

Modern  
Photography

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Distinctly modern photography owes its existence to the fact that dry plates may be prepared on a large scale, and in such a way that they may be preserved and used at the pleasure of the photographer. But before considering the work that is being done at the present day it may be well to take a rapid view of the progress made in this art since the time of its discovery.

The earliest photographer on record is Johann Schulze. He was the first to produce a photograph by means of the action of light upon silver salts. This photograph being that of a string tied about a containing glass. It was taken as early as 1827. In

1826 The Frenchman Niepce experimenting in lithography covered a plate with asphalt in oil of lavender and exposed this in a camera obscura, afterwards dissolving away the parts not affected by the light, thus securing a picture in asphalt. A short time after this Daguerre and Niepce experimenting together tried to discover a method by means of which they might make a more perfect picture. But it was not until several years later that their object was accomplished and then the discovery was purely accidental. In 1839 the secret of this process was given to the public, a liberal pension being awarded to the discoverer.

Simultaneous experiments with photographs were being carried on by Fox Talbot. He is said to have been the first to obtain a negative picture such as could be copied on other sensitive paper by exposure to the sun. This first faint attempt at the negative

process, made in 1841, was the beginning of the great development of modern photography. Since that date there has been a rapid progress. The range of substances used in development has widened considerably since the time when pyrogallie acid and ferrous oxalate were almost the only developers known; and the field of photography has widened even more rapidly. The camera of today with its delicately sensitive dry plates and all the new apparatus for securing instantaneous photographs, with the other convenient attachments now used, is doing a work which its early disciples probably never dreamed was in the range of possibilities.

To the scientist the camera is of inestimable value. The botanist finds it a faithful recorder of facts which without it might be lost or be almost useless on account of inaccurate observation. The movements of plants have been

accurately observed by means of the instantaneous process of photography. The Youth's Companion gives an illustration of this in an interesting account of an ingenious Frenchman who suggested a way in which a flower could be caused to appear growing in the presence of a room full of spectators. He proposes to employ the kinematoscope, a magic-lantern so arranged as to produce moving figures on a screen by means of a series of photographs of living objects, each successive photograph having been taken only a small fraction of a second later than the immediate predecessor. But for the proposed new application of this instrument the photographs need not be made so near together since they are to represent changes which require several months for their development. Beginning with the first appearance of the bud, several thousand photographs of a growing rose are to be taken

just near enough together so that the  
 change of form in the flower is  
 almost imperceptible, until it has  
 attained its complete bloom, and  
 then has faded and fallen to  
 pieces. These photographs being  
 passed as transparencies in rapid  
 succession, through the kinematoscope,  
 there would appear upon the  
 screen the figure of a rose visibly  
 budding, growing, opening, spreading  
 its petals, and finally shrivelling  
 and dying, the whole process  
 occupying but a few moments.  
 In a similar manner other plant  
 developments, the sleep movements,  
 and all the phenomena of  
 plant life may be secured and  
 preserved for use in illustrating  
 class-room lectures, thus making  
 possible a more thorough know-  
 ledge than could be obtained in  
 the ordinary method of teaching;  
 and besides this giving an  
 added stimulus to original research.

Prof. Barnard

of the Lick Observatory says that  
 photography has practically revolutionized  
 astronomy. It is because it has made  
 possible the recording of facts in a  
 permanent form, with comparative  
 ease, when formerly it took the  
 closest attention for a great length  
 of time in order to make any record  
 that could be relied upon. But with  
 the advent of telescopic photography  
 has come an incentive to further  
 study which has led students to  
 attempt the making of a chart of  
 the heavens which will serve as an  
 absolutely true record of the heavens  
 as they are at this time, for the  
 use of the generations to come.  
 The great telescope of the Lick  
 Observatory being the largest in  
 the world makes this a comparatively  
 easy matter. Also a record of  
 the condition of the moon's surface  
 has been obtained by making  
 photographs as the shadows there  
 change. New stars have been  
 discovered by means of photographs.

and a photograph of the transit of Venus across the surface of the sun shows the relative size of the two bodies. The Harvard college observatory has made an attempt to show the movements of stars by means of photographs. By superposing plates taken at different intervals the change may be noted.

Not only to the Philatelist and the astronomer is this art of the greatest value, but to every department of science. The entomologist finds it a great help in preserving records of the work of insects which could not otherwise be preserved for use. Also by means of the instantaneous process the motions of walking and flying insects may be noted and used for the purpose of illustrating

Telescopic photography allows the zoologist to observe at a distance animals which could not be persuaded into closer relations.

An apparatus for securing photographs under water opened another field. It consists of a small camera enclosed in a rectangular water-tight metal box with windows of glass in the sides. The difference in pressure on the inside and the outside when below the surface is regulated by means of a kind of balloon filled with air and attached to the box. Very satisfactory pictures have been obtained; those in the shallow water being taken with the sun-light, and others by using a specially prepared magnesium light.

Photography is now used in almost every branch of physical research. It has superseded the drawings made free hand, and is of especial value in the cases where observation must be continued for a great length of time. It gives much more perfect representations than could be made by drawing.

Although these various sciences find photography of so great value, another branch which has been more completely revolutionized by means of it than has any one is the science of medicine. Microscopic photography has been the greatest factor in this progress, although surgery has been wonderfully benefitted by the Roentgen rays, making it possible to remove the causes of untold discomfort, when formerly only rash guesses could be made as to the location of such.

The student of radiology has been enabled to keep a record of his observations of the life under the microscope, and it is by comparisons made in this way that the germ theory of disease has been evolved. Section slides may be prepared from these photographs, and are of the greatest value to students who are unable to make observations for

themselves on a large scale. Almost every hospital has a photographic service, and a photograph taken of the patient on his arrival may be compared with those taken later on and so allow the physician to make a fair judgement. In cases when the movements and attitudes in different stages of the disease are of importance, instantaneous photographs will aid in studying the progress of the disease. The photography of moving objects is very necessary in studying muscular movements etc. By an ingenious arrangement of shutters it is possible to secure the primary attitudes assumed in making any movement. To the physiologist these are a most helpful addition to his data. Photography makes it possible to record a fair representation of anatomical specimens and to preserve records of important cases which give to the student

a deeper insight into his profession than could readily be obtained when it is not possible for him to study every case that he might desire to see.

Outside of the field of science there are numerous cases in which the development of the art of photography has been a means of improvement.

In the detection of crime the witness that may oftenest be relied upon is the camera. The testimony that will soon be in greatest demand in the courts will be that of the photograph. "Snapshots" taken at the scene of a crime will represent the case more faithfully than a fallible human witness. Microscopic photography has enabled men to reproduce tracings from important manuscripts, and also to make faded writing visible. The well-known case of photographed blood corpuscles found on objects connected with

some crime shows the importance of this single factor in the proceedings of the court. In a case of suspected poisoning it was shown that the crystals formed by the  $\frac{1}{1000}$  part of a grain of arsenic could be successfully photographed by means of microscopic photography.

In Journalism the photograph is becoming an important help in making attractive articles. The daily paper with its reports of exciting events is made far more interesting by the use of illustrations made from photographs taken at the seat of action. The magazines of today are far more attractive and elevating than in years gone by, and simply because of the illustrations. The beautiful half-tone pictures, now so commonly produced, give to the person who is unable to travel, a reasonably fair idea of the countries beyond the seas; and the wonders of his own land are laid before him in

such a clear, artistic way that he blesses the inventor of the camera and marvels at the skill of the operator.

The possibilities of photography are great. Only one hundred and seventy years have passed since the first photograph was taken. It was the wonderful reproduction of a bit of string about a foot long. Today we reproduce on paper all the motions of an insect flying in the sunlight; photograph the bones of the human body through the living flesh, bring the most distant stars before us in permanent record; we have photographed the compressed air before a flying bullet; and some even profess to have secured photographs of those most evanescent of things, the spirits of their departed friends, and the thoughts emanating

from Their own brains. — what  
may we not hope to ac-  
complish in years to come?

Maya Norton.