

satisfactorily is the triple, and the focus of No. 1 is too short, and that of No. 2 too long to give the angle required on 11 by 9 plates. The No. 2 triple has an equivalent focus of a fraction over 11 inches, and would give you on 11 by 9 plates an angle of 52° , or a trifle more. This is the nearest to your requirements of any existing lens which we know. If you especially require the results to which you refer, we have no doubt that Mr. Dallmeyer would make a special lens for you of the desired focus. The aplanatic would not, as you have seen, give the angle, and the distortion for engineering subjects would be intolerable.

It is a very difficult thing to popularize the subject to which you refer. When the equivalent focus of the lens is known, it is very easy to any one familiar with mathematics to ascertain the angle included in a given picture. As we stated a few weeks ago, those who have access to a table of tangents may easily make the calculation by measuring the angle formed by the equivalent focus and the base line of the picture, the amount of subject included is twice the tangent of half that angle, as we have before stated. Perhaps the simplest popular method would be to proceed as follows: ascertain the equivalent focus of the lens, either from the optician, or by direct experiment, as we have described on a former occasion. Then measure the horizontal line of the picture; upon this line let fall a perpendicular the length of the equivalent focus. Now, with a protractor measure the resulting angle, which will give, with sufficient accuracy, the amount of subject included. Your calculations as to the angle included by the respective lenses referred to in your letter are correct. The origin of the method of stating the foci of lenses as measured from the back glass originated in the importance of giving some idea as to kind of camera required, and the space necessary between the lens and ground glass. It is a great pity, however, that the equivalent focus is not also stated. The practice is, however, becoming more general.—[Ed.]

THE LIME TONING BATH AND ITS DIFFICULTIES.

DEAR SIR,—I am an unfortunate man; a skeleton hangs in my photographic cupboard, and his name—no bad nomenclature considering his chemical composition—is *lime*. I am an old practitioner and printer, and for years met with such success by the old process of printing that it was with difficulty I could bring myself to adopt the new. No doubt I am looked upon as an old-fashioned fellow with out-of-date ideas when I say that I am prepared to produce from any given good negative a better print in point of tone, depth, and *modelling* than can be got from it by any of the new processes. However, in deference to the spirit of the age, I adopted the new systems, and consoled myself for any deficiency I found with the idea that the prints might possibly be more permanent. I found no difficulty in getting as good effects as other people with the acetate, the carbonate, and the phosphate; in fact I went on conquering, and, as I thought, to conquer; but at last came my check—my Waterloo—and the destroying enemy is the oil-shop product I have named above. Seduced by the hope of getting those "rich blacks" with "warm flesh tints," I began with Ommeganck, then I carefully tried those formulæ given in the News as the "Experiments at Ryde," with your own modification. Last of all I have tried Parkinson's, as given in your last number, but the result in all is the same. The difficulty begins at once, I may truly say, meets me in lime-ine, for no sooner are the prints immersed than free chlorine attacks them and the bleaching process begins. Whether I make the bath with hot or cold water, or add the lime when the solution is milk-warm, according to one of your correspondents, or try it within an hour or a week, (your own modification I tried each day successively for ten days), the result is always the same: of course you know the exact effect, and I need not describe it. Shakespeare in his prescience must have caught a glimpse of "printing difficulties," for who could better describe a "mealy print"?

"And a most instant tetter, bak'd about
Most vile and lazar-like, with loathsome crust,
My wholesome body."

I may mention, that in addition to every conceivable precaution, I have more than once "changed my oil-shop," but all samples of the devouring fiend seem alike. What can I do? like the ancient waggoner stuck in the mud, I invoke the gods—the deities of the photographic press, and make my first appeal to you as the Jupiter Tone-ans of that august body. Will you simply state in your column of answers if I was wrong in anything, except the quality of the lime. In my working out Parkinson's formula, I saturated a small bottle full of water, with chloride of lime, shaking it well for some minutes, this I filtered and saturated it with whiting, and filtered that compound. Of this I took the exact quantity (rather more than $1\frac{1}{2}$ drachms), and added 35 ounces of water with 2 grains of gold—after 24 hours, I tried it, and again in 48 hours, but in both cases the same and the old failure—bleaching and meanness.

Meal, meal, meal,
On every print immersed,
Meal, meal, meal,
The last as well as the first.
It's O! for the process old
That gave me such beautiful tints,
The honest compound of hypo and gold,
That never spoiled my prints.
Meal, meal, meal,
By Ommeganck, Parkinson, Hughes.
Meal, meal, meal,
By every receipt in the News.
An anomaly strange will appear,
If things in this fashion keep,
I shall find that bread is exceedingly dear,
While meal is so very cheap.
Meal, meal, meal,
If I float ten minutes or more,
Meal, meal, meal,
If I only float for four.
Both kinds of *Saxe* and *Rice*,
Both kinds of *Hive* and *Saxe*,
Oh, grant, kind Heaven, a short reprieve
From its venomous, deadly attacks.

—I am, dear sir, yours truly,

CHA-MEAL-ION.

[We are quite familiar with the difficulties our correspondent describes so pathetically. They proceed from excess of free chlorine, which, having such an affinity for silver, and finding it in a finely subdivided state in the print, the most convenient forms for its action, at one attacks it, and turns it into white chloride of silver, producing the lazar-like tetter of meanness. The remedy is to lessen the proportion of chloride of lime, and with a given sample of paper, gold, and lime, arrive by experiment at the proper proportion. Each of these articles vary in exact quality, and hence the variety of result when a constant formula is adhered to. Success is certain if the right method be followed. We have succeeded by pursuing the method we have described, others have succeeded by the respective formulæ for which they stand sponsors. Experiment is troublesome, it may be said. Very good: then there are other methods, giving good, but not quite the same results, which are less troublesome. Our correspondent may try a lime bath with which we have seen no failure by obtaining a bottle of Sutton's calcio-chloride of gold, and diluting it considerably more than is recommended in the directions for use. The old hypo and gold bath gave less trouble, but rarely such pure whites or rich tones as the alkaline bath, and never better than the best results of the latter, with all the greater risk of becoming yellow. If our correspondent will send us a directed envelope, we will forward him a lime-toned print, in which there is no meanness, but a rich black tone—[Ed].

Photographic Notes and Queries.

OLD IRON DEVELOPER v. NEW.

DEAR SIR,—I have with many of your readers been much troubled with fogged and dirty negatives during the last two or three weeks.

This has been the more annoying, as, putting faith in the