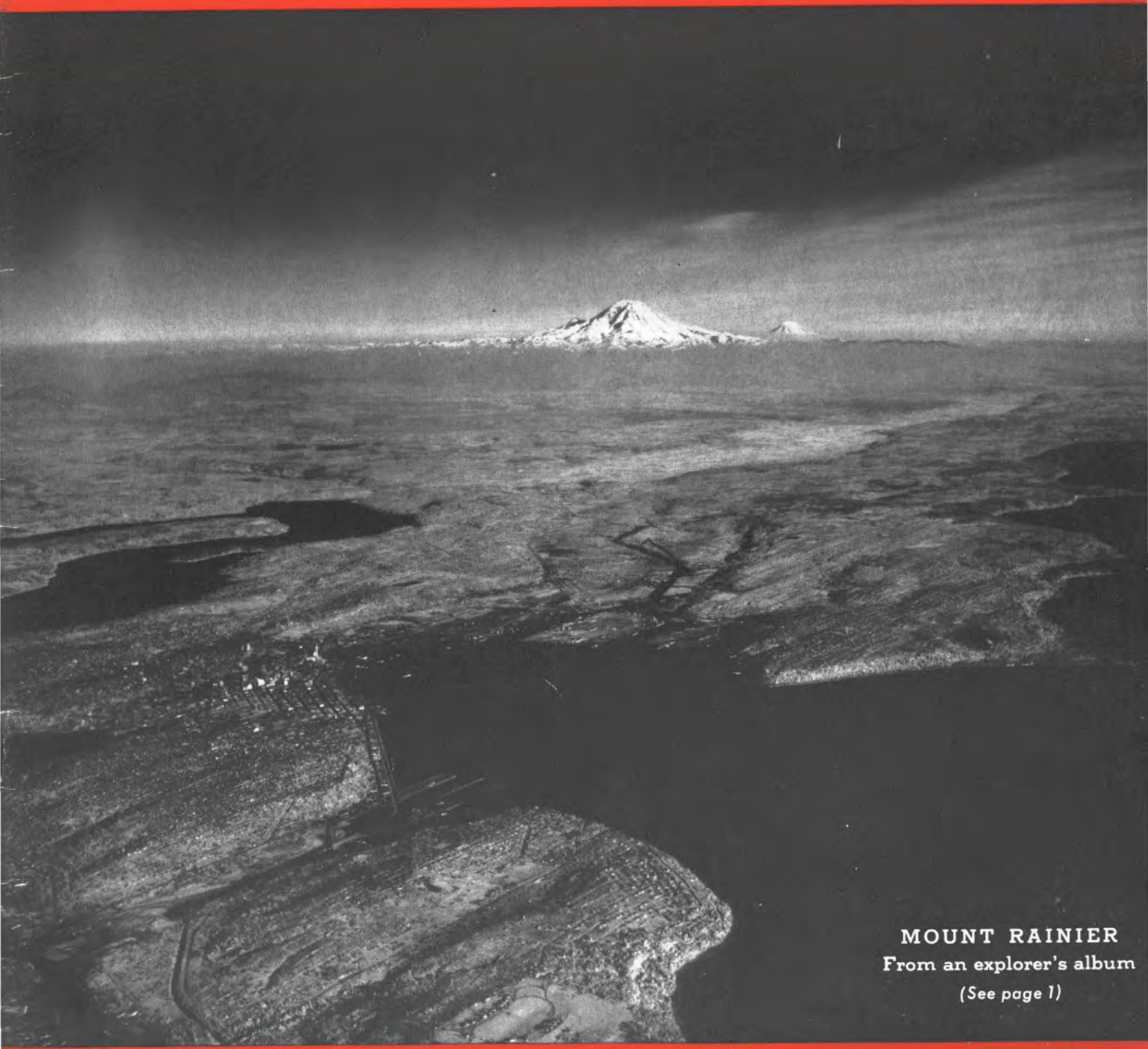
KODAK

A MAGAZINE FOR EASTMAN EMPLOYEES



MOUNT RAINIER
From an explorer's album
(See page 1)

JANUARY 1939

"PULLING OUT": this entry of Howard P. Stevens, of the Eastman Kodak Stores, Minneapolis, drew the Australian Trophy, second prize in the Thirteenth Annual Kodak International Salon of Photography, which was held at Harrow last month. More prize-winning pictures will be found on page 5 and inside the back cover

IN THIS ISSUE

KODAK

Volume 18 JANUARY 1939 Number 1

Pictures from an Explorer's Album

The summit of Mount McKinley photographed from an altitude of 21,000 feet in a strong southeast gale, and (below) the south wall of Mount Logan, in Canada, a 12,000-foot almost vertical rock and ice cliff. These fine aerial pictures and the one on the front cover—Mount Rainier shot with infrared film from 10,000 feet above Seattle—were taken by Bradford Washburn, noted explorer, of the Institute of Geographical Exploration, Harvard University

The Story of Lens Making at Hawk-Eye

Where Raw Optical Glass Becomes a Precision Instrument For Directing Rays of Light

DID YOU ever see a traffic cop directing rays of light? The question probably sounds rather fanciful, and yet an Eastman lens does serve as a kind of traffic cop. For it receives rays of light from any point in an object, bends them as they pass into the camera, and directs them to a sharp point on the sensitized film. Without the lens to control its behavior, a single point of light would spread over the entire film, and the negative would develop to an over-all black.

Now it shouldn't be supposed that any piece of glass, ground and polished to the familiar lens shape, would serve as a photographic lens. Lenses must be ground to precise mathematical specifications. So the lens designers at Hawk-Eye must first work out the formulas for the lens—a task that involves literally volumes of figures.

From their calculations, the designers determine the types of crown, flint, and other glasses that will be required, the number of elements or parts that will make up the lens, and the surface curvature and thickness of each of these elements. Their findings are sent in the form of blueprints to the Hawk-Eye Tool Shop where special grinding and polishing tools are made for each lens surface. Tools for grinding convex lens surfaces are made cup-shaped; concave surfaces are ground on convex tools.

In addition to the grinding tools, test plates are made to be used later, as we shall see, for checking the lens curvatures during grinding and polishing. These test plates are made in pairs, checked one against the other to insure perfectly spherical surfaces.

A Sample Lens Is Made

The elements of a sample lens are now made and mounted in the experimental optical shop. Then, if its performance under a series of tests meets the expectations of the designers, the lens is put into production and thousands must now be made with such precision as to equal the quality of the sample lens.

The required types of optical glass for each of the lens elements are ordered from the stock room. Delivered in the form of thin slabs, the glass is ruled with a diamond-pointed cutting tool and broken into small squares. Each square is the raw material for a single lens element. The squares are softened in a gas furnace

After raw optical glass has been ruled and broken into small squares, it is softened in gas furnaces of this type and molded into round discs known as lens blanks. Grinding operations come next

with a temperature of 1600 degrees, dropped into a cup-shaped die, and then placed under a plunger which molds the soft glass into round discs known as lens blanks.

Because the shaping of the lens blanks requires that the glass be heated to softness, it must now be annealed—heated almost to the softening point and then very gradually cooled—in an electric oven. This operation is necessary, not alone to remove any internal strains set up by rapid cooling, but also to restore the optical properties of the glass to their original condition.

The annealed blanks are then inspected for flaws and the faulty ones weeded out. It may be that some of the blanks, now ready for grinding, are too thick for making the lens elements. Since the grinding away of this superfluous glass with emery would be a costly process, the blanks are milled to the proper thickness.

Grinding the Lens

Preliminary grinding and shaping of the lens is done by hand. The lens blank is held against a revolving grinding tool until it has been ground almost to its final shape and thickness. It is then passed along to the automatic grinding machines. But first it must be accurately fastened

Long batteries of polishing machines move the lenses to and fro over polishing shells lined with pitch and beeswax. From time to time an experienced operator checks each lens with a test plate

to a concave or convex grinding "shell." This is done by "blocking" the glass with a button of molten pitch which hardens and holds it securely in place.

Automatic Grinding

The operation of the grinding machines is a source of wonder to the visitor. They are arranged side by side in batteries on long grinding benches. As the grinding tool revolves, the lens elements move back and forth across it in an irregular movement. If the lens element were held stationary while the grinding tool revolved, circular grooves would be ploughed into the glass. In some cases a lens is ground singly, but generally a number of the glass discs are blocked on one tool and worked together.

Emery serves as the abrading material, progressively finer grades being used as the grinding goes on. From time to time the lens element is inspected to see that it is being formed to the correct thickness and curvature. When it has attained such a finely polished surface as to be semi-transparent, it is removed from the grinding machine and passed along for polishing.

Polishing the Lens

The action of the polishing machines is very like that of the grinding machines. But here jeweller's rouge—not the kind used by the ladies—is employed as the abrasive, and the polishing shells are lined with a composition of pitch and beeswax. Under the action of this fine abrasive, the lens element reaches its final polished form. It is frequently examined during polishing by means of the test plate, which is really a lens of equal but opposite curvature. If the two surfaces differ by as little as 1/100,000 of an inch, circles of color show through the test plate.

When these circles, known as Newton's rings, are present, the polishing is continued until subsequent tests with the test plate no longer produce them. The polished surface is then coated with shellac to protect it during handling.

Each lens element is ground and polished to a size somewhat larger than is required for mounting. After polishing, it is optically centered and trimmed down to the exact size that fits the lens mount.

Checking and testing at every step in manufacture does much to insure the high quality of Eastman lenses. Here we see a commercial lens getting its final tests on the lens bench. The slightest errors can be detected

Now, it goes to the Cleaning and Inspecting Department. Here the shellac is first dissolved from its surface. Then each element is subjected to ten tests, the last two so precise that the verdicts of two sets of inspectors are checked one against the other.

A lens, when assembled, may consist of some elements which are cemented, while others are "air spaced," that is, mounted at a distance from one another. The cementing of the lens elements—generally a combination of crown and flint glasses—is done with Canada balsam, the turpentine obtained from the balsam fir. The job is performed on a revolving chuck where the operator, by watching light reflections on the lens surfaces, can determine when the elements are in perfect alignment.

"Air Spacing" the Elements

In mounting, the "air spacing" of the elements must be done with great precision. Exact spacing at a predetermined distance is not enough since the slightest variation in the thickness of an element will throw the lens out of adjustment. Only by careful testing and painstaking readjustment can the uniform excellence of the lens be insured.

We have seen how each step in manufacture is attended by checks and safeguards to insure the ultimate perfection of each part of the lens. Yet now that the lens is mounted, it is subjected to the most rigorous test of all on the optical bench. Here, the lens is held horizontally in a metal holder by which it can be turned on a vertical axis. Placed at a considerable distance from the test bench is an artificial "star." The lens forms an image of this star, and this image is, in turn, examined under a powerful microscope. In this way the image-forming properties of the lens over the entire field can be examined.

Unmasking Lens Defects

Any imperfection in optics or mounting can be easily detected and the necessary adjustments made. A final test is made after the lens has been mounted in the camera to see that it is in position to give the sharpest possible image on the film.

Such is the story of lens making from the mind of the lens designer to final mounting in the camera. Few picture-takers, certainly, have any conception of the infinite amount of genius and toil that lie behind those bits of glass mounted in their Kodaks. But because the computations of the designer are so carefully made, the work at Hawk-Eye so skillfully done, Eastman lenses have earned a world-wide reputation for uniformly high quality and for accurate performance.

Battling Bruin

RETURNING from a recent vacation in Canada, Thomas Ward, of the Advertising Department, and Mrs. Ward stopped at a wayside stand near Kirkland Lake and there discovered a caged bear which made a specialty of drinking chocolate chill from bottles given to him by tourists.

The Wards passed a bottle through the bars to the pampered animal. The bear retired to the top of his perch, rose to his haunches, and proceeded to enjoy the delicious beverage. Mrs. Ward instantly scented a fine picture and urged her husband into the cage for a striking close-up.

With his Ciné-Kodak purring faithfully, Mr. Ward did get a grand movie: the bear finishing his chocolate chill . . . the bear licking his chops . . . the bear sliding down from his perch . . . the bear reaching the ground and heading toward the camera. But here the movie record stops abruptly, for Mr. Ward suddenly realized that Brother Bruin was after him. "He landed several hefty blows before I could scramble through the cage door to safety," the daring photographer reveals with a shudder.

Mrs. Ward thinks the movies of the bear are just grand. Mr. Ward is trying to forget all about them.

New Film

AN ARTICLE elsewhere in this issue deals with various types of Eastman films and their uses, but there's one that we feel deserves a mention all by itself. It's Eastman Safety Autopositive Commercial Film, recently introduced by the Company.

Suppose you place it against a negative in your printer and make an exposure. Do you get a positive as you might reasonably expect to? No indeed you don't. If you expose it heavily, does the film go dark? It does not—it develops thin. Now give it a very short exposure. Maybe you've guessed it—it develops dense.

Sounds like a bad dream, but actually this seemingly unruly behavior is the result of careful work by Kodak's film makers. Autopositive Film simplifies for photographers the making of duplicate negatives by completely eliminating positives; and it halves time, labor, and expense.

Glacier Country

LOWLANDS covered with a carpet of dazzling green; a modern farm only 120 miles south of the Arctic Circle (four feet below the fertile crop and pasture lands the ground is frozen solid); immense glaciers—these are just a few of the scenes that Dr. Walter Clark, of the Research Laboratories, recorded in Kodachrome and in black-and-white during a visit to Alaska last fall. The trip was no mere pleasure jaunt: it yielded valuable first-hand information on the behavior of Eastman products under varying conditions both in the air and on the ground.

Five of Dr. Clark's Kodachrome pictures were reproduced in a recent issue of *Life*. "The Alaska most people know is the winter Alaska of endless snows, reindeer and crystal-white glaciers," said that magazine. "Quite another world is the summer Alaska. Soaring over the glacier country in Alaska's interior last August, Dr. Walter Clark of the Eastman Kodak Co. made a full picture record of its breathlessly vivid coloring.

"Alaska's summer comes late but suddenly. Plants shoot up from the few feet of thawed soil and grow prodigiously under 20 hours of sunlight. Down through mountain gaps flow the long tongues of ice to lick at vegetation which rivals the tropics in luxuriance. . . .

"The airplane from which these photographs were taken carried Dr. Clark and Bradford Washburn [see page 1], Harvard explorer, over a sheer mountain wall to the valleys of the St. Elias range, accessible only by air. Looking down, they saw a mass of ice 235 miles long, at places 20 miles wide and thousands of feet thick—the greatest mass of ice yet discovered outside polar icecaps. . . ."

A fascinating country, and a very memorable trip—about which we shall learn more in an article Dr. Clark is preparing for an early issue.

Balloon Maker

A KODAK PARK colleague tells us that Félix Nadar (see page 1, December KODAK) not only deserves fame as the maker of the first aerial photograph but also as the constructor of the largest balloon of its day.

"The largest gas balloon then known," our informant assures us, "was designed by Monsieur Nadar in 1863. The car had two stories. It was made of wickerwork, and it housed a small printing office, a photographic department, and a refreshment room.

"Nadar took it up for the first time on a Sunday afternoon in October, 1863. Evidently he meant to make a lengthy voyage, because he stocked a whacking supply of provisions. But he was down again at nine o'clock the same evening. . . .

"But what could he expect?" our friend demands. "He had thirteen persons in the car. Moreover, one of them was a lady."

Stop Street

WE'RE OFTEN irked by our own absentmindedness, but we must confess that the same weakness in others often calls forth an impish enjoyment.

Take, for example, the case of Kenneth W. Williams, of the Kodak Office. He was driving along Park Avenue with Mrs. Williams on a recent Sunday afternoon. As they approached Culver Road, Mrs. Williams expressed surprise at finding a police car parked in that orderly and law-abiding neighborhood.

"They're watching for drivers who go through that stop sign," explained the wise Mr. Williams.

After visiting with friends for some time, the Williamses headed back down Park Avenue for home. They approached Culver Road with its admonishing stop sign. Mrs. Williams, secure in her husband's understanding of both stop signs and police cars, raised a surprised eyebrow when he drove through without a pause.

"I simply forgot about that stop sign," explained Mr. Williams lamely as the officer tendered him a ticket.

From the Kodak International Salon

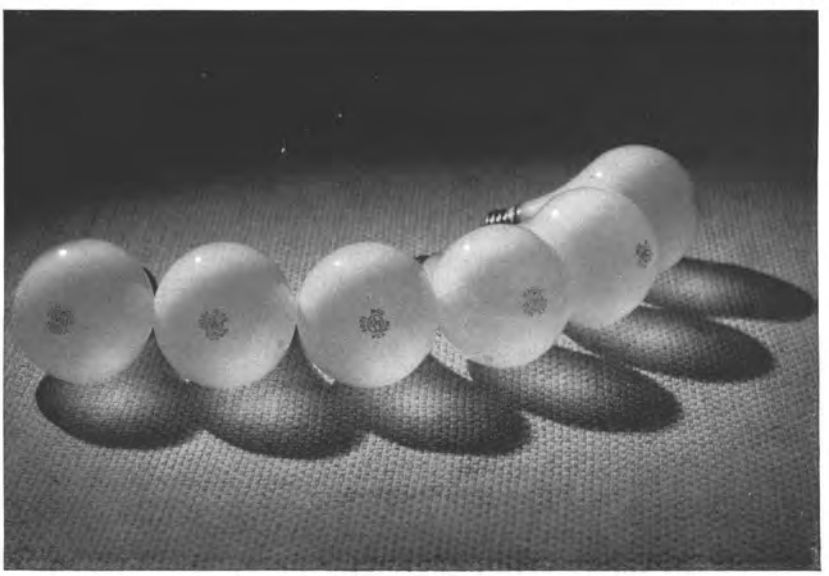
Reproduced here are prize-winning pictures from the Thirteenth Annual Kodak International Salon of Photography, which was held at the Kodak Hall, Harrow, early last month. "Starboard Watch," the Eastman Medal winner, was entered by Herbert H. Johnson, of the Kodak Office. The Superintendents' Cup went to Kan Shing Moy, Hong Kong, for his portrait (below right). "Research," by Richard V. Cunningham, of the Kodak Office, drew the Hutchison Cup, awarded for the most artistic advertising photograph. "Chow," by H. Wesley Vokes, of Hawk-Eye, was awarded a silver medal. "Pulling Out," the winner of the Australian Trophy, the second prize, appears inside the front cover. "Huckleberry Finn," Speth Memorial Gold Medal winner, is reproduced inside the back cover. The Adolph Stuber Trophy went to Donald M. Gordon, Glasgow

Eastman Medal

Superintendents' Cup

Silver Medal

Hutchison Cup



Eastman Service Backs Up Eastman Sales

Though It's Not Marked On The Ledger In Dollars And Cents, The Customer's Good Will Is A Priceless Asset Of The Company

To BEGIN WITH, let us suppose that every customer of the Eastman Kodak Company makes only one purchase of our goods and no more. A young man steps into an Eastman store and buys a Kodak Junior. An industrial photographer orders an Eastman Projection Printer. These are desirable customers, but still we are assuming that they will never come back.

If this were suddenly to become the actual state of affairs, the results would be very unfortunate indeed. For repeat orders from customers make up a large percentage of the sales of any successful business. Manufacturing operations depend upon them to a considerable degree. Without repeat orders, production schedules would have to be curtailed to a point where a very large number of people employed would be seriously affected. The Eastman Kodak Company must depend on repeat orders just as completely as do other companies. If our customers bought Eastman goods but once, the whole machinery of production would inevitably be thrown right out of gear.

The Service Department, Kodak Office, gives aid to the amateur picture-taker in many ways—here, by providing him with an accurate exposure guide for determining the exposure of indoor pictures

But, happily, our customers do come back again and again. Sale follows sale, and the consequent demand for Eastman goods keeps our plants and offices running, does much to keep our employment figures stable.

Now, the question we want to ask and then try to answer is simply this: What is it that brings our customers back?

In a broad sense the answer can be given very easily. The customer comes back, first, because he is well satisfied with *Eastman quality*, and secondly, because his good will has been won by thoroughgoing *Eastman service*.

The Importance of Service

The name, "Kodak," is synonymous with quality the world over, but few of us realize to what an extent the success of our company depends upon the rendering of prompt, courteous, unfailing service. Only by going behind the scenes and observing the activities of our service organizations can we gain a clear understanding of this tremendously important work. To do this, let us take one or two examples of customers in need of service and see how their problems are handled.

John Jones buys a Kodak Bantam. Even before he purchased it, our service department had taken steps to prevent any trouble by preparing a camera manual offering full instructions on how to operate his Kodak Bantam. They had also prepared leaflets and booklets telling him how to take pictures at night, how to make portraits, how to expose for every type of lighting. Consequently, John Jones has had fine success. But now he wants to improve the quality of his pictures by the use of filters. Knowing little about the subject, he writes to Rochester for information.

His letter arrives at the Kodak Office and is forwarded to the Service Department. A correspondent reads it, sees that Mr. Jones should have a manual on filters, and promptly mails him a copy of the booklet, "Color Filters and Kodak Film." He also writes the customer a friendly letter

A frequent and welcome caller at the studios of professional photographers, the demonstrator is prepared to solve the problems of his customers. His helpfulness wins and holds their good will

offering a few additional suggestions and encouraging him to call on the Service Department whenever further problems come up.

Seventy-eight thousand such letters were answered last year by the busy correspondents of the Service Department, and the great majority of those seventy-eight thousand customers, we feel sure, would agree we had done our best to answer their questions.

Customer Response

Do the Joneses and Smiths really appreciate this service? You can judge for yourself as you read their letters written in appreciation. Here are excerpts taken word for word from some of these letters:

"Some days ago I received the H & D curves and associated information on your films. I take these spare moments to sincerely thank you for your kind co-operation. I am positive that such interest in your customers sets up a friendly relation between Eastman Kodak and myself and my friends."

"I thank you for your letter of August 24th and for the information on how to take pictures indoors. . . . It is certainly gratifying to write your company and receive such a complete and satisfactory reply."

"The remarkable picture came and I am ever so pleased and so grateful

to you for your kindness in going to all this trouble of looking up the negative and making an enlargement for me."

Here, certainly, is visible evidence of customer good will earned by ungrudging service. Another example of a different kind:

Mr. Smith, a portrait photographer, is having difficulty maintaining the quality of his enlargements. The prints lack sparkle and sharpness. His customers are growing dissatisfied with his work. He steps to the phone one day and calls the Eastman store where he buys his photographic supplies. "I don't know what the trouble can be," he concludes dolefully. "Can you send someone down to help me?"

Enter the Demonstrator

Mr. Smith's urgent request is promptly answered. An Eastman demonstrator hops in his car with such materials as he may need and hurries off, for all the world like the family doctor, to cure the trouble of photographer Smith. Once there, he removes his coat, rolls up his sleeves, and sets to work. He checks the enlarger, questions Mr. Smith about his developer, and before very long the trouble is located and corrected.

The work of the demonstrators is as varied as photography itself. There are demonstrators specializing on paper, on film, on photofinishing, on the graphic arts, on medical photography. During a few weeks of each year they are on the road, holding schools in the larger cities where any photographer may come to learn the latest developments in his field without cost. All through the year more than seventy of these servicemen are in the field helping the harassed photographer to do his work properly. Each one is an experienced photographer himself, thoroughly trained and pleasantly mannered. Not a salesman, he and his fellow workers are employed by the Company simply as ambassadors of good will.

Is this costly demonstrating service justified? Ask the photographer. He will tell you that he turns to the Eastman demonstrator whenever the smooth operation of his business snags on a technical problem. He has learned to admire the demonstrator for his all-round ability, respects him for his courteous and willing service.

Travelers in foreign lands are never far from Eastman service. The Kodak sign greets them in nearly every country of the world. This movie-making tourist can have her films processed and projected before she returns home

And so, by gaining complete service as well as fine quality, the photographer has further reason to buy Eastman equipment and to stock his workroom shelves with Eastman films and paper.

But our service to the customer is even more varied than these two examples might indicate.

The Service Department at the Kodak Office has many jobs in addition to the extensive individual advice it gives our customers on their problems. Pocket exposure guides and exposure leaflets are prepared to guide the picture-taker. Comprehensive reference manuals are sent out to keep the salesmen and store clerks informed on the latest photographic developments so that they can better serve their customers. Helpful criticism of negatives and prints is given the amateur without charge. The inspection and repair of Kodaks, Ciné-Kodaks, and Kodascopes are efficiently handled.

Club Service

Eastman Camera Club Service, with its country-wide coverage, is another important aid for the amateur picture-taker.

In the field, the rendering of Eastman service is not limited to the demonstrator alone. Each one of our salesmen is a link in the strong chain of Eastman service. He must be prepared to answer technical questions, suggest improvements in method, handle complaints, and keep the customer satisfied by courteous and helpful effort.

The Eastman Kodak Stores, separately incorporated in their various states, are particularly well qualified to give complete photographic service. Their salesmen, in many cases trained at Rochester, are well prepared to handle the problems of both the amateur and the professional.

Eastman service extends to the far corners of the earth. Travelers can take their problems to the stores of our foreign subsidiaries. More than

(*Continued on page 16*)

Activities Calendar

January 16—Rochester Industrial Basketball League; Sibley's vs. Kodak Park, at Kodak Park

January 18—Camera Works card party, in the Kodak Office auditorium

—Camera Club print-critique and monthly competition

January 19—Camera Club ciné group, regular meeting

January 25—Rochester Industrial Basketball League; Rochester Telephone Corporation vs. Kodak Park, at Kodak Park

January 29—Kodak Choral Society concert, in conjunction with the Rochester Civic Orchestra. "Kodak Night" at the Eastman Theatre

Late January—Kodak Park Athletic Association, travel talk for girls

February 2—Camera Club, portrait demonstration and candid-camera meeting

Tiny Microbes and Mighty Stars

And Everyday Camera Subjects, Too, Require A Great Variety Of Eastman Films to Get Good Pictures of Each One of Them

YOU REMEMBER those delightful lines in *Alice in Wonderland:*

"The time has come," the Walrus said,
"To talk of many things:
Of shoes—and ships—and sealing wax—
Of cabbages—and kings. . . ."

Yes, the Walrus expresses very nicely indeed the fact that this world is full of a great variety of things. And since most of these things have their pictures taken at one time or another, there are many different types of Eastman films.

Still, it might not be immediately apparent why one type of film couldn't be used for taking the picture of a shoe, a ship, and perhaps a king. As a matter of fact, it could. The point to be considered, however, is that no one type of film could take the best possible picture of the shoe, and the ship, and the king—because the picture-taking requirements and the type of picture wanted would require different film characteristics from one picture to the next. Let's consider these film characteristics for a moment.

Probably the most important characteristic of a film is its *speed*. There are "slow" films and "fast" films, and films in between. Moreover, the speed of a particular film may vary according to the color of the light in which it works.

Another very important characteristic of films is their degree of *color-sensitivity*. Some are sensitive only to blue light. Others, the orthochromatic films, are sensitive to green as well as to blue light. Panchromatic films are sensitive to all the visible colors, the blues and greens and yellows and reds. All films are sensitive to ultraviolet and a few films to infrared light which the human eye cannot see at all.

Then there are films with great *exposure latitude* and others with very slight exposure latitude. Some films have a *long scale* of tone values from white through the grays to black, while other films produce sharp *contrast* between blacks and whites. And, finally, there is an important film characteristic which we refer to as *fine grain*. This is not a complete list, but the more important characteristics have been mentioned.

Combining the Characteristics

To produce films that will fill the picture-taking requirements of every photographic job means that the characteristics of a given type of film shall be absolutely uniform, regardless of the place or time it is purchased by the photographer, and that these film characteristics must be made available in many combinations. High speed, for example, may be combined with great exposure latitude. Complete color sensitivity may be combined with high contrast. Every one of the many Eastman films offers one of these valuable combinations. Let's see how this works in practice.

A Film in Action

A newspaper photographer gets a rush assignment to cover a late afternoon accident on a busy downtown street. He grabs his Speed Graphic, stuffs a pack of film in his pocket, and hurries off. Arriving at the scene of the accident, he thrusts his way through the growing crowd of spectators and quickly focuses for a close-up shot. To get depth in his picture, he wishes to stop the diaphragm down to *f*.11. But the late afternoon light is very poor, and unless his film is very fast he cannot get a full exposure. Now he moves around focusing and shooting rapidly from various angles. There isn't time to carefully plan each exposure, and he quite excusably over- and underexposes several of his shots. To save these incorrect exposures, his film must have wide exposure latitude. There are many colors in the summer clothing of people appearing in his picture. Only a fully color-sensitive film can render those colors in their correct black-and-white values. His exposures made, the photographer now dashes back to the office to get his shots in the last edition. Every second is valuable. He must develop the film quickly, print the negatives while they are still wet. So his film must be fast developing, and it must be physically hardened to withstand the rough treatment of wet printing.

An Ideal Press Film

So it can be seen that the most desirable characteristics of a press film would be high speed, wide exposure latitude, full color sensitivity, physical hardness, and ability to develop rapidly. All these characteristics are found in Eastman Super Panchro-Press Film. Thus, a special combination of qualities has been produced in one film to fulfill the requirements of press photography —and to fulfill them extremely well.

Amateur picture-takers depend on Kodak films chiefly for their unvarying uniformity and their wide exposure latitude. Even the young camera enthusiast with his simple Brownie confidently shoots on Verichrome

Such fine combinations of film characteristics are clearly needed in professional work, but why should the amateur require such a wide variety of Kodak films? As a matter of fact, the average amateur doesn't. His simple camera may have only one shutter speed and two or three diaphragm settings. Since the lighting conditions vary greatly from picture to picture, his exposures will be far from uniform. He is primarily interested, then, in getting a film that will take care of reasonable exposure errors. In other words, he wants a film having wide exposure latitude. Kodak Verichrome Film with its double-coated emulsion answers his purpose perfectly.

Other Requirements

But suppose that this amateur plans to take some indoor snapshots. Under Mazda lighting he must have a fast film, sensitive to red and orange light. So now he wisely loads his camera with ultra-fast Kodak Super-XX Film. At another time, planning to take some pictures for enlargements, he has the foresight to choose a film with extra-fine grain. Kodak Panatomic-X fills this requirement. And, of course, if he wishes to take pictures in full color with his miniature camera, he merely loads with Kodak Kodachrome Film and exposes his pictures in the same way that he exposes black-and-white films.

Eastman films meet every picture-taking requirement. Fishing for fantails with a Kodak Retina and Plus-X Film has its advantages over a hook, line, bamboo pole, and wiggling worms

Carole Lombard and James Stewart celebrate the New Year for the benefit of a Hollywood movie camera. This still from "Made for Each Other" is reproduced by the courtesy of Selznick International Pictures

If the amateur requires this rather wide choice of films for his picture-taking, it isn't surprising to find that the professional photographer requires a much wider choice to meet the changing requirements of his varied work. Eastman supplies him with about twenty-five types of professional films so that he can choose the right combination of film characteristics for every job. For example, he may choose from three Eastman Process Films for photographic copying. Here, great contrast is important, speed relatively unimportant. So process films have high contrast, slow speed, and various degrees of color sensitivity. If the professional photographer is a portrait worker, he will require a fairly fast film with a long scale of pleasing tone values. More than that, he must determine the color sensitivity of his film according to the lighting he uses and the subject he is photographing. So Eastman offers him several orthochromatic and panchromatic films which have the necessary speed and long scale.

In scientific and medical fields, Eastman films play an increasingly important role. Four x-ray films have been designed for dental work alone, and dentists are relying more and more on these x-ray records to guide them in their work. The use of Eastman x-ray films for examining every part of the body has added immeasurably to the accurate diagnosis of internal troubles, and, consequently, done much to relieve physical suffering and safeguard life.

Five Eastman films, three of them specifically designed for the purpose, are used in aerial photography. Here again film characteristics have been combined in different ways to meet ordinary and extraordinary requirements. The great speed and high contrast of Eastman Special Panchromatic Aero Film fits it for all-round aerial work. Sometimes, however, the aerial photographer will be working above light-colored or sandy regions where a film with very high sensitivity to green is needed. Eastman Aero Ortho Film fills this bill. Long-range aerial photography often requires a film capable of penetrating atmospheric haze. Eastman Infra-Red Aero Film, by eliminating the scattered light which causes haze, can "see" for great distances.

The Movie Films

Some mention should be made, too, of the many Eastman motion picture films. For the amateur, 8-millimeter and 16-millimeter Ciné-Kodak films are supplied in black-and-white emulsions of various speeds as well as in the outdoor and indoor

(Continued on page 16)

THE EDITOR'S PAGE

Are You House-Minded?

THE EASTMAN SAVINGS AND LOAN ASSOCIATION'S building service intends to have plans and colored renditions of houses ready for display during the early part of February. They will be exhibited in the various plants where the interest in building seems sufficient to make it desirable.

Included in the display will be bungalows, Cape Cod cottages, and two-story houses of various designs. Several of the latter will be expressly designed for the Koda-Vista and Bonesteel tracts.

Arrangements will be made for those interested to discuss specifications, costs, and financing with William R. Challice, of the Kodak Office, who has charge of the association's building service.

Watch the bulletin boards for further details.

The Thirteenth Salon

MORE THAN a thousand prints from sixteen countries were entered in the Thirteenth Annual Kodak International Salon of Photography, which was held in the Kodak Hall, Harrow, early in December. Of these, 242 were selected by the judges to go on exhibition.

Four of the six major awards that are offered for annual competition in the salon went to employees of the Company in the United States (see page 5 and inside the front and back covers). The others were won by employees in Hong Kong and Glasgow.

In addition to the major prizes, medals and certificates were offered for prints judged worthy of special recognition. Of the three silver medals distributed, one went to L. Richard Brittingham, Jr., of Eastman Kodak Stores, Philadelphia. Ralph J. Fallert, professional demonstrator, and Dr. Henry C. Staehle, of the Research Laboratories, received bronze medals. Among certificate winners were the following: Willis L. Thomas, of Kodak Hawaii, Limited; William E. Sillick, of Kodak Park; Wescott Burlingame, Jr., of the Kodak Office; Elliott Bowdoin, of Eastman Kodak Stores, Portland, Oregon; and Lewis T. Grayner, of Eastman Kodak Stores, Washington, D. C.

A number of prints, including the winner of the Adolph Stuber Trophy, one of the major awards in the salon, arrived too late for reproduction in this issue. They will appear in February KODAK.

"The Genesee Falls, Rochester": from a print published in London in 1838

From Our Mailbag

"SOME TIME AGO, I read an article in KODAK concerning hobbies," writes Monroe P. Killy, of Eastman Kodak Stores, Minneapolis. "I am an amateur archaeologist and have been collecting Indian relics for the last few years. I am enclosing a pair of photographs of a stone knife with its original bone handle that I dug out from under two feet of refuse in an ancient village site on the banks of the Missouri River north of Mobridge, South Dakota. I have been told that it is the only one that has been found complete. . . . If there are any more employees in the organization who are interested in studying and collecting Indian relics, I should be very happy to hear from them and compare notes." . . . We are happy to add yet another name to our list of hole-in-oners: John E. Wilson, of Building 26, Kodak Park. Mr. Wilson's feat was duly recorded by a local newspaper. We quote: "The only way Jack Wilson, a Ridgemont member, could break 100 yesterday at Brook-Lea was to get a hole-in-one. So he did. The ace dropped at the ninth, a 123-yarder from the short tee, and was achieved via a No. 4 iron. Wilson, who never before had holed a tee shot, finished with 99 blows." Welcome, Mr. Wilson, step right up and join the lucky ones. . . . And a note from the Camera Works Recreation Club: "While playing single-deck pinochle during noon hour in the Camera Works Dining Room, George Mallory held a 'miracle hand' of 1500 meld. He was playing in a foursome together with his partner Nick Rick against James Sheridan and Charles Klos." Our congratulations and commiserations—in due sequence—are tendered herewith. . . . "I am forwarding you an interesting print which my mother bought at the Caledonia Market in London," writes Walter F. Bent, of the Sales Department. "Perhaps other Rochester employees would like to see what the Genesee Falls section looked like a century or so ago." . . . The print is reproduced beside these words.

The Story of a House on Kingsway

Kodak Limited's Headquarters Is a "Pioneer" Building There

GREAT THRONGS lined London sidewalks and many a Kodak clicked as the royal carriage rolled by on October 18, 1905. Ardent amateur photographers themselves—they were among the first users of the Kodak—King Edward and Queen Alexandra doubtless smiled approvingly.

The royal pair were on their way to open two great new thoroughfares, Kingsway and Aldwych, between High Holborn and the Strand. Today, Kingsway—a splendid street 1,800 feet long and 100 feet wide—is noted for its beautiful office buildings, among them being Kodak House, headquarters of Kodak Limited.

Kodak's first London office was opened in Soho Square in 1885. The Company was then known as the Eastman Dry Plate and Film Company of Rochester. In 1888, operations were transferred to Oxford Street. Ten years later Kodak Limited was organized and once more the Company moved, to Clerkenwell Road this time.

In 1910, the year the last horse-drawn omnibuses were removed from London streets, Mr. Eastman made preliminary arrangements for an adequate headquarters for the growing Company in the heart of the city. He leased a site on Kingsway for a period of 99 years and retained Sir John J. Burnet to design and supervise the building.

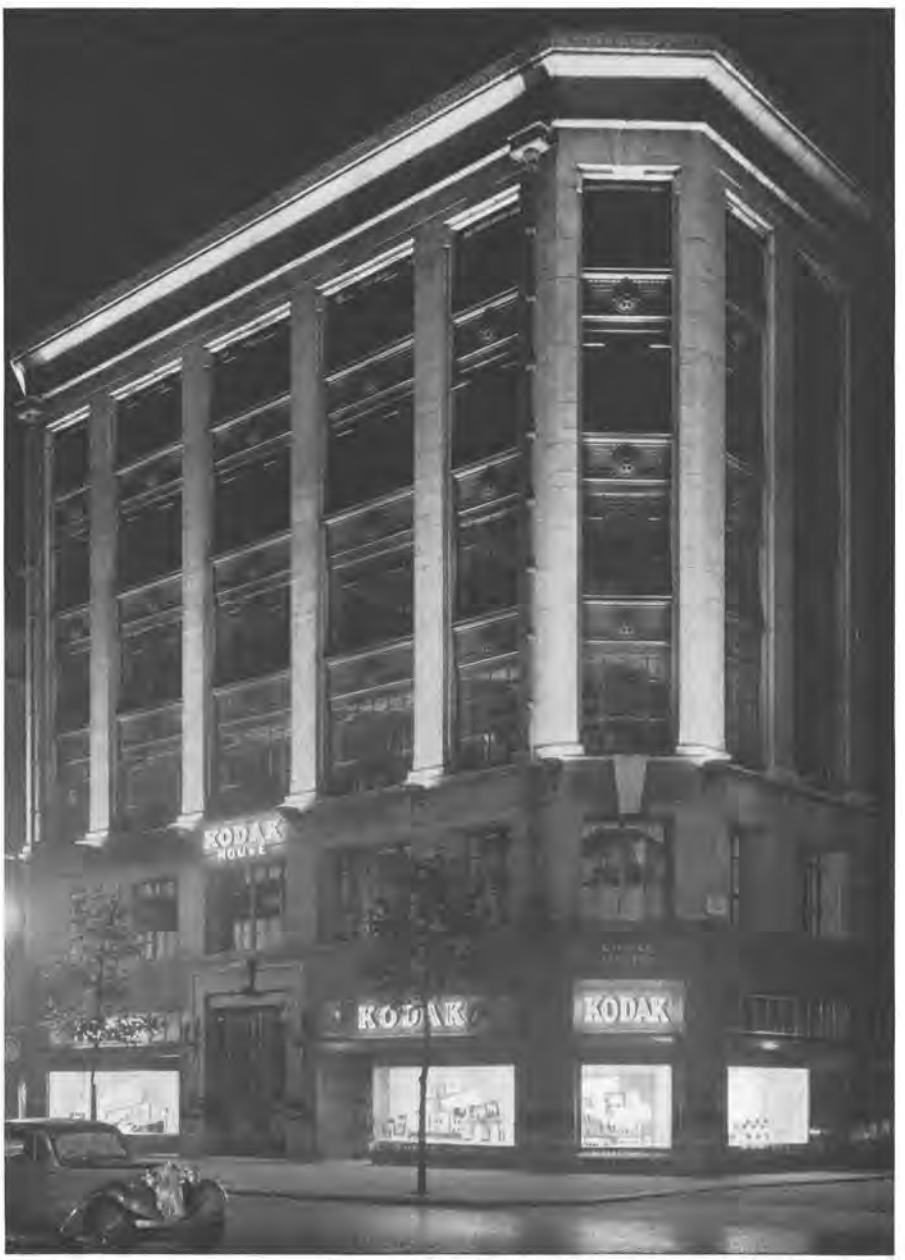
Sir John was already famous for his additions to the British Museum; but even though he had the services of such an eminent architect, Mr. Eastman characteristically insisted that the building should follow his own conception. Sir John was so impressed with the Kodak building that he followed its general features in the business buildings which he later designed in London. Thus, Mr. Eastman's idea set a new standard there for business architecture.

The marble and silver reception hall of Kodak House is surrounded by the offices of the principal officers of the Company, and in the center is a silver-grilled cash counter placed there at Mr. Eastman's personal request—the result of a recollection of his own old banking days. Flanking the main entrance, which is presided over by a blue-uniformed, bemedaled commissionaire—there's another at the side entrance—are Kodak stores, or "shops," as they are called.

The remainder of the eight floors—including a basement and ground floor—house all the sales departments, with the exception of the Sales Service Department, which is at Harrow. These sales departments control the Company's London shops in Regent Street, Brompton Road, Victoria Street, and Bishopsgate; as well as the provincial branches at Glasgow, Newcastle upon Tyne, Liverpool, Birmingham, and Dublin.

Outside of England, companies affiliated with Kodak Limited operate in Denmark, East and South Africa, Egypt, Greece, Turkey, India, Palestine, Java, Straits Settlements, and Syria.

Operations at Kodak House with respect to these companies duplicate, in effect, those of the Kodak Office with regard to our export subsidiaries.



Kodak House, Kingsway: this dramatic photograph of Kodak Limited's headquarters was taken at night. Mr. Eastman personally chose the site of this building 29 years ago and closely supervised its design

Eastman Employees In Plant and Office

Camera Works

Cutting and inspecting small gears to be used in a Kodascope. Cameras must be dressed up—leather covering is applied to the case of a Kodak. A multiple drill is skillfully employed to punch holes in the frame of a Kodascope

Hawk-Eye

Ground and polished lenses must be thoroughly cleaned before they are mounted. A Kodak lens is given a final severe test on the optical bench. Careful inspection helps to make Ciné-Kodak Special "the world's finest 16-mm. movie camera"

Kodak Office

A staff photographer aims his camera at a studio setup. An officer of the Kodak Office Recreation Club directs a bowling tournament. Writing up a new product, an advertising copy writer cudgels his brain for the right word

Kodak Park

Even waste paper is valuable when baled and sold by the Salvage and Reclamation Department. A roll of acetate film base is threaded onto the emulsion-coating machine. Sparks fly in one of the shops as metal and emery come together

They Put Them Through Their Paces

A Camera Works Department Insures by Harsh Treatment The Quality of Products, Materials

THERE'S MORE to a camera than meets the eye. Did you know that there are 34 separate parts in a Baby Brownie, 237 in a magazine Ciné-Kodak? The Camera Works Chemical Laboratory handles nearly every industrial product in its daily routine: brass, aluminum, steel, bronze, copper, and tin; lacquers, japans, and solvents; felts, woolens, velvets, silks, and cambrics; rubber and rubberized products; Tenite, glues, and plating materials—to mention but a few.

The quality of these materials is of vital importance, and Camera Works puts them through their paces to insure their fitness for the job. Samples of steel, for instance, are subjected to a pull of 45,000 pounds to the square inch. Six hundred different camera parts go through an ordeal by fire each day in the laboratory's metallurgical division. Delicate-looking springs are tugged and pulled by a machine known as the elasticometer. Weights crash on enameled and lacquered parts to determine the limit of their durability. A bellows actuating machine, invented at the Camera Works and adjustable for slow and rapid motion, gives camera bellows a wear-and-tear test that far exceeds any they would experience in actual use: the average test is about ten thousand operations, but some have been carried beyond the million mark. (Bellows material used at Camera Works, it may be of interest to note, was developed by the Chemical Laboratory.)

That Certain Cow

The cow that jumped over the moon would not—unless she made a miraculously unscathed landing—find favor with Camera Works, or with the manufacturers that supply the leather it uses. Specifications are high. If a manufacturer finds that his leather has too great an acid content, that the dye rubs off, that the surface is too hard and hence will crack, that the fence-jumping proclivities of the cow it once coated are told in many surface scratches, he knows that Camera Works is not its market.

The Camera Works Chemical Laboratory: here are tested the raw materials used in the manufacture of Kodaks, Ciné-Kodaks, Kodascopes, and an extensive line of photographic accessories

The Glue Room is an interesting division of the Camera Works. Here, glues are made, dressings are formulated, oils are prepared for Ciné-Kodaks—in all, 193 different items are produced under laboratory supervision. Further, they are constantly checked during actual factory operations to insure that they are being used under proper conditions.

Important is the work for Camera Works glue. It plays a large part in the eye-appeal of the Kodak. Before a new model is born, artists study color combinations, the Engineering Department studies design, covering materials are carefully selected. The same camera may see service in the cold North and on the Equator, in humid Singapore and the dry Sahara, and tests show it will do a good job.

Just Suppose

But suppose the cover comes off? It will still be a good camera, but it won't be nearly so attractive. That's where the glue comes in: made at

(Continued on page 16)

On this machine, adjustable to both slow and rapid motion, camera bellows are given a wear-and-tear test that is far more severe than they would experience in a lifetime of normal use in the camera

OUT OF THE HAT

Good Scout

NATURE STUDY, woodcraft, first aid, games, cooking, music, camping—Miss Dora Tobutt, of the Kodak Office, knows more than a thing or two about each. She is a former lieutenant in the Girl Scouts, Troop 45, and she holds the Golden Eaglet, which is the highest award in scouting.

In the not-too-remote days when she wore the green uniform of the scouts, Miss Tobutt likes to remember, she never used more than one match to light a fire (campers take notice). Two matches are allowed.

Knot-tying, too, was a Tobutt specialty in the good old scouting days. She won the city girl scout knot-tying contest. "It's easy to tie a knot," she says, "but it's not so easy to tie one that will hold and yet open readily."

Girl scouts are divided into three groups, Miss Tobutt informs us. Brownies range from seven years to ten; Intermediate Girl Scouts, from ten to fourteen; and Senior Girl Scouts from fourteen to eighteen. There are more than four hundred thousand girl scouts in America.

Sketching and making her own clothes are Miss Tobutt's hobbies. She does an 8-mile hike every day.

Miss Dora Tobutt: one match was ample

Clubman

FRANK C. SHERMAN, of the Camera Works, is rounding out his fourteenth year as secretary-treasurer of the Six Nations Association, an Indian organization for the improvement of conditions on the reservations. Mr. Sherman is the only white man among the officials of the association. The Six Nations are the Mohawk, the Onondaga, the Oneida, the Tuscarora, the Cayuga, and the Seneca.

A descendant of Roger Sherman, one of the signers of the Declaration of Independence, Mr. Sherman is secretary-treasurer-registrar of the Rochester Chapter of the Sons of the American Revolution. He also belongs

Frank C. Sherman: never lower than 99.3

to the Society of the War of 1812.

Mr. Sherman is an expert marksman. He competed in the National Rifle Association event for seven years and never shot lower than 99.3 per cent, and won every medal on the list. "Then," he says, "I quit." He was secretary-treasurer of the Citizen's Rifle and Revolver Club for 25 years, refused to run in 1937.

Twenty-nine years at Kodak, Mr. Sherman was one of the original directors of the Kodak Employees Association. His hobby is history.

Promoter

Miss Lois E. Patchen: plans are under way

MISS LOIS E. PATCHEN, of the Kodak Office, likes badminton so well that she spends two evenings a week—Wednesdays and Fridays—supervising the girls of the Kodak Office Badminton Club. Miss Patchen organized the girl's group a little more than a year ago with fifteen members. There are some fifty members now.

The girls have already taken part in several city tournaments, and plans are under way to organize mixed doubles teams for league play, with Hawk-Eye supplying the male element. "Kodak Office men seem to prefer ping-pong and shuffleboard," Miss Patchen says. "But they're missing a marvelous game."

Miss Patchen is a keen golfer. When she first took up the game, she was out on the course shortly after five each morning. She goes around in the low 80's and her club handicap is 6.

Her love of golfing carries over through vacations, too. She follows the major tournaments closely and she has taken movies of several. Among the best of these are her pictures of the Curtis Cup matches.

He Got the Light to Draw His Pictures

Louis Jacques Mandé Daguerre Gave Us the First Successful Photographic Process in 1839

On January 7th, 1839, the French Academy of Sciences proposed that the government should purchase the rights to a photographic process invented by a Parisian scene-painter named Daguerre. A few months later, daguerreotypy was formally announced, Europe went wild about it, and the camera came into everyday use for the first time.

"A few days later," says a contemporary writer, "optician's shops were crowded with amateurs panting for daguerreotype apparatus, and everywhere cameras were trained on buildings. Everyone wished to copy the view from his window, and he was lucky who at first got a silhouette of roof tops against the sky. He went into ecstasies over chimney tops, he counted again and again roof tiles and chimney bricks, he was astonished to see the very mortar between the bricks—in a word, the technique was so new and seemed so marvelous that even the poorest proof gave him an indescribable joy."

He Finds a Way

Louis Jacques Mandé Daguerre, like many another painter of his day, used the camera obscura to obtain his pictures. One day, a happy thought occurred to him: why not fix the image formed by this camera? There surely must be some way of doing it.

There was a way, and Daguerre discovered it—after long experimentation in partnership with another Frenchman, Joseph Nicéphore Niepce, who had been working on the same idea independently, and who, incidentally, is said to have obtained the first permanent photograph.

Niepce died in 1833 and his son became Daguerre's partner.

Light made so little effect on Daguerre's first plates that an exposure of several hours was necessary. But by 1837, he had succeeded in photographing a corner of his studio.

Then chance stepped in to lend a hand. One day, Daguerre set up his camera to get a picture, devoutly hoping that the sun would keep on shining during the long exposure. It soon became cloudy, however, and he put the plate back in a cupboard. Next morning, he took it out again to resensitize it—and found a beautiful picture. Amazed and delighted, he exposed another plate, put it in the cupboard overnight—and once more found a beautiful picture in the morning. Something had acted on the plate as a developing agent: what was it?

He looked at the contents of the cupboard. It occurred to him that a dish of mercury might contain the answer to his question—perhaps the vapor from it had altered the plates so that the pictures appeared. A simple experiment would tell.

Daguerre exposed a plate and held it over a dish of heated mercury. The fumes produced a clear picture. The daguerreotype was born. "I have seized the light!" he exclaimed. "I have arrested his flight! The sun himself in future will draw my pictures!"

Though the daguerreotype process yielded pictures of great beauty, it had several drawbacks. The picture could not be duplicated (except by rephotographing or hand-copying it). Subjects were reproduced in reverse position, as in a mirror. Tones were often harsh and the light produced annoying reflections at certain angles so that the pictures had to be held "just right" to be viewed. Exposure time was long, as this table from a manual published in 1840 shows:

Louis Jacques Mandé Daguerre: a daguerreotype portrait of the inventor of that process

Bright Sunlight	Summer	Winter
White Subjects	4-5-6-min.	8-9-10-min.
Colored "	8-9-10 "	12-15-17 "
Diffused Sunlight		
White Subjects	12-15-18 "	25-30-40 "
Colored "	20-25-30 "	40-50-60 "

The shortest time in that exposure table is a quarter of a million times longer than is required for the news photographer's snapshot of today.

Early portraits with the daguerreotype imposed an endurance test on the subject—twenty minutes in bright

Reproduced here is the earliest daguerreotype in existence. It was made by Daguerre in 1837. The original is in the collection of the Société Francaise de Photographie, Paris

A panoramic view of Niagara Falls: five daguerreotypes mounted in one frame resembling an arcade. The Langenheim brothers made several similar views of the falls, and they sent one to Daguerre

sunlight was pretty good time at first. The time, however, was shortened very considerably later. Among studio instructions for preparing sitters was:

"A person dressed in a black coat and open waistcoat of the same color must put on a temporary front of a drab or flesh color, or by the time that his face and the fine shadows of his woollen clothing are evolved, his shirt will be solarized and be blue, or black, with a white halo around it."

The steam packet *British Queen* brought details of the new process to New York on September 26th, 1839, and on the following day an Englishman named Seager made the first successful daguerreotype in the United States.

Dr. J. W. Draper made the first daguerreotype portrait in America a few weeks later. His camera was a cigar box fitted with a spectacle lens. In the following year, he obtained a photograph of the moon, but it was too small to be of value.

America took up daguerreotypy with tremendous enthusiasm. Daguerreotype studios mushroomed in every city, and free-lance daguerreotypists traveled the country recording the likenesses of our bustled and whiskered ancestors. The daguerreotype era lasted for little more than a decade: it was succeeded by another process, the wet-collodion—used by photoengravers still—about 1854.

Tiny Microbes

(*Continued from page 9*)

types of Kodachrome Film. A long list of 35-millimeter films is made available for professional movie work. Super X Negative Film with good speed and relatively fine grain is widely used for both indoor and outdoor work. The new Plus-X Negative Film, also used for general work, offers twice the speed and somewhat finer grain. Super-XX, by virtue of extremely high speed, is a new film admirably fitted for movie making under adverse lighting conditions and is well adapted for newsreel photography. A slower fine grain film, Background-X, is ideal for shooting exterior scenes which are later to be projected in the studio as backgrounds. By using Panchromatic-K, the movie photographer can achieve night effects though shooting in daylight. Sound-recording film is "exposed" simultaneously with the negative film, and the two printed on one positive to produce the "talkies." And, finally, there are the positive films which are distributed for theater projection, and duplicating films from which the positives are often made.

Eastman films find many uses outside the ordinary fields of amateur and professional photography. Some of these uses have an almost storybook quality, so surprising are they.

Pictures transmitted across the country by wire for use in newspapers are received on Eastman Wire Photo Film.

Whole libraries and the contents of our daily newspapers are condensed onto the frames of 35-millimeter Eastman Microfile Film.

Aerial gunners in the cockpits of fighting planes train their sights, pull the trigger—and catch their target on Eastman Gun Camera Film.

Cameras are focused through microscopes at wiggling one-celled organisms; focused, too, through great telescopes at the distant stars. In these extreme worlds of invisible minuteness on the one hand and measureless immensity on the other and in the everyday world that lies between, the photographer meets many unusual situations that make unusual demands on his film. The wide variety and unvarying uniformity of Eastman films, the many combinations of film characteristics furnished in them, provide him in every case with a film that fits the job.

Eastman Service

(*Continued from page 7*)

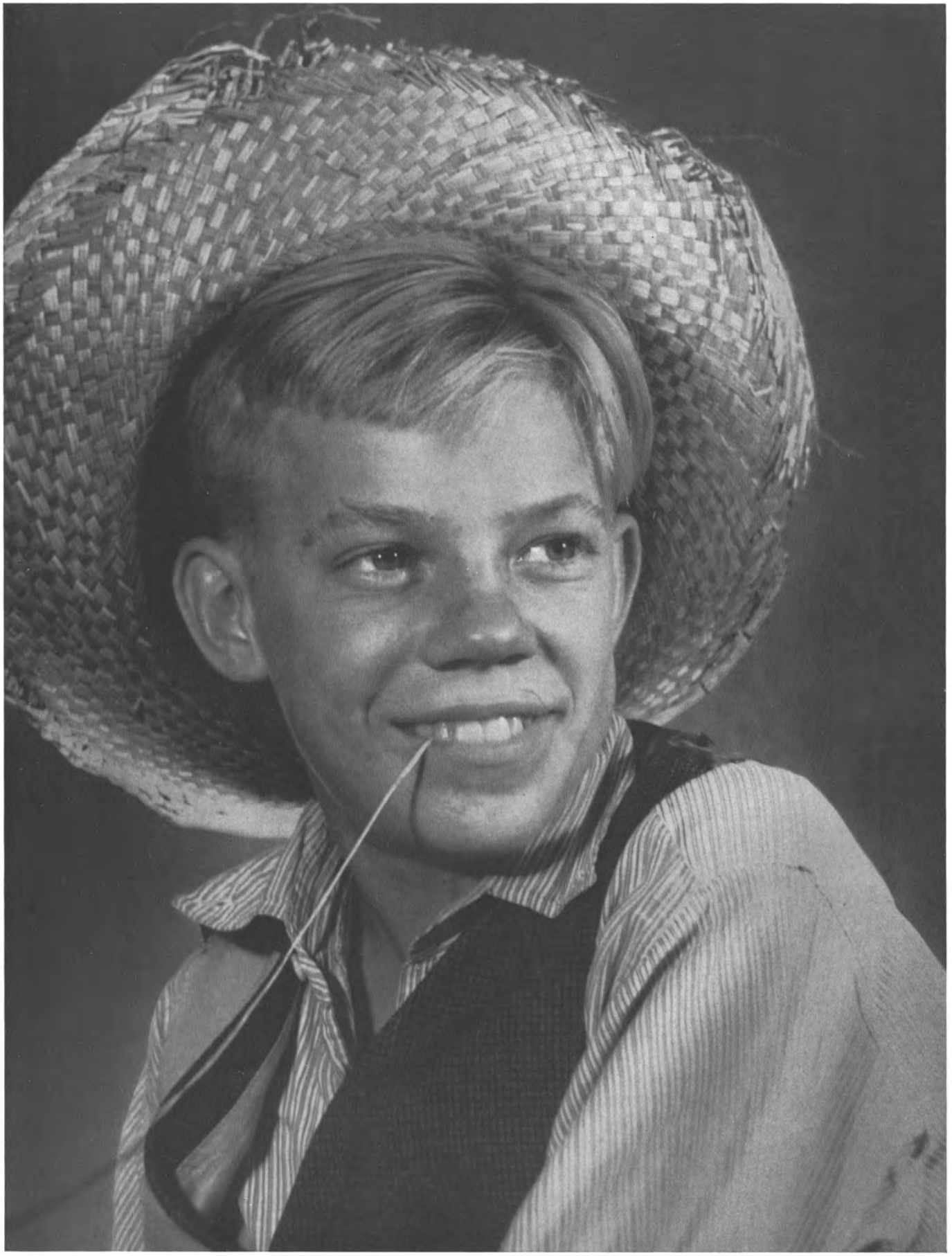
fifty processing stations in thirty-seven countries handle their Ciné-Kodak film as they pass through. The Kodak sign and Eastman service greet them wherever they go.

To render good service to millions of customers obviously demands hard work and involves much time and knowledge. An organization designed to give customer service is costly to run. Yet the results of Eastman service, the winning of customer good will and repeat orders, repay this effort and cost many times over. And because Eastman service ably backs up Eastman salesmanship, our plants keep running to fill the incoming orders, and our company profits.

They Put Them

(*Continued from page 13*)

Kodak Park, formulated by the Chemical Laboratory, and constantly checked for temperature, thickness, and other specifications during application in the factory. Underneath that camera cover are a coating of glue, a finish, and a primer; but the user will never see them unless he resorts to the use of a knife. And, perhaps, the laboratory's experts have anticipated him even there!



"HUCKLEBERRY FINN": entered in the Thirteenth Annual Kodak International Salon by Arnold S. Ragan, of the Eastman Kodak Stores, Cleveland, this picture won the Rudolph Speth Memorial Gold Medal—awarded for the print adjudged the best made by an entrant less than 36 years old. *Other salon pictures appear on page 5*

PRINTED IN U.S.A.
AT KODAK PARK

LO MAS FACIL DEL MUNDO

tomar instantáneas "imposibles" con estas soberbias Kodaks miniatura y estas nuevas Películas KODAK

Kodak Bantam Especial: Objetivo Kodak Anastigmático Ektar *f*.2.0, Obturador Compur-Rapid (1 a 1/500 segundo), telémetro acoplado, disparador al lado. Tamaño de negativo 28 x 40 mm.

Kodak Retina II: Objetivo Kodak Anastigmático *f*.2.0, Obturador Compur-Rapid (1 a 1/500 segundo), telémetro coincidental, disparador al lado. Tamaño de negativo 24 x 36 mm.

Instantánea tomada con Retina II, *f*.2.0 a 1/250 de segundo en Super-XX, con iluminación existente. Pida información a su distribuidor Kodak o escriba a la dirección de costumbre, sin compromiso alguno.

Tres nuevas Películas Kodak: Plux-X (grano fino más rapidez), Panatomic-X (grano microscópico), Super-XX (extrema rapidez con grano mínimo); esta última también disponible en todos los tamaños populares. Estas cámaras toman vistas en colores naturales, con Kodachrome.

EASTMAN KODAK COMPANY, ROCHESTER, N. Y., E. U. A.

Kodak Argentina, Ltda., Alsina 951, Buenos Aires; Kodak Brasileira, Ltd., Rua São Pedro 268, Rio de Janeiro; Kodak Colombiana, Ltd., Barranquilla—Bogotá—Cali; Kodak Cubana, Ltd., Neptuno 1062, Habana; Kodak Chilena, Ltd., Delicias 1472, Santiago; Kodak Mexicana, Ltd., San Jerónimo 24, México, D.F.; Kodak Panamá, Ltd., Avenida Central 111, Panamá; Kodak Peruana, Ltd., Divorciadas 652, Lima; Kodak Philippines, Ltd., Dasmariñas 434, Manila; Kodak Uruguaya, Ltd., Colonia 1222, Montevideo.

This Eastman advertisement appears in the current issues of several magazines that circulate chiefly in Latin America