

TECHNICOLOR ADVENTURES IN CINEMALAND*

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Summary.—An account of some of the highlights in the history of the development of the business of Technicolor Motion Picture Corporation primarily from the point of view of its contact with motion picture producers, distributors, and exhibitors; incidental to which is an account of the development and growth of the various Technicolor processes from a semi-technical point of view but with special reference to practical application in the motion picture industry.

Webster defines adventure as *chance of danger or loss; the encountering of risks; a bold undertaking, a daring feat; a remarkable occurrence or experience, a stirring incident; a mercantile or speculative enterprise of hazard; a venture.* The excursions of Technicolor into the domain of the producers, distributors, and exhibitors of motion pictures have been all of these.

Technicolor has manufactured and shipped prints of many hundreds of productions (during 1937 alone of over 350 subjects for some fifty different customers including more than twenty features) and since some phase of adventure usually develops during the photography or printing of any production, it is clear that this account does not pretend to be complete.

Nor are the events described in detail necessarily those of greatest importance. The writer having played a continuing part will no doubt unduly emphasize some which he found particularly interesting, whereas with the passage of time others only lightly touched upon or omitted may be found to be of greater significance. However, it is hoped that this paper may be a fitting preliminary to a more ambitious one which I have been asked to prepare, reviewing the progress of color cinematography over the past quarter of a century, with special reference to the contributions of Technicolor.

Early in the development of any color process, two decisions of

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policy must be made: first, how far will it permit departure from standard equipment and materials, and, second, how will it attempt to divide the additional requisites of recording and reproducing color between the emulsion maker, the photographic and laboratory procedure, and the exhibitor's projection machine. Technicolor assumed at the outset that special cameras and special projectors were permissible, provided raw film of standard dimensions were employed.

The earliest Technicolor laboratory was built within a railway car. This car was completely equipped with a photochemical laboratory, darkrooms, fire-proof safes, power plant, offices, and all the machinery and apparatus necessary for continuously carrying on the following processes on a small commercial scale; sensitizing, testing, perforating, developing, washing, fixing and drying negative; printing, developing, washing, fixing and drying positive; washing and conditioning air; filtering and cooling wash water; examining and splicing film; and making control measurements and tests. In 1917 the car was rolled over the railway tracks from Boston, Massachusetts, where it was equipped, to Jacksonville, Florida, where the first Technicolor adventure in feature motion picture production was to take place. The camera was the single-lens, beam-splitter, two-component type, without the refinements which came later. The picture was *The Gulf Between*, with Grace Darmond and Niles Welch playing the leads. Technicolor was the producer. Dr. D. F. Comstock, Mr. W. B. Wescott, Professor E. J. Wall, Mr. C. A. (Doc) Willat, Mr. J. A. Ball, Mrs. Kalmus, and I were all on the job. The process was two-color, additive, standard size frame, and hence demanded a minimum of the laboratory procedure.

During the progress of this production, February, 1917, I was invited by the American Institute of Mining Engineers to deliver a lecture at Aeolian Hall, New York, to expound the marvels of the new Technicolor process which was soon to be launched upon the public and which it was alleged by many could hardly do less than revolutionize their favorite form of entertainment.

The Gulf Between had been preceded by *The Glorious Adventure*, a feature picture made in England by the Kinemacolor Process. Since Kinemacolor photographed the color components by successive exposure, it was nothing for a horse to have two tails, one red and one green, and color fringes were visible whenever there was rapid motion. The Technicolor slogan was two simultaneous exposures from the same point of view, hence geometrically identical components and

no fringes. At that time hundreds of thousands were being spent by others trying in impossible ways to beat the fringing of successive exposures and the parallax of multiple lenses.

I thought the Technicolor inventors and engineers had a practical solution, commercial at least temporarily, so I marched bravely to the platform at Aeolian Hall. It was a great lesson. We were, of course, introducing the color by projecting through two apertures, each with a color filter, bringing the two components into register on the screen by means of a thin adjusting glass element. Incidentally, Technicolor had to invent and develop a horizontal magnetically controlled arc which gave one-third more light for the same current than the then-standard vertical arcs and which could be relied upon for constancy of position of the source. This latter was vitally important with a double aperture. During my lecture something happened to the adjusting element and, in spite of frantic efforts of the projectionists, it refused to adjust. And so I displayed fringes wider than anybody had ever before seen. Both the audience and the press were very kind but it didn't help my immediate dilemma or afford an explanation to our financial angels.

Arrangements were made with Messrs. Klaw and Erlanger to exhibit *The Gulf Between* by routing the photoplay one week each in a group of large American cities. During one terrible night in Buffalo I decided that such special attachments on the projector required an operator who was a cross between a college professor and an acrobat, a phrase which I have since heard repeated many times. Technicolor then and there abandoned additive processes and special attachments on the projector.

As early as 1918 Technicolor had in mind two principal methods of attacking the color problem. Dr. Leonard T. Troland, who, at the time of his death, was Director of Research of Technicolor Motion Picture Corporation, had done some important pioneer work on the Monopack process. Some of his inventions were embodied in numerous patent claims which have been issued and which were intended broadly to cover the multi-layer method both for taking and printing. The other Technicolor attack was by the imbibition method. Both Monopack and imbibition were obviously capable of ultimate development into multi-component processes, but since imbibition seemed to load more of the problems on the laboratory and relatively less on the emulsion maker, we pursued it with the greater vigor.

A first approximation to the Technicolor imbibition method consisted of two gelatin reliefs produced upon thin celluloid which were glued or welded together back to back and dyed in complementary colors. Combined with the Technicolor two-component cameras, this method provided an immediately available system (1919-21) capable of yielding two-component subtractive prints. A small laboratory or pilot plant was built in the basement of the building occupied by the Technicolor engineers, Kalmus, Comstock & Wescott, Inc., on Brookline Avenue, Boston, Mass.

In 1920 Judge William Travers Jerome first became interested in Technicolor; he brought as associates the late Marcus Loew, Nicholas M. Schenck, now President of Loew's, Inc., and Joseph M. Schenck, now Chairman of the Board of Twentieth Century Fox, Inc.

Both Joseph and Nicholas Schenck have on many occasions been most helpful to Technicolor by giving practical advice to Judge Jerome and to me, but at no time more so than when it was decided to produce the photoplay which was later called *The Toll of the Sea*. This was the first Technicolor production by the subtractive method. It was photographed in Hollywood under the general supervision of Mr. Joseph M. Schenck, Chester Franklin, Director, Anna May Wong, lead, and J. A. Ball, Technicolor cameraman.

Mr. Nicholas Schenck arranged for the release of *The Toll of the Sea* by Metro-Goldwyn-Mayer. The first showing was given at the Rialto Theater in New York, the week of November 25, 1922. Letters of praise were received from Maxfield Parrish, Charles Dana Gibson, and other artists. But because of insufficient laboratory capacity we were not able to supply prints fast enough to follow this up immediately and not until 1923 was the picture generally released in the United States. It grossed more than \$250,000, of which Technicolor received approximately \$165,000.

The prints of *The Toll of the Sea* were manufactured in the original pilot plant on Brookline Avenue, at a manufacturing cost of about 27 cents per foot.

Every step of the Technicolor work in *The Toll of the Sea* was carefully watched by the executives of the industry. Rex Ingram, who was in the midst of producing *Prisoner of Zenda*, wired Mr. Loew for permission to scrap everything he had done in black and white on that picture and start over again in color. D. W. Griffith wanted to produce *Faust* and Douglas Fairbanks telephoned about producing a feature.

Our first adventure in Hollywood seemed successful! We were told that with prints as good as we were manufacturing if offered at 8 cents per foot the industry would rush to color.

But, thus far we had made only inserts and one feature production, *The Toll of the Sea*, of which Technicolor was itself the producer. We had no adequate means of giving rush print service in Hollywood, and we were charging 20 cents a foot for release prints. It was another matter to convince a producer to employ the Technicolor company to photograph and make prints of a production at his expense and risk and under the conditions which prevailed in the motion picture industry.

Meanwhile Technicolor Plant No. 2 was being built in Boston in a building adjoining the one containing the Pilot Plant. It had a capacity of about one million feet of prints per month and cost approximately \$300,000. And in April, 1923, the late C. A. Willat, in charge, J. A. Ball, Technical Director, G. A. Cave, Assistant Technical Director, were sent from Boston to establish a small Technicolor laboratory and a photographic unit in Hollywood. This was established in a building in Hollywood rented for the purpose.

In November, 1923, Mr. Jesse L. Lasky and I finally agreed upon the terms of a contract between Technicolor Motion Picture Corporation and Famous Players Lasky Corporation for the production of *The Wanderer of the Wasteland*. We were told by Mr. Lasky that they had appropriated not more for this picture than they would have for the same picture in black and white. Also that the time schedule allowed for photographing was identical with what it would have been in black and white. The photography was to be done by our cameras in the hands of our technical staff, but following a budget and a time schedule laid out for them by Famous Players. Rush prints and the quality of negative were to be checked by them each day. During the six weeks of photography our entire staff worked from early morning to late at night, including Sundays and holidays. At one time we were accumulating negative which we did not dare to develop because of inadequate facilities in our rented laboratory. A few of us in Technicolor carried the terrorizing thought that there was no positive assurance that we would finally obtain commercial negative, and that the entire Famous Players investment might be lost. However, Mr. Lasky was not permitted to share that doubt. His confidence and help during the darkest hours were really marvelous and finally the cut negative emerged satisfactorily. We delivered ap-

proximately 175 prints which were shown in several thousand theaters over the country. These prints were billed at 15 cents a foot, for which Technicolor received approximately \$135,000. Some of these prints were made in the pilot plant, but more of them were made in Plant No. 2 which was now being run by operators we had trained.

Nevertheless there were reasons why we could not obtain a volume of business. Every producer in Hollywood knew that the first important production by the Technicolor process under actual motion picture conditions and not controlled by the Technicolor company, had just been completed by Famous Players Lasky Corporation. A considerable group of producers expressed themselves as interested, but were waiting to see the outcome. Another group believed the process to be practical and might have paid our then price of 15 cents a foot, but considered it impracticable to send the daily work to Boston for rush prints.

A small plant, primarily for the purpose of developing negative, making rush prints, and providing a California headquarters was installed at 1006 North Cole Avenue, Hollywood, in a building erected for our purposes. A large part of the equipment was built by our engineers in Boston and shipped to California. The installation was ready for operation about the middle of the year 1924.

Neither *The Toll of the Sea* nor *The Wanderer of the Wasteland*, nor any of the inserts made until the middle of 1924 had given us experience photographing with artificial light. We were therefore very glad to obtain an order for an insert in a production directed by Mr. George Fitzmaurice, called *Cytherea*, photographed in the United Studios lot in Hollywood, giving us our first experience in photographing an interior set on a dark stage. Mr. Fitzmaurice was delighted with the results.

In the Fall of 1924 we had six men and four cameras working in Rome on the Metro-Goldwyn-Mayer production, *Ben Hur*.

One of the great adventures of Technicolor in Cinemaland and a milestone in its progress was in the photography, print manufacture, and exhibition of Douglas Fairbanks' *The Black Pirate*. Mr. Fairbanks had the idea that the screen had never caught and reflected the real spirit of piracy as one finds it in the books of Robert Louis Stevenson, or the paintings of Howard Pyle, and that he could catch it by the use of color. He said, "This ingredient has been tried and rejected countless times. It has always met overwhelming

objections. Not only has the process of color motion picture photography never been perfected, but there has been a grave doubt whether, even if properly developed, it could be applied, without detracting more than it added to motion picture technic. The argument has been that it would tire and distract the eye, take attention from acting, and facial expression, blur and confuse the action. In short it has been felt that it would militate against the simplicity and directness which motion pictures derive from the unobtrusive black and white. These conventional doubts have been entertained, I think, because no one has taken the trouble to dissipate them. A similar objection was raised, no doubt, when the innovation of scenery was introduced on the English stage—that it would distract attention from the actors. Personally I could not imagine piracy without color. . . .”

But Mr. Fairbanks' attorneys pointed out that this production would cost a million dollars, and asked what assurance there was that Technicolor would be able to deliver prints, much less satisfactory prints. This difficulty was finally resolved by making a tripartite agreement in which the engineering firm of Kalmus, Comstock & Wescott, Inc., which still had the pilot plant in the basement of its building, agreed under certain conditions that it would deliver the prints in case Technicolor company failed. There was great discussion as to the color key in which this picture would be pitched. We made test prints for Mr. Fairbanks at six different color levels, from a level with slightly more color than black and white, to the most garish rendering of which the Technicolor process was then capable. Mr. Fairbanks set to work on the shore of Catalina Island and off that shore on his pirate ship, with four of the seven Technicolor cameras then in existence, to capture moods after the manner of impressionistic painting. The picture was released through United Artists in 1925. So far as audience reaction, press reviews, and box-office receipts were concerned, it was a triumph from the start, but for the Technicolor company it was a terrible headache.

Technicolor was still making the double-coated cemented together relief prints, so that the red and green images were not quite in the same plane, and the pictures didn't project too sharply on the screen. This double-coated film is considerably thicker than ordinary black-and-white film, with emulsion on both sides which tends to make it cup more readily and scratch more noticeably than black-and-white film. And the cupping could occur in either direction, more or less at

random. Judging from the complaints, at each such change in the direction of cupping, the picture would jump out of focus. We sent field men to the exchanges. We provided these men with a supply of new prints to replace the cupped ones in the theaters, in order that the latter might be shipped back to our laboratory in Boston for decupping. The newly decupped prints were temporarily satisfactory; the picture was a great success, but our troubles never ended.

It had been clear that this double-coated process was at best but a temporary method, and the work of developing a true imbibition process was being pressed in our research department.

But unfortunately the imbibition process was not ready for *The Black Pirate*, or for *The Wanderer of the Wasteland*.

Early in 1925 Mr. Sydney R. Kent, then head of distribution of Famous Players Lasky Corporation, said: "We have concluded not to do more Technicolor pictures for the present, for two reasons: first, because we have had a great deal of trouble in our exchanges due to the fact that the film is double-coated and consequently scratches much more readily than black and white, with the necessity of having to order more replacements, and it is an added bother to our operators; and, second, because the cost is out of all proportion to its added value to us. We paid \$146,000 additional for *Wanderer* prints. We understand that you need volume to get your costs down. At an 8-cent price we would be interested to talk volume."

Evidently Technicolor needed the single-coated imbibition prints and volume to lower the price to meet his conditions.

Meanwhile Mr. Nicholas Schenck, then President of Loew's, Inc., was advising us to produce a picture ourselves, to prove both quality and costs.

And so in 1926-27 I once more found myself explaining to the directors of Technicolor that I always had believed and still believed very thoroughly in the ultimate success of the Technicolor project, always provided, however, that it was recognized by all the Directors to be a tremendously difficult undertaking technically and one which requires business sagacity and financial endurance. These directors, including the late Wm. Travers Jerome, the late Wm. Hamlin Childs, the late A. W. Erickson, the late Wm. H. Coolidge, the late Thomas W. Slocum, James C. Colgate, Eversley Childs, and Alfred Fritzsche, had many earlier reminders of the necessity of financial endurance. Prior to 1926 over two and one-half million dollars had been spent, but this time I was not calling for money for cameras and

printers, for imbibition machines and research salaries; it was to go into production. When they asked me what I knew about production, I frankly told them nothing, but at least I could start from scratch without some of the fixed ideas and prejudices concerning color that some of the Hollywood producers seemed to have accumulated. I wanted to make short subjects, not primarily to make money as a producer, but to prove to the industry that there was nothing mysterious about the operation of Technicolor cameras, that the transition from what the eye saw to what the emulsion recorded was susceptible of reasonable control through understanding, that black and white cameramen could easily be trained to light for Technicolor cameras, that talented art directors could readily begin to think in terms of color, that rush prints could be delivered promptly, and generally that the job could be done efficiently and economically, utilizing but not minutely imitating black- and white-experience.

The first short we produced was a story of the creation of the American flag, an episode involving George Washington and Betsy Ross. George M. Cohan probably never produced anything more certain of applause than when George Washington unfurled the first American flag in glowing color. Another subject was the divorce episode of Napoleon and Josephine, photographed in November, 1927, which was booked all over the world as a companion short to Charlie Chaplin's then tremendously successful production, *The Circus*. We made twelve of these two-reelers, an experience which established the fundamentals of our studio service both in the camera and color control departments, and altogether disclosed the answers to a multitude of practical questions which have served us no end since that time.

They were produced economically and yet we were continually praised about them by Metro who distributed them. In my opinion Technicolor would not have survived without the experience of this series of short subjects.

Our friends and customers both in Hollywood and New York praised and applauded these short subjects, *but* they were only shorts. Mr. Nicholas Schenck advised us to produce a feature production which Metro would distribute.

I had been much impressed with a production called *The Covered Wagon*, a touching love story with the epic quality of slowly and laboriously conquering a continent. Why not have a love story of

the vikings with the epic quality of fighting mutiny and storms to conquer an ocean. Jack Cunningham, recently a writer and associate producer at Paramount, wrote *The Covered Wagon*, so we engaged him to write *The Viking*. We spent \$325,000 on this production and got our full money's worth of experience in all departments. But also we got our money back. The late Irving Thalberg, who was always our friend and a believer in Technicolor, thought we had a lot of production for that amount of money, and bought it for Metro by reimbursing our cost to us.

There seemed to be two principal troubles with *The Viking*, both of which I suspected but without certainty. First, it came out among the very last silent pictures in 1929 and, second, whiskers. Leif Erickson, the viking hero, true to character, had a long, curling mustache, whereas American audiences prefer their lovers smooth-shaven. At times the whole screen seemed filled with viking whiskers. But the picture was a good color job and the first to be synchronized with music and sound effect.

But thus far we had only isolated feature productions. The building of color cameras on the scale they exist today, the building of laboratories of sufficient capacity that prints could be made cheaply enough to make color generally available could not be carried on in terms of an occasional picture.

We brought out two-color imbibition prints with silver sound track in 1928. The advantages in respect of focus, cupping, scratching, size of reel, and cost of manufacture were immediate. The gelatin on the Technicolor imbibition film is harder than on ordinary black and white, and through the years there is substantial evidence that the life of Technicolor imbibition prints is greater than that of ordinary black and white.

By early 1929 all the important studios in Hollywood had become thoroughly sound conscious. This was a great help to us in introducing color. Prior to that, studio executives were loath to permit any change whatsoever in their established method of photography and production. But with the adoption of sound, many radical changes became necessary. Technicolor was always confronted with objections that photographing in color required more light, different costumes, a knowledge of color composition, additional time, and one or the other of these points, plus the added forceful argument that it cost more money, made it difficult for us to get started. In my opinion the turning point came when we ourselves produced the series of

short subjects. By entering the field as a producer, by keeping very careful records of our time and money schedules, and by openly discussing with studio executives everything that we were doing as we went along, we dissipated most of the prevailing misinformation. Meanwhile our quality was improving; our costs were decreasing. Warner Bros. and Metro-Goldwyn-Mayer were regularly coming out with satisfactory short subjects in Technicolor, and two inserts were highly successful, namely, *Broadway Melody* and *Desert Song*. Paramount had produced a successful feature length picture in Technicolor, *Redskin*. The studios were beginning to be color conscious.

But it remained for Warner Bros. and its affiliated company, First National, to take the first step on a large scale. Mr. J. L. Warner, with foresight and courage, signed up with us for a series of more than twenty features. These included *On with the Show*, the first all-talking all Technicolor feature picture, and *Gold Diggers of Broadway*, which has grossed over \$3,500,000 and which still ranks high among the all-time outstanding box-office attractions. The Technicolor mechanical service of providing and maintaining cameras in good working order and of delivering rush prints on time was well established. Two more subtle departments of service, namely, helping producers' cameramen to learn how to light and operate to advantage in Technicolor, and consulting and advising in matters of color control, were being demanded. Coöperation under the head of color control was ranging all the way from deciding the details of the color composition of sets, choice of materials and costumes, to the broad planning and preparation of a picture by wiring a color score after the manner in which the musical score is written.

As evidence of the increased color-mindedness throughout the industry, Technicolor had contracts for the ten months beginning March, 1929, covering the photography and delivery of prints of the footage equivalent of approximately seventeen feature length productions. This required a doubling of the Hollywood capacity which was accomplished in August, 1929. For the year 1930 Technicolor had closed contracts for thirty-six feature-length productions which would call for some 12,000,000 linear feet of negative to be sensitized, photographed and developed during that year in the Hollywood plant, and a print capacity of approximately 60,000,000 feet.

During this boom period of 1929 and 1930, more work was undertaken than could be handled satisfactorily. The producers pressed us to the degree that cameras operated day and night. Laboratory

crews worked three eight-hour shifts. Hundreds of new men were hastily trained to do work which properly required years of training. Many pictures were made which I counselled against, and all in the face of the fact that to book a picture in our crowded schedules called for a deposit of \$25,000. At one time we had \$1,600,000 of such cash payments.

Among the features photographed and released during this period were: *Bride of the Regiment*, Vivienne Segal (First National); *Bright Lights*, Dorothy Mackail (First National); *Doctor X*, Lionel Atwill and Fay Wray (Warner Bros.); *Fanny Foley Herself*, Edna May Oliver (RKO); *Fifty Million Frenchmen*, all-star cast (Warner Bros.); *Follow Thru*, Charles "Buddy" Rogers and Nancy Carroll (Paramount); *Gold Diggers of Broadway*, all-star cast (Warner Bros.); *Golden Dawn* (Warner Bros.); *Hold Everything*, Winnie Lightner, Georges Carpentier, and Joe E. Brown (Warner Bros.); *King of Jazz*, Paul Whiteman (Universal); *Kiss Me Again* (First National); *Life of the Party* (Warner Bros.); *Mamba* (Tiffany Productions); *Manhattan Parade* (Warner Bros.); *On with the Show*, all-star cast (Warner Bros.); *Runaround* (RKO); *Show of Shows* (Warner Bros.); *Song of the West*, John Boles and Vivienne Segal (Warner Bros.); *Song of the Flame*, Bernice Clair and Alexander Gray (First National); *Sweet Kitty Bellairs*, Claudia Dell and Perry Askam (Warner Bros.); *The Rogue Song*, Lawrence Tibbett and Catherine Dale Owen (Metro-Goldwyn-Mayer); *Sally*, Marilyn Miller (First National); *The Toast of the Legion*, Bernice Clair, Walter Pidgeon, and Edward Everett Horton (First National); *The Vagabond King*, Dennis King, Jeanette MacDonald (Paramount); *Under a Texas Moon*, Frank Fay, Noah Beery, Myrna Loy, and Armida (Warner Bros.); *Viennese Nights*, all-star cast (Warner Bros.); *Wax Museum*, Lionel Atwill (Warner Bros.); *Woman Hungry*, Sydney Blackmer and Lila Lee (First National); *Whoopee*, Eddie Cantor (Samuel Goldwyn and Florenz Ziegfeld).

In Warner's *Wax Museum* and Goldwyn's *Whoopee* the Technicolor two-component process may have reached the ultimate that is possible with two components.

By reason of the fact in Technicolor of complete separation of the sound-track technic from the picture technic, the necessity (as in black-and-white procedure) of compromise between the sound and picture quality is avoided and relatively better sound-track should result. The first to take advantage of this was Ted Reed who was in

charge of Mr. Goldwyn's sound department during the production of *Whoopee*. When that picture was shown in Hollywood the sound quality elicited much favorable comment and discussion among producers and technicians.

My greatest anxiety at the time was that there might be thrust upon the public productions which would be very crude in color composition and unfaithful in color reproduction. Our own color control department was doing everything possible to consult with and advise directors, authors, art directors, wardrobe heads, paint departments, and others in the studio, and this department was being expanded as fast as practicable. But there was more involved than questions of composition and design. There were the limitations of the process. As early as May 29, 1929, I reported to our directors: "The fact that we have signed this large volume of business on the basis of our present two-color process has not altered, in my opinion, the fact that the quality of this two-color output is not sufficiently good to meet with universal approval, and hence cannot be regarded as ultimate. I feel confident that the short-comings of our two-color process will be aided by the fact that they are combined with voice, and particularly by the fact that the work includes so many girl and music type productions like *Sally* with Marilyn Miller, and *Paris* with Irene Bordoni. Also this combination will offer a very considerable novelty angle for a time which is always important in the amusement world. Gradually, however, I believe the public will come to realize that these two-color pictures do not represent an ultimate natural color process. Consequently I feel urgently that our drive to put our process on a three-color basis as soon as possible should not in the least be abated because of our success in getting business on the two-color basis. This three-color work is moving ahead and involves a very considerable research department in Hollywood under the direction of Mr. J. A. Ball."

This premature rush to color was doomed to failure if for no other reason because the Technicolor process was then a two-color process. In the last analysis we are creating and selling entertainment. The play is the thing. You cannot make a poor story good by sound, by color, or by any other device or embellishment. But you can make a good story better. Broadway has a terrible struggle each season to find good stories or plays for a dozen successes. Hollywood is trying to find over five hundred. They don't exist. The industry

needs all the help it can get, all the showmanship it can summon—it needed sound; it needs color.

But color must be good enough and cheap enough. The old two-component Technicolor was neither—hence it failed, but it was a necessary step to present-day Technicolor.

During the rush to color, Technicolor had not only its own shortcomings to contend with, but also a surfeit of poor stories that were to be saved by color, and a monotony of musicals more or less on the same formula. An injustice was no doubt done Technicolor by causing it thus to be identified so largely with musical and period productions. I counselled at the time that producers were no doubt losing an opportunity in not taking advantage of the fact that color can be used to intensify dramatic effect and bring out the best points of personalities, advantages which have been later used with striking effectiveness.

During the years 1929 and 1930 Technicolor appropriated over \$3,000,000 for plants, equipment, and research work, which increased its plant capacity from one million to six million feet of two-component prints a month. At the same time that it had been building those plants and training personnel to operate them, it had been filling its orders. Such conditions were not conducive to the highest quality product, even if the orders had been normal. The fact that this rush was largely forced upon Technicolor by the producers wouldn't help in the slightest degree with the exhibitor or the audience, even if they knew of it. And executives who were glad to try to work it out with us gradually over a period of time, were suddenly confronted with the necessity for drastic curtailment of their own budgets because of a sharp drop in motion picture theater attendance. At the peak of the rush Technicolor had twelve hundred men employed with a payroll of approximately \$250,000 per month, whereas by the middle of 1931 these had dropped to two hundred thirty men and approximately \$70,000. In the middle of 1931 picture production in Hollywood was at an extremely low ebb and the last week in July is said to have been the worst week for theater receipts in fifteen years.

During 1931 the base price of Technicolor prints was reduced from $8\frac{3}{4}$ to 7 cents per foot.

But Technicolor had persisted in its research and development work so that by May, 1932, it had completed the building of its first three-component camera and had one unit of its plant equipped to

handle a moderate amount of three-color printing. The difference between this three-component process and the previous two-component process was truly extraordinary. Not only was the accuracy of tone and color reproduction greatly improved, but definition was markedly better.

However, we could not offer the three-component product to one customer without offering it to all, which required many more cameras, and the conversion of much of our plant. To allow time for this and to prove the process beyond any doubt, we sought first to try it out in the cartoon field. But no cartoonist would have it. We were told cartoons were good enough in black and white, and that of all departments of production, cartoons could least afford the added expense. Finally Walt Disney tried it as an experiment on one of his "Silly Symphonies." This first attempt was the delightful *Flowers and Trees*, following which Disney contracted for a series. For Christmas 1932 came *Santa's Work Shop*, the following Easter, *Funny Bunnies*; in May, 1933, came *Three Little Pigs*, which made screen history, and in March, 1934, *Big Bad Wolf*. I needn't relate the story of Disney's extraordinary success with Technicolor. The "Silly Symphonies" in Technicolor surpassed the "Mickey Mouses" in black and white, and then both Mickies and Sillies adopted Technicolor.

Both the Disney Company and Technicolor were rather undersized at birth and in recent years both have grown rapidly in importance. A frequent conversation has been as to which helped the other most. Much like the conversation between two Irishmen after a considerable session at the bar: "Yer know, Clancy, when I was born I weighed only five pounds." "Yer did, and did yer live?" "Did I live? Yer ought to see me now."

What Technicolor needed was someone to prove for regular productions, whether short subjects or features, what Disney had proved for cartoons. But the producers asked: "How much more will it cost to produce a feature in three-component Technicolor than in black and white?" This question is always with us and it seems to me the answer must be divided into two parts; the added cost of prints, negative raw stock, rushes, and lighting can be numerically calculated and requires little discussion. But then there are the less tangible elements about which there is much discussion. I have said to producers and directors on many occasions: "You have all seen Disney's *Funny Bunnies*; you remember the huge rainbow

circling across the screen to the ground and you remember the Funny Bunnies drawing the color of the rainbow into their paint pails and splashing the Easter eggs. You all admit that it was marvelous entertainment. Now I will ask you how much more did it cost Mr. Disney to produce that entertainment in color than it would have in black and white?" The answer is, of course, that it could not be done at any cost in black and white, and I think that points to the general answer. A similar analogy can be drawn with respect to some part of almost any recent Technicolor feature.

If a script has been conceived, planned, and written for black and white, it should not be done at all in color. The story should be chosen and the scenario written with color in mind from the start, so that by its use effects are obtained, moods created, beauty and personalities emphasized, and the drama enhanced. Color should flow from sequence to sequence, supporting and giving impulse to the drama, becoming an integral part of it, and not something super-added. The production cost question should be, what is the additional cost for color per unit of entertainment and not per foot of negative. The answer is that it needn't necessarily cost any more.

In 1932 we marked our base print price down from 7 cents to 5½ cents a foot.

Early in 1933 Mr. Merian C. Cooper and Mr. John Hay Whitney began to show a practical interest in Technicolor. After thorough investigation of the Technicolor situation by Mr. Whitney and his associates, and as a result of many conferences, a contract was signed between Technicolor and Pioneer Pictures, Inc., on May 18, 1933, which provided for the production of eight pictures, superfeature in character and especially featuring color. There were some conditional clauses, among others a provision for extensive preliminary tests. Certain doubts remained in the minds of Whitney and his associates as to the performance of our three-component process under certain conditions. Would the process reproduce the various shades of green in woodland and jungle? For one story they were considering a lead with very dark coloring and black hair. Would she photograph satisfactorily against light backgrounds? For another story they thought of placing a decided blonde in the leading part; how would she photograph against various backgrounds? What about make-up? What about the visibility of extremely small figures in the distance? An exhaustive sets of tests were made with results satisfactory to Mr. Whitney and Mr. Cooper.

Then began the hunt for the first story to be produced. At one time Whitney told me they had given consideration to no less than two hundred stories.

While Mr. Whitney was searching, Pioneer Pictures made a very practical and complete test of the process by producing the picture *La Cucaracha*. This short subject met with tremendous success.

La Cucaracha, together with "Silly Symphonies," caused a tremendous interest in three-component Technicolor. The industry was now waiting to see what the first Whitney feature production would be like. Meantime Technicolor business was improving. Positive film shipments for the first six months of 1933 were double what they were for the first six months of 1932. Appropriation was made to increase the number of cameras under construction from three to seven.

The first test of the three-component process on a very large set was for Twentieth Century Fox on the closing sequence of *The House of Rothschild*.

Since *Whoopee* in 1930 Mr. Goldwyn and I had talked regularly each year about another picture in Technicolor, so that on one occasion Eddie Cantor asked me if I were coming for my annual ritual. This time it was the closing sequence in his Cantor picture, *Kid Millions*, which was another important early three-component insert.

No account of Technicolor adventures in the realm of producers would be complete without affectionate mention of Mr. Andrew J. Callaghan. He was a Vice-President of the company, active in sales and studio contacts through our most troublous times. He was Hollywood's most popular man—loved by all—and has been tremendously missed by everybody in Technicolor since his death in 1934.

Mr. Whitney and his Pioneer Pictures associates finally settled on *Becky Sharp* as their first production of the series of eight. *Becky* was a champion for hard luck. The original director, Lowell Sherman, was taken ill and died during the period of photographing. He was succeeded by Reuben Mamoulian. Unusual difficulty was encountered in the sound recording so that Mr. Whitney found himself in the ironically anomalous position of having produced the first three-component Technicolor feature, of having surmounted all the hazards of color, yet being in difficulty with an aspect of the work which he had naturally taken for granted.

During the 1935-36 season we were manufacturing in the neighborhood of $2\frac{3}{4}$ million feet of prints a month, which included a larger volume of Warner Bros. short subjects than ever before and about forty per cent of all Metro-Goldwyn-Mayer short subjects.

A very interesting and important adventure in the history of Technicolor development was the organization of a British affiliate, Technicolor, Ltd., which I organized as a subsidiary of Technicolor Motion Picture Corp. and later developed in association with Sir Adrian Baillie, Mr. Alexander Korda, and The Prudential Assurance Company, Ltd.

The first Technicolor feature picture photographed in England was *Wings of the Morning*, a race-track story which has had very successful distribution throughout the world. This production was produced before the London laboratory was built, and was serviced from Hollywood. In 1936 the British laboratory was built at West Drayton, just outside of London where it is now regularly operating to service British made productions and prints of American made productions for distribution in the United Kingdom. Mr. Alexander Korda has been outspoken in his enthusiasm for color, as evidenced by a series of pictures which he has produced, including the current release *Drums*. He is now planning an all-Technicolor series of pictures, of which the first is *The Four Feathers*, at present being photographed in the Sudan.

Since *Becky Sharp* there have been produced at Hollywood and in London a large number of important feature productions in Technicolor, including: *Adventures of Robinhood*, Errol Flynn, Olivia de Havilland (Warner Bros.); *A Star Is Born*, Janet Gaynor and Fredric March (Selznick International Pictures); *Drums*, Valerie Hobson, Sabu, Raymond Masey (London Films Productions); *Ebb Tide*, Ray Milland, Frances Farmer (Paramount); *Garden of Allah*, Marlene Dietrich, Charles Boyer, Basil Rathbone, Joseph Schildkraut (Pioneer Pictures); *God's Country and the Woman*, George Brent, Beverly Roberts (Warner Bros.); *Gold Is Where You Find It*, George Brent, Olivia de Havilland (Warner Bros.); *Goldwyn's Follies*, all-star cast (Samuel Goldwyn Pictures, Inc.); *Her Jungle Love*, Dorothy Lamour, Ray Milland (Paramount); *Men with Wings*, Ray Milland, Louise Campbell, Fred MacMurray (Paramount); *Nothing Sacred*, Carole Lombard, Fredric March (Selznick International Pictures); *Ramona*, Loretta Young, Don Ameche (Twentieth Century Fox Productions); *Sixty Glorious Years*, Anna Neagle, Anton

Walbrook (Herbert Wilcox); *Snow White and the Seven Dwarfs*, Walt Disney (RKO Pictures, Inc.); *Trail of the Lonesome Pine*, Sylvia Sidney, Fred MacMurray, Henry Fonda (Walter Wanger Productions); *Tom Sawyer*, Tommy Kelly, Anne Gillis (Selznick International Pictures); *Valley of the Giants*, Claire Trevor, Wayne Morris (Warner Bros.); *Vogues of 1938*, Joan Bennett, Warner Baxter (Walter Wanger Productions).

Generally speaking, these pictures have been extraordinarily well received, some of them having broken attendance records in many parts of the world. Thus Technicolor has met the second great rush into color with steadily improving quality of its product and a broadening range of service. It is the purpose of Technicolor, during the time that prints of any picture are being manufactured in its plant, to hold the laboratory open for and at the disposal of the customer as if it were his own. His representative may inspect each of his prints and any changes suggested will be undertaken if practicable. To do this he simply moves into the inspection room where each print before shipment is compared by simultaneous projection with a standard print approved by the customer for the purpose.

William Wellman who has directed more three-component Technicolor pictures than any other individual, all of them successes, namely, *A Star Is Born*, *Nothing Sacred*, and *Men with Wings*, has said repeatedly of Technicolor photography that he takes it in his stride, at substantially the same number of setups per day as black and white. It is noteworthy that most of the camera work is now done by cameramen in the direct employ of the studios.

Broadly considered, this recent array of feature pictures is of such a late date that it is too early to render a verdict based upon any sort of generalization with respect to them.

Looking ahead, Technicolor has contracts for about forty feature-length productions spread among most of the outstanding producers, constituting a very substantial volume of business. Among these there are now either being photographed or in preparation the following: *Dodge City*, Errol Flynn, Olivia de Havilland (Warner Bros.); *Gone with the Wind*, Clark Gable (Selznick International Pictures); *Heart of the North*, Dick Foran, Gloria Dickson (Warner Bros.); *Jesse James*, Tyrone Power, Henry Fonda, Nancy Kelly (Twentieth Century Fox); *Kentucky*, Loretta Young, Richard Greene, Walter Brennan (Twentieth Century Fox); *Little Princess*, Shirley Temple, Richard Greene, Anita Louise (Twentieth Century Fox); *Northwest*

Passage, Robert Taylor, Spencer Tracy (Loew's, Inc.); *Sweethearts*, Jeannette MacDonald, Nelson Eddy, Frank Morgan, Ray Bolger (Loew's, Inc.); *The Light That Failed*, Ray Milland (Paramount); *The Mikado*, all-star (G. & S. Productions, Ltd.); *The Thief of Bagdad* (London Films Productions); *The Wizard of Oz*, Judy Garland, Jack Haley, Bert Lahr, Ray Bolger (Loew's, Inc.); and a second feature-length production is being prepared by Walt Disney Enterprises, Inc.

To meet this growing volume of business Technicolor many months ago appropriated some \$1,500,000 to increase the number of its cameras and to double its plant capacity. This expansion program is now well on its way to completion.

I have thus passed over rapidly the matter of eighteen pictures to be produced in Technicolor during the last part of this year and the first six months of next year, although they will probably represent an investment of some fifteen million dollars.

The foreign situation is becoming increasingly difficult. Sales to Germany, Spain, Japan, and China have practically ceased, and in many other foreign countries they are below normal. The Italian Government controls the entire distribution of films in Italy, which probably means that everything possible will be done to distribute Italian-made pictures at the expense of English and American-made pictures. To cope with the various regulations of censorship, the various languages requiring either superimposed titles or dubbing with new sound-track, has for years been difficult enough, but with the more recent quota laws, import duties, exchange difficulties, and especially in the face of the impossibility of getting money out of several foreign countries, to continue in the motion picture business there means adventures in other businesses, possibly including banking and politics. The establishment of Technicolor laboratories at various points over the world is a practical necessity and despite all these difficulties definite progress is being made.

About a year ago Technicolor established a department to contact exhibitors directly. Its representatives travel over the country to call upon exchange managers, theater managers, and projectionists. The purpose has been to study projection and screen conditions at the theater; to advise how to get the best results with Technicolor prints, to listen to complaints and establish good will, and particularly to obtain projectionist, manager, and audience reactions to productions in Technicolor. The results have been most gratifying; we

have found that the public reaction to Technicolor pictures is extremely favorable and that exhibitors throughout the country are realizing more and more that Technicolor has great box-office value.

In the letter from Dr. Goldsmith, suggesting for himself and Mr. Crabtree, that I write this paper, he said, "I believe it would be of particular interest to the engineers and the industry if you cared to indicate how you happened to cling so tenaciously to these developments through the 'dark ages' when color motion pictures were not so well appreciated." All I have said points to the answer; it was marvelously interesting; it was great fun; we couldn't let anybody down, neither customers, employees, stockholders, nor directors. But there was something else too; there was always something just ahead, a plan for tomorrow, something exciting to be finished—yes, and something more to be finished after that; and I am willing to predict that it won't be finished for many years yet. The type of film which will be standard for natural color pictures ten years hence may not yet have emerged. I predict that within two years Technicolor will have done away with special cameras and be regularly employing single strips of negative through any standard motion picture camera and that within two months for special purposes and within six months for more general purposes it will be offering to its customers a negative for use in its present cameras with from three to four times the speed of its present negative. That's why we cling so tenaciously; there's always something ahead; there always will be; our pride is enlisted; it's our job.

DISCUSSION

MR. CRABTREE: I have been greatly impressed by the way in which color develops the loveliness of the ladies, especially the blondes and the redheads. Are the producers sold on the fact, and do they make screen tests of potential stars in both color and black and white?

DR. KALMUS: The program of testing is always with us. There has been no end of tests, both in black and white and in color, for comparative purposes. Relatively few are being made now; many producers think they are not necessary.

MR. CRABTREE: I have been wondering whether the usual methods of inserting backgrounds are being used with Technicolor. Were there very many background shots in *Men with Wings*?

DR. KALMUS: We do projection background work regularly.

MR. CRABTREE: Is it as flexible as with black and white?

DR. KALMUS: Not quite, but sufficiently flexible to be very practicable.

MR. WOLF: I understand Technicolor will be available in a single film for use in standard cameras. Will the processing be difficult or will it be as simple as with black and white?

DR. KALMUS: That is getting into a realm I am avoiding for the present. However, I think it will be some time before the processing will be as simple as black-and-white, if ever. The program as we have it outlined will be simple and practicable as compared with the programs we have been through before.

MR. KELLOGG: When you have a two-color system, do you leave some silver in the film in order to get some black in addition to what you get from the dyes?

DR. KALMUS: The two-component system was strictly two-component. The present system is really four-component—the three components ordinarily thought of as the color components, and black.

MR. THOMAS: Have you obtained any data of value, from the projection standpoint, from the questionnaires sent out with the prints of *Goldwyn Follies*?

MR. RACKETT: We have received valuable information from the projectionists' comments on the cards sent to theaters in advance of the showing of Technicolor pictures.

The comments may be divided into two classes: first, those referring to the physical condition of the film, which have occasioned our making minor changes in the visibility of instruction titles and changeover cue marks; the second, relating to the density and color values of prints, which are a little more difficult to classify as they have to be interpreted in connection with data from our field division relating to projection equipment.

Most theaters are equipped with high-intensity arcs which produce a screen image that is slightly bluish. Technicolor prints are balanced to yield a neutral image on such a screen.

Small projection units equipped with Mazda light produce a screen image that is slightly orange. When a print balanced for a high-intensity arc is projected by a Mazda light the screen result will be slightly orange.

When we are establishing the density and color balance of a feature picture, we make a series of prints and usually arrange to view these with the producer of the picture in a number of first-run theaters, as far as time permits. We then compare a number of prints in a room where we can project simultaneously on matched screens as many as six prints of the same reel. We get a comparison of such fineness that we have not been able to find quantitative methods of measuring the differences.

All the data, including the important and welcome comments of the projectionists on the print comment cards attached to the print suggestion booklets, are very helpful in establishing the final results.

MR. GRIFFIN: How quickly is the rush print available in the three-component process after the negatives leave the camera?

DR. KALMUS: Regular twenty-four hour service.