Back to School is the theme for our newsletter this month. Let's go back to photo 101 to remind us how photography works.

We all grew up in households where mom would drag out our silverware, platter, pitcher or whatever else and discover it was tarnished. We had to use chemicals to remove the tarnish and keep the silver shiny. If no one ever told you before, that's the basis of photography. Traditional photography as we know it is not much more than the controlled tarnishing of silver, and what happens to both the silver and the tarnish.

When light strikes film, the silver in the film's emulsion "tarnishes" to the degree it was exposed to light. If no light hits the film, the film remains clear (for negative film). So, if you ever get a roll back from the processing lab that is clear, it was never exposed to light. If it is all black, it was exposed to so much light that all the silver became "tarnished". When normal exposures occur, there are both light and dark areas on the negative.

The chemicals involved in processing the film make the "tarnish" visible, remove the non tarnished silver, and "fix" the "tarnished" silver so in is no longer responsive to light. The negative is now relatively permanent with a life span of many years. The life span is mostly determined by the quality and accuracy of the film's development! This is true of both color and black & white, negative or transparency film.

When the negatives are printed, the same thing happens again, with the final result being a positive image of the original subject. In today's color pictures, the silver salts in the paper have been replaced with more stable color dyes before the end of the process. That's why today's prints last longer with better color than they used to.

Okay, how do engineers know how much silver to build into the film? Not an easy question; or answer. Obviously, there has to be some standard of film exposure (or density of negative) to serve as a baseline. This originated with black and white film emulsions, and therefore, the baseline is a specific shade of gray, where 18% (as measured by reflection) of the possible density is achieved. An old joke in photography is that this dark gray is the color of the noon sky in Rochester, NY on July 4$^{th.}$ If a gray area of the negative is less dense than 18%, that is referred to as overexposed. If another area of the negative is denser than the 18% standard, that area is referred to as underexposed. If the entire negative is 18% gray, yielding an 18% reflective gray print. When this happens, with consistent development, we can discover the emulsion speed (ISO#) of the film. ISO is an abbreviation for **I**nternational **S**tandards **O**rganization. (The ISO standard replaced the ASA rating system, previously used in the U.S.)

If we make a film which when exposed and processed yields a denser negative (everything else being equal), then this film is more light sensitive than the

original film. It would therefore receive a higher ISO rating. The opposite is also true, e.g. a slower film gets a lower ISO.

As we increase ISO ratings in films, we generally find that the clumps of silver (grain) are usually larger than slower films, and we refer to this effect as visual *graininess*. The basic rule of thumb is the lower the ISO rating, the finer the grain - the higher the speed, the coarser.

Assuming the negatives are all the same dimensions, it takes fewer coarse grains (clumps) of silver to fill the area than is true with finer grains. If each grain records some unique detail of the image that the camera transmits, there will be more detail in the slower, fine grained film than its faster counterpart because there are more grains present to see the light. Not only does this affect the sharpness of the picture, but the contrast as well.

Let's define contrast in terms of the number of tones available between white and black. If there are very few visible tones, consider that high contrast; and the greater the number of tones the lower the contrast.

In analysis, slower (higher ISO rating) films tend to offer greater definition with more normal contrast than faster (higher ISO rating) films. Given this truth, why wouldn't we always want to use slower, finer grained, higher definition films for all of our pictures?

Funny you should ask! Reason #1: Slower films require much more exposure. So much so, that in common picture-taking situations, the shutter speed is so slow that holding the camera steady might not be possible. Using a tripod would solve this problem, but who would use one for <u>every</u> picture taken? Also, because these films require more light to record an accurate exposure, flash photography would be limited to just a couple of feet. Photographing moving subjects, or subjects in low light situations would be difficult to do.

Reason #2: since the advent of autofocus SLR cameras, lens have gotten smaller and lighter. This change in lens design causes lower light transmission to the film, making faster films all but a necessity. Larger aperture lenses are still available, but for premium prices (3 – 10 times the price of popular lens prices).

Reason #3: most cameras have smaller aperture lenses that cannot transmit much of the light they receive. This is especially a problem with most of today's compact zoom snapshot cameras. The camera manufacturers don't want you to know how little light these cameras' lenses transmit to the film for fear you won't buy a camera.

Don't be frustrated or give up hope! Almost all recent film research and technology has been on higher speed films. These films today are simply marvelous. Many ISO 400 films today are finer grained and exhibit more normal

contrast than ISO 100 films did a decade ago. Kodak has even published data indicating Royal Gold® 400 film is finer grained than standard Gold® 100. It is amazing how great the quality sometimes is from ISO 800 Max® used in One Time Use Cameras.

Life is sometimes seen as a series of compromises. So is selecting film. Think about the pictures to be taken. Where will they be? What will light them? How much depth of field will be needed? How fast will the action be? What desirable film qualities must be compromised in order to get the all around best photograph? It's a difficult decision. That's why there are so many different films.

Since last month, Olympus has introduced a new digital camera that also uses Polaroid film. Canon has announced a new EOS Elan 7 camera. Pentax has unveiled a new digital camera made with the cooperation of Hewlett Packard. Nikon just announced a $50 instant rebate on their Pronea S Advanced Photo System SLR (It now sells for less than many point 'n shoots.).

For those of you who have never attended any of our photo field trips, we will meet at Madison PhotoPlus Sunday morning September 17, about 8:30and meet our Nikon representative, who will loan us whatever Nikon products we'd like to use during our trip. Normally, these items include amateur and professional cameras, lenses, flashes, etc. We then ride the bus to Tuxedo, NY for the Faire. Once there, we break up into groups with an instructor and "students" for the day. During the 6 hours or so at the Faire, as much or as little instruction is available as desired. At 5:30 we reboard the bus for the trip home. Some film and processing is supplied. During subsequent weeks, there will be a photo contest and many pictures will be displayed on our websites.

The cost for the trip is $40 (+ tax). The only thing not included is lunch (they don't permit food or beverages to brought in – mercenary of them, isn't it?). Signup sheets are available in both stores, and MUST BE DONE IN PERSON! We are limited to the number of seats on the bus; so if you are interested, act soon.