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ABSTRACT

This study traces the development of night photography, from February 7, 1839, when the effect of the moon on a Daguerreotype was first recorded by Alexander Von Humboldt, to the present. The contributions of the following photographers who advanced the field of night photography are discussed: Margaret Bourke-White, Paul Martin, Brassai, Bill Brandt, Felix H. Man, Jacob August Riis, Weegee, Lewis Hine, and Eric Solomon. Artificial lights utilizing calcium, oil, mercury, and magnesium, as well as gas and electricity; flash bulbs; and electronic flash units are all considered as sources of illumination for night photography as are the natural light sources, moonlight and the Mexican firefly. A bibliography about night photography is also included. (LL)

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THE IMPORTANCE OF ARTIFICIAL LIGHT IN THE DEVELOPMENT OF NIGHT PHOTOGRAPHY

Presented for the Photojournalism Division of AEJ
by Deloris Wood, Public Visual Communications Graduate
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Night photography has advanced spectacularly since its onset February 3, 1839, when the moon was first recorded on a Daguerrotype. This study traces the development of night photography.

An examination of the literature reveals little on the history of night photography and not a great deal more on the techniques and equipment related to the entire problem of its development. This being the case, the author set out to cure a portion of this overwhelming deficiency. This caused the researcher to concentrate on the greatest information deficiency--artificial light.

The scope of this paper ranges from the inventors to the photographers who used the inventions to bring night photography into its own. Included are inventors and photographers who utilized natural and artificial light. Artificial lights covered include calcium, oil, mercury, magnesium, gas and electric lights as well as flash bulbs and electronic flash units. Daylight, the major source of natural light, is excluded; however, other natural sources, such as moonlight and the Mexican Firefly, are included. Photographers who advanced the field for night photography and mentioned in this work are Margaret Bourke-White, Paul Martin, Brassai, Bill Brandt, Felix H. Man, Jacob August Riis, Weegee, Lewis Hine, and Eric Solomon.

Although the work concentrates on artificial light used in night photography, a small portion shows its predecessor action, the use of moonlight photography for the recording of images on film at night. From there the study brings together information relating to night photography so others may get into action more speedily and to point out certain areas needing additional study.

An effort also is made to go beyond the narrow scope of this paper. The historical bibliography is supplemented by a general bibliography of night photography taken from current periodicals for people interested in a broader exposure to the topic.

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Introduction

The method of this study is to trace the history of night photography. The scope covers inventors and their inventions and deals with a few photographers who helped bring night photography into its own.

It is the researcher's belief that bringing this material together will give interested persons a firm grip on night photographic background, giving them an edge, or greater speed, in gaining competence. Photography historians and writers, unfortunately, have neglected to record the advances in an organized and complete way.

Moonlight

Alexander Von Humboldt was the first person to report the moon's effect on a Daguerréotype, doing so on February 7, 1839. According to Erich Stenger in the March of Photography, this was the first record found by photography historians to indicate sunlight was not the only agent usable for photographic images. "Even the disc of the moon leaves its image on Daguérre's mysterious material."[1]

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[1]Erich Stenger, The March of Photography (London: Focal Press, 1958), p. 81.

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A German, Richard Jahm (1861-1938), was credited in 1882 with taking the first photograph of a building by moonlight. Exposure was seven hours to obtain a successful picture of the white marble mausoleum of the American President Garfield.[2]

Calcium Light

The (lime) calcium light was used to produce Daguerréotypes in 1840.[3] The calcium light worked by the use of a lime cylinder under an oxygen jet to produce a dazzling white light. David Octavius Hill experimented with portraiture photography using [Thomas] Drummond's calcium light and Talbotype paper in 1841.[4]

In 1844, Hippolyte Louis Fizeau and Leon Foucault compared the luminosity of calcium light and sunlight, optically and photographically, on Daguérreotype plates. They "were the first to find that the chemical and optical luminosities of the light sources were not proportionate to each other."[5] They found that the Drummond calcium light's chemical illuminating power was

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[2]Ibid., p. 85.

[3]Ibid., p. 81.

[4]Josef Maria Eder, History of Photography (New York: Columbia University Press, 1945), p. 529.

[5]Ibid., p. 528.

less than that of an electric arc light.[6]

Oil Lamp

The first photograph obtained by using an ordinary coal oil lamp was made in Vienna in 1841. It was created on a Daguerréotype plate in the hands of two brothers, Dr. Johann Natterer (1821-1900) and Josef Natterer (1819-1862).[7]

Electric Light Sources

Two Americans, W. M. Goode and B. Sulliman, were the first to use the electric arc light. In November, 1840, the two men photographed a medallion with a single lens to make a Daguerréotype. They used a twenty-second exposure. Similar experiments of portraits and photomicrographs with arc lights were made by De Monfort in 1846, and Marc-Antoinne Gaudin (1804-1880) in 1853.[8] Louis Walton Sipley, in Photography's Great Inventors, adds the names of Joseph Berres (1796-1844) and Antoinne Francois Jean Claudet (1797-1844) to the list of arc light experimenters.[9] Stenger tells that Claudet was

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[6] Ibid.

[7] Ibid.

[8] Ibid., p. 529.

[9] Louis Walton Sipley, Photographer's Great Inventors (Philadelphia: American Museum of Photography, 1965), p. 138.

using the arc lamp in Paris in 1840, but Sipley contends that Claudet was using it in England at that time.[10]

The well-known Paris photographer, whose credit line was Nadar (Gaspard Félix Tournachon, 1820-1910), photographed in 1861-62 the famous underground catacombs of Paris by the light of an electric arc light. The photographs of the catacombs aroused great excitement.[11] Nadar later used magnesium light because of its simplicity in photographing the subterranean construction of the canal of the Paris Catacombs.[12]

The photographic societies were avenues for the photographer to display his inventions, discoveries, and works. At the Paris Photographic Society session of December 21, 1863, Nadar exhibited wet collodion plates which had taken 60 to 85 seconds to expose. He used a white-painted reflector with the electric arc light for photographs.[13] Stenger held Nadar's arc light portraits in lower regard than Eder did. "Artists called these 'plaster heads,' because the highlights in the face and hands appeared as white as the shirt and

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[10]Stenger, March of Photography, p. 84.

[11]Eder, History of Photography, p. 529.

[12]Ibid.

[13]Ibid.

cuffs."[14]

William Henry Fox Talbot (1800-1877) photographed an object in rapid motion by the use of an electric spark for a light source in 1851. Talbot's photograph froze a rapidly twirling newspaper for a fraction of a second in a darkened room through the use of the electric spark. Helmut and Alison Gernsheim's Concise History of Photography stated that Talbot "photographed a rapidly revolving wheel with a page of The Times attached to it, and obtained a clear picture, the duration of the spark being 1/100,000 second."[15] Here Talbot laid the foundation for high-speed photography.

In 1884, Ernest Mach (1833-1916) used an electric spark to make a photograph of a bullet with a velocity of 765 m.p.h. The electric spark was activated by a flying bullet, according to Stenger.[16]

Edison's incandescent lamp was used in 1879 by Hermann Krone of Dresden, Germany, to photograph a group. The photograph took only forty seconds. Photographs from the incandescent lamp got speedier. This caused

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[14]Stenger, March of Photography, p. 84.

[15]Helmut Gernsheim and Alison Gernsheim, A Concise History of Photography (New York: Grosset & Dunlap, 1965), p. 159.

[16]Stenger, March of Photography, p. 158.

one author to say: "Such a lamp, which looks like a glowing egg, suffices to make a card-size photograph in fifteen seconds."[17]

Animal photography was done successfully in the 1880's using both magnesium and electricity. Stenger gives several reports in the History of Photography. Bernhard Johannes (1846-1899), noted landscape artist, in Partenkirchen, "set up his camera in a deer run, walked away for quite a distance, observed his quarry with a telescope and made the exposure [remotely] by an electric wire (1883)."[18]

George Shiras, a photographer in the United States, had an excellent idea. He set up an electric-magnesium flashlight network where the animals tripped over wires triggering the camera shutter. Carl George Schillings (1865-1921) published photographs, "With Flashlight and Rifle" in 1904 which Stenger said were unique. Schillings photographed the big game of Africa equipped with Night-Flash Apparatus manufactured by C. P. Goerz & Co., Berlin. Professor Walter Hege and Dr. Benget Berg (b. 1885) photographed wild animals. Stenger said their

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[17] Ibid., p. 85.

[18] Ibid., p. 134.

wild animal photographs were unequaled.[19]

> One of the first "night photographs" was probably attempted in 1883, on the Potsdamer Platz, Berlin, by the light of the electric street lamp; an exposure of fifteen minutes was successful and produced a picture which in daylight would have required four seconds.[20]

The electric current generated by dynamos made the arc lamp practical. The English photographer, Wilde, in 1866, in Manchester operated his "electromagnetic lighting apparatus" by a steam engine of one horsepower. The generator required the services of only two men. The machines were propelled by hand and gave over 300 candlepower and sold for 850 marks.[21] Saxon & Co., Manchester, according to Eder, produced twenty life-size photographs in one evening with Wilde's method.[22]

In 1876 Van der Weyde introduced "photography at night" at a regular portrait studio using the electric light.[23] A. Liébert (1827-1914), in Paris established a night studio in 1879 using a dynamo-generated electric light. Liébert added a reflector shade to his arc lamp and a circle of electric bulbs in 1903 which produced a

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[19] Ibid.

[20] Ibid., p. 85

[21] Ibid., p. 84.

[22] Eder, History of Photography, p. 530.

[23] Ibid.

shorter exposure time and a softer illumination.[24]

Mercury Light

The mercury light employed an electric arc and, according to Eder, had been used since the 1860's. A German, Leon Arons, in 1892 constructed the first practical mercury-vapor lamp. An American, Cooper Hewett (1860-1921), perfected the mercury lamp in 1901. The mercury quartz lamp followed in 1903.[25]

Magnesium Light

John Moule, an English chemist, invented the Photogen, in 1857, which was an artificial light for use in evening photography.[26] Moule used Greek fire, an incendiary chemical composition, in his photographic portraiture.[27]

In Heidelberg, Germany in 1859, Robert Wilhelm Bunsen (1811-1899) and Englishman Henry Enfield Roscoe (1833-1915) introduced the use of magnesium ribbon and wire as an artificial light source. Bunsen and Roscoe

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[24] Ibid.

[25] Ibid., p. 533.

[26] Sipley, Photographer's Great Inventors, p. 140.

[27] Stenger, March of Photography, p. 81.

invented an apparatus to burn the magnesium ribbon. Stenger said it "was wound from moving spools by clockwork, so that the end of the wire, at regular intervals, met the flame of an ordinary alcohol lamp, where it was ignited."[28] About the same time William Crookes, in London, made similar observations as Bunsen and Roscoe and concluded that burning magnesium had "considerable chemical action." Crookes tried magnesium light in his photography.[29]

A. Brothers made the first portrait by magnesium light in May 1864 in Manchester, England. He photographed Michael Faraday (1791-1867) after a lecture at the Royal Institution with the audience still present.[30] Another man, Carl Suck, worked about the same time. Photo historians Eder and Stenger disagree on the exposure time used in Suck's work with magnesium light. Eder says Suck used a wet collodion plate "exposing it for fifty-five seconds."[31] Stenger says: "His time of exposure was three and a half minutes, including several short pauses for relighting the extinguished wire, of

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[28] Ibid.

[29] Eder, History of Photography, p. 530.

[30] Ibid.

[31] Ibid.

which six feet eight inches were burned."[32]

Magnesium was very costly in 1865, but the demand soon led to cheaper methods of production. By 1887 the price had dropped to "one-thousandth of the cost when it was first used in photography."[33]

John Traill Taylor (1827-1895) introduced a magnesium compound flash powder in 1865, producing "a beam of light of intense brightness and of extraordinarily short duration.[34] The mixture was composed of magnesium powder, antimony sulphide, potassium chlorate, and sulphur. The experiment was ahead of its time because of the high price of magnesium and the low sensitivity of the negative which kept it from becoming popular.[35]

In 1865, W. White produced a torch by running shavings or blowing magnesium powder into the flame. The torches were introduced commercially by York Schwartz in Hanover in 1897. Motion picture photography utilized the magnesium torches for most of its night scenes in New York in the early 1900's.[36]

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[32]Stenger, March of Photography, p. 82.

[33]Ibid.

[34]Ibid.

[35]Ibid.

[36]Ibid., p. 83.

Eder records in his book many uses of magnesium for photographic lights. In the single year of 1865, he said C. Pizzi Smith (1819-1900) photographed the Great Pyramids' interior by burning magnesium wire. Bags were used to catch the smoke. Crinoline hoops were used to keep the magnesium smoke bags from collapsing. Then Alonzo Grant improved technique by using a clock to wind the magnesium wire, improving the hand winding method first used that year by W. Mather and F. W. Hart.[37]

Adolf Miethe and Johannes Gaedicke in 1887 at Berlin put John Traill Taylor's research into practical use. Miethe, in November of that year, took a flash-light photograph in the open air on the river road between Potsdam and Caputh. Faulty reports were carried by the Berlin and Potsdam newspapers. Meithe's flashes were reported as part of "a rare winter thunderstorm."[38]

The magnesium powders in form of "flashlight" soon came into general use everywhere. The fast flash burned, resulting in "instantaneous pictures of persons, groups, and so forth, possibly on gelatine silver bromide plates."[39]

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[37]Eder, History of Photography, p. 531.

[38]Stenger, March of Photography, pp. 82-83.

[39]Eder, History of Photography, p. 532.

The "vest-pocket sun" was developed in 1924 by Dr. Wilhelm Bohm (1873-1932). It used a thin ribbon of magnesium which ignited easily and was efficient for magnesium.[40] The use of magnesium in the form of compound flash powder and strips diminished rapidly and disappeared completely with the introduction of flashbulbs.

Gas Lights

The gas light with mirror reflectors was employed in 1879 in portrait photography. Called Wigham's lamp, the light-delivering device was a sensation, according to Stenger who said it combined sixty-eight separate flames tightly grouped in one burner. This combination produced a light of 1,200 candle power.

Acceptance was spectacular. Stenger told of a London photographer who was compelled to remove prints of his gas light photographs "because everyone wanted to have his picture taken by gaslight even in the summer."[41]

The incandescent gas mantle was used in photography until it was replaced by electricity. Carl Auer

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[40] Stenger, March of Photography, p. 82.

[41] Ibid., p. 81.

Von Welsbach (1858-1929) invented the incandescent gas light in 1855. Gas was very useful because of the yellowish light it cast. This light was improved in 1889 by Welsbach's mechanic Fabricious with the use of oxide of thorium and compressed air.[42]

Paul Martin was the first "candid camera" man forty years before the phrase was coined by the art editor in the January 11, 1930, issue of Weekly Graphic in London.[43] The term, candid camera, was coined to describe Eric Solomon's pictures. Martin in the 1890's took London Street scene snapshots and photographed people enjoying themselves at the seaside. He did this by using "a hand-held camera concealed in a briefcase." The first of their kind, the London by Night scenes, were taken in the winter of 1895-96, Helmut Gernsheim tells in Creative Photography.[44]

Mexican Firefly

Stenger gave an interesting source of light as follows: "In 1888 a negative was made on a highly

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[42]Eder, History of Photography, p. 533.

[43]Helmut Gernsheim, Creative Photography: Aesthetic Trends 1839-1960 (New York: Bonanza Books, 1962), p. 210.

[44]Ibid., p. 154.

sensitive gelatin plate with an exposure of half a minute by the yellow-green light of a Mexican firefly."[45]

Flashbulbs

The Vacuflash was invented, according to Stenger, by Dr. Paul Vierkötter in 1927. The Vacuflash was similar to an incandescent light bulb, but was smokeless and noiseless and had less glare.[46] The Vacuflash was ignited by a battery current. "J. Ostermeier perfected this flash bulb in 1929 by stuffing it with aluminum foil, and it was put on the market in Germany as Vacu-Blitz.[47] In 1931, the Photoflash and the Sashalite lamps, which had the same type of efficiency as the Vacuflash, became popular in the United States and England.[48]

Electronic Flash

The Edgerton light developed in 1931 gave a "brilliant light for as short a time as one microsecond

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[45]Stenger, March of Photography, p. 85.

[46]Ibid., p. 83.

[47]Beaumont Newhall, The History of Photography (New York: The Museum of Modern Art, 1964), p. 157.

[48]Stenger, March of Photography, p. 83.

(i.e., 1/1,000,000 sec.)."[49] Harold E. Edgerton (b. 1903) disclosed the results of his study of high-speed electrical flash photography methods and strobescopes at the Massachusetts Institute of Technology in 1939 in a book titled Flash! Seeing the Unseen by Ultra-high Speed Photography.[50]

Night Photographers

> In 1909 a Society of Night Photographers was founded in England by A. H. Blake, and many quite successful pictures were made in those early times in spite of the fact that the available sensitive materials were comparatively slow. An exposure of several minutes was called for in those days for subjects that now could be photographed in a fraction of a second.[51]

Although virtually every photographer seems to take a few night photographs, few do enough of them to gain recognition of that unusual specialty. However, a handful of individuals have excelled at night photography.

In the 1930's, Margaret Bourke-White had been in Russia photographing the country's progress. On the hunch of a Life editor, she returned to that country

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[49]Newhall, History of Photography, p. 159.

[50]Sipley, Photographer's Great Inventors, p. 132.

[51]Arthur Hammond, "For the Beginner," American Photography, December 1948, p. 786.

only one month before the war broke out in 1941. She told her story in Portrait of Myself and Shooting the Russian War.

Miss Bourke-White, then wife of novelist Erskine Caldwell, was one of the most widely known photographers of World War II. Many of her night photographs, like the German's bombing of the Kremlin in Moscow, were among the most memorable of the war.[52]

She talked her way around the Russian laws which decreed death to anyone found carrying a camera. In fact, her reputation and work were of such strength that she finally was able to function with a great deal of freedom, particularly for an alien photographer.[53]

Like all good photographers, Miss Bourke-White was unusually resourceful. The Germans bombed Moscow nightly. The balcony of her hotel suite overlooked the Kremlin and faced Red Square. A natural circumstance, therefore, existed which virtually commanded her to take the most outstanding night shots of the entire war. Since there was no precise exposure data for night pictures of this type--a darkened city subjected to light flashes and flames from incendiary bombs--Miss

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[52]Margaret Bourke-White, Portrait of Myself (New York: Simon & Schuster, 1963), p. 177.

[53]Ibid., p. 178.

Bourke-White set up several different cameras on the balcony. Each faced a different direction; each had different exposure settings. Then she waited for the bombers to come. The intensity of the raid was measured by the number of cameras she used. A "one-camera raid" was a trivial one, but a "three- or four-camera raid" was one of epic proportions.[54]

Bill Brandt (b. 1905), who published A Night in London in 1938, was born in the British capital and brought up in Germany. He learned photography from Man Ray in Paris in 1929 and 1930, then opened a portrait studio in the French capital. Under the influence of Cartier-Bresson and Brassaï, Brandt changed to reportage and settled in London in 1931 as a freelance photographer. During the Depression, Brandt documented the industrial North. Brandt held a one-man show in Paris under the guidance of Arts et Metiers Graphiques in 1936, the year A Night in London was published.[55]

The photographer known as Brassaï (Gyula Halasz, b. 1899) originally wanted to be a painter, but turned to journalism instead and became famous for his Paris by Night photos and his candid pictures of Parisians in

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[54]Margaret Bourke-White and Erskine Caldwell, Shooting the Russian War (New York: Simon & Schuster, 1943), p. 198.

[55]Gernsheim, Creative Photography, p. 233.

unguarded moments. Born in Brasso, Hungary, Brassaï studied art in Budapest and Berlin, but went to Paris in 1924. Six years later, he changed to photography and his reputation began to grow. Brassaï wrote several books, including Paris de Nuit (1933), Camera in Paris (1949), and Fiesta in Seville.[56]

Felix H. Man (Hans Baumann, 1893) was the first person to present photo essays or photo stories consisting of a series of pictures that explained a situation pictorially, such as a trotting race at night, an art auction in Berlin, life on the Kurfürstendamm between midnight and dawn, and the expressions and movements of symphony conductors, musicians and actors during performances at the theater.

Man was born in Freiburg and began his career as an illustrator of sports events for a Berlin publication. He turned to photography at first as an aid to his work. In October 1928, he turned professional photographer and pioneered with the Ermanox camera and worked as a reporter-photographer for the Münchner Illustrierte and the Berliner Illustrierte. In 1951, Man did night color photographs for Life magazine to depict the Festival of Britain. He published Eight European Artists

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[56]Ibid.

(1954), Gernsheim reports.[57]

Remie Lohse became an early candid camera master when he became a photographer for Vogue in 1933. According to John Whiting, in Photography is a Language, Lohse photographed the night club for its "dramatic lighting, emotional tension, and contrast of professional stagecraft with [its] vivid audiences."[58] He also covered dancers, weddings, dinners, and the social festivals of the spending class.

Paul Martin (1864-1942) began photography as an amateur in 1884 when he began serving an apprenticeship with a wood-engraving firm that did work for newspapers. In the early 'nineties he gave up pictorial photography for exhibitions, and, with a concealed hand camera, began to take candid snapshots in the streets of London and at English seasides. These candid snapshots created excitement. Martin caused still greater sensation with his photographs of London by twilight in 1896. Martin worked as a free lance press photographer from 1900 to 1908 and thereafter as a process engraver in London.

Martin's autiobiography is contained in Victorian

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[57]Ibid., p. 241.

[58]John Whiting, Photography is a Language (Chicago: Ziff Davis Publishing Company, 1946), p. 23.

Snapshots (1939), according to Gernsheim.[59]

Weegee (pseudonym for Arthur Fellig born 1900), became a press photographer in 1935. He worked fifteen years in close collaboration with the New York police as a freelance photographer covering candid news of crime, poverty, and calamities. Weege published night photographs in two books, one called Naked City (1945) and the other Naked Hollywood (1950).[60]

Eric Solomon (1886-1944) was a Doctor of Law in Berlin when he became a free-lance photo-reporter. He first covered a murder trial using available light. Solomon pioneered modern photojournalism using the Ermanox Camera. He sold his pictures to papers like the Berliner Illustrierte.[61] He took unposed pictures in all kinds of lighting conditions without permission in places that would have deterred other photographers even with permission.[62]

Lewis Hine (1874-1940) used his photographs to illustrate his research work in sociology. His photographs exposed shocking conditions which resulted in

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[59]Gernsheim, Creative Photography, p. 241.

[60]Ibid., p. 247.

[61]Ibid., p. 245.

[62]Ibid., p. 209.

the passage of the child labor law.[63] Hine used a 5 by 7 inch camera with open flash to photograph small children working in factories. The term "photo story" was first used to describe his work.[64]

Jacob August Riis (1849-1914) was America's first photo-reporter. Riis began a series of flashlight photographs of the slums in New York city documenting social conditions in 1887.[65] Riis used flashlight powder invented by Adolf Miethe and Johannes Gaedicke in Germany in 1887.[66]

Andreas Feininger had a cutline accompanying a shimmering cityscape which sets a good mood to conclude this paper. "Creative camera work can capture the beauty of lights shimmering on dark waters--dealing in ideas, emotions, facts, or abstractions. The camera is the tool of the modern artist, as well as the journalist."[67]

Summary, Conclusions, Recommendations

The researcher believes that this study gives a

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[63] Ibid., p. 238.

[64] Newhall, History of Photography, p. 140.

[65] Gernsheim, Creative Photography, p. 244.

[66] Newhall, History of Photography, p. 140.

[67] Whiting, Photography is a Language, pp. 30-31.

careful summary of the development of the limited material available on night photography. It is felt that with this background ideas for further activity or experimentation are stimulated.

However, the study uncovers many shortcomings. For one thing, the information which was gleaned existed in bits and pieces and came from a great number of sources, indicating clearly that a comprehensive work is overdue. In addition, the information collected showed clearly that systematic testing of variables under controlled situations is more uncertain in night photography than is probably necessary.

This means there is a great need for carefully measured experiments regarding lighting of various sorts and for research on additional materials, lenses, films, and light sources.

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