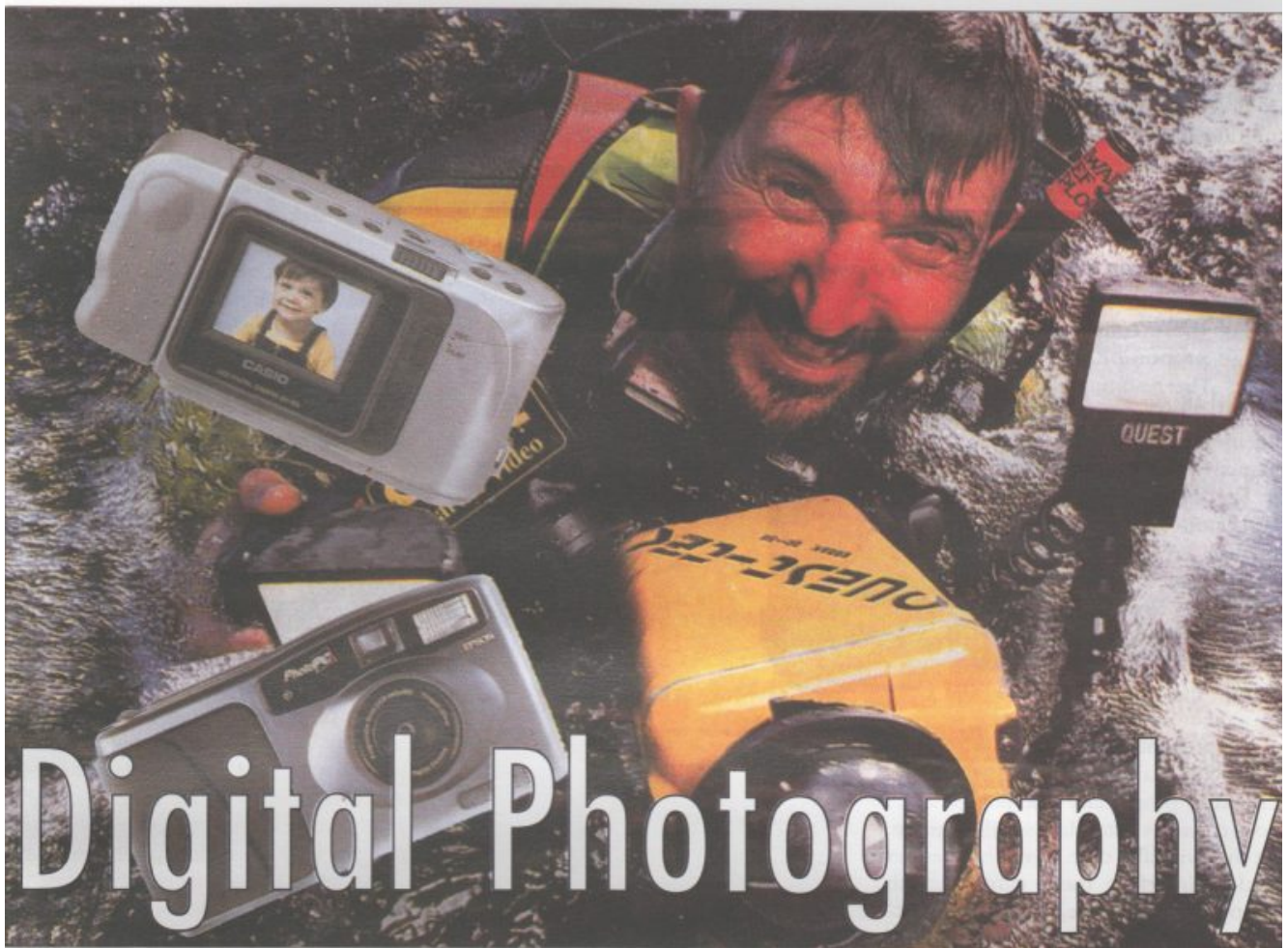


Digital Photography



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The Camera and the Computer Combine PHOTOGRAPHY, EXPLAINS THE 1983 edition of the Chamber's Twentieth Century English dictionary, is 'the art or process of producing permanent and visible images by the action of light or other radiant energy on chemically prepared surfaces'. Seeing this definition, one cannot help wondering how appropriate the name of the dictionary is. For this is a definition that holds good only for the twentieth century. As in the cases of the Television, Radio, Telephone and Auto- mobiles, the influence of a brave new partner is going to change the face of the camera beyond recognition. You do not have to be Arthur C. Clarke or Alvin Toffler to guess the name of this powerful partner. What else it could be, other than the Computer?

Even if you belong to the rapidly diminishing clan of Computer haters, you need not worry about this trend. Computer assisted photography is not going to be what you think it might. For instance, it does not mean that you have to take a PC,

or even a laptop in your shoulder to the Yala sanctuary to take a photograph of a mighty tusker. Wedding photographers do not have to bother learning complex operating systems like Unix and Novell netware. (But a basic knowledge of Windows 95 will always be useful!)

Digital cameras are of the same size and shape of the ordinary cameras. Some find they are easier to handle. I do not own one, but my good friend Pragathi does. This Agfa camera, which works with Apple Macintosh computers, is something given to him by the news- paper he works. Pragathi, probably the only press photographer in the island to use an innovative item like that, is quite comfortable with it. The photographs taken with it may not be fit for a wedding album, he admits, but they come excellent for the newspaper. It is the ideal camera to cover political meetings, inaugurations and other business functions where you do not get much time to adjust the camera. Pragathi recently went to Infotel with it and his paper was the first one to come with the pictures of the exhibition just two days later.

To understand how a digital camera works, you might have to recollect some high school Physics and Chemistry Fundamentals. The well-known chemical used in photography is Silver Nitrate. This colourless liquid has an extraordinary characteristic. It turns black when exposed to light. Therefore, a transparent plate coated with this chemical is placed at the focal point of a converging lens for a fraction of a second; a picture that corresponds to the actual scene with directly opposite colour conditions will be created. Repeat the process and this 'negative' will provide you with a 'positive'.

So how does this chemical and analog process reassemble to the electronic and digital one used in the digital cameras? Simple. Replace the Silver Nitrate coated plate with a silicon chip that combines a rectangular array of light sensitive cells with circuitry to process and digitize the image the cells record. As the camera's shutter exposes each one of these cells build an electrical charge proportional to the light it receives. The resulting image is read cell by cell. This action is called a 'bucket. brigade process' because it is similar to the activity of passing buckets of water by a group of fire fighters. The cells in the bottom row pass their charges to a serial shift register below the array. Cells in the rows above pass their charges down one row. Cell by cell, another chip reads the contents of the shift register, converting the processed into a digital image that is stored in the camera's memory.

At present the techniques used in the digital camera's can best be described as 'proprietary' and not 'generic. Most certainly, standards will emerge. but that will take time. Even the manner used to interface these cameras with computers vary largely from manufacture to manufacture. For instance, Kodak DC210 camera can download the images to your PC using a standard serial infrared connection. (The same camera also has a video output connector to view shots in a television screen.) On the other hand, some cameras like Sony's digital Mavica records the images on a standard floppy so you can play it back on any IBM so that converting the images to commonly used formats will be easier. More sophisticated ones have facilities to save images directly in graphical formats like JPEG.

Usually, the development process of color photographs is more complicated than that of black and white ones. Ditto in the digital world. Capturing color images require color filters (red, green and blue) because the individual cells in the chip measure only the intensity of light and not its frequency. (To a physicist, any 'color' is an optical wave with a particular frequency. The wavelengths as well as the frequencies corresponding to the different colors differ. For example, the frequency of the wave representing the color red is higher than the



one for violet.) The least complicated filtering technique 'dyes' the surface of each cell to sensitize it to one of the three colours needed. After few unsuccessful

attempts Kodak has come up with a checker board mosaic of coloured pixels. Theoretically, the resulting color pattern should have an equal number of green blue and red cells uniformly distributed, but the one practically used has more greens than reds and blues since human visual system perceives that ratio as sharper. Anyway, the paths taken by the other manufactures may not be the same. Perhaps they may have found better ways.

Surprisingly, some digital cameras do not require PCs at all. They stand alone and can give the output through a special type of a printer directly connected. Olympus P-300 is such a personal photo printer. If the advertisements are telling the truth, (don't we know that they rarely do so?) You just have to plug any Olympus digital camera directly into the photo printer and it can give you a 4×5.5 inch photo quality full color print within just 95 seconds. It also offers three output systems. You can feed high gloss photo paper or peel and stick photo labels or 16 per page miniature self-stitch photo labels into the printer. Making multiple copies, it seems a kid's play.

Olympus does not stop there. It also introduces a film scanner, which can convert your existing 35mm slides or negatives into digital image. This will solve all your problems in preserving the photographs for future use. Instead of investing in air conditioned chambers and special types of chemicals, you can store all the important images in a hard disk or an optical device for a fraction of the cost of that. One computer magazine recently quipped that hard disks are going to be the most expensive and bulkiest photo albums before long!

This is not the only way how a digital camera can turn an absolute beginner in photography into a professional in a day. Selection of light requirement to take a particular shot had so far been a matter of experience. The photographer had to decide whether he should risk an underexposed photograph by selecting f-11 or an overexposed one by selecting f-8. Not anymore, with models like Kodak DC210. It features a 2x 29- 55mm-zoom lens, automatic flash and a 1.8" LCD screen that provides the best viewing features. The zoom is for serious photographers who require precise control over an image. This feature can give you wide-angle shots or telephoto close-ups, just as they would with a conventional zoom lens.

The LCD screen can offer a preview of the shot you are about to take. This shows the image with the existent light intensifies and if the photographer does not like it he can either increase or decrease the brightness and see how the output will

finally show up. Some models provide four optional snapshots in the LCD screen different illuminated.

In this environment, professional photographers and those who are involved in the photo developing and printing industry are going to have a really bad time. I do not think any youngster should select photography as his future profession at a troubled time like this, unless he is prepared to take the mammoth challenges coming from the digital front.