisked the expedition from Coral Harbour to Native Point.

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Expeditions by W. E. Taylor (left) and Eugene Cretzschmar



vicinity. Usually the bodies rested in carefully constructed stone vaults, but some lay on the surface with only a surrounding enclosure of stones.

To excavate the site completely would have required an army of archeologists. We would be able only to sample it, digging just enough to obtain a rounded picture of the material culture and way of life of the Sadlermiut Eskimos.

Dogs Run Among the Dead

Victims of pestilence after pestilence, the Sadlermiuts numbered scarcely more than 70 survivors in 1896. Then, in the summer of 1902, a ship stopped to trade at Cape Low, Southampton Island. Sadlermiuts who came in contact with the crew contracted disease. Carried home to Native Point, they infected the last remnant of the Sadlermiuts.

Visitors to Native Point the following winter found a scene of death. Not an Eskimo had survived. Some lay in their houses on sleeping platforms; others on the ground outside, where their dogs still ran about.

In a corner of one of the stone ruins I found the tiny skeleton of an infant and imagined its last futile wailings for a mother who could no longer tend her child.

Back at camp we spent the balance of the first day putting up tents and organizing our gear. After a late supper we invited the Eskimos to a farewell singing party that lasted until 4 a.m., although they planned to leave the first thing in the morning.

They delighted in such old favorites as "Red River Valley" and "Darling Nelly Gray." When Emerson, strumming his guitar, harmonized "Alouette" with Taylor, our guests could hardly contain themselves (opposite page).

Once the Eskimos realized that we were not asking them out of politeness, they willingly sang their own intricate and haunting songs. These men, like most Eskimos, had fine voices and sang of the hunt in resonant, low-pitched tones.

After the Eskimos left for Coral Harbour, we began our archeological excavating. But, first, just what did we know of the Sadlermiuts who had made their home on this bleak corner of Southampton Island?

According to their own tradition, the Sadlermiuts once lived on Baffin Island. But, to date, their house ruins have been found only on Southampton Island and near-by

Coats Island. Their name combines two Eskimo words: *Sagdlern* (a native name for Southampton Island) and *miut* (people).

The Sadlermiuts spoke a strange dialect of Eskimo, built permanent stone-and-sod dwellings, and used snow houses only when traveling. In summer they lived in rude skin tents.

Neighboring Eskimos thought the Sadlermiuts primitive and mysterious and looked down on them for their unclean living habits. Blubber was everywhere on and about them. On the inside of the stiff bearskin pants they wore, the men smeared blubber to prevent chafing. Chunks stored on roofs dripped down on sleeping platforms; floors oozed with the greasy substance. From whales and walrus they cut big slabs of blubber which they carried away by slashing holes in them and putting them down over their heads like collars.

The Sadlermiuts' most distinguishing peculiarity, however, was their isolation from other Eskimos and white explorers, whalers, and traders of the 19th century. While neighboring Eskimos bartered skins for weapons and gunpowder, Sadlermiuts continued chipping their arrowheads, harpoon blades, and knives from stone. They brought the Stone Age into the 20th century and, having done so, promptly passed out of the picture.

Most of our information on these mysterious Eskimos was obtained by the Danish archeologist Therkel Mathiassen in 1922 by excavation and by systematic questioning of three old Aivilik Eskimos, two of whom had lived with the Sadlermiuts years before. Their information agreed very well with tantalizing bits of description from the journals of whalers and early explorers.

An Encounter with a Sadlermiut

First to describe the Sadlermiuts was Capt. George F. Lyon of H.M.S. *Griper*, who met them on Coats Island in 1824 while exploring in connection with Great Britain's search for the Northwest Passage.

"Shadlermioo," wrote Captain Lyon, "[is] a contemptuous term applied by Esquimaux to any others who are not of their own tribe." The first of these people to approach the explorer did so on three inflated sealskins, propelling himself with a whalebone paddle.

"On approaching," goes the account, "he exhibited some little signs of fear; his teeth chattered, and himself and seal-skins trembled in unison. It was evident from the manner



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Scientists and Dog Drivers Mix Chorus and Confusion by Singing in French and Eskimo

Norman Emerson (with guitar) and William Taylor won the Eskimos' confidence with music. Here Mr. Taylor, singing the French-Canadian song "Alouette," points to his nose and cries "le nez!" while his guests shout "kingak!" Inset: Eskimo guitarist Mike Bruce plays cowboy music. His favorite melody is "Red River Valley."



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Eugene Ostruff

Eskimos Test the Photographer's View Finder

These Aiviliks are modern successors to the extinct Sadlermiuts. Whalers in 1908 carried the Aiviliks to Southampton Island from mainland Canada. Winter finds these two hunting the arctic fox and exchanging furs for equipment, fuel, and canned food.

of this poor fellow, that he had come off as a kind of herald from his tribe...he soon came alongside, after having, as a peace-offering, thrown me a couple of dried salmon and a very rude arrow headed with a roughly-chipped flint; at my request he jumped into our boat, and taking his skins in tow, we rowed for the beach...he spoke a language differing very materially from that of any other Esquimaux whom we had seen...As we walked [to their tents]...several birds were shot by the officers; but although the natives saw them fall, they expressed neither surprise, fear, nor curiosity..."

Each man had "an immense mass of hair as large as the head of a child, rolled into the form of a ball, and projecting from the rise of the forehead. One of these bundles, which I caused a man to open, consisted of six long strings of his own locks, originally plaited, but now so matted with dirt, deer's fur, &c., as to resemble a rough hair tether. These extraordinary...tresses measured above four feet."

What more, a layman might wonder, would we like to know about the Sadlermiuts?

We wanted to determine, if possible, whether or not they were descended from the Thule Eskimos, who spread eastward from Alaska some 800 years ago, or from the Dorset Eskimos, who had occupied Southampton and near-by Coats Islands long before the arrival of the Thule people.

Study and comparison of Sadlermiut and Dorset stone implements might establish a new link in the chain of evidence that Eskimos brought their techniques and traditions through Asia from the European Stone Age, perpetuating them in the isolation of Arctic America for thousands of years after they disappeared in the Old World.

Of the Dorsets we know very little. They disappeared centuries ago, and, since no graves have been

found, we can only guess at their physical appearance.

Strangely enough, Dorset culture was discovered not by excavation in the Arctic but by keen-eyed Dr. Diamond Jenness at his desk in the National Museum of Canada in Ottawa in 1924. His discovery was based on two collections of stone, ivory, and bone objects sent to the museum by Maj. L. T. Burwash, a Canadian Government engineer. One the major bought from a Hudson's Bay Company representative; the other, much larger, was carelessly dug up by Eskimos at Cape Dorset on the southern shore of Baffin Island.

Bags of Bones Yield Clues

"They jumbled everything together into bags," said Jenness, "not caring whether they mingled modern harpoon heads of their own manufacture or the discarded weapons of a forgotten past."

But Jenness had the insight to recognize among them a number of implements and



**Frozen Southampton:
Tomb of the Sadlermiuts**
Scientists believe Eskimo culture was handed like a torch from Stone Age Europe to Asia and Arctic America, and finally to Greenland.

← Crossing Arctic wastes, Thule Eskimos migrated from Alaska to northwest Greenland some 800 years ago, centuries after the mysterious Dorsets settled around Hudson Bay.
↓ The Sadlermiuts' relation to other Eskimos long puzzled archeologists. Ruins at Native Point, Walrus Island, and Coats Island offered many clues to their origin.

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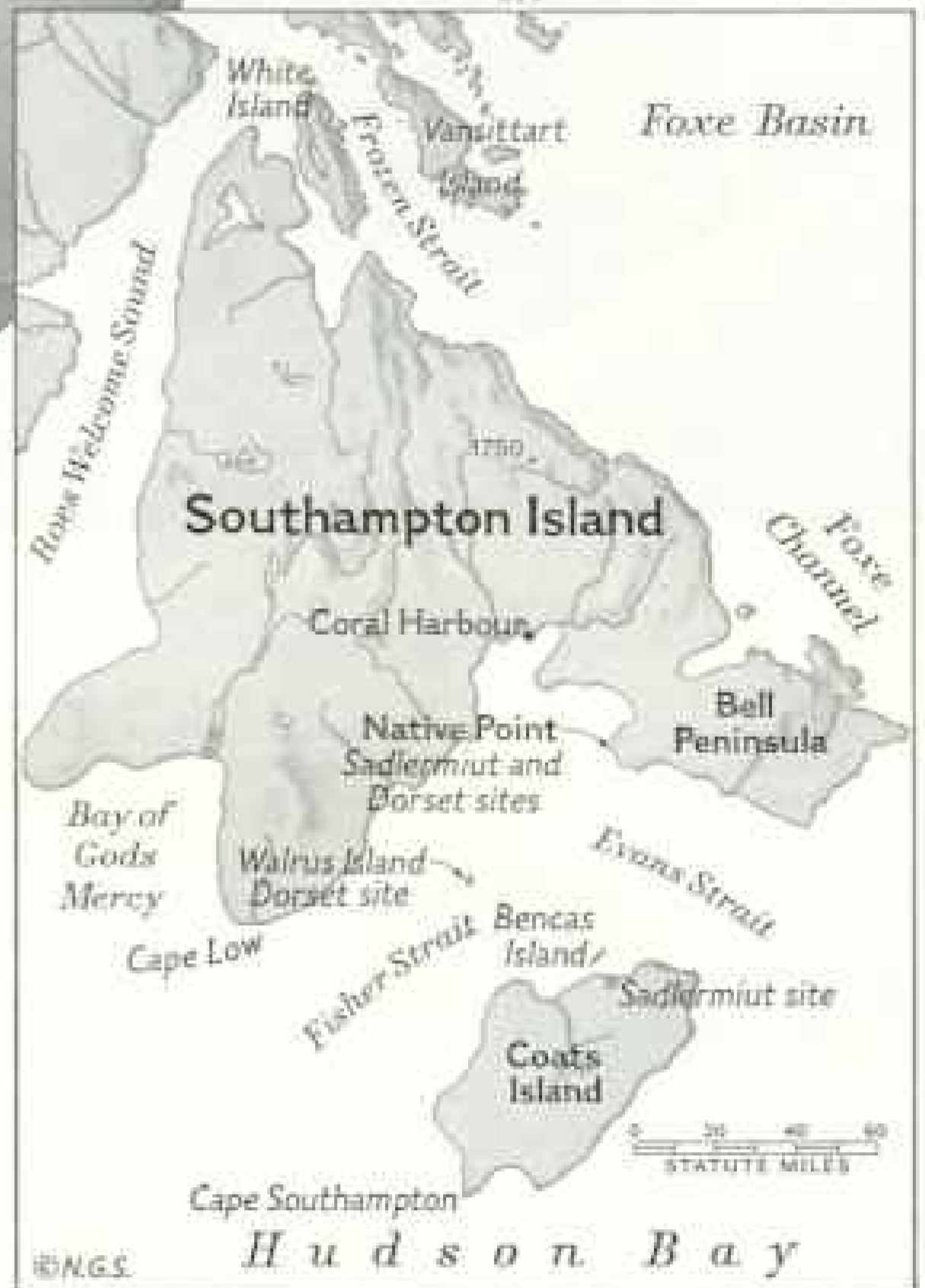
weapons of a type previously unknown, including harpoon heads perforated not with a bow drill as in other cultures but by delicate gouging. Thus the Dorset culture was first known and named. In the intervening 30 years other Dorset sites have been excavated, though little has been added to the first observations of Diamond Jenness.

With around-the-clock daylight to aid us, we put in long hours excavating two of the Sadlermiuts' stone houses. Successive layers of sand and refuse confirmed that these vanished Eskimos were not the tidiest of housekeepers. Garbage and scraps from stone chipping, woodworking, and ivory carving accumulated on the floor where they fell. When walking became too difficult, the Sadlermiuts covered floor and trash alike with a layer of sand and started over again.

New Light on the Sadlermiuts' Origin

Our work at Native Point weakened the previously held theory that the Sadlermiuts were an offshoot of the Thules, who spread eastward from Alaska much later than the Dorsets. We found evidence that the Sadlermiuts descended from the Dorsets—that they were in fact the last survivors of the Dorset culture.

Not only did we have traces of the last stages of Dorset in the Sadlermiut ruins, but, on a 70-foot headland a mile away, we found the site of a Dorset community



that showed the very beginnings of this mysterious Eskimo culture. We were finding new pieces to a baffling puzzle: although they did not yet fit one another as well as could be desired, we already felt well rewarded for our efforts.

On the site there were no traces of dwellings of any kind. It is unlikely that the Dorsets lived in snow houses, for we found no snow knives such as are commonly used in their construction. If the climate was milder thousands of years ago than at present—for which there is some geological evidence—these early Eskimos could have lived the year around in skin tents.



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↑ **A Canoe Party Returns to Shipboard
After a Day's Work on Coats Island**

It was 8 o'clock on a July evening; unceasing daylight lay ahead. Dr. Collins worked on deck until midnight, using the board in his lap to press plants for his botanist friends at home.

↓ **The Arctic Bursts into Bloom;
Dr. Collins Gathers the Record**

The author collected grasses, mosses, lichens, and flowering plants. Here on Southampton Island he cleans the roots of an arctic poppy for preserving in the plant press at right.





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↑ Doomed Walrus Ignores Danger

This ton of blubber and ivory could have rolled off the ice to safety; instead he stupidly watched an Eskimo make four harpoon casts. One glancing shot and two near misses failed to move him; the fourth try penetrated his tough hide.

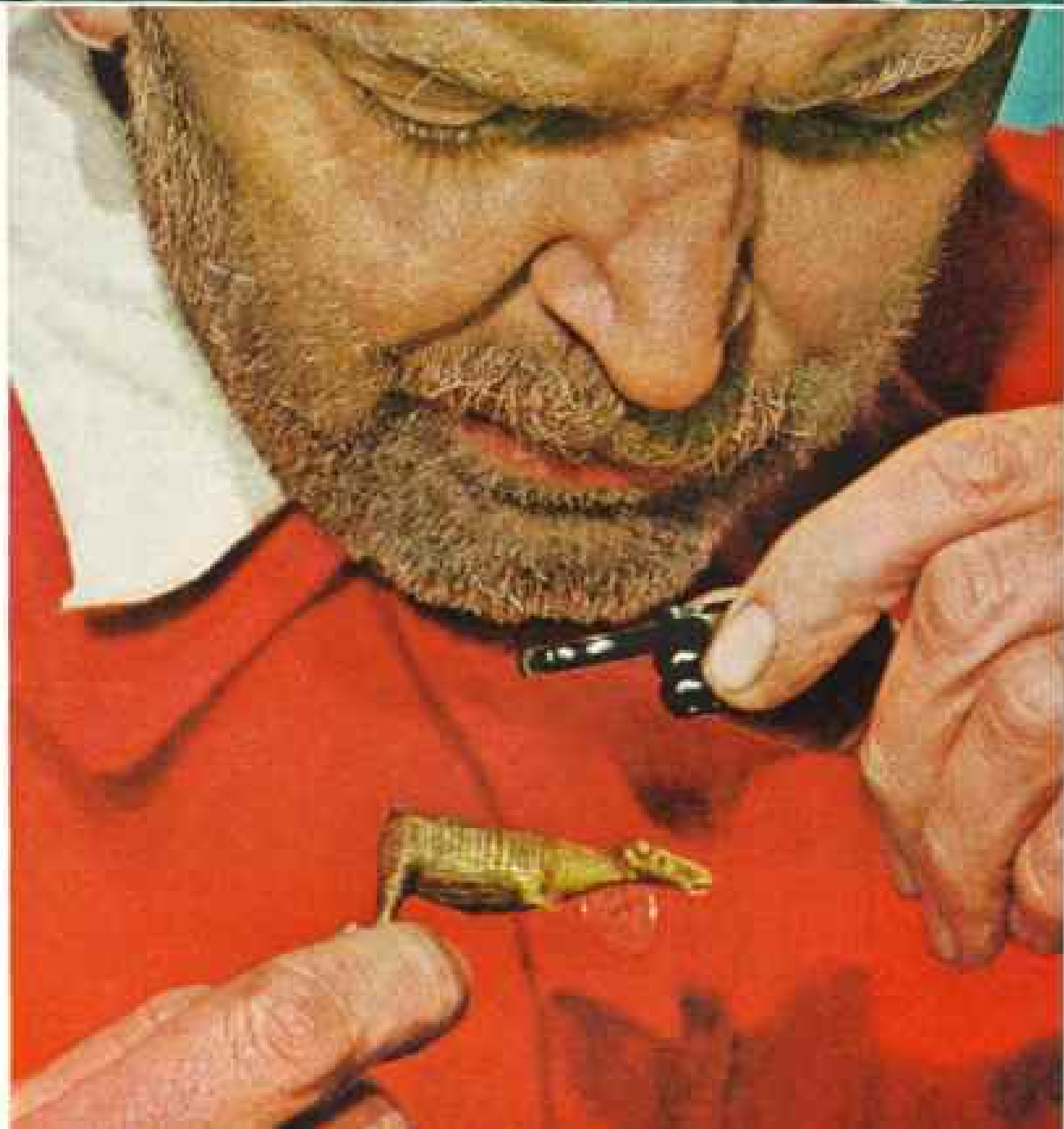
Indigestible seal skin found in the stomach showed that the walrus had deviated from his normal diet, clams and mussels.

→ Dr. Emerson, using a magnifier, examines an ivory caribou carved at Native Point by Dorset Eskimos. An ancient sculptor fixed the missing foreleg with mortise and tenon.

Evidently the Dorsets were not very successful in hunting the caribou, for their kitchen refuse contained few traces of its bones. Their successors, the Sadlermiut, feasted on the animal (page 685).

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Thomas Ostroff and (above right)
W. E. Taylor





Scientists Launch a Canoe into the Floe Ice off Native Point

Nayavak, a motorized freight boat, stands offshore to carry expedition members to lonely Coats Island. This Eskimo crewman waits for the canoe's second shuttle trip.

The site lay on gently sloping ground. At its edges, where wind had removed vegetation, flint chips, stone and ivory artifacts, and bleached animal bones littered the ground. Testing showed that shallow midden deposits—the refuse of human occupation—extended over more than 20 acres, a treasure of meaningful archeological clues.

No house pits broke the regularity of these shallow middens. But before summer was over they yielded some 25,000 mammal bones, uncounted quantities of bird bones, and about 3,000 stone, bone, and ivory artifacts that throw new light on the origin of the Dorset culture and its relationship to the other Eskimos of the Canadian Arctic.

Implements of ivory and bone such as dart points, knife handles, scrapers, flint flakers, adz heads, and ladles were recognizable as Dorset because of holes which were cut or gouged out instead of drilled.

Digging Unearths Flint Knives

We uncovered implements of unique forms, never before found in North America. Among them were rectangular flint flakes used as knives, with one edge sharp for cutting and the opposite thick in order that the finger might rest comfortably against it. They resemble tools made by the Mesolithic peoples of western Europe some 8,000 years ago.

Charred bones lying about the cooking hearths held the secret of the site's age. Though I knew it would be months before an answer came, I sent a bagful to Dr. J. L. Giddings, who was then at the University of Pennsylvania, with the request that he have the amount of radioactive carbon remaining in them measured by the carbon 14 method and tell me how many centuries ago the Dorset Eskimos had cooked them.*

One day while I was excavating a Sadlermiut grave, a young arctic fox came up and watched me dig. He was almost as tame as a dog, and I talked to him just as I would to a pet. A few bones I had laid out on the ground seemed to interest him. Suddenly he took a neck vertebra in his mouth and trotted off with it.

"Hey, come back here!" I said sternly, as if he were a dog accustomed to obeying his master's command. And the little fox obeyed. He dropped the bone, and when I brought it back he followed me and continued to nose around, stopping occasionally to scratch fleas as a puppy would.

When I went to another site he followed me, sat around a while, and then hopped into the far end of the test pit I was digging. Another day he tried to make off with a bag of bird bones Emerson had collected.

It was difficult to imagine what attraction these ancient bones could have for the fox, but to us they revealed fascinating details of Dorset and Sadlermiut diets. Comparison of bones found at the sites—some 45,000 in all—showed interesting differences in the hunting practices and food economy of the two groups.

Seal ranked first as the principal food animal of both. Dorsets ate more foxes but very few caribou, one of the most important food sources of the Sadlermiuts. Complete absence of dog bones at the Dorset site is evidence that these early Eskimos did not use dog sleds and therefore had no effective means of winter travel.

At some parts of the Dorset site 90 percent of the bones found were those of birds. Dorset Eskimos probably occupied these areas in summer, when enormous flocks of migratory birds come north to breed. We found no bolas or bird spears such as those used by other Eskimos, including the Sadlermiut. The early Dorsets may have snared birds with skin thongs, all traces of which would have disappeared.

Buntings Nest in Human Skulls

The low-lying area around our camp, with its ponds and lagoons, fairly swarmed with nesting king eider and old squaw ducks, herring gulls, arctic terns, snow buntings, and Lapland longspurs. Flocks of Canada, snow, and blue geese winged by. Loons filled the air with constant and strident clatter.

A group of whistling swans glided over the surface of a pond near our tents. Aware of the stately birds' extreme timidity, we took pains not to alarm them, and they remained most of the summer.

Snow buntings built nests in tin cans and in both animal and human skulls that lay about. Longspurs perched on top of our tents and slid down their sides, teetered on our laundry lines, and eagerly accepted grubs from our excavations.

Birds were not the only winged creatures at Native Point. Mosquitoes, hordes of them,

* See "Ice Age Man, the First American," by Thomas R. Henry, NATIONAL GEOGRAPHIC MAGAZINE, December, 1955.



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Rayne Orloff

↑ **Only Sadlermiuts Made Rock Cairns of This Topheavy Design**

Coats Island people used these solid limestone piles to store meat beyond the reach of dogs and foxes. Rangy polar bears, tall enough to have plundered a cache, were hunted so intensively that they dared not approach man or his monuments.

↓ **Rock and Sod Walls Sheltered Coats Island People**

Sadlermiuts occupied this dwelling half a century ago. Blizzards saw them huddled together underground, warmed by flickering seal-oil lamps and the radiant heat of their own bodies. Here the Eskimo Sandy points out the entrance passage to the author.



swarmed about us as we worked. We had nets, but found repellent more to our liking. At times I could hardly see the cloth of my sleeves through the mass of mosquitoes that covered them, but not one would touch my repellent-coated skin.

On July 17 a little single-masted freight boat made its way through the ice and anchored near the beach. It was the *Nayavak* (Little Gull), skippered by the Eskimo Sandy and manned by his crew of three: Napayuk, Kalugjak, and Okerluk (page 680). Sandy had come to take us 55 miles across Evans Strait to uninhabited Coats Island, where we hoped to find more Eskimo ruins. The smaller of Major Burwash's Dorset collections was reported to have come from there.

Eskimo's Keen Eyes Spot a Bear

For the first hour of our trip the 40-foot craft pitched along in a choppy sea. Then we entered the ice pack, where not a ripple broke the water's glass-smooth surface. Waves, though they may churn the edge of an ice pack, have scant effect on the waters within.

Suddenly Sandy cut the engine and reached for his gun. We drifted silently forward. Not until a bear jumped down from the hummock where the Eskimo had first seen him did my eyes pick him out. He had run only a few yards in the mist before I lost him again.

But Sandy didn't lose him. He raised his gun, twisted his shoulders slowly to keep the running bear in his sights, and fired one shot.

We anchored at the edge of the pan, walked over the ice about 100 feet, and there lay the bear. With deft strokes the Eskimos removed the skin, carefully keeping nose, ears, and claws intact.

The men quickly cut up the carcass. I noticed that they threw aside the liver, which in polar bears, unlike other Arctic animals, contains a superabundance of vitamin A and when eaten causes violent sickness. This the Eskimos know from their ancestors; the white man learned it by unhappy trial and error.

With our bear stowed away, Sandy doggedly pushed on until his boat reached open water, where he could safely anchor. When the fog lifted next morning, we were relieved to see that he had brought us safely within two miles of Coats Island.

On the north coast opposite Bencas Island we saw four old house ruins and went ashore. Near the beach stood two mushroom-shaped cairns of a type previously found only

at Southampton Sadlermiut sites (opposite).

The largest of the houses, cloverleaf in form and well preserved, measured 22 feet across and 15 feet from entrance to rear wall. Floor, walls, and even the roof were made of stones. A sod embankment surrounded the structure. The stem of the cloverleaf, a narrow passageway lower than the house floor and 10 feet long, admitted occupants and kept the cold air outside, conserving the warmth that rose from bodies and blubber lamps.

At 8 p.m. we returned to the *Nayavak* with a rich store of artifacts, all of which fell into the pattern of Southampton Sadlermiuts and left no doubt as to the site's identity. Iron knife blades indicated white contact, probably with whalers. This was the first definite record of Sadlermiuts on Coats Island since Lyon met them on the island's south coast in 1824.

Harpoon Bounces from Walrus's Back

We made our way back to Southampton Island over a glassy sea surrounded by masses of ice that shone like blue crystals in the sunshine. On one of them a young male walrus with foot-long tusks showed complete disinterest as the *Nayavak* bore down on him (page 679).

At 40 feet Okerluk threw a harpoon. The shaft bounced harmlessly off the beast's back. Two other futile casts followed, but the creature merely shifted its position slightly.

On the fourth try the harpoon hit its mark. The walrus dived into the water, but an empty gasoline drum on the harpoon line prevented escape. A rifle shot finished him off, and the Eskimos butchered him for dog food.

I remembered from past experience in Alaska that the liver is the best part of the walrus and as palatable as calf's liver. Napayuk cut off a generous piece. But a few minutes later Sandy, who had been examining the animal, warned that the liver would be bad because the animal had been eating seals instead of clams and mussels, its usual food.

How did the Eskimo know? The tusks bore scratches made by the sharp teeth and claws of seals as they struggled to escape.

When I questioned Sandy's diagnosis, Kalugjak cut open the stomach. Out fell a dozen pieces of rolled-up sealskin—an evil-smelling mass weighing some 10 pounds and quite beyond the walrus's digestive capabilities.

That a walrus will sometimes eat seal is common knowledge among Eskimos and the

Gone Is Stone Age Man; His House Is in Ruins

While other Eskimos traded furs for iron to make weapons, the Sadlermiut stagnated on Southampton Island. To their dying day they chipped weapons and tools from stone.

Dr. Emerson examines this Sadlermiut site beside Old Squaw Pond near Native Point. A timbered, sod-roof house ruin on the distant shore belonged to modern Alvilik Eskimos.

↓ Archeologists Leave No Stone Unturned

Excavations, numbered and marked off with twine, yielded Sadlermiut artifacts and the discarded bones of many a meal.

Scientists identified and counted the bones and tossed them into piles (opposite).

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W. B. Taylor

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✦ **Archeologist Taylor Measures a Hill of Bones Tossed Away by Diners**

Some 18,000 bones given up by Native Point garbage dumps revealed the Sadlermiut's dietary habits. For every polar bear consumed, they ate 70 seals, 11 caribou, 5 walruses, and 2 foxes.

Dog bones also came to light, but these were regarded as natural deaths; the Eskimos, it is presumed, ate their beasts of burden only in famines.

Numerous bird bones still awaiting a museum count suggested a summer diet of migratory fowl, which must have swarmed around the Eskimos' village, even as they did around the scientists' camp years later.



North's resident whites, but the fact has not yet reached the pages of zoological textbooks I have seen.

Back at Native Point another month's work developed the importance of the site to the point where we decided a second season's work would be necessary. So in June, 1955, Norman Emerson, William Taylor, and I returned to the North, accompanied by James V. Wright, a University of Toronto graduate student. To help support the work of that year, the American Philosophical Society joined our group of sponsors.

Once again Mr. Swaffield helped us get organized in Coral Harbour for the sled trip to Native Point. For several days we lived in one of the Hudson's Bay Company buildings, bunking in our sleeping bags and cooking our own meals.

Lily Jewel and her shadow, Kalowaq, a little Eskimo girl of the same age, appointed themselves our housekeepers. First thing in the morning, sometimes before we were up, they bounced in and began sweeping and cleaning. This was the real thing! Not just playing with dolls, but keeping house for live people.

Walrus Island Yields Treasure

About midsummer we interrupted our work at Native Point and went over to Walrus Island, a speck of land between Southampton and Coats, to examine several old house ruins. Two of them were of the same cloverleaf shape as the Sadlermiut ruins on Coats Island.

Our excavations produced hundreds of Dorset artifacts and only ten Sadlermiut pieces. This showed that the houses had at one time, probably at the beginning of this century, been used briefly by Sadlermiuts. But the presence of typical Dorset artifacts on and between the floor stones established the Dorsets as their builders and original occupants.

For the first time since Diamond Jenness discovered the Dorset culture in 1924, a village of Dorset house ruins had been positively identified.

The similarity of these Dorset houses to the Sadlermiut ruins on Coats and Southampton, plus the fact that some Sadlermiut implements clearly evolved from the Dorset culture, spelled out two important conclusions: One, that the Sadlermiuts derived their principal house type from the Dorsets; and, two, that the Sadlermiuts were culturally descended from the mysterious, long-vanished Dorsets.

There still remained the question of dates,

always in mind as we continued to uncover beautifully chipped stone implements at Native Point. Time and again I thought of the bag of charred bones from a Dorset cooking hearth that I had sent almost a year before to the University of Pennsylvania for carbon 14 dating.

Charred Bones Date Extinct Eskimos

The delay, I knew, was normal. There are few laboratories equipped to make carbon 14 tests, and scientists the world over have flooded them with their dating problems. To further complicate matters, each time an atom or hydrogen bomb sends its mushroom cloud aloft, carbon 14 tests must be suspended in some laboratories until the general radioactivity of the atmosphere is once again low enough to make the delicate readings possible. My bag of bones would have to wait its turn.

One day an Eskimo boat from Coral Harbour arrived with mail. Shuffling through my letters, I spied a Philadelphia postmark and tore the letter open "...results of your Dorset sample... 2,000 years old, plus or minus 250... Looks promising, doesn't it? Good luck, Louis Giddings."

More than promising, I thought. For the first time we had pegged Dorset man to the time scale.

Now we could visualize men chipping stone implements on Southampton Island during Christ's lifetime. Even more intriguing, some of these implements closely resembled those of European Stone Age men some 6,000 years earlier.

Tools a Definite Link to Europe

How do we account for this similarity? Could chance alone have caused primitive men, separated by half a world and thousands of years, to produce almost identical implements? We think not. The tools and weapons we found bear too precise a resemblance to Mesolithic implements of Europe to be written off as mere coincidence.

Furthermore, finds of early Neolithic and Mesolithic implements in central Asia and on the Alaskan coast, both of later date than European Mesolithic but earlier than Dorset, indicate that this culture followed the age-old route of man's migration into North America.*

* See "Nomads of the Far North," by Matthew W. Stirling, NATIONAL GEOGRAPHIC MAGAZINE, October, 1949.



Sled Dog Gets Leather Boots to Protect Paws from Jagged Ice

Aiviliks hitch dogs in fan formation (page 673), instead of Alaska's tandem style. This team made the 40-mile run from Coral Harbour to Native Point in 14 hours. Protective boots leave nails free for traction.

We have no proof that the people themselves actually and physically traveled from Europe across Asia to Arctic America. This appears highly unlikely because of the vast distances involved. How then can this movement of culture be explained?

Fitting the Puzzle Together

During long periods people invariably affect their neighbors, one culture touching another, people drifting back and forth; this is cultural diffusion, not migration, though the result often is quite similar. Thus it was, we think, that Eurasian Stone Age culture spread eastward to Alaska and then to Southampton Island. Why it lived on in North America for thousands of years after it ended in Europe remains unknown. Arctic isolation is perhaps the best explanation.

How does our puzzle of the Eskimos' origin stand now? What new pieces did we find in the snowy wastes of Southampton Island, and how do they fit together?

On one side we see the Stone Age cultures of Eurasia, dating about 6000 B. C. Next comes a tantalizing gap: the time until the Dorsets appear in Canada more than 2,000 years ago. Then another piece: the similarity of Mesolithic implements to those of the early Dorset site at Native Point.

The next piece, the relationship of the Dorsets to the Sadlermiuts, who actually entered the 20th century, fairly snaps into place. There we leave the puzzle, some pieces fitting neatly together, others poorly shaped, but the gaps between them a little smaller than they were before we investigated the tumbled ruins and middens of Southampton Island.



Australian Information Bureau

↑ Racing Shells Skim the Yarra in Melbourne's Annual Henley

Australia's crews, among the world's finest, gather each March for the Henley carnival, modeled after England's famed Henley-on-Thames Royal Regatta. Fitzroy Gardens and St. Patrick's Cathedral lie beyond the stream.

Seven Arenas Dot the Olympic Field →

Melbourne Cricket Ground (left), accommodating 110,000, will witness the ceremonies, track and field events, soccer and field hockey finals. Turf shown here covers two cinder tracks; recently both were uncovered and reconditioned. Athletes will assemble on Richmond Football Ground (background). Olympic Park (beside river) combines swimming pavilion, soccer and hockey fields, and velodrome for cycling. Another cricket ground lies at center.



Sports-minded

Melbourne

HOST TO THE OLYMPICS

AIR travelers arriving this month in Melbourne, Australia, for the 1956 Olympics will quickly discover that their host is one of the world's most sports-minded cities. Even as they circle overhead, they will find Melbourne heavily dotted with playing fields, tracks, and stadia (below).

Year in and year out, Olympics or not, the Melburnian regularly indulges his love of sports. On fall and winter Saturdays suburban football teams clash with 18 men to each side. With the earliest breath of spring, countless small boys swing cricket bats, and eight-oared shells ruffle the Yarra River.

Evenings find floodlit tennis courts jammed with youngsters who dream of making the Davis Cup Team. Golfers play on 28 courses. Horse racing is so popular that the running of the Melbourne Cup calls for a public holiday in the State of Victoria, whose capital is Melbourne. Indeed, the Olympics will feel at home this year.

The Duke of Edinburgh is scheduled to open the 17-day world sports festival on November 22 in the Melbourne Cricket Ground (below, left). Amid fanfares and fusillades, a runner will enter the stadium with a flame kindled by the sun's rays on Greece's Plain of Olympia and flown to Cairns, in northern Queensland. Relays of 2,750 runners, passing the torch from hand to hand, will carry the flame to the continent's southern tip.

Thus will begin the Games of the XVth Olympiad, successor to the Greek Olympics inaugurated in 776 B. C. and revived in Athens in 1896.







AT MELBOURNE CRICKET GROUND
SEATS AVAILABLE FOR OPENING CEREMONY
ATHLETICS. FINAL SOCCER. CLOSING CEREMONY

DATE	EVENT	64	48	36	24	16	11	9
THURSDAY	22 11:50 OPENING CEREMONY							
FRIDAY	23 11:16 ATHLETICS							
SATURDAY	24 11:56 ATHLETICS							
SUNDAY	25 11:56 ATHLETICS							
TUESDAY	27 11:56 ATHLETICS							
WEDNESDAY	28 11:56 ATHLETICS							
THURSDAY	29 11:56 ATHLETICS							
FRIDAY	30 11:56 ATHLETICS							
SATURDAY	1 12:56 ATHLETICS							
SATURDAY	2 12:56							

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Crowds Surge to the Olympics Box Office on the Opening Day of Ticket Sales:

Though the Games were 18 months away, Melburnians showed their devotion to sport by buying 60,000 tickets the first day. Many waited through a bitter night. When doors opened at 9 a.m. a three-line queue stretched 100 yards. The box office occupied most of a floor of the Myer Emporium, largest department store in the Southern Hemisphere. Tickets ranged from 9 shillings (\$1.01) to 64 shillings (\$7.17). Best seats sold out by nightfall.





Skyscrapers Soar Where Stone Age Men Lived 121 Years Ago

In 1835 a sheep farmer named John Batman sailed from Tasmania to the empty plains of southernmost Australia seeking new grazing grounds. At the head of Port Phillip Bay he found a river, and his party named it the Yarra Yarra, adopting an aboriginal term meaning "large stream."

"This will be the place for a village," Batman wrote. Land-hungry Tasmanians quickly followed his lead, buying half a million acres from the aborigines and establishing a town despite the frowns of the royal governor at Sydney. They named the community for Lord Melbourne, England's Prime Minister.

Seldom has the world seen a city develop so fast. The discovery of gold near by, luring fortune seekers by the thousands, spurred the boom. Today, less than a century and a quarter later, the "village" spreads 310 square miles around river and bay, and bustles with nearly 1,600,000 people. A busy seaport and trading center, Melbourne ranks ninth in size in the British Commonwealth and next to Sydney in Australia.

Here the Yarra flows past narrow Flinders Street Station (right center), which handles a flood of commuter traffic.

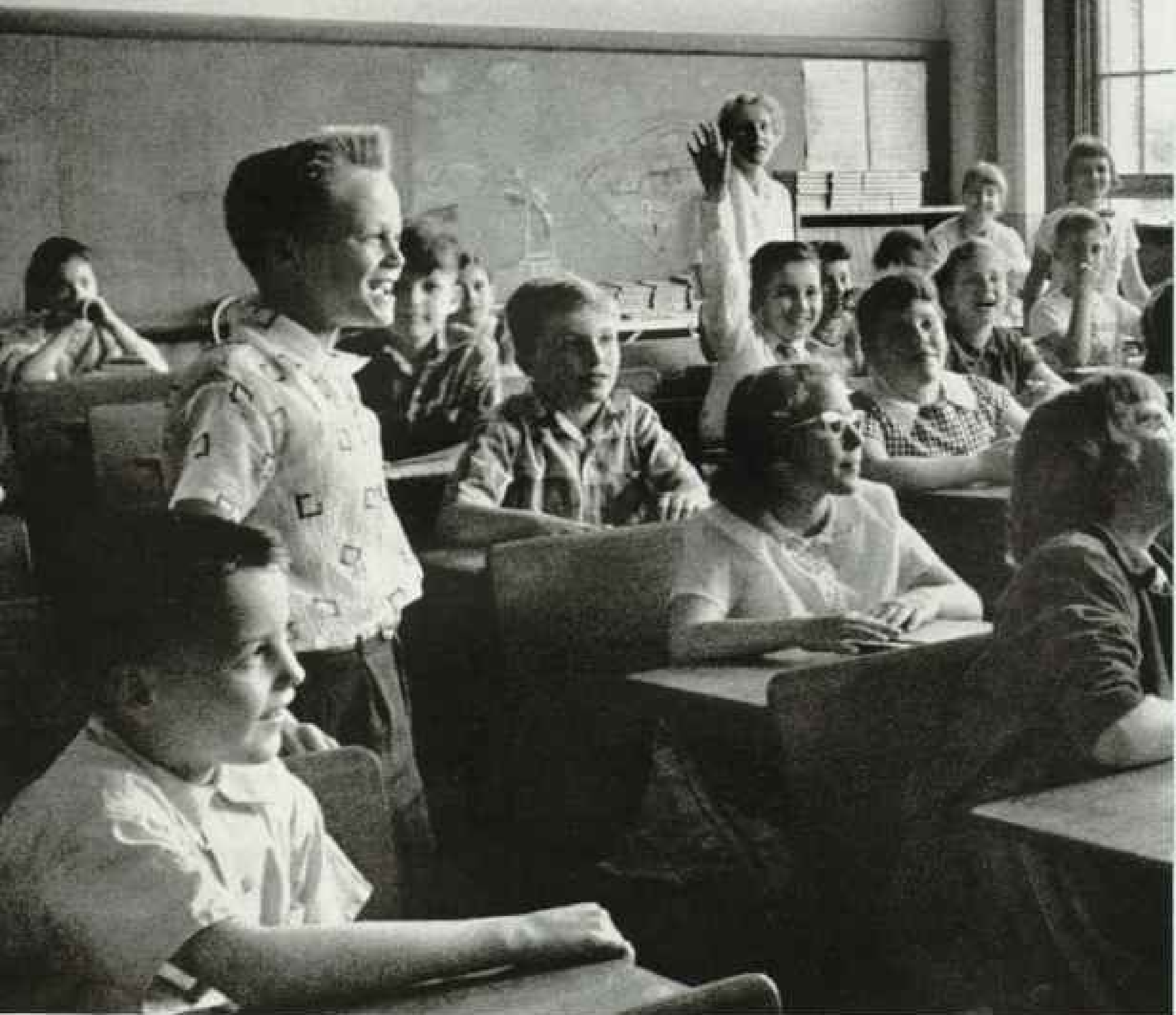
Set in a park beyond the business section, the domed Exhibition Building will house Olympic wrestling and weight-lifting contests.

An 850-dwelling settlement (lost in the haze) has been built to house some 6,200 athletes and officials expected from 75 countries. Dubbed Olympic Village, it operates its own medical and shopping centers, dining halls, and theaters.

Cliff Battersley,
Australian Information Bureau

ZOO ANIMALS GO TO SCHOOL

By MARION P. McCRANE



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MISS Alice Kirkpatrick's fourth-graders in Public School 36 in the Bronx were excited and full of questions about the furry animal on my arm.

"No, she's not a monkey," I replied to the boy with the crew cut. "She's a kinkajou. That's a sort of raccoon from Central and South America. Kinkajous like sweet things, and sometimes they'll raid a beehive to get honey. That's why they're also called honey bears."

"Can I keep one at home?"

"Well, they make good pets, but they're very delicate. They must be kept warm all

the time, or they'll get a chill. Then they might get a cold or pneumonia, just like you."

Encouraging youngsters to ask me such questions is a big part of my job as the "Zoo Lady"—the traveling lecturer from the New York Zoological Park, better known as the Bronx Zoo. I talk to about 30,000 children a year, in schools within 25 miles of New York City, and show them tame animals I bring along from the zoo.

The purpose is to stimulate the youngsters' interest in zoology, to give them a close look at each animal while they hear about it—where it lives and what its habits are. I also



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let them touch the animals. In a way this helps fill a gap in the relatively petless lives of city children.

Their reaction to their animal visitors is always the same: wide-eyed wonder and bubbling delight. For most of them have never seen, let alone petted, such marvelous creatures as Puff and Marshmallow, the Japanese silky fowl; Prickles, the European hedgehog; Buttercup and Cappy, both de-scented skunks; Captain Hook, the screech owl; Pogo, the

*Illustrations by W. E. Garrett,
National Geographic Staff*





"Zoo Lady" Heads Schoolward. Tame Animals Ride in Ventilated Cases

Marion McCrane, the traveling lecturer for the New York Zoological Park, delights more than 30,000 school children each year by taking live animals into classrooms. Youngsters have affectionately nicknamed her the "Zoo Lady." For each school visit, the author usually selects a mammal, reptile, and bird from the zoo's 2,600-odd animals. Lectures are free; schools provide transportation. Pets are small and easily carried.

opossum; Albert, the alligator; or Otto, the potto, a lower primate from the Belgian Congo (opposite and page 701).

More than once I have been surrounded by earnest third-graders begging me to "Leave just one of the animals" for them, or, if I couldn't do that, to "Come back tomorrow." And a girl from the sixth grade wrote: "The program was so good that when the bell rang we didn't want to go home to lunch, which is very unusual."

All Children Love Animals

Part of the excitement is due, I suppose, to the break in classroom routine. But I am convinced that it stems primarily from the children's natural, deep-rooted love of all animals. This was especially brought home to me at a recent pet show in a New York department store. As one of the judges, I was inspecting snails, guppies, hamsters, caterpillars, white mice, salamanders, frogs and

toads, when a little girl came up with what seemed simply a glass full of mud.

What was her pet? She beamed and said proudly: "Worms."

Questions Tumble from Eager Lips

It would seem that rare and exotic animals would be the most popular in the classrooms, but this is not always true. When I bring familiar ones—rabbits, guinea pigs, or turtles—they too are always loved.

The boys and girls often are speechless at first. But they recover quickly and bombard me with questions. How much does he cost? Where can I buy one? How old is he? How big will he get? How long will he live? How much does he weigh? How big are the babies?

Invariably, there are questions about reproduction, such as "Does he come from an egg?" These are perfectly natural inquiries, and I try to answer in terms the children will understand. I was momentarily stumped, however,

by "How does a mother know if she should lay eggs or have babies?"

Even extremely shy children will wave frantically and nudge out classmates to learn more about an animal. Suburban children with a good deal of experience with animals are no less thrilled by the traveling pets. Their eyes become wide as saucers and they grin from ear to ear when I tell them that a newborn baby possum is smaller than a honey-bee, or that skunk musk is used to make perfume.*

Why the Owl Flies Silently

They are amazed that the owl's feathers are fringed with down, so that it can fly silently; that the kinkajou can use its long tongue like a spoon to scoop out fruit; that the alligator has extra eyelids—transparent, to protect its eyes underwater; and that the Japanese silky fowl are the only chickens in the world with dark-blue skin. At times the rapt faces of my audience have captivated me so completely that I have forgotten what I was saying and have had to begin all over again.

Children show very little fear of animals, except possibly snakes. These always cause a sensation in any group old enough to have heard of venomous species, but snakes have a fascination that's hard for a child to resist.

I take only harmless snakes to school, of course, and once the children are convinced that they are not dangerous they notice the lovely colors and patterns of the skin. They try to figure out how a creature without arms or legs can move so gracefully. Gradually they become so engrossed that fear melts away and they begin to look on the snakes as pets.

I give simple, everyday names to the animals because they help put the children at ease right away. But this name-giving caused a misunderstanding not long ago.

Children kept coming to the zoo's Reptile House in-

quiring after someone named George. Finally the head keeper asked one boy why so many people wanted to see George when no one by that name worked there.

"George isn't an ordinary old *person*," the boy said. "He's a *snake*, a friendly snake!"

But since the mystery of George I make quite sure that the zoo people also know just what I name their charges.

Snakes are marvelous lecture animals, especially suited for scotching fallacies. The children can see, for instance, that snakes are neither wet nor slimy, that they are really dry and warm.† Then there is the belief ingrained in human beings that a snake's tongue is poisonous, or a "stinger." I point out that the tongue is simply a delicate sensory organ. It helps the snake in smelling.

To prove that a snake's tongue is harmless, I put my finger in front of George's nose.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Br'er Possum, Hermit of the Lowlands," by Agnes Akin Atkinson, March, 1953; and "Skunks Want Peace—or Else!" by Melvin R. Ellis, August, 1955.

† See "Our Snake Friends and Foes," by Doris M. Cochran, with 15 illustrations in color from paintings by Staff Artist Walter A. Weber, NATIONAL GEOGRAPHIC MAGAZINE, September, 1954.

Otto, the Potto, a Lower Primate, Starts a Day's Journey

Petting Otto is Dr. Fairfield Osborn, naturalist, conservationist, and president of the New York Zoological Society, which operates the Bronx Zoo.







Fear Turns to Fascination as Schoolgirls Discover Inky's Friendly Nature

"Snakes are marvelous locust animals," says the author, "for fallacies can be explained and the children taught not to persecute beneficial species. If a snake is not included in the day's program, the girls and boys make me promise to bring one next time."

When youngsters realize the snake won't harm them, they move in closer to see the skin pattern and to feel the scales.

Maggie, another snake that often accompanies Miss McCrane, inspired one little girl to write an essay:

"Yesterday we had a visitor from the Bronx Zoo. She brought a boa constrictor. The snake was named Maggie and it was covered with a design. I was afraid to even touch it. But someone pushed me, and I touched it, and I liked the feel."



For a moment the audience is aghast. Then everyone wants to try it.

I admit that I was squeamish about snakes myself until I learned something about them. Since then snakes have won me many friends and helped me through some trying moments. The worst was in a reform school for boys from 11 to 16, who met me with resentful looks and murmurs of scorn. Such animosity was completely new to me, and my knees started to knock. What would these youthful cynics say to the furry kinkajou and the cuddly skunk?

George Saves the Day

Luckily I had also brought George. Now a two-foot hognose snake isn't the most impressive reptile in the world, but George, bless his heart, was big enough. As soon as I took him out I heard the old familiar gasp. Faces broke into smiles and hands shot up as the boys thought of questions. They loved all the animals, and even I turned out to be "O.K. for a girl."

Small, informal groups are ideal for my sort of lecturing, but in large, overcrowded city schools I often have to talk to many children at a time in an assembly program. I hold each pet while I talk about it, and then carry it around the room during the question period.

I often give some of the animals partial liberty on a leash. Running about on a school stage is apt to give them dusty paws, and then when they jump on me at the end of my talk they leave marks. These kept my cleaner curious for a year, until one day he asked, "How do you get so many footprints on your dresses?"

I try to take a bird, a mammal, and a reptile on each trip, and fit my talks to the age level of my audience. Take, for example, the kinkajou and its tail.

To the six-year-olds in the first grade I say simply that kinkajous can swing by their tails, as some monkeys do. To third-graders I point out that this tail is what we call a

grasping tail, or, to use a technical word, a prehensile tail. Third-graders remember such terms pretty well. Older children, in the sixth or eighth grade, hear that the kinkajou is a tree dweller and that its tail is an adaptation to its surroundings.

I am often asked, "What is the children's favorite animal?" I cannot even guess. Their thank-you letters tell of particular favorites, and these are as varied as the children themselves. Typical comments are:

"Marshmallow was a lovely rooster."

"The animal I liked best was the skunk. I liked her face because she had a round nose and baby eyes."



Zoo Train Passengers Get a Preview →

Last year tame animals provided an added attraction for these New Englanders who ride to the zoo aboard special excursion trains.

"Zoo trains are a smash hit," reports the author. "Everyone has a good time, and the animals are just as calm as in an ordinary classroom."

Here Miss McCrane roams the aisle with Otto, the potto. Herbert J. Knobloch, head of the zoo's Education Department, carries Bobbert, a sparrow hawk.

"Maggie is a snake from South America. I like Maggie a lot. I really like her."

If any generalization can be made, it would be that boys tend to prefer reptiles—snakes, turtles, lizards, and crocodilians.

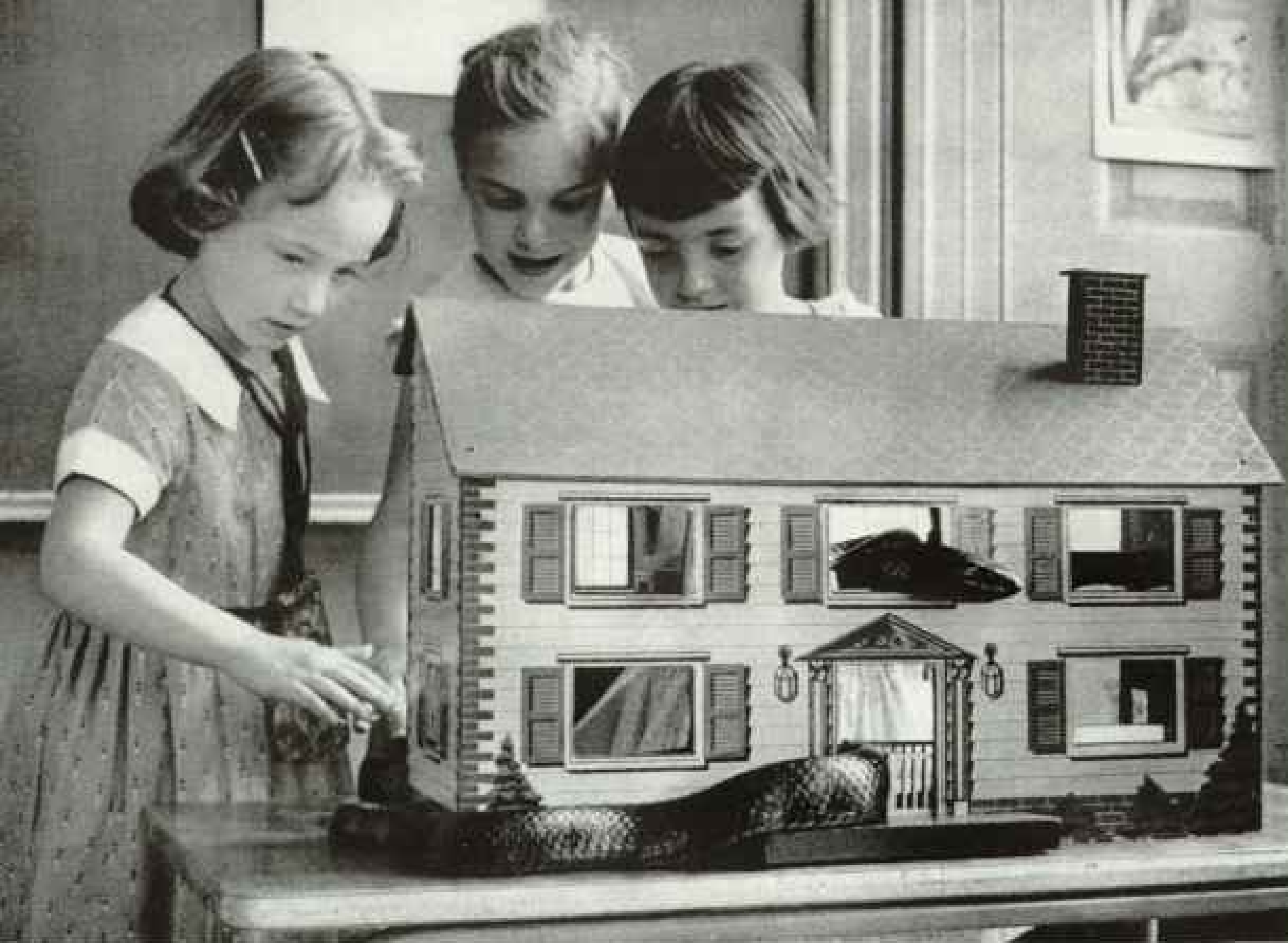
Of course when an animal does something unusual he is likely to be named the favorite of the entire class or school. Kenneth, my vivacious wanderoo monkey from India, is a master at this—stealing pencils, erasers, books, plants, chalk, or my jewelry. If there is a piano in the room, he'll hop up and down on the keys. He loves to go to school. Whenever he sees his carrying case, he climbs in, impatient to be off.

The antics of Tinker, the kinkajou, also enchant teachers and pupils alike. She likes to wrap her feet, legs, and tail around a microphone. She sniffs loudly into the sound head while I try to talk, and then slides down the stem like a fireman down a pole.

Tinker usually awakens slowly. When I take her out of her carrying case in a schoolroom, she yawns and stretches. If I give her a chance, she'll dash back into the case and close the lid—anxious to get back to sleep.

Anyone in the animal business knows how foolish it is to predict what an animal will do, but I had watched this performance so many times that finally I couldn't resist.





Inky Investigates a Dollhouse and Rejects It as Permanent Quarters: Too Small

After explaining Tinker's expected behavior to a particularly nice group, I released her. To my embarrassment, Tink bypassed her carrying case and dived under the curtains of the auditorium stage. My audience waited politely while I crawled on hands and knees around the pitch-black stage interior until I could feel her little body.

Discipline varies from school to school, and so I find receptions ranging from well-mannered and quiet but bursting-at-the-seams anticipation to noisy, jumping-up-and-down excitement. Sometimes the teachers are appalled by their pupils' behavior. But a reminder that noise frightens the animals is usually enough to restore order. If it looks as if the room will dissolve into chaos again, I put the animal I am discussing back into its carrying case. This gets silence immediately, and, I might add, looks of utter dismay.

Zoo Lady Loves Her Charges

Working with these tamed wild animals has brought me a deep love for each, partly because they respond so well in what to them must be frightening situations. One of my most pleasant duties is to let the animals

get to know me so they will have some sense of security in unfamiliar surroundings.

When we visit a school, the animals' welfare is always my first concern. There is time out for rest or a drink, and I show the children how to hold and pat them. (Don't poke at them. Keep hands away from their eyes. Pat slowly in the direction of the fur. Give them plenty of support, so that they won't worry about falling.) I take along peanuts for Kenny, or a blanket for Otto. In winter I sometimes put heating units into the carrying cases.

Bouquet Makes a Snack for a Skunk

Most of these animals have stayed overnight in my apartment when I wanted them for a television show early the next morning, or when they were very young and needed extra care. I started taking Cappy home over week ends because he was such a tiny orphaned skunk. That was more than a year ago, and Cappy is still home because I cannot bring myself to part with him. In the morning he rides to work with me on the bus.

Such unusual pets are apt to be mischievous at home, but so far there have been only

minor incidents—wastebaskets overturned, cookie jars raided, and bouquets ruined; Tinker and Cappy love to eat flowers. Pots and pans fascinate some animals too. However, by tying cupboard door handles together I save my food and utensils.

I was in a real quandary, though, about Maggie, my big, beautiful boa constrictor. I took her home one bitter winter night for a TV show the next day, and I worried because snakes are very sensitive to temperature changes. My apartment was a far cry from the 80 to 85 degrees in the Reptile House, and a chill might have been the end of her.

Maggie Shares the Zoo Lady's Bed

When the temperature dropped to 62 degrees, I bundled up the snake as best I could. But it didn't do much good. Maggie was cold. So I put her back in the cloth sack in which my snakes always travel, and tied a secure knot. Then I took her to bed with me. Next morning she was fine, warm and ready for the show.

Maggie is one of the gentlest animals I ever handled, but she is big and heavy. Six and a half feet and eight pounds of snake is quite difficult to hold for any length of time, so I loop her over my shoulder or drape her around my waist while talking to audiences.

But on the stage of a large Manhattan school Maggie once wound herself so closely in and out of my belt that I had to take it off in the middle of the program to disentangle us both. The children shook with laughter as my dress hung shapeless as a nightgown. But within a few minutes we were all fascinated by Maggie again and forgot about my appearance.

Maggie had certainly made a hit, as was shown by this report from a fifth-grader:

"Today Miss McCrane came from the Bronx Zoo. She brought a hedgehog and a boa constrictor. I liked the boa constrictor best because it wrapped around Miss McCrane. We were allowed to touch it. I felt its tongue and it felt like sandpaper and its skin felt like leather. The snake's name was

Albert Alligator, Relaxed and Statue-still, Models for a Young Artist





Maggie. She was so colorful and beautiful that I wish she were mine."

I have been the Zoo Lady for two years now, but the School Lecture Service itself dates from 1944 and is part of the Bronx Zoo's Education Department, established by the New York Zoological Society in 1929. This department provides many free services.

There's the Question House, for instance, where visitors ask about the zoo animals and the care of pets. Guided tours are organized for groups from the fifth grade or higher. The department also helps

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Joy Shines in the Faces of Hospital Shut-ins When the Animals Pay a Call

to produce and distribute films for rent or sale, conducts courses for Scout leaders and teachers, and handles inquiries by mail and telephone. But its most popular activity is the School Lecture Service, and all the zoo people cooperate in supplying us with animals.

The Animal Hospital reports baby arrivals. The Bird House lets us know about new tame hawks or owls. The Children's Zoo is always glad to lend a possum, rabbit, or fancy chicken for the day. The Mammal Department has purchased animals especially for

our lecture service. The keepers in the Reptile Department have obligingly stretched out snakes to measure them precisely, because one of the children's first questions about a snake is, "How long is he?"

Frequently we get requests for the traveling pets from children's wards of hospitals, and even when our schedule is full we try to make room for one more visit. Perhaps I only imagine this, but it seems that the animals are especially tolerant of the necessarily awkward handling they get from sick young-



Braces and Wheelchairs Are Forgotten; Eyes Rivet on George, a Hognose Snake



"He Feels So Soft!" Hands Reach Out for Marshmallow, a Japanese Silky Rooster

sters. Hospitalized children cannot match the delighted exuberance of healthy children, but I know that the animals bring them no less joy and happiness.

Visits to the children's wards have given me some of my most poignant memories, especially the little boy who loved Pogo so. This tiny boy was incurably ill in one of the big city hospitals. When I told him about Pogo, his enormous brown eyes slowly opened. I put the snuffly old possum in his arms, and he smiled the warmest and most beautiful smile I have ever seen. Tears were in everyone's eyes, for the nurses said it was the first time he had smiled in his three and a half months in the hospital.

Blind Child "Sees" a Rooster

Handicapped children tour our zoo in a little tractor-drawn train. In the Children's Zoo, blind youngsters can hold animals. I will never forget one little blind girl who meticulously examined a rooster with her sensitive fingers and murmured to me happily, "He's beautiful!"

Perhaps my most challenging lectures have been before special classes for children who

are hard of hearing. I had to speak slowly so that they could watch my lips. For my first visit I took along a spunky rooster who likes to crow. He does this often, but never at the right time—preferring to embarrass me by cutting loose at a busy street corner. On my second trip I knew better, and brought Bobbert, the sparrow hawk.

Bobbert Pierces the Sound Barrier

Sparrow hawks, or American kestrels, the smallest hawks in the United States, are known for their loud, piercing cry: "killy-killy-killy." I knew Bobbert would screech in protest every time she was stroked.

It proved to be a supreme thrill for these children. Their faces almost burst with enthusiasm. They shouted with joy, and some kept pointing to their ears.

Apparently Bobbert's shrill noises were audible to a number of them, although they had difficulty in hearing normal human speech. For some it may have been the first animal sound they had ever heard.

Poor Bobbert looked a bit annoyed the rest of the day. But somehow I don't think she really minded.

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A notable undertaking in astronomy was completed in 1954 by The Society and Palomar Observatory of the California Institute of Technology. This project photomapped vast areas of space, making available to observatories all over the world, at less than cost, the most extensive sky atlas yet achieved.

The Society and individual members contributed \$100,000 to help preserve for the American people the forest of California's sequoias, the Giant Forest in Sequoia National Park.

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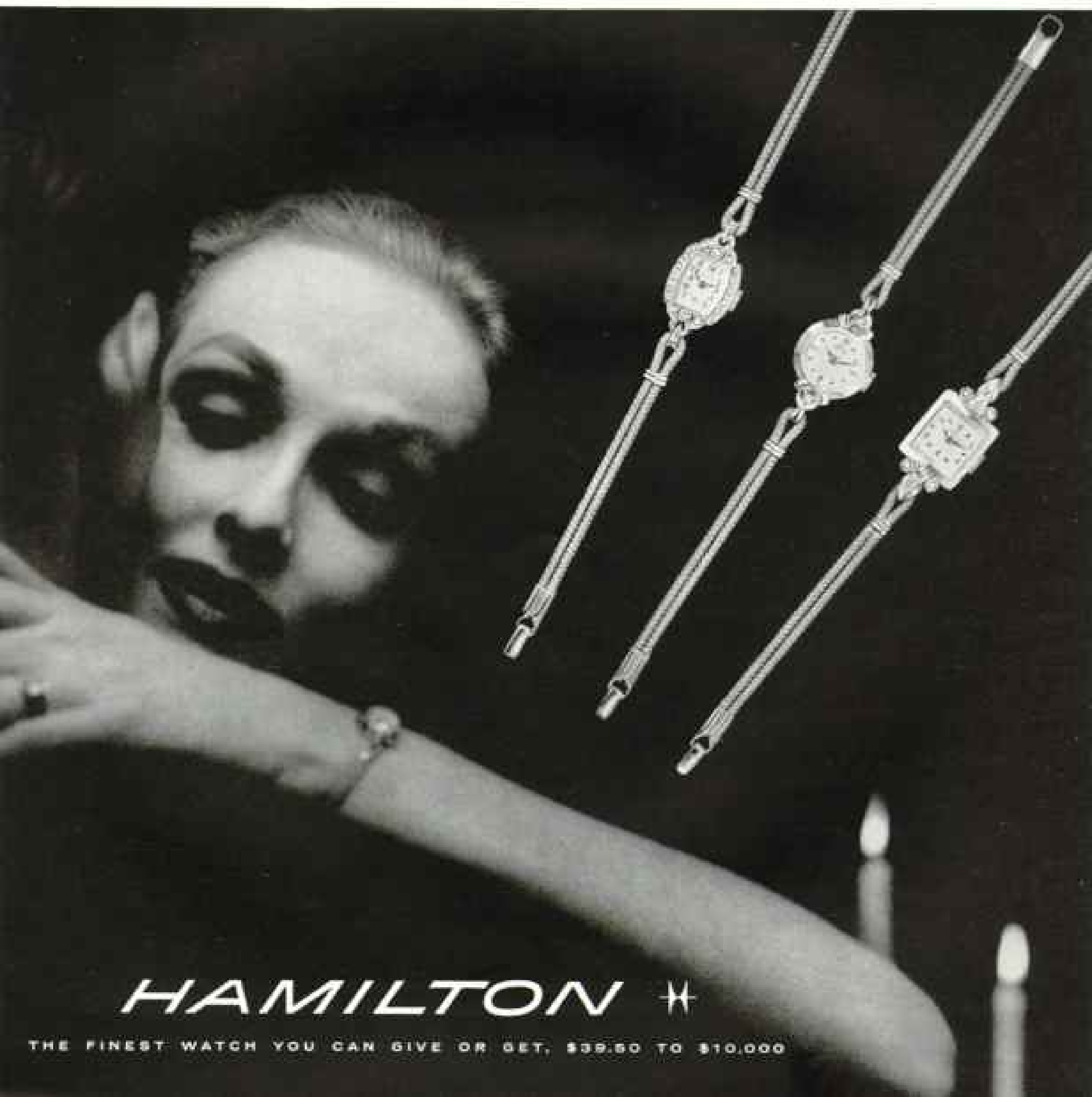


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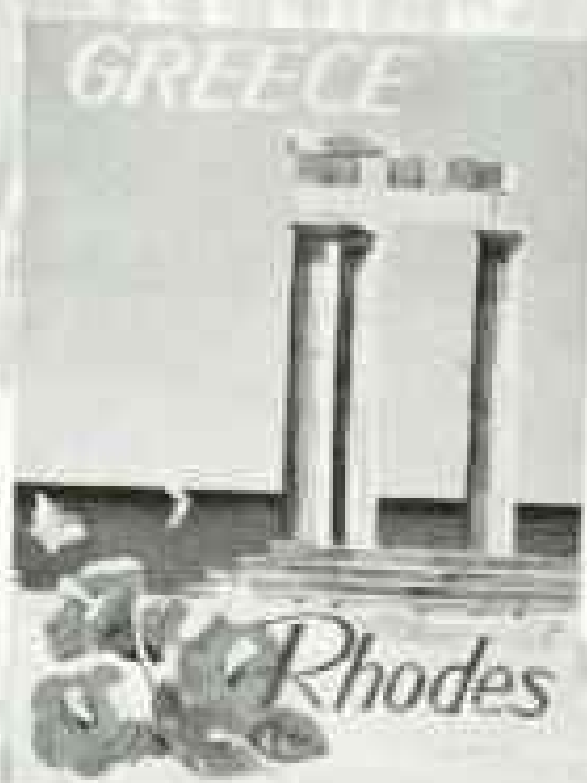
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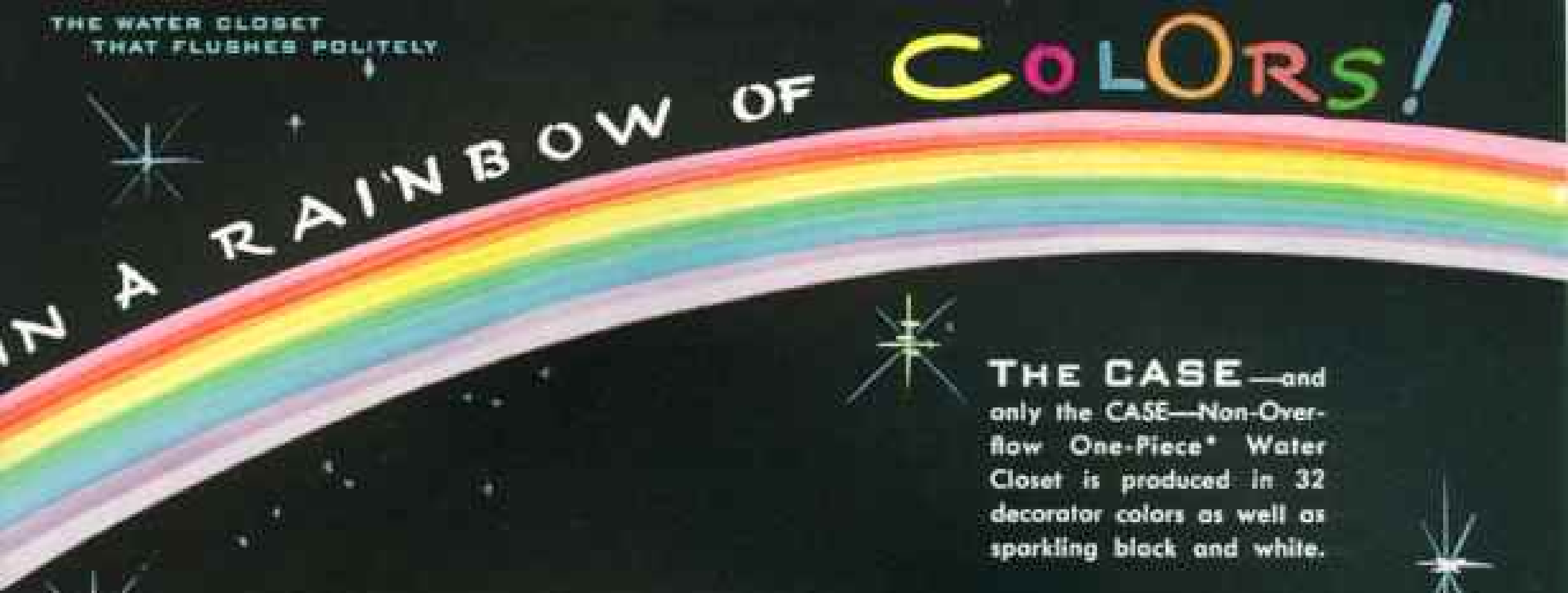
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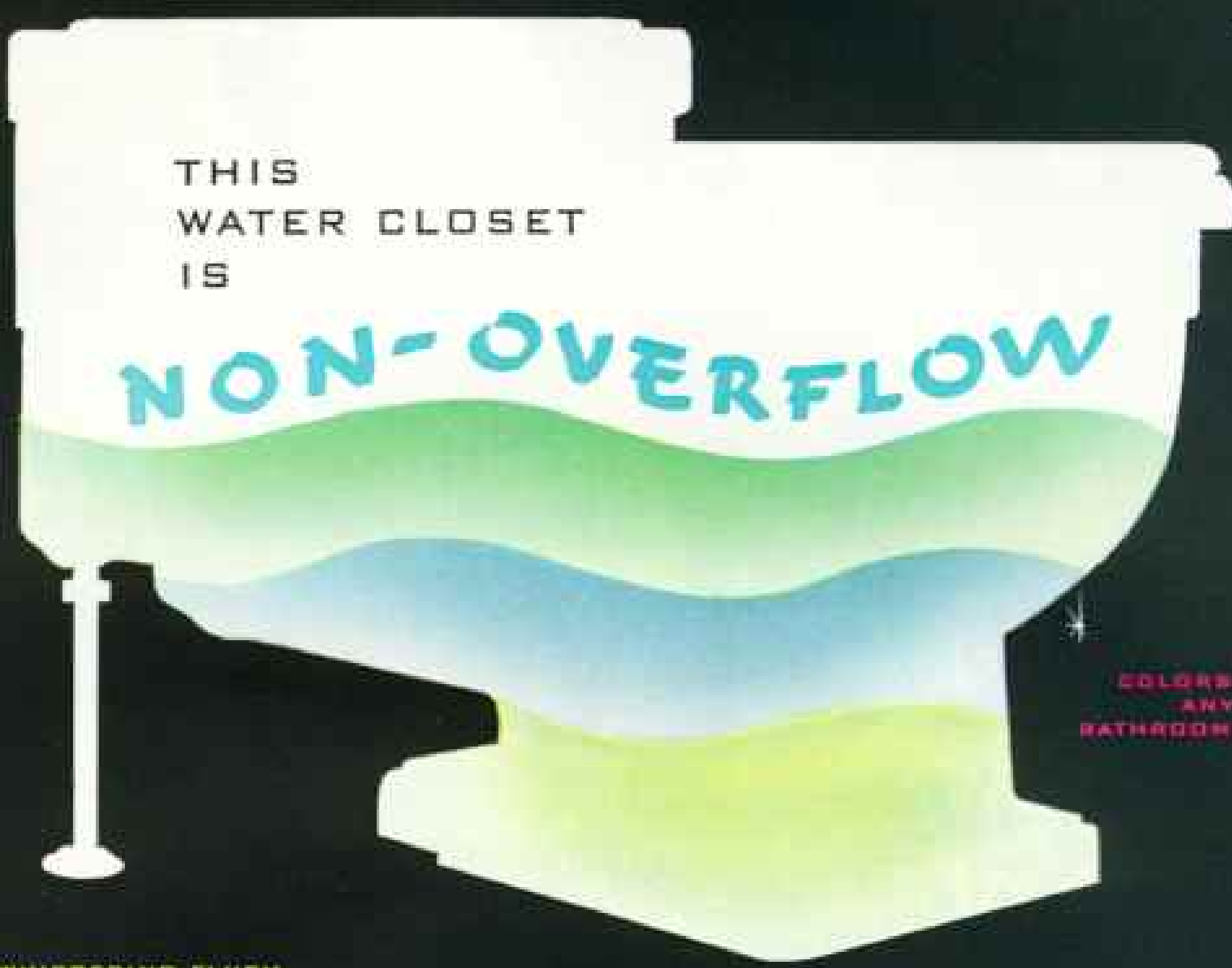
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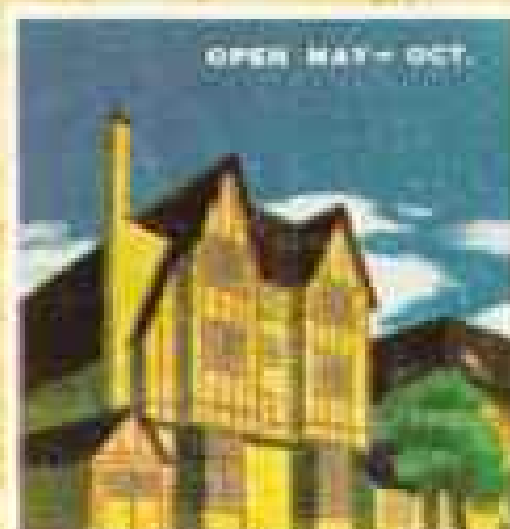
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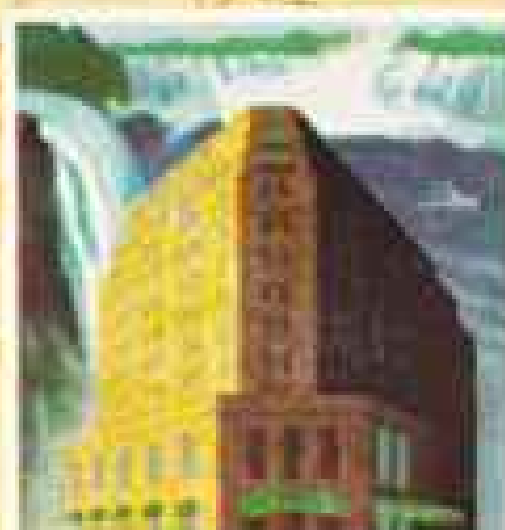
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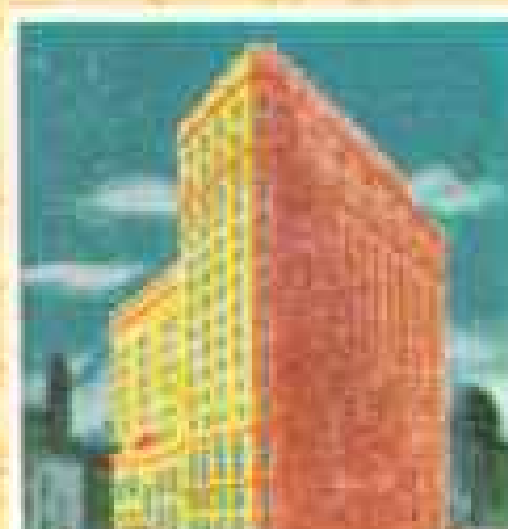
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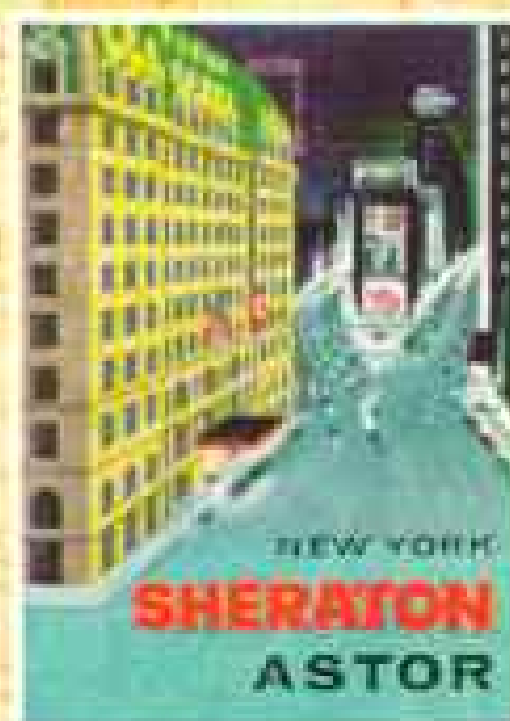
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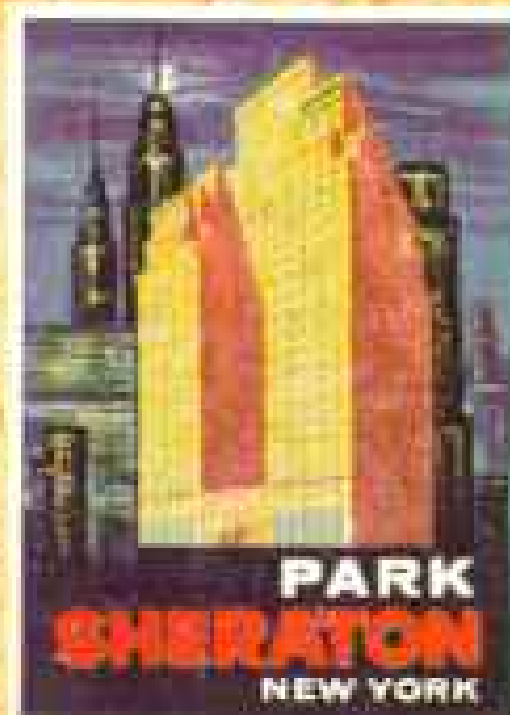


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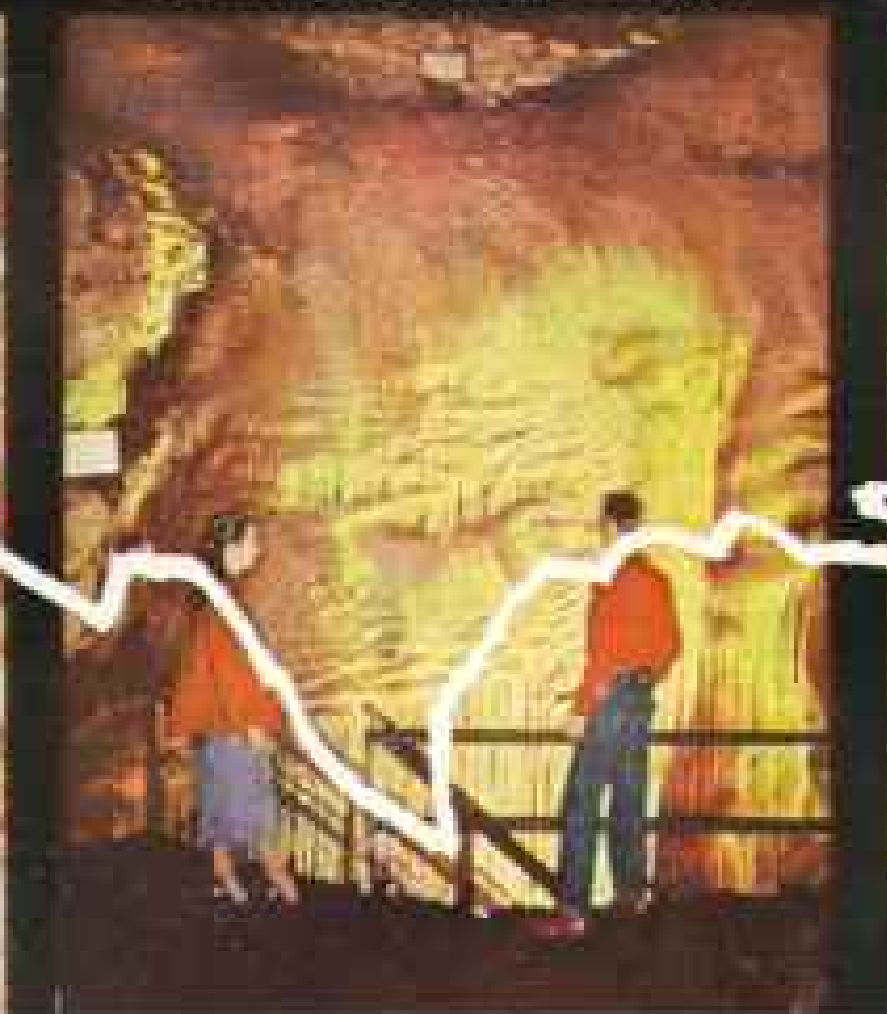
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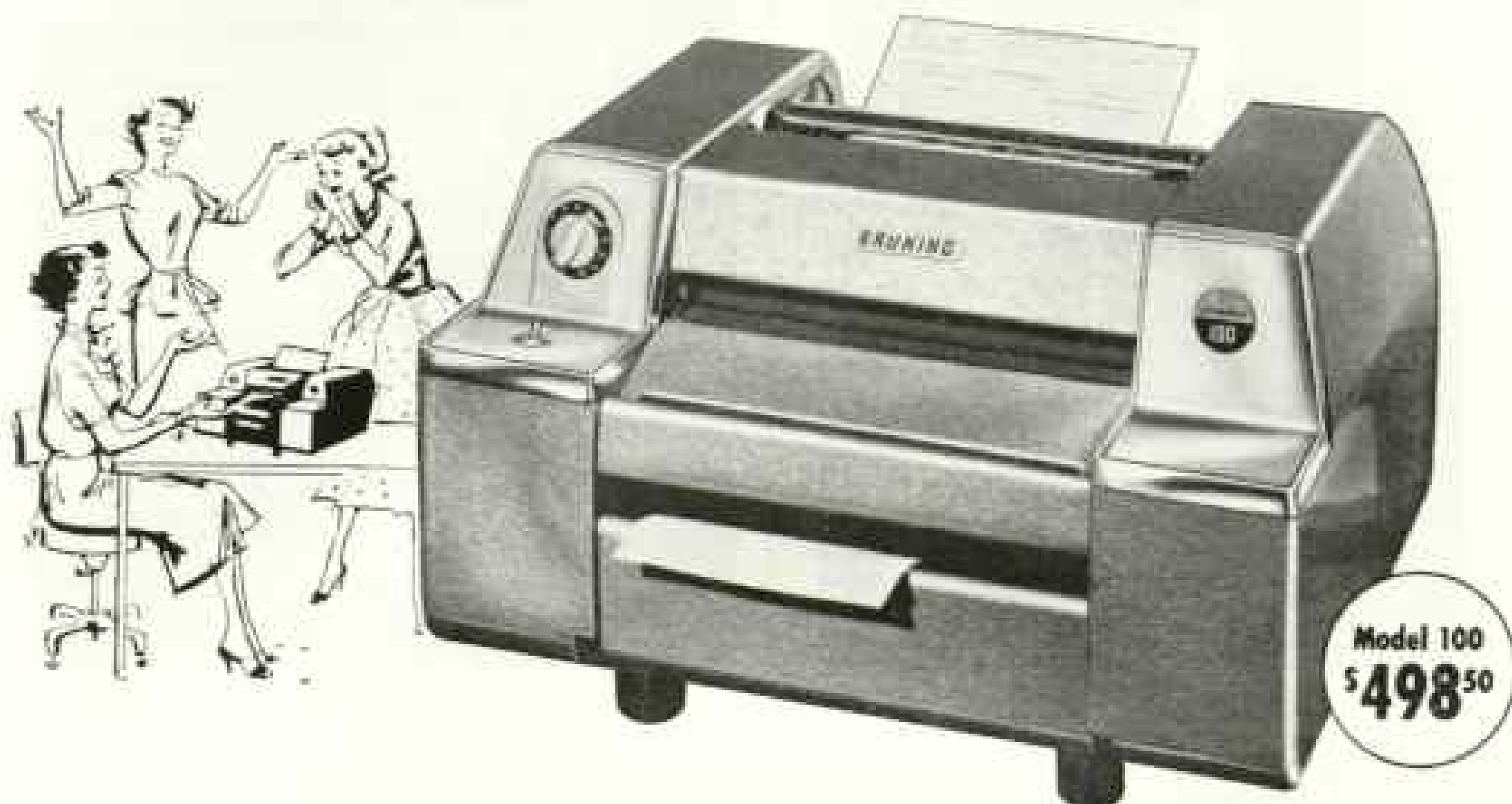
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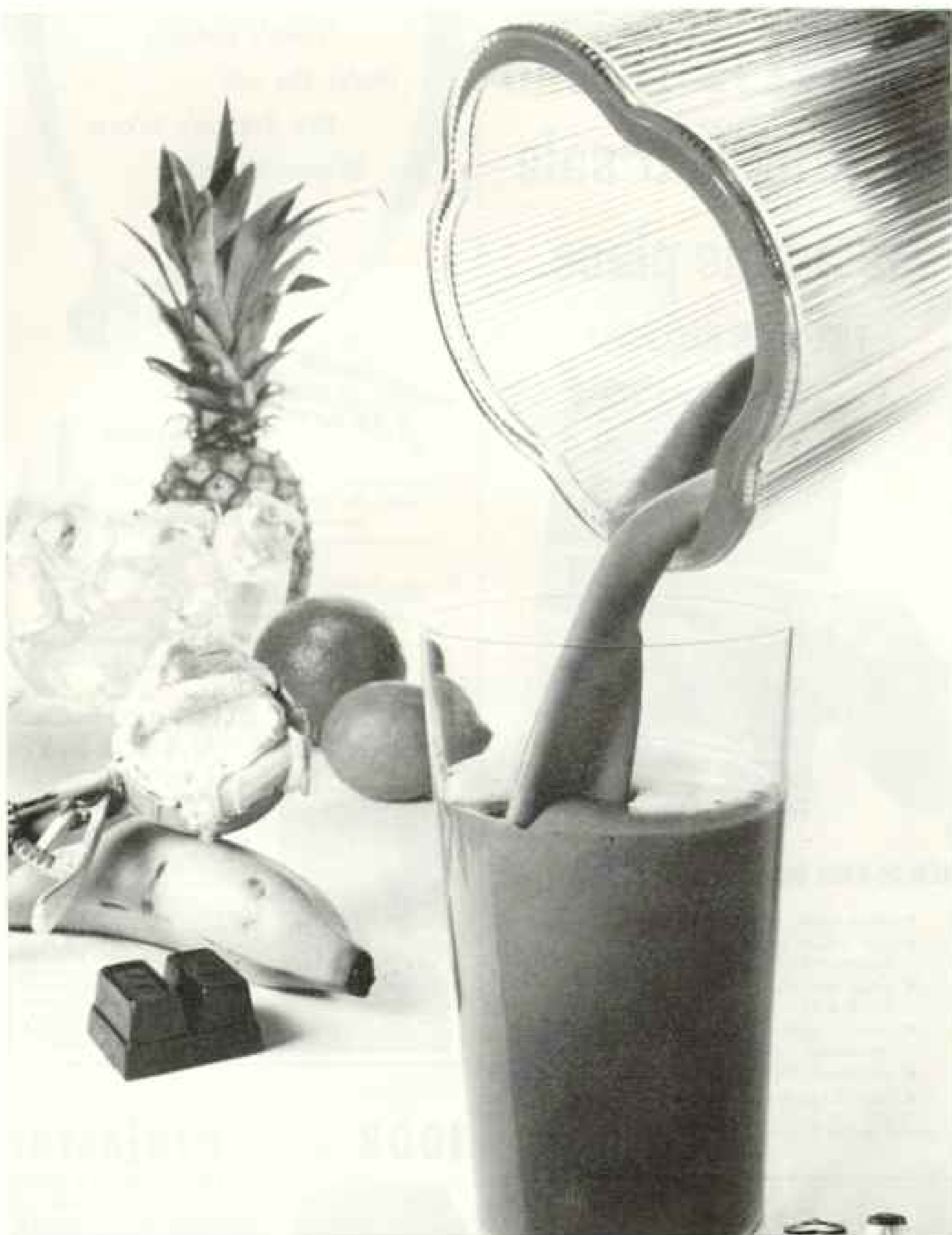
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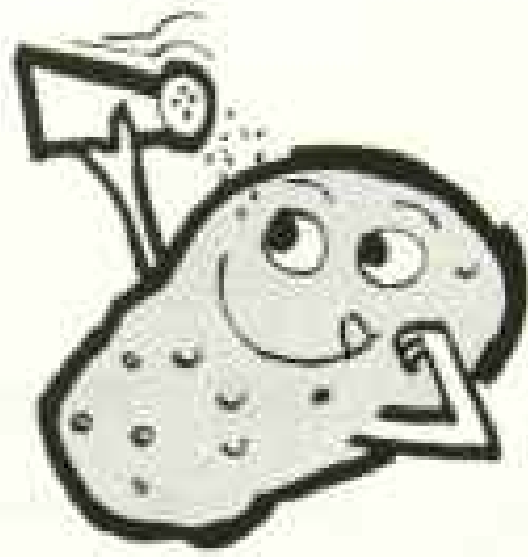
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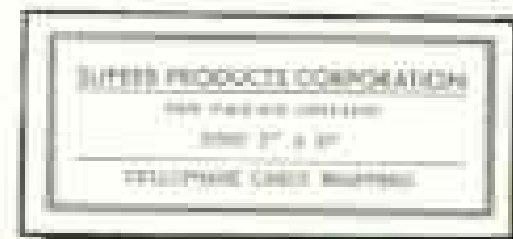
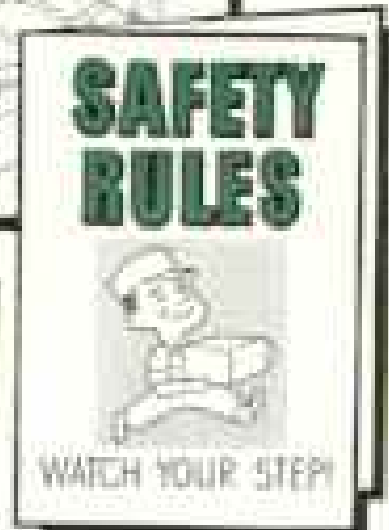
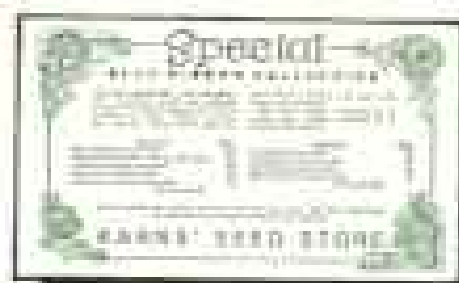
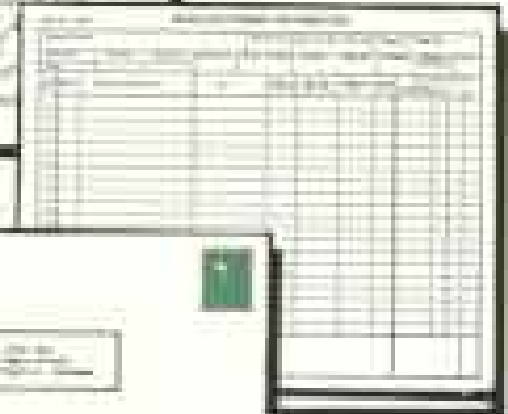
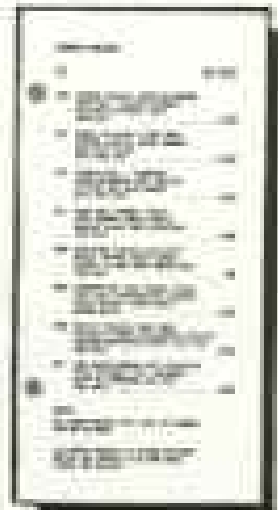
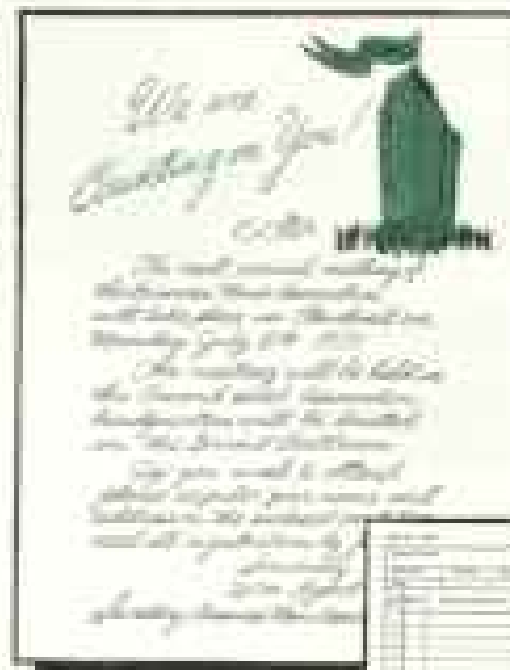
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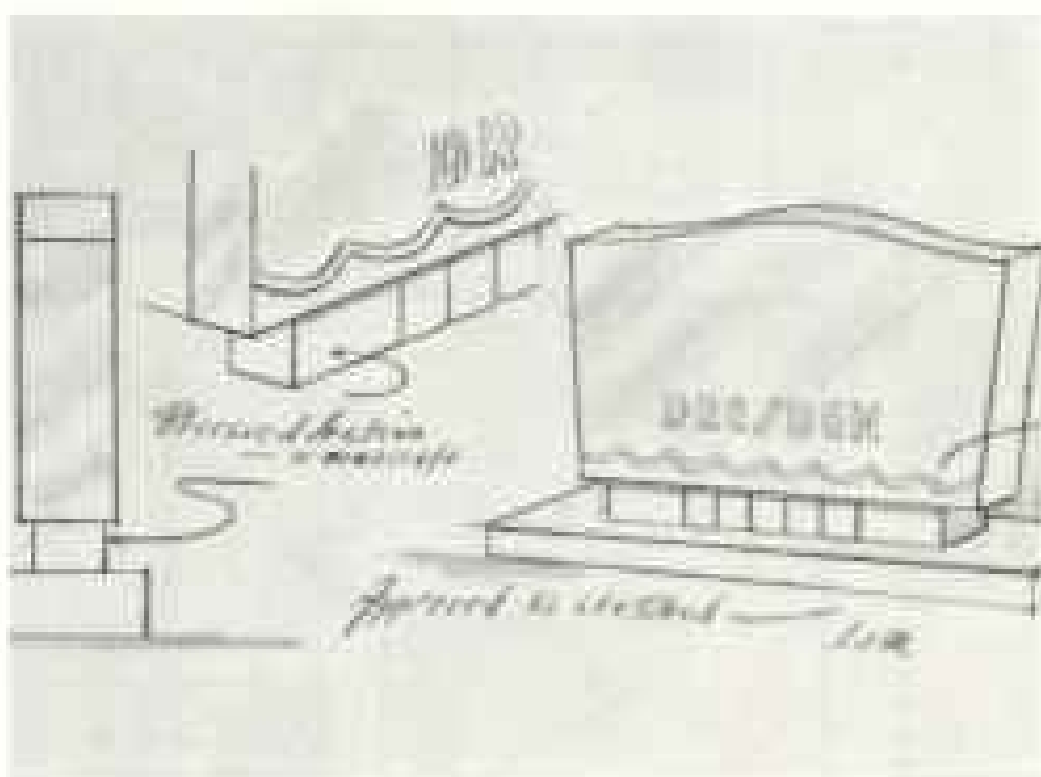
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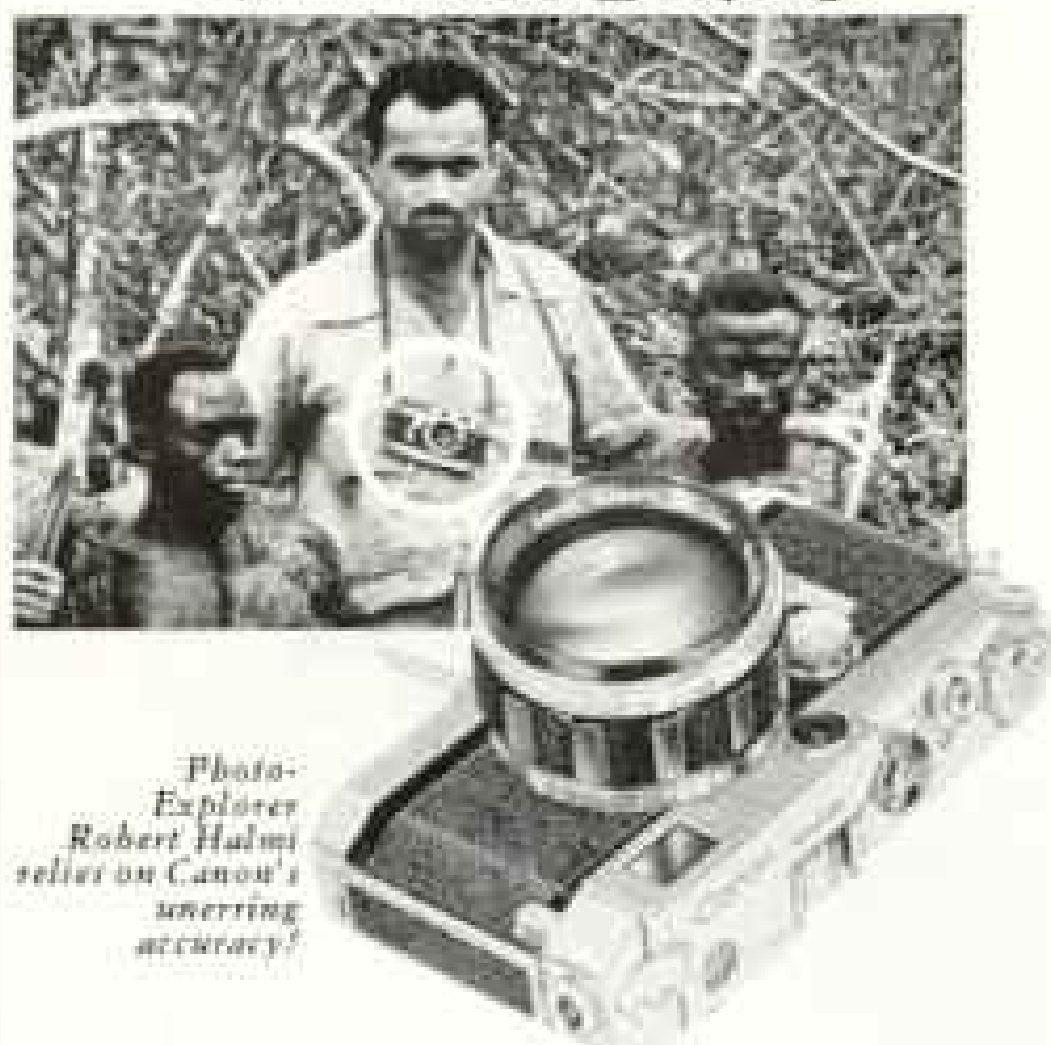
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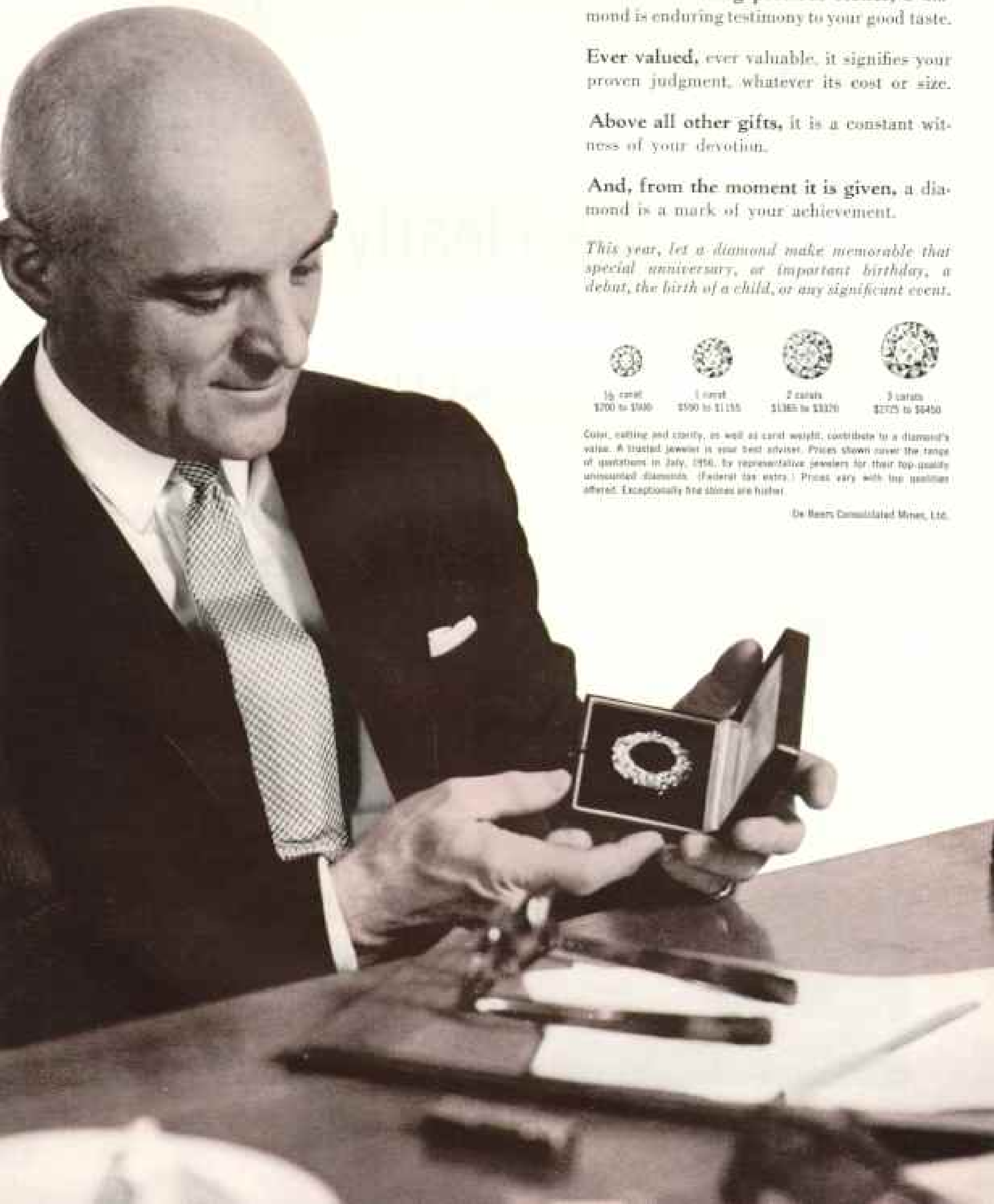
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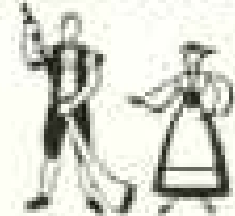
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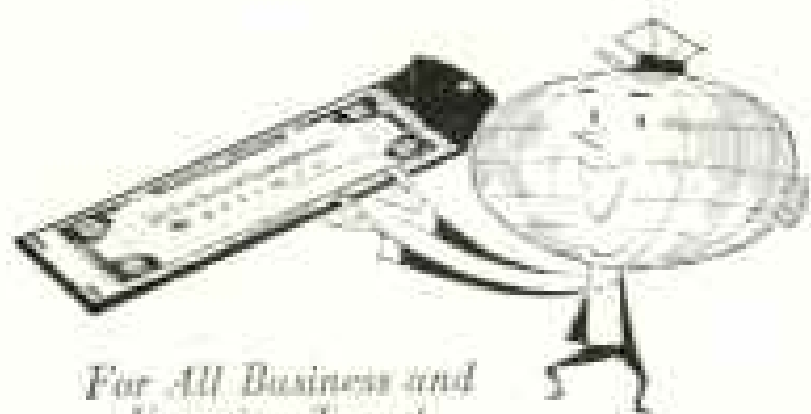
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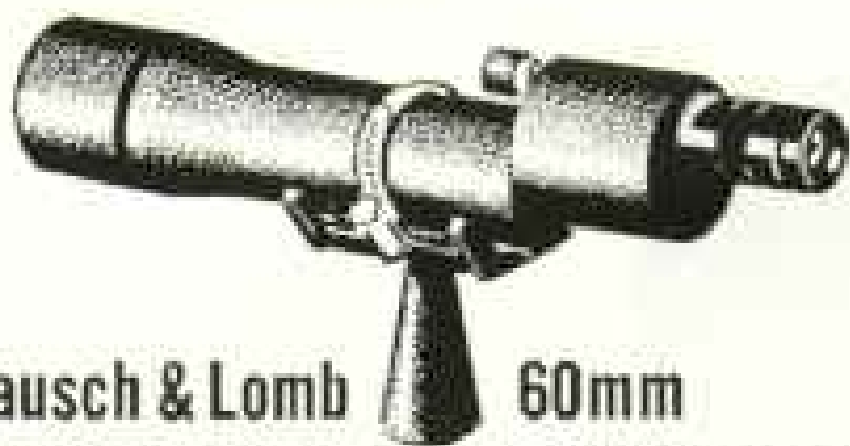
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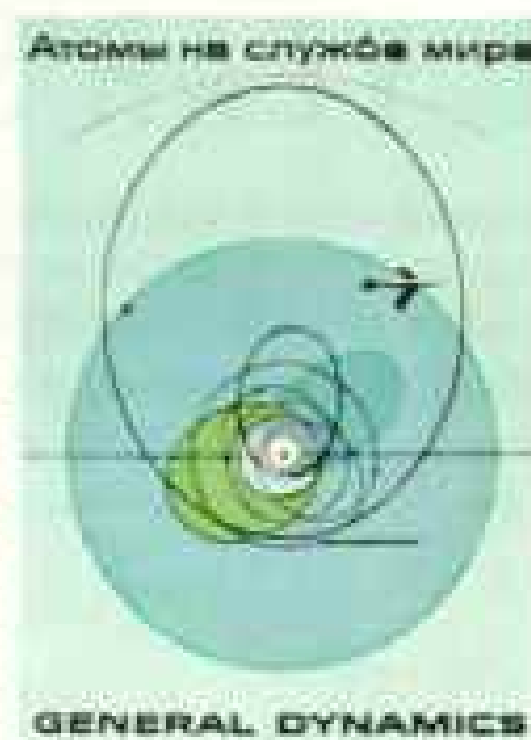
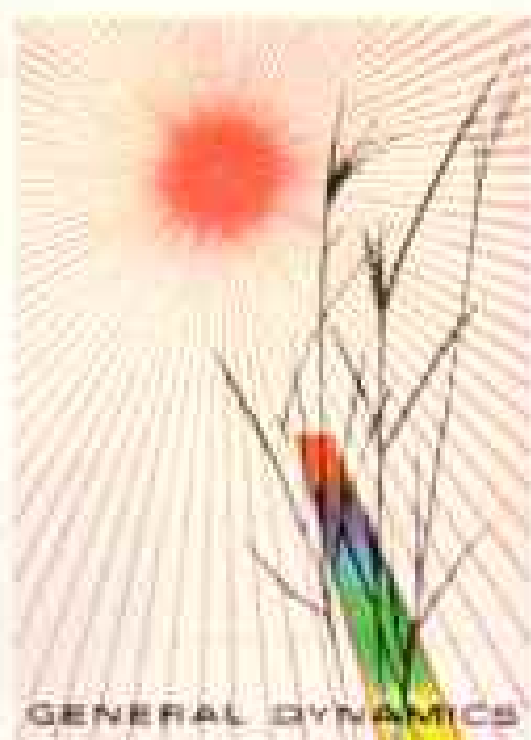
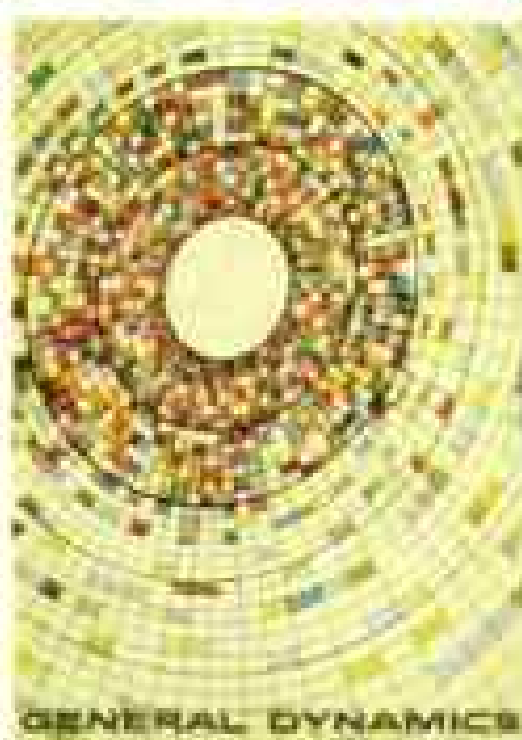
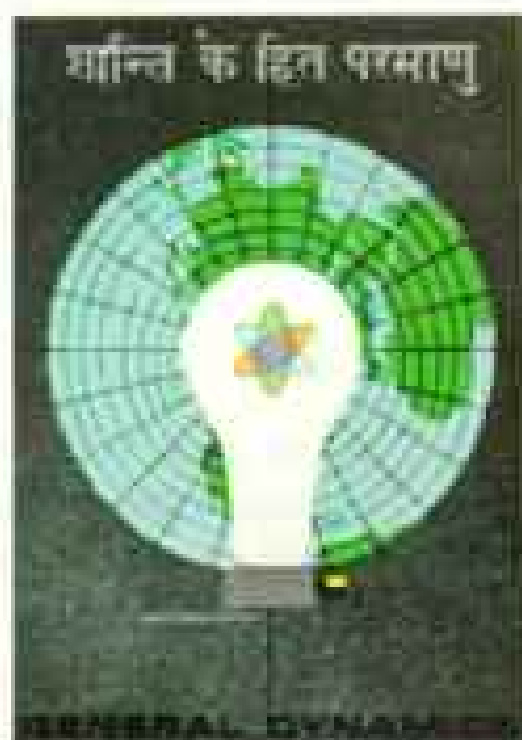


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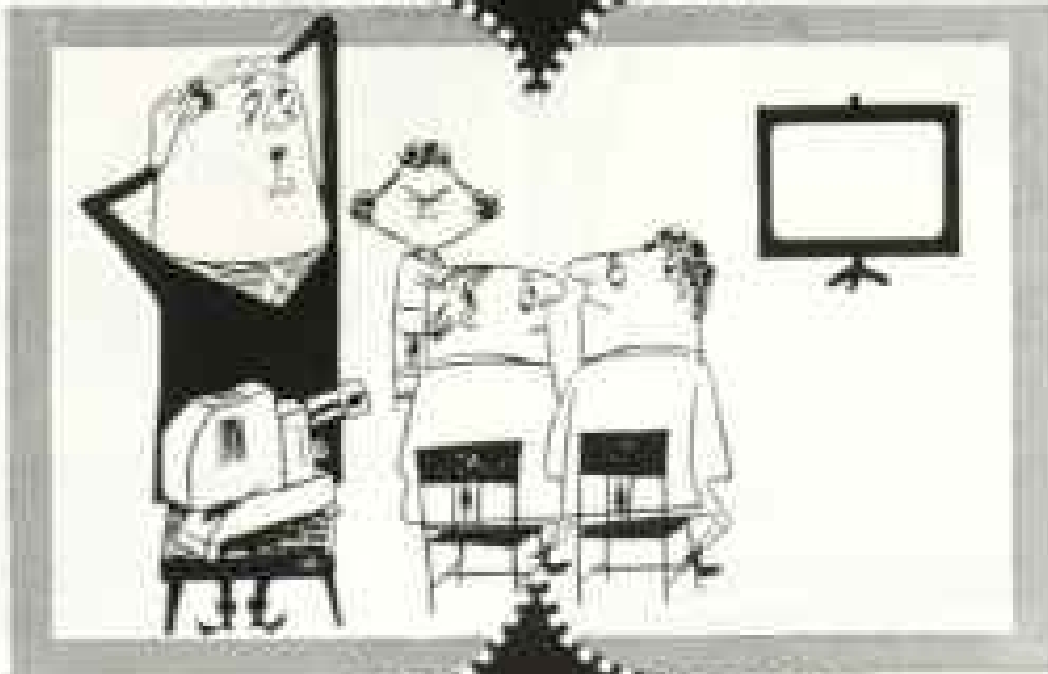


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Jarmey Miller

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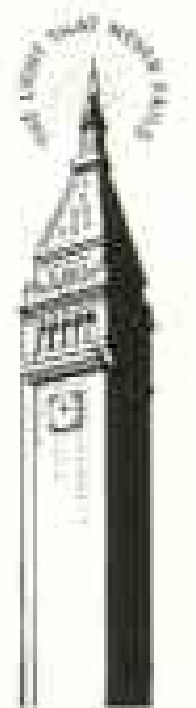
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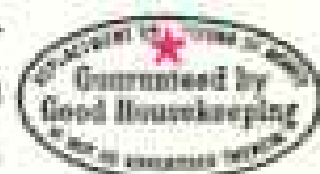


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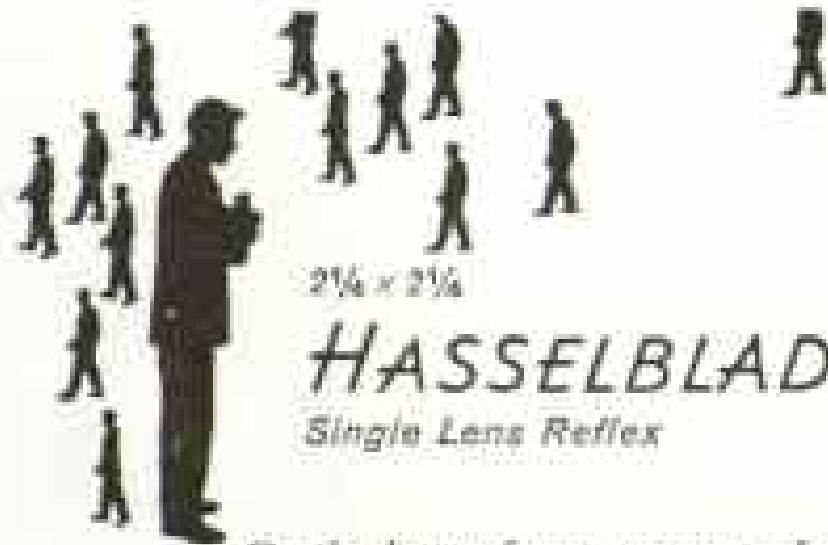
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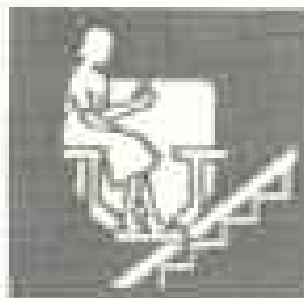
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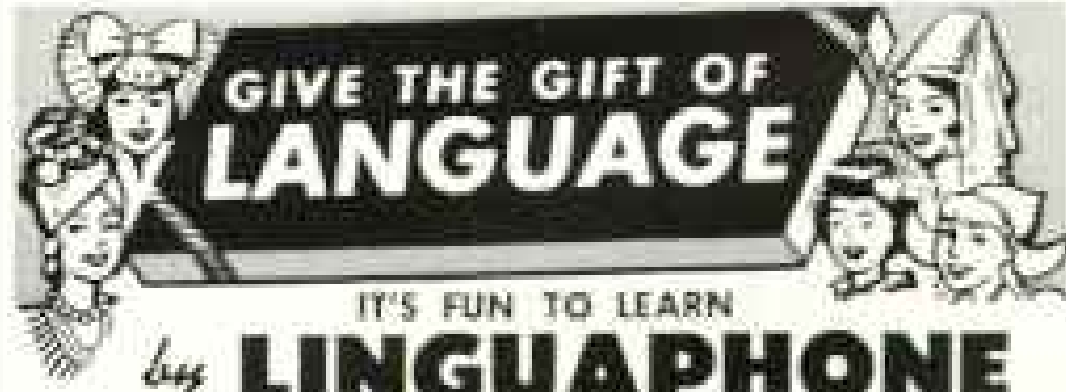
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