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MAKE YOUR PICTURES

PAY OFF

by

Fred C. Clark, Jr.
Photographer
U. S. Indian Service

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FOREWORD

THIS IS NOT ANOTHER SET OF REGULATIONS:- Tho it did start, in the Chicago Office. Most divisions have files containing hundreds of pictures which field men have submitted. Although the Central Office needs many pictures, and field men send in plenty, very few of the pictures are useable.

WHY: Well, there were fogged pictures, out of focus fuzzy ones, poorly exposed ones, and some pictures that showed nothing at all.

The Chicago office realizes that field men, living on reservations have little opportunity to learn about photography. They also realize that field men have little time to devote to study. But, underneath all of this, is the basic thought that if we are to take government cameras and films and use them, we should not waste the material and money.

Visual developments have made great progress in the last few years, and though it may seem hackneyed to repeat, it is still true that one picture is worth several thousand words. One GOOD picture, that is. How can you learn to take good pictures, while holding down a field job on the reservation? Admittedly this is tough. But others have taught themselves through written pamphlets and experience. We feel that if you want to, you can too.

We looked over many of the hundreds of books which have been written on photography. None seemed really suitable for reservation use. So we have compiled this pamphlet to help field men get a start toward good pictures, that will tell something of the story that must be told. It is written in simple, easy to understand language. Its suggestions are tailored for use with cameras now available in the field, most of which fall into the folding "Kodak" class. Most of these cameras can be made to take a very good picture, satisfying to the maker, valuable to the organization. But it takes a little knowledge to do it.

In the course of the last ten years, I have worked with and become indebted to, hundreds of field workers in the Indian Service, particularly in the Southwest. I know that they are interested in photography, for they have asked many questions. Some of the queries were difficult for me to answer, because the person who asked the question lacked the basic photographic knowledge which would make my answer intelligible. This pamphlet starts off with fundamentals. Not too much theory, but just enough to make the story understandable. If it helps my friends to understand, and answers some of their questions, it may in some slight measure allow me to repay them, for the generous help they have given me in the production of some fifteen Indian Service motion pictures.

F. C. Clark Jr.
Photographer

I N T R O D U C T I O N

There are many different kinds of photography. Most of us understand personal photography best. We need only a reasonably clear photographic reproduction of an outing, a string of fish, or our kids to achieve success. We snap the shutter, send the film to the finisher, get back contact prints (same size as the film negative) and if they "come out", we are happy and our friends pretend to admire our skill.

But the pictures of the sort the Indian Service needs go much farther than that. First of all, instead of contact prints, most of the pictures must be enlarged. An enlargement is never as good as a contact print because all errors are magnified. After the enlargement is made, the picture may be reproduced for printing presses. Here again the faults are magnified, even more than on the enlargement. To be suitable and acceptable in its final form on the printed page, or as an enlargement, you must have a much better picture than you need for your own personal use. We are speaking now of technical quality. Beside this important consideration, there is the matter of picture interest. Your pictures must "tell a story", or "do something". We have divided the pamphlet into two parts. The first concerns itself with the technical details, the second with picture interest.

This may seem a little tough. You may say "Why don't those birds try to be realistic, once in a while. They want us to take pictures for publication, and all we have is a beat up old folding kodak, purchased years ago. Beside that, it isn't working very well lately. If they want us to take good pictures, why don't they send us a professional camera, with all the gadgets, like you see in the mail order catalogue." There are answers to this one, too. First of all, the government doesn't have the money to furnish each field man with a \$300 - \$400 outfit. Secondly, few field men have time to master a complicated camera, even if it were furnished. More than that, technically good, interesting pictures, enlarged and printed, are being taken every day with folding cameras of just the type that most field men have. It CAN BE DONE, if you understand your camera, and USE IT PROPERLY.

UNDERSTANDING YOUR CAMERA AND ITS CONTROLS:

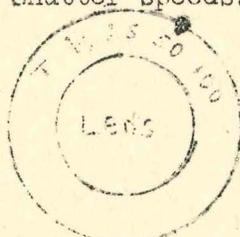
If you were teaching a person who had never seen an automobile, how to drive, you would have to explain WHAT each control did, before you could tell your pupil when and how to use the various controls. We will do the same thing. Before we tell you how to take good pictures, we will have to explain WHAT the controls, which affect your picture taking, are. This section will acquaint you with your camera. You must understand certain basic facts before you can learn to use them properly.

No matter how expensive or complicated a camera is, there are but three basic controls and adjustments. There are:

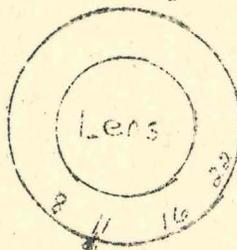
1. The diaphragm
2. The shutter
3. The focusing arrangement

Get your camera out of its case. If it is loaded with film, unload it and sacrifice the film for educational purposes. Looking at the front of the camera lens, you will see two sets of figures, and two pointers. The set marked 8 11 16 etc. control the diaphragm. The set marked T, B, 25 50 100 control the shutter.

Shutter speeds.



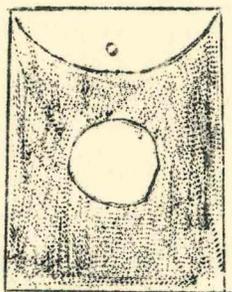
Diaphragm controls
or stops.



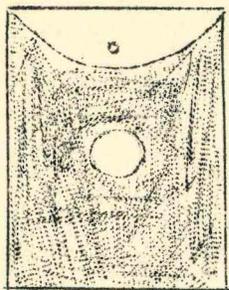
Set the shutter on "T" (time) and open the shutter so that it stays open. Now open the back of the camera, and holding it up to a light turn the diaphragm lever. You will see that the hold becomes larger and smaller, as you move the diaphragm control. Years ago, when photography was in its infancy, cameras had no diaphragms, and all pictures were taken through the entire diameter of the lens. Then someone discovered that better pictures could be made if a small metal plate with a round hole in it was placed behind the lens. This allowed the light rays to travel only through the center portion of the lens, instead of through the entire lens. Better

pictures resulted. Further experiments proved that various size holes were needed for different pictures. If the diaphragm control had not been developed, you would still have to carry around a set of metal plates with various size holes in them. Modern cameras have diaphragms which allow the light to come through only the center portion of the lens, just as the old time metal plates with holes in them did. It is a much handier arrangement, but it does exactly the same thing. The original plates with holes in them were called stops, because they stopped the light from coming through the outside edges of the lens. Since the diaphragm does the same thing, forming holes of various sizes, its positions are also called stops, a term which you hear commonly in photography today.

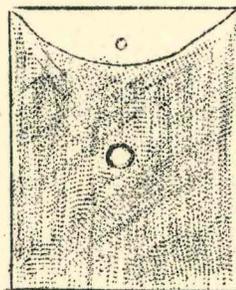
Early lens stops.



F 8

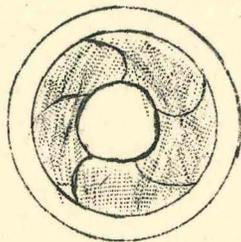


F 11

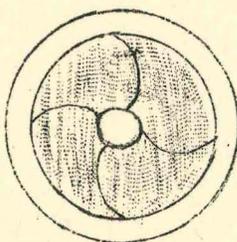


F 16

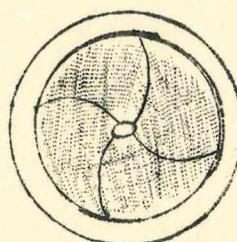
Modern diaphragm stops with which folding cameras are equipped today.



F 8



F 11



F 16

As photography developed, it became apparent that some relationship between stops was necessary. Looking through the back of your camera, with the shutter open, set the diaphragm at 16. You will see a relatively small hole. Now move the lever to 11, and look again. You will see a slightly larger hole. Moving to 8, you will see a still larger hole. This is the first thing to remember about diaphragm stops.

THE LARGER THE NUMBER, THE SMALLER THE DIAPHRAGM OPENING.

As we have said, a definite relationship between these stops was needed. So old time photographers decided to make each stop twice as large as the next one. Stops are written with an "f" in front of the number. How "f" came to be used (f 16, f 11, etc.) would involve us in higher mathematics than we want to wade into here, so let us just assume for the sake of learning that f 16 opening lets in ONE UNIT OF LIGHT. Going to f 11, we would have an opening twice the size, which would let in twice as much light, or two units. Going to f 8, we would have an opening that would let in twice as much as f 11, or four units. Each larger stop lets in just twice as much light as the next smaller one. That is the second thing to remember about diaphragms. EACH STOP LETS IN TWICE AS MUCH LIGHT AS THE NEXT SMALLER ONE.

Here it is in a diagram.

f 16



F 11



f 8



If f 16 lets in
one unit of light,

f 11 lets in twice
as much, or two units

f 8 lets in twice
as much as f 11 or
four units.

While we are on the subject of diaphragm stops, notice what happens when you go from one stop to a smaller one. Here the light is halved. Doubled going larger, halved, going smaller, for full divisions of the diaphragm stop. Though we have taken only 3 stops for simplicity's sake, all the others bear the same relationship. Later on we will discuss other stops, but for the moment, the important thing to remember is the relationship. With one exception, which we will explain later, every stop lets in twice as much light as the next smaller, half as much as the next larger. You may still be wondering what the "f" numbers mean, or why they didn't use simple numbers easier to understand. This is an interesting story well explained in a book mentioned in the bibliography. But it is theory and won't help you make better pictures now, so we won't go into it here.

THE SHUTTER

Everyone knows that a photographic film is sensitive to light. Because of this sensitivity we must have some way of keeping the light away from the film before and after we take our picture. During the actual picture taking, we must have a way to allow light to act upon the film, for the proper interval. Collins, in the "Amateur Photographers Handbook", describes the shutter as "a mechanical light chopper." At the time of taking a picture, the shutter opens for an instant, lets the light act upon the film and then closes again. Between pictures, the shutter remains closed and keeps the light from reaching and spoiling (fogging) the film. Old time shutters were as crude as the old diaphragm stops and some early photographers accomplished this chore with a cap over the lens. The cap was removed for the exposure, and replaced over the lens, when the light had reached the film for the proper length of time. Films are much more sensitive to light today and it would be mighty hard, if not impossible, to remove a lens cap for $1/25$ th or $1/50$ th of a second. Modern spring operated shutters do this job for us and automatically time the interval during which light is allowed to reach the film.

Some shutters are relatively simple, having only a few controls on them. T, B, (time and bulb) 25, 50, and 100 may appear on yours. The numerical figures represent the bottom half of a fraction, with 1 as the top figure of the fraction. In other words, 25 is $1/25$ th of a second, 50 is $1/50$ th of a second, and so on. Other shutters may have many more figures on them, such as T, B, 1, 2, 5, 10, 25, 50, 100, 250, etc. All that you have to remember is that each figure is the bottom half of a fraction. Thus 5 represents $1/5$ th of a second, 2, is $1/2$ of a second, and 1, is $1/1$ or a full second. Going back to our fifth-grade arithmetic, we recall that $1/25$ th of a second is twice as long, or twice as much time as $1/50$ th of a second, and that $1/10$ th is (approximately) twice as long a time as $1/25$ th of a second. Although the numbers may not be exactly double, for all practical photographic purposes, we consider them to be double. Here again we see the same relationship between shutter speeds that we did between stops. Each shutter speed allows light to act on the film twice as long as the next faster speed, and by the same token allows light to act on the film for only half as long as the next slower. Representing it in terms of relative speed, we might explain it this way.

<u>If</u> $1/100$ th of a second lets in light for a time we might call one unit,	<u>then</u> $1/50$ th of a second lets in light for a period of time equal to two, or twice what $1/100$ th of a second did,	<u>and</u> $1/25$ th of a second lets in light for a period of time equal to four, or twice as long as $1/50$ th did.
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Now you can see that the shutter speeds bear the very same relationship to each other that the diaphragm stops did. Half the next faster, twice the next slower. This is a definite help, as we shall soon see.

THE RELATIONSHIP BETWEEN SHUTTER SPEEDS AND DIAPHRAGM STOPS

Right now, I can hear some of my readers griping. They say "This thing was supposed to be easy to understand, but all that I have seen is some long-haired abstract figuring. How is that going to help me take better pictures?" "Well," I might answer, "exposure is one of the most important technical details of picture taking. You can't understand exposure until you savvy the shutter speeds and diaphragm controls which control it." You can't learn how to change from one shutter speed to another (to stop a moving object, for instance) unless you understand what happens when you do it. Nor can you intelligently change from one film to another, or use a filter unless you know how the diaphragm and shutter combinations affect such changes. So, let's go on with a little more theory.

Let's assume that you want a picture of a field of grain. From a meter reading, an exposure chart, or just plain experience, you know that on a sunny day you need an exposure of $1/50$ th of a second at $f 16$ for this subject, with the film you ordinarily use. Just as you look through the finder on your camera, a combine starts into the field not too far away from you. This will improve your picture, so you want to include it. If the combine is fairly close and moving directly across your picture, $1/50$ th of a second may not be a fast enough shutter speed to stop its motion. If you took the picture at the original $f 16$ and $1/50$ th the combine might be blurred and unrecognizable. So you need a faster shutter speed. $1/100$ th may do it. Now if you set your shutter at $1/100$ th and leave the diaphragm at $f 16$, you have halved the exposure. Now the film will receive only half the light that you know it needs. To get the proper exposure you must open up the diaphragm to $f 11$. Here you have halved the time that you allow the light to act upon the film, but doubled the amount of light that you allow to enter. As far as exposure goes, $f 16$ at $1/50$ th of a second is exactly equal to $f 11$ at $1/100$ th of a second. It would be exactly equal to $f 8$ at $1/200$ th, too. If you have an exposure meter available, you can check this. Set the dial for any given light condition. Then you will find numerous combinations of diaphragm stops and shutter speeds. At first this may seem confusing, but remembering what we have said, you will see that they all add up to the same thing, with regard to exposure, and any set of figures will give you a properly exposed film. A little later on, we will tell you when to use the various combinations, but for the moment, try to understand that they are all equal. Going back to our relative values again, let's prove the equality of the various combinations.

ASSUME THAT: $f 16$ lets in one unit of light
 $f 11$ lets in two units of light
 $f 8$ lets in four units of light

ALSO ASSUME: $1/100$ th of a second lets light in for one unit of time.
 $1/50$ th of a second lets light in for two units of time.
 $1/25$ th of a second lets light in for four units of time.

F O C U S

This is one of the simplest operations in picture making. Perhaps this is why it is so easy to forget. If your focus is off, the contact print may look acceptably sharp, but the enlargement almost surely will not be. That means that it is virtually worthless for the purpose for which your official pictures are taken. A sharp picture is absolutely necessary, so don't forget to focus.

There are two types of folding hand cameras. On one you merely open the front, and the lens springs into place. On others you open the front, and then slide the lens out to the stop. If yours is the latter type, be sure that you slide the lens out to the stop every time. If you don't hit the stops, you will be sure to have an out-of-focus picture.

Depth of field is an interesting little help in photography. Here's how it works. When you focus your camera on an object, say 25 ft. away from the camera, only objects in the picture which are 25 ft. away from you will be absolutely dead sharp. But there are other objects, somewhat nearer than 25 ft., and a good deal farther away than 25 ft. which will appear sharp. These we call "acceptably sharp." The distance between the nearest object that is acceptably sharp, and the farthest object that is acceptably sharp is called "Depth of Field." We have included charts showing the depth of field, at the end of this chapter. All folding cameras and reflexes using the same film size will have the same depth of field. This depth varies, depending upon the diaphragm stop used, and the distance focussed on. In the case of a $2\frac{1}{2} \times 3\frac{1}{4}$ folding camera focussed at 25 ft., using a stop of f 8, everything from 19 ft. to 35 ft. would be sharp. If you left the focus at 25 ft., and stopped your lens down to f 16, everything 16 ft. to 60 ft. would be sharp. If you stopped down to f 32, everything from 12 ft. to infinity, (or as far as you could see) would be acceptably sharp. The smaller stop you use, the greater depth of field you gain. This does not mean that you should try to shoot everything at the smallest possible stop, because you lose certain other advantages, when you stop down too far. It does give you a handy and predictable means of getting the important objects in your picture sharp, where they are both near and far away from your camera. If you wanted an object 5 ft. away to be sharp as well as the background over a hundred feet away, you would refer to the depth of field table, and find that the best that you could do would be to focus on 25 ft. and shoot at f 32. This would give you everything from 12 ft. to infinity. Your 5 ft. object would not be sharp. The only thing to do in this case would be to move back so that your nearest object was at least 12 ft. away, if you wanted to keep them both in focus. If you had an object 25 ft. away, which you wanted sharp, as well as the distant background, reference to the table would tell you that focussing at 50 ft. at f 16 would give you everything from 23 ft. to infinity. The chart is a mighty handy thing to have in your camera case for those occasional difficult shots involving depth of field.

FILM AND FILM SPEEDS

When you first study photography, you find a maze of intricate details. We have explained diaphragm stops, shutter speeds and focus. Now let's consider the different kinds of film, and film speeds. There are many different kinds of films, with many different speeds. There are even several ways of figuring the speed of a film. For simplicity's sake, we shall consider just one set of film speeds. This is the one issued by the Weston Electrical Instrument Co., makers of the well known Weston meter. We have selected this system because it is the one referred to in our Government contracts. Speed of a film, should not be confused with shutter speeds, or the speed of a moving object which we might include in our picture. It means, in reality, film sensitivity. The film speed figures are numbers which are assigned to various films to indicate their relative sensitivity. It doesn't help right at the start, to find that film speed numbers are frequently the same as the most commonly used shutter speeds. But as we said, the two facts have nothing to do with each other. And one good thing about film speeds, differing from diaphragm stops and shutter speeds, is that they do not go backward. A film with a speed of 100 is twice as fast as a film speed of 50, and four times as fast as a film with a speed of 25. These three speeds are all that we will have to concern ourselves with. As we have said, film speeds refer to the relative sensitivity of the film to light. If $f 16$ and $1/50$ th of a second is the proper exposure for a given picture with a speed 100 film, then a speed 50 film which is only half as sensitive as the 100 film needs twice as much exposure. We could get twice as much exposure by opening the diaphragm up one stop, doubling the amount of light, or by slowing the shutter speed, one division, thus doubling the time. Thus if $f 16$ and $1/50$ th is the correct exposure for a film of 100 speed, then either $f 11$ at $1/50$ th or $f 16$ at $1/25$ th would be correct for a 50 speed film. A "25-speed" film would need another stop opening, either $f 8$ at $1/50$ th or $f 11$ at $1/25$ th. You will find it easiest to use one film all the time. Once you get that film set, and know what exposure to use for various pictures, you can use those same exposures for that film every time you shoot a similar picture. If you have been using Verichrome which has a 50 speed, and decide to change to Plus X, or any other film which has a 50 speed, you use exactly the same exposure. However, if you have only a roll of 100 speed available, you will need to close down one stop, or go to the next higher shutter speed. Likewise, if you have only a 25 speed film available, you will need to open up one stop or go to the next slower shutter speed. Most field men use the 50 speed orthochromatic film like Verichrome or Plenachrome. Both are excellent films, and will produce fine pictures. We believe that you will produce better pictures if you use a 50 speed Panchromatic film, such as Eastman's Plus X, or Agfa's Superpan Supreme. The reasons are subtle but the enlargements sometimes show quite a difference. You will find it no harder to use, for the speed is the same as the Verichrome-Plenachrome type film you have probably been using. And if your camera is one of the ones that

will use either wooden or steel spools, get the steel spools.

There is one little misunderstanding that we might clear up. Some people think that the faster a film is, the better it is. They feel that if a 50 speed panchromatic is good, a 100 speed panchromatic should be twice as good. But, like many other things, film manufacture is a compromise. If you choose the advantage of increased film speed, you must sacrifice certain qualities of the slower film which contribute to a clearer picture. This difference in clarity is again even more obvious in enlargements. The medium speed film (50), is the best all around for average picture taking.

There is little to choose between film of different manufacturers, as far as the field man is concerned. Either Ansco or Eastman, both of which are available on the current contract, will be found excellent.

YOUR CAMERA AND ITS MAINTENANCE

Not long ago, on a Southwestern reservation a certain field man asked me to look at his camera. He said that he had put eight straight rolls of film in it, without a single picture "turning out." At first this was good for a laugh, but after a little thought, his waste of film seemed more serious. His shutter was so full of dirt that it stayed open for about a minute whenever he tried to take a picture. Almost all of the cameras now in the field are relatively old. We work under dusty conditions, which are tough on cameras as well as on other equipment. Your camera should go to the factory, or competent repairman for cleaning and adjusting at least every two years, and probably every year. The repairman will inspect it, and tell you, if the repairs are too expensive to be practical. Usually it costs less than \$10.00 for all the repairs a \$30 camera needs. Without this maintenance there can be nothing certain about your picture taking! Bellows get holes in them, shutter speeds slow down, dirt gets into the lens surface, and the rollers which transport the film begin to scratch. The best professional photographer in the world couldn't get good pictures with a camera in bad condition. Your own efforts, plus the cost of film and processing are too much to gamble on an old box in bad repair. Do justice to yourself and the government film you buy. Get your camera in shape now, and send it for maintenance every year or two, at least. Eastman cameras can be repaired by sending them to Kodak at 343 State St., Rochester, New York, c/o Repair Department. Ansco Cameras can be repaired by sending them to the Repair Department of Ansco, Binghamton, New York. Field men in the Southwest will find competent repair facilities, stocked with parts at Camera Projector Service, 319 North 6th Street, Albuquerque, New Mexico. Even if your camera seems to take good pictures, send it for repair every two years. This is merely common sense insurance. And speaking of sending the camera for check-up, here is a tip. Some of the cameras in the field have only the old waist-level viewfinder. When you hold the camera at your beltline and look at your picture, it is extremely difficult to see, all of the things you need to see, to take a picture. When you send your camera in for repair, ask the manufacturer if he can install an eye level finder. It will help your picture taking tremendously.

TAKING CARE OF YOUR CAMERA, IN THE FIELD

There is very little that you have to do to take care of your camera in the field, but that little bit is extremely important.

1. A carrying case is essential. Probably you have one and keep your camera in it all the time that it is not in use.
2. Where you carry the camera in your car is important. The glove compartment is about the worst place you could select. The heat during the summer is very harmful to the camera, to

the film and to your meter, if you have one, On a fairly hot day the glove compartment temperatures may rise to 130°- 140°.

Never keep any sort of photographic equipment in the glove compartment, or on the window sill under the rear window.

Under the seat is probably the coolest spot in the car, but it may be excessively dusty. Some field men slide an old file box under the seat and keep some of this dust away. Others carry them on the seat beside them. You may find that reservation roads loosen the screws on your outfit. Probably the seat beside you is the best place of all.

3. Keeping the camera, especially the lens clean is a vital, yet almost universally neglected part of camera maintenance. If you wear glasses, you know how difficult it is to see through dirty ones. You can take pictures through a filthy lens, but they are never as clear or sharp as those taken with a clean lens. The fault is even more obvious on enlargement. Cleaning a lens is simple and easy, and yet few amateurs do it properly. You need four tools. One is a small two-bit rubber ear syringe, which you can get at any drug store or hospital. The second tool is a small camels hair brush, such as children use for painting. The third thing is a package of lens cleaning tissue, and the fourth, a small bottle of lens cleaning fluid. These last two can be secured by mail, or from any photographic store. The ear syringe is used first. Blow all the loose dirt off the lens surface. Then brush away any particles that are left on the lens, or around the edges of the lens mount. If the lens appears clean, that is all you need to do. The less you have to use the lens tissue and lens

cleaning fluid, the better it is. If finger prints, or other smudges will not blow or dust away, put a drop or two of lens cleaning fluid on the lens, and carefully polish with a lens cleaner. Don't rub hard with your finger right on the tissue. Roll the tissue like a cigarette, and hold it at least $3/4$ of an inch from the end that touches the lens.

Remember that the most important thing is to get all the sand, dirt and abrasive particles off the surface of the lens before you start rubbing it with anything. Lens tissue is advertised as being scratch-proof, but if there is any abrasive matter between the tissue and the lens, scratches will surely result. The front of the lens needs cleaning most often, but every time you change film, inspect the back of the lens. If it needs attention, give it the same routine. Does all this seem like a lot of foolishness? Perhaps, but lenses are a species of optical glass designed for easy grinding and are many times softer than a milk bottle. I can guarantee to put enough scratches on your lens in two cleanings with my necktie and a little dirt to make it completely unuseable, as far as clear, sharp pictures are concerned. If you get out in a dusty spot, without your lens cleaning kit, as we all sometimes do, blow all the dirt off with your breath, and then dust the rest off carefully with a handkerchief. But don't rub or scour. Watch your lens carefully for finger marks. It is very easy when loading to let your hand or finger touch the front of the lens. Perspiration and moisture from the body contains acid which soon etches lines in the lens. Check frequently, especially after loading,

for such marks. If they occur, clean the lens right away. It is also pretty smart to watch the inside of the camera and bellows for dust and dirt when you are loading, and to keep this part of your camera very clean. If you run out of lens tissue, Kleenex is a good substitute. One word of warning. Do not use any liquied for lens cleaning other than commercial lens cleaning fluid. Alcohol, Carbon tet, gasoline and other commonly used cleaning fluids may dissolve the lens cement or attack the black paint used on the inside of the lens mount. If you can't get lens cleaning fluid when you need it, you can use your breath as a substitute. Don't minimize these points. If you have one of the latest post war cameras with a coated lens, don't use your breath. On the older cameras breath wont hurt. You can't take good pictures with a dirty lens and you can ruin a lens with improper cleaning. A clean lens definitely makes better pictures.

ACCESSORIES OR GADGETS???

The Photographic magazines are full of intriguing gadgets, designed to help you in all sorts of ways. Most of them, actually do help, in one circumstance or another, but very few of them will aid the average field man in the sort of picture he ordinarily takes. One that will improve practically every picture is a lens shade. This keeps stray reflections from the sun, sky, and the ground from reaching your lens. You shade your eyes when looking at distant objects -- a shade does this for your lens. Buy one and put it on your camera for every shot, even if the sun is directly at your back. There are a number of good ones available, and you can get any that your photographic dealer or mail order supply house can furnish, which will fit your camera. Eastman's shade, which costs about \$3.25 is as fine as any. This price includes the shade and the adapter ring to fit the lens. Better send the vendor all the figures you find on the lens, when ordering by mail. The only other accessory that you could frequently use is a light yellow filter. In Eastman's line this is designated as K-2. Some filter manufacturers advertise, that with their product, you can paint with light. This is something of a misstatement, for a filter never adds a thing to a picture. It merely subtracts something. In the average outdoor scene, there is usually some sky. If this sky is blue, it will be made darker on the print by the use of the K-2 filter. Clouds will be much stronger and prettier. Without a filter, the blue sky tends to photograph much too light on the finished print. The important thing to remember is that the yellow filter only makes blue colors come out darker. A deep blue sky through a K-2 prints very dark. A lighter blue sky prints lighter. A grey sky is not affected by a filter at all. In fact, on cloudy days, you do better without a filter. One disadvantage of a filter is that shadows photograph darker. Frequently an Indian with a wide brimmed hat shading his face will become absolutely black, when photographed through a K-2 filter. So if the Indian's face is a necessary part of the picture, take the filter off. Old timers used to say, never use a filter unless you know why. In this case, you would use it only when you have a blue sky which we want to darken on the final print. Bald white skies are mighty uninteresting. So when you have a blue sky, and no shadows in which detail is important, the K-2 will almost always help you make a better picture. Don't forget that the K-2 blocks some of the light, and you must open up your lens to compensate for it. With Plus X or Superpan Supreme, you open up one full stop. With Verichrome-Plenachrome type film, you do exactly the same thing, open up one full stop.

M E T E R S

The question of exposure meters, is one that comes up fairly frequently. The photoelectric cell type like the Weston, G.E., Dejur, etc., are excellent aids to serious photography. We would be lost without ours. But we work almost exclusively with critical color film and under many difficult conditions. Actually a meter is harder to learn to use properly, to read and interpret, than a folding camera. Unless you take your photography seriously, we believe you will do better with a simple exposure guide, than with a meter. If you do get a meter, get the photoelectric cell type. The good ones now cost about as much as a good folding camera.

TAKING THE PICTURE

Let's review the steps necessary to take the picture. First you take the camera out of its case, check the lens, and dust it off with your brush or eary syringe, if needed. Then you look at the scene to determine the value of a filter. If it is needed you place it in the lens shade and put it on the camera. If it isn't you simply install the lens shade. Just as you should never take a picture without a lens shade, even more so should you refrain from using a filter without a lens shade, because the reflections on the unshaded filter glass will almost surely degrade your picture. Now you must figure your exposure. Some people always shoot at $1/25$ th of a second shutter speed. This is a recommended procedure in many books and instructions. We have found that very few pictures shot at $1/25$ th with a hand held camera will enlarge sharply. They may make good contact prints, but they won't blow up. So our minimum recommendation for all average work, is at least $1/50$ th of a second. You may find $1/100$ th even better. We are considering camera movement only. Some individuals can hold a camera steadier than others, but $1/50$ th is a recommended minimum; $1/100$ th is better. Once you have decided on the shutter speed, you can estimate the diaphragm stop from tables, such as the kodak snapshot guide. These are readily obtainable and simple to use. If the guide gives you the exposure at a shutter speed different from the one you plan to use, just compute the diaphragm stop change by the method outlined in the chapter on the relationship between stops and shutter speeds. Now consider movement in the scene. If you have no movement in the scene, $1/50$ th of a second should be a safe speed. If you have relatively slow movement, such as a man walking or plowing with horses, not too close to the camera, $1/100$ th should suffice. $1/100$ th will usually stop the slower moving machinery, if it is coming towards or away from the camera. If machinery is moving across the picture from one side to the other, close enough to the camera to be easily recognizeable, $1/200$ th of a second would be better. There are many complex tables, charts and formulae used to figure out just what shutter speed is needed to stop a moving object. We want this to be as simple as possible, so we have reduced it to an absolute minimum. You need a faster shutter speed if the subject is moving fast, or across the picture (from one side to the other) or close to the camera. You can use a slower shutter speed if the object is moving slower, or at an angle into or away from the camera, or is farther away. Remembering these three variables and experimenting with them, will tell you much more than pages of text. There are only three. 1. Angle of travel. 2. Speed of object. 3. Nearness to camera. As you use the faster shutter speeds, you must open up your lens to compensate and allow enough light to act upon the film. You lose depth of field, when you do this, so focussing is more important. One way to do this, is to watch a picture, involving movement, and decide where you think the subject looks best. Mark this spot, and measure it. On the next time around, shoot the picture when the object is in the desired position. If you need extreme depth of field, in the case of an Indian close to the camera looking off at his field, you might find that you needed to stop down to f 32. The exposure might call for $1/10$ th of a second at this stop. A tripod is one way to shoot this picture, but if it isn't handy, you can put the camera on a fence post, box, your car, or other steady object. In this case, trip the shutter carefully, holding the camera steady, so that you won't have a blurred picture that shows camera movement. In fact it is best to steady the camera for any exposure slower than $1/50$ th of a second.

PICTURE INTEREST

For the past few chapters we have talked only about technical details. Some of them may have seemed pretty deep and involved, though good pictures aren't really as hard as all that. Simplifying the problem, it boils down to two things. Technical excellence and picture interest. Picture interest is somewhat difficult to define, for what may interest one person, may not do a thing to another. We can tell you some of the things that make pictures interesting to most people. At the top of the list is good composition. There are dozens of books on the artistic side of composition which are pretty involved for most of us. The composition which means much to the field man can be divided into three parts:

1. Background
2. Elimination of extraneous matter
3. Focus of attention.

Bad background is one of the commonest flaws in pictures submitted to the Central Office. The human eye has the happy faculty of looking at a scene, concentrating on the point of interest and not seeing anything else. The camera has no such happy faculty, and if your background is cluttered up with things which detract from your picture, the camera will faithfully record them. So, look carefully at your background. Make it either neutral, or definitely helpful. Sometimes it is hard to eliminate telephone poles, roads, and similar things, but if you will look for them, you will nearly always find a way to cut them out. A high angle from a roof or your car, may help eliminate many things. A low angle close to the ground may allow you to hide many other undesirable features in a scene. Extraneous details are akin to background faults. The great frequency with which a government car appears in a scene, or a trash pile, or a dog or children, when these are not a part of the picture, testifies to this common failing. Move them out, or choose another angle that eliminates such things, unless they are a definite part or help to the picture you are taking.

The final point in our simplified composition, concerns focus of attention. Don't try to tell two or three things with one picture. Have one point in mind, and concentrate on it. If people appear in your picture have them looking at the center of interest, or doing something natural that contributes to the overall idea. This center of interest should be close enough in the foreground of your scene to allow people who did not take the picture to see clearly and unmistakably what is happening. Be sure that you focus sharply on the center of interest. For pictures that count, eliminate, simplify and concentrate attention.

LIGHTING: Not so long ago, the snapshotter was cautioned to shoot always with the sun at his back. Now that film and cameras have been improved, some believe that they can shoot in any direction they please. Neither is quite correct. If you shoot with the sun directly at your back, (called front lighting), the resulting picture is liable to appear dull and

uninteresting with very little separation between the various objects in your scene. If you shoot with the sun coming directly at the camera, (called backlighting), even tho the sunshade keeps the direct rays of light from hitting the lens, everything in your foreground will appear black and heavily shaded. Unless you have a reflector or flashgun, better leave the back lighting to the arty. It seldom makes a good picture of the sort needed by the Office. One exception is a field of grain or similar picture where backlighting adds translucence and beauty to the scene. Don't trust to luck on backlighting - be sure it adds to your picture. Sidelighting with the sun coming someplace between your back and side brings out texture. Look at an object that is sidelit. The sun throws a highlight on one side and a shadow on the other. The object appears to have greater depth. It is probably the best all around working light in photography. It is pretty safe from another angle too, the elimination of the shadow of the photographer across the foreground of the scene. No one has to tell you that that is strictly off the cob, in a number three size can.

MAKING YOUR PICTURES TELL A STORY: Very few field men attempt to tell a story in their pictures. A typical example is a shot of an Indian standing beside a tractor, grinning at the camera. This sort of thing is usually captioned, "Joe G. Juan, XXX Indian standing beside the new tractor which he secured on loan agreement from the extension division XXX agency." A little later on in the year this same extension man will send in a print which shows a field of grain with his hat thrown down in the foreground. This classic will be titled - "Wheatfield of Joe C. Juan XXX Indian of XXX reservation grown with tractor secured on loan agreement, secured by extension division XXX agency. (See shot of Joe C. and his tractor sent in a while back.) (Note hat in foreground for size of grain)". This sort of thing has been done a good deal in the past. But that doesn't make it good. Beside a lack of understanding of photography and good reporting, this shows a lack of planning. Good pictures, like good farming, take thought and effort. A series of pictures carrying this story through would do the job better and effectively. Here is a suggestion as to how the story might be told. The first picture shows an Indian plowing with a team. The Indian is fairly close to the camera so that we can fairly easily recognize him. He is intent upon his plowing. The caption would identify him as Joe C. Juan of XXX reservation, who operates a farm of a certain size, with a certain yield, and a certain income with horse drawn equipment. The next shot might show in a longer view, the same Indian plowing, but would mainly indicate that he operates a relatively small farm with his horse drawn equipment. The next shot might show the Indian with his team or plow evident, talking to the extension agent. Then a shot of Joe C. Juan, inspecting, or greasing his new tractor, or hooking up a plow to it. A shot of the Indian using the machine could be taken next, with a final shot of a larger field of grain raised with the motorized equipment. The Extension agent and the Indian might be in the foreground of this last picture discussing the crop. Elementary? Perhaps, but it does tell a little story. The same idea could be developed farther and better. The main thing to remember, however, is to retain the main features of the narrative form. Start someplace, do something and show results. It takes planning, and a little more time, but

in the end you have something to show for your efforts. This does not mean that a complete story absolutely can not be told with one picture. But it seldom is. A series, intelligently thought out and photographed, will get a real job done. Snapshots will not.

If you should come on the pay-off or cream shot of a series you had not contemplated, you might be able to take it when it presents itself, and later build up the first part of the story which apparently precedes the final shot. This is frequently done professionally and can be just as effective as shooting the set in chronological order. Remember to have the people in your pictures doing something natural. No grinning at the camera, none of the "I'm having my picture taken" sort of stuff. No government cars on the sideline; no out houses to detract attention from your point of action, (unless, of course, the out house is the point of your story.) You will, in this way, have a real, purposeful, story telling set of pictures. Watch Life, Look and other picture magazines to see how the big league boys use these tricks with telling effect. A little analysis of what went to make up one of their stories will give you many ideas which you can use. In a scene the whole problem is complex. In another sense it is relatively simple. Technical excellence, picture interest. Together they will help you tell your story, and result in pictures that the Indian Office can use. They will help you develop skill in a fascinating hobby, and definitely advance your field of work.

YOUR NEW CAMERA

Many cameras now in the field are worn out and need replacement. If yours falls into this category, you are undoubtedly dreaming of a good year to come when cameras will be available, and you can squeeze one out of your budget. Here are some of the things you should consider, when you start figuring out the requisition. First of all, we strongly advise against the miniatures which use 35 mm film, and the sizes which split 127 film into 16 pictures. Yes, I know that some people take good pictures with their miniatures, and I know too, just how handy they are to carry and use. I own one and it is swell for color. But miniatures are sheer devils to make good black and white enlargements for reproduction. You have to be an expert, in constant practice and good form, to do it. Color reproduction is so costly right now that it has little importance to the Indian Service.

If you are just an ordinary photographer, who wants pictures of his work, for reports, the folding cameras made by Eastman and Ansco with f 6.3 lenses and 1/100th or 1/200th shutters will be quite adequate. If you are a little more deeply interested, the sort of guy who will order and read some of the books mentioned in the bibliography, because photography is an interesting hobby, the folding camera with an f 4.5 lens and a 1/400th shutter will be worth the added expense. It will give your work much greater flexibility. If such cameras are available with built in synchronizing shutters, you may find flash photography worth your while. It adds greatly to the possible scope of your work. If your project has enough money, the $2\frac{1}{2} \times 2\frac{1}{4}$ reflexes now being offered by several manufacturers may prove a "best buy". There is something about seeing the picture right side up in a ground glass, which greatly aids composition. Many people find it a good deal easier to take a fine picture with a reflex. It is easier to compose the picture, easier to see and eliminate extraneous details which so frequently slip into pictures taken with other cameras. The film size is a little small, and you will have to take a little extra care to send your film to a good finisher, but once you get started, that isn't hard. Flash work too, is easier with the reflexes, than the folding cameras.

Film size:

Film sizes are pretty well standardized now. The $2\frac{1}{2} \times 3\frac{1}{2}$ is an excellent choice for the folding camera. The $2\frac{1}{2} \times 4\frac{1}{4}$ is a much less desirable size because so few picture chances fit this proportion. Usually much film space is wasted with this size film. The old post card size 122, $3\frac{1}{2} \times 5\frac{1}{2}$ is still a nice size film, though the cameras are somewhat bulky. The $2\frac{1}{2} \times 2\frac{1}{4}$ negative of the reflex causes a little waste in cropping, but is necessary because of the difficulty involved in operating the camera sideways.

BIBLIOGRAPHY

Some people learn photography through formal instruction, while others learn through association with skilled workers. Most field men have to gain a great deal of their knowledge from books. There are many books on photography available, from 10 cent pamphlets up to fifteen dollar texts. Some of them are very good. A great many more are very poor. We are going to err on the side of oversimplification by recommending just two books. The first concerns the technique of photography. "THE AMATEUR PHOTOGRAPHERS HANDBOOK"; by Collins and Sussman published by the Thomas Y. Crowell Co., (1941) of New York at about \$3.25. If the average professional knew all the things included in this book, he would take much better pictures. It is written for the amateur, in fascinating style, and is as complete and comprehensive a coverage as you would want. For accuracy, for interest, for a balanced coverage of the subject, we think this one book is absolutely tops. By all means, get it and read it first, if you want to improve your photography. It is excellent.

The other book we recommend, concerns the picture story angle. It is called "THE TECHNIQUE OF THE PICTURE STORY" by Mich and Everman, published by McGraw Hill (1945) of New York. These two men are important staff members for Look. They have written the first book we have seen on the subject, and for interest and definite help this too, rates at the top. The tariff is \$3.50, but like our other recommendation, it is worth it. Compared to some cheaper books, these two might be classed as real steals. You will enjoy them both if you like photography at all.

FINISHING

Just as with photographic publications, some good, others awful, so is the work of photo finishers. The average drug store job has improved in recent years, but still leaves a great deal to be desired. Some concerns dump untold rolls of film into the "crock of soup", pull them out sometime later, when they think of it, and have nothing else to do. The film still makes pictures, of course, but compared with proper processing the results are appallingly bad. If you are going to take any pains at all with your pictures, you should take the same pains to see that the film gets a fair shake in the processing. It is hard to say whether you are now getting good processing, but if you have any reason to doubt it, try sending a roll to Earl V. Lewis, 213 West 11th Street, Los Angeles, 15 California. Honestly now, this concern is not a friend or relative. They are a large commercial finishing firm, who for years have held a contract with the Irrigation District Office of the Indian Service. It was mandatory only for that office and has since expired. When I was attached to that office and ordered to send all finishing work to Lewis, I put up a howl that was pretty loud, because I had a very good and very reasonable finisher working on film in Albuquerque. Before I had sent Lewis the second order, I wished I could have eaten my letters of complaint. Their work was excellent, and they were very fast. The contract used to call for perfect work, or else. In six years I never knew of their having to remake a single print, nor spoiling a single picture in their plant. Their prices are listed at the end of this chapter. Just remember - play fair with them. Send a Purchase Order with every roll and do everything you can to see that they get paid promptly. They prepay the return postage and you will find their work unusually good.

Film size	Unit	Developing cut film, rolls, packs	Contact prints each
1-5/8 x 2 1/4	roll	.08	.03
2 1/4 x 3 1/4	roll	.08	.04
2 1/2 x 4 1/2	roll	.08	.05
3 1/2 x 3 1/2	roll	.12	.06
3 1/2 x 4 1/2	roll	.12	.06
3 1/4 x 5 1/2	roll	.12	.06
2 1/4 x 3 1/4	1 doz. cut film or 1 pack	.20	.05
3 1/2 x 4 1/2	" "	.28	.06
4 x 5	" "	.32	.06
5 x 7	" "	.60	.12

C O N C L U S I O N

I have tried to make this little pamphlet as simple and short as possible and still give you an understanding of some of the more important fundamentals of photography. It was fun writing it, and I hope you have enjoyed reading it. We want to see you get better pictures, and to see those pictures published. If you have any questions about film, cameras or photographic problems of any kind I would be glad to try to answer them.

Address:

Educational Film Lab.
c/o U. S. Indian School
Santa Fe, New Mexico.

F. C. Clark, Jr.
Motion Picture Producer.