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Exposure is the quarterly journal of record of the Society for Photographic Education, and is a benefit of SPE membership. The journal reflects the Society's concerns, but opinions expressed herein are not necessarily endorsed by the SPE.

Gretchen Garner, Editor

Steven Klindt, Managing Editor

Jan Zita Grover, Contributing Editor

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Covers: Front, **Ellen Land-Weber, Teapot Collector** © 1979; back, **Charles Sawyer, Josef Sudek in his Studio, 1976**, © 1979. For more 'evidence of a novel kind' see *Connections*, p. 20.

THE DEADLINE FOR THE NEXT ISSUE OF EXPOSURE IS JANUARY 1

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Summary of Proceedings and Decisions of Annual Board and Membership Meetings—March 1981

Complete minutes of proceedings and decisions of the Board of Directors and the Society Membership at their annual national meetings which took place, March, 1981, at Asilomar Conference Center, Pacific Grove, California, appear in the SPE/Newsletter, April/81 issue. The following summary of proceedings and decisions of those meetings has been prepared by Society Chairperson William Parker based on the minutes taken by former Secretary of the Society Richard Stevens and current Secretary Ellen Land-Weber.

ACTIONS TAKEN AND RESOLUTIONS MADE BY THE BOARD OF DIRECTORS OF THE SOCIETY FOR PHOTOGRAPHIC EDUCATION DURING THEIR MEETINGS, MARCH 13-15, 1981, PRIOR TO THE ANNUAL NATIONAL CONFERENCE OF THE SOCIETY, ASILOMAR CONFERENCE CENTER, PACIFIC GROVE, CALIFORNIA, MARCH 15-18, 1981:

Convening the board at 2:10 P.m., 3/13/81, Michael Simon, Chairperson of the Society, extended welcome to newly elected board members: Kathleen Gauss, Betty Hahn (elected by board to fill Enos board vacancy; not present due to illness); Harold Jones, Jean Locey (not present initially due to travel difficulties and service as Assistant Conference Coordinator), and Martha Strawn (reelected to the board). Thanks were expressed to outgoing board members: James Alinder, Peter Bunnell and Anne Noggle.

Accepted the *Membership Committee Report* which identified 1297 society members as of the publication of *S.P.E. Membership Directory* (1/18/81), plus 111 new members since 1/18/81, for a current total of 1408 members as compared to 1627 members for 1980. Membership renewals received as of 3/11/81 reported as 578; non-renewals for 1979 reported as 336. Number of institutional subscribers to society publications reported as 88 domestic, 20 foreign. Approved that the Membership Committee research possible ways to advertising the society and that it take steps to increase the membership. Unanimously resolved to express the deep appreciation of the membership for the outstanding service rendered the society by Peter Bunnell, Membership Chairperson. Approved that a membership application form be included with every mailing of *Exposure* and that the Publications Committee be directed to carry this out.

Accepted and approved the *Treasurer's Report: Year Ended December 31, 1980*, showing a national treasury balance, in checking and saving accounts combined, of \$34,092.39. Approved to amend the proposed society budget for 1981 to reflect a membership lower by 300 and that this budget be used until the next Executive Committee meeting when a revised plan for finances shall be made.

Accepted the *Publications Committee Report* which reviewed the procedures followed by the committee in its search for new publications editors recommended to the Executive Committee for final selection and reported information on the progress of *Exposure* issue 18:2 and 18:3 & 4 (double issue). Approved the Executive Committee appointments of Gretchen Garner as Editor of *Exposure* and Peter Kloeck as Editor of the *SPE/Newsletter*, congratulating these new editors on work accomplished thus far.

Approved the minutes of the previous annual board meetings at Stevensville Country Club, Swan Lake, New York, 3/14-17/80, as published in the *SPE/Newsletter*, July/80.

Accepted the *Nominating Committee Report* announcing newly elected board members as defined.

Approved the revised policies and procedures regarding the office of Executive Secretary of the Society as defined by the special Policies and Procedures Committee in the proposed *S.P.E. Policies and Procedures Manual*. Approved as a mandate the hiring of an Executive Secretary of the Society and the acquiring of a permanent office for the national society when feasible. By separate action, with required revisions occurring with each action, approved the organization, responsibilities and functions of society staff and committees defined in the sections of the proposed *S.P.E. Policies and Procedures Manual* identified as: I. Executive Secretary; II. Com-

mittees; III. Membership and Membership Committee; IV. Nominating Committee and Procedures for Nominations; V. Publications and Publications Committee; VI. Conference Committee and Annual National Conference; and VII. Regions and Regional Affairs Committee. Recognized that sections VIII through XIII of the manual mandated by the board concerning responsibilities and functions of the officers of the society and additional policies and procedures shall be later submitted to the board for approval.

Approved the motion to alter the by-laws, Article III *Directors*, Section 2, *Election of Directors*, to reflect a deadline for receipt of return ballots to be thirty (30) days before the annual meeting.

Approved through roll-call vote, the continuance of the policy now in force of not holding national conferences in states which have not ratified the Equal Right Amendment. Approved that a ballot on the ERA issue be presented to the membership and that a new membership vote on the question of current policy be taken, such ballot to be mailed with the *SPE/Newsletter* along with published statements in the newsletter for and against the proscription toward holding the national conference in states not having ratified the ERA. Approved that membership decision on the issue shall become official policy for the society and that such decision shall be determined by a simple majority of the votes cast.

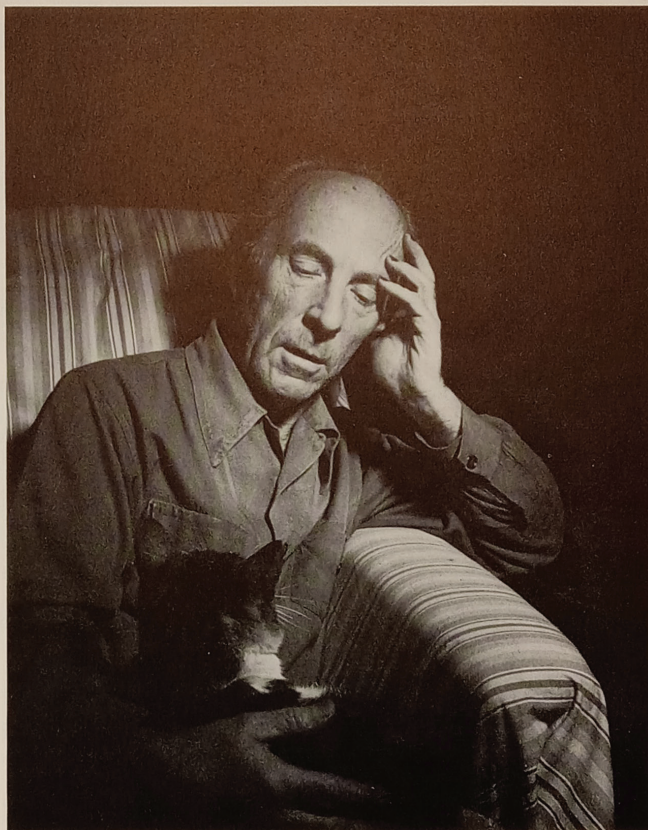
With reference to the special education issue of *Exposure* (double issue, Vol. 18: Nos. 3 & 4), in preparation by guest Editors Thomas Neff and Tony Frederick at the University of Colorado, approved that: the board agrees to the overrun of 500-700 copies as planned, such copies to be hardbound and sold to repay a loan made by the University for the issue independent of society funding; the title or facing page of such copies must include in large bold type: "This publication is a reprint of *Exposure*, Journal of the Society for Photographic Education, Issue 18: 3 & 4."; both the issue of *Exposure* and the overprint must be copyrighted in the name of the society and, where requested by individual authors, in the name of the author.

Accepted the *Regional Affairs Committee Report* announcing the Mid-Atlantic region charter revisions and approved committee recommendations concerning Section VII, *Regions and Regional Affairs Committee*, as amended or revised, for inclusion in the *S.P.E. Policies and Procedures Manual*. Approved the combining of the Midwest and Mid-America regions into a single region to be designated as the Midwest region, thus determining that there are now a total of eight (8) officially recognized regional organizations within the national society. Approved the Regional Affairs, Policies and Procedures and Executive Committees' recommendations of by-laws changes identified as: Article IV *Committees*, Section 7, *Regional Affairs Committee* and Article VI *Regions*, Section 2, *Regional Definition*; Section 3, *Officers and Organization*; and Section 4, *Finances*.

Approved the *By-Laws Additions/Revisions* document as recommended by the Policies and Procedures Committee to the board by letter of 2/28/81, based on previous approval by the Executive Committee in November, 1980, identifying additions or revisions for by-laws: Article IV *Committees*, Section 1, *Committees Enumerated*; Section 3, *Nominating Committee*; Section 4, *Steering Committee*; Section 5, *Publications Committee*; Section 6, *Conference Committee*; Section 7, *Regional Affairs Committee*; Section 8, *Membership Committee*; Section 9, *Other Committees*; Article V *Officers*, Section 3, *Term of Office*; Section 6, *The Secretary*; Section 7, *The Treasurer*; Article VI *Regions*, Section 2, *Regional Definition*; Section 3, *Officers and Organization*; Section 4, *Finances*. Approved that all submitted and subsequent changes in the by-laws made during the current meetings of the board be orally presented at the meeting with the membership on 3/17/81 and that such by-laws additions or revisions be subsequently presented to the membership for approval by ballot vote.

Elected the newly required Executive Committee of the Board of Directors presented as a slate: William Parker, Chairperson; Martha Strawn, Vice-Chairperson; Ellen Land-Weber, Secretary; and Kathleen Gauss, Treasurer. As of 7:30 p.m. on 3/14/81, the chairpersonship of the society was transferred to William Parker.

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Edward Weston with a Cat, 1946

The part of Edward Weston that is little publicized was his great attachment to his very simple house and garden, built for him by the Weston boys. Edward also had great attachments to pyro developer, KIN-HEE Quick coffee pots and, as he grew older, deep attachments to his many, many cats. Edward, in effect, was a very fulfilled man. (See Beaumont

Newhall's photograph of Edward's kitchen in the August 1981 issue of Darkroom. The KIN-HEE Quick coffee pot is in the foreground.)

Imogen hated cats though she photographed them constantly but she shared Edward's attachment to the KIN-HEE Quick coffee pots to the end of her days.

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Stieglitz and Autochrome: Beginnings of a Color Aesthetic

Donato Pietrodangelo

The emergence of serious color photographic imagery within the past decade has been so amply heralded that any additional proclamation here might seem redundant. Clearly, as it cautiously sheds its snapshot/glamor/commercial stereotypes, color is assuming a newfound posture of importance. Color is said to have come of age.

When and where did it begin? More specifically, *how did* serious color photography come of age? Voluminous discussions address the development of a reliable color photographic process, but literature on the origins of *serious* color imagery, and historical criticism of the medium, is scarce. On the surface, this paucity of critical literature might be written off as a somewhat esoteric concern; yet, a lack of criticism holds practical implications beyond the academic. It deprives the medium of a point of origin, its *aesthetic roots*, if you will. This implies serious color really has no history, thereby fueling the notion held by some critics that color photography, with the whirl of the SX-70, is simply a current and passing trend in an era of technomania. Equally important, the issues and concerns presently being articulated about color and its aesthetic are assumed to be unique revelations caused by its recent emergence. I hope to show here that this is not the case.

While Max Kozloff, in "Photography: The Coming to Age of Color," presents an important critique of color photography's arrival and use, his aesthetic concerns and issues describe only the past 30 years or so as the era of origin.¹ Along the same line, Allan Porter, editor of *Camera*, proclaims Eggleston, Meyerowitz, Shore, Slavin and others as "The Second Generation of Color Photographers." The first generation, according to Porter, existed between 1938 and 1968 evolving after the introduction of Kodachrome in 1935. Anything before is seen as pre-history or "period zero." Discounting period zero, he suggests that because they were hampered by technical deficiencies, the first generation experimented, whereas the second generation expressed.²

Kozloff and Porter, particularly because of his definitive "period zero," seem to sell color short. Both isolate the recent past as the era of inception and evolution of serious color

imagery. This is not the fact of the matter. While the 1935 introduction of the populist Kodachrome was an undisputed milestone in the maturation of color, the foundations of a color aesthetic and criticism can be traced further: to the 1907 introduction of the Autochrome process. It was Autochrome that marked the point of departure for serious color.

Intruding on the Photo-Secession, used by Alfred Stieglitz and Edward Steichen, Autochrome prompted discussion on the implications of photography in color. As it was praised and criticized, issues and potentialities regarding serious color surfaced for the first time.

The introduction of the Autochrome process was, at the very least, a momentous technological achievement. Though color was reportedly recorded as early as 1827 by Niepce and Daguerre, 19th Century processes were, for the most part, unreliable and impractical: they were in the domain of persistent photo-scientists. By the late 1800s color photography *was* possible; but only to the most patient and fastidious. It was a cumbersome exercise in multiple exposures, colored filters, precise registration and special lighting for presentation. Even then, many considered the processes fraudulent because of their inability to render the 'true color of nature.' Such skeptics, disdaining the woeful state of the art, pronounced the photographic reproduction of natural colors as a practical impossibility.³ Nonetheless, color pictures were being made and exhibited, with speculation beginning on the future impact of this unexplored medium.

Camera Work, Alfred Stieglitz's renowned photographic journal, first broached the subject of color in a 1903 article in issue No. 2, entitled, "The Pictorial Aspects of Photographs in Colors." Authored by the respected R. Child Bayley, editor of the British publication *Photography*, the article presented one of the first serious discussions of color aesthetics.

Observing that photographs in colors had found their way into 'pictorial' exhibits, Bayley suggested that the future might proffer a cavalcade of color, leaving black and white work in neglect. Juxtaposing the merits of monochrome over color, he dismissed any real threat (to black and white) with a belief that

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"the color problem for practical work has been solved"

accurate rendition of hue was still impossible. The increased exhibition of color pictures was, according to Bayley, "due to the desire to encourage a promising process rather than for their pictorial qualities." He concluded that all color work, not reasonably true and convincing, is artistically offensive and immensely inferior to a correct monochromatic rendering.⁴ Bayley was not alone in his conclusions. The *Australian Photographic Journal* observed, "... those delicate tints which appeal most to the cultivated eye are just those which no known process has produced."⁵ With his conclusion, Bayley expressed what would become a lasting concern about color imagery: full chromatic accuracy is inherent to the medium's creative viability. In other words, if color could not be true, it would not be art. Seventy-five years later, some still subscribe to Bayley's contention that accurate rendition of hue is impossible, thereby flawing the medium as misrepresentative.

The arrival of Autochrome in 1907 made much of the prior technical criticism of color moot. First, it was seen as a comparatively practical process. Second, it rendered fairly accurate color. Invented by the Lumiere brothers of France, Autochrome required only a single exposure to produce a full color transparency.⁶ The process used a glass plate coated with a light sensitive emulsion and microscopic starch grains dyed red, blue and green. On exposure, the grains acted as tiny filters for recording one-third of the visible spectrum on the black and white emulsion. Processed as a negative, then a positive, the still present tri-colored grains formed a full color transparency (the visual result being similar to a present-day television picture, which is a composite of tri-colored dots of light). With Autochrome, practical color photography became readily available to the amateur and serious worker for the first time.

By chance, Stieglitz and Steichen were in Paris in June when the first Lumiere plates were to be shown. Illness caused Stieglitz to miss the demonstration; Steichen went and though he described the results as "pretty good only," he bought some plates to see what he could do with the new process.⁷ After seeing his results, Stieglitz proclaimed "the color problem for practical work has been solved."⁸

Within a few weeks, Steichen traveled to London where he sought out R. Child Bayley to show him some plates. Bayley was astounded with the results—the lack of grain, the variety of coloring and the wonderful richness. A striking portrait of Stieglitz, holding a copy of *Camera Work*, demonstrated the

process' sensitivity to a broad palette of colors—the rich distinction of a rough blue coat, the subtleties of the journal's grayish cover, the naturalness of the flesh tone, the nuances of a green velvet foreground. Steichen, too, was thrilled. "The pianola," he offered to Bayley, "has often been compared with modern pictorial photography, but this new process is the phonograph of color. It copies with the same startling realism that a good phonograph records a Caruso solo." While in London, Steichen photographed George Bernard Shaw, Lady Hamilton and a group of four women on a houseboat. According to Stieglitz, the pictures were artistically far in advance of anything the photographer had previously done.⁹

To this day, these images represent a significant milestone in the use of color photography. First, they reflect some of the earliest examples of the artistic potential of serious color images. Second, they most likely marked the inception of earnest color portraiture.

Stieglitz was convinced—he declared that the possibilities of the process seemed to be unlimited and that soon the world would be color-mad. Yet, he tempered that enthusiasm with a cautionary note: "The difference," he offered, "between the results that will be obtained between the artistic fine feeling and the everyday blind will be even greater in color than monochrome."¹⁰

Upon his return from Europe in September, Stieglitz presented an exhibit of Autochrome work by Frank Eugene, Steichen and himself. After the well received exhibit, Stieglitz prophetically reflected that the purely pictorial use of color would eventually be a side issue. Realizing the potential and the future implications of serious work in color, he wrote, "the effect of these pictorial color photographs when up to the Secession standards will be revolutionary, and not alone in photographic circles."¹²

It must be noted that the availability of practical color in 1907 was not unanimously acclaimed as a new means of valid artistic expression; not everyone was impressed.

In his December 1907 Presidential Address to the Walsall Photographic Society, E.J. Shaw, J.P., maintained in no uncertain terms that color photography could never be a medium of art. He saw color as totally incapable of entering the domain in which the artist (*i.e.*, the painter) makes known impulses that move man to action. The painter is and will continue to be supreme in artistic rendering of color, he argued, because he can combine the colors of nature with an inter-

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pretation from emotion. According to E.J. Shaw, color photography's true merit rests in its ability to record accurate color, to provide representational pictures which detail the varieties of hue, but only as such hues exactly are and, "as every passing eye sees them." Though color would produce "things of beauty" and be a "great educational force," it was simply mechanics and not art.¹³

With his usual outspokenness, Stieglitz rebuffed such criticism. Interestingly, he likened the controversy to those waged in photography about sharpness and diffusion, and 'straight' and 'crooked' photographic images. The debate, he suggested, just wasn't important. At the same time, Stieglitz rebutted the criticism of color as simple mechanics in an important statement differentiating between the artist's use of color and the ordinary photographer's use of the process:

... the Lumiere process is only seemingly nothing more than a mechanical one. It is generally supposed that every photographer will be able to get fine artistic pictures in color merely by following the Lumiere instructions, but I fear that suppositions are based upon mere illusions. Given a Steichen and a Jones to photograph the same thing at the same time, the results will, like those in black and white, in one case reflect Steichen, and in the other case probably the camera and lens—in short the misused process. Why this should be so in a mechanical process—mechanical and automatic are not synonymous. . . .

Those who have seen the Steichen pictures are all of one opinion. Lumiere's own examples . . . as well as those samples shown me at the various dealers in Munich, would never have aroused me to enthusiasm nor led me to try the process myself. That in itself tells a story.

"The photographer," he concluded, "who is an artist and who has a conception of color will know how to make use of it."¹⁴

The importance of individual artistry, as well as the special challenges and sensitivities of the medium were emphasized by other proponents. James A. Sinclair wrote of the charm of subtle tones, hence requiring the photographer to develop an effective sense of color.¹⁵ Robert Demachy also spoke of the photographer's need to understand color, and color harmony, previously a concern of the painter. He pointed out how (often) the Autochromist seemed to be only interested in correctly rendering certain isolated colors, ". . . without realizing that the presence of an adjoining color is sufficient to entirely modify the first." He observed, perhaps for the first time, the implications of color's limited latitude. "What is wrong is wrong and remains so," he wrote.¹⁶ Steichen, too, recognized

the imperative need for a sensitivity to color's unique demands, particularly the need to avoid "too much color." "The use of color," he later wrote, "at first it became more of a liability than an asset, for it brought forth an orgy of color. Instead of colorful pictures, we had coloriferous images."¹⁷

Finally, W. H. Alexander pointed out an interesting by-product of practical color imagery. To him, it would at least have a valuable educational effect related to color perception:

by making 'the man in the street' accustomed to notice the colours in nature, and to compare them with what profess to be reproductions of them, cannot fail to have a valuable educational effect. . . . and the crude harsh colour schemes that satisfy so many at present should become things of the past. . . .¹⁸

Yet with all of this, the flurry that accompanied the arrival of Autochrome began to wane in 1908. Over the next ten years serious work in color became virtually non-existent.

Perhaps it truly had been a novelty that wore off. Perhaps, lacking a color print process, the limitations of a singular transparency relegated the art too impractical. Two decades after its introduction, Autochrome and color photography were mostly in the domain of the amateur or commercial picture taker. Most notably, this period saw the birth of magazines which used color photos to bring their readers the flavor of far-away places or the current fashions.¹⁹

Pictorialism became passe. Stieglitz and the Photo-Secession evolved into Gallery 291. The realism of sharply focused 'straight' images, typified by the work of Paul Strand and Edward Weston, became the fare of the day. The fully scaled monochromatic print became the trademark of the new photographic vanguard. F. J. Mortimer, editor of *Photograms of the Year*, assessed the situation in his comments on the London Salon exhibit of 1921. ". . . there is a decided slump in photography in colors or color photography . . . in fact we doubt, even if color photography on paper becomes an accomplished fact, whether it will even oust good monochrome from favor," wrote Mortimer.²⁰ Several years later, *Photograms of the Year* again reaffirmed color's decline and deficiency, stating that further advancement to practical application for the every day worker would not occur "until it becomes possible for the amateur to produce color photographs on paper as readily as we can now make an ordinary print from a negative."²¹

Of the accomplished photographers of the period, Steichen alone continued to work in color. In the years to come, he produced color pictures for the new, and well paying, com-

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*Of the accomplished photographers of the period, Steichen alone
continued to work in color*

mercial magazines. For this he became the target of criticism from some of his colleagues. He was accused of having compromised, even though he maintained a clear functional distinction. While he saw color photography as a technique enriching the value of the image as visual information and documentation, he also held that "in the domain of abstract photography, I believe it can be regarded as an entirely new medium."²²

In retrospect, some historians have concluded that though Stieglitz and the Photo-Secession took a momentary interest in color, they made no important contributions to the progress of color photography.²³

This is a superficial analysis and simply untrue. Short-lived as their interest was, it was crucial: coinciding with the Photo-Secession their involvement with color lent initial credence and validity to a new means of photographic expression, and it provided an arena for the first body of color criticism.

Chromatic accuracy, color as mechanics, individual artistry, the supremacy of painting and monochrome, the essentials of color harmony, the viability of subtle hue, and the propensity for too much color all surfaced as considerations during this period. Even the question of permanence was raised.²⁴ All of these factors would be contemplated, debated, defended or disregarded by the coming generations. Some are still concerns today.

Additionally, this period allowed for the first inclusion of color imagery in serious exhibitions. Interestingly, some 33 years later a color section was included in The San Francisco Pageant of Photography of The Golden Gate International Exposition. Ansel Adams, director of the exhibit, recently confirmed that the color prints were "included . . . primarily as 'historic items,' " not as art.²⁵

It seems that even the demise of Autochrome foretold the future use of color for many years to come. Color photography would find its prominence among amateurs, most often as a novelty for documentation, or as a functional tool for commerce, for selling a product or recording the person. Both of these stereotypes held for years, diminishing only now as color photography has come of age.

Donato Pietrodangelo is a photographer and writer teaching at LeMoyné Art Foundation in Tallahassee, Florida.

1. Kozloff, M., "Photography: The Coming to Age of Color," *Artforum*, January, 1979, p. 30.
2. Porter, A., "The Second Generation of Colour Photographers," *Camera*, July, 1977, pp. 3-4.
3. *Photography*, The Journal of The Amateur, The Professional and The Trade, November, 1888.
4. Bayley, R.C., "The Pictorial Aspect of Photography in Colors," *Camera Work*, No. II, April, 1903, pp. 42-46.
5. "How Stands Photography in Colours Today?" *Australian Photographic Journal*, August 13, 1904, pp. 144-145.
6. In 1976, Mme. Jacqueline Millet claimed that Autochrome was invented by her great-grandfather, Louis Amedee Mante, at least a decade before the Lumiere discovery. Her claims have not been fully substantiated. They do not affect the point of this article, because, regardless of the inventor, Autochrome was not available for use (or criticism) until after 1907.
7. Stieglitz, A., "The Colour Problem for Practical Work solved," *Photography*, August 13, 1907, p. 136.
8. *Ibid.*
9. Bayley, R., "An Interview with Mr. Edouard J. Steichen," *Photography*, July 16, 1907, pp. 45-47.
10. Stieglitz, *op. cit.*
11. Stieglitz, A., "The New Color Photography—A Bit of History," *Camera Work*, No. 20, October, 1907, p. 22.
12. *Ibid.*, p. 25.
13. Shaw, E.J., "Photography and Painting," *Photography*, December 17, 1907, p. 496.
14. Stieglitz, A., *op. cit.*, p. 24.
15. Sinclair, J., "The Fascination of Colour," *Photography*, September 10, 1907, p. 221.
16. Demachy, r., "Pictorial Photography in France," *Photograms of the Year, 1910*, pp. 3-5.
17. Steichen, E., *A Life in Photography*, Doubleday and Company, New York, 1963, unpaginated.
18. Alexander, W., "Amateur Colour Photography," *Photography*, July 30, 1907, p. 88.
19. *National Geographic* published its first Autochrome, by Paul Guilleumette, in 1914. During the 1920s, the fashion magazines *Vanity Fair* and *Vogue* began the use of color images.
20. Mortimer, F.J., *Photograms of the Year, 1921*.
21. Mortimer, F.J., *Photograms of the Year, 1924*.
22. Steichen, E., *A Life in Photography*, Doubleday and Company, New York, 1963.
23. Sipley, L.W., *A Half Century of Color*, Macmillan and Co., New York, 1951.
24. Stieglitz, A., "The New Color Photography—A Bit of History," *Camera Work*, No. 20, October, 1907, p. 24.
25. Personal correspondence from Ansel Adams to author on February 5, 1979.

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THE NEW YORK TIMES, SUNDAY, MARCH 3, 1957.

STEICHEN ON COLOR

He Discusses the Place Of Experimentation

By JACOB DESCHIN

UNLESS the experimental attitude in photography is a full-time job, it is bound to be superficial, Edward Steichen recently told a large and attentive audience at the Museum of Modern Art. The museum's director of the photography department spoke on "Experimental Photography in Color."

Criticizing the notion popular among today's photographers that experimental color was necessarily a kind of photography calling for a special approach, Mr. Steichen asserted that the creative photographer is always experimenting, that every photograph he takes is an experiment. It is the attitude of a dedicated person, he insisted, one who is constantly searching for new and more effective ways of communicating his visual impressions through pictures.

One cannot be an artist one day a week, turn the artistic sense on and off, he said; the serious photographer is involved in his art, and exploits his capacities for creative work every time he takes a picture. True experimental photography, whether in color or black-and-white, is not concerned with trick effects, as is too often assumed.

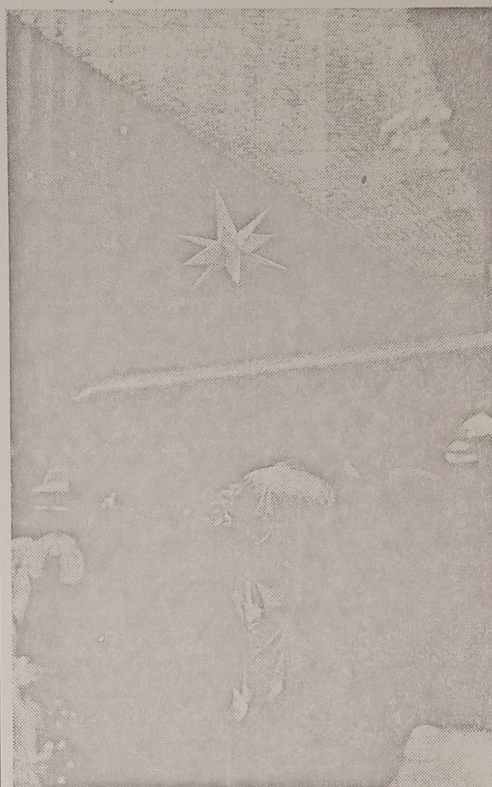
Slide Illustrations

Mr. Steichen illustrated his talk with a large assortment of color slides by prominent photographers. Among these were slides by Harry Callahan, in whose pictures Mr. Steichen found the photographic image preserved intact. In commenting on slides by Ernst Haas, he noted treatments derivative of painting.

Between these two limits was a range of approach supporting Mr. Steichen's thesis that it is not the photographic manner nor the content that makes a color picture experimental, but rather the photographer's thoughtful, emotional and artistic responsiveness to any material in terms of the color medium.

"Serious photographers and students of the art of photography have long since concluded," he said in commenting generally on recent experimental color work, "that any form of local interference with the photographic image constitutes an invasion of the other graphic arts. Today we must recognize

STREET REFLECTIONS



This picture by Frank Pauln is from his one-man show at Limelight Photo Gallery, 91 Seventh Avenue South.

the possibility that much experimental photography is moving into a more serious aberration when the influence of concepts of modern painting leads to imitating concepts that are actually peculiar to painting."

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April 1935

VANITY FAIR

Steichen's description of "Color-Printing" in connection with his American Ballet "snapshots" in that issue (pp. 38-39). G.M.M.

THE EDITOR'S UNEASY CHAIR

Home from the Wars

After twenty years of foreign corresponding, Raymond Gram Swing (whose article on Secretary of the Interior Ickes begins on lead-page 15 of this issue) returned to America last summer to become an editor of *The Nation*. His European service started in Germany before the War, when he was Berlin correspondent for the *Chicago Daily News*. One of the two Americans who eyewitnessed the Allied attempt to force the Dardanelles in 1915, he was likewise the only American ever to have been torpedoed by a British submarine—a very enviable piece of good-luck which overtook him in the Sea of Marmora.

Swing was born at Cortland, New

HARRIS & EWING



RAYMOND GRAM SWING

York, in 1887. He took up journalism in Cleveland, and lost more and more sleep for newspapers in Cincinnati and Indianapolis, before going abroad in 1913. In the closing year of the Late Unpleasantness he served as Examiner of the U. S. War Labor Board. The New York Sun sent him back to Berlin in 1919, and two years later he crossed to London in behalf of the New York *Evening Post* and the Philadelphia *Public Ledger*. From his newly-acquired post at *The Nation*, Mr. Swing finds America so exciting that he no longer reads about European affairs with anything but the greatest difficulty.

Color-Printing

For this number of *VANITY FAIR*, Edward Steichen went to Hartford, Connecticut, to snapshot the American Ballet, toe in air. The magnificent results of his visit appear on pages 38 and 39. So numerous have been the inquiries about the special method of color-photography which Steichen follows, that he has written a summary of it, which explains, in concise terms, the details of color-printing. The summary follows here.

'*VANITY FAIR* color snap shots are a compromise between the technique of two color and three color photography. The original negatives are made on Defender "Du-pac film." Any type of camera using plate or cut film holders may be employed. A plate or film

holder that will hold the pair of "Du-pac film" in close contact is necessary. (The Finley type plate holder is well suited to the purpose.) A Mendelsohn flash bulb synchronizer is used on the camera so that flash-bulb exposures can be made in one one-hundredth to one three-hundredth of a second, depending on the speed the shutter is capable of. The films are developed in the standard developer recommended by the film maker.

'We now have two color separation negatives, one a red and one a blue printer. By choosing the proper printing colors excellent prints can be made in two colors from these two color separation negatives but due to the technical limitations of any two colors chosen the results will all be monotonously alike. For the purpose of magazine illustration we require a more flexible printing medium and a more variable technique.

'For the printing medium we employ the new Eastman "Wash-off film" and their special three color dyes. This film can be used for making color transparencies or imbibition prints.

'To make our two color separation negatives produce results that will reasonably give the effect of a true three color job we use the very simple and ingenious method devised by Hiram Deeks. First the usual prints are made, one from the red printer and one from the blue printer. For the third, the yellow printer, the following technique is employed. The "Du-pac" red and blue printer negatives are placed over each other on the glass top of a printing machine and brought into accurate register, then while held firmly in register one negative is taped down to the glass top of the printer on one side and edge with adhesive tape, the other negative taped down on the opposite side so that both negatives are on hinges and in register. A sheet of "Wash-off film" is laid over the negatives in printing position, taped down and thus hinged to the glass on the upper edge so that it can be brought down over either one or both of the negatives at will. Thus the two original negatives flop one to the right and one to the left and the printing film on the top edge flops down towards the operator.

'In making the print the exposure is made during a part of the required time through the blue printer negative and for the balance of the total exposure it is made through the red filter negative. By varying the time of exposure made from each of the two color negatives the resultant yellow printer is changed and the balance and general color of the final picture can thus be varied considerably and in some cases the appearance of a straight three color photograph is satisfactorily achieved.

'This brief résumé of the color snap shot technique will enable any experienced color photographer to use it successfully. To photographers inexperienced in color photography the study of one of the standard books on color photography is recommended as a preliminary before

attempting any actual color work. These books and the material mentioned can be obtained through any photographic supply concern. Instructions regarding the manipulation and processing of the materials mentioned can be obtained from the makers.'

Wreaders writhed

Unrest grew among readers of *VANITY FAIR* last month as they perused and tried to digest *The Growing Cruelty of the Law*, by Westbrook Pegler. "I have been unable," wrote Blackmer Humphrey, of Williamstown, Mass., "to decide whether it was intended as an earnest diatribe against the criminal system of the United States, or merely as a collection of whimsical fancies. As either," Mr. Blackmer went on to say, "it was a complete failure." In Schenectady, New York, Mr. D. A. Yates was "left in a quandary." Said he, "It seems rather ridiculous to attribute the cause of all criminal action to claustrophobia. . . . If Mr. Pegler is serious, I should say he is very narrow-minded." Upon Mr. B. L. Schueler, of Utica, the simple little thought that Pegler might have intended his piece as satire never dawned at all. "Evidently," he writes, "Mr. Pegler would excuse every criminal on the assumption that he was suffering temporarily from a disease. . . . Rather warped."

Briefly, the Pegler point was this, stripped of its definitely (to some of us) satirical embellishment: that feloniously inclined persons, who comport themselves "against public policy," ought to be shot on sight, and rubbed right off the map, especially when they plead "Insane" to boot.

Forbear

In the fall of 1859, a weekly digest called *Vanity Fair* began to be read in the fashionable foyers of New York. A poster, advertising No. 75 of this now extinct venture, is shown here, below. Deliberately copied after England's age-old *Punch*, and edited by Artemus Ward, the best-known hu-

morist of his time, it relieved distress in an era of social darkness, as, in its own way, another *VANITY FAIR* has attempted to brighten the prospect of living in these troubled times.



ADOLF DEHN

Wagnerites beware!

On page 35 of this issue, Adolf Dehn reappears to the devout after a lapse of three years. His immediate target is the opening of *Siegfried*, Act III, at the Metropolitan Opera. (Brünnhilde, you will recall, has been imprisoned within a circle of fire by a stern parent, and the heroic Siegfried is en route to reclaim her, to the tune of Wagner's immemorial love-lyric, "Through the Smoke and Flame, I've Got to Go Where You Are.") Artist Dehn shows these things, first, as they are rehearsed, and then, as they are performed. And we trust that no Wagner-addict will find his illusions too widely dispersed, after seeing the blooming Brünnhilde immersed in a copy of the New York *Mirror*, during the rehearsal.

Dehn was born in Waterville, Minnesota, forty years ago. His parents had the good sense to respect their son's artistic ambition, and he was sent to an art school in Minneapolis. At twenty-one, he came to New York and enrolled at the Art Students'

League. There was little money and the consequent irritation of small receipts from a world to which he had so much to give. His drawings began to reflect a satirical outlook; but thanks to his innate good nature, they bespoke an affable, Rabelaisian touch, rather than a relentless hatred of bourgeois institutions, as once nourished by George Grosz.

In 1921, Dehn went abroad. He has studied in Vienna, Berlin, Paris, and London, and only recently returned to make New York his permanent home. Dehn lithographs hang in the British Museum, the Metropolitan Museum of Art, and in the Academy of Fine Arts at Honolulu. He says, on the other hand: "I had succeeded in never winning a prize with my prints until the Philadelphia Art Alliance came along last year and spoiled everything with a First Prize."

ARTHUR CARLSON COLLECTION

VANITY FAIR!
No. 75. Just Out.
ARTEMUS WARD
Gives his experience among the FREE LOVERS.
The Southern Mallbrook.
A SONG OF THE FUTURE.
A VIEW OF THE GREAT
SOUTHERN PETER PUNK SHOP.
Showing how the C & A Bonds are READILY taken.
We show the INFANTILE disposition
The Telegraphic Descent.
A TRIBUTE TO THE GALLANT
ELLSWORTH.
For Sale by all Newsamen. Price 6 Cents.

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LETTERS TO THE EDITOR

Dear Editor:

I just received *Photographica* for October, 1974, this morning, November 6, 1974.

This mailing announced a speech, October 16th by Eaton S. Lothrop, Jr. Does this seem fair to you?

Cordially,
Harry H. Servis, Jr.
1002 Temple Building
14 Franklin Street
Rochester, N.Y. 14604

Editor's note: The October issue was in the mail well in advance of Mr. Lothrop's speech, but, unfortunately, Photographica was at the mercy of a local UPS strike which dislocated the N.Y. postal system. We mail at the special educational rate, not at the 1st class rate which would cost the Society an additional \$3 per year per member. The Society now spends over \$10 per member per year to publish Photographica. One alternative is to raise membership dues. Do any readers have any comments or suggestions?

Editor, PHOTOGRAPHICA

During a recent long-distance phone call, a friend inquired where he could get a copy of "that nifty book on old cameras" that he had seen at my home. I offered to have one sent by the local specialty photo booksellers. The clerk there was very obliging and took the information, agreeing to send him a copy. As you might expect, their big business today is photographic fine art publications. (There are, sadly, few books on antique cameras.) The clerk wanted to verify the title again - "That's one copy of 'Sensuous Cameras'?" I thought that everyone was familiar with "A Century of Cameras" by Eaton S. Lothrop, Jr. - N.M.G., Rochester, N.Y.

To the Editor:

While recently sorting through photographs in the Steichen estate in Redding, Connecticut, I came upon a number of autochromes taken by him. Some of them were in diascopes, as described by Margery Mann (in *PHOTOGRAPHICA*, June-July 1974, p. 25). Two of them were for 5x7" autochromes and bore the same markings mentioned in Ms. Mann's letter; that is, Diascopes #2 manufactured by L.A. Dubernet Sept. 1, 1908. There was an additional one for a 7x10 autochrome which was also manufactured by Dubernet. After finding these absolutely intriguing viewing devices, I became interested in the whole autochrome era and did some further research. I found a price list dated September 1923, put out by the R.J. Fitzsimons Corp., 75 Fifth Avenue, New York City. The list included prices for diascopes. I am enclosing a copy of this price list, which may interest some of your readers.

Bobbi Carrey
Cambridge, Massachusetts

Dear Editor:

I am a student at Southern Illinois University and involved in a camera obscura project. My project is to build a reproduction of a camera obscura. It would be of great help to me if any of your readers could please send any plans, diagrams or any information regarding the assembly procedures and mechanical data for the camera obscura. Due to the limited amount of time I have for this project, please make efforts as soon as possible.

Thank you,
Les Lesclotto

c/o Amy Caldwell
R.R. 6
Carbondale, Ill. 62901

SOCIETY DONATION FOR PLUMBE MONUMENT

The PHSNY Board of Directors voted at the November meeting to make a contribution of \$25 to *The John Plumbe Memorial Association*. Formed under the auspices of the Dubuque County Historical Society, the Association is seeking to raise \$500 to erect a black granite monument at the location of Plumbe's unmarked grave site in Dubuque, Iowa. Several Society members have also made personal donations to the fund.

In announcing the contribution, Society President Jerry Sprung said, "John Plumbe can be counted with a small group of photographers who played a significant role in the first twenty years of photography in America. Our Society is particularly pleased to be able to contribute to the Memorial Association's effort to recognize Plumbe's place in history."

The John Plumbe Memorial Association, which can be reached at the Dubuque Historical Society, P.O. Box 305, Dubuque, Iowa 52001, has pledged that donors of \$5 or more will be sent an ornate memorial certificate and a biographical sketch of Plumbe.

1890 U.S. CENSUS: 20,040 PHOTOGRAPHERS

At the time of the 1890 Census, there were over 20,000 photographers operating in the United States. Surprisingly, over 10% of them were female!

The following Census figures show the number of photographers and, for comparison purposes, the number of males and females making their livings in several other common occupations.

1890 U.S. Census - Occupations

	Male	Female
Photographers	17,839	2,201
Dairymen/dairywomen	16,161	1,734
Journalists	20,961	888
Dentists	17,161	337
Architects, draftsmen	17,134	327
Restaurant keepers	16,867	2,416



J. FLEURY-HERMAGIS

OFFICIER D'ART ET D'INDUSTRIE, MEDAILLE D'OR LA SOCIÉTÉ FRANÇAISE LA PHOTOGRAPHIE
BOULEVARD DE TOUL LES MINISTÈRES ET DES GRANDES ADMINISTRATIONS
Médaille d'Or, Exposition Universelle, Paris 1889 - La plus haute
reconnaissance décernée aux objets utiles pour la France
PARIS - 18, Rue de Rambuteau

NOUVEAU APAREILS INSTANTANÉS (F. 7) demi grand angle et
L'ANALYSEUR EN SANS ASSIGNEMENT CONTRAINDRE AU SUPPLÉMENT À CROIX DES
modèles marqués d'angles (Nomb. de l'œuvre et de la comparaison à l'appareil)

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Color Photography

Inventors and Innovators

1850–1975

Yale University Art Gallery

11 November to 11 January

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Frank Eugene Smith
Stieglitz and Emmy 1907
Transparency from Lumiere autochrome
8 x 10
Metropolitan Museum of Art, New York

Edward Steichen
Portrait of Alfred Stieglitz 1907
Transparency from Lumiere autochrome
8 x 10
Metropolitan Museum of Art

Edward Steichen
Mrs. Gertrude Kasebier no date
Transparency from Lumiere autochrome
8 x 10
Metropolitan Museum of Art

Edward Steichen
Rodin (posed in a sheet) 1909
Transparency from Lumiere autochrome
8 x 10
Metropolitan Museum of Art, New York

Alfred Stieglitz
Frank Eugene drinking beer 1907
Transparency from Lumiere autochrome
8 x 10
Metropolitan Museum of Art, New York

Alfred Stieglitz
Mrs. Selma Schubert in a yellow dress outdoors 1907
Transparency from Lumiere autochrome
8 x 10
Metropolitan Museum of Art, New York

Dr. Arthur Traube
Portrait of a Woman no date
Uvatype
10½ x 7½
The International Museum of Photography
George Eastman House

F.W. Westley
Swimming Bath RMS Empress of Britain 1937
Vivex
11 x 14½
The International Museum of Photography
George Eastman House

Designed by Laura Geringer and Jane Cullen
Set in 9 and 11 point Garamond
Printed by Yale University Printing Service

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Color Photography

Inventors and Innovators

1850-1975

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Edward Steichen

Born, 1879 Luxembourg. Family settled in Michigan, 1881. Father worked in copper mines; mother trimmed hats. Age 15, became apprentice to a lithographic company in Milwaukee, 1894. Organized and became first president of Milwaukee Art Students League. First public showing of photographs, 1899 at Second Philadelphia Salon. Met Alfred Stieglitz, 1900 at Camera Club of New York. Participated in exhibition, "The New School of American Photography," Royal Photographic Society, London, 1900, organized by F. Holland Day. Elected member of Linked Ring, 1901. First one-man show, La Maison des Artistes, Paris, 1902, including paintings as well as photographs. Became one of founding members of the Photo Secession, 1902. Worked with Stieglitz in establishing "The Little Galleries of the Photo Secession," later known as 291, New York, 1905. Took his first color photographs with three color separations, 1904. Exhibit of photographs including experiments in color at Photo Secession, 1906. Color autochromes shown at Members' Show, 1907. Began pioneering role in gathering work by modern artists in Europe to be shown in America including Rodin, Matisse, Marin, Cezanne, Craig and Brancusi. Three autochromes reproduced in *Camera Work*, 1908. Sister Lillian married to Carl Sandburg, 1909. Balzac series exhibited, reproduced in *Camera Work*, 1911. Joined US Army, 1917. Became Commander, Photographic Division, Air Service. Retired 1919 with rank of Lieutenant Colonel. Chief photographer for Conde Nast publications, 1923-38. First showing at the Museum of Modern Art, 1932. Display of hybrid delphiniums at the Museum of Modern Art, 1936; the first one-man show featuring breeding living material as an art. Began using 35mm color film, 1938 during a vacation in Mexico. One-man retrospective exhibit at Baltimore Museum of Art. Joined US Naval Reserve, 1942. Commanding Officer, Naval Aviation Photographic Unit. Retired with rank of Captain, 1946. Appointed Director, Department of Photography, Museum of Modern Art, 1947. Organized a number of exhibits including one on "All Color Photography," 1950 and "The Family of Man," 1955. Retrospective exhibit, Bibliotheque Nationale, Paris, 1965.

"Personally I have no medium that can give me color of such wonderful luminosity as the autochrome plate. One must go to stained glass for such resonance, as the palette and canvas are a dull lifeless medium in comparison . . . 2,000 nuances can be produced in a square millimeter!"

from *Camera Work*, 1908, No XXII

"The introduction of Kodachrome color film at last made the use of color available to the art of photography as a practical technique. At first, it became more of a liability than an asset, for it brought forth an orgy of color. Instead of colorful pictures, we had coloriferous images. Color photography can be considered as a technique that enriches the value of a photography as visual information and documentation but in the domain of abstract photography, I believe it can be regarded as an entirely new medium."

from *A Life in Photography*, autobiography, New York, 1963

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La Moisson.

A. MINGET.

LES HARMONIES DE COULEURS ET LA PLAQUE AUTOCHROME

LA simple et admirable solution du problème de la photographie en couleurs fournie par la plaque autochrome a mis les pictorialistes en face d'un autre et nouveau problème. De même qu'un enfant cueillera dans un parterre la fleur la plus rouge, nous avons usé nos premières plaques sur cette couleur, obéissant ainsi à d'ancestraux et sauvages instincts, qui n'en sont pas plus mauvais, du reste. Mais, aux débuts, nos perceptions esthétiques spécialisées dans l'étude du blanc et du noir vont recevoir un premier et sévère à-coup. Car nous tenterons fatalement de plier nos plaques autochromes aux anciennes lois qui régissaient notre travail, jusqu'au jour où nous constaterons qu'il est aussi absurde de photographier la nature en couleurs sous les règles de l'art monochrome que de se donner beaucoup de mal pour faire ressembler une épreuve à l'huile à un bromure.

Il semble tout d'abord certain que toute image destinée à être vue par transparence appelle la couleur. Car nulle autre condition de vision ne nous donnera pareille sensation d'intensité colorée — les superbes vitraux de la cathédrale de Chartres, par exemple, dans le travail desquels tout a été sacrifié à la lumineuse harmonie des couleurs, nous en fournissent la preuve. Mais gardons-nous d'en conclure que le succès en autochromie consiste à accumuler follement sur une plaque les bleus, les rouges et les jaunes; bornons-nous à admettre que, puisque nous possédons un procédé qui nous permet, ce qu'aucun autre n'a fait jusqu'ici, la reproduction des couleurs,

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c'est du côté de la couleur que nous devons nous orienter. Malheureusement la plaque autochrome obéira avec docilité aux ordres du photographe, que celui-ci soit artiste et coloriste ou qu'il ne le soit pas.

Il est admis scientifiquement que plus les tons d'une harmonie de couleurs sont purs et lumineux, plus cette harmonie sera belle. Mais faut-il encore qu'il y ait harmonie dans l'arrangement général et la juxtaposition des tons. De toutes les symphonies colorées, c'est la symphonie en camaïeu, ton sur ton, qui offre le moins d'écueils à celui qui n'est pas coloriste d'instinct et qui recule devant l'étude des effets plus intéressants, mais plus difficiles, produits par le contraste des couleurs. Tant que les plaques autochromes, ou autres, ne seront pas livrées en de grandes dimensions (nous ne parlons pas des petites plaques destinées à être vues en projections, puisque leur agrandissement subséquent les fait rentrer dans la catégorie des grandes images), il sera avantageux de se limiter à des effets de camaïeu ou, du moins, à ceux qui sont régis par une couleur nettement dominante.

Une plaque autochrome, même de dimension de 18×24 remplie d'une mosaïque de différentes couleurs, n'offre aucun intérêt dès qu'elle est vue à la distance normale, tandis qu'un sujet composé de larges surfaces de même couleur ou comportant une harmonie générale en un ton, jouira d'une qualité lumineuse extraordinaire et qui portera loin.

Voici, par exemple, un vase en cuivre rouge rempli de fleurs jaunes se détachant sur un fond de tonalité dorée. Cette harmonie de couleurs restera belle à travers tous les stades du traitement de la plaque; et le renforcement, même répété, ne fera qu'intensifier la richesse de ses tons, en supposant, bien entendu, que les opérations précédentes, pose incluse, aient été convenablement dirigées. Supposez encore une femme à chevelure rousse habillée d'étoffes rouges et brunes, de tonalités chaudes, contre un fond de mêmes couleurs ou un arrangement en bleu-vert et brun.

Ce sont des effets simples à manier et qui donneront d'excellents résultats en couleurs.

Mais un contraste de couleur, une note de lumière vive sur un accessoire de cristal, d'étain ou de cuivre, quelquefois une simple tache de noir pur, feront chanter bien davantage le reste de l'harmonie ton sur ton. En somme, nous devons étudier l'enveloppe colorée du modèle et la composition générale sur la nature, exactement de la même façon qu'un peintre sur sa toile commencée.

L'écran Renngott nous aidera beaucoup. Son influence sur l'harmonie des couleurs est extraordinaire. Il avive les jaunes, les verts et les rouges et noie la composition dans une enveloppe dorée du plus heureux effet. Il est vrai que la pose s'en trouve presque doublée, mais je considère que cet inconvénient est amplement compensé par les avantages que je viens de décrire. Nous pouvons aussi obtenir une enveloppe similaire en étendant, entre le modèle et la source principale de lumière des voiles de mousseline de soie de couleur appropriée. Car le ton général du tableau, l'enveloppe en d'autres termes, est puissamment influencé par la couleur de la lumière incidente. Ainsi la lumière ensoleillée d'été réchauffe tous les tons, même

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dans un appartement. Un temps gris jettera, au contraire, sur le motif un voile bleuâtre et froid. Il est donc nécessaire de tenir compte, en vue du résultat final, non seulement de l'intensité, mais encore de la couleur de la lumière ambiante.

Il est plus compliqué et plus difficile d'obtenir une harmonie de couleurs en opérant par contrastes. Sachons d'abord que, si deux couleurs complémentaires sont placées côte à côte, l'intensité de ton et la luminosité de chaque couleur seront augmentées par le voisinage de sa complémentaire — et que, lorsque ces deux couleurs occupent un espace important dans une composition, les autres couleurs, bien que non complémentaires, gagneront cependant au voisinage de celles-là. Habillons une femme d'une robe rouge que nous tenterons de reproduire à son éclat maximum; il nous faudra choisir un fond plutôt sombre, de couleur vert-bleu. Mais si c'est un portrait dans le vrai sens du terme que nous nous proposons de faire, le rendu de la robe deviendra secondaire et nous éteindrons au contraire sa couleur en la faisant détacher sur un fond de tonalité neutre. Dans tous les cas, nous éviterons les fonds crus de peluche rouge ou bleue, à moins que nous ne voulions faire une étude de peluche, mais alors le modèle est de trop.

Il est nécessaire de bien connaître la série des couleurs complémentaires au point de vue de la composition des natures mortes et de l'entourage du modèle. En voici la liste : le jaune de chrome est la couleur complémentaire du bleu d'outremer; l'orange, celle du bleu; le vermillon, celle du vert-bleu; le rouge, celle du bleu-vert; le violet, celle du vert.

Dans les compositions comprenant un personnage, les fleurs et les étoffes de couleurs variées nous seront très utiles comme accessoires. Une note vive fournie par une orange ou un citron suffira souvent à compléter heureusement le tableau. Mais l'autochromiste devra se méfier des larges zones de tons unis, tentantes cependant. C'est là que viendront fatalement se grouper toutes les taches et les défauts de nos plaques.

La superposition de deux positifs autochromes permet d'obtenir des intensités de couleur très remarquables. Faites deux plaques identiques d'une nature morte, posez très largement et superposez les positifs bien exactement; les couleurs et les noirs doubleront de puissance.

Mais au point de vue couleur, nous aurons parfois des déboires. Ainsi certaines harmonies colorées que nous admirons dans la nature doivent leur beauté plutôt à la texture de leur matière qu'à leur couleur vraie. Voyez la combinaison de rouge et de violet de certaines fleurs. Et cependant, en ces cas particuliers, le photographe l'emporte sur le peintre parce que la lumière traverse ses couleurs au lieu de s'y refléter simplement; elles gagnent à être vues par transparence.

Cette question de texture explique la déception de bien des femmes devant le rendu sans intérêt de leurs robes en peinture. Il y a deux raisons pour cela. D'abord l'impossibilité de rendre sur une toile les minutieuses harmonies colorées qui se jouent dans les reflets des soies et des satins. Ensuite la double personnalité du couturier et de l'artiste, le premier n'ayant pas composé sa robe en vue du fond et de l'entourage que le second lui a

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En Italie.

A. KEIGHLEY.

taches de noir dans des compositions de ton très clair. Mais, pour ceux-ci, il faut ajouter que leurs couleurs sont appliquées sur des dessous clairs et que leurs taches peuvent, en somme, n'être considérées que comme des accents.

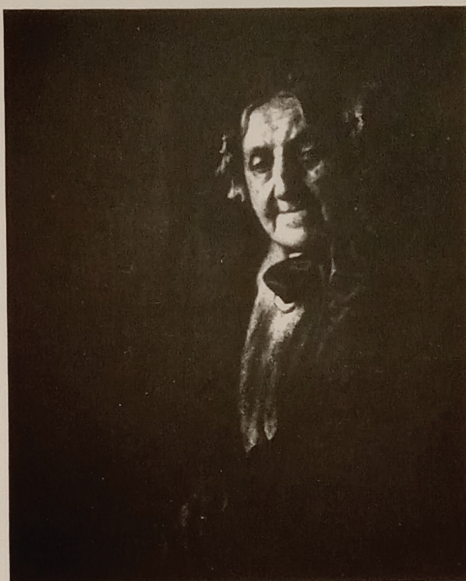
donnés. Car il n'est pas discutable que bien des modistes et des couturières parisiennes ont davantage le sentiment de la couleur que la plupart des peintres. En vérité, je ne connais pas de champ d'étude plus profitable que celui des chapeaux et des robes des Parisiennes. Vous y trouverez toutes les combinaisons possibles depuis le ton sur ton — j'ai vu ainsi d'admirables harmonies en brun — jusqu'à l'emploi hardi des couleurs intenses et des contrastes complémentaires.

Les arrangements les plus difficiles à réussir sont, sans aucun doute, ceux qui comportent deux couleurs qui sont différentes mais contiennent cependant un élément commun, soit l'arrangement en orange et jaune, en rouge et violet, en rouge et orange. On y arrive quelquefois en séparant les couleurs par un ton noir. Aussi l'intensité du ton joue un rôle important. Ainsi le rouge et le bleu dans toute leur vigueur peuvent donner de beaux effets; délayés en rose et en bleu pâle, ces couleurs deviennent atroces. Ces tons pâles peuvent cependant être réveillés par la contiguïté d'une note blanche. Ainsi nous aurons soin, si nous avons à photographier des fleurs aux tons très pâles, de les rapprocher d'un objet blanc. De même, nous placerons contre un fond blanc un modèle habillé d'étoffes claires et légères. Nous l'entourerons, au contraire, de noir, si ses vêtements sont de couleur sombre; ils en paraîtront plus clairs. Cependant, on ne peut ériger ces principes en lois, car nous voyons Rembrandt et les Vénitiens se servir de bruns et de noirs pour corser leurs couleurs et les Japonais introduire des

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Quand nous aborderons le paysage en autochromie, nous nous heurterons à de nouvelles difficultés; car nous nous trouverons à la merci de la nature et notre contrôle ne pourra s'exercer que sur le temps de pose et de développement. Cependant l'emploi intelligent de l'écran Renngott et d'autres écrans variés, de teintes très pâles, ajoutés à l'écran Lumière, nous donnera quelques facilités.

Les principales erreurs que j'ai relevées dans la plupart des paysages autochromes peuvent se résumer ainsi : développement trop prolongé, renforcement exagéré. Il en résulte des couleurs crues et fausses. Dans les contre-jours surtout, les troncs d'arbres et les ombres portées sont rendus par des masses noires et bouchées. Le remède est tout indiqué : Augmentez légèrement la durée de la pose et diminuez celle du développement. L'expérience seule déterminera le degré de modification à apporter à ces opérations, il n'y a pas de formule possible.



Portrait de Mme de G.

M^{me} A. Buxton.

C'est en été, bien entendu, que se consomme le plus grand nombre de plaques autochromes. Tout est vert à cette saison-là et on peut être sûr que cet océan de verts va être renforcé jusqu'à faire hurler. Voyez les charmantes plaques autochromes de projection par M. Personnaz; vous n'y trouverez pas un seul paysage vraiment vert, et ils sont tous exquis. Car il a cherché ses effets parmi ceux de la nature qui sont les plus subtils et les plus délicats. Il est intéressant d'étudier à ce point de vue la différence entre les paysages autochromes de l'amateur photographe de culture moyenne et les tableaux des grands paysagistes. L'effet que le peintre évite ou n'aborde que rarement semble la règle chez le photographe. Nous chercherons en vain des effets de verts brillants, de verts de sève pour ainsi dire, dans l'école de Barbizon. Même chez les impressionnistes qui se sont fait une spécialité des effets de lumière et de plein soleil, les verts ne jouent qu'un rôle effacé. A tel point, que lorsque le motif comprend dans la nature de larges espaces de cette couleur, les artistes comme Monet prennent soin de rompre la crudité des verts par des petites touches de rose et de violet.

Du reste, en comparant les résultats de l'autochromie avec les théories

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de l'impressionnisme, on est étonné de reconnaître que beaucoup de ces théories sont confirmées pour la plaque autochrome et que beaucoup de points de technique sont contredits. Ainsi, à l'époque où le public s'irritait devant les ombres bleues des plein-air de la nouvelle école, la plaque autochrome aurait convaincu les incrédules qui avaient des yeux et n'y voyaient point. Au contraire, nous pouvons aujourd'hui prouver l'inanité de l'explication de la technique pointilliste donnée par les critiques à l'apparition de cette école. Il était admis que des taches juxtaposées de couleurs diverses se fondaient optiquement (au centre optique cérébral du spectateur) pour former un ton composite. Or, étant donné le diamètre de ces taches de pâte, il faudrait, pour qu'elles puissent se confondre optiquement, que le spectateur soit à plusieurs centaines de mètres de distance de la toile. Et si ce mélange optique avait lieu, il donnerait tout simplement du gris à la place des riches tonalités cherchées; tandis que l'intention des pointillistes est d'obtenir une vibration lumineuse toute particulière en plaçant leurs tons à côté les uns des autres au lieu de les mélanger. En effet, le bleu et le jaune, quand le mélange est effectué sur la palette, donnent un vert beaucoup plus éteint que lorsque ces couleurs sont appliquées pures, côte à côte sur la toile même. Dans ces conditions, le mélange optique proprement dit ne se réalisera pas. Mais l'œil, passant rapidement de la tache jaune à la tache bleue, il y aura persistance d'impression rétinienne et il en résultera une illusion de vert.

Et si nous parlons de mélange optique *scientifique*, ce n'est pas même du gris que nous ferons en fondant deux complémentaires comme le jaune et le bleu, mais bien du blanc.

Actuellement, les aspirations tendent sans doute au transport de l'image en couleurs sur du papier. Je suis persuadé que la solution de ce problème est proche. Mais nous ne devons pas nous attendre à des résultats pareils à ceux



Nature morte.

BOB DE MEYER.

que nous donne l'image vue par transparence. Le rendu de la couleur sera peut-être exact au point de vue des tons, il ne sera jamais à la hauteur de celui des plaques autochromes au point de vue de l'intensité et de l'éclat. Bien des sujets que nous admirons aujourd'hui perdront tout intérêt, toute beauté aussi, dès qu'ils seront vus par réflexion. Tous les motifs riches en

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couleur et en lumière nous donneront pareille déception, car leur beauté n'est due qu'à l'intensité de leurs couleurs. Dès que celles-ci seront éteintes par leur nouveau support, il ne restera plus rien.



Coucher de Soleil.

L. MISONNÉ.

Les plaques autochromes nous ont apporté un nouveau médium qui restera. A mon avis, c'est le plus beau que la photographie nous ait jamais donné pour traduire la nature.

EDUARD J. STEICHEN



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EDOUARD J. STEICHEN. A SELF-PORTRAIT.

An Interview with Mr. Edouard J. Steichen.

SOME ACCOUNT OF HIS AUTOCHROME RESULTS. SPECIAL TO "PHOTOGRAPHY."

ONE day last week we had the pleasant surprise of a call from Mr. Steichen, who was paying a flying visit to London. We had heard that he had been getting some wonderfully successful pictures on the new Lumière Autochrome plates, and we lost no time in making enquiries about them.

"I have got them in London," said Mr. Steichen. "I brought them over on purpose to show you, so if you will come along to my hotel, we will go through them, and you can see for yourself what they are like."

We told him that we had almost given the process up as a mere flash in the pan, so great had been the delays in bringing it out.

"There has been a tremendous lot to do," he replied. "Think what it means. They had to devise apparatus for sorting out the starch grain so as to get it all of a size, to find out dyes that were exactly suitable, to get machinery for coating the plates with the starch grains, which the inventors state are so fine as to run 20,000 to the inch (8,000 per mm.) These are so disposed that they have on their surface an even layer of the fine dyed particles in equal proportions of orange, green, and violet, just one particle thick; for they must not overlay each other. Then the interstices between the grains have to be filled in with black, so

that no white light whatever can pass through the plate. I believe it is then subjected to heavy pressure in some way or another before it receives its coating of emulsion."

"Is it an ordinary emulsion that is on the plates?" we asked.

"It seems an ordinary panchromatic emulsion, but the coating is very much thinner than that on an ordinary plate. It has to be, or it would not be possible to reverse the negative so simply—to turn it into a positive, in fact—by means of the permanganate. I called on Professor Lippmann the other day, and saw some of the colour photographs made by his method. There you have the real colour photography—the only real colour photography, one might almost say. What wonderful things they are, but one must see them thrown on the screen to appreciate them. What a pity the process is quite impracticable, and I am afraid it must remain so. This Lumière method, though, is practicable enough. The instructions given with the plates are comparatively simple, and it is bound to create a perfect furore for the work. You see, it does away with the doing of all the operations three times over—with the dyeing or staining, with superposing, and the loss of register that sometimes followed. And it is so good. The other day I had a

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visit from Moncure Conway, the celebrated lecturer. I had told him nothing about the process, but he sat down in the studio, and I photographed him on one of these plates. My wife entertained him for twenty minutes while I was in the dark room, and by that time I was able to take the plate out, and show him a picture of himself in natural colours. He was struck all of a heap, as you can well understand. The operation don't take anything like as long as it does to make a negative in the ordinary way, and get a print from it."

At this point we adjourned to the hotel, where two or three plate boxes were brought out, and the colour photographs were produced. The first to be shown us was a copy of a painting; and, of course, the first thing to be looked for, after noting the wonderful richness and variety of the colouring, was the grain, but for the naked eye it did not exist. It was only after Mr. Steichen had handed us a magnifier that we were able to see that the greys and whites were actually made up of minute grains of the most intense violet, green, and orange, and that the purest blue—and the picture contained a striking cobalt blue—was an optical mixture of violet and green. The grain was quite unnoticeable, and we said as much.

"At the conference they showed a large number of lantern slides," said Mr. Steichen, "and I was only a few yards from the screen, but the grain even then was hardly perceptible. Isn't that blue wonderful? As pure as could be wished, and yet nothing but violet and green. Look here, too," and he passed us another portrait—that of Moncure Conway, just referred to.

"Look at the truthfulness of those flesh tints. Most of the specimens I have been shown had the flesh a mere pinkish grey. The sitters were put in a strong light to reduce the exposure, and the result was at once a grey. Look at my hand here—and here," and he held it first near the window and then in the subdued light of the room. "That portrait had a minute and a half well inside my studio, and you see at once how the flesh is a real flesh tint, and not a grey."

A striking portrait of Stieglitz served to show how wonderfully the new plates dealt with blue colours, the various lightings of a rough blue coat he was wearing being rendered with wonderful realism; but most striking of all were the greys and greyish whites of the cover of "Camera Work"—he was holding in his hand, the flesh tint of the hand that held it, and the countless nuances on a piece of green velvet in the foreground. "I have photographed Stieglitz till I was black in the face," said Steichen, "but I never got a portrait approaching that in truth. The same may be said of this," and he held up a portrait of a lady.

"What are these?" we enquired as we pointed to some conspicuous blemishes in the pictures.

"Black spots. I don't know what they are caused by, but they seem almost unable to make the plates quite free from them. It is very rarely that you come across a plate without them, and it is not easy to retouch them out. The makers point out that at present they cannot prevent them entirely, but they seem to keep their own specimens free from them."

We suggested that it was hardly likely that the specimens shown would be defective, and that Messrs. Lumière would naturally pick out the most perfect for exhibition.

"There is another thing I have to grumble about," pursued Mr. Steichen, "while I am talking of defects, and I wish you would rub it in. The plates are such

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a high price that I think they might avoid by cutting off a strip of half an inch or more along both edges, which turns up black in the finished positive. You see what I mean in all these. The whole plates have it along both sides, and in some cases it is 'nearer' an inch than half an inch.

"Now look at those two," and he handed us two landscapes identical in subject and arrangement, but quite different in effect. "They are the same scene, and taken within five minutes of one another; but one was in diffused light and one with bright sunshine. Look how faithfully the alteration in all the colours has been reproduced. Look at those poppies, at the tone of that face, the real colour of the flesh in the open air. Look at the colour of these distant trees. Compare this with that, and you will see that the process has kept every subtle difference of colour due to the difference in the lighting. That probably is one of the most striking examples of the lot."

"What about the exposure?" we asked.

"A second with $f/8$ is what they recommend for landscapes in a bright summer light. That is using the compensating light filter which Lumières supply for use with the plates. Excessive under-exposure leads to a dark heavy result, but there is a considerable latitude; two pictures with two different exposures may both be very fair renderings of the same subject, but in a different key. These two are copies of a painting, which had two very different exposures, and you see the result.

"Here is another interesting thing. I see you said in *Photography* that these colour pictures could not be reproduced, and this is the impression given out by Lumière. There seems to be no very clear reason why they should not be approximately reproduced, and so I tried to see how far I could succeed in copying one. These two are an original colour transparency from nature, and a copy of it in the camera. They are near enough alike to show that the thing can be done. Some of the finer tones are naturally lost."

The copy was not an absolute facsimile of the original in colour, but was sufficiently close to satisfy most people. Mr. Steichen's original and copy seemed to show that it was quite possible to produce very satisfactory copies.

Perhaps the most remarkable thing about the plates was the success with which the colours had been so proportioned as to give white. There could be no two opinions about this. Mr. Steichen produced one of the plates with no photographic image upon it at all, and on holding it up to the light it was a good greyish white, without any sign of colour whatsoever. Yet the magnifier revealed the fact that there was no spot on its surface where white light could pass; the colour was due entirely to the admixture of the violet, green, and orange particles.

"Lemon yellow and a carmine red," said Mr. Steichen, "are the colours which it seems least able to render properly; but even then the yellow is apparently truthful."

Another triumph for the process was the extraordinary realism of the frame, which had been photographed along with a picture. It was one of those dull matt surface frames of a greenish bronze colour, and both the tint and the characteristic lustre were very notable.

"Now you have seen all I have done," said Mr. Steichen. "I have brought a few plates with me, and may expose them over here. But they are expensive things. Those whole-plates, or the French equivalent,

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for example, cost about four shillings each. And they are selling like hot cakes in France; the makers cannot cope with the supply.

"The great future of this process is certainly in the hands of the amateur photographer. For the professional it can have little value, as its method of presentation is impracticable. In the field of magazine illustration it will revolutionise things. I venture to predict that England will be the best customer of this product, for the serious amateur is more in evidence here than anywhere else. In America we look upon any process as commercially impracticable until

we can get the same results by as simple a means on paper.

"The pianola," said Mr. Steichen, "has often been compared with modern pictorial photography, but this new process is the phonograph of colour. It copies colour with the same startling realism that a good phonograph records a Caruso solo. The rasping of the needle on the disc in the phonograph is the grain in the colour plate. When the sound is sufficiently clear and forceful, the rasp is lost. When the colour scale is sufficiently in evidence, the theory and construction of the autochrome plate is forgotten."

A Book on the Wet Collodion Process.

THOSE who talk about "the wet plate days" as a period long since gone by may be surprised to learn that wet collodion is very far from being an obsolete process. As our readers, no doubt, are well aware, it is very extensively used to this day for process work; and in the illustrations, for example, which form such a feature of *Photography* week by week, the wet plate has played its part as well as the dry. Besides this application, the process is used for copying pictures and similar work, for slide making, and for the ferrotype which flourishes between the tide-marks. If any further indication were wanted that the wet plate is alive and kicking—and every user of the silver bath will admit that it *can* kick—it is to be found in the handsome text book called "The Wet Collodion Process," which Mr. Arthur Payne has just written, and Messrs. Mawson and Swan have published—with 144 pages and twenty-two illustrations in line and half-tone, substantially bound in cloth, price 3s.

The book is a good one. Old as is the process, it contains a remarkable quantity of new and valuable information, conveyed clearly and in simple language by one who is fully versed in his subject. In fact, we are bound to admit that it was an agreeable surprise to us to find that a practical treatise on so ancient a topic could be made so fresh and interesting; and we heartily congratulate our old friend Mr. Arthur Payne on the result. We are sure, too, that many of our readers will find the book entertaining; and will be led, by its perusal, to take up wet plate work themselves. For the collodion process has its advantages for the amateur as well as for the professional.

The lantern slide can be made as successfully by the wet process as by any; while the method has two advantages, in its economy and in the satisfaction that is to be derived from the manipulations and from the feeling that the result is the personal work of its producer throughout, a sensation which no other photographic process will give to anything like the same extent. Nor need the collodion be used "wet," Mr. Payne describes a method, largely his own, for the production of dry collodion plates with the silver bath, which ought to prove particularly applicable to the making of lantern slides by reduction. We can strongly recommend such a method to anyone anxious for fresh photographic fields to conquer; it ought to repay him well. The wet plate itself makes admirable slides. It is used by the largest manufacturers of slides, and Mr. Payne seems to think that this fact is a testimony to its suitability "when it is remembered that the manufacturers' sales depend upon the quality of the slides"; but on this point we cannot agree with him. The standard attained by commercial slides is far below that of the average amateur worker, the excessive hardness and brilliancy which their customers demand being repugnant to all skilful slide makers; and we should therefore be sorry to bring forward the commercial slide, suitable as it is for its own market, as evidence of the excellence of the wet plate slide. But the process will yield harmonious slides as well as brilliant and harsh ones; and slides that will not deteriorate in the lantern by repeated use, as do those made on gelatine plates.

Another novel feature of this book is Mr. Payne's method of obtaining stripped or filmed negatives with wet collodion. Messrs. Mawson and Swan supply the "Lotos" stripping films—sheets of gelatine—which are soaked in cold water and floated over the collodion negative. By gently warming the glass side of this, the gelatine cements itself to the collodion film, and when dry the negative may be stripped off the glass very easily. This method should appeal to process-workers in particular, as also will the author's method of turning a negative into a positive by dissolving out the image on the unfixed plate with nitric acid, and then re-developing

the haloid image that is left. His methods of colour sensitising are also very interesting.

Although we have gone very carefully through the book, we find hardly anything noted as needing revision. The "safe-lights" on page 124 might be amplified a little with advantage, pointing out the conditions under which each deserves the title of "safe." When we first read it, we gathered the impression that all four screens, orange, green, gathered and extreme red, were united, in pairs, to form the safe-light referred to in the following paragraph; and though we light see that this is not what Mr. Payne meant, it is fairly deducible from the text. Nor was it at first that we realised that "Professor" Gamble was none other than our friend at the big Manchester institution. These are but trifling matters. The book is sound and reliable throughout; clearly printed and well got up, and should prove the standard handbook of its subject for many years to come.

Death of Mr. A. L. Henderson.

WE regret to have to announce the death of Mr. A. L. Henderson, who passed away on the 5th inst., at Bad Nauheim, and was buried at West Norwood Cemetery last Wednesday. Mr. Henderson's health for many years had necessitated his wintering abroad, but when we saw him in England there was nothing in his appearance to lead anyone to suppose that it would be his last visit.

The modern photographer hardly knows the name of Henderson, but in the spacious days of the seventies and eighties no one figured more largely before the photographic world. At his professional studio in King William Street, City, the stairs were frequently crowded with sitters for the then novel "C.D.V.," and it was in that unpretentious building that Mr. Henderson secured the competence which enabled him to spend the later years of his life in the search for sunshine and the health it gave him.

He was much more, however, than the professional photographer. He was one of the earliest to take up the gelatine dry plate process, and certainly one of the most successful makers of extremely rapid plates in those days, and was conspicuous also for his willingness to impart his knowledge to others. He was the most skilful of photographic enamelers also, and the collection of this beautiful form of photograph made by Her Late Majesty contained a very large number from his hands. He was the founder of the London Provincial Photographic Association, and when in London was its most regular attendant.

Mr. Henderson was a strong man, hot tempered, and a born fighter. Nothing raised his ire like pretence and assumption, and a sign of this would bring forth a volcanic outburst of wrath. Like so many of this temperament, there underlay his vigorous enmity the kindest of hearts and the most sympathetic of dispositions. Open as the day in other matters, in his charity he was secret and reserved, but we are able to speak from personal knowledge on this point, and to testify that he was generous and helpful to a degree. There was no one in the whole photographic world to whom we could appeal for a deserving case with a greater certainty of a hearty response. Many a photographer to-day will feel that he has lost a good and kind friend.

THE GLASGOW SOUTHERN PHOTOGRAPHIC ASSOCIATION will hold its seventh annual exhibition from January 14th to 28th, 1908. The exhibition secretary is Mr. Charles Young, of 217, Crow Road, Partick.

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The New Color Photography

THE NEW COLOR PHOTOGRAPHY
BY J. NILSEN LAURVIK

AT LAST color photography, that long-wished for consummation of the monochrome, seems to have been fully realized in the new autochromatic plate invented and perfected by M. Antoine Lumière and his sons.* This process, which has slowly been developed through many years of careful and persistent experimentation, is the first really practical method that has been made available for use by any capable worker in photography. With this plate the most subtle and evanescent colors of natural objects can be reproduced with one exposure, and with but little more labor and manipulation than is required by the ordinary monochrome plates. The result is, however, not a photograph in the generally accepted sense but a transparency which, to be seen, must be held up to white light, when it will be found to reveal with truly exquisite precision the most delicate gradations of color in nature. These transparencies can very effectively be used for lantern slides, where the result achieved is thrown upon the screen with a most startling reality. So far no method of duplicating or printing these results on paper has been devised, and every one of these autochrome transparencies are, at present, as unique as were the original daguerreotypes, and it is safe to say that these early plates will, in time, become as highly prized as are now the first tentative attempts in photography.

It is of interest, perhaps, to note that, while the honor of the discovery of both monochrome and color photography must be accorded to France, to America is due, in no small measure, the credit

of having developed the artistic possibilities latent in both of these remarkable discoveries in the scientific application of light. Much of this pioneer work has been done by that little group of earnest workers, "The Photo-Secessionists," through whose persistent efforts the artistic merits of pictorial photography have gained general respect and acknowledgement. It is, therefore, not surprising to find that even now, in the early stages of experimentation, they have also been the first to give an individual and artistic touch to this newly discovered color-photography—their trial plates far surpass in truth and beauty anything so far accomplished, even by Lumière himself, who has, however, been chiefly concerned in developing the scientific resources of the process.



PIERRE LUMIERE
INVENTOR OF LUMIERE COLOR PLATE

BY GERTRUDE
KASEBIER

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ALFRED STIEGLITZ

BY ALVIN LANGDON COBURN

While this autochrome process is as yet not wholly devoid of faults and has its limitations like every other process, it has, nevertheless, a much wider range than was at first supposed. This has been convincingly demonstrated in the initial color-photographs made by Eduard J. Steichen, Alfred Stieglitz and Frank Eugene, who were about the first to explore the artistic resources of the plate. The experiments made by these three Americans in Paris, last summer, furnished conclusive evidence of the wide scope of the Lumière method when employed by experienced photographers. These first examples, which were recently shown to the public by Mr. Stieglitz, at the Photo-Secession, 291 Fifth Avenue, include still-life studies, genre pictures and portraits in which the colors have been reproduced with surprising fidelity and with a richness and brilliance of tone that, in some cases, rival those of an oil painting.

These autochrome plates are made sensitive to the colors of natural objects by means of a layer of semitransparent potato-starch grains of even and exceedingly minute size—about 5,000,000 to the

square inch. These particles, after being impregnated with a dye, consisting of equal portions of light-green, red-orange and blue-violet, are mixed in equal proportions and spread or dusted over the plate in one uniform layer. It is then covered with water-proof varnish, after which this granulated surface is coated with a panchromatic collodion emulsion. When held up to the light this prepared plate resembles a piece of ordinary ground glass with a slight pinkish tinge. The plate, when ready for exposure, is turned glass side

toward the lens so that the colors of the objects photographed pass through the delicate surface of the impregnated starch grains before the light rays reflected from the objects reach the sensitive film. These act as selective ray filters and produce corresponding color values in the film. In the first plates made it was found expedient to fill up the infinitesimal interstices with black to prevent any white light from passing through. Later, a roller was invented which entirely overcame this difficulty by spreading the granules composing the color surface over the plate with great evenness. It was also found necessary to place a yellow filter, or screen, before or behind the lens to retard the action of the blue rays. After the plate has been developed it is treated with acidified permanganate of potash, which acts as a reducer. This and the redeveloping of the plate are undertaken in broad daylight, the result being a positive transparency in natural colors which can only be seen by being held up to white light. It has so far been found quite impossible to remedy any faults by means of retouching, as the color surface of the plate is

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The New Color Photography

entirely too delicate. One of the greatest difficulties experienced in the developing of the plate has been its tendency to "frill," which has now been largely overcome by later experiments in manipulation and by recent improvements made by the manufacturer himself. New photographs, among others a fine portrait of Bernard Shaw, show a degree of intelligent control of the action of the plate that promises even more remarkable results when the full resources of the plate shall have been explored.

Since the advent of this new process the notion has become prevalent in certain quarters that all that is now needed to make an artist of every owner of a camera is an autochromatic plate. It is hardly necessary to dispute this—the world will soon, too soon we fear, have an opportunity to judge, for no doubt it will not be long before no home will be quite complete without its autochromatic artist. That it does remove certain definite and hitherto insurmountable obstacles in the way of the actual representation of natural objects, it is true. For the first time we may get some adequate notion of the luminosity and the mystery of light inherent in every shadow, instead of seeing them represented as opaque, dead black surfaces. It also demonstrates most conclusively that the colors of objects are conditioned by the reflection of the sky and the enveloping atmosphere—that there is no *fixed* color whatever. In short, color-photography marks the beginning of a new and thoroughly scientific study of color that will, no doubt, revolutionize all forms of color processes as well as exert a strong influence on the art of painting, which has so long been divorced from its original scientific application as practised by Leonardo, Velasquez, Hokusai and the immortal Whistler—all men who knew and had a

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SELF PORTRAIT, 1901, GUM PRINT

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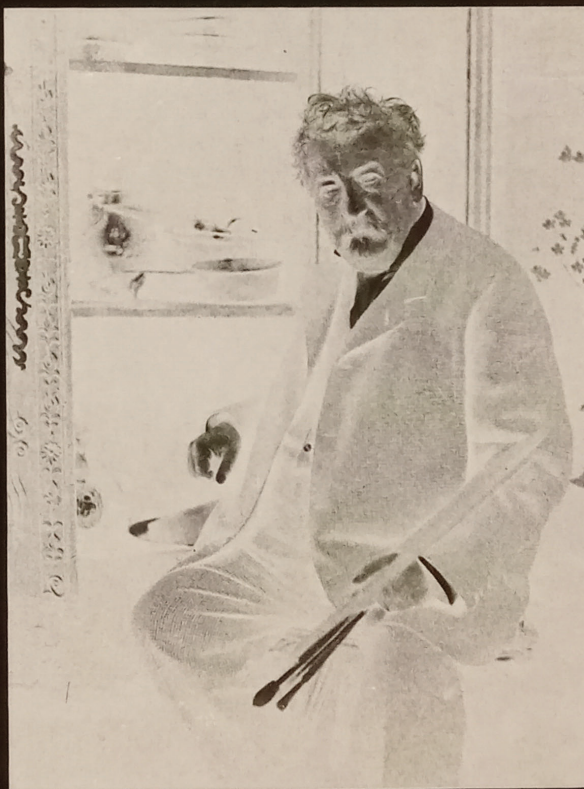
The New Color Photography

THE NEW COLOR PHOTOGRAPHY
BY J. NILSEN LAURVIK

AT LAST color photography, that long-wished for consummation of the monochrome, seems to have been fully realized in the new autochromatic plate invented and perfected by M. Antoine Lumière and his sons.* This process, which has slowly been developed through many years of careful and persistent experimentation, is the first really practical method that has been made available for use by any capable worker in photography. With this plate the most subtle and evanescent colors of natural objects can be reproduced with one exposure, and with but little more labor and manipulation than is required by the ordinary monochrome plates. The result is, however, not a photograph in the generally accepted sense but a transparency which, to be seen, must be held up to white light, when it will be found to reveal with truly exquisite precision the most delicate gradations of color in nature. These transparencies can very effectively be used for lantern slides, where the result achieved is thrown upon the screen with a most startling reality. So far no method of duplicating or printing these results on paper has been devised, and every one of these autochrome transparencies are, at present, as unique as were the original daguerreotypes, and it is safe to say that these early plates will, in time, become as highly prized as are now the first tentative attempts in photography.

It is of interest, perhaps, to note that, while the honor of the discovery of both monochrome and color photography must be accorded to France, to America is due, in no small measure, the credit

of having developed the artistic possibilities latent in both of these remarkable discoveries in the scientific application of light. Much of this pioneer work has been done by that little group of earnest workers, "The Photo-Secessionists," through whose persistent efforts the artistic merits of pictorial photography have gained general respect and acknowledgement. It is, therefore, not surprising to find that even now, in the early stages of experimentation, they have also been the first to give an individual and artistic touch to this newly discovered color-photography—their trial plates far surpass in truth and beauty anything so far accomplished, even by Lumière himself, who has, however, been chiefly concerned in developing the scientific resources of the process.



PIERRE LUMIERE
INVENTOR OF LUMIERE COLOR PLATE

BY GERTRUDE
KASEBIER

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The New Color Photography



ALFRED STIEGLITZ

BY ALVIN LANGDON COBURN

While this autochrome process is as yet not wholly devoid of faults and has its limitations like every other process, it has, nevertheless, a much wider range than was at first supposed. This has been convincingly demonstrated in the initial color-photographs made by Eduard J. Steichen, Alfred Stieglitz and Frank Eugene, who were about the first to explore the artistic resources of the plate. The experiments made by these three Americans in Paris, last summer, furnished conclusive evidence of the wide scope of the Lumière method when employed by experienced photographers. These first examples, which were recently shown to the public by Mr. Stieglitz, at the Photo-Secession, 291 Fifth Avenue, include still-life studies, genre pictures and portraits in which the colors have been reproduced with surprising fidelity and with a richness and brilliance of tone that, in some cases, rival those of an oil painting.

These autochrome plates are made sensitive to the colors of natural objects by means of a layer of semitransparent potato-starch grains of even and exceedingly minute size—about 5,000,000 to the

square inch. These particles, after being impregnated with a dye, consisting of equal portions of light-green, red-orange and blue-violet, are mixed in equal proportions and spread or dusted over the plate in one uniform layer. It is then covered with water-proof varnish, after which this granulated surface is coated with a panchromatic collodion emulsion. When held up to the light this prepared plate resembles a piece of ordinary ground glass with a slight pinkish tinge. The plate, when ready for exposure, is turned glass side

toward the lens so that the colors of the objects photographed pass through the delicate surface of the impregnated starch grains before the light rays reflected from the objects reach the sensitive film. These act as selective ray filters and produce corresponding color values in the film. In the first plates made it was found expedient to fill up the infinitesimal interstices with black to prevent any white light from passing through. Later, a roller was invented which entirely overcame this difficulty by spreading the granules composing the color surface over the plate with great evenness. It was also found necessary to place a yellow filter, or screen, before or behind the lens to retard the action of the blue rays. After the plate has been developed it is treated with acidified permanganate of potash, which acts as a reducer. This and the redeveloping of the plate are undertaken in broad daylight, the result being a positive transparency in natural colors which can only be seen by being held up to white light. It has so far been found quite impossible to remedy any faults by means of retouching, as the color surface of the plate is

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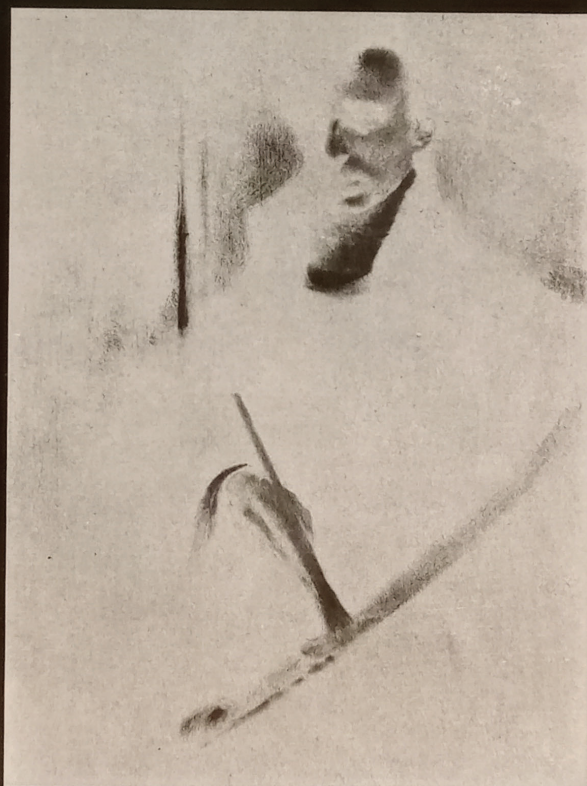
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entirely too delicate. One of the greatest difficulties experienced in the developing of the plate has been its tendency to "frill," which has now been largely overcome by later experiments in manipulation and by recent improvements made by the manufacturer himself. New photographs, among others a fine portrait of Bernard Shaw, show a degree of intelligent control of the action of the plate that promises even more remarkable results when the full resources of the plate shall have been explored.

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Antoine Lumière à son arrivée à Lyon - 1870

Chronologie

1822

Claude Nicéphore Niepce réalise à Saint-Loup de Varennes la première photographie sur plaque de verre enduite de bitume de Judée dissous dans de l'huile animale: 8 heures de pose en plein soleil.

1839

Louis Jacques Mandé Daguerre, après avoir été l'associé de Niepce depuis 1829, annonce un procédé de photographie sur plaque de cuivre argentée, le Daguerreotype, acquis par l'Etat français moyennant une rente annuelle de 6000 francs or. Temps de pose: 15 à 20 minutes au soleil.

1840

A. Ormoy, village de Haute-Saône, 400 habitants, naissance d'Antoine Lumière, fils d'un forgeron.

1841

Fox Talbot dépose à Westminster le brevet de son procédé photographique donnant un négatif sur papier en 1 minute de pose, et permettant de tirer ensuite autant de copies positives qu'on pouvait le souhaiter, chose impossible auparavant.

1847

Niepce de Saint-Victor invente le négatif sur verre, émulsionné à l'albumine, dont la préparation était fort complexe...

1852

Le nouveau procédé au collodion humide va (relativement) simplifier la vie des photographes.

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1854

A Ormoy (Haute-Saône) le choléra sévit et fait d'Antoine Lumière un orphelin, que recueille le peintre Auguste Constantin. Celui-ci va lui apprendre à Paris le métier de peintre d'enseignes.

1860

A Paris, Antoine Lumière, à peine âgé de 20 ans, épouse Jeanne Joséphine Costille.

Auguste Constantin avance à Antoine une somme de 1500 Francs afin de lui éviter le service militaire. Antoine et Jeanne viennent s'installer à Besançon, et ouvrent un atelier de photographie.

1862

Naissance d'Auguste Lumière.

1864

Naissance de Louis Lumière.

1870

Naissance de Jeanne Lumière et départ pour Lyon où Antoine ouvre un atelier de photo rue de la Barre. Il opère toujours sur plaques au collodion humide, qu'il convient de préparer juste avant l'emploi avant que l'émulsion ne sèche...

1880

Apparition des plaques "sèches" au gélatino-bromure d'argent, qui sont importées de Belgique avec parcimonie et qui sont fort chères - (mais tellement plus pratiques d'emploi!).

1881

Auguste (19 ans) et Louis (17 ans) envisagent de fabriquer eux-mêmes des plaques sèches.

1882

Mise au point par les deux frères d'une plaque plus sensible que celle du commerce. Décision d'Antoine de commercialiser ce procédé. Vente moyennant 30.000 Francs de l'atelier de la rue de la Barre, fondation de l'usine de Monplaisir.

1883

L'usine emploie dix ouvriers, mais elle a 375.000 Francs (or) de dettes.

1886

Production annuelle: 1.300.000 plaques. Fin des soucis d'argent.

1893

Production annuelle: 18.000.000 de plaques, 700.000 mètres de papier sensible...

Pendant ce temps, les Lumière continuent d'innover dans divers domaines, notamment dans celui de la photographie animée. Mais ceci est une autre histoire...

Nadar (à g.), Antoine Lumière (à dr.)



Chronologie

1860

Louis Ducos du Hauron: "Toutes les couleurs par l'organe visuel se réduisent à trois: le rouge, le jaune, le bleu. Les combinaisons en diverses proportions, donnent la variété des nuances de la nature."

1869

Charles Cros et Ducos du Hauron: "L'un de l'autre, ne se connaissant rien, ils poursuivaient chacun de leurs recherches sur la couleur, et le hasard vint les réunir tous deux le même jour à la séance de Photographie (7 mai 1869), discutant aux mêmes conclusions: de réaliser des photos en couleurs. Toutefois, Charles Cros ne formait pas d'opinion, tandis que Ducos du Hauron s'appuyait sur ses écrits."

1891

Gabriel Lippman montre à l'Académie le résultat de sa méthode de photographie des couleurs.

1895

Les frères Lumière expérimentent le procédé décrit auparavant par Lippman: trois prises de vues successives à travers trois filtres colorés différents, et trois positifs correspondants appariés. Résultats complémentaires de couleurs intéressants, mais beaucoup de dépenses pour la possibilité de photographier des objets du moindre mouvement: trois prises de vues!

1903

Le 17 octobre, les frères Lumière commercialisent une plaque photographique en couleurs, qui contient en fait trois images séparées, obtenues dans le procédé Chroma.

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Chromologie

1860

Louis Ducos du Hauron : *"Toutes les couleurs perçues par l'organe visuel se réduisent à trois couleurs élémentaires : le rouge, le jaune, le bleu, dont les combinaisons en diverses proportions produisent l'infinie variété des nuances de la nature."*

1869

Charles Cros et Ducos du Hauron, vivant à 800 km l'un de l'autre, ne se connaissaient pas. Pourtant ils poursuivaient chacun de leur côté des recherches sur la couleur, et le hasard voulut qu'ils adressent tous deux le même jour à la Société Française de Photographie (7 mai 1869), des mémoires aboutissant aux mêmes conclusions sur la possibilité de réaliser des photos en couleurs. Seule différence toutefois, Charles Cros ne formulait que des théories, tandis que Ducos du Hauron joignait deux épreuves à l'appui de ses écrits.

1891

Gabriel Lippman montre à l'Académie des Sciences le résultat de sa méthode "interférentielle" de photographie des couleurs.

1895

Les frères Lumière expérimentent (et pensent commercialiser sous la marque *Chroma*) un procédé décrit auparavant par Ducos du Hauron : trois prises de vues successives en noir à travers trois filtres colorés différents, et superposition des trois positifs correspondants après teinture dans les couleurs complémentaires de celles des filtres. Résultats intéressants, mais beaucoup de travail, de patience et de dépenses pour une photo. De plus, impossibilité de photographier des sujets susceptibles du moindre mouvement entre chacune des trois prises de vues !

1903

Le 17 octobre, les frères Lumière prennent un brevet concernant une plaque pour la photographie en couleurs, qui contient en elle-même les trois filtres qu'il fallait utiliser séparément sur trois plaques dans le procédé *Chroma*.

1907

Mise dans le commerce de cette nouvelle plaque maintenant fabriquée industriellement sous le nom d'Autochrome. C'est enfin la photographie en couleurs à la portée de tous grâce à sa facilité d'emploi. Mais les images sont des positifs directs sur verre, à regarder par transparence ou à projeter sur un écran.

1913

Les Usines Lumière produisent plus d'un million de plaques autochromes par an.



300.000 plaques. Fin des

18.000.000 de plaques, r sensible...

Lumière continuent d'innover, notamment dans l'animée. Mais ceci est une

e (à dr.)



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Principe de la méthode Lumière

*pour la photographie directe des objets
avec leurs couleurs naturelles*

Les plaques autochromes Lumière

Si l'on dispose à la surface d'une plaque de verre et sous forme d'une couche unique, mince, un ensemble d'éléments microscopiques, transparents et colorés en rouge-orangé, en vert et en violet, on peut constater, si les spectres d'absorption de ces éléments sont corrects et si les éléments eux-mêmes sont en proportions convenables, que la couche ainsi obtenue, examinée par transparence, ne semble pas colorée, cette couche absorbant seulement une fraction de la lumière qu'elle reçoit.

Les rayons lumineux traversant les écrans élémentaires orangés, verts et violets, reconstitueront, en effet, la lumière blanche, si la somme des surfaces élémentaires pour chaque couleur et l'intensité de la coloration des éléments constitutifs se trouvent établies dans des proportions relatives bien déterminées.

Auguste Lumière



Cette couche mince trichrome ainsi formée est ensuite recouverte d'une émulsion sensible panchromatique.

Si l'on soumet alors la plaque préparée de la sorte à l'action d'une image colorée en prenant la précaution de l'exposer par le côté verre, les rayons lumineux traversent les écrans élémentaires et subissent, suivant leurs couleurs et suivant les écrans qu'ils rencontrent, une absorption variable. On a ainsi réalisé une sélection qui porte sur des éléments microscopiques et qui permet d'obtenir, après développement et fixage, des images colorées dont les tonalités sont complémentaires de celles de l'original.

Cette couche trichrome peut être obtenue dans la pratique à l'aide de la fécule de pomme de terre du commerce, laquelle est composée de grains de dimensions très différentes, les uns mesurant à peine quelques millièmes de millimètre de diamètre, tandis que d'autres dépassent 1/10^e de millimètre. Cette irrégularité n'aurait pas permis de constituer la couche uniforme qui est indispensable à la bonne réussite du procédé. Ce sont les grains

Louis Lumière



ayant de 10 à 15
mètre qui convie
nous occupe ; or,
de 2 à 3 % de gra
fallu réaliser, au
construits à cet e
Ce problème est
le croire à priori,
de très nombreux

Les grains une f
trois lots et chaq
en orangé, en vert
appropriées.

On procède ensui
minant la propor
saires, de manières
aucune couleur
intime et bien hor
est alors réparti
machine spéciale
labilement recouv
fig. 1 représente c

Après cette opérat
quer les intervalle
est réalisé par un
mément sur la p
extrêmement fine
les grains et s'y tr
préalablement di
plaque, ainsi prép
destiné à écraser
une sorte de mo
représente l'aspec
microscopiques.
puisque le champ
vraie grandeur, a
environ.

Ces petits grains
à 7 000 par millim
complètement inv
une idée de la f
qu'une plaque du
environ 140 000 C

Cette plaque, bie
ments microscop
intense en orangé
présenter aucune

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ayant de 10 à 15 millièmes de millimètre de diamètre qui conviennent le mieux dans le cas qui nous occupe ; or, la fécule du commerce renferme de 2 à 3 % de grains de cette dimension. Il a donc fallu réaliser, au moyen d'appareils spécialement construits à cet effet, la séparation de ces grains. Ce problème est plus compliqué qu'on ne pourrait le croire a priori, et il n'a pu être réalisé qu'après de très nombreux essais.

Les grains une fois sélectionnés sont divisés en trois lots et chaque lot est respectivement coloré en orangé, en vert et en violet au moyen de teintures appropriées.

On procède ensuite au mélange des grains en déterminant la proportion de chacun des lots nécessaires, de manière à obtenir un ensemble n'ayant aucune couleur dominante. Ce mélange bien intime et bien homogène des trois poudres colorées est alors réparti régulièrement, au moyen d'une machine spéciale, sur des plaques de verre préalablement recouvertes d'un enduit poisseux. La fig. 1 représente ces grains fortement grossis.

Après cette opération, il est indispensable de masquer les intervalles compris entre les grains, ce qui est réalisé par un autre appareil répandant uniformément sur la plaque une poussière de charbon extrêmement fine. Cette poussière est fixée entre les grains et s'y trouve retenue par le vernis adhésif préalablement disposé sur la plaque de verre. La plaque, ainsi préparée, est soumise à un laminage destiné à écraser les grains de fécule et à produire une sorte de mosaïque trichrome. La figure 2 représente l'aspect définitif de la couche d'écrans microscopiques. C'est une image très agrandie puisque le champ correspond à un cercle qui, en vraie grandeur, a 1/5^e de millimètre de diamètre environ.

Ces petits grains de fécule sont au nombre de 6 à 7 000 par millimètre carré, c'est-à-dire qu'ils sont complètement invisibles à l'œil nu. On peut se faire une idée de la finesse du grain en remarquant qu'une plaque du format courant 13 x 18 contient environ 140 000 000 de grains colorés.

Cette plaque, bien qu'elle soit recouverte d'éléments microscopiques teints d'une manière intense en orangé, en vert et en violet, ne semble présenter aucune coloration parce que les rayons

orangés, verts et violets qui la traversent se combinent pour former de la lumière blanche.

Comment cette mosaïque d'écrans colorés peut-elle donner naissance à des images colorées ?

Le mécanisme de la genèse des couleurs est extrêmement simple. C'est par soustraction, par obturation partielle ou totale de tel ou tel grain coloré que la formation des couleurs les plus diverses peut avoir lieu.

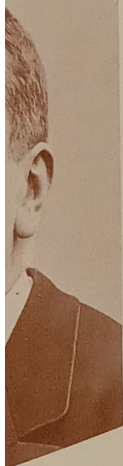
Supposons que par le procédé qui sera indiqué plus loin, nous arrivions à supprimer, à obturer les écrans verts et violets : les grains orangés subsisteront seuls, ainsi que le montre la figure 3, et la plaque vue à l'œil nu présentera une coloration orangée. La suppression des grains orangés et violets laissant subsister les grains verts (fig. 4), communique une teinte verte à la plaque. Enfin, l'obturation des grains orangés et verts produira, comme on peut le constater sur la figure 5, une image résultante bleu-violet.

Nous venons de voir ce qui se passe lorsqu'on obture deux grains sur trois. En obturant un seul des trois grains, la couleur de la plaque est la résultante de la lumière qui passe au travers des deux autres. Si l'on masque les grains verts, les grains orangés et violets subsistants donneront une résultante rouge. L'obturation des grains orangés laissant les grains violets et verts visibles, fournira du bleu. Et enfin, si l'on obture les grains violets, la lumière qui passera au travers des grains orangés et verts donnera une résultante jaune.

Si l'obturation de tel ou tel grain, au lieu d'être totale, comme nous venons de le montrer, est partielle, le résidu coloré pourra prendre les teintes les plus variées.

Comment s'effectue cette obturation des grains que nous venons de décrire et qui donne naissance aux couleurs ? Elle s'opère d'une manière très simple et automatiquement, grâce à la préparation sensible à la lumière qui recouvre les grains.

A cet effet, les plaques de verre portant le système d'écrans trichromes préparés comme il a été indiqué, sont recouvertes d'une émulsion photographique à base de bromure d'argent sensible à la lumière. Ces plaques sont alors prêtes à recevoir l'impression lumineuse. Cette impression doit



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s'effectuer de manière que les rayons lumineux traversent le dos du verre et la mosaïque d'écrans avant d'atteindre la préparation sensible.

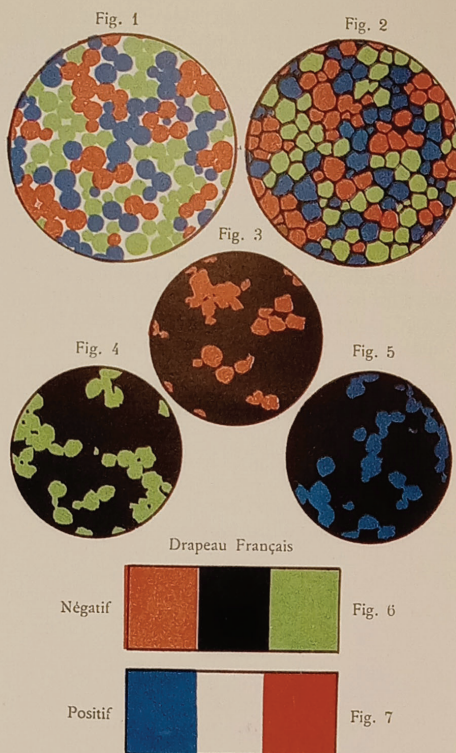
Supposons, par exemple, que la plaque autochrome soit frappée en un point donné par de la lumière verte; examinons comment cette lumière verte peut être enregistrée par la plaque.

Les rayons verts frappant la mosaïque trichrome sont arrêtés par les grains orangés et violets. Seuls les grains verts sont traversés par ces rayons verts; la préparation photographique sensible qui se trouve derrière ces grains est par conséquent impressionnée par la lumière tandis qu'elle reste inaltérée sous les grains orangés et violets. En traitant la plaque par un développeur, on réduira la préparation dans les parties impressionnées, c'est-à-dire sous les grains verts. Par conséquent les grains verts se trouveront présentement obturés et si les opérations étaient limitées à ce premier développement, on aurait une image formée des grains orangés et violets restés inaltérés, c'est-à-dire une image rouge. Cette image est le complément de celle qu'il faudrait obtenir.

Mais si nous dissolvons, au moyen d'un produit chimique approprié, l'argent réduit par ce premier développement, les grains verts vont être libérés et redeviendront visibles, seulement nous aurons toujours sous les grains orangés et violets la substance sensible non altérée.

Procédons alors en pleine lumière à un deuxième développement: cette substance sensible sera impressionnée à son tour puis noircie par le développeur. Par conséquent les grains orangés et violets seront masqués à leur tour, les grains verts restant seuls visibles. Nous aurons ainsi reproduit l'image verte considérée après avoir passé par une image rouge complémentaire.

Ces explications peuvent être répétées pour toute autre couleur et l'on comprend, en fin de compte, que toutes les couleurs prennent naissance par soustraction, en éliminant, partiellement ou totalement, du ternaire orangé-vert-violet, celui ou ceux des éléments de couleurs complémentaires à la couleur que l'on doit obtenir. Cette élimination, cette sélection, s'effectuent d'une manière automatique par les rayons colorés eux-mêmes venant de l'objet photographié.



Photographie du Drapeau Français
PAR LE PROCÉDÉ
Autochrome LUMIÈRE

C'est à cette mosaïque d'écrans trichromes recouverte d'émulsion sensible à la lumière, que M. Max de Nansouty a donné le nom si original de "piège à radiations". Les radiations lumineuses suivant leurs couleurs, sont, en effet, en quelque sorte, prises au piège, enregistrées et fixées par la plaque photographique nouvelle.

D'après les explications sur la formation de la couleur, si, au lieu d'effectuer des inscriptions indiquées ci-dessus, on effectue la solution de l'argent par le premier développement et deuxième développement, on obtiendra une image complémentaire de celle-ci.

Ainsi, la fig. 6 est l'image d'un drapeau français. Les couleurs ont été arrêtées après le premier développement et que le rouge est le drapeau prendra la version indiquée, c'est-à-dire l'argent réduit primitivement en place.

Dans l'application pratique, les plus grandes difficultés les plus nombreuses. Il nous suffira d'en énoncer une idée des obstacles dans la réalisation de ces produits.

Ces difficultés principales sont :

1° La séparation, dans le commerce, des grains de diamètre environ 10 microns.

2° La coloration de l'émulsion, en couleurs stables, concorde avec le colorant et comme il faut.

3° Le mélange homogène de l'émulsion sur des verres à surface plane et minima.

4° Le garnissage des verres, au moyen de la poudre, l'architecture de ces grains, maculer de noir.

5° Le laminage de l'émulsion, les considérations, briser le verre de support.

6° La réalisation d'une image et présentant un indice de contraste afin d'isoler la couleur d'émulsion.

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D'après les explications que nous avons données sur la formation des couleurs, on comprend que si, au lieu d'effectuer la série des opérations successives indiquées ci-dessus : développement, dissolution de l'argent réduit par ce premier développement et deuxième développement, on se borne à faire le premier développement seulement, on obtiendra une image dont les couleurs seront complémentaires de celles de l'objet photographié.

Ainsi, la fig. 6 est la représentation schématique d'un drapeau français pour lequel les opérations ont été arrêtées après le premier développement, suivi d'un fixage : on voit que le bleu est orangé et que le rouge est remplacé par du vert. Mais ce drapeau prendra les véritables couleurs par l'inversion indiquée, consistant en la dissolution de l'argent réduit primitivement suivie d'un deuxième développement en pleine lumière (fig. 7).

Dans l'application pratique de ce procédé, les difficultés les plus considérables ont été rencontrées. Il nous suffira d'énumérer les principales pour donner une idée des obstacles qu'il a fallu surmonter dans la réalisation d'une fabrication industrielle de ces produits.

Ces difficultés principales sont les suivantes :

1° La séparation, dans la fécule de pomme de terre du commerce, des grains ayant 1/70^e de millimètre de diamètre environ ;

2° La coloration de la fécule par des matières colorantes stables, concordantes comme qualité de couleur et comme intensité de coloration ;

3° Le mélange homogène des grains et sa répartition sur des verres avec juxtaposition à intervalles minima ;

4° Le garnissage des interstices entre les grains au moyen de la poudre de charbon, sans modifier l'architecture de ces grains, sans les noyer ou les maculer de noir ;

5° Le laminage de la couche, qui exige des pressions considérables, sans arracher la couche, ni briser le verre de support ;

6° La réalisation d'un vernis mince, imperméable et présentant un indice de réfraction convenable, afin d'isoler la couche des grains de la couche d'émulsion ;

7° Le coulage sur les plaques ainsi préparées, en couche très mince et régulière, d'une émulsion photographique sensible à toutes les radiations colorées, etc., etc.

Toutes ces difficultés, et bien d'autres encore, ont exigé des études et des recherches ayant duré plusieurs années, mais elles ont été successivement vaincues, et les plaques que livre la Société Lumière permettent d'obtenir, en utilisant les appareils photographiques ordinaires, et à l'aide de manipulations très simples, la reproduction des sujets avec l'infinie variété des couleurs qu'ils présentent dans la nature.

Auguste et Louis Lumière

(1903-1907)



Auguste Lumière démontrant les possibilités d'instantané des plaques Lumière (photo Louis Lumière)

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Si vous êtes en mal de créativité (rétro):

Procurez-vous des grains de fécule de pomme de terre, triez-les avec soin et ne retenez que ceux dont le diamètre est compris entre 12 et 16 millièmes de millimètre. Ensuite partagez votre stock en trois lots équivalents, que vous teignez respectivement en orange, en vert et en violet. Mélangez les trois lots.

Étendez sur une plaque de verre au format de votre appareil, un enduit poisseux, sur lequel vous saupoudrez régulièrement vos grains de fécule colorée, jusqu'à concurrence de 140 millions de grains pour une plaque 13 x 18. Puis écrasez le tout à une pression de 5.000 kg au centimètre-carré de façon à réduire à un centième de millimètre la couche qui va jouer le rôle de filtre sélectif trichrome. Alors vous "coulez"

sur cette surface une émulsion "panchromatique" traditionnelle sensible à toutes les couleurs et vous terminez par une couche de vernis.

Votre plaque autochrome est prête à être chargée dans le châssis de votre appareil, mais veillez à le faire à l'inverse de la méthode habituelle, car les rayons lumineux devront traverser les filtres de fécule avant d'atteindre l'émulsion.

Il ne vous reste plus qu'à partir à la recherche d'un paysage idyllique, par exemple les rives d'une calme rivière bordée d'arbres majestueux. Si vous prenez soin de placer harmonieusement dans ce décor quelque être cher préalablement coiffé d'un béret rouge, les mânes de Corot n'auront qu'à pâlir...

René Basset
(1978)



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Comment je développais mes autochromes.

Il fallait le faire dans le noir absolu. Si l'on utilisait une lumière à travers le filtre "Virida" (je crois ?), les couleurs obtenues étaient beaucoup moins brillantes.

Dans la chambre noire, on avait préparé 3 "cuvettes" en porcelaine blanche soigneusement lavées, d'un format un peu supérieur à la plaque considérée. La première contenait le "révélateur", la seconde de l'eau pure, la troisième le bain inverseur.

Après s'être enfoncé, on procédait plaque par plaque. A l'époque, chacune avait été placée dans un "châssis" que l'on accolait à l'appareil au moment de la prise de vues. On sortait donc la plaque du dit châssis, on enlevait un carton mince qui avait protégé le côté sensible contre toute rayure (ce qui était possible puisque l'image était reçue à travers le verre).

On saisissait la plaque entre les deux branches d'une pince (pour ne pas toucher le liquide et pour qu'il n'y ait pas de trace de doigts). Et les opérations pouvaient commencer.

Le problème était que le développement devait durer deux minutes et demi, pas une seconde de plus, pas une seconde de moins. Or on était dans le noir absolu. Personnellement, j'avais résolu le problème de la façon suivante : je postais ma mère à l'extérieur avec une montre à secondes et au moment où je plongeais la plaque dans la cuvette n° 1, je criais "TOP" et ma mère m'annonçait "1 minute - 2 minutes - TOP". La plaque passait immédiatement dans la cuvette n° 2 pour lavage et, après un court moment, passait dans la cuvette n° 3. Après deux ou trois minutes, il fallait sortir au grand jour, au plus grand jour possible. Après quelques moments, laver à grande eau et replonger dans la cuvette n° 1. Les couleurs apparaissaient promptement dans toute

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leur gloire. Il n'y avait plus qu'à laver et laisser sécher; et si on en avait le loisir, fixer un verre transparent contre l'émulsion pour empêcher les rayures et l'oxydation.

En somme très simple : trois opérations au total avec lavages intercalaires et final.

Alors que faire de ces merveilles :

Sous peine de les voir peu à peu pâlir, il valait mieux les conserver dans leur boîte et ne les sortir que pour les regarder – ou mieux les projeter (comme on fait maintenant avec les diapositives). On faisait cela

avec de majestueuses "lanternes" éclairées par une "lampe à arc", qui donnaient une lumière puissante et permettaient des agrandissements considérables et fort nets, étant donné la grandeur de l'original (en général 9 x 12 ou même 13 x 18).

On pouvait aussi les exposer. A l'époque (avant la guerre de 14), les Sociétés de photographies – car il existait des Associations d'Amateurs – faisaient périodiquement de ces sortes de manifestations dont les autochromes étaient reines.

Aymé Bernard
1979 (86 ans)



Les tirages de M

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Les tirages de Michel Fresson

Pour ma part j'aime particulièrement les recherches de Louis Lumière. Cet homme de sciences, très cultivé, n'avait pas seulement des préoccupations esthétiques : ce qui est merveilleux, c'est qu'il a inventé un moyen technologique propre à rendre les couleurs ; et ses couleurs, celles de ses plaques Autochrome, sont toujours là, dans le matin, dans l'automne, dans des ombrelles roses...

Je ne vois que les couleurs que je peux toucher, celles d'un Autochrome ou celles d'un tirage Fresson. Cette approche tactile me semble le seul moyen d'en pressentir toute la subtilité, la densité, la justesse. (...) Les tirages Fresson sont faits pour des

siècles ! Les couleurs en sont stables à la lumière et dans le temps. (...) Quatre stades de réalisation, correspondant aux trois couleurs de base d'impression, Bleu, Jaune, Magenta, puis le passage en Noir. C'est une technique manuelle propre à ce procédé. A chaque photographie, à chaque nouveau tirage d'une même photographie, le travail est à reprendre depuis le début. (...) On imagine la difficulté de tirer avec le procédé au charbon, lorsque l'on sait que la moindre différence de repérage entre le passage des couleurs change totalement le rendu final d'un gris. A une époque où tout est industrialisé, automatisé, conditionné, c'est une grande chance qu'il existe, encore, des Michel Fresson...

John Batho
(1978)



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Les harmonies de couleurs et la plaque autochrome

La simple et admirable solution du problème de la photographie en couleurs fournie par la plaque autochrome a mis les pictorialistes en face d'un autre et nouveau problème. De même qu'un enfant cueillera dans un parterre la fleur la plus rouge, nous avons usé nos premières plaques sur cette couleur, obéissant ainsi à d'ancestraux et sauvages instincts, qui n'en sont pas plus mauvais, du reste. Mais, aux débuts, nos perceptions esthétiques spécialisées dans l'étude du blanc et du noir vont recevoir un premier et sévère à-coup. Car nous tenterons fatalement de plier nos plaques autochromes aux anciennes lois qui régissaient notre travail, jusqu'au jour où nous constaterons qu'il est aussi absurde de photographier la nature en couleurs sous les règles de l'art monochrome que de se donner beaucoup de mal pour faire ressembler une épreuve à l'huile à un bromure.

Il semble tout d'abord certain que toute image destinée à être vue par transparence appelle la couleur. Car nulle autre condition de vision ne nous donnera pareille sensation d'intensité colorée – les superbes vitraux de la cathédrale de Chartres par exemple, dans le travail desquels tout a été sacrifié à la lumineuse harmonie des couleurs, nous en fournissent la preuve. Mais gardons-nous d'en conclure que le succès en autochromie consiste à accumuler fortement sur une plaque les bleus, les rouges et les jaunes; bornons-nous à admettre que, puisque nous possédons un procédé qui nous permet, ce qu'aucun autre n'a fait jusqu'ici, la reproduction des couleurs, c'est du côté de la couleur que nous devons nous orienter. Malheureusement la plaque autochrome obéira avec docilité aux ordres du photographe, que celui-ci soit artiste et coloriste ou qu'il ne le soit pas.

Il est admis scientifiquement que plus les tons d'une harmonie de couleurs sont purs et lumineux, plus cette harmonie sera belle. Mais faut-il encore qu'il y ait harmonie dans l'arrangement général et la juxtaposition des tons. De toutes les symphonies colorées, c'est la symphonie en camaïeu, ton sur ton, qui offre le moins d'écueils à celui qui n'est

pas coloriste d'instinct et qui recule devant l'étude des effets plus intéressants, mais plus difficiles, produits par le contraste des couleurs. Tant que les plaques autochromes, ou autres, ne seront pas livrées en de grandes dimensions (nous ne parlons pas des petites plaques destinées à être vues en projections, puisque leur agrandissement subséquent les fait rentrer dans la catégorie des grandes images), il sera avantageux de se limiter à des effets de camaïeu ou, du moins, à ceux qui sont régis par une couleur nettement dominante.

Une plaque autochrome, même de dimension de 18x24 remplie d'une mosaïque de différentes couleurs, n'offre aucun intérêt dès qu'elle est vue à la distance normale, tandis qu'un sujet composé de larges surfaces de même couleur ou comportant une harmonie générale en un ton, jouira d'une qualité lumineuse extraordinaire et qui portera loin.

Voici, par exemple, un vase en cuivre rouge rempli de fleurs jaunes se détachant sur un fond de tonalité dorée. Cette harmonie de couleurs restera belle à travers tous les stades du traitement de la plaque; et le renforcement, même répété, ne fera qu'intensifier la richesse de ses tons, en supposant, bien entendu, que les opérations précédentes, pose incluse, aient été convenablement dirigées. Supposez encore une femme à chevelure rousse habillée d'étoffes rouges et brunes, de tonalités chaudes, contre un fond de mêmes couleurs ou un arrangement en bleu-vert et brun.

Ce sont des effets simples à manier et qui donneront d'excellents résultats en couleurs.

Mais un contraste de couleur, une note de lumière vive sur un accessoire de cristal, d'étain ou de cuivre, quelquefois une simple tache de noir pur, feront chanter bien davantage le reste de l'harmonie ton sur ton. En somme, nous devons étudier l'enveloppe colorée du modèle et la composition générale sur la nature, exactement de la même façon qu'un peintre sur sa toile commencée.

L'écran Renngott nous aidera beaucoup. Son influence sur l'harmonie des couleurs est extraordinaire. Il avive les jaunes, les verts et les rouges et noie la composition dans une enveloppe dorée du plus heureux effet. Il est vrai que la pose s'en trouve presque doublée, mais je considère que cet

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inconvenient est amplement compensé par les avantages que je viens de décrire. Nous pouvons aussi obtenir une enveloppe similaire en étendant, entre le modèle et la source principale de lumière des voiles de mousseline de soie de couleur appropriée. Car le ton général du tableau, l'enveloppe en d'autres termes, est puissamment influencé par la couleur de la lumière incidente. Ainsi la lumière ensoleillée d'été réchauffe tous les tons, même dans un appartement. Un temps gris jettera, au contraire, sur le motif un voile bleuâtre et froid. Il est donc nécessaire de tenir compte, en vue du résultat final, non seulement de l'intensité, mais encore de la couleur de la lumière ambiante.

Il est plus compliqué et plus difficile d'obtenir une harmonie de couleurs en opérant par contrastes. Sachons d'abord que, si deux couleurs complémentaires sont placées côte à côte, l'intensité de ton et la luminosité de chaque couleur seront augmentées par le voisinage de sa complémentaire – et que, lorsque ces deux couleurs occupent un espace important dans une composition, les autres couleurs, bien que non complémentaires, gagneront cependant au voisinage de celles-là. Habillons une femme d'une robe rouge que nous tenterons de reproduire à son éclat maximum ; il nous faudra choisir un fond plutôt sombre, de couleur vert-bleu. Mais si c'est un portrait dans le vrai sens du terme que nous nous proposons de faire, le rendu de la robe deviendra secondaire et nous éteindrons au contraire sa couleur en la faisant détacher sur un fond de tonalité neutre. Dans tous les cas, nous éviterons les fonds crus de peluche rouge ou bleue, à moins que nous ne voulions faire une étude de peluche, mais alors le modèle est de trop.

Il est nécessaire de bien connaître la série des couleurs complémentaires au point de vue de la composition des natures mortes et de l'entourage du modèle. En voici la liste : le jaune de chrome est la couleur complémentaire du bleu d'outremer ; l'orange, celle du bleu ; le vermillon, celle du vert-bleu ; le rouge, celle du bleu-vert ; le violet, celle du vert.

Dans les compositions comprenant un personnage, les fleurs et les étoffes de couleurs variées nous seront très utiles comme accessoires. une note vive

fournie par une orange ou un citron suffira souvent à compléter heureusement le tableau. Mais l'autochromiste devra se méfier des larges zones de tons unis, tentantes cependant. C'est là que viendront fatalement se grouper toutes les taches et les défauts de nos plaques.

La superposition de deux positifs autochromes permet d'obtenir des intensités de couleur très remarquables. Faites deux plaques identiques d'une nature morte, posez très largement et superposez les positifs bien exactement ; les couleurs et les noirs doubleront de puissance.

Mais au point de vue couleur, nous aurons parfois des déboires. Ainsi certaines harmonies colorées que nous admirons dans la nature doivent leur beauté plutôt à la texture de leur matière qu'à leur couleur vraie. Voyez la combinaison de rouge et de violet de certaines fleurs. Et cependant, en ces cas particuliers, le photographe l'emporte sur le peintre parce que la lumière traverse ses couleurs au lieu de s'y refléter simplement ; elles gagnent à être vues par transparence.

Cette question de texture explique la déception de bien des femmes devant le rendu sans intérêt de leurs robes en peinture. Il y a deux raisons pour cela. D'abord l'impossibilité de rendre sur une toile les minutieuses harmonies colorées qui se jouent dans les reflets des soies et des satins. Ensuite la double personnalité du couturier et de l'artiste, le premier n'ayant pas composé sa robe en vue du fond et de l'entourage que le second lui a donnés. Car il n'est pas discutable que bien des modistes et des couturières parisiennes ont davantage le sentiment de la couleur que la plupart des peintres. En vérité, je ne connais pas de champ d'étude plus profitable que celui des chapeaux et des robes des Parisiennes. Vous y trouverez toutes les combinaisons possibles depuis le ton sur ton – j'ai vu ainsi d'admirables harmonies en brun – jusqu'à l'emploi hardi des couleurs intenses et des contrastes complémentaires.

Les arrangements les plus difficiles à réussir sont, sans aucun doute, ceux qui comportent deux couleurs qui sont différentes mais contiennent cependant un élément commun, soit l'arrangement en orange et jaune, en rouge et violet, en rouge et orange. On y arrive quelquefois en séparant les

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couleurs par un ton noir. Aussi l'intensité du ton joue un rôle important. Ainsi le rouge et le bleu dans toute leur vigueur peuvent donner de beaux effets; délayés en rose et en bleu pâle, ces couleurs deviennent atroces. Ces tons pâles peuvent cependant être réveillés par la contiguïté d'une note blanche. Ainsi nous aurons soin, si nous avons à photographier des fleurs aux tons très pâles, de les rapprocher d'un objet blanc. De même, nous placerons contre un fond blanc un modèle habillé d'étoffes claires et légères. Nous l'entourerons, au contraire, de noir, si ses vêtements sont de couleur sombre; ils en paraîtront plus clairs. Cependant, on ne peut ériger ces principes en lois, car nous voyons Rembrandt et les Vénitiens se servir de bruns et de noirs pour corser leurs couleurs et les Japonais introduire des taches de noir dans des compositions de ton très clair. Mais, pour ceux-ci, il faut ajouter que leurs couleurs sont appliquées sur des dessous clairs et que leurs taches peuvent, en somme, n'être considérées que comme des accents.

Quand nous aborderons le paysage en autochromie, nous nous heurterons à de nouvelles difficultés; car nous nous trouverons à la merci de la nature et notre contrôle ne pourra s'exercer que sur le temps de pose et de développement. Cependant l'emploi intelligent de l'écran Renngott et d'autres écrans variés, de teintes très pâles, ajoutés à l'écran Lumière, nous donnera quelques facilités.

Les principales erreurs que j'ai relevées dans la plupart des paysages autochromes peuvent se résumer ainsi: développement trop prolongé, renforcement exagéré. Il en résulte des couleurs crues et fausses. Dans les contre-jours surtout, les troncs d'arbres et les ombres portées sont rendus par des masses noires et bouchées. Le remède est tout indiqué: augmentez légèrement la durée de la pose et diminuez celle du développement. L'expérience seule déterminera le degré de modification à apporter à ces opérations, il n'y a pas de formule possible.

C'est en été, bien entendu, que se consomme le plus grand nombre de plaques autochromes. Tout est vert à cette saison-là et on peut être sûr que cet océan de verts va être renforcé jusqu'à faire hurler. Voyez les charmantes plaques autochromes

de projection par M. Personnaz; vous n'y trouverez pas un seul paysage vraiment vert, et ils sont tous exquis. Car il a cherché ses effets parmi ceux de la nature qui sont les plus subtils et les plus délicats. Il est intéressant d'étudier à ce point de vue la différence entre les paysages autochromes de l'amateur photographe de culture moyenne et les tableaux des grands paysagistes. L'effet que le peintre évite ou n'aborde que rarement, semble la règle chez le photographe. Nous chercherons en vain des effets de verts brillants, de verts de sève pour ainsi dire, dans l'école de Barbizon. Même chez les impressionnistes qui se sont fait une spécialité des effets de lumière et de plein soleil, les verts ne jouent qu'un rôle effacé. A tel point, que lorsque le motif comprend dans la nature de larges espaces de cette couleur, les artistes comme Monet prennent soin de rompre la crudité des verts par des petites touches de rose et de violet.

Du reste, en comparant les résultats de l'autochromie avec les théories de l'impressionnisme, on est étonné de reconnaître que beaucoup de ces théories sont confirmées pour la plaque autochrome et que beaucoup de points de technique sont contredits. Ainsi, à l'époque où le public s'irritait devant les ombres bleues des plein-airs de la nouvelle école, la plaque autochrome aurait convaincu les incrédules qui avaient des yeux et n'y voyaient point. Au contraire, nous pouvons aujourd'hui prouver l'inanité de l'explication de la technique pointilliste donnée par les critiques à l'apparition de cette école. Il était admis que des taches juxtaposées de couleurs diverses se fondaient optiquement (au centre optique cérébral du spectateur) pour former un ton composite. Or, étant donné le diamètre de ces taches de pâte, il faudrait, pour qu'elles puissent se confondre optiquement, que le spectateur soit à plusieurs centaines de mètres de distance de la toile. Et si ce mélange optique avait lieu, il donnerait tout simplement du gris à la place des riches tonalités cherchées; tandis que l'intention des pointillistes est d'obtenir une vibration lumineuse toute particulière en plaçant leurs tons à côté les uns des autres au lieu de les mélanger. En effet, le bleu et le jaune, quand le mélange est effectué sur la palette, donnent un vert beaucoup plus éteint que lorsque ces couleurs sont appliquées pures, côte

à côté sur la toile même. Le mélange optique proprement dit n'a pas lieu. Mais l'œil, passant rapidement de la tache bleue, il y aura perception d'un gris. Et si nous parlons de mélange, ce n'est pas même du gris, fondant deux complémentaires, le bleu, mais bien du blanc. Actuellement, les aspirations au transport de l'image en couleur, je suis persuadé que la solution est proche. Mais nous ne devrions pas nous attendre à ce que les résultats pareils à ceux de l'image vue par transparence, leur sera peut-être exact au point



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à côté sur la toile même. Dans ces conditions, le mélange optique proprement dit ne se réalisera pas. Mais l'œil, passant rapidement de la tache jaune à la tache bleue, il y aura persistance d'impression rétinienne et il en résultera une illusion de vert. Et si nous parlons de mélange optique *scientifique*, ce n'est pas même du gris que nous ferons en fondant deux complémentaires comme le jaune et le bleu, mais bien du blanc.

Actuellement, les aspirations tendent sans doute au transport de l'image en couleurs sur du papier. Je suis persuadé que la solution de ce problème est proche. Mais nous ne devons pas nous attendre à des résultats pareils à ceux que nous donne l'image vue par transparence. Le rendu de la couleur sera peut-être exact au point de vue des tons,

il ne sera jamais à la hauteur de celui des plaques autochromes au point de vue de l'intensité et de l'éclat. Bien des sujets que nous admirons aujourd'hui perdront tout intérêt, toute beauté aussi, dès qu'ils seront vus par réflexion. Tous les motifs riches en couleur et en lumière nous donneront pareille déception, car leur beauté n'est due qu'à l'intensité de leurs couleurs. Dès que celles-ci seront éteintes par leur nouveau support, il ne restera plus rien.

Les plaques autochromes nous ont apporté un nouveau médium qui restera. A mon avis, c'est le plus beau que la photographie nous ait jamais donné pour traduire la nature.

La Revue de Photographie
no. 2 12p 7-13, 1908

Eduard J. Steichen
(1906)



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American Photography
Vol. 41 (Oct, 1947) pp 38-39

THE ADVENT of COLOR

by RODGER J. ROSS

DURING the past few years there has been a revival in color photography due to the introduction of Kodachrome and Kodacolor, Ansco Color Film, and more recently, Ektachrome, as well as the cheaper and simpler methods of making prints from color transparencies. So much attention has been given to these products and methods, that many amateurs believe that photography in color is something new.

It is interesting and decidedly disconcerting in looking back through the old magazines to find the very problems we are confronted with today being discussed forty years ago with a good deal of discernment and enthusiasm.

We might be quite safe in saying that the desire to reproduce nature in color dates back to the invention of photography itself. But it was not until Louis Ducos du Hauron in 1869 outlined the theoretical possibility of color photography as we know it today, and still later, in 1876, when the nature of the blue-sensitive silver emulsion was adjusted by means of dyes to permit the recording of green and red, that color photographs could be actually produced. Even then, the great practical difficulties of the three-color process limited color photography to a few enthusiastic experimenters.

On July 16, 1907, the announcement of the Autochrome color plate burst upon the photographic world with the startling suddenness of the explosion of the first atomic bomb. But, first, on July 2nd, Mr. R. Child Bayley, editor of the weekly magazine, *Photography*, published in London, England, reprinted a small item that was like the lightning flash before the thunder's roar. Buried in the announcements column, it was noted that a certain Professor Stebbing had written in a letter to the Bury St. Edmunds Free Press that the Lumière starch grain process of color photography was in the commercial stage. Mr. Stebbing had purchased a dozen half-plates in Paris for thirty francs and had taken pictures of landscapes, flowers, and fruit which were magnificent.

Mr. R. Child Bayley, to the credit of his magazine and the undying enthusiasm of amateur photographers the world over, rushed over to Paris and bought some plates himself. Two weeks later the entire front page of *Photography* was devoted to an announcement of the discovery of Real Color Photography that would have warmed the heart of any wide-awake 1947 model publicity agent. The heading in large type read "Color Photography — A Revolution. The new Lumière Autochrome Plates are creating an immense sensation in France. An interview with Mr. Steichen who has obtained some most remarkable color pictures with this process. The first detailed account of amateurs' experiences to be published. Demand so great in France that there are no plates for England at present."

There follows an article "My Own Experiences with the Autochrome Plates," by R. Child Bayley: "It is now possible, or it was last week to go into a shop in Paris and to purchase a special form of dry plate which, exposed much as any other plate is exposed in the camera, gives within half an hour of exposure a finished and dry positive transparency on glass in all the colors of nature as true as the best three-color work I have ever seen, far and away better than most. Never since I developed my first plate twenty-three years ago did I feel the interest and impatience that filled me as I carried that slide into the darkroom." There follow two pages of description of the process. He concluded, "It is impossible at this stage to foretell what will be its results. That it is revolutionary is unquestioned, yet paradoxically enough it is not novel. Messrs. Lumière published the details years ago but the photographic world looked upon it as a beautiful laboratory experiment."

Mr. Edward J. Steichen was in on the announcement with two more pages. He gave as his opinion that "The great future of this process is certainly in the hands of the amateur photographer. For the professional it can have little value as its method of presentation is impractical. In the field of magazine illustration it will revolutionize things. In America we look upon any process as commercially impracticable until we

can get the same results by as simple a means on paper."

Editorially, Mr. Bayley commented in the same issue: "We have maintained a great deal of reserve for several years now on the subject of color photography. So much has been written for advertising ends or for mere sensationalism and so little real advance has been made that we had rather come to the despair of three-color work. No doubt in the very early days of photography itself all was so wonderful that a very shadowy result was regarded as a marvel. Just such a phase has three-color work passed through; and color, right or wrong, has been regarded as, in itself, most amazing. This was never shown better than at a lecture by Miss Ackland when the applause was strictly quantitative. The more color, the more glaring the yellows, greens, and blues, the greater seemed to be the appreciation of the audience. The time has come for a revision of this attitude. A full account of the Autochrome plates — the first to be published in the English language — we are able to give this week."

A week later Mr. Bayley exhibited his plates before the London and Provincial Photographic Association.

Mr. Bayley commented "The sensation which last week's *Photography* aroused has led to countless discussions of the possibilities of the Lumière process. One of the most promising lies in the use of Uto paper to which Dr. Smith has been giving much of his time. Theoretically it ought to be possible to make a gray-black paper which should bleach to the colors of light to which it was exposed. Uto paper is still a long way from perfect, but the results are decidedly encouraging."

"Mr. Steichen, who has done more with this process than any other amateur worker, has exposed two Autochrome plates on a field of bright red poppies. One was developed and reversed in the ordinary way; the other not reversed at all. The result was a color picture in which every color in nature was represented by its complementaries, the poppies being bright green."

What, then, is new after all!

In the less formal era of journalism forty years ago, editors spent a good deal of time prodding their contemporaries. Mr. Bayley, fortunate enough to scoop the world's photographic press with his announcement of the Autochrome plates, frequently gloated over his achievement at the expense of other English magazines. "I have been told not once but fifty times by those who have seen the color pictures that I have not said a word too much about them. All will soon know that this is so and that those who for the moment profess to think otherwise are simply writing out of their own inner consciousness without a knowledge of the facts, and inspired possibly by the galling thought that in making this great advance known to the British public they have been in the position of the man who fell out of the balloon, that is to say — 'not in it.'"

And a week later, "Thanks to their praiseworthy practice of only writing about what they know and to an excusable pride which prevented them from taking any steps to see the specimens on view at 20 Tudor Street [Mr. Bayley's editorial office], our contemporaries have been kind enough to leave to *Photography* a complete monopoly of information on the color process. But we fear that even Mr. Hinton [editor of *The Amateur Photographer*], will ultimately learn that a great step has been taken without his approval and even without his knowledge." No doubt Messrs. Lumière appreciated Mr. Bayley's million-dollar advertising campaign on behalf of the Autochrome plates, for as a final barb, he says: "Through the courtesy of Messrs. Lumière themselves we have enjoyed practically a constant supply of Autochrome plates for the past four weeks."

Alfred Stieglitz wrote from Germany: "While in London

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Steichen did Shaw and Lady Hamilton in color. Soon the world will be color mad, and Lumière will be responsible."

On September 3rd, Mr. J. McIntosh, Secretary of the Royal Photographic Society, announced that special facilities were being offered at the forthcoming exhibition of the R. P. S. at the New Gallery for the adequate display of Autochrome pictures. And so the first color-slide salon was arranged.

The Autochrome plate, by the way, was composed of a mixture of dyed starch grains sprinkled on a tacky glass plate, crushed to cover the surface as evenly as possible, any open spaces between the grains being filled with carbon black; then an emulsion was coated over the starch. Exposure was made through the back. In processing, the image was reversed. The starch grains were very minute, approximately 1/2000 inch in diameter, and were dyed orange-red, green, and violet in about equal proportions. Unfortunately the plates were very slow, requiring great increase in exposure over popular plates of the day. Mr. Bayley, in relating some of his experiences, notes: "We gave two seconds at f:11 and got a fine rendering of sky, but the foreground was decidedly underexposed. We fear that at the present at any rate the scale of the plate is too short."

On September 24th Autochrome plates went on sale in London, and the demand for information entirely sold out several issues of *Photography*. Mr. Bayley reprinted the information in pamphlet form, and sold 2000 copies the first day.

Mr. Stieglitz, writing in *Camera Work*, said: "Color photography is an accomplished fact. The seemingly everlasting question whether color would be within the reach of the photographer has been definitely answered. This answer the Lumières of France have supplied. For fourteen years, it is related, they have been seeking it. They have given the world a process which in history will rank with the startling and wonderful inventions of those other two Frenchmen, Daguerre and Niépce. We venture to predict that what the Daguerreotype has been to modern monochrome photography the Autochrome will be to the future color photography."

The introduction of the Autochrome plate stirred up a tremendous interest among photographers in the whole subject of color photography. At a lecture at Cambridge the original photographs made by Clerk Maxwell to show the principle of

three-color work were shown. The Warner Powrie color process, based on the ruled screen plate of Professor Joly, was described by Mr. Powrie at the R. P. S. Dr. Albert in Munich was just about ready to announce a new process. M. Jougla was working on another, Omnicolor. M. Antoine Lumière visited the United States in December, 1907, and was entertained at dinner at the Majestic Hotel, Philadelphia, by the editors of *The Camera and Bulletin of Photography*. The invitation described M. Lumière as founder of the house of A. Lumière et ses Fils, Lyons, France, who made color photography possible by the invention of the Autochrome plate. The history of three-color photography up to the Autochrome plate was carefully gone over.

Aside from the technical aspects of the subject, photographers in 1907 were alive to the problems of color rendition. A writer in *The Amateur Photographer* of January 14, 1908, related the words of Ruskin about such things. "I once asked Ruskin why he hoped that photography in natural colors would never be an accomplished fact. His reply was that in the first place nature very rarely sang in tune and that he did not see how the camera and the man behind it would be able to know when nature was singing in tune, for, he added, photographers made such terrible mistakes when they had only monochrome to deal with that he shuddered to think what they would do if they had all the colors of the rainbow to manage."

Another writer in the same magazine on May 19, 1908, addresses himself "To My Color-Blind Colleagues: For years photographers have been seeking to eliminate the element of color from their mental impressions and to look upon nature as a color-blind man could see her, depending for composition on harmonious light and shade. Suddenly photography has been enriched with a new and beautiful process, the characteristic of which is its wonderful rendering of that color to which we have so long turned a blind eye. The consequence is that in most cases photographers are unprepared to utilize this new and wonderful power. The first impulse of those able to obtain Autochrome plates appears to have been to ransack larder and garden for all the brightest and most varied colored objects they could lay hands on. Luckily most of the films of these early efforts frilled off in development. Some, however, have seen the light of day and stand as solemn warnings to posterity."



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Color Photo Process On Display

"There has never been anything like this. It's the clearest demonstration of what color photography is that I ever have seen."

Edward Steichen, director of photography at New York's Museum of Modern Art, said that after a visit to Eastman House yesterday.

Steichen was previewing a new four-room exhibit of the principles and history of color photography. This permanent display, another "first" for the world's first photographic museum opened today.

"Historically, this show is beyond what I dreamt could be done," Steichen added. Beaumont Newhall, Eastman House curator, planned the exhibit.

OFFICIAL OPENING of the exhibit followed ceremonies in the Dryden Theater last night. Heading the list of guests were Leopold Mannes and Leopold Godowsky, musicians whose "side interest" resulted in the development of the Kodachrome color process. A gift of \$25,000 from them made possible the exhibit.

Dr. C. E. Kenneth Mees, Kodak vicepresident and Eastman House trustee, told of his association with Mannes and Godowsky and their decision to leave music — Mannes piano and Godowsky violin — in 1931 and enter the Kodak laboratory to perfect their process.

THOMAS H. MILLER of Kodak's photographic training department, described the Mannes-Godowsky color method.

Among the guests were Dr. and Mrs. Cornelis de Kiewiet, Mr. and Mrs. Raymond N. Ball, Arthur See, Guy Fraser Harrison and Dr. Herbert E. Ives, son of Frederick E. Ives who in 1895 developed the original three-color lantern slide projector which is included in the exhibit.

INCLUDED IN the demonstration apparatus is Newton's spectrum experiment showing the colors contained in "white" light. Then the visitor can create white light by mixing primary colors.

Next he can see that the color of objects depends upon the light they reflect or transmit. Finally, he "colors" a picture of a house by projecting red, green and blue slides on a screen.

Other principles of coloring are demonstrated until the visitor reaches the Technicolor movie making process, which is about the latest word.



PHOTOGRAPHY PREVIEW — Edward Steichen, curator of photography at New York City's Museum of Modern Art, examines one of the early color cameras, part of new color exhibit which opened today at George Eastman House.

George Eastman House: Principles and history of color photography, astronomical photographs, prints from Rochester Camera Club and Kodak Camera Club; 2 p. m. today, organ music, Harold O. Smith.

Dryden: 2.30 and 4 p. m. today. "The Fighting Coward," 1924 film, with Mary Astor, Ernest Torrence, Noah Beery, Phyllis Haver and Cullen Landis.

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New Color Room At George Eastman House

A preview of the permanent and history of color photography at Eastman House. It was opened

Leopold Mannes and Leopold Godowsky, whose generosity made possible the new color rooms, were introduced by Dr. C. E. K. Mees, president of Eastman House. Mannes and Godowsky are the inventors of the Kodachrome process of color photography.

T. H. Miller, head of the Photographic Training Dept. at KO, gave a lecture on "The Work of Mannes and Godowsky and Modern Color Photography." The story behind the new exhibit was told by Beaumont Newhall, curator of Eastman House. Trustees were hosts at the opening ceremonies.

Four rooms on the second floor of Eastman House have been redesigned. In the first room dem-

Color Photo Show Proves Fascinating

Both fascinating and instructive is the color photography exhibit which will open today at Eastman House.

A gift of Leopold Mannes and Leopold Godowsky, the first to make practical the modern process of color photography, the permanent exhibit is housed in a redesigned section of the second floor.

Last night at special unveiling ceremonies, Mannes and Godowsky spoke briefly prior to a lecture by T. H. Miller on "The Work of Mannes and Godowsky and Modern Color Photography."

Miller outlined their work from 1931 to 1939 as research engineers in Eastman Kodak Company laboratories, where they developed the Kodachrome process.

In the first room of the exhibit are demonstration devices, which, when operated by the visitor, portray the principles of colors, how they are formed, and creation of white light by mixing the three primary colors.

Pair Donates Film Color Pro

A \$25,000 gift from two musician-scientists Leopold Mannes and Leopold Godowsky, inventors of the Kodachrome color process, has resulted in a new permanent exhibit in George Eastman House.



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Courtesy of International Museum of Photography
at George Eastman House
Steichen spoke at opening of color exhibition there
(March 2, 1951)

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when it has cooled. Such a solution is a good acid fixing bath, and a preservative against frilling as well, and can be made up in quantity and taken as required for use. It will not cure frilling that has started in the developer, but it will prevent it from going any further, and this is generally all that is required.

Packing a Wet Negative.

Some time ago we described a method by which a wet negative could be sent through the post, and as bread cast upon the waters may return again after many days, so we find the method which we published has just been quoted by a writer, with all due acknowledgment, who says it stood him in good stead last year when in Belgium, and that he sent home several negatives in this way, which he had not time to allow to dry properly at the place where he was staying.

The method is as follows. A piece of glass the same size as the negative is taken, or a spoilt negative with the film cleaned off, or, if two plates are to be packed, the second may be used instead of the glass, and the wet negative is placed on the glass, film inwards, separated from it at each end by one of the little cardboard separators with which plates are packed. The two pieces of glass are then tied together, wrapped in a sheet of paper thoroughly wetted, and then wrapped in waterproof paper; the waxed paper in which plates are packed answers very well. The plates may then be put in a box and sent through the post. The wet paper must not be omitted, or the negative may dry in parts, and drying marks will be left; and it is certainly well, if possible, to give negatives which are to undergo this ordeal a bath of dilute (ten per cent.) formaline, especially if the weather is at all warm.

There is no expense to the reader. If he secures a new reader of "Photography," he receives a complimentary copy of the photographic book he selects, free, and post paid. Particulars are given this week on the loose inset.

A Rival for Selenium.

So far, as we pointed out a few weeks ago, all methods of transmitting pictures by wire are based upon that remarkable property of a certain modification of selenium, by which its electrical conductivity is altered by altering the intensity of a beam of light falling on it. It is now announced that this same property is shared by antimonite, or native antimony sulphide—the principal ore of antimony. The discovery is due to a Dutch scientist, M. Jaeger, who found that the conductivity of a rod of Japanese antimonite was considerably greater when light fell on it than it was in the dark. Tellurium is also said to manifest the same property.

"Photography's" Index.

With this issue of *Photography* we begin a new volume. The index for the last will be ready in a few days, and can be obtained free of charge by anyone applying for it to our publishers, Messrs. Iliffe and Sons Ltd., 20, Tudor Street, London, E.C. All applications must specify the name of the paper, and must be accompanied by a stamped ($\frac{1}{2}$ d.) addressed wrapper, not by loose stamps. As on previous occasions, the index has been compiled to make it as far as possible a complete key to the contents of the paper. We ourselves are probably the most frequent users of the index, since we need it in our daily work,

PHOTOGRAPHY. JULY 2ND, 1907.

and we have therefore long realised what a perfect index should be like, and what are the shortcomings of the average index of a photographic journal, compiled, as it seems often to be, by some clerk or other quite ignorant of photography. There are professional "indexers" in London, but, excellent as might be their labours on journals dealing with general topics, the indexing of a photographic journal is quite another matter, and an index compiled without a knowledge of its subject matter is not worth the paper on which it is printed. Readers who want a copy of the index to *Photography* should lose no time in sending for it.

A Constant Supply.

A kindly reader asks us not to measure the extent to which *Photography* is recommended to other photographers by the number of applications for the books which our publishers offer, as there are many staunch supporters of *Photography* who have introduced it to others, yet who will never apply for the complimentary books. We are sure of it. At the same time, there are many who are glad to avail themselves of the offer; and nothing is more curious than the regularity or constant supply of applications for the books. It was not merely a rush at first followed by a complete cessation; but keeps almost constant, with a slight tendency to increase as the weeks roll on. Under these circumstances our publishers state that they feel that the offer should remain open at least for another month, but they would be glad if those who propose to take advantage of it would do so as soon as possible.

A Little Late.

We read in a contemporary that "by about the time Mr. Coburn starts from America, Mr. Alfred Stieglitz will have arrived on this side." As Mr. Stieglitz has been in Europe for nearly a month past, the meaning of the sentence is not very clear. Has Mr. Coburn started already, and is he coming the long way round from America, or did he start when Mr. Stieglitz arrived or thereabouts, in which case Mr. Coburn should have been here a fortnight? Anyhow, our contemporary seems to have got a little out of touch with those whose movements it professes to chronicle. It seems to know that Steichen is in Paris, though. Come, we are getting on.

Photographing One's Self.

Alluding to our poster last week, which bore these words in big letters, the "Evening News" remarks: "Of course, the great thing is to look pleasant. So many amateur photographers make the mistake of taking themselves much too seriously." There is many a true word spoken in jest.

Lumière Starch Grain Process.

According to a letter which Professor Stebbing has sent to the "Bury St. Edmunds Free Press," the Lumière starch grain process of colour photography is now in the commercial stage. M. Stebbing has seen it demonstrated and has purchased a dozen half-plates, for which he paid thirty francs. He states also that the results are transparencies and cannot be reproduced, so that for a dozen photographs of the same subject a dozen plates must be exposed; but he reports that the photographs in colours that were shown, which included landscapes, flowers, and fruits, were "magnificent."

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PHOTOGRAPHY

A JOURNAL FOR EVERY CAMERA USER.

EDITED BY R. CHILD BAYLEY.

PUBLISHED WEEKLY.

JULY 16TH, 1907.

TUESDAY.

No. 975. Vol. XXIV.

COLOUR PHOTOGRAPHY.

A REVOLUTION.



The new Lumiere Autochrome Plates, which are creating an immense sensation in France, give a direct positive in colours in a single operation. There is only one exposure needed, and no printing, or superposing.

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SPECIAL TO
"PHOTOGRAPHY."
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An Interview with Mr. Steichen, who has obtained some most remarkable colour pictures by this process; with some account of his results.

THE FIRST DETAILED ACCOUNTS OF AMATEURS' EXPERIENCES TO BE PUBLISHED.

DEMAND SO GREAT IN FRANCE THAT THERE ARE NO PLATES FOR ENGLAND AT PRESENT.

My Own Experiences with the Autochrome Plates.

By R. Child Bayley. Special to "Photography."



HE "discovery of photography in natural colours" is boomed in some quarter or another almost every week. "Wolf! wolf!" has been cried so frequently that I should not be greatly surprised if a number of my readers pass the announcement we make this week with some such phrase as "Oh! the old story."

Yes. It is the old story, down to its very details, but with the difference that what has hitherto appeared as a theoretical possibility is

Actually a Practical Commercial Fact.

"What is that?" says the reader.

Just this. That it is now possible, or it was last week, to go into a shop in Paris, and to purchase a special form of dry plate, which, exposed much as any other plate is exposed in the camera, gives within half an hour of exposure, a finished and dry positive transparency on glass, in all the colours of nature, as true as the best three-colour work I have ever seen—far and away better than most.

No Skill Required.

There is no difficulty about the process whatever. It calls for no skill or knowledge that it is not the common property of every photographer. There is no balancing of one screen against another, no dyeing

or washing out, no triple exposures and triple treatment of any kind, no registration or want of it, not even any waiting. It is a simpler and a far easier process to produce a perfect colour photograph on these plates than it is to make an ordinary negative and to print it in P.O.P.

No Imperfect Rendering Needing Apology.

Nor is there any imperfect colour rendering to be apologised for. One or two shades are not quite right, but as a whole the colours are true; certainly there is none of that general weakness of some one colour one often sees in three-colour work.

The Severest Test Passed.

An expert knows that the severest test of three-colour photography is to get a white and a black. Many a process, which will deal fairly well with coloured subjects, breaks down completely when tested by its power of dealing with white, black, and grey, giving them with a marked tint. This does not. In the midst of the most brilliant colours faithfully rendered, black, white, and grey come out without the faintest tinge.

Transparencies on Glass.

The results are positive transparencies on glass with a fine grain, so fine that they can be used very satisfactorily as lantern slides; but people with good sight

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EXPERIENCES WITH THE AUTOCHROME PLATES.

can detect the grain without a magnifier, while with a magnifier it is very distinct. There is, up to the present, no way of reproducing these pictures on paper; but they can, of course, be used as originals from which three-colour illustrations can be made in the customary manner. They can be viewed from either side.

Personal Experiences with Commercial Plates.

Nor are these "inventors' claims," but a matter of my own personal knowledge. My results have not been obtained on samples sent me by the makers for trial. I wish they had, for the new plates, half-plate size, cost about half-a-crown apiece, and I had to buy them in the ordinary way. Nor is there any secret, mark, as to the general outlines of their production. The makers give all the necessary formulæ, so that those who will can make up the solutions for themselves, while those who like to save themselves the trouble can buy them ready made. They are just ordinary developers and things, without anything not readily purchasable.

The Inventors.

The new plates are called "the Autochrome plates." They are the invention of Messrs. Lumière, of Lyons, and have been on sale in Paris for some weeks. I say "on sale"; perhaps I ought to have said "they have been sold," for the demand has so outrun the supply that they can only be got now and then, and in small quantities. So great has been the interest they have aroused there that none have yet made their appearance in the English market. But the factory in which they are made is rapidly extending its capacity, and before long no doubt they will be obtainable in any quantity through the recognised channels. My own supplies were obtained from the shop of M. Henri Calmels, of 150, Boulevard Montparnasse, Paris. In 13 x 18 centimetre size (a trifle larger than 7 x 5 in.) they sell at ten francs a box of four. In addition to the plates a yellow screen is used on the lens, and a few chemicals are required. The yellow screen must be that which the makers supply; no other will do.

The Exposure made through the Glass.

Later on I will say something about the theory of the process. Let me first deal with the manipulations. I will suppose the plates, chemicals, etc., have come to hand, and the impatient amateur wishes to make his first colour photograph. First of all, then, he turns his focussing screen round so that the ground side of the glass is away from the lens. This is done because the plates are exposed through their glass, or from the back, so we must allow for the different distance in focussing, and turning the glass does this near enough.

Filling the Dark Slide.

Then we load the slide, having first made a carrier to take the French size plate, if we have not got one already. As the plate is turned glass side to the lens, we must be most careful not to injure its very sensitive surface with the spring of the dark slide, so with each box of plates we find we have given to us a set of cards of the same size, with one side of each blackened. After putting the plate in the slide, one of these cards is laid down on the top of it, black side next the plate, and then the dark slide is fastened up in the ordinary way. As the plates are sensitive to red light, as they must be to reproduce red colours, the slides must be filled in the dark, or at least in a position where no direct light from the lamp can reach

them. This I did by turning the lamp to face the wall, so that there was just a very feeble light in the room, but nothing more. I may say there was no trace of fog on any of my results.

The Exposure Problem is the only Problem.

All is now ready for exposure. Although the emulsion is extremely sensitive to light, the plates need a comparatively lengthy exposure; that is to say, a very little light will fog them, but a good deal is needed, reaching them in the legitimate way, through the glass, to give the picture in its natural colours. The makers say that in good bright sunshine a landscape, with f/8, requires one second exposure. Six seconds are needed if the weather is cloudy. Few people are likely to expose their first plates on landscape subjects, but will select rather a group of flowers or some other still life, readily attainable, and the problem of exposure is to be faced. It is all the more serious because it is the only problem in the whole process. Everything else is quite automatic, and could be done almost, if not quite, as well by a machine as by a man.

A Watkins Speed of about 2.

I arrived at the exposure by the aid of the invaluable Watkins meter, of course. I barked back from Messrs. Lumière's instructions. In good diffused light we are told that the plates require about six seconds at f/8. Now six seconds is about the time the meter paper takes to darken in good diffused summer light, from which it is clear that they must have a Watkins speed of about 2. This means that with f/11 the correct exposure is about twice as long as it takes the Watkins meter paper to darken.

Accordingly, having set up a still life subject indoors, I put the meter down beside it, and found the paper in the meter darkened in four minutes. Using f/11 for my first exposure, then, I gave eight minutes. The result was a tribute to the accuracy of my deduction and to the usefulness of the meter. It was as correctly exposed a plate as could possibly be wished.

The development was next put in hand. Never since I developed my first plate, twenty-three years ago, did I feel the interest and impatience that filled me as I carried that slide into the dark room. For the reader must remember that I had seen specimens of what the process would do in skilful hands, and wondered how far I dare hope to be able to do likewise.

Pyro-ammonia the Developer.

The developer is the old-fashioned pyro-ammonia, and a liberal supply has to be used, for there can be no stooping over the dish in the red light to see if the plate is covered. It must be covered and developed in the dark. The Stanley clock, which forms a prominent feature of my dark room, is put where the light of the red lamp falls on it; there is no need to take the temperature of the solution, for sufficient reasons.

Development and Completion.

The developer is poured on, the dish covered with a card, and rocked for two minutes and a half. As soon as that time is up, the developer is poured off, and the plate held under the tap for fifteen seconds, put back in the dish, and covered with a solution of potassium permanganate and sulphuric acid. I will not go into details of the composition of the baths, as elsewhere this week I give a translation of the formulæ. Let it suffice to say the acidified permanganate (Namias's reducer, in fact) is poured over the negative, and as soon as that happens—less than three minutes,

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all told, after beginning the development—the plate, unfixed, may be carried out into broad daylight, and everything else done in the fullest light. In less than half a minute, on holding up the plate, the colours will be seen to make their appearance; and in a couple of minutes the permanganate has done its work, and the plate is no longer a negative, but a positive, in true colours, though the colours are not so brilliant as they will be at the finish. It is again rinsed for fifteen seconds, and an ordinary amidol developer poured on, in daylight. This darkens the creamy-looking surface of the film, and when it has acted for two minutes it is poured off again. Another fifteen seconds rinse is followed by a quarter of a minute or less in the permanganate reducer, but this time it must be very dilute. Another rinse, and we pour on a silver intensifier, which is allowed to act for half a minute or more. This brightens up the colours, and as soon as it has acted sufficiently it is poured off, and a fairly strong plain solution of permanganate is applied for half a minute. This is followed by a rinse, which in its turn is followed by two minutes in acid-hypo, then the plate has five minutes washing under the tap, and is finished. It dries in ten minutes or a quarter of an hour, without the aid of heat, and may be varnished or protected with a cover glass, like a lantern slide.

No Difficulty of any Shape or Kind.

Now although if that list of operations is read over quickly it seems elaborate, they take less time to perform than it has taken me to write a sketch of them. The sensitive film is so thin that each solution speedily acts right through it; hence the fixing is complete in two, the washing in five, and the drying in fifteen minutes. Here, too, let me point out the absence of difficulty of any shape or kind. Except the silver intensification, there is no one stage which calls for any determination by the help of the eye. The development is done by the watch, and all the other operations by time also. Anybody who can pour liquid over a plate and can tell the time by a watch can carry them out as efficiently as Messrs. Lumière could do them themselves. As for the intensification, that is done until either the colours are bright enough, which can easily be seen, or the solution becomes muddy, in which case it must be poured off, and fresh must be used.

The First Attempt a Complete Success.

But I do not want, here, to rewrite instructions, but to narrate how I myself got on with my own attempts. Let me say that my first plate was as good as any three-colour photograph, produced in any method, by the most skilful three-colour experts that I have ever seen. And it was my first—using a strange, unfamiliar plate, a developer I have not used for years, and working with nothing more than the makers' printed instructions, with the recollection of an interview a day or two before with my friend Mr. Steichen—a full report of which I give elsewhere this week.

Portraiture, with Fifteen Seconds Exposure.

My second plate was a portrait. Now for portraiture with comparatively slow plates, a good light and a rapid lens are almost essentials. I had no studio available and no portrait lens, so I had to do the best I could with an f/6 stigmatic and an ordinary London room, light being the light of London in (alleged) summer. A lady model was good enough to sit unmoved for three minutes (f/8 being used), the time of exposure being the time it took to darken the meter paper. The result was equally good. The

flesh tones were flesh, the colour of the eyes distinct and unmistakable, and the shadows in the white blouse free from the slightest trace of any greenish tint so often seen in three-colour work in such conditions. A bunch of roses, a blue-black velvet focussing cloth, and other details, were equally well rendered. With a studio in a good light, and a portrait lens, the exposure should not be longer than from fifteen to thirty seconds. Other plates were exposed on other subjects, but need not be specifically described. Let me add merely that the plates worked "like clockwork," and there was not one which, treated exactly as the makers laid down, did not give perfect rendering.

How the Plates are Made.

The theoretical basis of the process must not be passed by, although it has all been published years ago in *Photography*. It is only our old friend the three-colour process in a new guise; only, instead of interposing screens, getting three negatives, making positives, and superposing in registration, all is lumped into one. The glass is first coated with some tacky adhesive, on which is spread a layer of transparent grains of starch. These grains are all of a size. They are of three kinds, however—one dyed an intense violet, one a vivid green, and one a brilliant orange. The dyed starch grains are thoroughly mixed in such proportions that, when dusted over the plate, the coloured light passed by them, being combined by the eye, as the grains are very small, looks perfectly white, and without any trace of colour whatever. The interstices between the starch grains are then filled up, in some way not described, with black particles—carbon in some form—so that no light whatever can pass through the plate, except through the dyed starch grains. So that, although every particle of light passing through such a plate is vividly coloured by the starch, yet on holding it up to the light the plate only looks much like a piece of finely ground glass, without perceptible colour. It says wonders for the able way in which this most ingenious process has not only been devised, but carried out, that this blending, easy in theory, is accomplished in practice.

I believe that at this stage the plate is subjected to pressure to consolidate its coating, but this is a detail of manufacture which has not been published. At any rate the starch-coated plate, with or without some protective varnish, is then used as the basis for a coating of some panchromatic or red sensitive emulsion, similar to that used on the red-sensitive variety of orthochromatic plates; but this layer, as already mentioned, is kept extremely thin. Such is the "Autochrome" plate.

A Yellow Screen used on the Lens.

As no emulsion is so perfectly orthochromatic that it can be used without any colour screen at all, a yellow light filter, adjusted to these plates, is supplied for use with them. It is fairly intense in colour, and is of the ordinary kind in tint, very much like the "ten times screens" on the market, but deeper.

What Happens.

When a negative is made by exposing an Autochrome plate with its glass side to the lens, the light after passing through the glass has to pass through the dyed starch grains before it reaches the sensitive film, and these starch grains act as the colour screen. Let us suppose we have a coloured object, and for simplicity's sake we will assume that it is violet in colour—the exact shade, in fact, of the violet-dyed starch particles. The violet light passes unaltered

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through the starch that is dyed violet, but is stopped completely by the green and orange particles.* After developing them, under each violet particle, in the part of the plate representing the violet object, there is a little particle of black image, while under each green and orange particle, no light getting to the sensitive emulsion, nothing develops. When the acidified permanganate is applied, this reducer dissolves away the black particle of silver under the violet starch grain, but has no action on the unaltered silver bromide under the green and orange starch grains, which, therefore, remain, not opaque, but partially opaque. On holding the plate up to the light at this stage, therefore, and looking through it, the light comes through the violet starch grain uninterruptedly, but the green and orange grains are partly hidden by the undeveloped, creamy coloured, silver bromide. The result is that the film in that part looks violet—the colour of the original. When the plate is immersed in the amidol developer, in daylight, this darkens the silver bromide, and makes it more opaque, and so the colours are brightened up. When we further intensify the picture with silver, we darken the silver bromide grains (which are no longer bromide, but metallic silver), and so still further brighten the colours. Finally, if there is any unaltered bromide left in the

* The action is not quite so simple as we are describing it to be, but this may be taken as being true in outline.—R.C.B.

film, this is removed by the hypo, which acts as a kind of guarantee that the final image is silver, and silver only.

To what will it all Lead?

Such is the process in outline. It is impossible at this stage to foretell what will be its results. That it is revolutionary is unquestioned, yet, paradoxically enough, it is not novel. Messrs. Lumière published the details years ago, and they were faithfully recorded in *Photography*, but, to tell the truth, the photographic world looked upon it much as it looked upon the Lippmann results—as the outcome of a beautiful laboratory experiment, and nothing more. Messrs. Lumière have shown that it is very much more. That it is a practical, commercial, simple process. Just as the Kodak Co. advertise "the skill is in the tank," so may Messrs. Lumière say "the skill is in the plates." They have done the experimenting and the thinking, they have done the balancing of violet against green and green against orange, the orthochromatism, the dyeing, and the registration. The customer buys the product of their inventive genius and their great technical knowledge, he uses it with his ordinary photographic knowledge—nothing more whatsoever.

And the results. Well, they must be seen to be believed. I did not believe in them till I saw them. And I can hardly believe in them now that I have made them myself.

Formulæ for Using the Lumière Autochrome Plates.

THERE is no need to publish a complete translation of the instructions for the use of the Lumière Autochrome plates, since they are issued with the plates themselves, while the actual manipulations will be found set forth in the article by Mr. Child Bayley, which we print this week.

The composition of the solutions used may be of interest, and will enable any of our readers who order the plates to prepare beforehand to use them as soon as they arrive. Ten liquids, including the varnish, are required; but they look more formidable than they really are, and the prime cost of the ingredients is comparatively trifling.

FOR THE FIRST DEVELOPMENT.

A.	
Alcohol	100 c.c.
Pyrogallie acid	3 grammes

B.	
Water	85 c.c.
Potassium bromide	3 grammes
Pure ammonia (.92 or 22° Baume)	15 c.c.

FOR REVERSAL.

C.	
Water	1000 c.c.
Potassium permanganate	2 grammes
Sulphuric acid	10 c.c.

FOR THE SECOND DEVELOPMENT.

D.	
Distilled water	1000 c.c.
Anhydrous sodium sulphite	15 grains
Diamidophenol	5 grains

FOR OXIDATION.

E.	
Water	1000 c.c.
Solution C (as above)	20 c.c.

FOR INTENSIFICATION.

F.	
Water	1000 c.c.
Pyrogallie acid	3 grammes
Citric acid	3 grammes

G.	
Distilled water	100 c.c.
Silver nitrate	5 grammes

FOR CLEARING.

H.	
Water	1000 c.c.
Potassium permanganate	1 gramme

FOR FIXING.

I.	
Water	1000 c.c.
Sodium hyposulphite	150 grammes
Sodium bisulphite (commercial)	50 c.c.

FOR VARNISHING.

J.	
Pure benzine	100 c.c.
Gum dammar	20 grammes

The following summary of the time taken in each solution, and of the total time for completion, from the commencement of development may be interesting:

In developer, which consists of 1 part of A, 1 part of B, and 10 parts of water	
Rinsing	2m. 30s.
In the reversing bath C	say 2m.
Rinsing	20s.
In the second developer D	say 3m.
Rinsing	20s.
In the dilute permanganate	say 10s.
Rinsing	20s.
Intensification in 10 parts of F to 1 of G	say 1m. 30s.
Rinsing	20s.
Clearing in H	1m.
Rinsing	20s.
Fixing in I	2m.
Washing	5m.

Total time 19m. 20s.

The actual operations, allowing for loss of time in passing from one to the other, take decidedly less than half an hour—a fact due to the necessarily thin coating of the film, which is soon penetrated by the liquids.

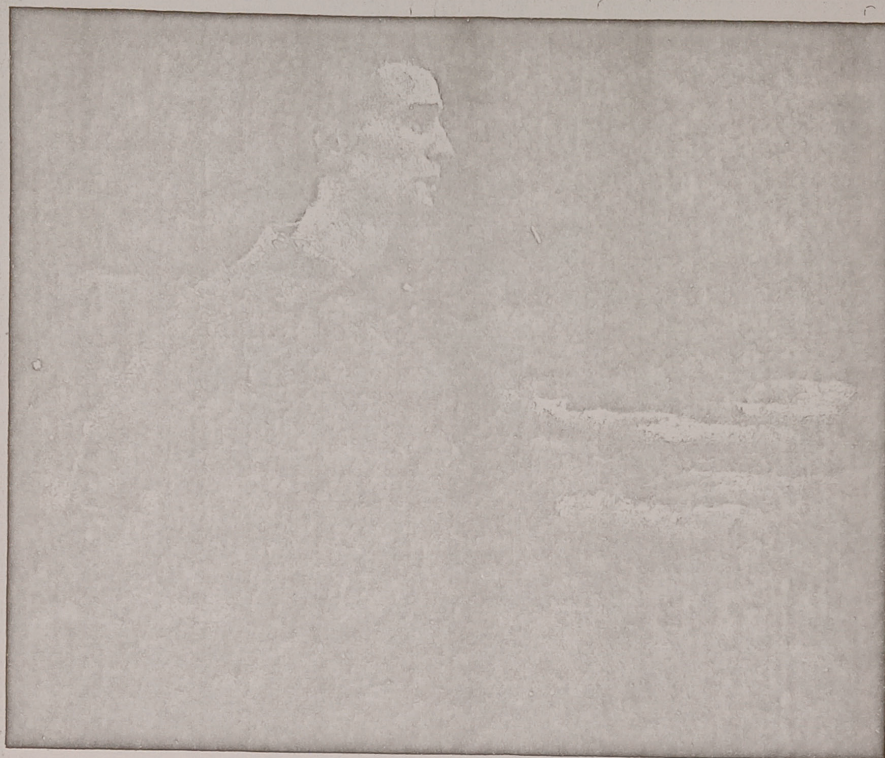


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EDOUARD J. STEICHEN. A SELF-PORTRAIT.

An Interview with Mr. Edouard J. Steichen.

SOME ACCOUNT OF HIS AUTOCHROME RESULTS. SPECIAL TO "PHOTOGRAPHY."

ONE day last week we had the pleasant surprise of a call from Mr. Steichen, who was paying a flying visit to London. We had heard that he had been getting some wonderfully successful pictures on the new Lumière Autochrome plates, and we lost no time in making enquiries about them.

"I have got them in London," said Mr. Steichen. "I brought them over on purpose to show you, so if you will come along to my hotel, we will go through them, and you can see for yourself what they are like."

We told him that we had almost given the process up as a mere flash in the pan, so great had been the delays in bringing it out.

"There has been a tremendous lot to do," he replied. "Think what it means. They had to devise apparatus for sorting out the starch grain so as to get it all of a size, to find out dyes that were exactly suitable, to get machinery for coating the plates with the starch grains, which the inventors state are so fine as to run 20,000 to the inch (8,000 per mm.) These are so disposed that they have on their surface an even layer of the fine dyed particles in equal proportions of orange, green, and violet, just one particle thick; for they must not overlay each other. Then the interstices between the grains have to be filled in with black, so

that no white light whatever can pass through the plate. I believe it is then subjected to heavy pressure in some way or another before it receives its coating of emulsion."

"Is it an ordinary emulsion that is on the plates?" we asked.

"It seems an ordinary panchromatic emulsion, but the coating is very much thinner than that on an ordinary plate. It has to be, or it would not be possible to reverse the negative so simply—to turn it into a positive, in fact—by means of the permanganate. I called on Professor Lippmann the other day, and saw some of the colour photographs made by his method. There you have the real colour photography—the only real colour photography, one might almost say. What wonderful things they are, but one must see them thrown on the screen to appreciate them. What a pity the process is quite impracticable, and I am afraid it must remain so. This Lumière method, though, is practicable enough. The instructions given with the plates are comparatively simple, and it is bound to create a perfect furore for the work. You see, it does away with the doing of all the operations three times over—with the dyeing or staining, with superposing, and the loss of register that sometimes followed. And it is so good. The other day I had a

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AN INTERVIEW WITH MR. STEICHEN.

visit from Moncure Conway, the celebrated lecturer. I had told him nothing about the process, but he sat down in the studio, and I photographed him on one of these plates. My wife entertained him for twenty minutes while I was in the dark room, and by that time I was able to take the plate out, and show him a picture of himself in natural colours. He was struck all of a heap, as you can well understand. The operation don't take anything like as long as it does to make a negative in the ordinary way, and get a print from it."

At this point we adjourned to the hotel, where two or three plate boxes were brought out, and the colour photographs were produced. The first to be shown us was a copy of a painting; and, of course, the first thing to be looked for, after noting the wonderful richness and variety of the colouring, was the grain, but for the naked eye it did not exist. It was only after Mr. Steichen had handed us a magnifier that we were able to see that the greys and whites were actually made up of minute grains of the most intense violet, green, and orange, and that the purest blue—and the picture contained a striking cobalt blue—was an optical mixture of violet and green. The grain was quite unnoticeable, and we said as much.

"At the conference they showed a large number of lantern slides," said Mr. Steichen, "and I was only a few yards from the screen, but the grain even then was hardly perceptible. Isn't that blue wonderful? As pure as could be wished, and yet nothing but violet and green. Look here, too," and he passed us another portrait—that of Moncure Conway, just referred to.

"Look at the truthfulness of those flesh tints. Most of the specimens I have been shown had the flesh a mere pinkish grey. The sitters were put in a strong light to reduce the exposure, and the result was at once a grey. Look at my hand here—and here," and he held it first near the window and then in the subdued light of the room. "That portrait had a minute and a half well inside my studio, and you see at once how the flesh is a real flesh tint, and not a grey."

A striking portrait of Stieglitz served to show how wonderfully the new plates dealt with blue colours, the various lightings of a rough blue coat he was wearing being rendered with wonderful realism; but most striking of all were the greys and greyish whites of the cover of "Camera Work" he was holding in his hand, the flesh tint of the hand that held it, and the countless nuances on a piece of green velvet in the foreground. "I have photographed Stieglitz till I was black in the face," said Steichen, "but I never got a portrait approaching that in truth. The same may be said of this," and he held up a portrait of a lady.

"What are these?" we enquired as we pointed to some conspicuous blemishes in the pictures.

"Black spots. I don't know what they are caused by, but they seem almost unable to make the plates quite free from them. It is very rarely that you come across a plate without them, and it is not easy to retouch them out. The makers point out that at present they cannot prevent them entirely, but they seem to keep their own specimens free from them."

We suggested that it was hardly likely that the specimens shown would be defective, and that Messrs. Lumière would naturally pick out the most perfect for exhibition.

"There is another thing I have to grumble about," pursued Mr. Steichen, "while I am talking of defects, and I wish you would rub it in. The plates are such

a high price that I think they might avoid by cutting off a strip of half an inch or more along both edges, which turns up black in the finished positive. You see what I mean in all these. The whole plates have it along both sides, and in some cases it is 'nearer' an inch than half an inch.

"Now look at those two," and he handed us two landscapes identical in subject and arrangement, but quite different in effect. "They are the same scene, and taken within five minutes of one another; but one was in diffused light and one with bright sunshine. Look how faithfully the alteration in all the colours has been reproduced. Look at those poppies, at the tone of that face, the real colour of the flesh in the open air. Look at the colour of these distant trees. Compare this with that, and you will see that the process has kept every subtle difference of colour due to the difference in the lighting. That probably is one of the most striking examples of the lot."

"What about the exposure?" we asked.

"A second with 1/8 is what they recommend for landscapes in a bright summer light. That is using the compensating light filter which Lumières supply for use with the plates. Excessive under-exposure leads to a dark heavy result, but there is a considerable latitude; two pictures with two different exposures may both be very fair renderings of the same subject, but in a different key. These two are copies of a painting, which had two very different exposures, and you see the result.

"Here is another interesting thing. I see you said in *Photography* that these colour pictures could not be reproduced, and this is the impression given out by Lumière. There seems to be no very clear reason why they should not be approximately reproduced, and so I tried to see how far I could succeed in copying one. These two are an original colour transparency from nature, and a copy of it in the camera. They are near enough alike to show that the thing can be done. Some of the finer tones are naturally lost."

The copy was not an absolute facsimile of the original in colour, but was sufficiently close to satisfy most people. Mr. Steichen's original and copy seemed to show that it was quite possible to produce very satisfactory copies.

Perhaps the most remarkable thing about the plates was the success with which the colours had been so proportioned as to give white. There could be no two opinions about this. Mr. Steichen produced one of the plates with no photographic image upon it at all, and on holding it up to the light it was a good greyish white, without any sign of colour whatsoever. Yet the magnifier revealed the fact that there was no spot on its surface where white light could pass; the colour was due entirely to the admixture of the violet, green, and orange particles.

"Lemon yellow and a carmine red," said Mr. Steichen, "are the colours which it seems least able to render properly; but even then the yellow is apparently truthful."

Another triumph for the process was the extraordinary realism of the frame, which had been photographed along with a picture. It was one of those dull matt surface frames of a greenish bronze colour, and both the tint and the characteristic lustre were very notable.

"Now you have seen all I have done," said Mr. Steichen. "I have brought a few plates with me, and may expose them over here. But they are expensive things. Those whole-plates, or the French equivalent,

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for example, cost about four shillings each. And they are selling like hot cakes in France; the makers cannot cope with the supply.

"The great future of this process is certainly in the hands of the amateur photographer. For the professional it can have little value, as its method of presentation is impracticable. In the field of magazine illustration it will revolutionise things. I venture to predict that England will be the best customer of this product, for the serious amateur is more in evidence here than anywhere else. In America we look upon any process as commercially impracticable until

A Book on the Wet Collodion Process.

THOSE who talk about "the wet plate days" as a period long since gone by may be surprised to learn that wet collodion is very far from being an obsolete process. As our readers, no doubt, are well aware, it is very extensively used to this day for process work; and in the illustrations, for example, which form such a feature of *Photography* week by week, the wet plate has played its part as well as the dry. Besides this application, the process is used for copying pictures and similar work, for slide making, and for the ferrotype which flourishes between the tide-marks. If any further indication were wanted that the wet plate is alive and kicking—and every user of the silver bath will admit that it *can* kick—it is to be found in the handsome text book called "The Wet Collodion Process," which Mr. Arthur Payne has just written, and Messrs. Mawson and Swan have published—with 144 pages and twenty-two illustrations in line and half-tone, substantially bound in cloth, price 3s.

The book is a good one. Old as is the process, it contains a remarkable quantity of new and valuable information, conveyed clearly and in simple language by one who is fully versed in his subject. In fact, we are bound to admit that it was an agreeable surprise to us to find that a practical treatise on so ancient a topic could be made so fresh and interesting; and we heartily congratulate our old friend Mr. Arthur Payne on the result. We are sure, too, that many of our readers will find the book entertaining; and will be led, by its perusal, to take up wet plate work themselves. For the collodion process has its advantages for the amateur as well as for the professional.

The lantern slide can be made as successfully by the wet process as by any; while the method has two advantages, in its economy and in the satisfaction that is to be derived from the manipulations and from the feeling that the result is the personal work of its producer throughout, a sensation which no other photographic process will give to anything like the same extent. Nor need the collodion be used "wet." Mr. Payne describes a method, largely his own, for the production of dry collodion plates with the silver bath, which ought to prove particularly applicable to the making of lantern slides by reduction. We can strongly recommend such a method to anyone anxious for fresh photographic fields to conquer; it ought to repay him well. The wet plate itself makes admirable slides. It is used by the largest manufacturers of slides, and Mr. Payne seems to think that this fact is a testimony to its suitability "when it is remembered that the manufacturers' sales depend upon the quality of the slides"; but on this point we cannot agree with him. The standard attained by commercial slides is far below that of the average amateur worker, the excessive hardness and brilliancy which their customers demand being repugnant to all skilful slide makers; and we should therefore be sorry to bring forward the commercial slide, suitable as it is for its own market, as evidence of the excellence of the wet plate slide. But the process will yield harmonious slides as well as brilliant and harsh ones; and slides that will not deteriorate in the lantern by repeated use, as do those made on gelatine plates.

Another novel feature of this book is Mr. Payne's method of obtaining stripped or filmed negatives with wet collodion. Messrs. Mawson and Swan supply the "Lotos" stripping films—sheets of gelatine—which are soaked in cold water and floated over the collodion negative. By gently warming the glass side of this, the gelatine cements itself to the collodion film, and when dry the negative may be stripped off the glass very easily. This method should appeal to process-workers in particular, as also will the author's method of turning a negative into a positive by dissolving out the image on the unfixed plate with nitric acid, and then re-developing

AN INTERVIEW WITH MR. STEICHEN.

we can get the same results by as simple a means on paper.

"The pianola," said Mr. Steichen, "has often been compared with modern pictorial photography, but this new process is the phonograph of colour. It copies colour with the same startling realism that a good phonograph records a Caruso solo. The rasping of the needle on the disc in the phonograph is the grain in the colour plate. When the sound is sufficiently clear and forceful, the rasp is lost. When the colour scale is sufficiently in evidence, the theory and construction of the autochrome plate is forgotten."

the haloid image that is left. His methods of colour sensitising are also very interesting.

Although we have gone very carefully through the book, we find hardly anything noted as needing revision. The "safe-lights," on page 124 might be amplified a little with advantage, pointing out the conditions under which each deserves the title of "safe." When we first read it, we gathered the impression that all four screens, orange, green, red and extreme red, were united, in pairs, to form the safe-light referred to in the following paragraph; and though we now see that this is not what Mr. Payne meant, it is fairly deducible from the text. Nor was it at first that we realised that "Professor" Gamble was none other than our friend at the big Manchester institution. These are but trifling matters. The book is sound and reliable throughout; clearly printed and well got up, and should prove the standard handbook of its subject for many years to come.

Death of Mr. A. L. Henderson.

WE regret to have to announce the death of Mr. A. L. Henderson, who passed away on the 5th inst., at Bad Nauheim, and was buried at West Norwood Cemetery last Wednesday. Mr. Henderson's health for many years had necessitated his wintering abroad, but when we saw him in England there was nothing in his appearance to lead anyone to suppose that it would be his last visit.

The modern photographer hardly knows the name of Henderson, but in the spacious days of the seventies and eighties no one figured more largely before the photographic world. At his professional studio in King William Street, City, the stairs were frequently crowded with sitters for the then novel "C.D.V.," and it was in that unpretentious building that Mr. Henderson secured the competence which enabled him to spend the later years of his life in the search for sunshine and the health it gave him.

He was much more, however, than the professional photographer. He was one of the earliest to take up the gelatine dry plate process, and certainly one of the most successful makers of extremely rapid plates in those days, and was conspicuous also for his willingness to impart his knowledge to others. He was the most skilful of photographic enamelers also, and the collection of this beautiful form of photograph made by Her Late Majesty contained a very large number from his hands. He was the founder of the London Provincial Photographic Association, and when in London was its most regular attendant.

Mr. Henderson was a strong man, hot tempered, and a born fighter. Nothing raised his ire like pretence and assumption, and a sign of this would bring forth a volcanic outburst of wrath. Like so many of this temperament, there underlay his vigorous enmity the kindest of hearts and the most sympathetic of dispositions. Open as the day in other matters, in his charity he was secret and reserved, but we are able to speak from personal knowledge on this point, and to testify that he was generous and helpful to a degree. There was no one in the whole photographic world to whom we could appeal for a deserving case with a greater certainty of a hearty response. Many a photographer to-day will feel that he has lost a good and kind friend.

THE GLASGOW SOUTHERN PHOTOGRAPHIC ASSOCIATION will hold its seventh annual exhibition from January 14th to 28th, 1908. The exhibition secretary is Mr. Charles Young, of 217, Crow Road, Partick.

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PHOTOGRAPHY

A JOURNAL FOR EVERY CAMERA USER.

EDITED BY R. CHILD BAYLEY.

PUBLISHED WEEKLY.

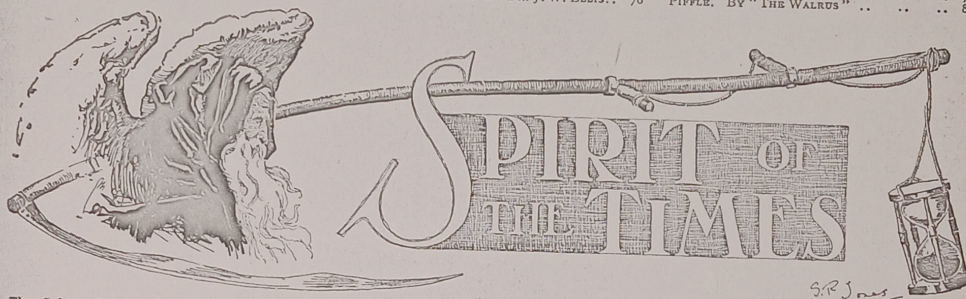
JULY 23RD, 1907.

TUESDAY.

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The Colour Photography Sensation.

During the past few days we have been inundated with enquiries as to the new colour process; and we hear that some of the most enterprising of the dealers have similarly been besieged for Autochrome plates. There can be no doubt that the articles in *Photography* last week have aroused a widespread attention—more attention, in fact, than any other departure since the discovery of the gelatine dry plate. Fortunately, the distinctly reserved, not to say pessimistic, tone which we have felt compelled to adopt for years toward three-colour processes has helped to convince the public that when we do announce a radical departure, there is something in it; or we fear even our articles of last week might not have had the attention the process merited.

The fact that our contemporaries have been silent on the subject, so far, is no reflection on their judgment, but the contrary. We all had much the same information, no doubt, about the new plates; except that in our own case we were not only informed about them, but had seen and used them. This is emphatically a case in which seeing is believing, and we frankly confess that it was only when we had seen the actual things themselves, and made them ourselves, that the real extent of the departure which they constituted forced itself upon us. During the past week, over and over again, we have been told that the cry of "colour photography" was too old to arouse curiosity again, and that our articles had been read, but had not carried conviction. It was no more than we expected. But when we have shown not merely our own results, but a result side by side with the original subject, everyone who has seen them has confessed freely enough that the case was not over-stated, and that the process fully deserved every word we have written about it.

Many of the daily papers also have realised at last that here was a new departure in colour photography—

and an immense departure. Some of those with photographic columns do not yet seem to have grasped the fact, their photographic articles bearing unmistakable evidence of having been written some days ago—in fact, before the appearance of last week's *Photography*; but, no doubt, in due time they will awake to the importance of our announcement. "The Morning Post," in Mr. Maclean's article, was one of the first to realise what had happened; and "The Times," "Daily Mail," and others were not behindhand.

Not to be Shown at Present.

We have received an immense number of applications to show our results in public, but we have been compelled to decline almost every one. We regard Messrs. Lumière's work in this connection as most extraordinarily painstaking and successful. We think they fully deserve all the credit and all the success that the process can achieve. We hear that the sale of plates in Paris a few weeks since was not quite what they had designed, and that it has left them more or less without a supply of plates even for their own specimens, much less to put on the French, and still more the English, market. Were we the inventors, we should not like our process to be judged by the early trials of those who had only secured a few plates; and we do not think it fair to Messrs. Lumière, therefore, to make any further public display of our results. In a way they are perhaps even more convincing than samples shown by the inventors, since the public would be sure to suspect these latter of being expert work and picked specimens, while we have shown every plate we have exposed. But people are so ready to overlook a fact of this sort that, in justice to the inventors, we will ask those who have written us to leave the matter in abeyance for the present.

Pyro-stained Negatives.

A few weeks ago we gave a formula for removing pyro-stain from a negative, but it is certainly better to prevent it, in the first place, rather than to try sub-

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COLOUR PHOTOGRAPHY.

Further Details Concerning the Autochrome Process.

The sensation which last week's "Photography" aroused has led to countless discussions of the possibilities of the Lumiere process, and we have had many opportunities of learning the opinions of experts, and of gathering further information on the subject. The plates are not yet available; but such further particulars as we have gathered we give below.

THE intense interest aroused by the display of his Autochrome results at the meeting of the London and Provincial Photographic Association by Mr. Child Bayley, followed by the publication of last week's *Photography*, has been somewhat checked at the outset by the impossibility of obtaining any more plates at present. Messrs. Lumière say that the demand has been so great in France that their entire supply has been absorbed; they have none even for the preparation of specimens which they themselves need, while they are inundated with orders. No more will be on sale, therefore, until they feel that they are in a position to meet the demand. In the meanwhile, photographers must possess their souls in patience, and they have turned their attention to the future possibilities of the process.

Printing from the Colour Pictures.

One of the most promising of these lies in the use of paper of the Uto kind, to which Dr. Smith has been giving much of his time. Theoretically, it ought to be possible to make a grey-black paper which should bleach to the colours of the light to which it was exposed. Uto paper is still a long way from perfect, but the results that have been obtained on it are certainly decidedly encouraging. When a piece of the paper is exposed under a coloured transparency, it yields a coloured print, in which to some extent the tints of the transparency are reproduced. It will be seen that the Autochrome picture seems to provide exactly the right sort of original from which the Uto paper prints could be made. We understand that attempts have already been made to get copies in this manner, but without success. If it ever becomes a practical process, photographers will have to revise their nomenclature, for the temptation to speak of such a process as using the Lumière "negative" as a means of making a print is almost irresistible; whereas, of course, the Lumière picture is not a negative at all, but a positive, and it is a positive that the Uto paper needs. The final Lumière picture is on the actual glass plate that is exposed in the camera, but it is not a negative. The reversal with permanganate, which forms the second stage of the process, has changed the negative into a positive.

Suppose the Reversing Process is Omitted.

Speaking of negatives and positives, Mr. Steichen, who has certainly done more with this process than any other amateur worker, showed us a very interesting picture of a field of bright red poppies. He had exposed two Autochrome plates on it—one he had developed and reversed in the ordinary way, the other he had not reversed at all; but after developing it with pyro ammonia, as directed in the instructions, he had simply placed it in hypo, and finished it off as a negative. The result, of course, was a colour picture, but every colour in nature was represented in the picture by its complementary colour, the most striking example being the poppies themselves, which were a bright green. A few carefully prepared speci-

mens of this sort should be very useful in teaching the nature of colour and the composition of mixed colours.

Can the Colour be Controlled?

One of the points which has aroused enquiry—and from a pictorial point of view is certainly most important—is the extent to which the photographer can control his colour. In the earlier three-colour processes, his control was very great, although it was most difficult to exercise it in precisely the way desired. So much was this the case that it was only now and then that the most accomplished workers obtained results which might be regarded as truthful replicas of the original. Strongly coloured subjects were represented easily enough by strongly coloured three-colour pictures; but the subtler shades, and especially greys and whites, nearly always possessed a residuum of colour, of which no amount of control seemed able to get rid. How far, then, the user of Autochrome plates could control his results was one of the first enquiries to be put, and it is also one of the easiest to answer.

He Cannot Control it at all.

He can upset the colours altogether, but he can no more regulate them than one can regulate a watch with a poker. The adjustment of the plates to the yellow screen used with them is so beautifully carried out by the makers that any attempt to modify the relationship by the use of a different colour screen, which is the only way one could expect to alter the colours, makes so vast and so brutal a change that it could only be abandoned as soon as tried. It is one of the greatest triumphs of Messrs. Lumière that the combination of plate and screen has been so accurately regulated, and anyone who would advantageously modify them must at least possess as much skill as those who are responsible for the Autochrome plate itself. To put it very mildly, there are not many photographers about who answer to this description. In the ordinary sense, then, the colours are not under the control of the photographer. He can select his subject to give him the effect he wants, and he can get either what is practically a correct rendering or else one that is glaringly inaccurate by the use of some unsuitable colour screen, but he can make no delicate modifications in the hues of his photograph.

But the Brilliancy can be Regulated.

There is one control, however, which is very largely in his own hands, and that is their strength and brilliance—the key of the photograph, in short. Under-exposure gives a dull, heavy result; the tints are degraded with an excess of black. Over-exposure, on the other hand, gives feeble colours, diluted with a great deal of white. Neither of these processes is to be recommended as a method of control. But the colours are visible as soon as the plate is reversed in the permanganate, and if their hue cannot be altered their strength or intensity can, by intensifying or not with the silver solution, and by the extent to which the intensification is carried. A very slight intensification is all that is necessary in some cases; in fact,

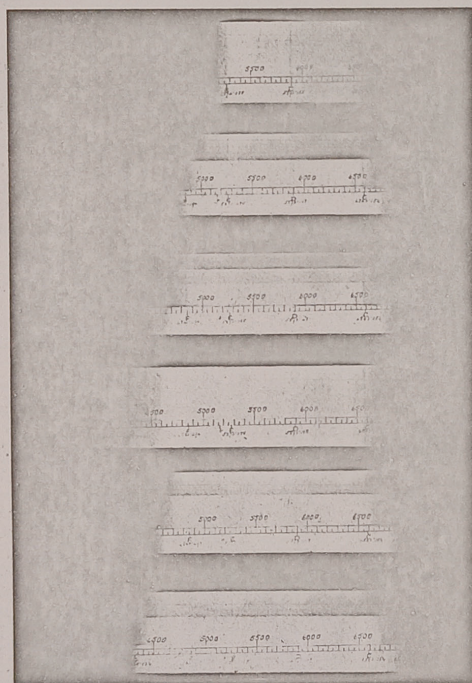
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COLOUR PHOTOGRAPHY.

we should not be surprised to find that when the process comes to be worked many who use it for their own pleasure, and not merely to get brilliant colour pictures to please the general public, will prefer the delicate, not-too-insistent colouring of the unintensified picture to the brilliancy that can be got by carrying the intensification to its limits. In this sense, there is a real power of control, and one that can be exercised with the great advantage that the photographer can see what he is doing.

The Results of Fogging the Plates.

The precise nature of the colour screen that is used is very interesting. It is, of course, one of the most important features of the process, and its adjustment to the plate we have already praised. Without it the entire picture has a violet colour, owing to the inevitable excess of sensitiveness of the emulsion to the violet end of the spectrum. In like manner, if any light leaks



The illustration represents six comparative exposures on Wratten and Wainwright Panchromatic plates on the solar spectrum (diffraction). Counting from the top we have—

1. The spectrum without any screen (2 secs.)
2. The spectrum with Wratten's No. 3 screen (2, 6, and 18 secs.)
3. The spectrum with the Autochrome screen (2, 6, and 18 secs.)
4. The spectrum without any screen (5 secs.)
5. The spectrum with Wratten's No. 3 screen (5, 15, and 45 secs.)
6. The spectrum with the Autochrome screen (5, 15, and 45 secs.)

into the camera other than through the lens and colour screen, and so fogs the plate, that fog will have an intense violet tint, since its most marked effect has been manifested upon those parts of the emulsion which lie behind the violet particles of starch. If the light gets to the back of the plate—that is to say, the part which is turned away from the lens,* then the fog is a general grey tint, without any particular colour, which after

reversal appears as a light rather than a dark patch.

The Nature of the Colour Screen Employed.

The best way to convey an idea of the absorption exercised by the colour screen is by testing it in the spectroscope; and this Mr. McIntosh at the Royal Photographic Society has been kind enough to do for us. We give a reproduction of the test plate below. The exposures were made on a Wratten Panchromatic plate, sunlight being used, and the five times yellow screen supplied by Messrs. Wratten and Wainwright is given for purposes of comparison. Mr. McIntosh sums up his results by saying—

"Identical exposures were given through the Wratten No. 3 screen and through the Lumière Autochrome screen. There appears to be little difference in the correction, but as the Lumière Autochrome screen stops the light least, the spectrum taken through it extends further towards both the red and the violet ends. The Lumière screen appears to be well suited for monochrome orthochromatic work."

The Plates under the Microscope.

Another question which aroused some discussion at the London and Provincial Photographic Association was the presence or absence of a black filling between the coloured particles of starch. Our readers will remember that it has been said that after the plate receives its coating of dyed starch, the interstices are filled up with some form of carbon black, so that no white light whatever can get through the plate, and this would seem to be a necessity of the process. Two microscopes were provided at the L. and P.P.A., and in these portions of a plate that were cut up for the purpose were critically examined. It might be thought that this would settle the question at once, but the meeting was divided in opinion. Some members declared that they could see no trace of black between the particles, others that it was clearly visible. Whether it could be seen or not, theory shows it to be a necessity, and Messrs. Lumière have stated that they apply it.

It is too soon to say more of the process, of its manipulations, and of the possibilities that lie before it. We are in touch with those who are working it, and have been able to secure some more plates, and readers of *Photography* can rely upon being kept fully posted upon future developments as they take place. In the meantime the factory is being rapidly extended in capacity, and before long we hope all those photographers who wish will be able to try the process for themselves.

* The back of the plate in the ordinary sense is of course the glass side; but in this process the glass side is turned towards the lens.

Supplies by Post.

THERE is no side of American retail business that is more remarkable than that which is done by the Express Companies; that is to say, by the equivalent of our parcel post, and we are not surprised to learn, therefore, that a company has been formed to carry on a similar business on this side in photographic goods.

The Postal Photo Co., of Rotherham, is the outcome of certain arrangements that have been made by photographic dealers of old standing and long business experience. We are acquainted with the ruling spirits of the concern, and know that those who have any transactions with it are not likely to be other than satisfied with its straightforward conduct and businesslike management. The company proposes to do a postal business only; it will carry a large stock of all kinds of apparatus and material, and all orders small and large will receive alike prompt attention. Carriage and packing will be free on all consignments; in fact, it will carry on a post order retail business, but without any attempt at counter trade.

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STEICHEN'S COLOR! 50 YEARS OF 35MM PHOTOGRAPHY. JANUARY \$1



WORLD VOLUME 2 NUMBER 1 JANUARY 1974

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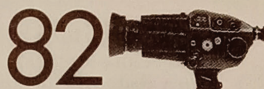
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PIONEER COLOR BY A YOUNG STEICHEN

In 1906 Edward Steichen left America and, for the second time in six years, went to live in Paris. Then twenty-seven, the Luxembourg-born, Milwaukee-raised artist (who died in March at 93) was still dividing his creative time between painting and photography. So it was probably with a painter's eye that he kept track of developments in the search for practical color photography. Color pictures were a mirage during the 19th century with various inventors promising but never really producing a practical, true-to-life color process. It was not until after the turn of the century that two Frenchmen, Louis and Auguste Lumière, most famous for their pioneering work in movies, successfully devised and marketed a process which introduced color photography to both amateurs and professionals. One customer was young Edward Steichen.

"The greatest photographic event of 1907," wrote Steichen of those Paris days in his autobiography, *A Life in Photography*, "was the Lumière Company's introduction of color photography in the form of autochrome plates... The results were extraordinary." An Autochrome was a glass plate covered with millions of grains of potato starch dyed red, green and blue. After the plate was (continued on page 33)

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Lady Ian Hamilton, 1907. Autochrome.

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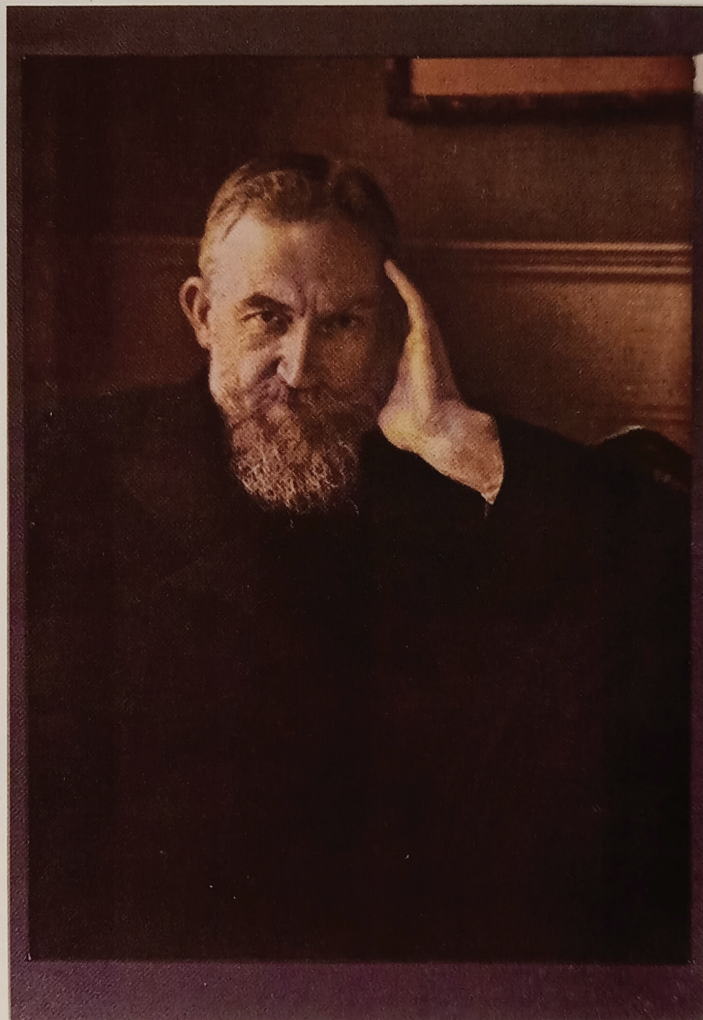
Experiment in Three-color Photography, 1906.

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Houseboat on the Thames, 1907. Autochrome.

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George Bernard Shaw, 1907. Autochrome.

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exposed and processed, it could be projected with just the same satisfaction, and something approaching the brilliancy, of a transparency today.

Steichen bought a batch of Autochrome plates, distributed some to fellow photographers Alfred Stieglitz and Frank Eugene who were passing through Paris on their way to Munich. He himself set off for London to photograph George Bernard Shaw. Steichen always knew a good subject. "Shaw's rosy complexion and luminous blond-red hair and beard made him a natural target for color photography," wrote Steichen. "I also photographed a group on a houseboat on the Thames, and Lady Ian Hamilton."

Stieglitz, who had earlier published one of Steichen's first color experiments, a 1906 landscape, was so impressed with these new Autochromes that he reproduced all three in the Spring 1908 issue of his famous magazine, *Camera Work*. Thanks to *Camera Work*, these charming pioneer color photographs survive, since the original glass plates have long since vanished. (Recently, a cache of actual Steichen autochromes have been discovered; they will be published in the Time-Life annual, *Photography Year: 1974*.) In 1935, Autochrome gave way to Kodachrome, and Steichen had become one of the most celebrated figures of his day, but a quarter century earlier, a young master and a new medium had produced the beautiful, painterly photographs on these pages.

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"PHOTO SECESSION"
291 FIFTH AVENUE

New York, September 26th, 1907.

To the Press:-

Gentlemen:-

Color photography is an accomplished fact. That this is actually true will be demonstrated at an exhibition, reserved exclusively for the Press, in the Photo-Secession Galleries, 291 Fifth Avenue, on Friday and Saturday, September 27 and 28, between the hours of 10 and 12 A.M. and 2 and 4 P.M.

Mr. Alfred Stieglitz, having just returned from Europe, has brought with him a selection of color photographs made by Eduard J. Steichen, Frank Eugene and himself.

They will demonstrate some of the possibilities of the remarkable Lumière Autochrome Process, only recently perfected and placed upon the French market. These pictures are the first of the kind to be shown in America. You are invited to attend the exhibition.

Yours truly,

Director of the Photo-Secession.

Alfred Stieglitz

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