Aramco World

505 PARK AVENUE, NEW YORK 22, N. Y.

Mrs. David Carlson
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Fitchburg, Mass.

CSF

CHARCOAL STAGES A COMEBACK

charcoal. Loaded into special power-driven cars, the chemically treated wood glides through ovens where strictly regulated gas heat and airflow reduce the baking time to as little as twenty minutes. The kilns of brick, steel or cinder-block are typical of the smaller operations. Where volume of production makes capture of the by-products worthwhile, the cooking of the charcoal is performed in an immense retort. Methyl alcohol, acetone and acetic acid are extracted in a distillation process. Like the first discovery of charcoal by the cave man, this is said to have come about partly through happenstance; businessmen who set out to be distillers woke up to the fact that they were accumulating salable stocks of charcoal.

The favorite woods for charring have always been oak, hickory, maple, beech and birch, in that order. More efficient techniques have improved the ratio, but traditionally a piece of wood subjected to charring lost three-fourths of its original weight and a third of its bulk. The cooking briquettes, representing up to 15 per cent of present output and so popular with the patio Escoffiers, are made of pulverized charcoal molded in huge presses after the addition of a starch binder.

It was anthracite coal which put the skids under charcoal as the primary industrial fuel. Charcoal production was already tapering off when the Civil War's demands revived the industry temporarily. After the conflict, with steel replacing iron on a wholesale basis, the charcoal blast furnaces began collecting cobwebs.

At this stage charcoal was not only less desirable for most purposes; it was murderously expensive. The forests having been depleted around the ore deposits, charcoal had to be hauled hundreds of miles, and labor costs went shooting up.

At last came the technology which found in charcoal the ideal purifying agent and which displaced the old colliers, with their mattocks and billhooks, in favor of the young chemical engineer.

Latest Commerce Department figures put domestic production at 230,000 tons of charcoal of all types while approximately 7,000 additional tons are annually imported from Mexico, Canada and Ceylon. Altogether it ranks as a $16,000,000 industry, and despite the views of the family whose home was invaded by the fumes of dripping shish kebab, charcoal appears to be here to stay. ■

Very popular among the patio chefs are cooking briquettes made of pulverized charcoal.

ARAMCO WORLD

AUGUST—SEPTEMBER
1960

Talking it over on tape

Aramco World

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FRONT COVER: Student Gray Lafrenz of the Dhahran School in Dhahran, Saudi Arabia, "talks" on tape to students at Cascade Junior High School in Eugene, Oregon. Social studies teacher Norman May is at left. On the opposite page is a story dealing with the way teachers and students in two junior high schools got to know each other across 10,000 miles.

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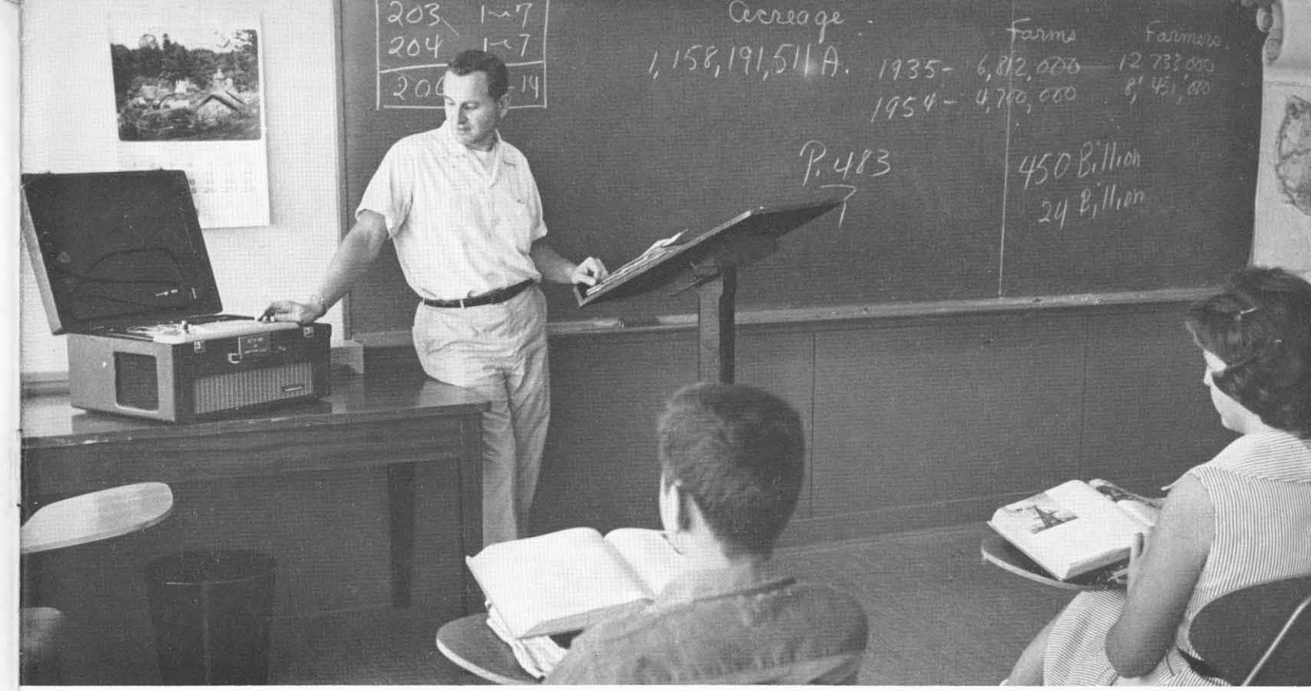


Class at the Dhahran School listens to play-back of some of their classmates' voices answering questions about life in Arabia asked by junior high school students in Eugene, Ore.

Although students in Dhahran, Saudi Arabia, and Eugene, Oregon, are 10,000 miles apart, they learn a lot about each other by...

TALKING IT OVER ON TAPE

A GROUP of junior high boys and girls, students of a class in social studies, was sitting very still, listening to a series of questions being reeled out on a portable tape recorder. Suddenly the usual decorum of the classroom session broke down completely. One question had caused such general merriment that the instructor had to stop the machine and repeat it for those who hadn't heard. "Our friends," he said, "want to know if you go to school on camels."

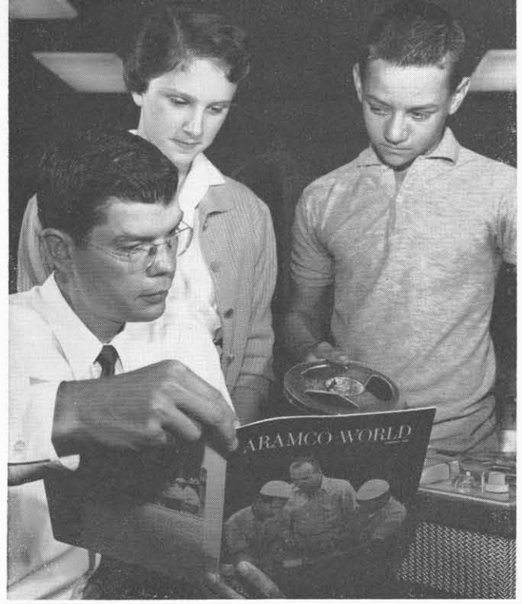
This was one of several classes putting tape recorders to good use as learning aids by "talking things over" with their contemporaries some ten thousand miles away. The teacher of this particular class in Dhahran, Saudi Arabia, was Norman May who comes from Fitchburg, Massachusetts; his students were children of Aramco employees. The youngsters with whom Mr. May's students compare notes on their respective ways of life, attend junior high in Eugene, Oregon, and their teacher Philip Janz is the one who got the unique two-way conversations going in the first place.

The question about the camels actually was a good one: most children of the West – and many of their parents, too – normally associate camels with Arab lands. The camel question gave the social studies students in Dhahran a chance to tell their correspondents in Eugene about the modern transportation facilities which a large portion of Saudi Arabia now enjoys. They described the railroad that leads from the thriving port city of Dammam, on the Persian Gulf, to Saudi Arabia's inland capital, Riyadh. They mentioned the many miles of hard-top roads linking Aramco's oil operations centers and the larger Saudi Arab communities like Dammam, al-Khobar and Hofuf.

To answer the question that started the discussion, the Dhahran students explained that their town was not so large but that most students could walk from home to school in ten minutes or less. However, there are company-run buses which students may ride. The buses are particularly popular during the heat of the summer.

Saudi Arabian climate provides a dependable source for all kinds of queries from students living in Eugene. Usually questions on this topic go; "How do you stand the hot weather we read about out there?"

Students on the Dhahran end of these tape-recorded conversations can give their opposite numbers in green, rainy Oregon impressive figures on this score. "Yes, it gets pretty warm here. In July, August and September the old thermometer sometimes gets up to 120° F. And, boy, you really feel it, too, when humidity is an even 100 per cent!"



Teacher Philip Janz and students Gwen Rutter and Ronnie Ballard used Aramco World to help frame questions about Saudi Arabia that they sent on tape to pupils in Dhahran.

TALKING IT OVER ON TAPE

The boys and girls in Norman May's class point out, however, that it really isn't as bad as it sounds, because their school and all their homes are air-conditioned. One son of Wisconsin remembers winters back home when everybody stayed indoors most of the time to keep warm. "Out here," he says, "we stay indoors a whole lot in the summer, to keep cool." And a youngster from Texas tells about his visits on home leave to see his grandmother. "No air conditioning in her house. Man, that's when we really feel the heat!"

A small, serious voice comes out over the tape-recorder speaker: "Can any of you speak Arabic?"

The question of communications between Americans living in far-away lands and their hosts is one that comes up all the time, and the youngsters have ready answers for this one, too. Yes, most of the kids in the class know enough Arabic to be able to exchange polite greetings with the Saudi Arabs they meet, and some can carry on conversations with various degrees of fluency. Their school offers after-hours classes in Arabic which a number of youngsters attend on their own time. But since nearly every one of the Saudi Arabs working for Aramco speaks English, which they have learned at company training centers, most conversations are in English.

Arabic is a very difficult language. It uses an entirely different alphabet from English or European tongues, and in order to speak Arabic correctly it is necessary to employ sounds and voice inflections never heard in any of the languages of the West.

A seventh-grade Oregonian with a statistical turn of mind wanted to know how many students went to school in Dhahran, and if that school was the only one children of American employees attend.

TEACHER PHILIP JANZ HAD AN IDEA

"It all started early in our school year. The Middle East had cast its spell over my students and they were wanting to know more than our reference books could tell us during our reports on Saudi Arabia. We discussed ways in which we could get answers for our questions. Current, up-to-date answers were what we wanted. And, thanks to the New York public relations office of Arabian American Oil Company for putting me in touch with two teachers in Dhahran Senior Staff School, this is what we got. Both Mr. Marvin Johnson and Mr. Norman May expressed a desire to help us by answering our questions on a tape recording.

"My classes really had their interest aroused when they found out we could exchange a tape recording with a school in Saudi Arabia. So the text of our tape was planned around the idea to encourage the Dhahran students to give us their viewpoint on where they live; to find out more about the country, people, customs and the general type of life of the Saudi Arabs, and in turn tell them a little something about Oregon to stimulate their interest and questions and to promote better understanding in both schools.

"In order to accomplish our aims we divided into three basic groups and did research on the above areas. One group on questions we wanted answered about Saudi Arabia, the second and third groups respectively on telling something about Cascade Junior High and the Willamette Valley in Oregon.

"After our material was gathered we typed it into scripts and practiced for timing; adding sound effects and smoothness in presentation.

"About four weeks after starting our project we put the final recording on the first half of a tape reel (the last portion reserved for Dhahran's answer) and sent it off to Dhahran.

"Along with the tape, we sent our class roster. Due to this, several of Mr. May's class started corresponding with individual students in our room. These letters were shared with our whole class and everyone enjoyed the written viewpoints of these boys and girls.

"The big day came, however, when the tapes were returned and how eagerly my classes pored over each word they heard. Both classes in Dhahran did an excellent job in answering our questions and we felt satisfied that we really had a much better understanding of Saudi Arabia, the Arabs and the Middle East in general."

A little research at the school office had to be done, and many yards of tape were spun off before the students in Norman May's class were certain they had supplied full answers to this pair of questions. The son of an old-timer at Aramco started things off by explaining that there are three major areas in eastern Saudi Arabia where the company has its operations. Abqaiq, about 45 miles straight into the desert from Dhahran, is the center of the oil-producing part of Aramco's activities. This is the town where the people live who have the most to do with getting oil out of the ground. Abqaiq has its own school, part of the Aramco system, where about 300 pupils are enrolled.

Ras Tanura, 45 miles up the coast from Dhahran, has the refinery and a marine terminal where tankers come to pick up crude oil and refined petroleum products. It, too, has its own school, with just under 350 students. Dhahran, the town where Aramco has its headquarters, is the largest of the three by far. This spring 625 boys and girls were enrolled in the school there.

The machine clicked off and the speaker turned to his classmates: "Do you think that just about covers it?"

"Hey, let's not leave out Nariyah!"

Nariyah is a small pump station about 80 miles northwest of Dhahran which helps push crude oil along the pipeline that starts near the oil fields of eastern Saudi Arabia and terminates at Sidon, Lebanon, on the Mediterranean Sea. The number of kids who live there fluctuates, but it's never very large. This spring four children of various ages were attending school at Nariyah. They are all even with, or perhaps a little ahead of, their classmates in the larger communities.

With each of Aramco's schools accounted for, Norman May's class went on to explain on tape that the grades go from kindergarten through the ninth. Graduations are held toward the end of July at each school. They are quite formal affairs, and the girls wear traditional long, white graduation dresses; the boys appear on stage in dark slacks, white shirts and ties. (Remember this is during the middle of summer heat.) Real corsages for the young ladies frequently are flown in from Beirut as gifts of the local PTA.

Graduates of the schools continue their high school educations outside the Kingdom, and they have the whole world from which to choose. The majority of students go on to secondary school in Beirut, Rome, Switzerland or the United States. This year youngsters in the last three years of high school were sprinkled over 13 countries and 46 states.

While Norman May was changing the reel of the tape recorder, a voice piped up from the back of the room. "Mr. May, we just mentioned that our graduations take place in July. Before coming out here I'd never even heard of graduating in any other month except June. Don't you think we ought to clear that one up?"

A girl standing by the window agreed. "Maybe this is a good place to tell them about the trimester system, Mr. May. And how it's impossible for us to graduate in June out here."

Children attending Aramco elementary and junior high schools in Saudi Arabia start each year early in September, just as it's done in the States. The first semester lasts three months, with all of December a holiday for students who are up in their work. Those who need help are given special classes during the "off" month. Another school session goes from January to the end of March. Only special and remedial classes are held in April. The last three-month semester goes right through July, and unless they have makeup work, students have all of August off.

". . . . And that's why we have graduation in July. Sounds crazy, doesn't it? But you get used to it."

"The thing I had the most trouble getting used to was our system of weekends." The speaker was the newest member of the class. Her family had arrived in Saudi Ara-

Philip Janz and his seventh grade class in social living listen to the tape recording sent them from Saudi Arabia.

Some Cascade Junior High School students who have pen pals in Dhahran, share their interesting letters with classmates.

TALKING IT OVER ON TAPE

bia just three months before.

"You know," she said into the microphone, "the Islamic Sabbath always falls on Friday. Most of Aramco's employees are, of course, Moslems. So the company's entire schedule is set to conform to Islamic traditions and customs — and that includes our schools. We get Thursdays and Fridays off, and our school week begins bright and early on Saturday morning. How would you kids in Eugene like that?"

Questions on the subject of recreation take a great many different forms, but they all point in the same direction: young Oregonians are insatiably curious about what their contemporaries in Dhahran do in their spare time.

"Our school has a pretty full athletic program, considering its size and the distance from other schools . . . ."

The star athlete in the class goes on to tell about how the seasons for sports are juggled to suit local climatic conditions. Only the Little League baseball teams hold forth in the spring. School baseball contests are played in the fall. Wintertime, which can get quite cool, is ideal for a rugged season of touch football. In the handsome, air-conditioned gymnasium attached to the school, basketball runs a good part of the summer. Teams play regular schedules in all these sports with their rivals in Abqaiq and Ras Tanura, encouraged on the sidelines by a bevy of pretty cheerleaders dressed in school colors.

There are active groups of Boy Scouts, Girl Scouts, Cubs and Brownies. Regular teen-age dances are held in the gym during the hottest weather and out on patios when it's cool enough. Recently the entire body of Dhahran junior high students — all 146 of them — got together with some of the parents for a swimming and picnic barbecue party on Half Moon Bay.

"I'll never forget my surprise the first time I saw TV antennas on the houses here," the new girl said. "Yes, we have television in Dhahran — on two channels. Aramco has a station that puts out programs for Saudi Arabs. It shows a lot of good things from the States. And there's a station over at the Dhahran Air Field run by the U.S. Air Force Training Mission there. 'Peter Gunn,' 'Garry Moore,' 'Ed Sullivan,' 'What's My Line?,' 'Gunsmoke,' 'Sea Hunt,' 'Wagon Train' . . . We can see them all here. Except they're on film, of course. But they can be just as rough on the old homework, can't they, Mr. May?"

The teacher had to wait a few seconds for the knowing laughter to die down before he handed the microphone over to the next student.

"We're very proud of our school bands. There are two of them — one for kids from the fourth grade up, and the other for older students. There's a total of 75 instruments in both. Some of us have been chosen to play in the adult Community Orchestra which started up this spring. Last year one of our bands had the thrill of playing in a command performance for King Saud.

"Then we have movies in Dhahran, and a very active amateur group called Dramaramco. A few of the kids get good parts in the plays they put on. Oh, I almost forgot. Our town has a bowling alley with twelve lanes, all kept up to American Bowling Congress standards."

Each American working for Aramco in Saudi Arabia goes back to the United States every other year for a two- or three-month home leave. That's the main reason Aramco schools are organized under the trimester system. With school vacations falling in December, April and August, instead of being concentrated over the whole summer, students can be away with their parents at any time of the year without missing too much classwork at a stretch.

There's a lot of territory between Saudi Arabia's Eastern Province and, say, Houston or Los Angeles, where many Aramco families come from, and the residents of Abqaiq, Dhahran and Ras Tanura are probably more widely traveled than those of any community of like size in the world.

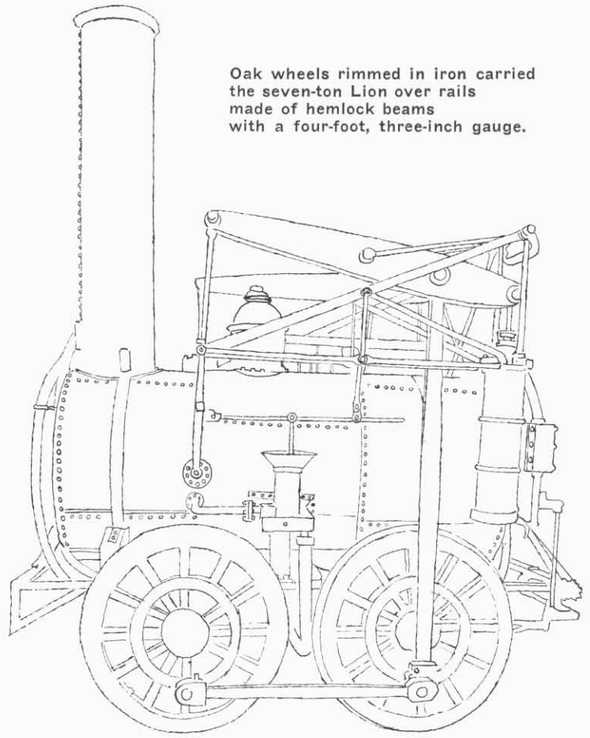
Not a few of the youngsters living in Dhahran have gone around the world at least once. Rome, Bangkok, London and Hong Kong are looked on as mere way stations by many of the kids whose parents have lived in Saudi Arabia for ten or fifteen years. They become as adept at handling shillings, pesetas and drachmas as they are at making change in dimes, quarters and Saudi Arabian riyals and qirsh.

One lad in Norman May's class had been doing some positive thinking about the extent his exposure to travel was affecting his standing in the social studies course. He told his unseen friends in Oregon: "Last leave we visited the Acropolis in Athens, the Roman Forum, the house where Columbus lived in Genoa, the Statue of Liberty, and the Alamo in Texas. I guess I'd have to be pretty dumb to flunk geography or history after seeing all that stuff." ■

Norman May's social studies class gathers around global map as he points out Mongolia during discussion on the Far East.

the first iron lion

Oak wheels rimmed in iron carried the seven-ton Lion over rails made of hemlock beams with a four-foot, three-inch gauge.



All along the route, men waved their hats, small boys shouted, and women stared in amazement as the *Stourbridge Lion* thundered past at the frantic speed of 10 miles an hour

SHE was all fired up and ready to roll. With the sun winking on her polished plates, her engine pounding, and her tall stack belching soot and smoke, the lion's head painted on the snout of her boiler looked almost alive. Seven tons of impatient, vibrating power! Even those who came to jeer had to admit she was a sleek-looking machine.

She was the first full-size locomotive to run on rails in America—the *Stourbridge Lion*—and this was her maiden run: August 8, 1829.

The United States had entered railroading late. Locomotives had been used in England ever since 1804 when Richard Trevithick tracked the first commercial model in South Wales. But bitter feelings preceding and following the War of 1812 had injured relations between the two countries and had hindered introduction of the new idea into the New World.

It wasn't until 1828 that the Delaware and Hudson Canal Company, finally convinced that the British had developed something worthwhile, sent a young man named Horatio Allen to England with orders to buy four locomotives and ship them back home. The first model, called the *America,* reached New York on January 15, 1829, but it never went into operation. Records show that it was shipped up the Hudson soon after its arrival, but where it went after that nobody knows.

The *Stourbridge Lion,* manufactured by Foster, Rastrick, and Company of Stourbridge at a cost of $2,914.90, arrived next and was sent on to eastern Pennsylvania. Under Allen's direction the company built a three-mile stretch of track between the towns of Honesdale and Carbondale. The "rails" were constructed of thick hemlock beams 20 to 30 feet long. They were surfaced with tough iron strips and were held in place by wooden cross-ties supported by posts and crushed rock. At one point a curved wooden trestle was built to span the Lackawaxen Creek.

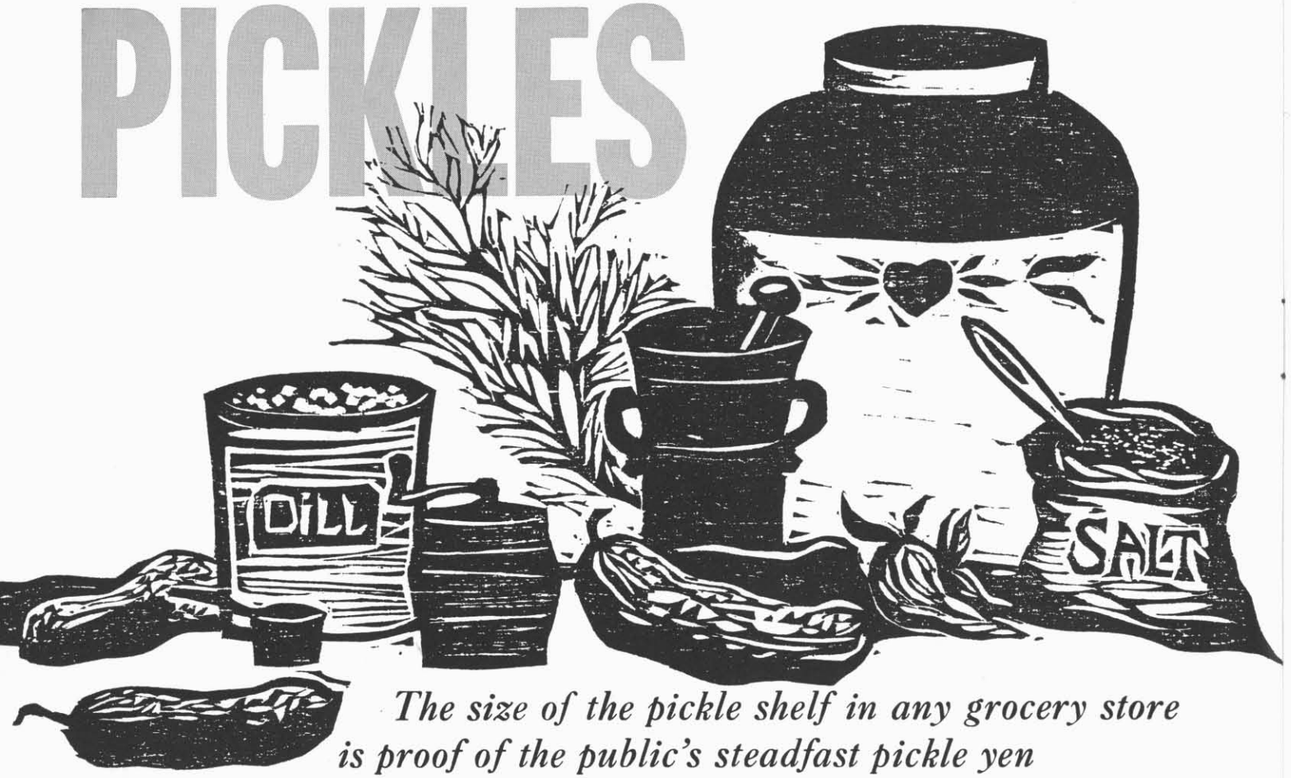
People came from miles around to see the first performance of the *Lion.* Allen was the engineer, and he refused to let anyone ride with him — probably because neither the engine nor the trestle had been previously tested. There was a moment of suspense when he was given the signal to start — and then, slowly, the wheels began to turn. With cheers ringing in his ears he opened the throttle wide and began his historic trip. All along the route men waved their hats, small boys shouted, and women stared in amazement as he thundered past at the fantastic speed of ten miles per hour. Who would ever have believed that anything so big could move so fast without a horse to pull it?

But the *Stourbridge Lion* proved too heavy for the flimsy track and was later used as a stationary source of power. It is now in the Smithsonian Institution in Washington, D.C. The company that owned her changed its name to the Hudson Canal and Railroad Company, Horatio Allen went on to become a major figure in American railroading, and rails began to link the cities and towns of the eastern United States.

Newer and bigger locomotives were built and imported — the *Best Friend, Tom Thumb, Old Ironsides, John Bull* — and trains got faster and faster. Ten miles an hour . . . twenty . . . thirty . . . forty! A new generation of Americans welcomed the birth of a new era — and the old-timers, who had been around when the nation was young and slow, shook their heads and muttered: "If God had wanted man to go that fast, He'd have made him with wheels!" ■

People like

PICKLES



The size of the pickle shelf in any grocery store is proof of the public's steadfast pickle yen

HISTORY tells us Cleopatra was a confirmed pickle eater. Her royal palate delighted in their flavor.

In this, she had a good deal of illustrious company: Julius Caesar, Emperor Tiberius, Pliny, Queen Elizabeth I, Samuel Pepys, and such famous Americans as George Washington, John Adams and Thomas Jefferson. It was Jefferson who wrote:

"On a hot day in Virginia, I know of nothing more comforting than a firm, spiced pickle, brought up trout-like from the sparkling depths of that aromatic jar below stairs in Aunt Sally's cellar."

The common yen for pickles that has existed since the earliest records of man, although the result of his more capricious taste buds, is not entirely without benefit. Recent studies show pickles to contain vitamins A, B_1, B_2, and best of all, generous quantities of vitamin C, a substance most essential to good health.

It must have been instinct or good luck that guided explorers during the Middle Ages to stock heavily with pickles during those long voyages into the unknown, voyages often plagued with attacks of vitamin deficiencies such as beriberi and scurvy.

A curious legend — born of the rumor and gossip of that day — explained the naming of the Western World in terms of preserved cucumbers. Because, as a young man, Amerigo Vespucci had equipped caravans and convoys with supplies — including barrels of pickles, it was somehow assumed that he could thank the pickle trade for his fame and fortune as an explorer. Of course, the fact that his voyages were sponsored by the owners of the ships he sailed, as chief navigator, and later as "major pilot" of Spain, never stopped the silly rumors.

Pickle popularity, however, is not fickle. Myths and stories do not seem to affect the demand for the product. Ever since Colonial days, when cucumbers and other vegetables were preserved in brine to supplement food supplies during a long winter of no fresh vegetables, pickle consumption has apparently been increasing. Moreover, the pickle barrel still is to be seen in stores from which the cracker barrel long since has disappeared.

In recent years, the volume of pickles sold in the United States has been approaching the half-million ton mark or more than six billion pickles of varying sizes, flavors and uses. And pickle popularity is not confined to this country. Salty, finger-sized pickles are the favorite in China; Latin countries prefer hot pepper pickles; the French like sweet gherkins; Britons savor mustard pickles, and kosher dills have been introduced to most of the world.

To meet the demands for varying tastes, cucumber culture now operates under rigidly controlled conditions. For the most part, pickle packers supply special seeds to cucumber farmers and agree to purchase the entire crop before it is even planted. The seeds are carefully pre-selected strains that ensure the final product will be of the desired quality and variety.

Along with the seeds, precise formulas and details of processing are trade secrets among the packers. But general principles of pickle processing were evolved more than 4,000 years ago and have changed only slightly over the centuries. The type of pickle desired dictates which of many processes the cucumbers will undergo.

Years ago, harvesting of cucumbers for the pickle market was something of a race against nature. Since small, thin-skinned vegetables usually are desired for pickling, a farmer used to watch his crop carefully to be sure he could harvest it before the cucumbers matured to a point where their bulk lessened their market value. This required fast footwork when the planted acreage was large and pickers were not over-plentiful.

Today, a pickle crop will mature within about two months of planting time. Farms range from about 500 to 3,000 acres, except for the occasional truck farm that raises a cucumber crop for home pickling and local sale. Commercial crops are harvested by itinerant pickers.

Fresh-picked "cukes" are divided immediately into "green stock" and "salt stock." The former are shipped, as picked, to the packers. The latter are processed at salting stations near the farms on which they were raised.

Under the watchful eyes of the packers, the salt stock cukes are cleaned and sorted, then placed in wooden vats for a carefully controlled fermentation period. Over the course of weeks, the salt content of water in which the cukes are immersed gradually is increased. Slowly and evenly the salt permeates the cukes and keeps fermentation within desired limits. After three or more weeks, when the salt content of the water has reached fifteen per cent, the process is considered completed. Now classified "brine stock," the processed cukes can be held almost indefinitely for additional treatment and marketing.

"Genuine dills" are also processed at the area in which they were raised. They are put immediately into a special salt solution flavored with dill and other spices and are cured and finished at the same time and place by a process of natural fermentation. They can be marketed as soon as they are packed for sale.

Green stock also is quickly readied for market, perhaps within an hour and one-half of the time it arrives at the packing plant. After washing and sorting, the green cukes are packed in containers for the consumer under modern sanitary safeguards. They absorb their flavor as "fresh cucumber dills" or "pasteurized dills" from the liquors in which they are packed for distribution.

Salt stock requires more time for handling, but its preserved nature enables the packers to supply the market on call. As demand arises, these are de-salted for processing and packing. All but three per cent of the salt can be removed readily by rinsing, heating in clear water and rinsing again as many times as taste demands.

De-salted brined cukes destined to become "processed dill pickles" are placed in a brine-acid-dill-spice solution for a week to absorb the desired flavor. For "sour pickles," spiced sour vinegar is used instead of a dill solution.

"Sweet pickles," strangely enough, first are processed as sour pickles. The sour solution then is drained off and a sweet, spiced liquor is added in which the pickles are permitted to soak in vats, perhaps for months. The contrast between the portion of the sour solution the pickles retain and the sweet flavor that is added give sweet pickles their "sweet and sour" pungency.

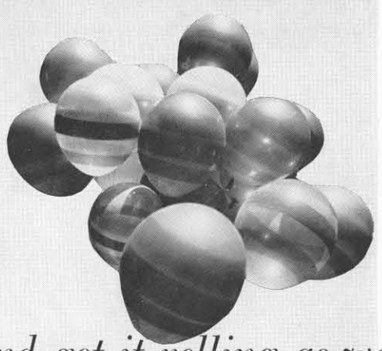
Of course, there are endless varieties of pickles. Pickles called by the same name by different packers usually will taste noticeably different. But the disparate amount of shelf space at the grocer, awarded pickles in preference to other vegetables, is a pretty accurate gauge of how tastes differ and how much insistence there is by the public on the pickle of its choice.

If a bowl of pickles isn't on the restaurant table, it's a pretty safe bet a pickle slice will accompany any sandwich order. Luncheon counter people feel it dresses up the plate and offers a sparkling taste contrast between bites of a simple ham-on-rye or an elaborate dagwood.

Hamburger dispensers, too, agree on the appeal of the pickle. Center slices of pickles often are popped into the bun without the customer's request and although one hears frequent shouts of "No onion, please," almost never is heard the command to "hold the pickle!" ■

Platter represents extent of pickle popularity in the United States where the annual per capita consumption is 82 pickles!

COME TO THE FAIR



In 1810, a businessman-turned-farmer put the fun in the fair and got it rolling as we know it today

IT was a big day for the Harrisons at the Deerfield County Fair. Mother's watermelon pickles had been judged the best; Father's Hereford cattle had tied for second; and Junior's pet hog, Filibuster, who had been acting kind of uppity of late, had surprisingly come in third.

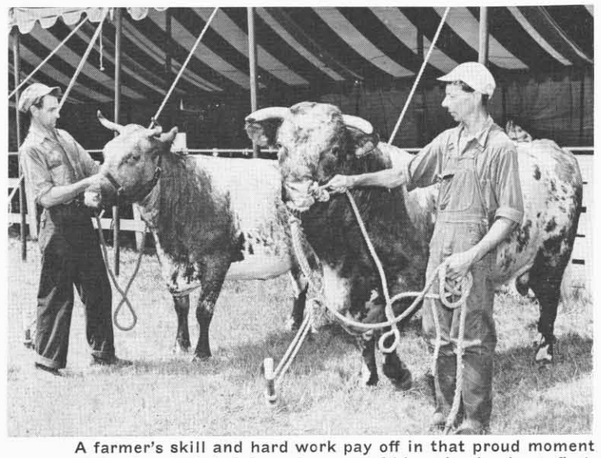
Congratulations were heaped on them from all sides, by neighbors and friends in the throng, which, in festive holiday mood, had gathered on the sprawling exposition grounds. The health of relatives and acquaintances ("Uncle Angus's sciatica has got him down"), the news of harvesting and crops, the latest bits of gossip and the affairs of the community were discussed. Children, with dripping ice-cream pops and cotton candy, darted through the crowd, between displays of tractors and kitchen ranges, threshing machines and electric dishwashers, vats of butter and cheeses, corn and other grains. Some tugged at ropes attached to reluctant calves and foals and roosters; others exhorted their parents to "Come and see the man dive off the tower into a pail of water" or to purchase them another ticket for a pony or carrousel ride.

A typical scene at an American county fair.

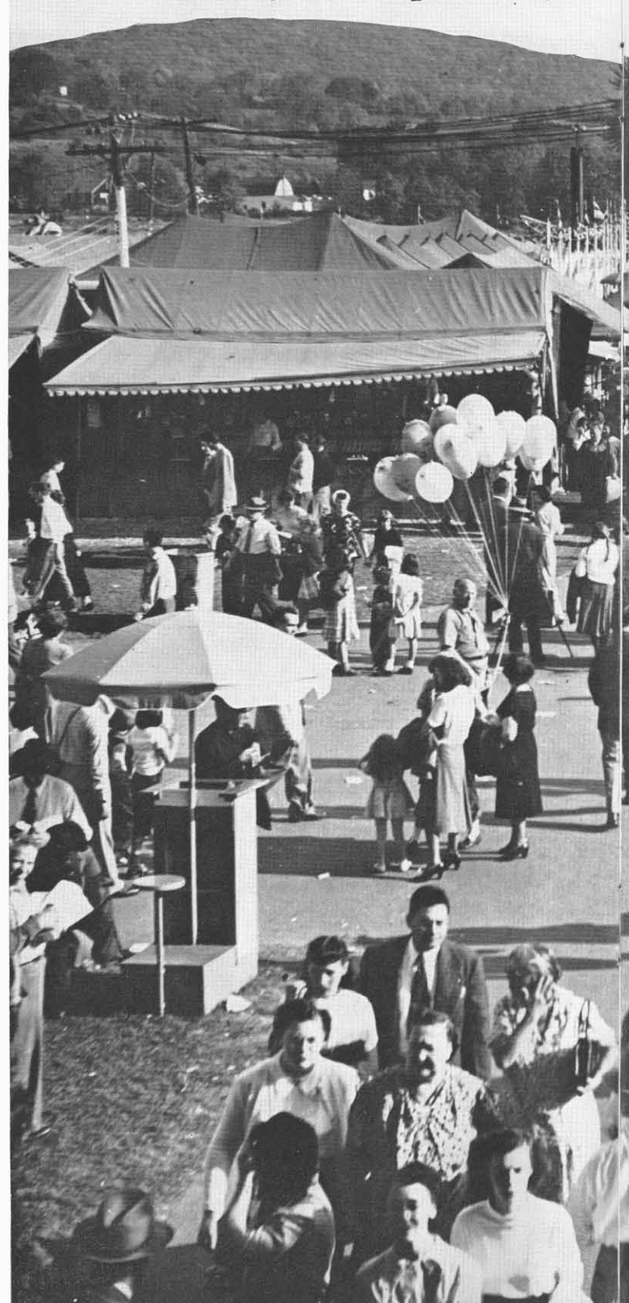
Almost all of the rural fairs in the United States – state, county and local – are peculiarly American in character, an important part of the national scene. They are primarily agricultural and horticultural exhibits, designed to bring buyers and sellers together in an open market. Livestock, poultry, dairy products, fruits and vegetables and grains are the usual merchandise traded. Farm machinery and equipment, household goods and appliances are also sold.

Although they started as simple business and educational enterprises, American fairs soon became places of social gatherings and entertainment. Yankee traders were quick to learn that people loosened their purse strings when they were relaxed and in a festive mood.

The word, *fair,* comes from the Latin, *feria,* meaning holy day. Early worshippers, since they were gathered together on religious holidays, put these occasions to use for



A farmer's skill and hard work pay off in that proud moment at the livestock judging when one of his animals places first.



Harness racing is a major attraction at the local fair and lots of fun for everyone. Pictured is a race at the Tunbridge (Vermont) Fair.

The long aisle of the midway is an exciting place at any fair.

What's more festive than a mouthful of cotton candy?

commercial transactions. During the Middle Ages, fairs grew into regular media of trade, at local, national and even international levels; and were of immense importance to the economy of England, Russia and the European nations. The only practical means by which foreign goods could be introduced and distributed, they nourished agricultural and industrial growth and exerted a strong influence on medieval life and customs. For they introduced, in their evolution, many of the features and side attractions — such as actors and acrobats, clowns and musicians — that are taken for granted in fairs today.

Criticism from the clergy, which disapproved of mixing prayer with business and recreation, and the Industrial Revolution, which brought on a standardization of manufactured products and made it no longer necessary for a buyer to inspect each individual item before purchase, led to the change in the fair, from its original, or religious, role, to the straight agricultural or industrial type we have today.

In America, agricultural fairs are, by far, the most popular and prevalent. Between 2,500 and 3,000 of all sizes and shapes, are held annually, representing, collectively, a billion dollar institution. It all started in the East, with gentlemen farmers, men of considerable learning and means, who patterned the first agricultural societies after the English models. They were rather scholarly and dull affairs, consisting of erudite treatises and experiments intended to improve agricultural practices; they had little attraction for the working farmer, who had neither the money, the time nor the education to participate.

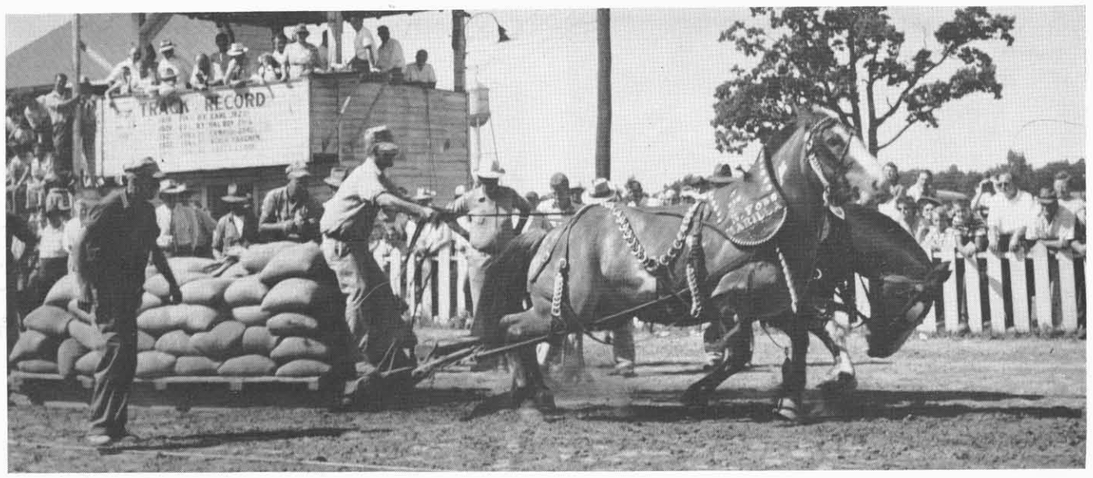
It wasn't until Elkanah Watson, a retired businessman turned farmer, desiring a broader, more democratic agricultural society, promoted the first Berkshire Cattle Show in 1810 in upstate New York, that the fair as we know it at present really got rolling. Watson, a born showman, introduced prizes and competition. It wasn't long thereafter that the fair became a permanent fixture of American rural life.

In scanning reports of fairs in the newspapers of a century ago, the announcements paint a quaint and distant scene: "Wheeler & Madden exhibited a variety of Stoves, cook, parlor and office, of their own manufacture, and handsome in pattern, execution and finish . . . Lytle and Chattle exhibited a patented coupling for carriages, whereby the danger of upsetting in turning short is avoided . . ."

Since then, fairs have come a long way. Attendance records keep steadily climbing; several state fairs attract over a million persons annually. To guarantee large turnouts, big-name popular entertainers often are highlighted. In county and local fairs, sports car rallies and rock 'n roll shows are featured, to pull in the crowds.

"Step up, ladies and gentlemen, step right this way and see . . . the greatest . . . the most amazing . . . the death-defying . . ." The midway in the average fair is a blaze of color and sound. Standard carnival fare, presided over by the leather-voiced barkers and pitchmen, is dispensed here: so are amusement rides, circus acts and exhibits, games of skill and chance, and refreshments of every kind.

The honky-tonk is only secondary, though. Folks have



Mighty chests and shoulders strain as husky local teams compete in pulling contests in which weight of load is progressively increased.

During the Middle Ages, the early fairs were of immense importance as a stimulant to industry and agriculture.

Poultry judging requires a critical eye, these 4-H boys discover, as they scrutinize entries at the local fair.

come here chiefly to see the livestock and poultry exhibits, the cattle, sheep, horses, dairy products and grains, the rows of blue-ribboned homemade preserves, and all the rest. They have come to inspect the very latest equipment for farm and barn and house — including swimming pools and color TV sets. And to watch the various contests and shows — cornhusking, logrolling, hay loading, men's and ladies' tractor racing, square dancing, horseshoe pitching, pet shows and fashion parades.

Special attractions, such as complete Western, New England and Fairyland towns, are put on for children. And, of course, the youngsters have their own contests and shows. Among the 4-H Clubs (associations devoted to the cultivation of head, hand, heart and health), the "Future Farmers of America" and other organizations for young people, some of which have grown so large they now have their own permanent buildings, the competition for livestock and agricultural products prizes is especially keen.

While admission prices are charged for the major spectacle and thrill shows, the big-time vaudeville acts and championships races, many of the offerings are free: these generally consist of local talent — vocal and instrumental groups, parades, band concerts, art exhibits and beauty contests.

Some persons fear that the original conception of a fair as an agricultural exhibition may have become submerged, of late, in an overemphasis on fanfare and spangles. The program listing for a recent Eastern exposition included: The Royal Canadian Mounted Police, a World Championship Rodeo, the U.S. Navy's Blue Angel Stunt Planes, a Baton Twirler's Festival, a Horse Show, a Jazz Festival, Auto Races, a Music Theatre, the famed Ballet Espagnol, Arthur Godfrey and Herb Shriner! Quite a bill.

However, the objective of many fairs, it is frankly admitted, is public relations, education and entertainment for the consumer of farm products, as well as competition and education for the farmer, himself. And as the farmer and agricultural community have benefited substantially from the fair, in increased trade and goodwill, who minds if all this hoopla has been added?

After all, you don't have to indulge in the sideshows, if you don't wish to. And what's wrong with occasionally mixing business with a little fun? ■

Since agriculture is the underlying business of most fairs, farm machinery exhibits are always main drawing cards.

A busy day at the fair can tucker out even the best of us.

the pleasing penguin

—a most engaging bird

PENGUINS are everyone's favorites. In our egocentric fashion we see them in human terms — as somewhat pompous creatures in dinner jackets whose vanity is continually deflated by their tipsy gait.

Penguins may be clumsy clowns on land but in the water they are masters and able to out-swim most small fish.

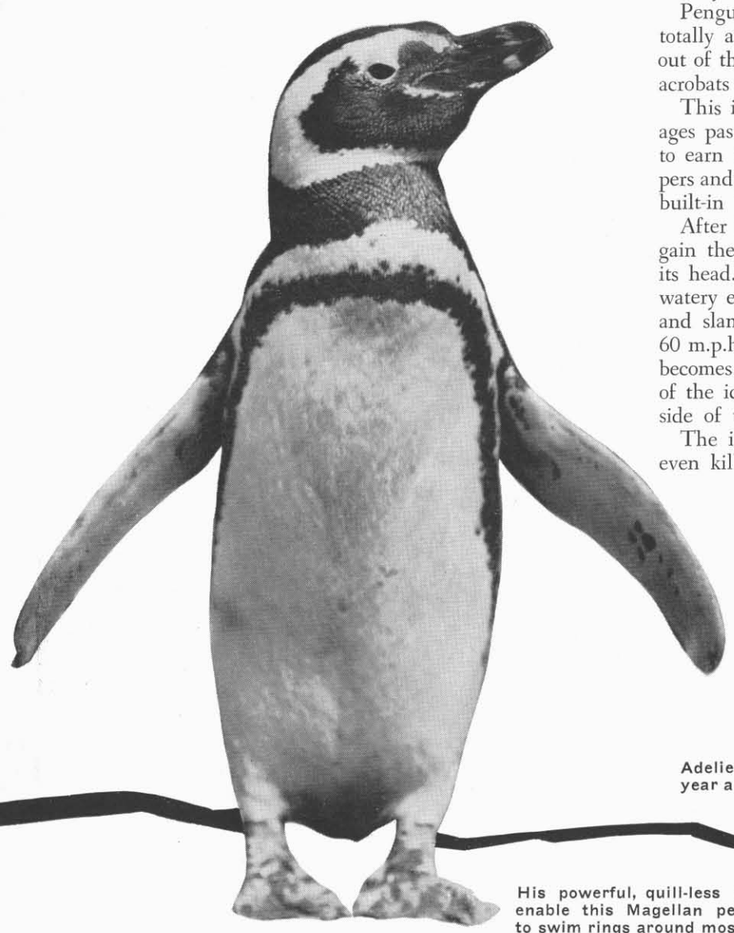
They need to be able to do this, of course, because small fish are their staple with cuttlefish, small shrimp and other crustaceans appearing on the menu from time to time. Their quill-less wings are most efficient paddles and usually work alternately with a rotating motion.

Penguins are also smarter swimmers than many other totally aquatic creatures; they can make frolicsome leaps out of the water that rival those of porpoises and as water acrobats they can — literally — swim circles round seals.

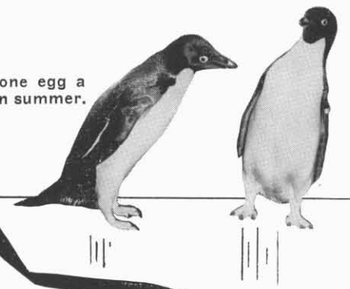
This is a considerable feat for a bird which in distant ages past turned away from flight and took to the water to earn its living. Evolution moulded its wings into flippers and as a bonus equipped its body with most wonderful built-in "shock absorbers."

After it has dined in the water the penguin has to regain the edge of the ice floe some five or six feet above its head. It swims in close, measures the distance with a watery eye and heads out some thirty feet. Then it turns and slams into top speed under water, reaching possibly 60 m.p.h. Just short of the ice floe it planes upwards and becomes a hurtling aerial torpedo. Mostly it makes the edge of the ice floe. But on occasions it smacks hard into the side of the ice floe.

The impact is hard enough to cripple the penguin or even kill it, were it not for its ingenious spring buffers.



His powerful, quill-less wings enable this Magellan penguin to swim rings around most fish.



Adelie penguins lay one egg a year and build nests in summer.

Penguin feathers grow straight out from the body and then towards their ends take a right-angle turn to make springy "shock absorbers."

Penguins have also acquired stout insulation against the cold. This is a thick layer of blubber under the skin, similar to that of other warmblooded water creatures such as seals and whales. (This fatty insulation has been responsible for the slaughter in the past of many thousands of the larger species in Antarctic waters.)

Nature, too, has equipped the penguin with superb eyesight. It is good on land — as is the sight of most birds —but even better in the water.

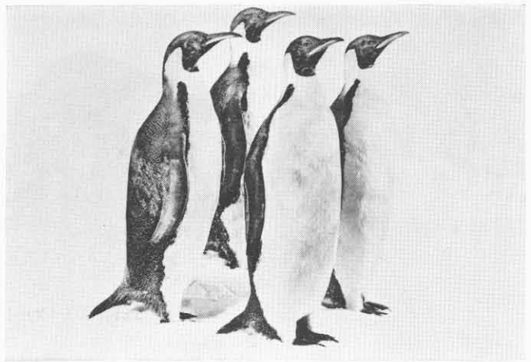
Another evolutionary gift is the streamlined, elliptical body which sheers nose-first through the water.

Such efficiency in aquatics has to be paid for: the penguin is not so efficient on land. When standing it rests its weight on its tarsus (shank of its leg) which is widened like the foot of a quadruped. When it walks or runs it does so on its toes, which explains its teetering gait. Occasionally, as though dissatisfied with its clumsiness and seeking to experiment, the penguin throws itself down and toboggans over the ice, using its feet and flippers. It can achieve a respectable speed in this way but it is presumably tiring. After only a short sprint the bird clambers to its feet and resumes its waddling gait.

Penguins are confined to the Southern Hemisphere. Though we associate penguins with the Antarctic, only two of about 20 species live on the Antarctic Continent. These are the two largest, the Emperor and King penguins, which stand about four feet high to the up-pointed beak (a penguin characteristic). Both have orange patches on the sides of the head. Other species are found on Antarctic Islands, in Australia, New Zealand, South Africa and South America. Many have never seen snow and ice —

Largest of the penguins is the Emperor. Hailing from Antarctic, it often weighs over 50 pounds and is at least three feet tall.

The familiar King penguin thrives in the ice and snow of Antarctica.



Penguins are notoriously gregarious and seem to enjoy doing most things together — even just standing around.

THE PLEASING PENGUIN

one species common to the west coast of South America extends north almost to the equator.

The smallest species inhabits the Galapagos Islands, almost on the equator.

Penguins, indeed, are very scientifically conforming birds. The largest inhabit the Antarctic Continent and the smallest live on Galapagos, thus providing a perfect illustration of Bergmann's rule for warmblooded creatures — that the size varies directly with the latitude.

What all penguins have in common is little fear of man and a great deal of curiosity. They are fearless because for aeons they have had few natural enemies. The sea leopard is one, but they are relatively scarce creatures. At nesting time skua gulls will sometimes raid their eggs.

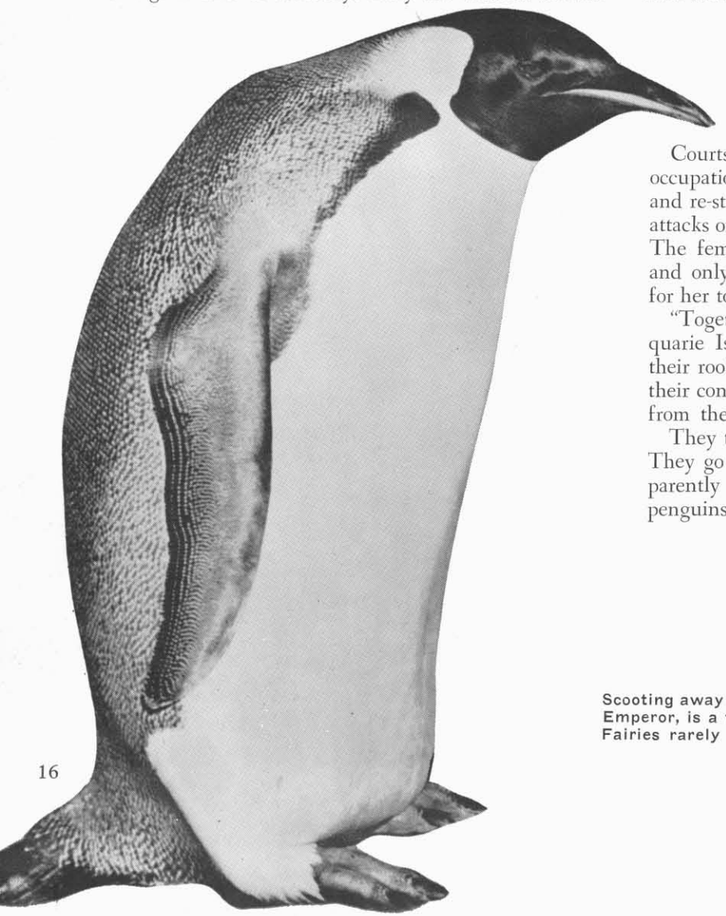
Antarctic explorers have repeatedly reported that inquisitive penguins have fearlessly approached to within a few feet and solemnly inspected them. Approving or disapproving of what they have seen, they have nonchalantly waddled away or sometimes merely yawned and gone to sleep.

Nature is economical. Birds with many enemies lay large clutches of eggs in order to ensure survival. Penguins lay one or two only. The Emperor penguin breeds only on the Antarctic Continent but the King breeds also on a number of Antarctic islands.

These two build no nests but carry their eggs on their insteps where they are sheltered by a peculiar pouch of skin and feathers. During incubation the mother considerately moves very little and with a shuffling gait.

Many of the smaller penguins build nests of an elementary kind — platforms of rounded stones and pebbles.

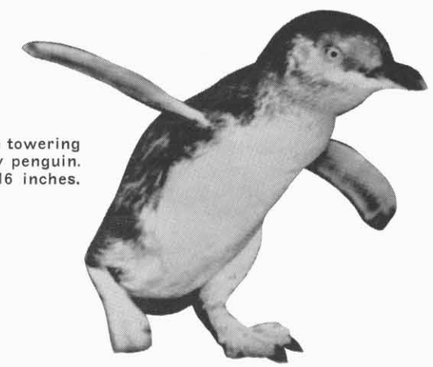
The fairy or little blue penguin (16 inches high) of Australia, New Zealand and adjacent islands nests in burrows, often under the tussock grass on the sand dunes. They also nest in rock crevices. Their burrows are about four feet deep.



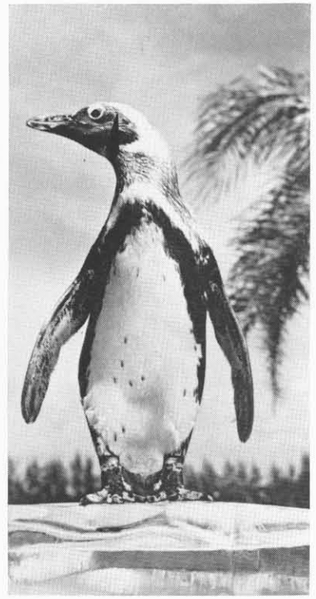
Courtship and nesting is a noisy, gregarious springtime occupation. A great deal of energy is devoted to stealing and re-stealing the nesting stones and pebbles and making attacks on the skua gulls. Motherhood is almost continuous. The female looks after the young for almost 12 months and only pushes it out in the cold world when it's time for her to lay a new egg.

"Togetherness" extends throughout the years. On Macquarie Island a colony of half a million penguins have their rookeries in the valleys behind the beaches and from their constant traffic they have worn "roads" five feet wide from the sea to their homes.

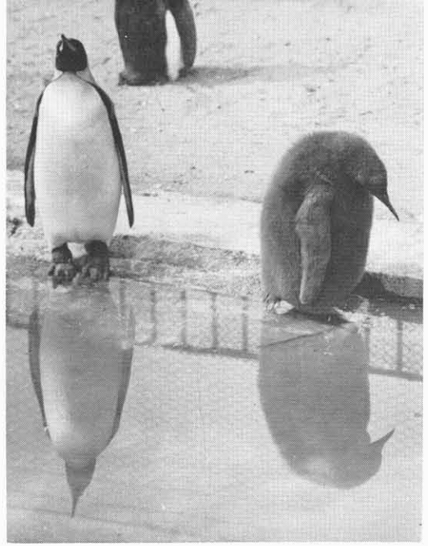
They take their pleasures together, too, in large crowds. They go swimming and diving in noisy large groups, apparently just for the fun of it. It is asserted that some penguins have been observed to push their fellows into the sea and then peep over the edge to enjoy the indignant splutters of the victim.



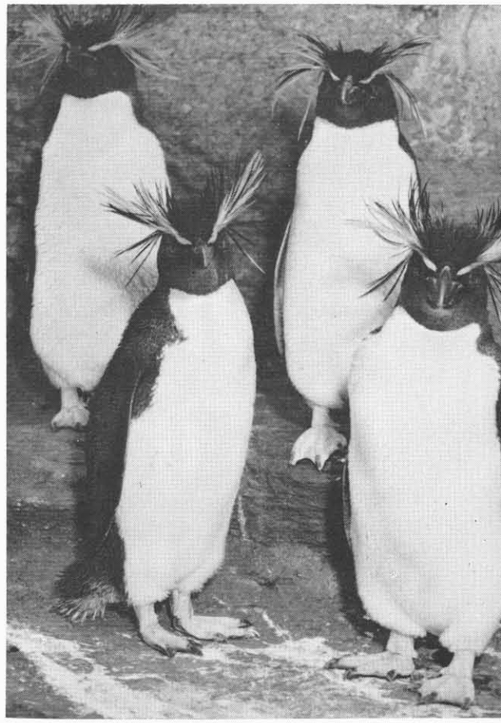
Scooting away from the towering Emperor, is a tiny fairy penguin. Fairies rarely exceed 16 inches.



A Humboldt penguin keeps cool in the Florida heat, ignoring the palm trees and perching on cake of ice.



Baby hangs its head studying reflection in pool, probably wondering when its fluffy coat will be replaced by elegant formal attire of its seniors.



Lively-colored head feathers give Rock penguins their arch look. The birds come from Tristan da Cunha Island in the Atlantic which is 1700 miles from city of Capetown.

There is distinguished evidence that penguins enjoy some types of music.

The polar explorer Robert F. Scott noted that penguins would always "come up at a trot" when the men were singing, and he says that several of his men could frequently be found on the poop of the ship singing before an "admiring group of Adelie penguins." Sir Ernest Henry Shackelton observed the same thing. But apparently penguins are somewhat priggish about their music. A phonograph was put out on the ice, and soon a crowd of penguins gathered around, and apparently listened with pleasure and interest. This continued for a time, but when the music (which had been sedate, seemly, and at times sacerdotal) became frivolous, the birds began to be uneasy. Then the record was changed to "Waltz Me Around Again, Willie." This was too much for the penguins. "For a moment, a moment only, the birds waited; then, with one mind they turned, squawking disgustedly, and went off. Their ancient dignity had been profaned."

Fairy penguins, perhaps the most engaging of the family, have a knack of avoiding severe gales which can only be emulated by submarines. When the sea gets up, the fairy penguins descend to the bottom of shallow waters. They paddle around hunting food and, astutely, only appear at the surface at infrequent intervals. ■

Baby talk works fine even on baby penguin, Bronx Zoo keeper finds. New five-pounder is a mixture of the Blackfoot and Humboldt species.

That Old Tin Can

42 billion cans a year! That's what we use here in the United States—and it all started in England 150 years ago when a Britisher put to work a Frenchman's idea

EXACTLY one hundred and fifty years ago an obscure Parisian chef named Nicholas Appert filled an empty wine bottle with partially cooked food, corked it, immersed it in boiling water, and presented it to Napoleon Bonaparte. The Emperor examined it, gave him 12,000 francs, and Appert went home to write a book.

What was it all about? Well, although neither Appert nor Napoleon could have realized it at the time, it was about the birth of the tin can!

It all began in 1795 when the French Directory, faced with the difficult problem of supplying its armies with unspoiled rations, offered a prize to anyone who could invent a new and effective means of preserving food. After fifteen years of research, Appert came up with his bottle, cork, and boiling-water theory, and a new industry was on its way.

That same year Peter Durand, an Englishman, read Appert's book, *The Art of Preserving All Kinds of Animal and Vegetable Substances*. He recognized the value of the idea at once and obtained a patent from King George III for the English rights to the preserving process. After a number of unsatisfactory experiments with glass and pottery, Durand fashioned a cylindrical canister of tin plate — iron coated with tin. (In time the term "tin canister" became abbreviated. Americans called them "cans"; the British called them "tins.")

The first commercial canning factory was set up in Bermondsey, England, in 1813. The owners, Bryan Donkin and John Hall, tested their products by offering provisions to the English armed forces. Canned food was shipped to military bases all over the world, including, ironically, the tiny post at St. Helena where the defeated Napoleon was being held in exile.

In the years that followed, various expeditionary parties seeking the elusive Northwest Passage carried preserved foods with them, and the popularity of the tin can began to spread. Thomas Kensett introduced them to the United States in 1825 and by 1837 they were well established in this country. During the Civil War canning became a major industry almost overnight. By 1865 production had jumped from a pre-war output of five million cans to a new high of 30 million.

Early metal canisters were made entirely by hand. A skilled plumber could make about five or six cans an hour, cutting each piece with metal shears and then soldering them together. By the late 1870's mechanization and the use of steel instead of iron had upped production to 60 cans an hour, and during the 1890's a machine was invented which could turn out 6,000 cans an hour. The most advanced machines today make more than 30,000 cans an hour. They can be filled and sealed at a rate of about 1,000 per minute, faster than any other kind of packaging.

Cans were introduced to the United States by food preserver Thomas Kensett in 1825. Mechanization and use of steel instead of iron upped output to 6,000 cans an hour by 1890.

Canners have been bedeviled for years by the belief of some housewives that food should not be kept in tin cans after they have been opened. According to the U. S. Department of Agriculture: "It is just as safe to keep canned food in the can it comes in — if the tin is cool and covered — as it is to empty it into another container." This persistent fallacy may have been started by the suggestion found on some labels that food be transferred to another container before serving. Canners made this suggestion because they reasoned that dishes looked better than tin cans on dinner tables — not because they were afraid that cans might spoil the food. As a matter of fact, a just-opened tin can is often the most sterile container in the average kitchen.

Cans are still tin-plated. In recent years some manufacturers have experimented with tough plastic coatings which protect the steel from corrosion and the food from spoilage, but no coating protects as fully and as cheaply as tin. We don't use as much tin today, however. The old plating method — immersion of the plate in molten tin — formed a coating about two ten-thousands of an inch thick. Modern plating methods use about one-tenth that amount — less than two per cent of the metal in the can.

The early pioneers in tin canning grew with the industry they helped to build. A man named Gilbert Van Camp, for example, was one of the first to stress the convenience of canned foods. His pet project — pork and beans in tomato sauce — won the immediate admiration of housewives at the turn of the century.

Other men introduced the tin can to other fields. In the 1860's a New York City dentist named I. W. Lyon designed a can to market his ready-made dentifrice under the label "Dr. Lyon's Tooth Powder." A New Jersey druggist named Gerhard Mennen canned his popular talcum powder and sold it as "Mennen's Baby Powder." And Ernst Moeller of the Bayer Company had the bright idea of selling aspirin in tablet form, packaged in little metal boxes.

The tin can quickly proved its versatility. The tobacco can, developed in 1892, was responsible for one of canning's most artistic moments. The decade and a half between 1895 and 1910 witnessed an endless parade of tobacco can creations — embossed cans, cans curved to resemble the Taj Mahal or a Japanese pagoda, cans roofed with baroque domed lids, cans twisted and bent into a hundred fantastic shapes. The more elaborate the shape the greater the re-use value during the gas lamp era. A customer might well buy the product just to own the can it came in.

The paint can appeared in 1906, the beer can in 1935. Nellie Bly, the famous newspaperwoman who went around the world in less than 80 days in 1889 (72 days, 6 hours, 11 minutes), made history again in 1900 when she invented and patented the steel oil barrel. In 1932 metal oil cans replaced glass bottles at filling stations, and today over two billion cans of motor oil are sold annually in the United States.

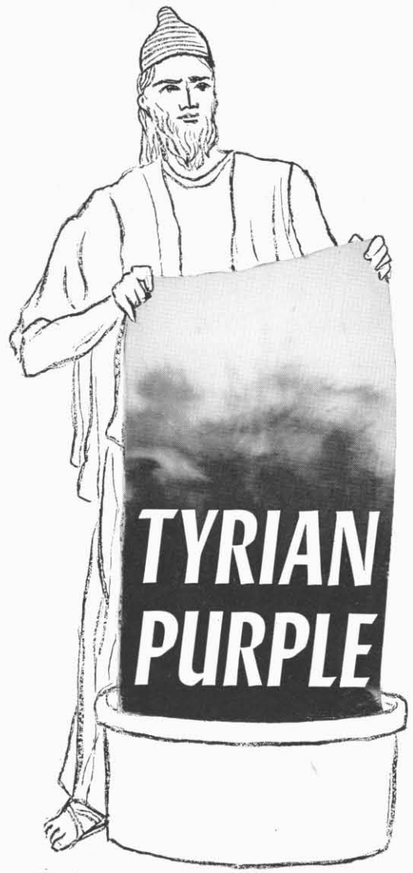
The latest development in canning is the aerosol can. Developed during the Second World War to combat malarial mosquitoes in the South Pacific, this "bug bomb" exploded on the consumer scene in the years that followed. Today the public uses these heavy canisters of compressed gases to spray shaving cream, paint, deodorants, antiseptics, and a host of other products — 500 million cans a year.

In the area of advanced research, scientists are experimenting with the possibility of preserving food in tin cans by means of nuclear energy.

Over the feeble protests of home-cooking gourmets, this 150-year-old French invention has become a part of our American civilization. A housewife in the United States can choose among 1,200 different kinds of canned foods when she draws up her dinner menu. Her countrymen use 115 million tin cans a day. You, yourself, will use about 250 of them before this year ends.

No wonder packagers have come to ask themselves whether or not there is anything the can can't can. ■

The tin can has come a long way from the days when a skilled plumber could turn out five or six of the metal canisters an hour.



Never before in history—or since—did a color bequeath so much glory to a nation

ONE day while Hercules was strolling along the shores of Phoenicia with a nymph he loved, named Tyrus, his dog, who was running beside them, came upon a *Murex trunculus,* with head protruding from its trumpet-like shell. The dog quickly devoured the shellfish and came away with a mouth stained brilliant purple. Enraptured by the tint, Tyrus claimed a robe of that same striking shade as the price Hercules would have to pay for her hand.

Hercules, being Hercules, was able to gather from the Mediterranean waters enough mollusks to fulfill the wish of his ladylove. Thus goes the legend of the origin of Tyrian purple.

The true story of the purple-dyeing industry of Tyre also has its beginnings so far back in antiquity that they have become obscure, faded into the past along with the fabled cities and colonies of Phoenicia. Whatever the circumstances of the origin of the reddish-purple dye, the trade and prosperity of Phoenicia depended on it to a vast degree. Horites of Mesopotamia reached the Mediterranean and described the shoreland as "knaggi" which meant "belonging to (the land) of purple." This word became "kena" in Phoenician, "kena'an" in Hebrew and finally "Canaan," an Old Testament term for Palestine. It was the Greeks who applied to the Canaanities (with whom they first traded) the term Phoenicia, from the Greek "phoinix," meaning purple-red.

Probably, then, purple-dyeing had been established in Phoenicia about the 17th century B.C., when the term "purple" had already been linked to the inhabitants of Palestine.

Tyrian purple was praised by prophets and poets. Homer wrote his great epic poems during the heyday of Phoenicia and spoke of the brilliance and beauty of the cloths that Paris brought back to Troy from there. In the Old Testament, Ezekiel lamented the fall of Tyre, and spoke of — "perfect beauty" and of "purple and broidered work and fine linen . . ."

At certain periods of history, wearing purple was considered the prerogative of priests, senators and emperors. The term "born to the purple" to this day has the connotation of high or royal birth because during the Byzantine period empresses bore their royal offspring in special chambers draped in the opulence of purple cloth.

The island city of Tyre, known as the indomitable "Mistress of the Mediterranean," somehow survived for more than 2,000 years the waves of civilization and conquest that swept the eastern shores of the Mediterranean. And long after Phoenicia ceased to exist as a nation, the Syrians carried on the Tyrian purple-dyeing industry. In the first century, A.D., the Greek geographer Strabo, with less elegance than Ezekiel or Homer, referred to Tyre as a city made "unpleasant for residence" by the smell from the many dye works. Throughout the era of Rome's great empire, when silk was imported from China, it was sent to Beirut to be loomed, then on to Tyre to be dyed, with purple silk fetching the highest prices.

Much later, a 12th-century visitor speaks of the "purple dye" of the city and describes Tyre as "very commercial and one to which traders resort from all parts." Yet another pilgrim of that century writes that Tyre "surpasses in beauty all the cities of Phoenicia."

Pliny seems to offer the best account of the Tyrian method of dyeing, although the fine points of the process, which gave the Tyrians their unmatched superiority, is still anyone's conjecture.

The dye that made Tyrian purple unique was extracted from the meat of not one, but *two* distinct species of shellfish — the *Purpura pelagia* or *Murex trunculus,* and the *Purpura lapillus* or *Buccinum lapillus.* The *Buccinum* is found on rocks in comparatively shallow water, while the *Murex* prefers deeper water. In modern times it has been dredged from depths of 25 fathoms. Both shells have a wide mouth, like a trumpet, and a spiral form terminating in a small, rounded head. The *Murex* is much larger, however, and the shell more rough and spinous.

In ancient times, the waters of the Phoenician coast abounded with these now rare shellfish. Although they were to be found widely along the shores of the eastern Mediterranean, it appears that only on the rocky part of the coast between Tyre and Haifa, near Mount Carmel, were they so abundant that, from a few drops of fluid per fish, so vast an industry was maintained.

The coloring matter is a creamy liquid contained in a vein of the mollusk, which must be taken alive for it rids itself of the juice when it dies. Moreover, the shellfish have to be collected at the end of winter or very early in the spring, before their egg-laying season, or they become weakened and depleted of their color-producing fluid.

The usual method of collecting them was by lowering baskets, at the end of long ropes into the sea. The bait was mussels or frogs, which the *Murex* would seize upon eagerly. The *Murex* was taken from the shell, and its pigment-rich vein swiftly extracted before the coloring matter could deteriorate. The smaller *Buccinum,* on the other hand, was crushed with its shell and the whole mixture, with salt added, was allowed to steep for three days. Then the pulp was simmered in a leaden vessel (brass or iron was carefully avoided, for such metals might alter the dye). These cauldrons were heated by pipes leading from a central furnace. After ten days of gentle boiling and repeated skimmings, the precious liquid was perfectly clear and so reduced in quantity that 8,000 pounds of pulp produced only 500 pounds of the dye. Raw wool was then tested in the dye until the proper dilution was obtained to produce the color.

One of the trade secrets of the Tyrians probably was the mingling of the dyes from the two different shellfish; for the *Murex,* if used alone, produced a dull, dark purple and the *Buccinum,* a red tone which faded easily. *Buccinum* red was less in demand — 200 pounds of *Buccinum* dye brought only 111 pounds of the *Murex.* It was by immersing a cloth, first in the dye of the *Murex* and then in that of the *Buccinum,* that the dark, rich color known as Tyrian purple was obtained. It has been described as "the color of coagulated blood, but when held up to the light showing a crimson hue."

Whatever the particular shade, and however the Tyrians obtained it, none of their Mediterranean neighbors using the same species of shellfish, could match them. Tyrian purple was imitated at various places in the Middle East, Italy, North Africa, and in the Canary Islands, but nowhere could the color be equalled.

Was this partly due to the superiority of the shellfish along the coast of Tyre? Noted historians, like Philip K. Hitti, dismiss this idea by noting that the Phoenicians "discovered and imported the dye from as far as the port of Sparta and the neighborhood of Carthage and Utica."

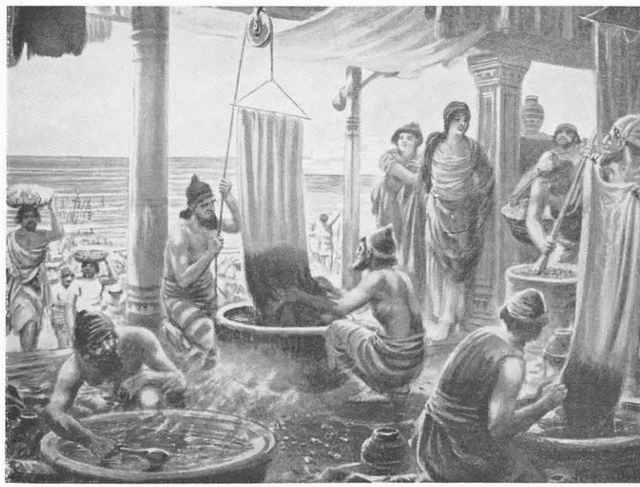
Was it perhaps due to the brilliance of the sun that shone upon Phoenicia? This might have been a factor, for exposing the tinted cloths to certain degrees of light had a great deal to do with the hue. If a cloth was immersed in the fluid of the *Murex* or *Buccinum* and then exposed to a strong light, it turned successively green, blue, red, deep purple-red, and, finally by washing in soap and water, a permanent shade of bright crimson. The Phoenicians evidently not only put to good use the sunlight of their shores, but also profited by some secret, chemical knowledge. And probably as important as the trick of combining dye and sunlight, was the well-guarded skill of how to use mordants to set the colors permanently. It is well known that alkali from a certain seaweed, found principally on the coast of Crete, was employed in fixing dyes in some places. But whether or not the Phoenicians used it or what they did use, is not known. What is clear, however, is that the Tyrians could obtain dyes with their shellfish in various shades of pink, lilac and pale or deep violet, to supplement their wares of purple cloth.

As the first renowned maritime traders, the Phoenicians contributed inestimable benefits to civilization. From the cedars of Lebanon, they constructed magnificent fleets of trading ships. Intrepid adventurers, they dared the Pillars of Hercules and sailed their fragile boats bravely into the Atlantic; they were the first to visit Britain, perhaps Norway, and the first to circle Africa. Through widespread colonies in Cyprus, Rhodes, Crete, Egypt, Sicily, Malta, France, Spain and North Africa, some of its settlements, such as Carthage, eventually eclipsed the fame of their mother cities.

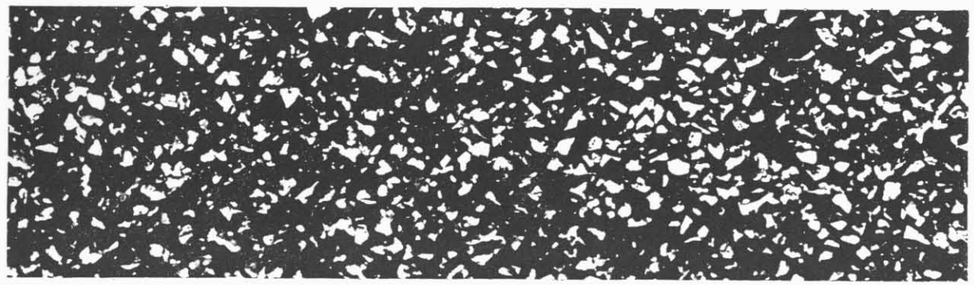
Wherever they went, the Phoenicians propagated the luxuries that made living more pleasant and comfortable, as well as the knowledge by which such material well-being was attained. As shipbuilders, navigators, merchants, miners, metallurgists, gem-engravers and engineers, they were the first great pioneers. They even spread use of the alphabet far and wide, opening unlimited horizons to the mind.

Whatever combination of inventiveness, industry and Nature's bounty may have spelled success for the manufacturers of Tyre, this much is certain — never before or since in history did dye bequeath so much to the glory of a nation. It was the humble treasure beneath the calm blue sea that lapped their shores which, as much as anything, brought fame and prosperity to the "land of the purple." ■

Dating back to the 17th century B.C., Tyrian purple was manufactured from a species of shellfish abounding on the shores of the eastern Mediterranean.



Charcoal Stages a Comeback



Scores of new duties for the black carbon have cleared away the cobwebs from an old American industry

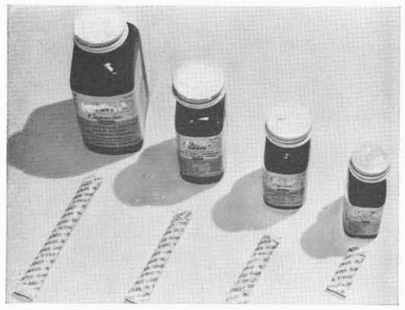
LAST summer in Washington, D.C., two neighboring families once on the very best of terms wound up in court, tempers in shreds, because the aroma – delectable or revolting, according to which side you are on – from one family's outdoor charcoal grill was constantly wafted by the prevailing breeze into the other family's dining room.

The wholesale reversion to charcoal as a cooking fuel has had its impact on the American social pattern. For one thing, it has provoked controversy. There are those who insist they prefer their meat un-scorched and indoors, claiming that mosquitoes make undesirable dinner guests. But their voices cry out in the wilderness of popular disregard, and the manufacturers of the little charcoal briquettes in handy paper sacks face the financial future with equanimity. There is every evidence that the rolling charcoal brazier is a permanent fixture in the suburban backyard.

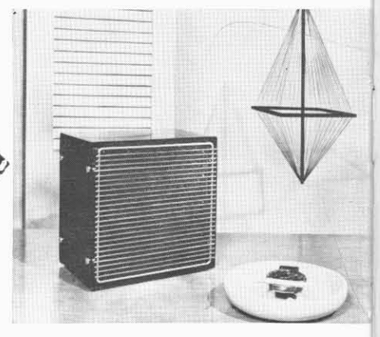
There is no record of the invention and early development of charcoal. Men learned to make charcoal before the wheel was dreamed of and long before anyone thought to file reports. For uncounted centuries charcoal was indispensable to the advance of civilization and even now constitutes a key element in industrial projects of the space age.

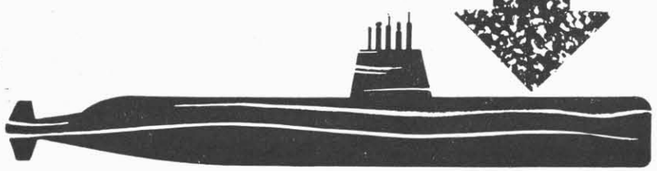
Charcoal is the residue obtained when animal or vegetable substances containing carbon are partially burned or heated to dissipate, in the form of smoke and gases, the unwanted tarry and volatile components. A wide variety of raw materials will produce charcoal – bone charcoal and charcoal from sugar have had specialized roles from time to time – but it is wood charcoal which has been so vital to the history of mankind.

In the beginning charcoal was the only fuel capable of producing the heat required to soften metal to the point where is could be fashioned into implements and weapons. Progressively its other properties became apparent. The Romans knew that charred wood was singularly resistant to decay; stakes with blackened points have been dredged from the Thames and identified as Roman handiwork. It is believed the pilings which support ancient buildings in Venice were given the fire-preservative treatment. In time, charcoal in combination with sulphur and saltpetre resulted in gunpowder.



Activated charcoal is made from carbonaceous material (like wood and coal, nut shells) by reaction with steam at high temperature which gives it tremendous absorbent quality. Its countless uses include (left) the removal from pills and capsules of unwanted tastes; purification of air in home and industry (right) and recently in atomic subs.





The electric kitchen and the H-bomb, however, have not made charcoal *passé*. A vast array of new uses for the black carbon have been found, largely in connection with its long-recognized eagerness to absorb impurities. Where once the rural family filtered its drinking water through a barrel filled with charcoal, now the chemical, drug, cosmetics and sugar refining industries use it by the carload for just this property. When the Kaiser unleashed poison gas against the Allies, the canister of each doughboy's gas mask was filled with activated charcoal. In chewing gum its presence helps to sweeten breath.

Charcoal finds its way into the glass factory, the laundry, the brass and copper foundry and the roofing materials establishment. A dab of charcoal in their diet seems to give hogs and poultry a lift, and many plants are equally responsive. As a cooking fuel charcoal retains its importance throughout the world's underdeveloped areas, as well as in the barbecue pits of plush restaurants. And charcoal, with proper generating equipment, will even propel an automobile.

From one point of view at least, charcoal's star part in the history of nations came with the American Revolution. Had the Colonies not developed a dependable source of charcoal prior to their dispute with George III, the course of the struggle would have been far different. From the charcoal-and-iron complex of western New England, called the Salisbury Ironworks, came General Washington's artillery.

Western Europe began to run short of hardwood for charring in the 1600's. The demand for iron had become so insatiable that whole forests were turned into terrestrial crewcuts, before rulers awoke to the likelihood of treeless realms with no place to hold their hunting parties, and imposed a form of conservation. With charcoal thus rationed, iron output dwindled. There was little enough for domestic consumption, and exporting it was out of the question.

In this climate the early settlers of this country, to whom virgin timber was as much a nuisance as an asset, lost no time probing for iron ore and setting up their own foundries. Furnaces popped up out of the Berkshire Hills like toadstools, as the necessary technicians – mainly the highly-skilled colliers, or charcoal makers – were enticed from as far away as Lithuania and Switzerland with firm pledges of free homesteads and high pay. As a consequence, when the war broke out the Colonies were well prepared to manufacture their own weapons.

Though the shaggy Neanderthal who discovered charcoal doubtless did so by lucky accident, the making of charcoal in quantity with handwrought tools was no mean trick. It required long experience, infinite patience, considerable nerve and a sixth sense which would tell the collier that somewhere, deep in his "pit," live flames were threatening to nullify weeks of backbreaking labor.

The technique brought over from the Old Country, which held good until the 20th century, saw the master collier and his one or two helpers trudging through the woods until they found a level area in the lee of a hill. High wind was perilous to charcoal-making operations, and slopes were avoided which might add to the work of hauling.

Cutting the wood during the winter and allowing it to air-dry until spring, the crew then began the painstaking construction of the pits, which were not pits at all, but rather cone-shaped mounds of split logs covered with thick layers of leaves and dust. The pits ranged in size from thirty to forty feet in diameter, of equal height. Between twenty-five and fifty cords of wood went into each one, the smallest chips and twigs included. The small fragments were needed to fill every chink of the structure and make it airtight.

The charring process depended for success on strict control of air circulation. Too much draft and – poof! Intense care went into the lapping of the split billets around the small hollow at the base of the "chimney" into which the collier, when all was in readiness for firing, dropped a shovelful of live coals.

The charcoal maker was seldom pestered by accident insurance agents, it being well known that his duties involved periodic clambering over the face of the smouldering pit, checking for vents and weak spots, an activity for which asbestos breeches would have been a desirable accessory.

In this ante-automation era of charring it took about two weeks for the pits to burn off and be ready for the raking-out and cooling process. This meant two weeks of solid vigilance with frequent trips up the crude ladder to the top of each pit (one coaling crew usually built and tended eight pits in a season) to check on the fire glowing inside. This was done largely by "feel." A long green pole called a fagan was rammed up and down inside the chimney. His sense of touch told the collier how things were coming along.

There is no guesswork in the mass production of today's

A modern charcoal kiln, loaded and ready for the torch. Experienced operators can determine stage of burning from color and odor of smoke.