



Paper: Select VC, Developer: SE 15 Polychrome  
*Photos: Alfred Särchinger*

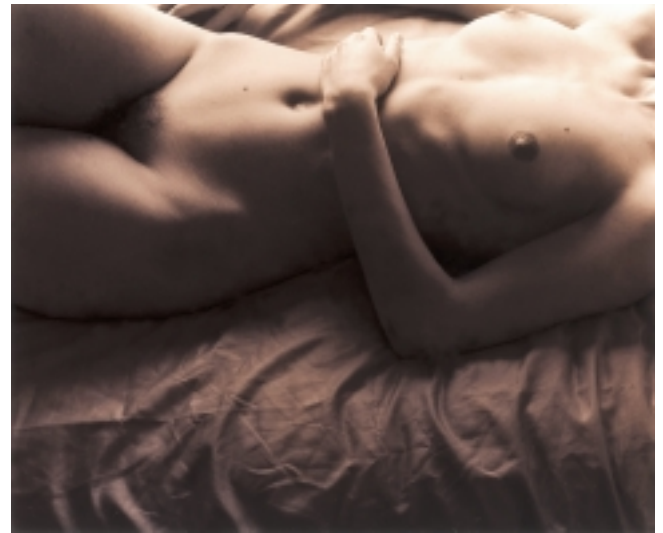
Creative toning techniques

# COLOR FOR BLACK-AND-WHITE

THOSE WHO THINK THAT BLACK AND WHITE ONLY EXISTS OF AN INFINITE BANDWIDTH OF FINE DIFFERENTIATED GREY TONES BETWEEN THE TWO EXTREME ENDS OF THE TONE SCALE WERE THOUGHT OTHERWISE ON THE LAST ISSUE. IN THIS SECOND PART WE ARE TOPPING THAT- IT GETS EVEN MORE COLORED.

## METHODS OF AUTOTONING

development of black-and-white emulsions were already known toward the end of 19th century. Attention should particularly be paid to the basic works, like on many other fields, of Pizzigheli and Eder. In his publication "about toning by autotoning development" of 1929 Professor Miroslav Milbauer from Prague described procedures which even today still lead to usable results. Even at times of our grandfathers one was dependent on suitable emulsions. Developers leading to wonderful results on a definite paper, could turn out to be useless on other emulsions. What the paper choice concerns, today, we can only dream of the possibilities of photographers then. Perhaps who



was lucky to have once a paper example book of Gevaert in hands for example could have a vague idea of the black-and-white heaven.

Unfortunately, enlarging papers without incorporated development accelerators got rare today. Particularly the market leaders seem not to let this nonsense be. That other ways exist prove manufacturers from eastern europe like Foma and Forte as well as the two british companies Kentmere and Fotospeed, at least with some of their products. Since we are just at the topic, I would suggest the award of a "golden tomato". Unchallenged first candidate is the Kodak Company. Letting the incomparable Ektalure die is to other quality conscious photographers and me completely unaudible. Statements about this

decision must been felt unnecessary since, until today, no explanation concerning this disgrace was done to me.

The reason why papers with developer substances or development accelerators are unfit for toning developments lies in the super additive reactions of two or several developer substances which increase both the speed and the diminution capacity of developers. To produce coloured picture tones first a high light quantity at simultaneously delayed picture appearing is needed by only one developer substance in low dosage or low pH value.

The ideal paper for autotoning development has a high chloro silver amount. Pure chloro-silver emulsions are so insensitive that they would be unsalable today.

**Above on the left: Paper Fomafort, developer metol 1+15 with ammonium chloride + potassium carbonate, pH10.10. By alkaline adding the gradation was improved but the before reddish brown tone got green.**

**Above on the right: Paper Select Sepia, developer of SE 5 LITH 1+10; The development was interrupted (after 4 min) before the "Lith effect" could occur. The resulting low shade density is wanted, because it was completely sufficient for the further development, in the second tray of course.**

**Below on the left: Paper Select Sepia, developer of SIENNA (glycine+additive) 1:10 pH 9.10. development time 6 min. Very colorful but weak.**

**Down on the right: Paper Select Sepia, first developer LITH 1:10 4 min stop bath 20 sec, water bath 1 min, second developer SIENNA 1:10 4 min**  
*Photos: Wolfgang Moersch*



Paper Classic Arts Polywarmton, first developer LITH 1:7 with grain additive 3:30 min, second developer SIENNA 1:10 5 min

Photo: Rolf H. Funke

Fortunately emulsifiers still exist which despite all standardizations and marketing considerations make their visions come true and create high-quality papers for a circle of smaller becoming, quality conscious users. But now back to mentioned Professor Milbauer. His recommended prescriptions (see box for self mixing) are with some of the available papers today (see sources of supply), concerning reddish brown picture tones, absolutely usable. With the increasing red tone however the gradation course and shade differentiation get unsatisfactory. The effect of all described prescriptions here is based on the take up of oxidation products from the developer substances onto the silver grain. Particularly with high

dilutions and small quantities of the oxidation inhibitor sodium sulphite, colourful picture tones between yellowish brown and reddish orange can arise.

### Glycine: fine but expensive

The by far most intense colour produces pyrogallol. At least for positive development one should keep the hands off this substance. Pyro is poisonous, thinned working solutions oxidize so quickly that every print looks different, in addition, it is rather expensive for the needed quantities.

Glycin, after tests with various papers is the ideal substance. Even at very strong dilutions glycine solutions are extremely durable and productive. Unfortunately it is more expensive than pyro. Attention has to be paid to use glycine which is only fresh or stabilized with bisulphite. The fresh product is pale yellow till beige at loose, fluffy consistency.

Metol produces less intensive tones than Glycine. It has a reasonable price and in little quantities available at some photo mail-order houses. For first attempts one should concentrate on this substance.

Independent of the used developer substances a common characteristic of the prescriptions given here is the addition of ammonium chloride.

All chlorides delay the development and cause a moving of the picture tone from brown into yellowish to reddish nuances. With high chloride addings the pH value of the developer descends so much that the developing capacity strongly reduces. If a picture is still produced at all, the tone becomes intense but gradation sinks deeply up. Now the pH value could be raised again by alkali addings but especially the use of highly effective ammonia salts produce a dichrotic fog and for sensitive noses the smell of ammonia becomes a torture. At pH values over 10.0 reddish tones turn into greenish (see torso next page on the left).

By renunciation of high chloride quantities similar intense colors can also be produced with strong overexposure (4-8 f/stops) and extreme dilutions. But here too the gradation becomes extremely unsatisfactory. The missing shade densities can be increased with a selenium toning, however, it needs a little exercise for this approach.



If selenium reacts too long all densities are increased and the result is as before -- only "muddy". Now all done for nothing?

### The POLYCHROME TECHNIQUE

Two tray development could save the whole thing. But the conventional method must fail here because at the intense light quantities needed, a strong second developer would in any case (at first or at the second development) blacken the complete sheet within seconds. Well, only a developer working very rich in contrast by slow picture build up has to be considered. Only true Lith-developers fulfill this demand in the ideal way. For everyone, still not knowing the Lithprinting method this whole story will remain unaudible. However, the understanding of the chemical coherences is indispensable for own trials. A short introduction therefore. Positive developers usually contain two or three developing substances, which together multiply the performance of a single component. This is described as Superadditivity. Developers with only a developing substance are very slow or their capacity is low. The hydroquinone developer takes a special position if the normally high sulphite content as oxidation protec-



tion is renounced. This for every development procedure inevitable, oxidation intermediate product, semiquinone, does not like other oxidation products deposit on the already available metallic silver but reduces silver salts and this faster than hydroquinone. Nothing seems to be won at first, once we don't need speed. If we set in front of these semi's a chemical barrier, they need a while to overcome these. The slower hydroquinone softly continues developing in the meantime. As soon as sufficient predeveloped silver germs and sufficient amounts of semiquinone exist the barrier is abruptly

**Paper Fomatone, first developer of LITH 1:5 3 min, second developer of SIENNA 1:12 4:30 min**

The second developer was coordinated to produce greenish shade tones and reddish yellow lights. This is reached by the two enclosed additives. At a following selenium toning, first the shades got dense moving the picture at the same time to a crimson tone. The highlights at first remain untouched but then turn slowly to reddish, followed by magenta tones and lastly get blue. The process of toning can be interrupted when the desired picture tone is reached. This should happen particularly at highly concentrated toning attempts (1:4 to 1:10) abruptly. For this the Print has to be under running water rubbed off on the front and back side with a cotton ball.

*Photos: Uschi Becker*



**Small picture above:**  
By addition of ammonium chloride and slight increase of the pH value through carbonate, shades get green lying like a fog over the shades. The more intensive this tone appears, both density increase and polychromaticity will be more distinctive after a selenium toning.

**Small picture below:**  
Identical with upper picture before toning. Selenium 1:4 1 min

**Large picture on the left:**  
Before toning shades turn green at roughly the same densities. Selenium 1:4 1 min

**Photos: Uschi Becker**

skipped. The result is a rapid increasing blackness of highest opacity starting on the deepest shade always willing, if we would allow, to spread out over the middle tones. Of course we don't do this and we end the action as soon as it has enough progressed for our purposes. For this reason the print must be put quickly into the stop bath without long dripping. Before putting the print into the second developer it needs a short but intensive washing. The reduction of soaked up developing substances in the paper is more important than the elimination of the acid. Interrupter baths stop the development by neutralizing the alkalines. The developer substance remains unimpressed and would be activated, even if for a short time, by the alkaline of the second developer and result in



fog formation. A one minute rinsing off in the shell with running water is completely sufficient, at rocking motion and once water change.

The picture shades are either fully developed or vaguely available, middle tones should be weakly visible by darkroom light. An altogether bright picture would just be right. (See example torso on page 2 above on the right)

The second developer depending on the developing substance and coordination, produces more or less colorful lights and middle tones. If no or just a very weak toning is planned, the gradation must be correct now. If a further toning for example selenium be

required, average tones and shades may not show any high covering, otherwise the print would get much too heavy after the toning. Still subtly differentiated shades would run in. The "right" densities and partial contrasts have to be determined by own trials. (see nude beside the door)

**Per Aspera Ad Astra or Nothing will come of nothing**

Everything described here seems at first sight to be rather complicated and expensive appearances here are unfortunately NOT deceptive! It is consuming and for users without experience in the Lithprinting technique even highly complicated. Feelings of success will nevertheless happen quickly. Negatives seeming to be "unprintable" till now will by using the amazing possibilities of contrast mastering be able to be copied onto the paper.

In the next issue further papers and multiple tonings will be introduced.

*Wolfgang Moersch*



**(Paper Select Sepia, first developer 6 min LITH coordinated sharp (with surplus of A solution) but strongly slowed down with much potassium bromide): A 100 ml: B 70 ml: Water 700 ml: D (KBr 10%) 40 ml. Second developer 6 min, SIENNA 1:5  
Photo: Uschi Becker**

**Developer recipes for self mixing:**

Pyrogallol developer

Water 500ml  
Sodium sulphite 15 g  
Sodium carbonat 12 g  
Pyrogallol 6 g  
Ammonium chloride 50 g  
Potassium bromide 1-2 g  
Dilution 1:1 to 1:20

Set of ready to use developers:

Developer Set  
Moersch SPECIAL EDITION 15  
POLYCHROME  
Contains: SE 5 LITH, SE 14 SIENNA and additives for picture tone control

Metol developer

Water 500ml  
Metol 10 g  
Sodium sulphite 25 g  
Ammonium chloride 25 g  
Potassium bromide 2,5 g  
Dilution 1:1 bis 1:10

Recommended papers:

Formatone  
Select Sepia, Select Shedlight  
Classic Arts Polywarmton  
BerggerPrestige CB Variable  
Forte Polywarmton

Glycine developer

Water 500ml  
Sodium sulphite 1,5 g  
Potassium carbonat 3 g  
Glycine 1 g  
Ammonium chloride 5 g  
Potassium bromide 0,25-0,5 g  
Dilution 1:5 bis 1:50

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