

Instructions  
For The Use  
of the  
Graf Variable  
Anastigmat



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**Graf Optical Co.**

HOW TO BE HAPPY  
WITH THE  
GRAF VARIABLE  
ANASTIGMAT

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ALONG COMES  
THE  
CINE VARIABLE

BY BERT GLENNON

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SUGGESTIONS  
ON  
SOFT NEGATIVE  
DEVELOPMENT

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GRAF OPTICAL CO.



## Instructions for the Use of the Variable

First, note that the front mount of the Variable revolves. The movement of this adjustable mount controls the image of the Variable,—making it an Anastigmat, or making it a soft lens of any desired degree of softness. The turning of this mount to the LEFT, and entirely OUT, makes the lens an Anastigmat. Turning this mount to the RIGHT, and IN, makes the Variable soft. Note that it has no fixed positions, or adjustments, and that movement can be stopped in whatever positions it gives the desired amount of softness.

As soon as this moving mount is turned in, even though only a trifle, the introduction of softness begins. As the mount is turned in, the softness gradually increases. At the same time, the lens grows longer, and, since aperture remains the same, it also becomes slower in speed. It is due to this change in focal length that the Variable must be focussed *after* each change of the adjustment, no matter how slight. All sizes of the Variable follow this same law, proportionately. The 14-16 in., Series A, Variable, as an example, follows:

- |         |        |   |
|---------|--------|---|
| 14 in.  | F:3.8  | Ultra Speed Anastigmat, (Children, Group, Speed). |
| 14¼ in. | F:3.9  | Soft Anastigmat, (Children, Small Group).         |
| 14½ in. | F:4.   | Very Soft Anastigmat, (Full Length, Small Group). |
| 14¾ in. | F:4.1  | Very Slightly Soft Lens, (Full Length and ¾).     |
| 15 in.  | F:4.15 | Slightly Soft Lens, (¾ and Bust).                 |
| 15¼ in. | F:4.2  | Medium Soft Lens, (Bust and Medium Close Head).   |
| 15½ in. | F:4.3  | Soft Lens, (Bust and Medium).                     |
| 15¾ in. | F:4.4  | Very Soft Lens, (Large Close-up Head).            |
| 16 in.  | F:4.5  | Extreme Soft Lens, (Very Large Close-up Head).    |

Thus, the above Variable is 14 in. as an F:3.8 Anastigmat. It is 16 in. as an F:4.5 lens at the Extreme Soft position. The 14-16 in. Series B, Variable would be 14 in. as an F:4.5 Anastigmat and 16 in. F:5.6 in full soft position. Here it would be well to repeat that the Variable has no fixed positions. The above positions are taken arbitrarily. One Variable lens should fairly be considered as being more than all of the above lenses in the same instrument, since the intermediate positions are infinitesimal.

Subjects mentioned in parentheses, are what might be considered as an average when the lens is used at each of these positions with wide-open diaphragm. The Variable thus allows for the correct degree of softness, at full aperture, for all varying sizes of images. More or less softness can be used, according to the individual tastes of the operator—more softness tending to eliminate more retouching.

Referring, again, to the above example,—note that it considers only the full aperture of the lens in the various mentioned adjustments. The Variable is subject to the usual diaphragm in all its positions. It can be set at the full soft position and the softness entirely controlled by diaphragming at that point. More remarkable, and most unusual, however, the soft adjustment and the diaphragm can be coordinated to produce myriads of different images, each with varying depth, speed and degree of softness or definition. If the Variable be adjusted to a given softness, at full aperture, by means of the adjustable front mount, and if the lens be set at full softness, and diaphragmed to this same given softness, there is a difference in image. The first has the speed for portraiture; the second method the depth for landscape. As an example of this: The Variable, at full aperture in the 15 in. position, has the same degree of softness as it has at the 15½ in. position, when stopped to about F:5.6, or at the 16 in. position, when stopped to about F:6.3. This may be made to occur in any and all positions of the Variable—same softness with varying depths and speeds. To hold any given degree of softness, the softness would first be increased by means of front adjustment and then, by means of diaphragm, sharpened to the original



softness. The reverse, by decreasing the softness by adjustment and increasing the aperture. Thus, the Variable will give the same softness, in myriads of ways, beyond giving every degree of softness between the extremes of the adjustment.

## Use as an Anastigmat

As an Anastigmat, the Variable is just like any other—in that it is simple to focus and it is subject to the usual diaphragm for the increase in depth and definition. However, the Variable, being a maximum speed F:3.8 Anastigmat, is subject to several little tricks which enable it to be most successfully used as a Group Lens, a Copying Lens, a View Lens, etc. Where finer detail is desired, or a larger plate, as in group, copying, etc., it is best to block off the marginal rays of the Variable thus decreasing the maximum speed of the lens and eliminating the more difficult of control rays. Smaller front apertures can be cut into black discs of paper which will fit into the front hood of the lens and against the front surface of the front element. An F:6.3 front aperture would be cut to be of same size as diaphragm, as it appears to be through front combination, when set at the F:6.3 marking in the sharp series of diaphragm indications. Likewise an F:8 front aperture when the F:8 aperture is viewed through the front combination of lens. The F:6.3 front aperture placed in front of the lens makes the Variable a maximum speed F:6.3 Anastigmat. Iris diaphragm, in this case, would be used at F:6.3, or smaller, just as if an F:6.3 Anastigmat were being used—in group work and the like. Where ultra fine detail is required, as in fine copy work, an F:8 front aperture could be used. As an F:8 maximum speed Anastigmat, the Variable very closely approximates the image of a process lens.

When using smaller front apertures on the Variable, it is best to turn the adjustment mount approximately one-eighth of the total adjustment IN from the extreme sharp end of adjustment. This increases definition and covering power of the lens. Examination of flat news-print on wall and covering entire ground-glass, will show the best position of the front

adjustment when using smaller front aperture. If the user of a Variable anticipates considerable use of the lens in this way, it would be well to find this position as accurately as possible and mark the mount so that it can be turned to this point without preliminary examination.

## Soft Adjustments of the Variable

As a soft lens, in any of its positions, the Variable is the easiest of all to use since it has no chemical focus. The image that is seen on the ground-glass is the same that will appear on the negative. The focussing of a soft lens is easy for some photographers and difficult for others. Perfect focussing of a soft lens demands careful examination of the ground-glass, good eye-sight, and the formation of correct habits. If eye-sight is bad, failures will be many—correctly fitted eye-glasses would be the only remedy.

In any of the soft positions of the Variable, it should be focused so that the underlying definition is at its very best, no matter how soft, or how sharp, the lens may be adjusted. The "Underlying Definition" is important, and, it is necessary that this definition be seen in spite of a haze which seems to envelop it. This haze, by the way, gives the Variable its peerless soft image-quality—a softness well described by the French "Envelope," and which beautifies what seems to be a greatly deepened Anastigmat image. This haze might be described, in effect, as breaking down the minute detail into mass, but, without loss of structure or drawing, and with great increase in depth.

## Focussing Landscapes, Still Life, Etc.

For landscapes, still life, etc., focus for parts in shadow to appear at their darkest, providing, of course, that these parts are in the principle plane. By focussing as above, the tendency to eliminate detail in the shadows, or eyes, is safeguarded. The



snap of the negative, at these places, will be an improvement over the hazy effect so common in many cases and due to incorrect focus.

## Focussing Portraits

For portraits, especially large heads, focus on the eyes until they appear the darkest. Do this regardless of the color of the eyes or setting of lens for sharp or soft image.

## General Suggestions

If, in the first test negatives made with the Variable, you do not get the best soft image-quality that you have ever been able to get, something is wrong with the focussing. It is possible that the lens has been focussed by contrast, due to poor eye-sight, or failure to understand the Variable image. When focussed in this way, the image on the ground-glass is more brilliant (more black and white), but the underlying definition is gone. Small detail is blurred rather than veiled. In this case, it will be found that the fine planes of image-quality lie between subject and lens—front focussed—too much bellows extension. If trouble arises, when the Variable is used on soft adjustments, that is, if you are not happy over the results that you are getting, it might be well to experiment and check up. Use as a subject, both for practice focussing, and for negatives, a large wall-calendar, large news-print, or the like, at an angle of about 45 degrees, and close up. This will more readily show the fine definition, underlying the haze, and it will show your best image plane on the negative. Examination of the first negative, check-up with ground-glass (which should have remained in same position), refocussing and another negative should correct the error. The Variable, with proper treatment, will give the finest soft image-quality of any lens that has ever been made and it is worth, in a pinch, many, many test negatives.

Even the beginner should have no trouble with the Variable. In case he should, the above sugges-

tions, and the exposure of a dozen test plates, with patient and careful data, will help him to attain a greater photographic happiness than he has ever before known. Where test and experimental plates are made, it would be well to expose, develop, and possibly print, before the next exposure is made. Take for granted, no matter what happens, that the Variable is tried and proven. Since they are adjusted, even at the soft adjustments, exactly as are Anastigmats adjusted in manufacture, they do not vary in image-quality. Therefore, no matter how weird may be your first results, do not blame the Variable. The lens is entirely O. K. Look for errors in focussing. Remember that one need make no allowance for chemical focus. Let the ground-glass be your guide.

If necessary, until you become accustomed to the use of a soft lens, use a magnifier to find the fine underlying definition. Practice with this magnifier on fine news-print—then you will quickly see what is meant by fine underlying definition. The print may seem a bit more gray, than at some other point where it might be focussed, but the outline of the small letters will be perfect underneath this grayness.

## Enlarging—Sharp

The Variable, as an Anastigmat, is splendid for sharp enlarging. Where an F:6.3 lens, or a Process Lens would normally be used, the Variable can be treated with the small front aperture, so as to have the same advantage as, to elimination of marginal rays.

## Enlarging—Soft

As a soft lens, the Variable is the finest soft enlarging lens that has ever been produced. Here, again, the results that are attained depend entirely on the focussing. Here, likewise, the lens must be focussed for the finest possible definition at a given adjustment of the lens, and despite the fact that another adjustment would give more contrast.



In the case of soft enlarging, instead of the whites running into the blacks, as in negative making, the blacks tend to run into the whites. Therefore, the Variable should be focussed so that this phenomenon does not occur, and, it will be found that the position which eliminates this, and the position which shows finest underlying definition, coincide. One merely checks the other.

## How to Learn to Know Your Variable

For bust pictures, try the Variable about one-third of its entire adjustment from the full soft end, at both full aperture and stopped to about F:5.6. These negatives will be a general guide as to which way you might prefer to work—somewhat softer, to eliminate more retouching, or somewhat sharper, if your customers prefer. On a medium sized head, the Variable can be adjusted so that the image seems sharp, to the average purchaser of portraits, but still, with careful examination, a sharp line could not be found. The position for this would be about the middle point of adjustment and stopped to about F:5.6. It would vary with different size images, but, no matter what size the image, this happy point can be found in the Variable, and, though the customer is entirely satisfied that the portrait is sharp enough, you have the advantage of a great saving in retouching, of greater depth, and, most important, the advantage of a much more pleasing roundness and general character than could possibly be made with an Anastigmat. Quite naturally, the same degree of softness could be had at a sharper adjustment of the Variable and with larger diaphragm aperture, but, in this case, the depth would not be so great and the portrait not quite so pleasing. There is almost no limit to the possibilities of the Variable in this speed, depth and degree of softness aspect.

If the Variable be divided into ten equally separated adjustments, and three negatives made at each one of these adjustments, one at full aperture, one at F:5.6 and one at F:6.3, it will be found that each

negative is different. A test of this nature should not be attempted until one is familiar with the soft phases of the Variable—nor should it be attempted without the aid of a magnifier. This, in order that little errors in focussing might not break up the perfect gradations. If, to the Professional Photographer, to the Cinematographer it is worth while to beautify the work by which he earns his living, then, it is worth while to make this test. It is not necessary. It would take much time, patience and plates. But it would help him to master the Variable—it would help him to see possibilities in photography which have never existed before the advent of the Variable. It would help him to take advantage of the first nearly plastic photo-optical masterpiece that has ever been available. A test of this nature could be made on fewer plates by dividing the adjustment into eight, six, or even fewer divisions. This would depend on the individual's desire to master the most helpful of all lenses.

## Landscape Pictorial Work

For the landscape Pictorialist, we would suggest a first negative at full soft adjustment, stopped to F:6.3. Possibly more softness (larger aperture), for contact prints; possibly sharper adjustment, or smaller stop, where negatives are to be enlarged. At any rate, the full soft position, at F:6.3, would be a good place to start.

## Color Photography

To the best of our information, the Variable, in soft positions, is the only soft lens which is successfully doing three-color separation work and color photography. For this work, our test suggestion would be to use a large and colored wall calendar at an angle of 45 degrees for first tests. One very ingenious test, inspected by the writer, was made of a row of Prince Albert, Tuxedo and other highly colored tobacco cans and placed at an angle to the lens. High colors and well defined black print made an excellent subject for test.



## Use of Single Combinations

Single combinations of the Variable can be used at small apertures, F:22 and smaller. The front combination has exceptional focal length range controlled by the adjustment between the two front elements.

## Diaphragm Indications

A few words concerning the Diaphragm Ring indications will not go amiss. They have confused some and may confuse others. Since the focal length of the Variable changes, the speed also changes. The full aperture of the lens therefore changes in value. One series of markings could then only cover either one extreme or the other, or an average of the two. The Variable is engraved to give correct apertures at both Extreme Sharp and at Extreme Soft. When the diaphragm is fully open you will note that one barrel indicator points to "F:3.8 Sharp," and the other indicator points to "F:4.5 Soft." The F:3.8 indicator and indications are used only when the lens is in the sharp adjustments. The F:4.5 indicator and indications when the adjustment is in the soft half of the lens.

## Indications on Adjusting Mount

All markings on the adjustable mount are entirely arbitrary. The Variable is Anastigmat when this mount is turned out, to the left, as far as it will go. It is Full Soft, as soft as it can be made, when this mount is turned in as far as it will go. The indications on this mount are merely to help the operator to turn the lens to certain favorite positions. He would remember that he liked the lens, for a given subject, say, three-quarters of a turn, or one and a quarter turn, or whatever it might be, from the full soft position. These indications would help him to do it accurately without the necessity of marring or scratching the surface of the mounts.

## Attaching Flange

When mounting the Variable, it would be well to mark top of front board "TOP." Have flange screwed snugly to lens, and mark flange "TOP" where indications will be in the most easily seen positions. If flange is placed on front-board without first determining best positions, the indications are just as apt as not to be on underside of the barrel when it is turned snugly to flange. Indications can be made to appear wherever they are most handy. Find the correct position before attaching flange.

## Care of the Variable

You will learn to love the Variable. Take good care of it. Keep it clean. When dusty, first dust surface of glass carefully with camel hair brush. Then breathe on surface and wipe carefully dry with a CLEAN, soft, oft-laundered old handkerchief. If merely breathing on surface does not suffice, use just a bit of Ivory soap and water. *Only in an emergency* should alcohol be used. Never an acid of any kind. No matter what might be used to moisten the surface, wipe it dry immediately. When one of your unknowing friends, or helpers, finger-marks the surface of the glass, remove it IMMEDIATELY. The exudations of the pores contain acids and salts, and if finger marks are allowed to remain on the glass they will rapidly oxidize it.

Remember that it is important that only the two outside glass surfaces of the lens be cleaned. Why clean the inside surfaces, merely for the pleasure of doing it, chancing more than are necessary, scratches, imperfect reassembly, possibly wrong assembly and even breakage? However, sometimes, in emergencies, it is necessary that the inside surfaces be cleaned, not because of dirt, but because of condensation due to changing temperatures, etc. Fortunately this is inapt to occur. If it does, be systematic and careful. Clean the back combination first. It turns to the left and out. When removed,





# GRAF VARIABLE ANASTIGMATS.

## Series B.

No.	Focal Length In.		PLATES			DATA					Price
	As F:4.5 Anastigmat	As F:5.6 Full Soft Lens	Plate for Good Perspective	Normal Plate	Emergency Plate	Flange Diameter	Flange Thread Diameter	Total Length	Length Flange to Front	Weight Pounds	
71	5 $\frac{1}{2}$	6 $\frac{1}{2}$	2 $\frac{1}{4}$ x 3 $\frac{1}{4}$	2 $\frac{1}{2}$ x 4 $\frac{1}{4}$	3 $\frac{1}{4}$ x 4 $\frac{1}{4}$	2 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{1}{2}$	\$ 49.50
72	6 $\frac{1}{2}$	7 $\frac{1}{2}$	2 $\frac{1}{2}$ x 3 $\frac{1}{2}$	3 $\frac{1}{4}$ x 4 $\frac{1}{4}$	4 x 5	2 $\frac{3}{8}$	1 $\frac{1}{4}$	2 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	\$ 57.00
73	7 $\frac{1}{2}$	8 $\frac{1}{2}$	3 $\frac{1}{4}$ x 4 $\frac{1}{4}$	4 x 5	4 x 6	2 $\frac{1}{2}$	2	2 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	\$ 67.50
74	8 $\frac{1}{2}$	9 $\frac{1}{2}$	4 x 5	4 x 6	4 $\frac{1}{2}$ x 6 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	\$ 82.50
74A	9 $\frac{1}{2}$	11	4 x 6	4 $\frac{1}{2}$ x 6 $\frac{1}{2}$	5 x 7	3 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{2}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	\$ 99.00
75	11	12 $\frac{1}{2}$	5 x 7	5 x 8	6 $\frac{1}{2}$ x 8 $\frac{1}{2}$	3 $\frac{1}{8}$	2 $\frac{1}{8}$	3 $\frac{3}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	\$129.00
76	12 $\frac{1}{2}$	14	5 x 8	6 $\frac{1}{2}$ x 8 $\frac{1}{2}$	8 x 10	4 $\frac{1}{8}$	3 $\frac{1}{8}$	3 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	\$165.00
77	14	16	6 $\frac{1}{2}$ x 8 $\frac{1}{2}$	8 x 10	9 x 11	4 $\frac{1}{8}$	3 $\frac{1}{8}$	3 $\frac{1}{4}$	2 $\frac{1}{4}$	3 $\frac{1}{8}$	\$210.00
78	16	18	8 x 10	9 x 11	10 x 12	4 $\frac{1}{4}$	4	4 $\frac{1}{8}$	3	3 $\frac{1}{4}$	\$264.00
79	18	20 $\frac{1}{2}$	9 x 11	10 x 12	11 x 14	5 $\frac{1}{8}$	4 $\frac{1}{8}$	6 $\frac{1}{8}$	3 $\frac{1}{8}$	5 $\frac{1}{2}$	\$330.00
79A	21	24	10 x 12	11 x 14	12 x 15	6 $\frac{1}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	4 $\frac{1}{4}$	8 $\frac{1}{4}$	\$460.00

NOTE: Where flanges are too large for front-board, threaded metal front-boards can be supplied at nominal charge. Long lenses can be used with short bellows cameras by means of extension adapters and front-board extension boxes.



the inside, or flint element can be removed in the same manner. Clean carefully. In replacing element and, later, combination, be sure to turn them snugly to the shoulders. The lens will be out of adjustment if they are not.

The front combination of the Variable is a bad one to clean, internally. The rear surface of the flint is easily cleaned when the entire combination is removed.

Let us hope that it is not necessary to clean the inside surfaces. If it is—First, the small stop screw will have to be removed from the mount into which the adjustable mount turns. This removed, the adjustable mount turns to the left and out. BUT, turn out slowly and mark one thread and the groove in which it is moving. This is important. The lead thread of the Variable, for quick movement of the adjustable mount, is a double thread. Two distinct sets of threads move in two distinct sets of grooves. If after the elements are cleaned, this mount is replaced simply with the desire to get it right, you have just a fifty-fifty chance of getting it right. Therefore, mark it before the threads are removed entirely from groove. Then there will be no trouble. In case of accident, or failure to find markings—the right set will turn more easily than the wrong. Turn out and replace in the correct series. Further, there may be trouble in cleaning the surfaces of the glass. Of necessity, lubricant must be used on the bearing threads. Unless cleaned very carefully, some of this lubricant may be rubbed onto the surface of the glass and it will be most difficult to remove. Should this happen, moisture will not help. Rub lightly and carefully with a perfectly dry section of the CLEAN, soft, old handkerchief, with circular motion, and changing surface of cloth until the grease is entirely removed. It is a mighty mean job. By all means, avoid it if you can. After all is said and done, be entirely satisfied with cleaning the two surfaces of the Variable—only excepting condensation (sweating) on the inside surfaces.

Yes—you will love the Variable. Be gentle with it. If of large size, because the glass is very thick

and heavy, a drop would be fatal. If of small size, the mounts are made as compactly as can be so as to make it possible that they be mounted into cameras where they are most useful. The  $7\frac{1}{2}$ - $8\frac{1}{2}$  in. Variable and the  $8\frac{1}{2}$ - $9\frac{1}{2}$  in. series A and B, have been made especially compact, and light, in order that they may be fitted to the Revolving Back Auto Graflex cameras, allowing front to close. Neither of them would be quite fit for "Duck and Drake." If you buy a lens correctly, you buy as carefully as you would a diamond. If you care for a lens correctly, you care for it as if it were the finest watch in the world. Just be careful with that Variable. Study and learn its disposition. It will return to you untold bounties.

## Why—Long Lenses

Regarding lenses in general—the tendency is now to use the longest lens which conditions will permit. This is due to an ever increasing desire for better pictures. Ideal drawing and perspective would call for a lens with focal length about equal to double the long side of the plate. This would mean a 14-in. lens for 5 x 7 plate—a 20-in. lens for 8 x 10 plate. Possibly somewhat extreme for many photographers. A good perspective and drawing would be given by a lens with focal length equal to a long and short side of the plate—12-in. for 5 x 7—18-in. for 8 x 10. Surely, excepting in emergency cases, such as Home Portraiture, short operating room, bellows limitations, etc., it would be quite unwise to go shorter than this.

Lenses should not be purchased for Portraiture or Pictorial Work, simply because they will cover a plate. Eight-inch, ten-inch, twelve-inch lenses can be made to cover 8 x 10 plate but they are just naturally not considered excepting when operating room or space will not permit the use of longer lenses. Wide-angle Lenses, and Medium-angle Lenses, have their use but not in the studios.

Few realize the ideal conditions of perspective under which motion pictures are made. The negative is  $\frac{3}{4}$  x 1. The normal 2-in. lens gives them the



same perspective as would be given on 8 x 10 plate with a 20-in. lens. On close-ups, the movies use three-inch, and even longer lenses. Here, the three-inch would be equal to the 30-in. lens on 8 x 10 plate. The short lens is a handicap. The long lens is helpful.

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## Along Comes the Cine Variable

*By Bert Glennon*

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The Graf Optical Company has published a very instructive booklet under the title of "How To Be Happy with the Graf Variable." After reading its many pages of valuable information I found everything therein to be true and interesting. I sincerely wish that I had known of this booklet at the time I received my first Graf Optical Company contribution to Motion Picture Photography—the Graf Cine Variable.

This lens was the answer and fulfillment of effort put forth by other Motion Picture Photographers and myself to obtain a sharp picture and yet have the soft, pleasing stereo effect or quality. I had tried many textures of gauze in front of the photographing lenses in use at that time but they did not meet with my desire. The gauze gave my pictures an effect of soft focus but not of soft quality. So along came the Variable, with a beautiful soft quality, and, with it, the sharp picture with a quality I have yet to see EQUALLED.

Three of these lenses were introduced at our studio, one of them being turned over to me for trial. I struggled with this new piece of optical cleverness, and, in a day or so, I saw its possibilities.

Mr. P. F. Pfeil, of the Graf Co., calls it the "Flapperish Variable." I believe he is right. As I understand flappers, they have to be handled right to bring out the gold underneath. One simply must focus the Variable correctly—otherwise this new, different, sharp-soft image-quality will be lost. As above—had I had one of these booklets that is published to instruct the user of the Portrait Variable Lenses, I would have had but little trouble in obtaining comparatively immediate and beautiful results. This brings us right back to the old adage, "WORKMAN, KNOW YOUR TOOLS."

So I endeavor, in the writing of this message, to help, if possible, Motion Picture Photographers give our industry better photography. In this contribution of the Graf Optical Co., in the form of the Cine Variable Lens, we have an opportunity to express that individuality within us that gives rise to our success. Please accept the following as a suggestion that is the result of experience.

The Cine Variable Lens is all that the word variable means in the photographic sense. It is variable in focal length and in the degree of softness of quality. It is a lens that any photographer will use for any type of work, whether it be a very sharp picture or a very soft one. I am still using the first Graf Variable placed at my disposal. This first lens, if I recollect correctly, was first used in the filming of "Java Head," some two years ago. Later it helped me to beautify "The Ten Commandments." And, right now, I have no desire to put it in the case, in reserve, for some special shot. I use it continually. Usually, a new lens, especially a soft lens, is used for a few shots and then held in reserve for future shots of the same type. The Variable, once you know it, will be your standby. This is particularly true if you will study it and its results with various lightings of subjects photographed.

When you receive your Variable, study its workmanship. Note that the front mount revolves. The movement of this adjustable mount controls the image of the Variable, making it an anastigmat, or making it a soft lens of any desired degree of soft-



ness. The Cine Variable, however, differs from the "Still Variable" in that there is no stop at the sharp position of the adjustable mount. In using the Cine Variable, therefore, each user will have to find this anastigmat position and mark it upon his mount. In the case of my lens, I find that the lens is an anastigmat when turned out, from the full soft (entirely in) position exactly one complete turn to the left. I am advised that this would tend to vary in other lenses. As we turn back, to the right, or in, the Variable becomes soft. It has no fixed positions. Movement, in or out, can be stopped in whatever position it gives the desired softness for a given subject. At full aperture, without touching diaphragm adjustment, any degree of softness is possible.

The adjustment which changes the image of the Variable, also changes the focal length of the lens—the focal length increasing as the lens is adjusted for more softness and decreasing as the lens is turned sharper. Due to this changing focal length, the Cine Variable positively must be refocussed after each change of the adjustment, no matter how slight this change may have been. So, find the place that pleases you. After that, it is merely a matter of careful focussing—and then start shooting.

The degree of softness can be controlled in two ways—by setting lens full soft and sharpening by decreasing aperture, or, with full aperture and use of front adjustment only. Both can be coordinated to give you any softness, any depth, any effect that you may desire. I dare say, the Variable will always be ahead of you in that it will have more possibilities that you will uncover, unless you happen to be an extraordinary diligent student of your images. Personally, I have found that the use of full aperture gives consistent backgrounds and an effect of the stereoscopic.

The fact that the Variable has no chemical focus will appeal to you. The image you see on the ground-glass is the same as will appear on the negative. When using the Variable soft, focus for the underlying definition. Focus for the very finest detail. It is essential that this be seen despite the haze

which seems to envelop it. This haze gives the Variable its exquisite soft quality. It seems to break down minute detail without loss of drawing or structure. This new softness idealizes. It gives warmth. It beautifies. Your negative will catch textures, skin values, hair, fur, etc., in a way you previously thought impossible.

Study the image of the Variable. When testing the Variable against other lenses, make split screen tests for comparison of image-qualities. Also, make split screen tests in comparing one focussing method against another. Use a large news-print at an angle of forty-five degrees for both practice focussing and first tests. This will readily show the fine definition underlying the haze on the ground-glass, and, on the negative, will show your best image plane. If to you as a Cinematographer it is worth while to beautify the work by which you earn your living, it is worth while to spend a few hours learning the possibilities in photography which never existed before the advent of the Cine Variable.

Just a word about lighting. I do not mean a word. Lighting is just as important as focussing when using the Variable. By lighting, one can increase the stereoscopic effect and enhance its quality upon the screen. The use of soft, side and back light is an excellent means of handling a subject. A flat light requires microscopic focus and accurate exposure to eliminate a mushy image. Make the following experiment and you will be convinced of the importance of the proper use of light: Select any subject—a vase will do—and light it from side and back. Focus the image at the desired softness and make the exposure. When you see the result on the screen, you will notice that there is just the correct amount of light, needed in front, to pick up the detail of the vase, and there is a great sense of stereoscopic effect or roundness in the resulting picture.

The foregoing does not mean that all subjects should be lighted in this way for best results. I desire only to present an idea of the unlimited possibilities of the Graf Cine Variable Anastigmat.



I have spoken of the lens and its use under artificial light. Now, let us go outside. Try a test shot of, say, a cross lighted lane or avenue, shaded with trees on either side—and see what happens. Or, again, if possible, try it in snow covered country and you will see something that no other lens will do. It will capture the glisten and detail of the snow just as the eye sees it. This lens does something to backgrounds not yet equalled.

I do not write this message to help the Graf Optical Company make sales. I am more selfish than that. My wish is to advance the photography of Motion Pictures to such an extent that the public will demand beautiful and consistently well lighted scenes and well photographed pictures. The Graf Product is one method of helping toward this end.

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## Suggestions for Handling Soft Variable Negatives

For Portraits—Use a good grade of fast portrait negative.

Landscapes—A good grade of non-halation orthonon with three times filter. A plain fast negative without filter is good if there is no great variation in color values.

Still Life—A good grade of double-coated color sensitive plate or film with filter wherever any color exists.

Color Photography—Select plate for accurate color values.

Exposure—Give plenty of time always. When in doubt double the estimated time. Apply this regardless of subject or light conditions, whether portraits, landscape or still life.

Negative Development—You can use your regular developers but would suggest, for good, soft quality, that developer be diluted one to one with water, for same length of development, or with standard developer and development time cut in half.

Following is a suggestion for Pictorialists whether the subject be Portrait, Landscape or Still Life.

Tank Development—20 minutes at 65 degrees. Plates not to be moved. Allow fully twenty minutes without shaking or jarring.

#### SOLUTION A.

Water	-----	11 oz.
Potassium Metabisulphite	-----	50 gr.
Pyro	-----	300 gr.
Metol	-----	30 gr.
Potassium Bromide	-----	10 gr.

#### SOLUTION B.

Water	-----	11 oz.
Sodium Sulphite (Anhydrous)	-----	500 gr.

#### SOLUTION C.

Water	-----	11 oz.
Sodium Carbonate (Anhydrous)	-----	300 gr.

#### WORKING SOLUTION

Water	-----	140 oz.
A	-----	5½ oz.
B	-----	5½ oz.
C	-----	5½ oz.

For soft but snappy results with Portraits and Landscapes, and for use at all times on color sensitive plates, increase the Metol of Solution A to 60 grains.

Working Solution then is:

Water	-----	140 oz.
A	-----	5½ oz.
B	-----	5½ oz.
C	-----	1 oz.



Develop in tank 20 minutes, remove plates and add seven ounces of Solution C. Mix well. Immerse plates for not longer than 30 seconds, wash quickly and fix.

The long immersion with little carbonate allows the developer to soak in and act on the details and shadows without blocking the highlights. The final dash of excess carbonate gives the snap.

**CONTACT PRINTS.** Use any good Portrait Paper with the following soft developer used full strength as given:

Water .....	30 oz.
Metol .....	24 gr.
Hydrochinon .....	22 gr.
Sodium Sulphite (Anhy) .....	165 gr.
Potassium Bromide .....	12 gr.
Sodium Carbonate (Anhy) .....	50 gr.

Exposure should be such that development takes about three minutes at 65 degrees. Use acetic acid stop bath to check development. Use acid fixing and hardening bath per instruction furnished with paper.

A pleasing trick tone can be obtained on most any high-grade portrait paper with Barston Sepia Toner, made by the Barston Co., 39 Walnut St., Cincinnati, Ohio. This toner acts slowly and can be stopped at any point from warm black to full sepia. The trick tone is produced by placing the prints in very dilute acetic acid bath before toning. This causes the toner to form a pale pink stain over the entire print.

We would suggest to Pictorialists who desire to try out the above solutions, that they make five exposures of the same subject. One normal exposure. Second double normal and on up to five times normal exposure. Same 20-minute tank development in each case. Study the printing qualities carefully and select your standard.

# Standard Variable and Super Anastigmat F:4.5 Lenses for Popular Cameras

NOTE: Nos. 69, 79, 79A for best possible perspective on 8 x 10 plate.

- 3¼ x 4¼ R. B. Auto Graflex, Nos. 63, 73, 64, 74, 64A, 74A, 7, 8.  
 4 x 5 R. B. Auto Graflex, Nos. 64, 74, 64A, 74A, 65, 75, 8, 9  
 5 x 7 Home Portrait Graflex, Nos. 65, 75, 64A, 74A, 11.  
 3¼ x 4¼ Speed Graphic Nos. 62, 72, 6.  
 4 x 5 Speed Graphic Nos. 63, 73, 7.  
 5 x 7 Speed Graphic Nos. 64A, 74A, 75, 65, 9, 11.  
 5 x 7 Press & Compact Graflex Nos. 64A, 74A, 9.  
 3¼ x 5½ 3A & Compact Graflex & Graphic, Nos. 63, 73, 7.  
 2½ x 4¼ 1A Graflex No. 71, 5.

## NEW MODELS.

- |         |                             |           |
|---------|-----------------------------|-----------|
| 2¼ x 3¼ | R. B. Graflex Ser. B. ----- | Nos. 71,5 |
| 3¼ x 4¼ | Graflex Ser. B. -----       | Nos. 71,5 |
| 3¼ x 4¼ | R. B. Graflex Ser. B. ----- | Nos. 72,6 |
| 4 x 5   | Graflex Ser. B. -----       | Nos. 72,6 |
| 4 x 5   | R. B. Graflex Ser. B. ----- | Nos. 73,7 |
| 5 x 7   | Graflex Ser. B. -----       | Nos. 74,8 |

## OLD MODELS

- |         |                         |           |
|---------|-------------------------|-----------|
| 2¼ x 3¼ | R. B. Graflex Jr. ----- | Nos. 72,6 |
| 3¼ x 4¼ | Auto Graflex -----      | Nos. 71,5 |
| 3¼ x 4¼ | R. B. Telescopic -----  | Nos. 72,6 |
| 4 x 5   | Auto Graflex -----      | Nos. 72,6 |
| 4 x 5   | R. B. Telescopic -----  | Nos. 74,8 |
| 5 x 7   | Auto Graflex -----      | Nos. 74,8 |