

George Eastman Golden Jubilee Edition

Published Weekly by INTERNATIONAL BUSINESS MACHINES CORPORATION 50 Broad Street, New York, N. Y.

Business Machines

SPECIAL EDITION

Vol. 12

SATURDAY, APRIL 12, 1930

No. 12

GEORGE EASTMAN

Fifty Years at the Helm of Great Industry He Founded—Launched Business April 13, 1880 After Patenting Dry Plate

Built Institution of World-Wide Scope and Surmounted Many Obstacles to Reach Top—Continues to Work, Pushing Projects that Help World Generally

EASTMAN HOLDS UNIQUE POSITION IN INDUSTRY

During the half century in which Mr. George Eastman has remained at the head of the great industry he founded, April 13, 1880, the benefits from his indefatigable efforts have been extended to the entire world and have been enjoyed by all its peoples.

The dry plate which he invented has helped to build every industry, it has developed scores of new lines of business and has changed the whole panorama of world progress and prosperity.

The film which Mr. Eastman invented and which became so necessary a part of the success of motion pictures, has resulted in the motion picture industry which, in this country has an annual payroll of \$470,000,000 in employing some 235,000 persons. In other industries which serve it, there are thousands of persons directly or indirectly dependent upon motion pictures. In this country, approximately 22,600 motion picture theaters have been built. The building industry has benefited. Considering all the equipment and fittings which they require we can imagine the benefits to employees of the iron and steel, electrical, textile, paint and other industries which, in one form or another, supply the materials which make the additional equipment.

The benefits from Mr. Eastman's service to mankind have been manifold; the tribute which we pay him is small compared with the debt we owe him.

Our Congratulations

President Thos. J. Watson Voices the Tribute of International Business Machines Organization to Father of Modern Photography



Rochester, N. Y., April 12:—Fifty years ago tomorrow, George Eastman, millionaire, philanthropist, and head of the Eastman Kodak Company of this city, started to manufacture the dry plates which he invented and which revolutionized photography.

Such is a gist of the news, a dispatch that the daily newspapers might carry to mark an event which, to the world, has meant a fortune in benefactions—beyond the ability of the human mind to conceive.

Back of this stark brevity there lies a half century filled to saturation with the romance of a business created by a man who steadfastly refused to recognize the so-called handicap of starting from nothing, or the defeats which Fate scored against him time and time again in his efforts to forge ahead to the ultimate goal.

Mr. Eastman will be seventy-six years old on July 12, next. He is the only world industrialist who still heads a business of the scope of the Eastman Kodak Company after founding that company upon the merits of a patent a half century ago. That this great industry which he directs developed from a mere hobby Mr. Eastman had for taking photographs, is all the more marvelous.

A Worker and Thinker

Mr. Eastman does not look his years. He is alert, wiry and full of mental vigor. More than five years ago he announced that he was about to adopt a new philosophy, which would include leisure. However, tomorrow, the fiftieth anniversary of his entrance into the business he founded still finds him at work. That work includes not only industrial affairs, but philanthropy—he has given away nearly \$76,000,000.

Today Mr. Eastman employs 22,000 persons. His factories are among the most extensive in the world, comprising more than 90 buildings. In addition to this, his inventions have opened the way to many new industries which were made possible only by his creative genius.

But let us go back to the beginning of this story, for it is peculiarly American—another of those tales of American industry, American pioneering, that refute the argument that there is no room at the top for the man of humble beginning.

From a Small Beginning

Mr. George Eastman was six years old when his family left his native village, Waterville, N. Y., and moved to Rochester to recoup their slim fortunes. A year later his father opened a business school and died shortly after. His mother started a boarding house and when Mr. Eastman was 14 years old he was taken out of school and began his career as a wage earner. While still a stripling, he developed the habit of hard work. He was the only son and upon him fell the task of freeing his mother from the drudgery of running a boarding house and helping to support two sisters.

Young Eastman found his first job in an insurance office at \$3 a week. By long hours and hard work, he was able to progress and after some time, he had increased his earning capacity to the munificent sum of \$600 a year. This, he thought, was the most he could expect for a long time. However, he left that job and took a position in a bank at a salary of \$1000 a year. This all seemed very fine to Mr. Eastman. He was doing what he had set out to do; he was independent and a source of help to his mother.

At that early age, his hobby was photography and he was getting considerable pleasure from it. The

To the Members of the IBM Organization:

Mr. George Eastman, Chairman of the Board of Directors of the Eastman Kodak Company of Rochester, N. Y., is celebrating his fiftieth anniversary as the head of a business he founded and built—an industry which has played an outstanding part in the development of our country over the past fifty years.

With the mind of a genius, Mr. Eastman labored under most disheartening conditions to develop an idea. Discouragement followed discouragement but like every true pioneer he refused to give up, with the result that he brought forth the dry plate, an invention which revolutionized photography and gave to the world one of the most important inventions of the century. With this as a basis he founded in 1880 the business which he now heads, and from the outset, his constructive policies, his faith in his product and his ability to foresee its world-wide possibilities helped him to forge ahead.

Great as it was, however, Mr. Eastman was not satisfied with this single achievement. The spirit of pioneering which directed his initial efforts continued to manifest itself and resulted in several inventions which related to photography and the improvement of various processes. From these inventions have sprung new industries, giving employment to hundreds of thousands of people and contributing, in large degree, to the welfare and happiness of the people throughout the world.

Mr. Eastman's inventions have been among the most important factors in the development of our country and of other countries of the world. They have made possible a wealth of inexpensive entertainment that was undreamed of fifty years ago. They have contributed to the progress of education, the sciences, and the arts. Their benefits are evident on every side.

Mr. Eastman's work is an inspiration to us and all other organizations which seek to extend their usefulness to all parts of the world. He has demonstrated the spirit that makes life fuller and better for all mankind and, as pioneers in a business forty years old, the International Business Machines Corporation extends congratulations to Mr. Eastman and his organization upon their fiftieth anniversary in business.

Very truly yours,

President.

WORLD INDUSTRY BUILT BY EASTMAN

Inventor Showed America the Way to World Markets By His Policies

There is every reason to believe that Mr. George Eastman saw the international market and its extensive prospects even in the days when he was taking his first step into what was later to develop into the greatest industry of his kind.

After he had invented the dry plate, he became fascinated with the business possibilities of photography. It had been a hobby which had consumed him and he believed that he could make it the hobby, more or less, of every man and woman in the country. Regardless of the continuous fight which he had to wage against the pessimists of those days, he was able to foresee very keenly that there was a market in every part of the world for a camera.

So Mr. Eastman set to work to produce a camera which would eliminate all the discomforts of old methods; one which would be simple to operate and which could be sold at a price to attract the masses.

He did that very thing in 1888 and called it the Kodak.

Up to the time he produced the Kodak, he had been doing some business in the foreign markets where

(Please turn to page 7, column 1)

BELLOWS MAKING

One of the most interesting processes in the making of a Kodak is the bellows making. The lining of the bellows, which is a rubber coated cloth, is placed on a special form and attached to an aluminum frame, front and back, to brace it. Paper stays or strips are then automatically glued on by a special staying machine. The stays are for stiffening the bellows and locating the necessary folds. The form is next passed on to another operator who glues on the outside leather covering. The form is then placed in a hand press until the glue is set and the bellows are removed from the form and passed on where the folds are put in by hand and pressed in hand pressing machines.



George Eastman, Chairman of the Board of Directors, of the Eastman Kodak Company, which he founded fifty years ago.

"The man who thinks he has done everything he can do has merely stopped thinking. He is what might be called 'up and out'. And, excepting that he has more money, his case really is not very different from that of the man who is 'down and out'."

—George Eastman.

EASTMAN SOLVED COLOR PHOTOGRAPHY

Spent Fortune in 25 Years Experimenting But Realized Ambition

Saw Color Film As Next Step After Motion Pictures—Process Simple

After twenty-five years of experimenting, during which time large sums of money were spent, Mr. George Eastman at last realized one of his greatest ambitions when, on July 31, 1928, he announced the perfection of a system of color photography whereby any amateur photographer could take motion pictures which would reproduce all the colors of the spectrum in all their beauty.

During the decade preceding the successful culmination of Mr. Eastman's extensive efforts to develop a color film process, amateur motion pictures had enjoyed a steady and favorable growth. In other countries as well as the United States, the vogue for home films had caught on. Naturally, the color film was the next step, although it was more than just a step in the annals of progress in photography for it had required a quarter of a century to perfect.

Probably the most interesting fact relative to the presentation of the new color film by Mr. Eastman, was the manufacturer's ability to place it on the market immediately and at a price, slightly more than the black (Please turn to page 2, column 2)

Eastman Played Major Part In Giving Us Motion Pictures

Experimented Until Film Was Found That Would Operate With Success in Movie Camera Invented by Thomas A. Edison

In many respects the pioneering of Mr. George Eastman was dovetailed perfectly with the creative work of others who were first to show the way in the transformation of world conditions that had existed for generations. Not the least of these was the development of the motion picture camera by Mr. Thomas A. Edison. We know how this, in itself, has built up an industry which today ranks as one of the leaders in this country and which has added a huge figure to the growth of commerce of the United States with other nations. That Mr. Eastman's invention of the film, and Mr. Edison's creation of the motion picture camera have made this world a happier place in which to live—that they have inspired the inventions covering a wide range in both the educational and entertainment fields—are truths of magnitude unchallenged.

It was in 1876 that Mr. Edison moved to Menlo Park, N. J., and, during the next three years, he created the talking machine and the electric light. At the same time, Mr. Eastman was interested in photography as a hobby. Mr. Edison opened the first commercial central station for the distribution of electric light, power and heat and Mr. Eastman became one of his first customers, when he opened a factory for the manufacture of dry photographic plates.

The lives of these men were filled with the romance of the new invention. (Please turn to page 2, column 1)

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George Eastman Fifty Years a Captain of Industry

Built Success from His Hobby, Photography

Inventor, Millionaire, Philanthropist Will be 76 In July—Continues To Work and Seeks To Help World at Large.

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salary which he was receiving in his new position, was nothing to be sniffed at in those days. Something happened, however, which made him feel that the world of banking was not to be his perpetual hunting ground. One day, six years ago, he spoke of it musingly when he was interviewed at his home.

Didn't Get Advancement

"The world seemed a good place to me", he said, when I was keeping tab of dollars and cents and enjoying my leisure taking pictures and thinking up ways and means of improving them. Then the thing happened. My superior, whose assistant I was, left the bank. I had done a good deal of his work; I was fully conversant with it. The thing that I expected, the thing my co-workers expected, was that I should naturally fall in line for the promotion. I didn't get it. Some relative of one of the directors of the bank was brought in and placed over me.

"It wasn't right. It wasn't fair. It was against every principle of justice. I stayed for a short time longer, then I quit. I gave myself up entirely to the work of cultivating my hobby, photography."

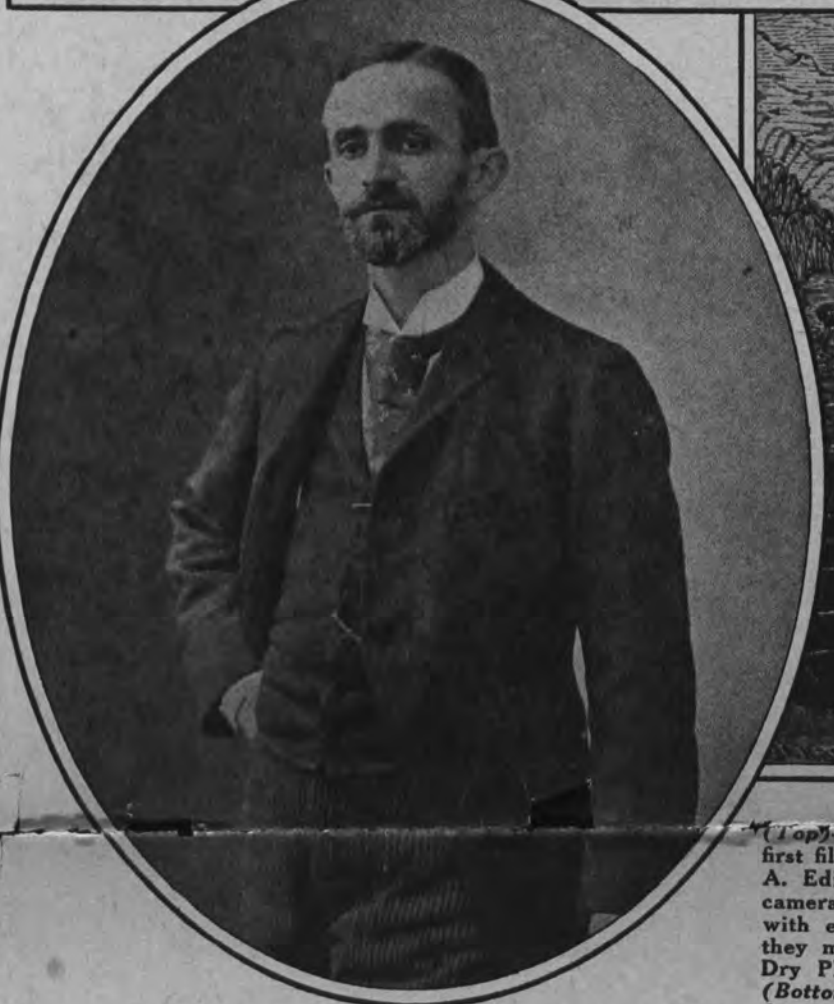
During the summer before he left the bank, Mr. Eastman was able to take a vacation of a few days, the first he had had in years. This proved to be a very important vacation. He had been reading in a British magazine about coating photographic plates with a new sort of preparation. The old way necessitated dipping plates into a solution and using them wet. The new way supplied dry plates that could be carried around without difficulty.

Bought a Camera

Mr. Eastman bought a camera and went out through the country taking pictures in the old-fashioned way. But when he returned from his vacation, he started in to experiment with the dry plates over which he had been brooding during his holiday. He worked at the bank by day, and at his photography by night.

As a staunch supporter of his efforts to make a camera that the amateur would find practicable, Mr. Eastman's mother encouraged him to continue when disappointments threatened abandonment of his dream. Those who know Martha Kilbourn Eastman in those days recall the quiet, shy woman entirely devoted to a son equally quiet and shy. Their devotion to each other continued to the day of her death, at the age of 86, in the beautiful mansion made possible through the experiments she encouraged. When he felt sure that the dry

HARKING BACK TO THE EARLY DAYS



vention of the dry plate, the photographer required an assistant to help carry equipment. (Below)—The first Kodak and roll holder—1888.

process was possible, Mr. Eastman set to work to find a formula for dry plate operation. For a few dollars a month, he rented a small

room and hired an assistant to take care of the routine work by day, while he was still engaged in keeping up the support of his mother's

household. At night he would retire to his improvised laboratory and live in a world of chemicals and test tubes.

In those days he rarely undressed to go to bed. Occasionally, while mixtures were in the process of coming to maturity, he would

snatch a few minutes' sleep, then rise and go to work all over again. On Saturday nights, a worn-out body would call a halt, and he would

Paid \$5 To Learn How To Operate Old Type Camera

Had No Time For Sleep, Rarely Undressed In Periods of Experiments On Dry Plate Process—Foresaw Big Field.

go home and turn in. Often, he slept from Saturday night until Monday morning, getting up only when his mother called him to meals.

Before long, the Eastman dry plates were becoming known and orders were drifting in. By 1881, when Mr. Eastman was 27, he was running a factory which was producing \$4,000 worth of dry plates a month. His force had grown with his success; he seemed on the high road to ease and luxuries when he received a severe setback in the form of complaints from many of his dealers.

Films that had been held over from the year before were found useless the next spring. It was then that he discovered that the sensitiveness of a film fades. Eastman took back all the bad plates and sent new stock in their stead. He wanted his name tied up with nothing that suggested poor service.

Foresaw Amateur Photography

So popular did the dry plate become that soon the market was overcrowded by companies created to manufacture it. It was then that Mr. Eastman decided that the big field in photography was the field of the man in the street, the amateur who wanted to take pictures of his sweetheart, his wife and his children. The film and its holder, now familiar to every person in America and to nearly every community in the world, grew out of strong mental action on this idea.

Hard work, and the cooperation of experts, scientists, practical photographers and inventors who found a hearing at his laboratory, led to the development of the Kodak, as it is known today.

The man who devised the black back to the film, which permits day loading of a camera, with a number for each picture that can be seen at a little window in the back, received \$40,000 for his idea. That was in 1894. The man who thought of the autographic Kodak, received a check for \$300,000. Other men helping development, are today handsome royalties for their share in his success.

From Mr. Eastman's first little factory at 343 State Street, Rochester, N. Y., have sprouted the other factories devoted to the manufacture of Kodak film, professional motion picture film, amateur motion picture film, plates, X-ray films, raw paper, film boxes, shipping tins for motion picture film, artificial leather for making the cheaper cameras, and a dozen other products. There is an Eastman Corporation of Tennessee that supplies wood and wood distillation chemicals from a forest of 35,000 acres.

EASTMAN'S PART IN MOTION PICTURES

(Continued from page 1, column 2)

tions and the business that they sought to develop in the future. Then, on May 30, 1889, Mr. Edison, as head of the Edison Phonograph Works of Orange, N. J., wrote a letter to the Eastman Dry Plate Company, ordering a Kodak camera, which had been one of the developments of the Eastman laboratory.

When Mr. Edison received the camera, he went to work to make his first motion picture camera. And he made it. The development of that machine opened a new field of operations for Mr. Eastman, one that was more extensive than the most optimistic dreamer could have imagined.

Since then, millions of reels of that film have been manufactured and used to give the world the greatest source of entertainment that it has known—these pictures with their modern developments, sound and color. The film has become the basis of entertainment. It is indispensable in medical and dental diagnosis. Armies and navies the world over, and scientific researchers are using it to a greater extent each year.

Eastman Solved Color Photography After Experimenting Quarter of Century

(Continued from page 1, column 1)

and white film or regular motion picture camera, but within the reach of the general public which had manifested an interest in home films.

Boon to Home Movies

Another feature in the presentation of the color film came with the announcement that the regular black and white film camera could be equipped to take color films. The old cameras could be made adaptable by the addition of a color filter which, at that time, cost \$15.

The birth of the "Kodacolor" process as it was called was hailed as marking a new era in photography. Again, the indefatigable and unrelenting efforts of a pioneer had achieved a new and epochal success. And again, the machine age had triumphed in its imitation of nature. The motion pictures had produced another astonishing novelty from

New Process, Most Successful, is One of Most Recent Achievements to Interest Whole World

their apparently inexhaustible bag of magical tricks.

Official Presentation

On the day that he announced the new color film, Mr. Eastman was host to a distinguished group of scientists, inventors, educators, publishers and business leaders in the private projection room of his home in Rochester, N. Y. Mr. Eastman gave the first public demonstration of his new "Kodacolor" process, casting incredibly gorgeous color tones

on a moving picture screen less than half the size of an ordinary classroom blackboard.

Among Mr. Eastman's many guests was Mr. Thomas A. Edison who commented as follows:

"Color pictures, by this great advance, have become a commercial instrument, which can be worked by all people. It is a very simple process, a simple solution of what was thought to be a complex problem. Years ago I worked on color problems myself and made a complete failure of it."

Mr. Edison called the process

simple, because its entire physical equipment comprised the microscopically small lenses on the surface of the film and the tricolored lens for the camera and projecting machine. However, to understand how it works is not simple.

How Color Was Reproduced

While the "Kodacolor" process is a year and a half old, it is comparatively new to the majority of us, and for that reason it is worthy of a brief description.

Let us suppose that a camera with the new device takes an exposure of a red ball. The red rays from the

ball pass freely through the red strip of the filter and fall, in the shape of a ball, upon the surface of the film, of which the lens side is out. Each tiny lens, being a form of prism, breaks the red rays falling upon it into a certain spot upon the sensitive emulsion or the back side of the film.

If the ball has a green background, the green rays similarly fall upon the surface of the film in the shape of a ball and the lenses similarly break them into tiny areas to be registered in the film emulsion.

When the film is reproduced, the light from behind causes the rays to perform the process backward, thus reproducing the original colors on the screen. The spots formed in the emulsion by the red rays go through the tiny lenses and are reshaped into the exact form as before, passing out through the red strip of the filter and falling upon the screen.

HOW NAME "KODAK" CAME INTO BEING

Eastman, its Originator, Liked the Letter "K" In Mother's Name

When Mr. George Eastman completed his model camera in which the film roll was to be used, he saw the importance of creating a name for it—one that could be easily pronounced, not difficult to spell and which could not be infringed or copied. He sought a word that would be strong, easy to remember.

The letter "K" interested him. It was the first letter of his mother's maiden name, Maria Kilbourn. It was easy to pronounce and unlike any other letter. By a process of association and elimination of letters, constructing words that were novel and attractive, he was able to put two K's into a word of two syllables—that was "Kodak".

He called his first camera style, "Kodak No. 1", after having the name "Kodak" secured by registration in the United States on September 4, 1888.



The Eastman Storage Building. The Company's Office Building, which is being enlarged to nineteen stories, can be seen rising in the background.



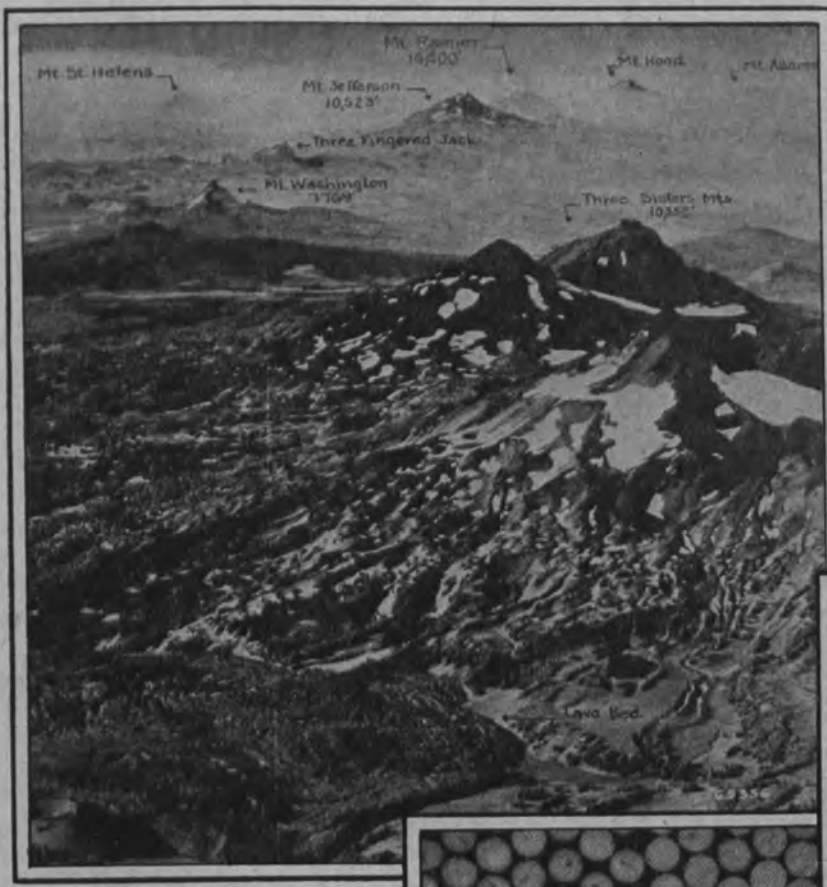
The Main Entrance to Kodak Park. Here you see a part of the extensive area covered with buildings in which the Eastman Company makes its products.



Kodak Factory at Melbourne, Australia. The scenic beauty surrounding this Eastman plant is unsurpassed.

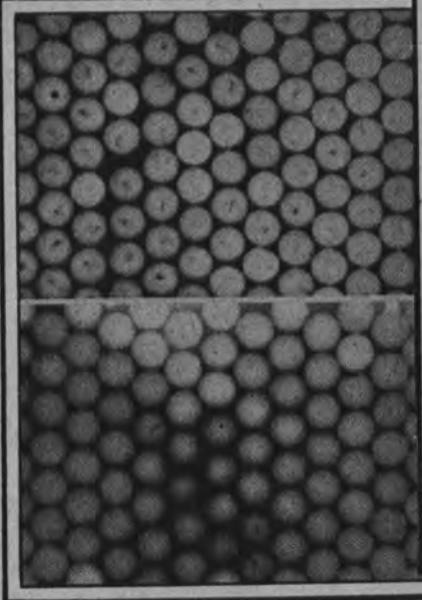
» Photography Is Modern Ally of Science «

Interesting Adaptations Enable Phenomena, Which the Eye Cannot See, to be Recorded in Many Fields of Research



Mount Rainier, in the State of Washington, is shown at the top of this photograph which was taken at a distance of 227 miles. The human eye cannot see that distance but the camera "eye" holds even greater possibilities.

(Right) — The two photographs grouped here show ball bearings made by a new method. When the bearings in the top photograph were X-rayed as they are pictured, it was discovered that 85% were defective internally. The bottom picture represents the same bearings after the new method had been corrected and 92% are perfect.



Captain A. W. Stevens of the U. S. Army Air Corps, who made the photograph of Mount Rainier and who has done much in scientific photography.



In the case of welds, which often play an important part in the matter of safety, an examination of the above radiographs will show how deceptive they may be in appearance. To the eye, all seemed perfect, but the radiographs show that there is practically no union of the parts in one (a), and gas bubbles are present in others (b, d, e). Radiographs c and f show a good weld.

(Left) — Commander Richard E. Byrd, now homeward bound from his Antarctic Expedition, is shown making motion pictures of Mr. Eastman in the inventor's garden. Commander Byrd made extensive use of photography and other modern inventions in his scientific work at the South Pole.

Modern photography besides bringing joy, pleasure and recreation to all the world has become one of the chief implements and allies of the scientist. The camera's all-seeing eye and the sensitive film provide a valuable method of accurately recording important data which often would be impossible to secure by any other means.

The human eye is a slow, inefficient organ for receiving light impressions compared to the ease with which an image can now be made on sensitive film, plate or paper. There are many things that can be photographed. Likewise things that happen so quickly that the eye cannot detect how they were done can be so slowed up in movement by photography that every opportunity is offered the visual sense to see just what they are all about.

In the world of science and research, therefore, the magic of photography plays a major role in making chemical and physical phenomena more readily explainable.

Boon To Astronomy

Without the photographic record the majority of data gathered by astronomers during the past half century could never have been obtained. It has proven invaluable as a method of determining the size, composition, color and location of the stars and other heavenly bodies.

In aeronautical work photography has been used to analyze many types of motion. An example is the oscillation of electrical current in a magnet of an airplane engine. Pressure reading devices using photographic film have been devised by the Langley Memorial Aeronautical Laboratory, Langley Field, Hampton, Virginia. A continuous curve has been plotted of the angular position of the control surfaces of a plane during steady flight, stunt flying or landing. An instrument known as the "Thirty Capsule Recording Manometer" measures the air pressure exerted on different parts of the wings. Holes drilled at various points are connected by

rubber tubes with a thin metal diaphragm which bulges in proportion to the pressure exerted, the change being recorded on a moving film by light reflected from mirrors on the diaphragm.

Oil Fuel Research

In research on heavy oil fuels for airplanes, a special camera has been devised which is capable of taking pictures of jets of oil at a rate of more than 3,500 exposures per second. At McCook's Field, Dayton, Ohio, moving pictures have been taken at eight times normal speed on panchromatic film of airplanes crashing against a concrete wall to determine the point on the engine where flames originate after the crash. These interesting records were made in order to improve on engine designs to reduce the explosion hazard.

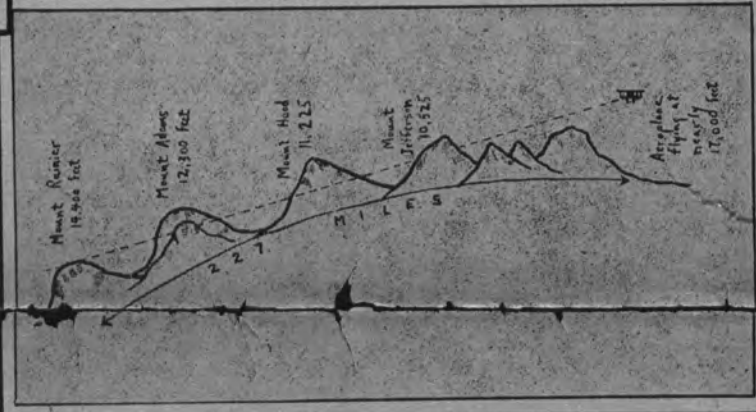
The increase in sensitivity of aerial film to red and invisible infrared light has made possible pictures through atmospheric haze and with the assistance of filters camouflage can be more readily detected from the air.

X-ray analysis has proven an excellent means of discovering flaws in airplane spars and in other metal and wooden parts of a ship. Improvement in aerial camera designs and the production of hypersensitized aerial panchromatic film has brought aerial photography to a much higher plane of precision.

Photos For Maps

Map-making from the air is usually done by vertical photography, the plane flying back and forth over

(Right) — Drawing showing how photographic feat was accomplished.



Mount Rainier Photographed From Plane at Distance of 227 Miles

An aerial photograph of Mount Rainier was successfully made from 227 miles away last summer by Captain A. W. Stevens of the Army Air Corps. This distance exceeded by more than 50 miles Captain Stevens' own previous record for long-range photography.

Mount Rainier is in the State of Washington. The picture was taken from well south of the center of the State of Oregon.

Captain Stevens' 227-mile picture shows quite clearly mountains far beyond the distance that the eye can see. Even on clear days the atmosphere contains sufficient haze to limit vision to much less than 227 miles, but the long-distance pictures were made on film sensitive to the invisible infra-red rays that penetrate smoke and haze. In the picture Mount Rainier appears low-

er, because of the earth's curvature, than closer mountains with less height.

Because he could not see his objective, Captain Stevens was obliged, on the various days when he attempted the picture, simply to point his camera in the direction of Mount Rainier and then to await the development of his films to learn whether he had been successful.

Rose 17,000 Feet For Photo

The 227-mile picture was made in an aeroplane flying at an altitude of nearly 17,000 feet above a landmark that could be identified on a map.

Captain Stevens is head of the photographic branch of the Air Corps at Wright Field, Dayton, O.,

and the War Department authorized the expedition because of the valuable contributions to military photography that were expected to result.

In addition to the data on photographic science to be gained from the long-distance pictures, Captain Stevens thinks that they may yield important measurements relating to the curvature of light rays around the surface of the earth; but these computations will require a good deal of time.

Also he believes that eventually it will be possible to photograph Mount Rainier from even a greater distance with the same photographic materials he used. The heavy forest fires increased the haze in the atmosphere; but that obstacle could be eliminated by making pictures before the forest fire season begins.

a territory while making successive exposures; the prints from which are joined up by over-lapping them to form a mosaic. This is re-photographed to obtain a single negative of the region surveyed. When one considers that in a plane flying at an altitude of 10,000 feet an area more than a mile square can

be photographed in one exposure with a camera having a lens of 12 inch focal length, an aerial survey provides the most rapid means of obtaining knowledge of an uncharted section and aids considerably in reducing the time necessary for subsequent ground surveys. Last year flyers of the U. S. Army

Air Corps photographed the whole Panama Canal from a height of 12,000 feet. This was the first instance in history that two oceans had been partially photographed at one time.

Portions of cities have been photographed at night by army airmen by releasing huge flashlight bombs

attached to parachutes. Flashes, while only lasting a small part of a second and illuminating a wide area for so short a time that the eye could hardly perceive it, however, have been able to impress upon the sensitive film in the cameras mounted in the plane, a detailed photograph of streets and roofs nearly a mile below.

Turning to the question of perfection of the method for telephonic transmission of photographs, the photographic film again plays a leading part. A piece by piece dissection of the photograph is accomplished by passing a tiny beam of light through the film image, the density variation on the film giving rise to fluctuation in the intensity of the transmitted beam. These light fluctuations are converted to electrical impulses which are sent over the wires. The process is reversed at the receiving end, photographic film being also used as the recording agent which is subsequently developed in the ordinary way.

In the field of medicine several instruments have been designed which use the photographic emulsion for recording the data. One device called an electro-cardiograph is used for delicate examinations of the heart. An impulse is created by the normal heart beat which causes a contraction of the muscle of the ventricle. Preceding the impulse is a very fine electric current which is detected by the instrument and is recorded on a moving strip of photographic paper as the shadow band from a galvanometer pointer.

When using another instrument, the roentgenocardiograph, the patient is arranged before a narrow slit in a lead frame so that the pulsating margin of the heart shadow produced by X-rays is recorded on photographic film moving transversely past the slit. Several records can be made simultaneously by adjusting two or more slits over

different parts of the heart. These records confirm the data recorded by the electro-cardiograph and in addition may be used to estimate the width of the heart and to investigate the movement of the diaphragm, stomach and the colon.

Another device called the capillarograph enables a kinomicroscopic study to be made of the movement of the skin capillaries. A high intensity arc is required and the light is polarized to avoid partial reflection at the skin surfaces.

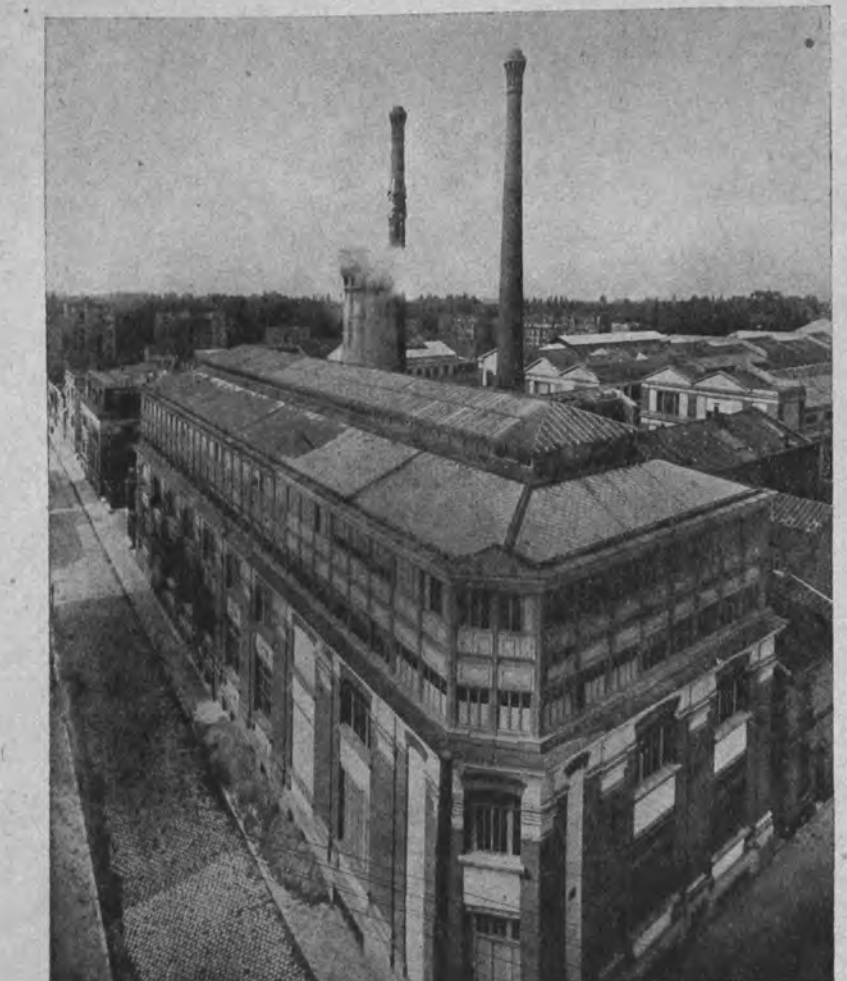
Photography by means of ultra-violet light is often used to decipher charred or deteriorated documents and ultra-violet filters are placed before the camera's lens in conjunction with a quartz mercury lamp to cause the letters of old parchment documents to fluoresce sufficiently for making a satisfactory photographic record.

The Government has turned to photography to enable many of its old valuable records to be more easily readable. The official files of federal bureaus are stuffed with dry and dirty documents barely intelligible to those bent upon intensive research. Of late, however, the trend of methods of the filing of papers has been towards liberal photographic illustrations and data for the purpose of making clear, readable and authentic records.

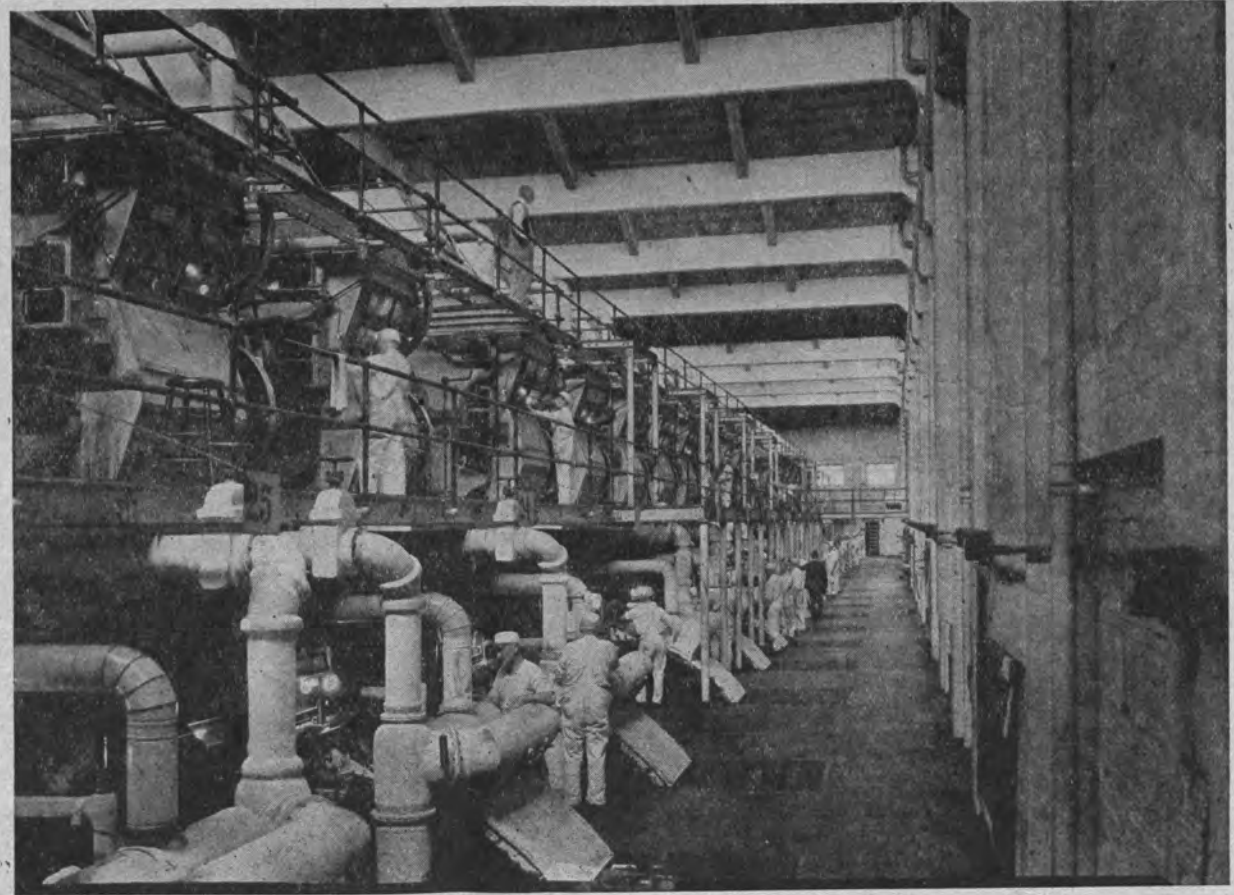
Government In Photography

Since its establishment the U. S. Bureau of Standards has made more than 100,000 photographs of its numerous experiments and tests and these range from the durability of aluminum to the wearing quality of waistscoats. Photographs are relied upon now to tell the story of these tests more graphically and in less space than is possible through volumes of printed descriptive matter. For increasing the efficiency of industrial workmen several types of motion study analyses have been de-

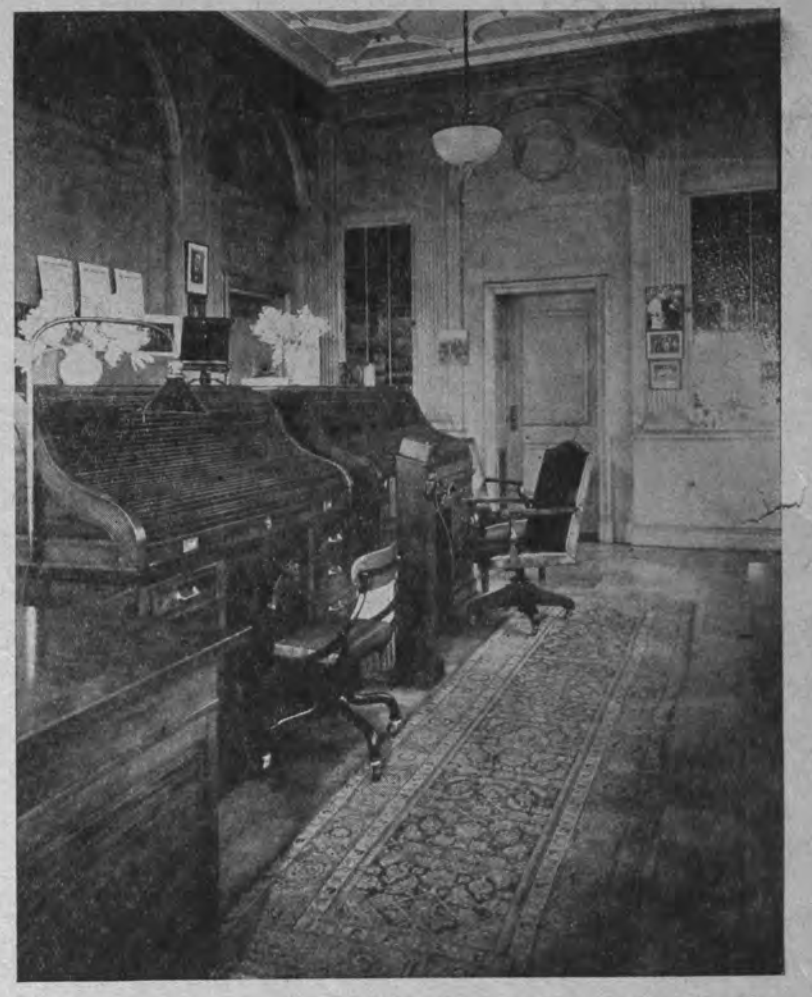
(Please turn to page 5, column 3)



Vaz Factory, Hungary, one of the large foreign plants of the Eastman Company.



Above you see a battery of Coating Machines which are used in the Rochester Plant to spread the "dope" in the making of film.



Mr. Eastman's office. It is said that the manufacturer does considerable planning at home, where he is able to think out big problems.

Business Machines

SATURDAY, APRIL 12, 1930

Owned and published by the International Business Machines Corporation, 50 Broad Street, New York, N. Y.

GEORGE EASTMAN—THE PIONEER

MR. GEORGE EASTMAN, Chairman of the Board of Directors of the Eastman Kodak Company, one of the leading industrial captains of our time, and among the great philanthropists has given more than \$75,000,000 to aid education.

That's one of the many interesting angles of the story of Mr. Eastman but it fails to start us off on the right foot. That concerns Mr. Eastman of more recent years. It does not even suggest the great struggle which he made to gain the wealth which gives him so much satisfaction when he distributes.

Let's go back to the day, April 13, 1880, which we are celebrating. It is fifty years ago that Mr. Eastman opened his first factory in a small room at 343 State Street, Rochester, N. Y.

Still, this announcement does not serve to supply the thought that we seek to describe the spirit, both aggressive and progressive, that caused the youthful Eastman to start a battle in the industrial world which would lead to success eventually.

We must go back—back to those more youthful days in the life of Mr. Eastman. We see him at six years of age. He is a newcomer to the neighborhood, having moved into Rochester with his family, his parents and two sisters. His father had seen the possibilities of founding a business school in that city. It was a new beginning and there was every indication that the Eastmans would be happy and prosperous there. However, a year later the senior Eastman dies, and George's mother opens a boarding house in an effort to support the household.

George Eastman grows up, and while a stripling of 14 years, he assumes a sense of responsibility. He quits school, planning to lift some of the burden from the shoulders of his mother, to whom he is much devoted. His first job in an insurance office at \$3 a week gives him a start in the business world. But he is not satisfied and he continues to work and learn. He sees a greater opportunity in the banking field and he finds a position in a bank, one which pays \$600 a year.

As time goes on, Mr. Eastman becomes interested in photography. It is soon his hobby. However, the mechanics of taking and making photographs is all too awkward to him. He hires a professional photographer and pays him \$5 to teach him all the fine points of the art and he finds considerable interest in all articles and writings concerning photography. He uses all his leisure time in thinking of possible ways and means to develop a dry plate, and thus eliminate one of the operations of photography which to him is highly detrimental to the progress of the art.

Then, one night, we see him reading an article in a British magazine. It has to do with a dry plate process that is being developed on the other side. It inspires him to seek a formula of his own. He continues to work in the bank but his nights are spent without thought of sleep, thinking of the formula, mixing various ingredients and testing them. His efforts are without result until, at last, the mixture is a success. He has found the basis for the making of a successful dry plate and he opens his first factory.

Here we have a synopsis of the events in the life of George Eastman up to the time when he decided that all the initial pioneering, all the sleepless nights, the hard work and untold anguish that he had undergone, had brought him results around which he could create a business.

George Eastman knew that the strenuous program through which he had passed, was only a small beginning. His pioneering days were not ended. He must continue to develop. He must build a camera, one that would be easy to operate and one that would make every person able to take, develop and print his own pictures.

Surmounting all the great obstacles that the pioneer finds in his path, George Eastman forged ahead. He, finally, gave the public the camera which he planned. It was the Kodak, a product known the world over.

One of his customers was Mr. Thomas A. Edison, a young inventor of that time whom the world was beginning to refer to as "The Wizard". He had invented the phonograph and the electric light. Mr. Edison had some ideas which he sought to place in one of Mr. Eastman's cameras. He did so and called the machine the Kinetograph. It was the first motion picture machine. Using a sensitive film which Mr. Eastman manufactured, Mr. Edison made the first reel of motion pictures. The invention opened a new field for Mr. Eastman, and many new fields for those who were to see the possibilities of building a great theatrical industry around it.

If the inventor of dry plate photography had decided that, in giving the world his new process, he had satisfied his ambitions for life, that he had every necessity for a successful career and nothing was left to be desired, the creation of that huge industry which we call motion pictures might have been an eternity from the conception of mankind.

We enjoy motion pictures because Mr. George Eastman was not willing to let well enough alone. The motion picture film, as we see it today, was made possible after laborious experiments by Mr. Eastman.

Photographic film in a continuous strip was originated and application for letters patent was filed in Washington, D. C., on March 4, 1884. The "stripping film" as it was called, was used in the new system of photography. It was made up of a paper base, a layer of collodion, a sensitized gelatine emulsion, and a soluble layer of gelatin between the paper and the collodion. After exposure and development, this soluble layer could be softened by warm water and the paper base separated from the negative and the latter then printed.

Mr. Eastman's cooperation in making the "stripping film" was an extremely important factor in the development of a camera for the taking of motion pictures.

We know something of what that film has done in the development of medical science, in the more efficient use of the X-ray, that business is using more film and finding more uses for it every day and it is almost impossible for the average person to have a complete knowledge of the progress which the use of film is making.

Back of that progress, there stands the spirit of a pioneer who has never stopped pioneering. Regardless of how impossible it seemed, each new problem that faced him was a challenge which he preferred to meet. Days and nights spent in searching and researching often failed to bring him any nearer to the solution of his problem. But he kept on, refusing to give up until he had the results which he set out to gain.

That is the spirit of the pioneer. That is what has given George Eastman his full measure of success. That is why he stands in a unique position today for he is probably the only American industrialist, who founded a business and remained at its helm of leadership for fifty years. He wears a coveted crown.

POINTED PARAGRAPHS

(Mr. Carl W. Ackerman, the author, has written a highly interesting biography of Mr. George Eastman and the volume of more than 500 pages has been published just recently by Houghton Mifflin Company. The following excerpts from that work are the words of Mr. Eastman found in various chapters and uttered at different periods of his career.)

Large corporations pay higher salaries than small ones.

The ideal large corporation is one that makes the best of the brains within it.

The real object of our system is the prevention of substitution and that is just as important to the public as it is to us.

It is rarely the case that any position in the company is filled other than by promotion.

If anybody alone decides whether a man is to be promoted, it is the man himself.

The only sound reason for the combination of many companies under one management is to obtain greater efficiency.

Consolidation has greatly increased the opportunity for a good worker to secure recognition.

I propose to fight until there is at least a quarter of an inch of ice on the surface of the hottest place that has ever been mentioned in sacred history.

Men who are capable of promotion are conspicuous and as a rule attract the attention of others beside their immediate superiors.

The same brains and ability can get greater results in a large corporation on account of the better coordination of the organization mechanism.

Opportunities of men increase with the size of the corporation just as they do with the size of the community in which they work.

The age of invention is by no means past and the progress of this country is just as much dependent as ever upon the stimulation of inventors.

I am unreservedly of the opinion that the only way to increase wages, or the purchasing power of wages, which is practically the same thing, is to increase the efficiency of the worker.

As far as possible all executive jobs in our organization are given to men who grow up in it. One of our most important plant managers started out as a carpenter.

The only clique that is recognized in this business is the one whose chief object is to get the best results for the company by efficient cooperation, and no man who does not show the very best results in his own line will ever be a member of that clique.

It does not require any separate system to show a man's competence and eligibility for promotion. The ordinary records ought to show it as far as it can be shown by any written records.

One of the first qualifications of a manager, superintendent or foreman is ability to recognize ability in those under him and to stimulate their initiative. Any concern where this is overlooked will be full of dry rot.

The saving grace is that if one recognizes that misfortunes are only marks, as on the thermometer, then one will know that, while the mercury can keep going down, it can just as easily go up.

Men are continually leaving small towns to go to large ones for the sake of greater opportunities afforded, and there is a tendency for able men to seek, or to remain with big corporations for the same reason.

An organization cannot be sound unless its spirit is. That is the lesson the man on top must learn. He must be a man of vision and progress who can understand that one can muddle along on a basis in which the human factor takes no part, but eventually there comes a fall.

By working seriously and effectively in our working hours, much can be done to enable us to make the most of our leisure hours. What we do in our working hours determines what we have in the world. What we do in our play hours determines what we are.

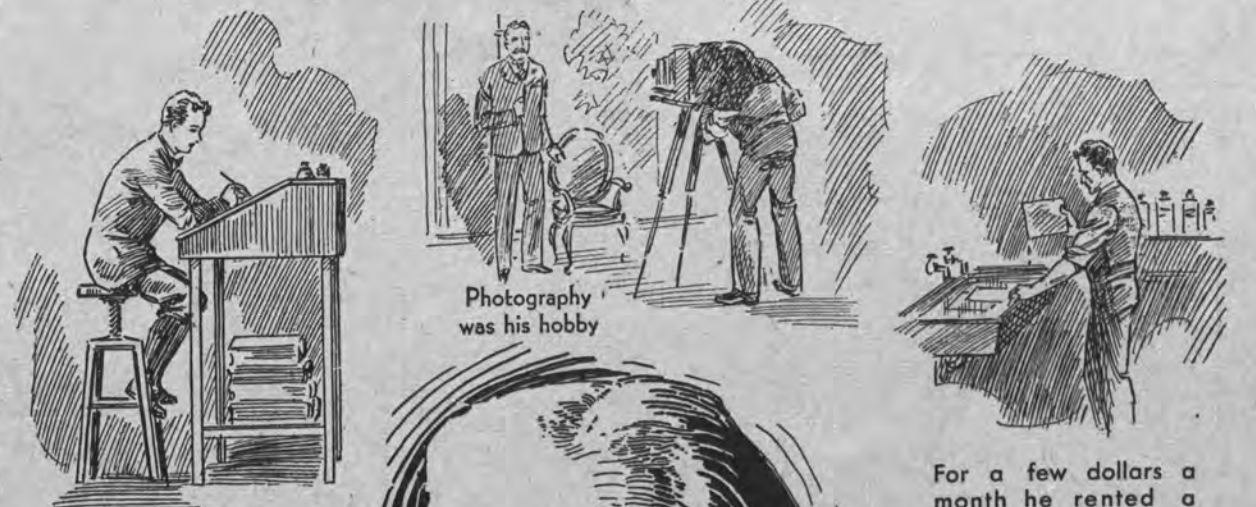
We never reach the end of anything. You may seem to have all of the misfortunes in the world. You may think that everything has happened to you that can happen. Or, on the other hand, you may imagine that you have reached perfection—the end of the journey.

But I hold that the man who says he is "down and out" is expressing exactly the same sentiment as the man who says, "I have attained success." It is true that they are talking of very different subjects but the mental approach is identical. No matter what has happened to one—unless it is death itself—there is always something more that may happen, fortunate or unfortunate. Neither cup is ever quite full.

It is the same with success. The man who thinks he has done everything he can do has merely stopped thinking. He is what might be called "up and out." And excepting that he has more money, his case really is not very different from that of the man who is "down and out."

Of course the best thing for all of us to do is to keep busy but, living and working as we do today, we need more time for recreation and reflection. I do not mean by this statement that the drudgery of work can be eliminated. There is a great deal of business that is drudgery. We must face that and not delude ourselves with the idea that work can be made play. The only antidote to drudgery is play, but the proper time for play is in our leisure hours.

From the Life of a Leader



Photography was his hobby

Found first job in insurance office at \$3 a week.

For a few dollars a month he rented a small room. At night he would retire to it to live in a world of chemicals.



George Eastman

First customers wrote that films bought months before had lost sensitiveness. He took back bad stock, experimented more, and found a film emulsion with lasting qualities.

Built an industry of world-wide scope, giving employment to over 22,000 persons. His factories comprise more than 90 buildings.

Pictures of the Past

Inventor of Dry Plate Revived Romance and Gave Us Age of Family Album

ONE of the strongest influences, which nourished the progressive spirit of George Eastman in the days when he sought to simplify photography by inventing the dry plate, was the love which he manifested for his mother. She was a widow and kept a boarding house. Young Eastman knew the great drudgery which she shouldered in an effort to support the family. He knew that the success of his efforts would remove a great burden from her life, and it was with this thought always uppermost in his mind that he finally achieved success. During the remainder of her life, Mrs. Eastman enjoyed the fruits of her son's labors.

The bond of love between Mrs. Eastman and her son was so great in its devotional magnitude, that it was uncommon even in that generation when children considered their respect for parents a solemn duty. She was convinced of his ability to create the dry plate process and she urged him on when others laughed in an effort to discourage him. That mutual love explains why Eastman never married.

HOWEVER, George Eastman has the distinction of having contributed considerable to the culmination of an untold number of romances. Through the agency of his Kodak, which, from the time it was first introduced, was made available at popular prices and attained wide distribution, Dan Cupid found a new and highly favorable and effective aid in his unrelenting efforts to weld romantic hearts.

Who can admit that he hasn't carried a snapshot of "the sweetest girl in the world"? Is there a father who can say that he has never taken one or a hundred pictures of the children, mother, grandma, the dog, the family next door or whoever happened to visit him while there was sufficient sun to make the quick exposure successful?

AGAIN, if we allow our reminiscing to swing back over the cycle, leading up to the advent of the snapshot, cannot we recollect those days comprising the era of picture taking when the family album was the best seller in the non-fiction class? That family album was a sacred thing. It held more sentiment than all the phonographs, radios or other media which, in turn, have become a part of the source in which the average family finds a mutual interest.

In much the same manner as our modern song writers, the poets of the past found unlim-

ited inspiration in the photograph. In elegant words, they wrote delightful romance around the picture of someone who had cast the spell over them. Their poetic outbursts became near-classics in the old homesteads. Their words were memorized and recited in those hours of loneliness which must be a part of every romance. And, today, if we were to view those pictures, some so straightlaced and others so artless that the subject was required to pose like a statue, we would be carried back into a world of wonderment—we would have hallucinations—but we would not be so thoughtless as to forget that those photographs represented other days and other ways.

WITH the knowledge that Mr. Eastman gave us the film which was the basis of the development of the motion picture era, we can answer the question as to their benefits to the romantic side of life. It is a long story, but we may cover it briefly by stating that, without the motion picture, the film stars, the 22,000 motion picture theatres and all other developments of the art which has come down to us in colorful presentations, with talking and sound devices to give realism, with tuneful music that lingers in our memory, this world would lack something that would not have been easy to do without.

In much the same manner as the camera gained wide distribution and found a very necessary place in the home, motion pictures are following a very similar course.

THE use of motion pictures in the home was introduced several years ago, but in the last few years it has taken a stronger hold on the household. The invention of color motion pictures by the Eastman laboratories, after 25 years of experimental work by Mr. Eastman, has helped to increase their favor.

Today we see the family in motion pictures. As the years pass, they record a most interesting history of that family. In adopting these home movies, we are coming back to that cycle not unlike that when the family album gave us the characters and the stage on which we could recollect each act in the comedies and dramas of our past. We have a new and certainly more lifelike recollection from the motion pictures and there is no reason to believe that the kind of heart sentiment which the family album kept alive was interred with it. Motion pictures in the home will make the family circle more complete.

Eastman's Philanthropies Total Above \$75,000,000

He Has Endowed Many Institutions of Learning, Given Clinics to Aid Health

"A literally stupendous factor in the education of the modern world."

These are the words of Dr. Nicholas Murray Butler, President of Columbia University, and they were used to describe Mr. Eastman.

The opinion of Dr. Butler does not over-emphasize the value which the great contributions of Mr. Eastman have been to the world.

His creation of the dry plate was the first of a series of inventions which gave us a new system of education. First of all it gave us the photograph without the great inconvenience which had been necessary in the antiquated process which preceded it. That photograph was the basis of the photo-engraving process, it was the inspiration of it. Photo-engraving gave us the pictures we see nowadays in our newspapers and magazines—and that was the first step which brought education out of the initial invention of Mr. Eastman.

Film in Education

Pictures have become one of the most effective means of education. Pictures in advertising have given us the desire to buy. They have taught us to appreciate the value of other things.

The motion picture, the film of which was invented by Mr. Eastman, has been another great power in the spread of knowledge. We have learned many things from motion pictures, even from those movies that we consider entertainment. In only a short space of years, the motion picture industry grew to gigantic size and, at the same time it developed a high standard of excellence. Motion pictures have become an important part of the life of the peoples of the world and all have been improved by them.

The industry which Mr. Eastman founded and so skillfully developed into one of world-wide consequence, has had a far-reaching influence on American business as a whole. The policy which he pursued and the manner in which he executed that policy has been an education in itself to American industry. Bulk production at a low cost for a world market had not been attempted by an American manufacturer until Mr. Eastman showed the way. This was one of the great lessons which American industry learned from Mr. Eastman.

Has Given Fortune

benefits which Mr. Eastman has contributed a large fortune to institutions of learning both in this country and afar.

It always has been Mr. Eastman's belief that institutions can create a nation, and, it is probably with that thought in his mind that he has given more than \$75,000,000 in his program of philanthropies during the last several years. His gifts have been noteworthy, both because of their amount and the wise discrimination shown in their making.

No complete record of his contributions to institutions has been published for Mr. Eastman has never cared to take credit for what he did. However, the following will give the reader some idea of the extent of his philanthropies:

University of Rochester, \$23,578,500; Rochester Dental Dispensary, \$2,500,000; Massachusetts Institute of Technology, \$1,550,000; stock of Eastman Kodak Company to employees (valued at date of delivery, July 1, 1924) about \$9,000,000; Y. W. C. A. and Infants' Summer Hospital (Rochester), \$25,000; Children's Society (Rochester), \$55,000.

Stevens Institute of Technology, \$100,000; Homeopathic Hospital (Rochester), \$75,000; Rochester Parks, \$104,350; Hahnemann Hospital (Rochester), \$100,000; State and municipal research bureaus, \$333,050; war relief, \$225,000; Red Cross (1917), \$250,000; Y. M. C. A., \$340,000.

Other Institutions Helped

Tuskegee Institute, \$412,000; Mechanics' Institute (Rochester), \$390,000; for enlarging Rochester General Hospital, \$500,000; war chest and community chest, \$1,725,000; Chamber of Commerce Building (Rochester), \$590,000; addition to Chamber of Commerce Building (Rochester), estimated at \$750,000; Rochester Friendly Home, \$50,000; Tuskegee Institute (additional gift), \$1,000,000; Hampton Institute, \$1,000,000.

The above totals \$58,602,900.

On April 22, 1927, Mr. Eastman gave \$1,500,000 for the establishment of a dental, tonsil and adenoid clinic in London, England. The gift was given as a mark of affection and admiration for the British people, Mr. Eastman having resided in London for a considerable period at one time.

It was last May 22 that an announcement was made that Mr. Eastman had given \$200,000 to the Association of American Rhodes Scholars for the establishment of a professorship at the English University of Rochester.

In 1924, when Mr. Eastman made large contributions to four institutions of learning, he said:

"I wanted my money to go to specific purposes. Things change so rapidly that a will would not be satisfactory. A man cannot make a new will every month. Conditions change. They change before he dies. They change further before the will is administered. I wanted to see it work during my lifetime."

He smiled. His face relaxed. He looked even boyish. It was as if he said he wanted to see the whole show himself, from beginning to as near the end as a man can. He had

watched the money accumulate; he wants to watch the service it does.

Disposal Is More Difficult

"Besides," he went on, "the disposal of money is more difficult and more dangerous than its accumulation. It is even more interesting to distribute money than it is to make it. I cannot say what I would have done if I had had a family. It might have changed my whole attitude. But I think I would have done the same thing. I believe the inheritance of large wealth is dangerous, does harm. In the same way, the unwise disposal of money is likely to be harmful.

"I have given largely to educational institutions because I believe education is perhaps the most important thing. I don't limit that to technical education. A man needs to be educated fully. That is why I have given to the liberal arts work of the University of Rochester.

"Another important thing is how men use their leisure. It seems to me that listening to music—good music—is the best way of using leisure. Athletics are good, too, but the leisure time for athletics is limited. There is no such limit to music. The appreciation of music requires some education in listening to it. It does not require the technical education that playing music does. I can't whistle a tune, I cannot keep the air of a tune, but I have learned to get a great deal from good music.

Sees Little Increase of Leisure

"I have no distrust of leisure if it is used properly. But I don't see much increase of leisure for most men in the immediate future. I don't see the six-hour-day in sight. Industries are pretty well set. Machinery is doing almost all the work in its present form it can.

"No man will have more leisure than he can get after having earned the so-called necessities of life. He must produce just so much in order to have leisure. He must give up eating as much as he does or living as well in order to work less. I don't think most people want more leisure than they have. More leisure to most men can only come by the increase of production by machinery.

"I have not sacrificed anything by disposing of my money. I have all the luxury I want. I like luxury. Unfortunately, a man's capacity for luxury is limited."

Machine Makes Pictures to Protect Business

The Recordak, a machine which makes pictures of checks on film, and which is now used by a large number of the leading banks, is one of the products of the Eastman Kodak Company. It is manufactured by its subsidiary, the Recordak Corporation. The first installation of these machines was made May 1, 1928, in the Empire Trust Company, New York City. More than 1,000,000 checks a day are now being photographed in New York City by fifty-one banks which use 18,000 feet of film each day.

PHOTOGRAPHIC MUSEUM

An interesting commercial museum, containing a sample of practically every photographic device the Eastman Kodak Company has ever made, is maintained at the main office as an adjunct to the company's patent department. There are also many examples of photographic apparatus which antedate the company's activities.

SUB-ASSEMBLING

In what may be called sub-assembling rooms at the Eastman Plant, the aluminum and steel frames and other parts of the cameras are fastened together. These are then sent to the lacquering room where various liquid finishes are applied, after which they are dried in automatic electric baking ovens. The outside leather covering is then glued on, the raw edges being burned with hot irons to harden them and prevent fraying. The frames are next placed in power presses to imprint decorative creases on the leather.

SHUTTER MAKING

One of the most intricate operations in all Kodak making is the assembling of the shutter. Infinite care and precision are required, and the operators must have skillful fingers with a well-developed sense of touch. In some shutters more than 100 different infinitesimal parts are used. The flat parts are stamped out by the punch presses, and the round parts by the special screw machines.

Uses Tenth of Silver Mined In United States



Here is a fortune in silver. The Eastman Kodak Company uses one-tenth of all silver mined in the United States each year. The many tons of metal are necessary for sensitizing Eastman products. Each bar in the safe pictured above weighs forty-two pounds.

PHOTO IS MODERN ALLY OF SCIENCE

(Continued from page 3, column 7)

which also use the photographic film as a recording medium. They consist of having the workmen wear a very light harness having either tiny electric lights or mirrors to reflect the light from the point to be studied. The results are shown as an illuminated path where the movements are traced.

An interesting adaptation of motion picture photography is used to study the rate of contraction and expansion of the pupil of the eye. The first picture in the motion strip shows the normal eye; during the next two frames which represent 1/4 of a second in time a flashlight powder was burning. The eyes, however, show no attempt to relieve the blinding glare by closing the eyelids until the fourth frame, or 1/16 of a second later, in which time the flash is practically over. The last frame indicates that the lids have dropped to a nearly complete covering of the eye while the glare of the flash is no longer present.

Used In Auto Tests

In Germany a unique use for motion pictures has been uncovered. Applicants for automobile licenses are tested in a scientific laboratory to determine how they would react to dangerous emergencies. The driver sits at a control position of an automobile with devices attached which register results. Right in front is a screen on which motion pictures of traffic in a congested street are thrown. Controls are required to be manipulated as the driver would do if he actually had to meet the danger and emergencies he sees on the screen. Every movement is registered and if he fails to react correctly in the matter of skill, presence of mind and endurance he is out of luck.

Automotive engineers have called upon photography in a large measure to aid them in working out their problems. A device called an accelerometer which uses motion picture film is able to record the riding quality of automobiles with considerable accuracy. It is also useful in the study of springs suspension, shock absorbers, tires and cushions. The picture shows the record of the vibration of an automobile engine made with this device.

It will also record shocks, jars and tremors. Tremors, for instance, in a building due to distant traffic can be definitely measured as well as the vibrations of a bridge.

Many Other Important Uses

A machine called the Midgley Optical Indicator records by photographic means the combustion in a cylinder of a gas engine. This device is a delicate scientific instrument but it can make a record that the average layman can easily understand. The three graphs illustrate what happens inside a cylinder at smooth combustion, when fuel or other conditions produce a knock and when pre-ignition of the mixture occurs.

In the field of physics important data has been secured through photographic methods. A reproduction of a rifle bullet is shown entering and going through a soap bubble. It will be noted that even the air waves set up by the movement of the bullet have been recorded as well as the fact that the bubble has not yet started to break even after the bullet has pierced it. Such a picture must of necessity represent an interval of time too infinitesimal to grasp.

A special camera was used to secure the pictures of the interior of a rifle barrel; one showing corrosion and the other without. With

Eastman Has Helped to Build City of High Standards

Kodak Maker Gives More Than \$40,000,000 to Improve Rochester With Institutions

ROCHESTER, N. Y.—George Eastman, in addition to being Chairman of the Board of Directors of the Eastman Kodak Company, is Rochester's most widely known citizen.

This city is of one voice in shouting the plaudits of Mr. Eastman. More than any other person, he has built this city around the industry which he founded fifty years ago and there are no people on earth who are quicker to take the opportunity of his anniversary to congratulate him.

Mr. Eastman has done considerable for the city in which he found so much success, after coming here from Waterville with his parents when a youth.

School of Music

His gifts to Rochester include the internationally known Eastman School of Music and other departments which have been added to the University of Rochester. He also made possible by his generous contributions, the housing of the Rochester Chamber of Commerce in a building that is considered to be one of the most beautiful Chamber of Commerce buildings in the United States.

A dental dispensary and other philanthropies which Mr. Eastman has made possible for the residents of Rochester have cost him approximately \$40,000,000.

Added to Park System

An important part of Rochester's extensive park system is composed of a number of tracts of land which Mr. Eastman gave to the city. The Rochester Bureau of Municipal Research, which received its financial support largely from Mr. Eastman, paved the way for the City Manager Charter, which was declared a model of that form of government when it went into effect three years ago.

Mr. Eastman's palatial home on East Avenue, Rochester's foremost residential thoroughfare, is a distinct adjunct to the Flower City, in fact it is one of the city's show places. His beautiful conservatory is a particular pride and there he gives pipe organ recitals when his friends are assembled.

Music in Rochester has always been encouraged by Mr. Eastman. The Rochester Philharmonic Orchestra, a musical organization which had its birth in the Eastman School of Music, has made itself known by excellent concert work throughout the United States. The Rochester Civic Orchestra, which is a smaller organization, gives concerts Sunday afternoons and in the High Schools from which their programs are broadcast to other schools which have radio receiving sets donated by Mr. Eastman. These orchestras had their beginning in the gifts of a school of music and a

such photographs a method of actually measuring the extent of corrosion is provided.

Such photographic methods in all scientific observation prove of great value in accurately recording any reactions invisible to the eye. Rapid physical and chemical phenomena also may be quickly obtained to be examined later, with more deliberation. Moreover, such records eliminate personal errors and enable a series of observations to be made more rapidly than visually, especially when recording simultaneously two or more phenomena.

theatre to the community but their support is now city-wide.

Investigates Projects

It is said that Mr. Eastman investigates an investment in philanthropy as carefully as he would an investment in business. His aim is to make it produce the utmost results.

Watchful care of the teeth of children has been made possible by Mr. Eastman's gift of a dental clinic, where it is said that the teeth of every child in Rochester have been given attention.

In addition to his institutional philanthropies, a great deal of his time and his energies in the last few years have been devoted to arousing sentiment for the adoption of a 13-month calendar, in which each month would have exactly four weeks and holidays would fall on the same date and day of the week, preferably Monday, every year.

"Mr. Eastman never gives money to a project and lets it go at that," said a man who has been closely associated with him. "He gives his personal time and study to every undertaking represented in his gift of funds."

Corbett and Fitzsimmons in First Fight Film

The first motion picture of an event was that which resulted from the Corbett-Fitzsimmons prize fight in Carson City, Nevada, March 17, 1897. An order for 30,000 feet of negative film for that picture was the cause of considerable interest at the Eastman plant where it was made. Incidentally, that fight film caused the first censorship cloud for the new industry.

Eastman Giving Away 500,000 Cameras to Mark Anniversary

ROCHESTER, N. Y.—"The world's biggest birthday party," celebrated by the gift of half a million cameras to children 12 years old, will commemorate next month the fiftieth anniversary of the first photographic patent awarded to George Eastman, whose work did so much to transform amateur photography from a cumbersome process to the simplicity that marks it today.

The cameras, each accompanied by a roll of film, will be given away by the Eastman Kodak Company, of which Mr. Eastman is chairman of the board of directors. Any child whose twelfth birthday falls in 1930 will be eligible to receive a camera by applying to local photographic dealers in company with a parent or guardian.

The distribution of cameras throughout the country will begin May 1 and continue until June 1, if the 500,000 cameras have not all been given away before the end of the month. A further number will be distributed to children in Canada.

The cameras are of the box type, finished in a golden tan in recognition of the golden anniversary. Each bears a gilt medallion, with the in-

HUNTING, INVENTOR'S SOURCE OF PLEASURE

Eastman Has Taken Several Trips to Wilds—Big Game His Mark

Probably the one sport which Mr. George Eastman will tell you he gets the most enjoyment out of, and the only one which he has shown a great deal of interest in, is hunting for big game.

Years ago he was a member of a party that went up into the wilds of Alaska and stayed there for months, visiting the best game area in that territory and returning home with many trophies of the hunt.

During the summer of 1926, Mr. Eastman and a large party went into Nairobi, British East Africa, where they remained five months and returned home to tell of some highly interesting experiences which they encountered.

During that trip, Mr. Eastman did not employ the usual entourage of guides and bearers, and with one exception when the party went into the jungles for elephants, the rule was followed.

Mr. Eastman brought back trophies that bore witness to his marksmanship, having shot five of the sixteen lions bagged by the party; dropped a charging rhinoceros and bagged many species of smaller game.

Most of the 40,000 miles covered by the party, which crossed the Equator six times, was travelled in a Ford.

That Mr. Eastman prefers to take his recreation in hunting, fishing and the adventure which that outdoor sport has to offer, can be seen from the fact that in the past he has made several unannounced journeys into the wilds. The Rocky Mountains is one area which he has often visited. He has also gone into the State of Michigan and into Nebraska. He has a hunting lodge in North Carolina where he has spent much time. British Columbia, Nova Scotia or other points along the Atlantic Coast from Labrador to Panama have also attracted him.

SCIENCE, INDUSTRY USING X-RAY FILM

Finding Defects In What Eye Can't See Gives It A Wide Application

With the Eastman Dupli-Tized X-ray films, the Eastman Safety Dupli-Tized X-ray films, which cut the fire risk considerably, and many other Eastman products, including the intensifying screen, the X-ray exposure holders, lantern slide plates, film developing hangers, the Eastman Thermometer and X-ray illuminator, the achievements of Mr. George Eastman and his associates were the most important contributions to the success of the X-ray. The Eastman X-ray film showed the way in the creation of new uses of the ray which has become so important in industry, not to mention its great benefits to the world in its use by the medical profession.

In 1895, Professor Konrad Roentgen of the University of Wurtzburg, Bavaria, discovered the radiation which bears his name—the Roentgen rays—more briefly and popularly known as x-rays. The latter name was applied at the time on account of their mysterious and unexplained nature.

This discovery, only partially accidental, was made while studying the passage of an electric current through a vacuum tube.

How Shadows Were Made

The radiation from this tube caused the fluorescence of barium platinocyanide some distance from the tube, and it was immediately found that when opaque objects were placed between this tube and the cyanide salt, they were partially penetrated by the x-rays, forming a shadow.

This discovery attracted world-wide attention and its practical applications were immediately recognized. Notwithstanding the fact that their principal application has been in medicine, in the examination of the human body, it is interesting to note that the first picture exhibited by Roentgen, when his paper was presented to a scientific society, was one of a compass card and needle enclosed in a metal box.

Various other metal and opaque materials were examined at the time, and since, but greater strides were made in the field of medicine, not so much from its greater application but because the easy penetration of the human body made such work possible with the limited equipment of that time.

There is, in a sense, as much need to radiograph and examine the interior of metal casings, essential parts of automobiles, airplanes, welds, munitions, etc., as of the human body, for they are equally susceptible to internal ills that might lead to serious results.

Probes What Eye Can't See

X-rays may be applied to any opaque object where internal examination is desired. The method, of course, has its limitations, and can not be considered a cure-all. It is, however, the best and in fact the only way of examining the inside of opaque objects without damage to the material. Most other tests made for that purpose today are, as someone has pertinently pointed out, "like striking a match to see if it's good."

X-ray inspection is applicable to practically all opaque material of limited thickness and atomic weight. It has been used successfully in the examination of cast steel, bronze, and aluminum, welds, munitions, moulded articles, aircraft, wood and metal parts, rubber, ceramics, clay pots for the glass industry, electric insulators, radio tubes, coal, and innumerable other articles.

There are any number of examples which might be cited to show the value of x-ray examinations of castings. One notable instance recently was the examination of all the pipe for the high pressure steam line at the Edgar Station of the Boston Edison Company, at Weymouth, Massachusetts. The fittings for the 1,200 pound steam line and the cast shell of a 3,000 KW steam turbine were examined by x-rays. As a result of this examination some of the parts, which would have been accepted by any other test, were rejected.

Applied to Great Britain

In England, much work has been done in the examination of their own and enemy munitions. Radiographic examination of shells shows much of the internal mechanism, the type of fuse and whether it is in its correct position. Certain types of small munitions are subjected to 100% x-ray examination. They are loaded in trays or racks which are placed beneath the x-ray tube. The film for this work is usually in rolls and a strip developed after a certain number of racks are x-rayed. They are set aside until the film is developed and can be identified later by lead numbers which show in the film. The defective ones can be quickly sorted out. Many hundreds of these can be examined every hour and the method is applicable to a large number of small articles, such as ball bearings, golf balls, and other objects.

Much work has been done, particularly in England, on the essential or vital parts of aircraft. Because they are light, they lend themselves easily to x-ray examination, and because they are so important to human safety the most thorough examination is imperative.

It became necessary during the war to build wooden airplane parts from laminated small timber. They required fine workmanship, much of which would be hidden in the finished product. Consequently they were extensively examined by x-rays with the result that much defective gluing and poor workmanship was discovered.

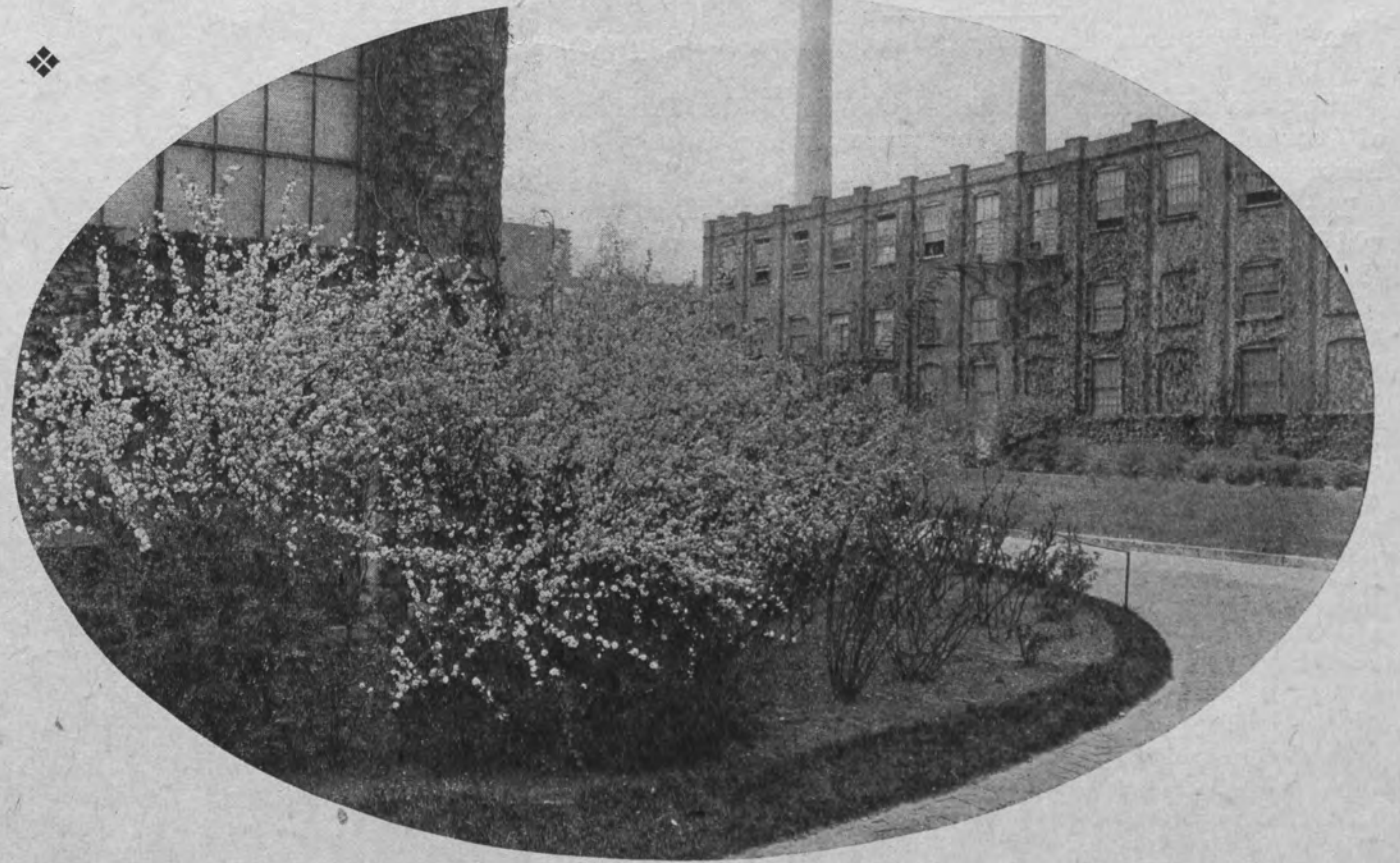
Gain New Knowledge

It was also found out in these examinations that much information could be obtained about fine wood. The detection of knots, resin pockets, grub holes, etc., is very important if (Please turn to page 7, column 2)

The Story of Eastman Industry In Pictures



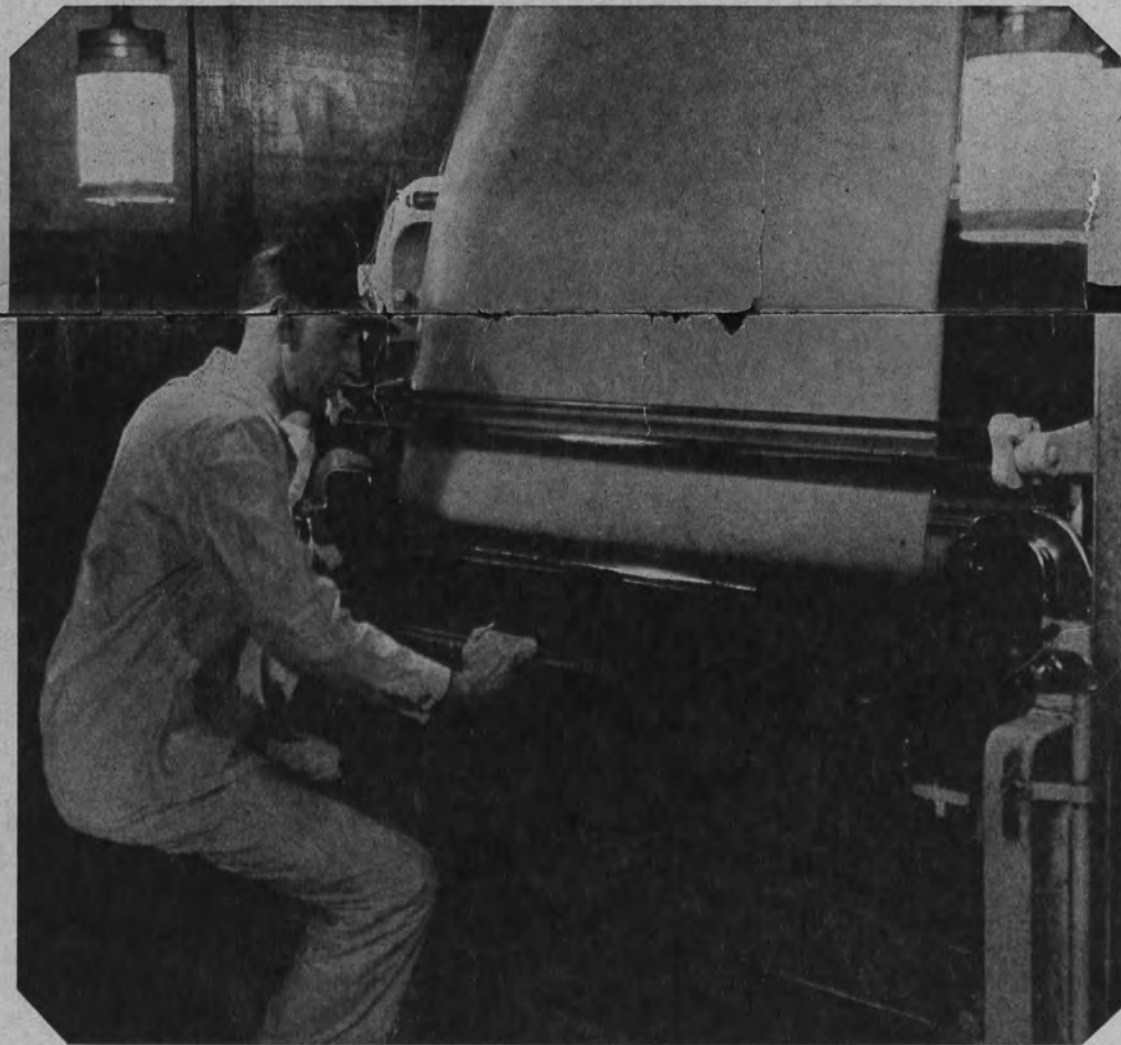
Hundreds of trained hands are employed in the Eastman camera works at Rochester. The operation in the above picture is that of gluing covers on the Kodak bellows.



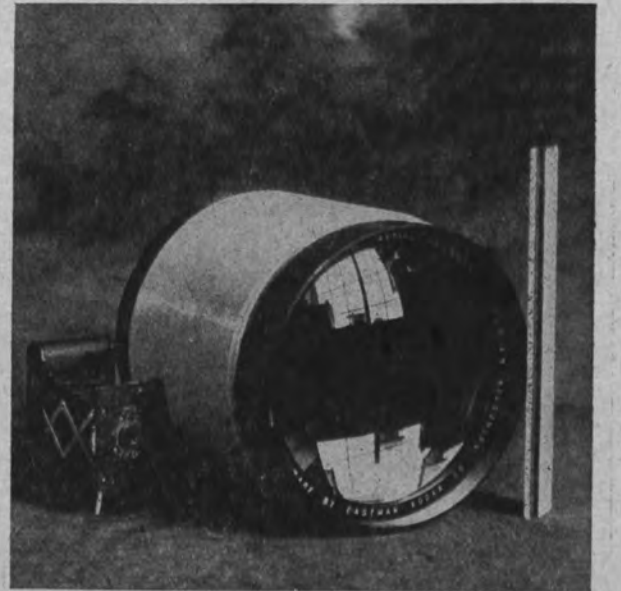
Kodak Park is noted for its beauty, which is evident especially during the summer months. The Kodak factory buildings in Rochester are centered in one of the city's garden spots.



Motors which become part of the Ciné Kodak are "run in" at the camera works.



Above is pictured one of the many interesting operations in the making of film. The light sensitive emulsion comes to this machine in a shredded form. There it is melted and spread on the film base.



(Right)—The smallest and largest lenses made are pictured here. The small one is a small part of the vest pocket Kodak. The large one is used to take photographs at great distance. It's ability is far beyond that of the human eye.

PUCK.
NEW YORK, DECEMBER 10, 1890.

NOT A PROFESSIONAL BEAUTY.

FIRST BEAR.—What's your hurry, Jim?
SECOND BEAR.—There's a couple men coming over there?
FIRST BEAR.—Have they got guns?
SECOND BEAR.—No; Kodaks.

(Right)—One of the first pieces of advertising copy to tell the world about the Kodak. The Eastman Dry Plate put the photograph into advertising. The majority of pen and ink illustrations for advertising are made today from photographs.



Trees, flowers and shrubbery beautify the entrance to the Eastman Kodak Works at Harrow, England.



(Left)—The grinding of lenses requires the undivided attention of men who have had years of training.

Eastman Has Built Great World-Wide Service

WORLD INDUSTRY BUILT BY EASTMAN

Inventor Awakened Our Great Interest In Outside Markets

(Continued from page 1, column 4)

his dry plates were being used. But the Kodak was the big factor in the demand for Eastman products which was to follow. Mr. Eastman found many difficulties, many problems to solve as the demand for Kodaks necessitated capacity production of his limited facilities.

In meeting the world-wide demand which developed through the limited foreign organization which represented him at the time, Mr. Eastman acted quickly to cover the European outposts. At the same time he was becoming the first manufacturer in the United States to effect the modern policy of large-scale production at low costs for a world-wide market. To support the policy which he inaugurated, he added scientific research and extensive advertising to the factors which he knew were necessary to the future of his company.

Mr. Eastman's success, his policy of mass production, and his consideration and high standard of service in the domestic and foreign markets have been great contributors of inspiration to American industry as a whole. They are the criteria which American manufacturers have followed religiously in making industry the great progressive foundation of this democracy, as it is today.

The example which Mr. Eastman set, and the effective manner in which he executed the task of building up an organization of world-wide scope, have been so great in importance as to overshadow the individual business of the Eastman Kodak Company. They have inspired the building of other great industries and they have shown the way to many great industrial successes.

In addition to its plants in Rochester, N. Y., the Eastman Kodak Company now has production units at Kingsport, Tennessee; Toronto, Canada; Harrow, England; Veszprém, Hungary; Vincennes, France; and Melbourne, Australia. The company also operates branches, retail stores and finishing stations in all important centers throughout the world.

The interest which Mr. Eastman took in the development of a foreign organization was extensive and very active. He spent considerable time in foreign countries, personally directing the creation of his foreign branches. One of his first foreign factories was built at Harrow, England, and there a laboratory was installed and experts were set to work to conduct film experiments.

Mr. Eastman was never satisfied that his business had been developed to the limit. He was always able to foresee greater gains in the future. At each stage in the development of the business, plans were underway for a greater volume of sales in the year to come.

After the branch in Great Britain was started, Mr. Eastman ordered its directors to train men and have them learn the languages so that they could take over the management of wholesale depots in every large country.

It was in 1899 that Mr. Edison's peek-show Kinetoscope became the attraction of the Penny Arcades. However, in 1895, the first motion pictures were thrown on a screen in New York City. It was the first public screen show and the world read about it with considerable interest.

Mr. Eastman saw the possibilities of market for motion picture film. His managers in London and Paris also became interested. The managing director of London hurried to America and arrived in Rochester to find the Eastman laboratories at work, hurrying experiments in an effort to develop a film more durable and more adaptable for the future motion pictures. They were successful in their efforts. The Eastman organization had a new product, and his branches in many foreign cities were able to add to the activities of the company on the other side because the novelty of motion pictures had sped the invention of motion picture machines in some of the foreign countries.

Eastman's Latest Product Is Business Kodascope

The Eastman Business Kodascope is one of the recent products of the Eastman Kodak Company. It is a motion picture machine with a screen, all the working parts installed in a box-like case that can be easily carried by a salesman.

The new machine has been placed on the market to make it easier to sell certain products.

Some branches which suggest the scope of the operations of Eastman Kodak Company—It covers both hemispheres



(Top)—The New York City Branch of the Eastman Kodak Company. (Center)—Chicago Branch. (Bottom)—The building occupied by the branch in San Francisco, California.



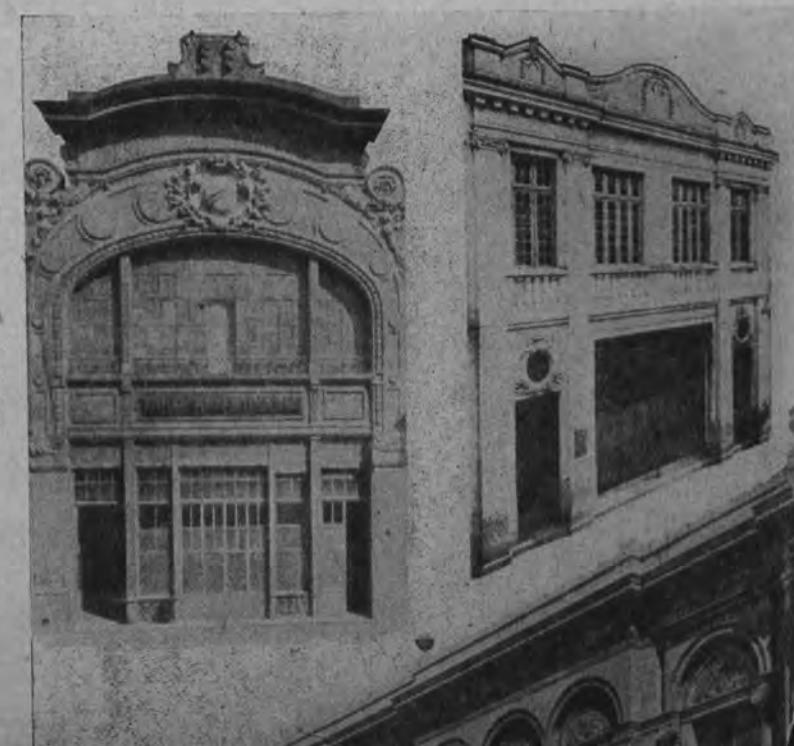
An air view of the Kodak Company, Limited, at Kodak Heights, near Toronto, Canada.



The wood chemical plant of the Tennessee Eastman Corporation.

(Extreme Right)—Kodak Brasileira, Limited, Rio de Janeiro.

(Right)—Kodak Argentina, Limited, Buenos Aires.



Kingsport, Tennessee, where many products are made by wood distillation.

SCIENCE, INDUSTRY USING X-RAY FILM

(Continued from page 5, column 7)

the wood is to be subjected to strain and it is also important if the wood is to be used in fine furniture. The late discovery of these spots after much labor had been done would mean a distinct loss, for the piece would have to be discarded. Much information can be gained about any abnormalities in the structure and the grain. It is also possible to detect defective material hidden in plywoods.

In the rubber industry, golf balls have been x-rayed to determine the symmetry and correct positioning of the hard rubber core. One of the rubber companies has made examinations of its tires to determine the union between the rubber and the cord. This is done by filling the cord with some lead salts which make them opaque to x-rays.

The presence of metallic particles in electric insulators often causes trouble on high voltage lines and the x-ray is proving a big aid in its detection.

Cables, heavily insulated wire, and all hidden and concealed wiring often require examination, and x-rays offer the easiest way to do it.

Examine Radio Tubes

The Westinghouse Electric and Manufacturing Company is using x-rays to examine its metal radio transmission tubes. Each tube is x-rayed twice, the positions differing by 90°, to assure that there is correct spacing between the grid and the filament.

Grinding wheels of all types are subjected to great strain during use and it is important that they be perfect. Slight internal cracks which might be detected only by x-rays may open and cause the wheel to break during its rapid rotation.

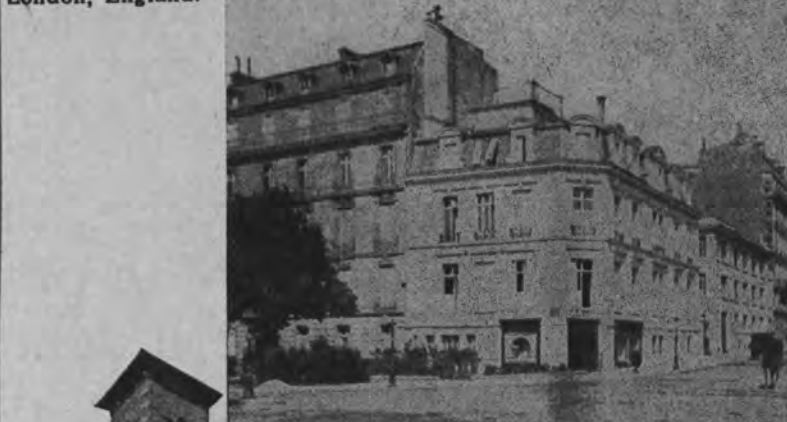
Fire brick may be examined for the detection of hidden cracks and flaws and metallic particles. This has a particular application to clay fire pots used in the glass industry. Metallic inclusions are attacked and the pot ruined. A preliminary x-ray examination would save much trouble and expense.

X-rays have been used to detect the ash content of coal. The combustible portion of coal is very transparent to the ray while the ash which consists largely of calcium and iron salts is opaque. From such an examination of a sample of coal or a boring, much important information may be obtained. An examination of the washing products will determine if there has been an excess of burnable coal discarded.

X-rays have also been used to determine the diameter of capillary metal tubing. In fact there are innumerable uses which have not been noted here and as yet the number of instances to which x-ray examinations have been applied are few compared with the cases to which they are applicable.



Kodak, Limited, London, England.



Kodak Societe Anonyme Francaise, Paris, France.



Kodak House, Cape Town, South Africa.

BUSINESS LIBRARY

A Business Library is maintained for the use of all employees of the Eastman Kodak Company, containing trade and technical publications as well as books, periodicals and pamphlets on general business subjects. It is open for reference any time during office hours with trained librarians in charge.

SAFETY MEASURES

The fire and accident prevention of the entire Eastman Kodak Company is in the general charge of one person, the General Safety Supervisor, who devotes his time exclusively to this work. A constant effort is made through the provision of adequate mechanical safeguards and through frequent inspection to prevent accidents occurring to employees.

MORE THAN 40 MODELS

The Camera Works occupies an entire city block and is the second largest Eastman factory in Rochester. It has a floor area of more than eight acres. There are about 3,000 men and women, most of them skilled workers, employed in the building. More than forty distinct types of cameras are made in that plant.

FIRST KODAK PICTURES

The first photographs taken by the early Kodaks were round. When a photographer had exposed all the film in his camera, both the Kodak and the roll were returned to the factory for unloading, reloading and developing.

MOTION PICTURES PROSPERITY FACTOR

Increases the Demand For American Products, Says Will Hays

Motion pictures are a major factor in creating at home and abroad a demand for American manufactured products, which is the "real basis for our future prosperity."

This declaration was made recently by Will H. Hays in a radio talk. The president of the Motion Picture Producers and Distributors of America said in part:

"While motion pictures have been bringing art and entertainment of the finest quality for the first time to the farthest corners of the earth and building a democracy of amusement, the screen has also rendered another basic service, a service to American business so vast that motion pictures must be recognized as a major element in the national battle for permanent prosperity.

"Motion pictures perform a service to American business which is greater than the millions in our direct purchases, greater than our buildings, greater than our use of transportation, greater even than the direct livelihood which the industry pays to families totalling 1,250,000 of our people.

"A new factor in American economic life, which challenges our enthusiasm and gives us a solid basis of hope for the future is the increasing spiral of demand.

"Motion pictures are one of the great forces which place before our people in convincing fashion the comforts and conveniences which are available to those who will work and save. Our standards of living are steadily on the upward trend. This is a great triumph of our civilization. That men and women should live well, that children should have the advantages of attractive homes, good clothes and adequate education, these, my friends, are not small things. Nothing comes out of poverty but ignorance, and nothing comes out of ignorance but sloth

and crime. The more of our people who can live a rounded, satisfactory life, to just that degree will art and civic progress—yes, and religion, too—flourish.

"The motion picture carries to every American at home and to millions of potential purchasers abroad the visual, vivid perception of American manufactured products.

"I want to leave you with a sense that motion pictures are your industry. You have made them so by a patronage of 115,000,000 weekly in the 22,000 theaters in the United States. You have made them so by frank criticism of what you don't like and generous praise for the vast product that you have endorsed by a patronage that no other art has ever enjoyed."

MEDICAL DEPARTMENT

Chief among the functions of the Industrial Relations Department of the Eastman Kodak Company is the work of the Medical Department, the staff of which consists of a director, five other physicians, two of whom are on full and the others on part time, and nine trained nurses. All prospective employees receive a rigid physical examination before beginning work and periodic re-examination of all employees has recently been instituted.

DENTAL WORK

Through special arrangement with the Rochester Dental Dispensary—one of Mr. Eastman's own city benefactions—dentists are also detailed to visit all the plants from time to time to clean, without cost, the teeth of employees who desire this service.

United States in an International Conference to consider the question numbered 1154, or 80.5%.

Those opposed to calendar simplification and the participation of the United States in such a conference numbered 268, or 19.5%.

Those who made a choice between the two plans numbered 488, of which 480, or over 98%, preferred the 13-months' plan.

Those who replied to the question of the participation of the United States in the conference numbered 952, of which 781, or 82%, were in favor.

In the last Congress, Hon. Stephen G. Porter of Pennsylvania offered a House joint resolution authorizing the President to appoint delegates to an International Conference on Calendar Reform to be held in Geneva, Switzerland under the auspices of the League of Nations. Hearings were held on the resolution but it did not come up for passage before that Congress expired. The resolution has been introduced in the present Congress.

The Eastman Kodak Company is among the more than 80 business organizations which are using the 13-month calendar in their operations.

Eastman Advocates Change to Make Calendar 13 Months

During the last six years, Mr. George Eastman, Chairman of the Board of Directors of the Eastman Kodak Company, has been actively engaged in furthering the program for calendar reform, which was initiated by Moses B. Cotsworth, of England.

In the Congressional Digest of April, 1929, Mr. Eastman stated in part:

"The possibilities of an international fixed calendar which would divide the year into thirteen months of twenty-eight days, each comprising four complete weeks, beginning on Sunday and ending on Saturday, first came to my attention in 1924. Since then my interest has increased day by day as I have observed this movement gather momentum throughout the world, and it seems to me now that it is merely a question of time until all nations meet in conference to agree upon a change. There is no doubt in my mind of ultimate success, because the world moves inevitably toward the practical. When the public understands the many conveniences of the thirteen-month year, and when business in general realizes the necessity for a more serviceable calendar than we have today, all governments, religious organizations, business, educational institutions and professions will welcome an international congress such as a President Arthur called in Washington, D. C., in 1884, when standard time was officially adopted."

formed as the result of a communication by the League of Nations to the United States Government suggesting the creation of such a body. After the committee was formed, Mr. Eastman extended invitations to men and women prominent in business and social life to accept membership in the non-official section of the committee and to others to become members of special committees to sponsor its inquiry in many fields. Similar committees were formed in other countries.

The National Committee for the United States began its study of the subject of calendar reform and its task to ascertain public opinion on the question immediately after its formation.

Sent Out Questionnaires
The committee spent three years investigating the calendar question during which time it examined 185 proposals for calendar reform received from thirty-eight countries. It sent out questionnaires to governments, religious bodies and international associations, accompanied by a resolution of the International Chamber of Commerce recommending "a special congress at which the ecclesiastical, scientific and commercial world should be represented for the purpose of adopting a fixed and perpetual calendar;" and by the minutes of the calendar reform committee of the International Astronomical Union recommending certain principles for establishing a fixed calendar.

The National Committee sent out questionnaires to national, state and local organizations, with the result that it received 1,433 definite replies. Those in favor of calendar simplification or the participation of the

Pioneers - Progress - Prosperity

An Editorial

By THOS. J. WATSON

PRESIDENT

of International Business Machines Corporation

ON occasions such as this, when our attention is directed to the achievements of a fellow American whose accomplishments have enriched the world, we find without exception that pioneering played the all important part in the success of his career. Pioneering always has been, and always will be, the source from which the world will draw all the beneficial factors in the steady evolution and progress of the world.

We have no definite conception of the extent of treasures which will be hidden from us until such time as they are brought to light by the pioneer. The knowledge of the extensive progress which has been made in the last few centuries has caused many to ask, "How long will this industrial progress continue?"

In the past I have replied to that question by reciting the narrative in which our present position can be compared with that of the Indian who sat on a mountain in Pennsylvania, wrapped in a blanket and surrounded by snow, with a coal mine seven feet below him. He did not know it was there; and would not have known how to make use of it if he had known. I also compare our position today with that of the farmer who lighted his building with tallow candles while coal oil was flowing freely a few feet under the surface of the earth. That was not very many years ago, and I believe that today, in spite of all things we have developed, we are still in the position of the Indian and the farmer.

Because the pioneer is the discoverer, the developer and the producer of everything that explains the progress and prosperity of the era in which we live, we are indebted to him. He has shown us the way to a higher standard of living. He is necessary to our well being! We cannot do without him!

Pioneering that has moved with perpetual motion throughout the years, and has increased its momentum considerably in recent times, brought us out of an age of darkness into the light of civilization. If pioneering were to cease, civilization would move backward; industry, business, and the most favorable living conditions which now exist would ebb to the depths from which pioneering lifted them.

PIONEERING MUST NEVER CEASE!