THE COMPANY IN WAR

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FROM THE ANNUAL REPORT
OF THE
EASTMAN KODAK COMPANY

PRINTED FOR KODAK EMPLOYEES

FROM A KODACHROME ORIGINAL

EASTMAN KODAK COMPANY

ROCHESTER, N. Y.

April 14, 1942

To Kodak Employees:

For a number of years, an analysis of the financial statement in the Company's annual report to stockholders has been published in "Kodak," the Company magazine. The issue for April, 1942, contains the analysis of last year's financial statement.

This year, the second half of the report to stockholders consists of an account of our most important present business: the Company's activities in relation to the war. This part of the report is here reprinted, as being of equal interest to employees.

F. W. Lovejoy

FWLovejoy:BMH

Chairman of the Board

THE entire Company is dedicated for the duration to the service of winning this war. For many of the personnel, this means service in the armed forces. For the larger number, it means service with the Company on the industrial front. We all realize the supreme effort required on the part of everyone. Our right to perpetuate the American way of life is being measured now by the service we render. Greater diligence, harder work, longer hours, and more sacrifices, cheerfully and voluntarily undertaken, will be America's answer to the enemy. We feel confident in bespeaking continued fidelity to these aims on the part of our entire organization. Whatever the service required or the job assigned, it will be done to the limit of our ability.

—From the president's letter in the annual report to stockholders

THE COMPANY IN WAR

THE Eastman Kodak Company is "in the war" on many fronts. . . . Photography is the eyes—and the memory—of the Army and the Navy and a specific tool of war industry. As combat is now conducted on both sides, a fighting force or a production force without the materials of photography would be seriously handicapped. The Eastman Kodak Company is a major source of supply for photographic materials in the countries fighting the Axis. . . . Eastman war production has not, however, been limited to photographic materials and equipment. With its varied skills and manufacturing techniques, the Company has been able to undertake major commitments extending beyond the ordinary functions of its plants. At the outset of the defense program, it became apparent that the factories making cameras and optical goods could be adapted to the large-scale manufacture of nonphotographic articles requiring a high degree of precision. To meet urgent needs for military optical instruments and for certain other items of ordnance, the camera and optical plants have been expanded and converted from civilian to military purposes to the extent that more than 80 per cent of their 1942 output will be war production.

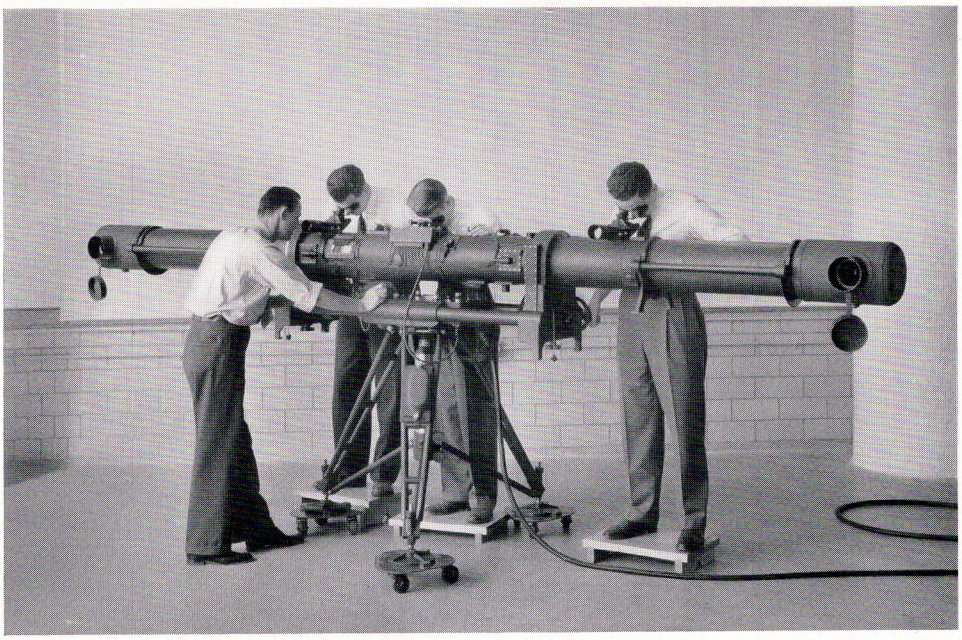
PHOTOGRAPHIC PRODUCTION FOR WAR

DIVERSIFIED types of film and photographic paper comprise the Company's principal output of sensitized goods. In spite of the fact that this production is the largest photographic-manufacturing operation in the world, more than half of the Company's American output of photographic sensitized goods is currently used for military purposes or for industrial and commercial purposes recognized as essential to the war effort.

The functioning of industries normally employing more than 450,000 people depends directly on the availability of photographic materials, as does the hobby of millions of amateur photog-

Eyes for the Army and the Navy.... Aerial lenses, for use on cameras like this one, have been made continuously by the Company since World War I.

The material on this and the following pages has been submitted to the proper Government departments for review, and no disclosure herein is considered inconsistent with public policy.



Equipment for war from plants that made photographic apparatus in peacetime. . . . Four optical workmen are here seen at the operating positions of a height-finder. These intricate instruments for use with antiaircraft guns had never been manufactured by the Company before the defense program.

raphers. By and large, such businesses as the motion-picture industry, medical, industrial, and office photography, picture magazines and picture newspapers, photoengraving and photolithography, and commercial photography, cater to civilian needs that might be classed anywhere from essential to important.

Production of photographic sensitized goods requires relatively small quantities of critical materials; small both as percentages of the value of the products in which they are used and as percentages of the United States supply of these materials. The major raw materials, such as cotton and silver and highly purified spruce fibers, have been available in sufficient quantities.

ADAPTATION TO WAR

THE management of the Eastman Kodak Company has from the beginning of the defense effort followed a policy of making anything required of it for war purposes to which its facilities and skills and capacity were adaptable. Longer than two years ago, the camera and optical factories—which were unlike the highly specialized sensitized-goods plant in being capable of conversion to alternate purposes—began preparations to fabricate military products of types not previously made by the Company. These factories are now producing high-precision implements such as mechanical time fuses for shells, height-finders for antiaircraft batteries, aiming circles for use in directing the fire of artillery, fire-control telescopes of several types, and various

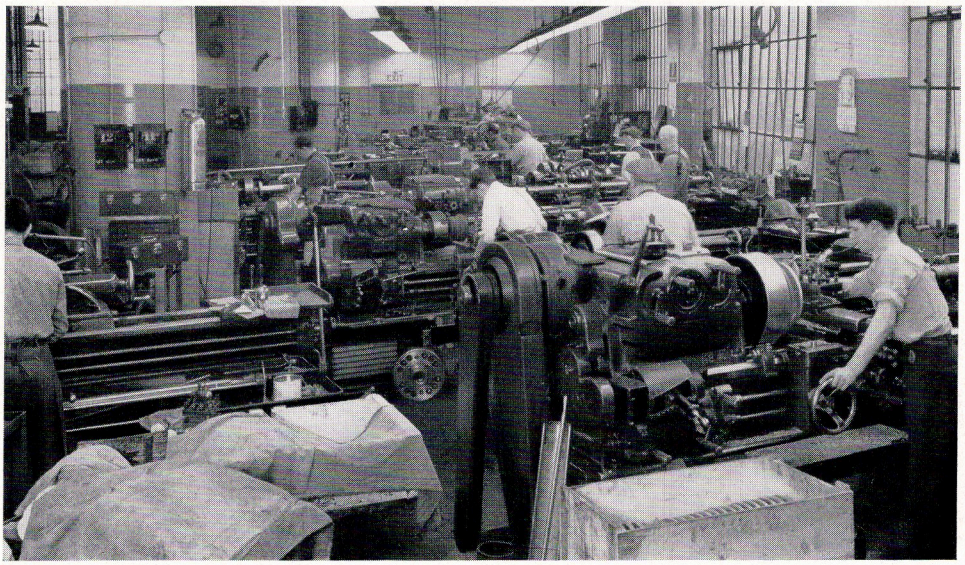
instruments the nature of which can not be disclosed. The output this year of such non-photographic military products never before made by the Company will far exceed the value of any peacetime year's manufacture of the civilian goods heretofore normally produced in these plants.

To companies making fire-control instruments but lacking facilities to make optical elements for them, the Eastman Kodak Company is supplying the "optics." In addition to doing optical and mechanical work as subcontractors for other prime contractors, the Company has granted, and is continuing to grant, subcontracts for mechanical parts and subassemblies and assemblies under many of its own prime contracts with the Government.

The manufacture of aerial lenses has been greatly increased. The Company has been a major supplier of this special product continuously since the last war. The Kodak Research Laboratories' new rare-element glass, announced last year at this time, afforded to lens-designers the first basically new optical material in fifty years at a time when the glass could be put to use in the refinement of aerial lenses for the air forces.

The machine shops that equip and service the processes for manufacturing photographic sensitized goods are producing, on an emergency basis, metal fabrications and even some machine tools needed by the Government and by other war industries. This is being done without handicap to fulfillment of the plant's war responsibilities in the manufacture of essential photographic materials.

Every effort is being put forth to accelerate schedules originally set so as to meet greatly increased demands that have arisen since December 7th, 1941. The new schedules for some war products being made by the Company have already been attained.



Making Eastman resources count wherever possible. . . . This is a view in one of the machine shops that equip and service the processes manufacturing sensitized goods. In the emergency, these shops, connected with an essentially chemical operation, are producing mechanical fabrications for war.

A Flying Fortress photographed in Kodachrome

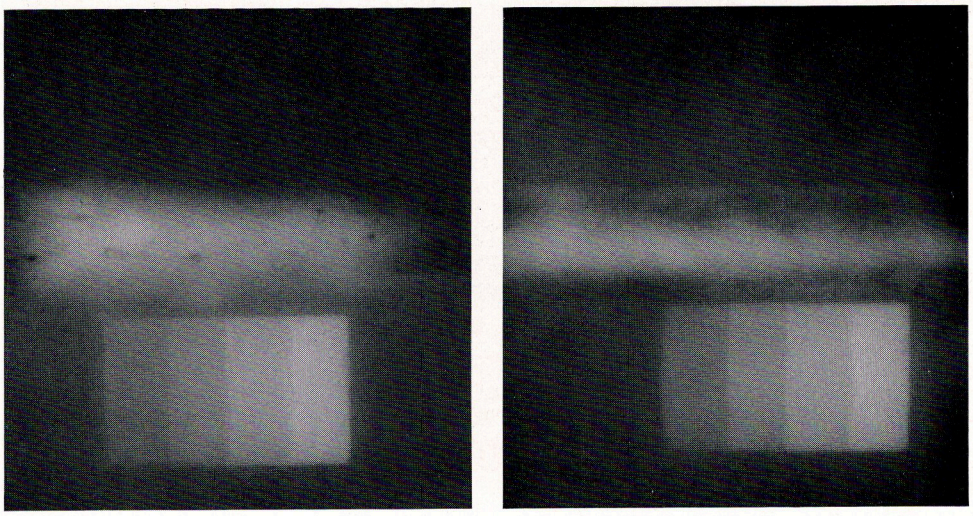
ON OTHER EASTMAN FRONTS

A LARGE share of the current activity of the research and developmental forces of the Company is devoted to war work, much of it in conjunction with the National Defense Research Committee. This effort is in addition to and apart from the Company's production undertakings for the Government. The research and experimental work involved is photographic, optical, chemical, and mechanical, according to the qualifications of the Kodak research and development personnel. As one generalized example of results, optical instruments have been quickly designed to meet military needs never before formulated.

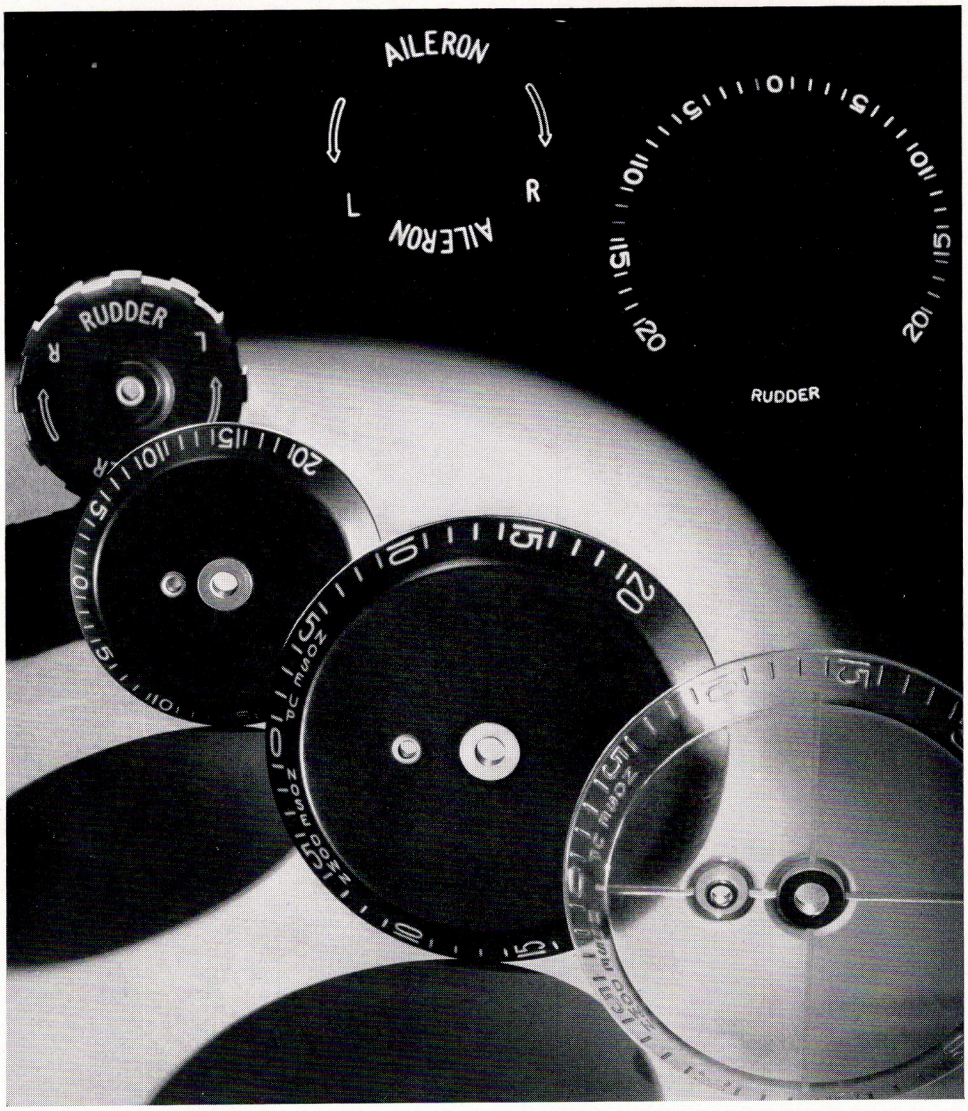
An instance of a Government project making use of existing photographic experience is to be found in the assignment of the Company to design and equip a central photographic laboratory for the Navy.

The large plant of Kodak Limited, in England, is actively engaged in the production of photographic supplies of wartime importance, and bears the designations of "nucleus firm" and "essential works" under various Government orders. Also concentrated upon war work are the respective plants of the Canadian Kodak Co., Limited, and of Kodak (Australasia), Pty. Ltd.

The subsidiary Tennessee Eastman Corporation is supplying its plastic molding composition, Tenite, for more than a hundred different articles used by practically all branches of our military forces. Among these may be cited handles of surgical instruments, blackout lenses for trucks, bayonet scabbards, ammunition rollers, gas-mask parts, control-stick handles, bomber visors, and instrument dials. Tenite is being used



So that boilers won't explode. . . . The boiler code requires x-ray inspection of high-pressure vessels and their welds. This practice is routine in manufacturing boilers for the ships of our fighting fleet. The x-ray on the left shows a defective weld—indicated by the presence of dark streaks and spots. The x-ray of a satisfactory weld, shown on the right, is free from the defects that are potential sources of danger. The stepped-density scale in each x-ray is a "test object" used by x-ray technicians.



A modern material for war uses. . . . Instrument dials and control knobs for military airplanes have been reduced by a precious 50 *per cent in weight where metal has been replaced by Tenite, the Tennessee Eastman Corporation's plastic molding composition. These luminous dials are among a hundred different Tenite articles going to war. Bayonet scabbards and blackout lenses are others.*

also in many essential civilian articles to replace aluminum, zinc, brass, hard rubber, and various other materials that have become scarce.

Tennessee Eastman supplies the cellulose esters from which safety film is made—and safety film is the base of aerial film, x-ray film, and other vitally important photographic materials being employed in the war both for combat and for training.

Since all of the available silk and most of the supply of wool now are required for military uses, Eastman Acetate Rayon yarn and Teca, the Tennessee Eastman Corporation's crimped rayon staple fiber, are becoming increasingly important for their replacement in necessary civilian uses.

Among other Tennessee Eastman products of wartime significance are charcoal for casehardening steel in armament industries, and inhibitors for high-octane gasoline.

PHOTOGRAPHY: A WEAPON AND A TOOL

PHOTOGRAPHY is commonly thought of not as a weapon but in its more evident peacetime applications. The wide and ingenious uses of photography in the prosecution of war can be glimpsed by examining the following summary of the subject.

The redoubtable cameraman, Matthew B. Brady, drove his wagons laden with cumbersome apparatus and heavy glass plates close to the battlefront in the Civil War and made pictures of the action. Not until World War I did photography for military purposes show any notable advance beyond mere pictorial recording. Extension of photography in warfare followed naturally upon the widespread employment of aircraft. When it became possible to look down at the war locale from a plane, the inevitable next step was to make photographs from the same vantage point.

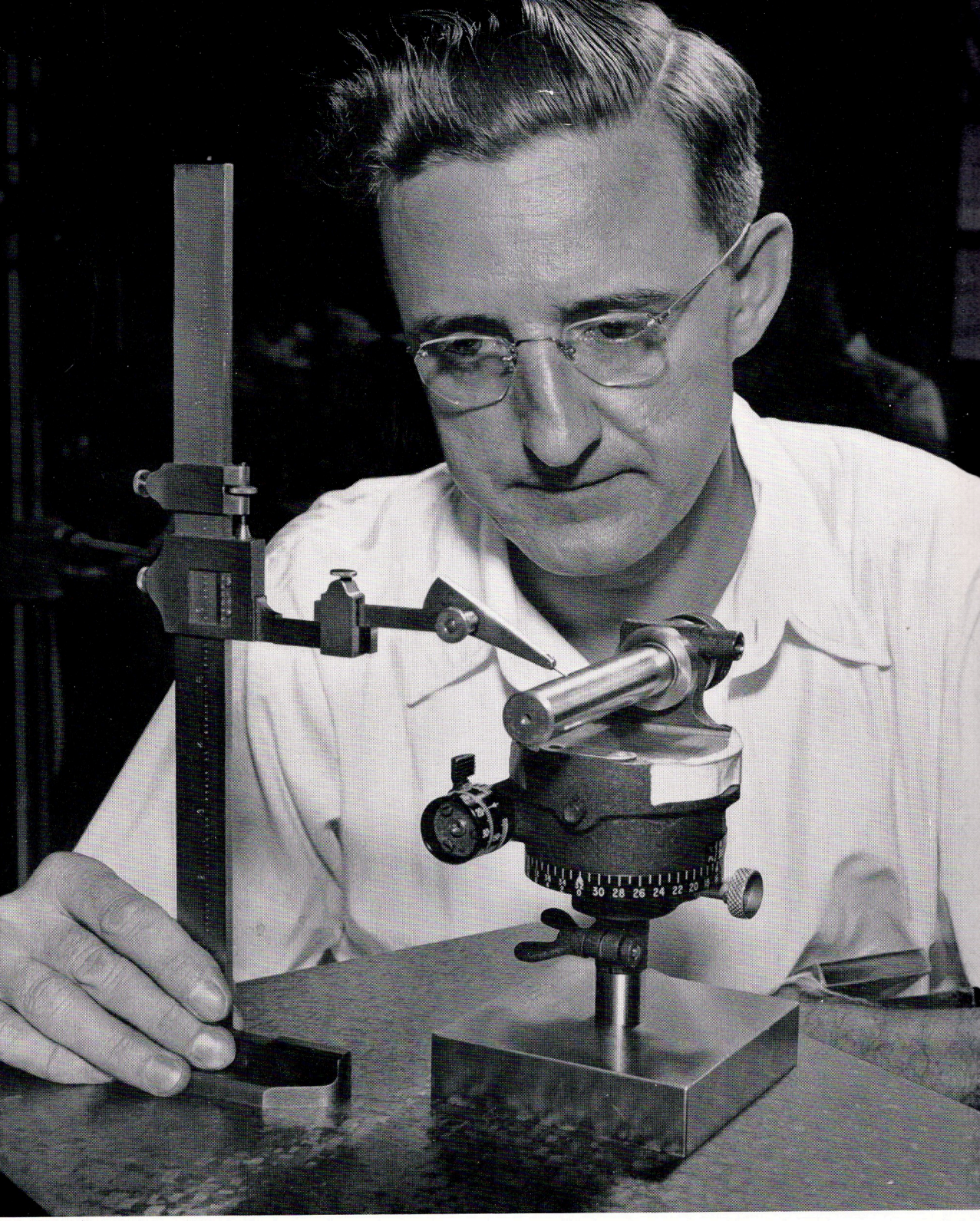
As a logical development, aerial photography is used in mapping terrain. The extent of mapping in World War II vastly exceeds that in any previous war . . . and photographic film, in increasingly large quantities, is its medium.

To escape antiaircraft fire and to minimize the danger of aerial opposition, wartime mapping must be conducted at high altitudes. Photographic techniques and films capable of penetrating the intervening haze make it possible. The Eastman Kodak Company has been co-operating for many years in solving the problems involved.

Aerial photography is widely used also for reconnaissance, which is a matter of reporting what is occurring on terrain already mapped. Reconnaissance photographs, in correlation with maps, establish objectives to be bombed or assaulted and disclose troop movements and troop concentrations, the presence or absence of ships, the results of bombing attacks and artillery fire, and other facts of key military importance. Night photography with flash bombs is one method used for conducting reconnaissance work.

Specialized photographic techniques reveal enemy camouflage and help to render friendly camouflage free from detection. . . .

Faces on lapels. . . . Proper plant precautions have made it commonplace for war workers to wear large photographic badges containing their pictures and names for identification.



An aiming circle for directing artillery fire, manufactured under conditions established for making precise photographic instruments

"Quick work" aerial photography drops negatives at headquarters for rapid interpretation; or, alternatively, drops prints finished in flying darkrooms. . . . Pilots practice aerial gunnery by shooting a camera gun instead of a bullet gun; and combat pilots record photographically their "hits" on other aircraft or on bombing objectives.

Time was when only a company commander needed to know where his outfit was headed. Today every tank, jeep car, and gun-carrier must have its maps—and must have more maps than ever before because the mobility in this mechanized war is greater than ever before. So, after the fliers have brought in the raw material in the form of aerial mapping pictures, the engineers have the problem of quickly making and manifolding the maps for distribution. Photolithography is the process employed, and an improvement newly devised by the Company's graphic-arts division and put at the disposal of the Army is being used for quantity production in the field.

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X-ray film stocked at many bases for diagnosis of wounds sustained in combat is one of the grim necessities of war. On a more routine basis, examination by x-ray, as also by dental x-ray and electrocardiographic techniques, assists in the qualification of men for induction into the armed forces and helps to maintain their health when they are in the service.

Widespread advantage is being taken of photography for training the forces in the unfamiliar routines of military activity and the complicated skills of mechanized warfare. Photographically illustrated instruction manuals, reproduced by printing processes involving photography, are distributed in quantity. Even more importantly, motion pictures are being employed as the quickest means of successful instruction for groups. Hollywood is making 140 reels, the Signal Corps 250 reels, and the Corps of Engineers and the Bureau of Naval Operations additional numbers of training films.

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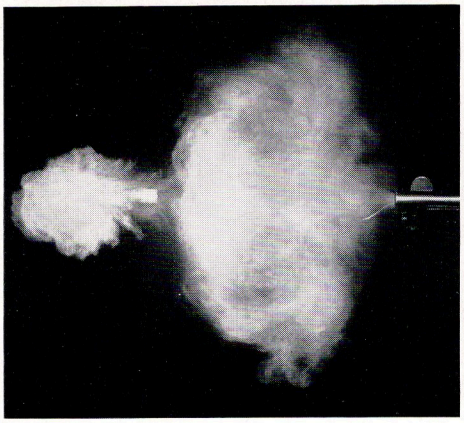
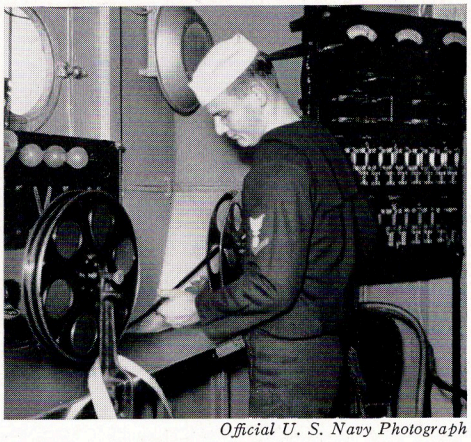
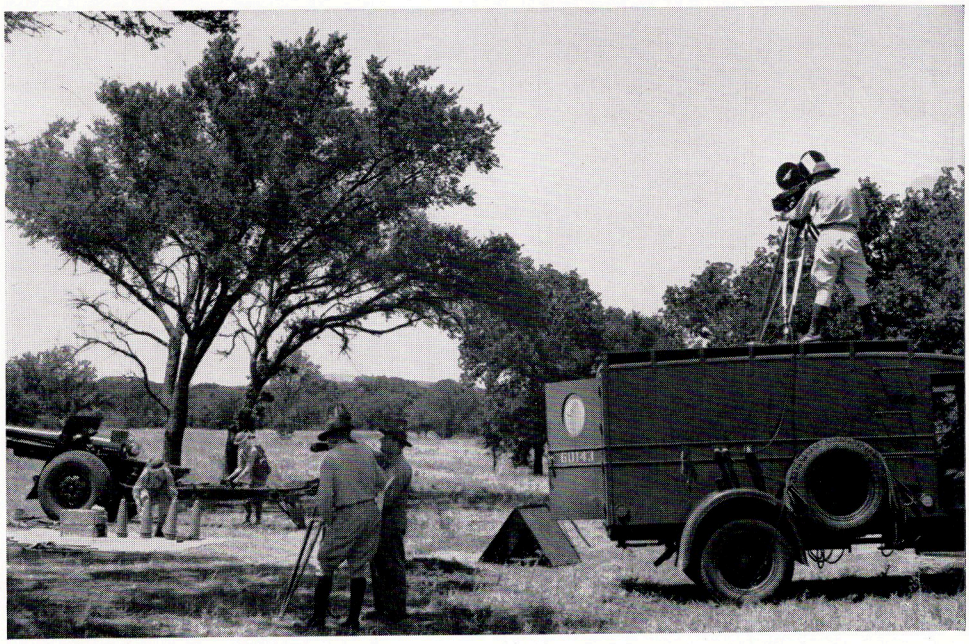




Official U. S. Navy Photograph

The business of war—and the pleasure. . . . Although a bullet may travel faster than 1,800 miles an hour, it can be "stopped" completely, by photography, for ballistic studies. . . . The Navy petty officer, in the right-hand photograph, is rewinding a reel of film after a motion-picture show on shipboard.



Photograph by U. S. Army Signal Corps

Photograph by U. S. Army Signal Corps

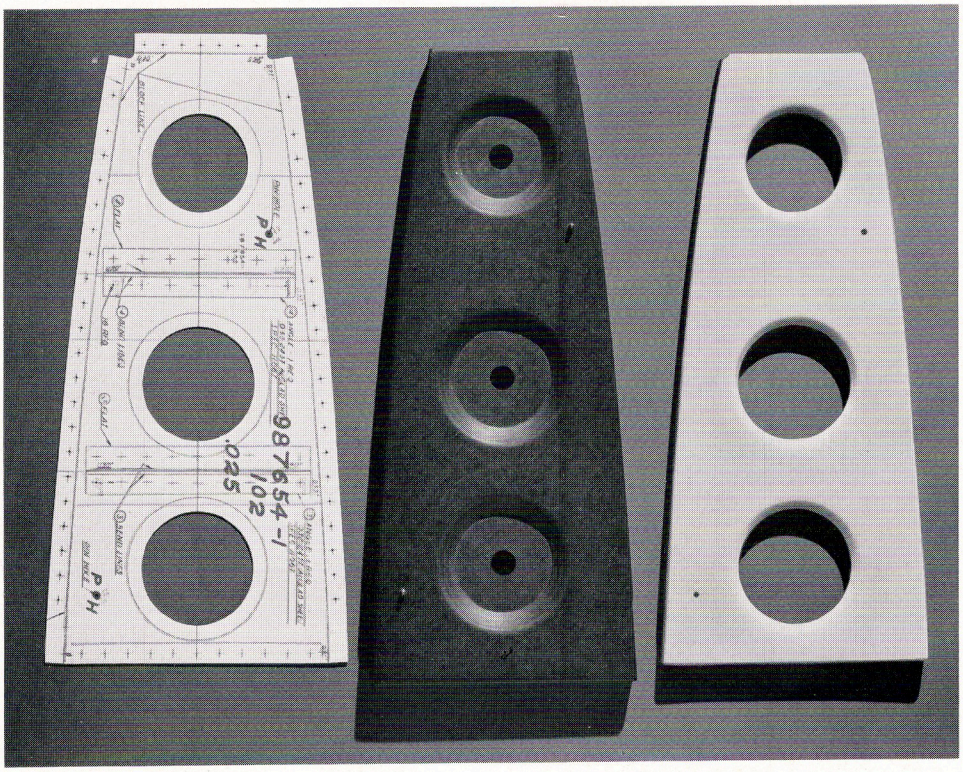
To supply training pictures for the Army and Navy, camera crews are working constantly on the required photography. . . .

NEW SOLDIERS AND SAILORS

Official U. S. Navy Photograph

Photograph by U. S. Army Signal Corps

. . . As a result, men new to the military services, like the roomful of soldiers just above, are learning faster and more easily.



A new photographic short cut to mass production. . . . The laborious and skilled hand-work job of transferring drawings to metal or plywood in making patterns to guide the shaping of production parts was a bottleneck in the aircraft industry. Matte Transfer Film now permits photography to do that job —and accelerate progress. On the left, in the picture above, is a metal pattern used in cutting out production parts for an airplane. To make this pattern—plus dozens just like it and thousands in other shapes—the original drawing was speedily photographed on Matte Transfer Film laminated to the surface of the metal. In the center of the picture is the forming block—made from a similar pattern— used to form parts after they have been cut to size from the pattern on the left. The finished airplane part is on the right, cut to size from the pattern on the left and pressed into shape over the forming block in the center. This Eastman process and film became available only about a year and a half ago.

The Airgraph is another adaptation of photography that is playing a significant role in the war. This is a system of photographing letters destined for air mail across seas. Greatly reduced photographs are made at the sending end and are shipped on a small roll of 16-millimeter film, with a 99 per cent saving in transit space consumed. Fifteen hundred letters are carried on a 7½-ounce roll. At the receiving end they are restored photographically to readable size. Britain is making good use of this process in carrying mail between London and Cairo and London and Canada; and the United States will use it to bring distant outposts nearer.

In less specialized functions, photography serves the military and naval services, and other branches of the Government, for intelligence purposes, for public-informa-

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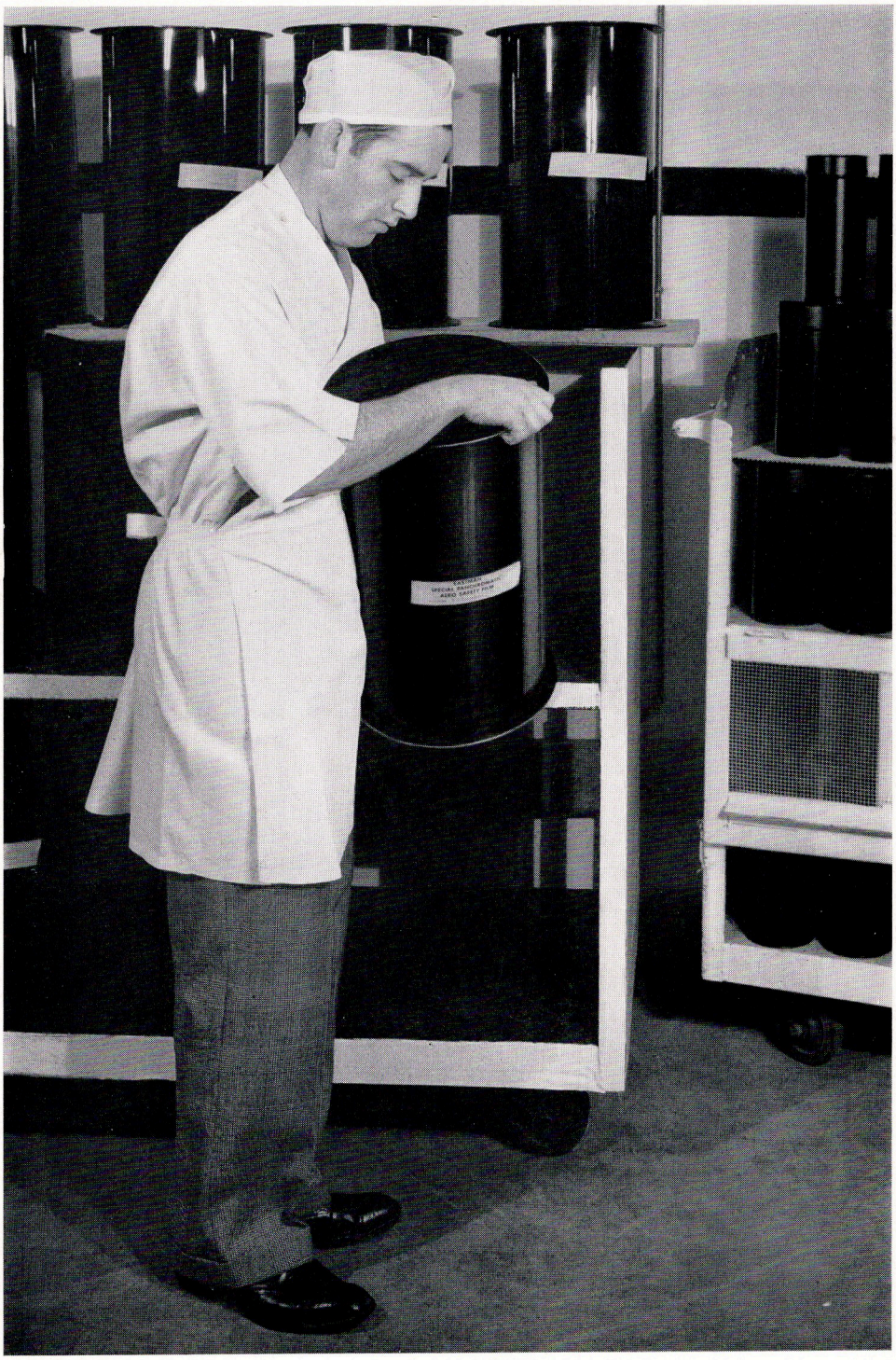
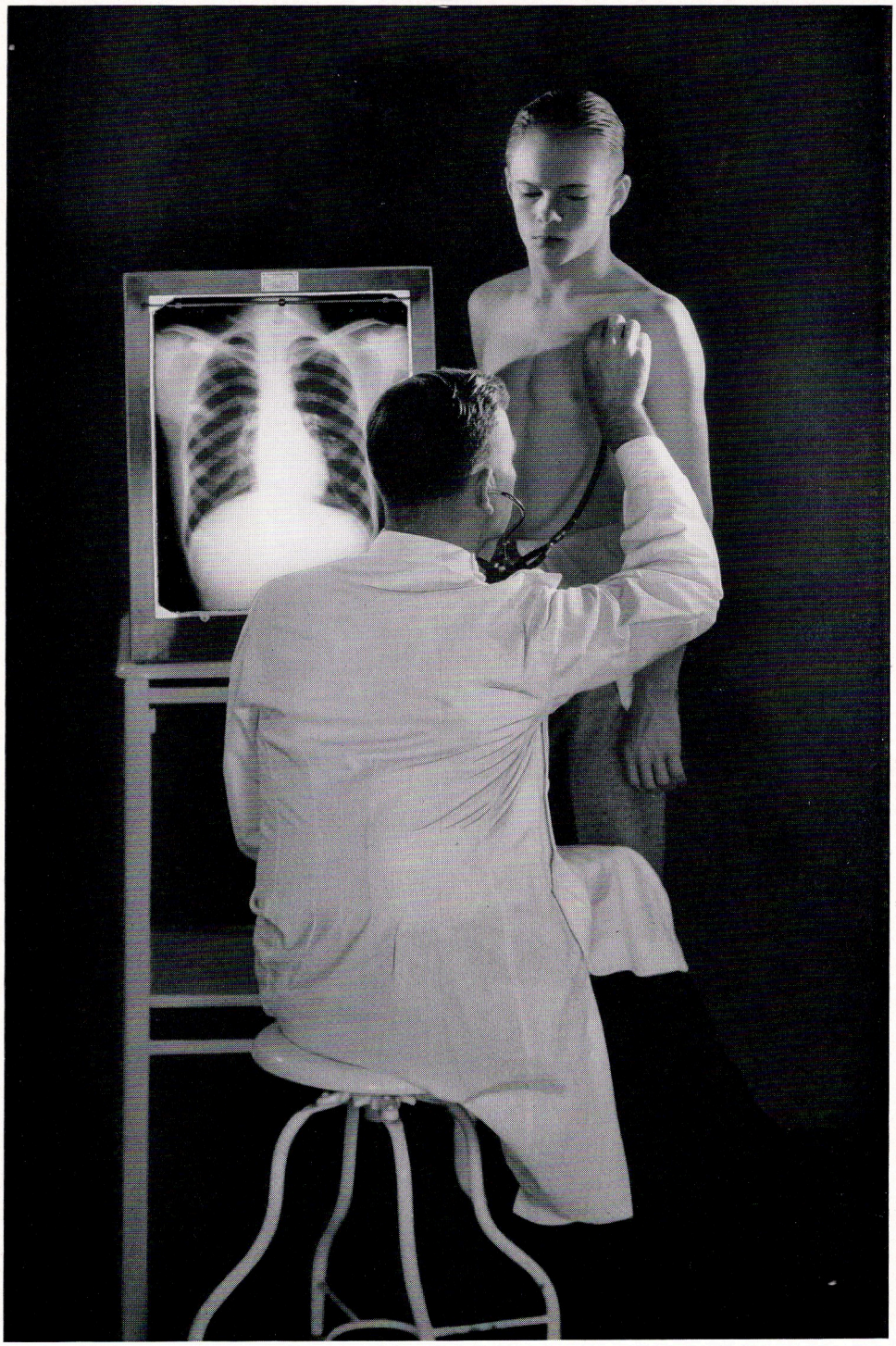
SNAPSHOTS FOR SOLDIERS

☆ PICTURES are providing a link between the men in uniforms and their home associations. This link, part of the pattern of America's fighting morale, is one item of the total job that photography is doing in prosecution of the war.

☆ THE snapshot reproduced on this page is Kodacolor, the Company's new color process. . . . Kodacolor in other times would be the Eastman Kodak Company's most important news of the year—and indeed the most important photographic news of many years—for Kodacolor, recently introduced after long research and development, brings to pass a dream of generations: full-color prints from color negatives made in ordinary roll-film cameras. Kodacolor at this time, when the country and the Company are wholeheartedly bending every effort toward victory, must for full recognition and full production await some future year.



A roll of aerial film, for mapping, seen in an Eastman factory before it leaves for one of the world's far-flung battlefronts



Positive proof by x-ray film: no incipient tuberculosis here to break down—and spread—under the strain of military duty

tion purposes, and for record purposes. The abundant War Department archives of photographs and motion pictures of American participation in World War I are an example of the historical function of wartime record-keeping through pictures.

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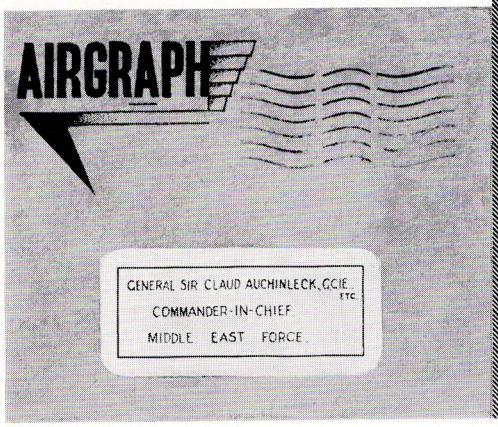
Photography carries an equally important responsibility in war industries. The new Matte Transfer process and film, developed by the Company only a year and a half ago, is speeding war production in various key plants. The process enables manufacturers to transfer design drawings photographically to sheets of metal—to serve as patterns for cutting out metal parts—instead of tracing the drawings on the patterns by hand. Production of experimental aircraft has been hastened by as much as four months, in addition to the facilitation of established production.

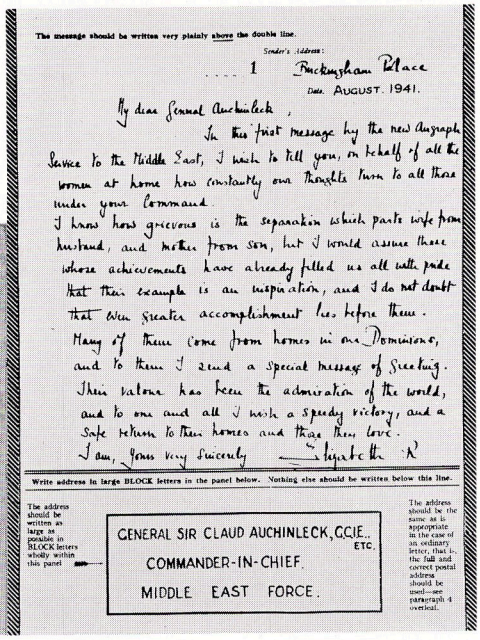
X-ray inspection—on a scale entirely unimagined by laymen—is used to hunt hidden internal flaws in castings and assemblies in the aircraft industry, in the manufacture of ordnance, in shipbuilding plants, and in other war factories. Metallography and spectrography are photographic methods of routine metal-testing in metallurgical laboratories.

Photographic performance records have become indispensable to the study of experimental developments in aircraft and armament, for film can record precisely how a wing vibrates or a bullet flies or a tank bearing wears.

The personnel of war industries is often instructed by photography—and photography produces the identification portraits that admit them to their plants. . . . Motion pictures and photographs are a short cut in conveying knowledge of processes to contractors and subcontractors. . . . Photographic tracing cloth is used to make blueprints

Photography as postman. . . . The Airgraph is a system, developed by the Company, of photographing letters destined overseas by air, with a 99 per cent saving in transit space. This letter from Queen Elizabeth to General Auchinleck was transmitted at the beginning of the Airgraph service from England to the Near East.




The message should be written very plainly above the double line.

Sender's Address:

1 Buckingham Palace

Date. AUGUST. 1941.

My dear General Auchinleck,

In this first message by the new Airgraph Service to the Middle East, I wish to tell you, on behalf of all the women at home how constantly our thoughts turn to all those under your Command.

I know how grievous is the separation which parts wife from husband, and mother from son, but I would assure those whose achievements have already filled us all with pride that their example is an inspiration, and I do not doubt that even greater accomplishment lies before them.

Many of them come from homes in the Dominions, and to them I send a special message of Greeting. Their valour has been the admiration of the world, and to one and all I wish a speedy victory, and a safe return to their homes and those they love.

I am, Yours very Sincerely — Elizabeth R

Write address in large BLOCK letters in the panel below. Nothing else should be written below this line.

The address should be written as large as possible in BLOCK letters wholly within this panel

GENERAL SIR CLAUD AUCHINLECK, GCIE., ETC.
COMMANDER-IN-CHIEF.
MIDDLE EAST FORCE.

The address should be the same as is appropriate in the case of an ordinary letter, that is, the full and correct postal address should be used—see paragraph 4 overleaf.

Business machines in military service. . . . With the Recordak, Government agencies keep records photographically. Here a few of the machines are to be seen in one section of the War Department.

with pictorial detail, for novice assemblers who can not read customary blueprints, but who can quickly comprehend the meaning when the visual aspect of the structure to be assembled is superimposed on the mechanical drawing.

Research and development in ordinary times are a matter of better living. As a responsibility of war industry, they may be a matter of life and death. A research tool that has become indispensable in the course of the past twenty years, photography is bringing scientific knowledge in hundreds of laboratories to bear upon the exigent needs of an unprecedented war.

In war industry, as also in the military services, photography is playing an unheralded but important administrative part. Reproduction by the Photostat process and by photolithography is serving as a quick and accurate means of disseminating information and orders. Photostat and the Recordak system, the latter of which is operated by a subsidiary of the Company for copying documents and checks and card files in miniature on narrow rolls of film, are used extensively in record-keeping; and the Recordak has an added function—looking toward the time when the war will be ended—of preserving material of historical significance.

Motion pictures, and snapshots from home, are mainstays of military morale. The Army itself operates more than five hundred motion-picture theaters at military posts in the United States, and the Navy's recreational-movie activities are equally broad.

"Behind the front"—for the sustenance of civilian morale—the film theaters are serving a heightened usefulness recognized as "a vital contribution to the total defense effort." This attitude within the American Government follows the experience

of Britain, where an order closing the theaters upon the outbreak of war was rescinded less than a month later because opportunity for relaxation in wartime was found to be a necessity, not a luxury.

OTHER INFORMATION

THE extensive role of photography in the war has been outlined in some detail in the belief that the stockholders are specifically interested. Production for the war will continue as the principal determinant of the Company's course, and manufacturing and inventive resources will be utilized for that purpose to the fullest extent possible.

Restrictions on the use of metals, and voluntary reductions in schedules, have sharply curtailed the output of amateur cameras and kindred equipment. Continued production of a relatively small number of cameras not requiring critical materials is contemplated, however.

The output of photographic sensitized goods has been adequate, so far, to meet the normal demand as well as the unusual military requirements; but this production, now at capacity, will be utilized increasingly to meet the rapid advance in demand for photographic products for war purposes. Progressive curtailment of photographic materials for civilian use seems inevitable.

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The Eastman Kodak Company voluntarily pledged in 1940 to refund to the Government any profit in excess of 10 per cent of cost on negotiated contracts, taken as a whole, entered into with the Government for special military products of types not previously made by Kodak. Any profit retained would of course still be subject to income and excess-profits taxes; and no compensatory arrangement was provided in case the Company earned less than 10 per cent of cost. The purpose of the pledge was to avoid the possibility of making undue profits as a result of prices negotiated on work involving new operations and unfamiliar equipment. This pledge is still in effect.

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The Company's employees in the United States numbered 28,097 at the end of 1940, and had been increased by several thousand at the end of 1941. In spite of the transfer of employees to war work, the total number has grown substantially since the close of the year, in consequence of commencement of full-scale production on several additional Government contracts.

More than 1,500 Eastman employees have entered the military services. The Company has adhered from the beginning to a policy of requesting Selective Service deferment only in the cases of a small percentage of men considered essential to the functioning of the Company as a war industry.

Approximately 90 per cent of the employees of the Eastman Kodak Company in Rochester are purchasing United States Defense Bonds on the payroll-savings plan.

Advertising is so much a part of the national economy that its continuance in time of war is important. The lifelike qualities of full-color pictures have gained for Kodachrome a significant place in the advertising of many businesses. The same qualities have appealed to amateur movie-makers to the extent that more than 70 *per cent of the Ciné-Kodak Film sold is Kodachrome. . . . The picture on this page, reproduced from a Kodachrome photograph, will appear in one of the Eastman Kodak Company's own forthcoming national advertisements. Kodachrome Film was introduced by the Company in* 1935.