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Colorsnap! Colour Photography, the Market in Patents and the 1929 Crash

Michelle Henning 

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1 – D. A. Spencer, *Colour Photography in Practice*, London: Pitman and Sons 1938, ix.

2 – See Jack H. Coote, *The Illustrated History of Colour Photography*, Surbiton: Fountain Press 1993, 78. Carbro was a variant of carbon printing, marketed by the Autotype Company of London, and widely used in colour photography.

Although very short-lived, the Colorsnap process, promoted in 1928–29 by the small British company Colour Snapshots (1928) Ltd, is mentioned in several histories of colour photography processes as a key example of a false start in colour photography. Such accounts emphasise problems with technical quality and poor industrial organisation, but miss the key role of the market in patents and changes in investment practices in the period. From 1926 to 1929, the London Stock Exchange saw a frenzy of speculative investment in companies touting new innovations in media, linked to gramophone, radio, cinema, photography and photo-telegraphy. Like most of these companies, Colour Snapshots was inexperienced and completely dependent on the success of an untested patent. The company promoter deployed the then-common strategy of underpricing, consequently the company was undercapitalised and unable to finance production. Colour Snapshots was liquidated in the Great Slump of 1929–33. This article situates it in wider cultures of the market, in cultural practices of invention, and ideologies of modernity and innovation. It argues that the rise and fall of Colorsnap expresses the opportunistic practices of invention and speculative finance of the time.

Keywords: *Ilford, Colour Snapshots, colour photography, amateur photography, photography patents, 1929, Wall Street Crash, London Stock Exchange, photography industry*

The history of colour photography makes depressing reading. It is a story of processes born before their time and processes that should never have been born at all, of ships that stagger past in the night, founder and rise again keel upwards only to be remanned by optimistic crews.¹

When he wrote this in 1938, D.A. Spencer may have had in mind a small British firm called Colour Snapshots (1928) Ltd. First announced in the British press in spring 1928, Colour Snapshots was floated on the London Stock Exchange to great fanfare later the same year. Spencer's own company, Colour Photographs Ltd, which also began operations in 1928, went on to dominate professional colour photography in Britain during the 1930s with 'Vivex'. The first colour print service for professional photographers in Britain, Vivex derived from trichrome carbro printing and used three negatives taken simultaneously in dedicated cameras.² By contrast, the process that Colour Snapshots promoted, called 'Colorsnap', was aimed firmly at amateur photographers, such as the holiday photographers who took their films to be



Aug. 16, 1932.

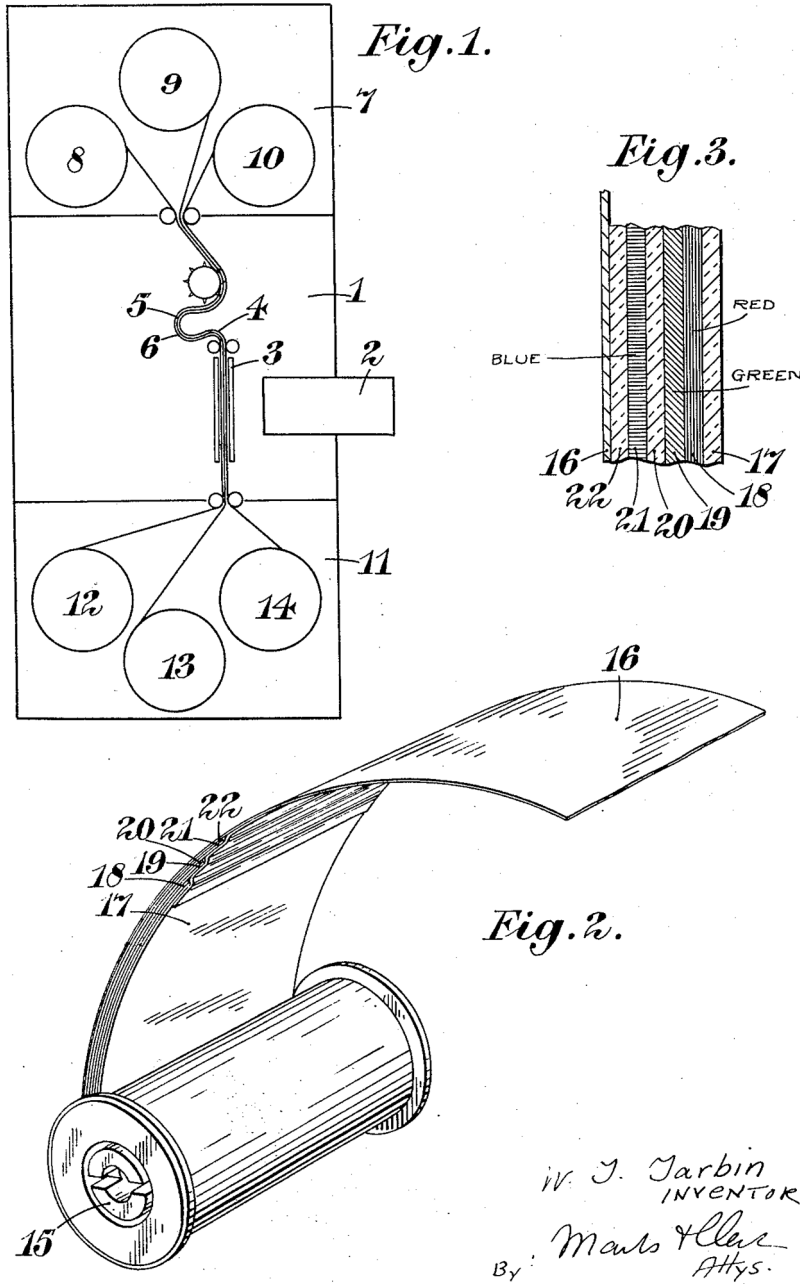
W. T. TARBIN

1,871,479

COLOR PHOTOGRAPHY

Original Filed Jan. 21, 1928

Figure 1. Illustration from Tarbin's patent showing the layering of the film.



W. J. Tarbin
INVENTOR
By: Mauts & Co.
Attys.

3 – As Peter Buse points out, the English vocabulary for describing the wide range of amateur photographic practice in the period is limiting. Here, I have tried to distinguish between the kinds of amateur photographers who sent their films and glass plates for processing via stores such as Boots and what he calls the ‘aspirational amateurs’ – readers of and writers to the photographic press. Judging from their *Merchandise Bulletin* and price lists, however, Boots also supplied [supplied] this kind of amateur with materials, and it is likely that a snapshotter could progress to an ‘aspirational amateur’ via the Photographic Department of Boots. Peter Buse, ‘The Photographer as Reader: The Aspirational Amateur in the Photo-Magazines’, in *Photography Reframed: New Visions in Photographic Culture*, ed. Ben Burbridge and Annebella Pollen, London: Bloomsbury 2018, 48.

4 – ‘Colour Snapshots (1928) Limited’, *Economist* (22 December 1928), 1178.

5 – The autochrome was a trichrome screen process using a three-colour grain, which began on glass plates and was later produced on sheet film; see Bertrand Lavédrine and Jean-Paul Gandolfo, ‘The Autochrome Process’, *History of Photography*, 18:2 (1994), 120–21. Anne Hammond reports that initial demand for the autochrome was ‘overwhelming’; see Anne Hammond, ‘Impressionist Theory and the Autochrome’, *History of Photography*, 15:2 (1991), 97.

developed at the high-street chemist.³ This tiny company was the first in Britain to offer to the snapshotter market a colour print processing service for roll film that promised to be as easy as existing black-and-white services.

An important selling point was that customers could use their existing cameras to produce prints rather than transparencies. As the chairman of the directors announced to the shareholders:

So far as your directors have been able to ascertain, your process is the only one which enables snapshot photographs in natural colours to be taken with an ordinary camera, and from such negatives to obtain prints in natural colours or in black and white.⁴

Specialist colour cameras were expensive and cumbersome. The most popular and accessible existing process was the Lumière company’s autochrome glass plate process, launched in 1907, which could be used in any plate camera with a tripod, but not in a handheld camera. Sheet film versions were introduced in 1930. The resulting image was a transparency viewed in a dioscope or magic lantern.⁵ Now, Colour Snapshots claimed, colour prints could be available using customers’ existing handheld – compact and box – cameras. This idea of colour without big and complicated investment was a central plank in the marketing.

It is clear there were severe problems with the quality of Colour Snapshots’ output, evident from documentary sources and the few remaining examples of their prints. The film was a version of the tripack system invented by Louis Ducos du Hauron in 1895 and first marketed circa 1916 by Frederic Ives. In 1927, an otherwise unknown inventor called William Thomas Tarbin applied for a patent for a roll film made up of three films layered together, each sensitive to a different primary colour (figure 1). Colour Snapshots (1928) Ltd bought the patent but subsequently found that the layering made the film extraordinarily thick, causing the back layer to be underexposed and affecting colour balance, hampering its movement through the camera mechanism and reducing sharpness as the layers tended to separate. To mitigate this last problem, Colour Snapshots introduced a pressure plate, to be placed inside the back of the camera and press the three layers of film together. The thin sensitised film was produced by Ilford Ltd, manufacturer

Figure 2. Unknown, Colorsnap colour photograph of a garage forecourt, 1929. The Kodak Collection at the National Science and Media Museum, Bradford, Object Number: 1990-5036/6071/4.



of some of the fastest consumer films on the market, and it was hoped that high sensitivity would resolve the exposure issues. The printing process was equally fraught with problems: early exhibition prints consisted of layers of celluloid mounted on white card, and the eventual commercial process was a photomechanical collotype process based on a 1927 patent, but the prints produced were poor quality, and some were hand-retouched (figure 2).⁶

All in all, the business was a dramatic failure: the film's arrival on the market was delayed, its processing inefficient, results were poor and the company was unable to keep up with demand. The 'brief and inglorious' story of the Colour Snapshots venture was summarised in 1930 by the photographer and author Captain Owen Wheeler:

Dazzled by glowing advertisements, the public eagerly bought 'Colorsnap' films, exposed them, and sent them through their dealers to headquarters for treatment. As a rule, weeks of waiting followed, with an eventual intimation that the majority of the films had been so wrongly exposed that it was impossible to print from them. When prints were supplied, they were usually of poor quality, and sometimes mere travesties of the originals [...] it will probably be some considerable time before a fresh attempt is made in this direction.⁷

After the stock market crashed at the end of 1929, Colour Snapshots (1928) Ltd folded. It was liquidated in December 1929, with actions pending against it. Subsequently, colour print (negative) film remained inaccessible for decades. Colour reversal (transparency) roll films became available in the 1930s and Ilford briefly introduced and then discontinued a colour printing service for its transparency process, Dufaycolor.⁸ Although Agfacolor negative film was introduced in 1939, Kodacolor in 1942 and Ektacolor in 1947, it was not until the 1960s that colour negative films and colour prints began to be regularly used by snapshot photographers.

Although very short-lived, Colorsnap is mentioned in several histories of colour photography. These books – by Joseph Friedman, Brian Coe and Jack H. Coote – all describe problems with the company's patents, the poor quality of its results and its commercial and practical incompetence.⁹ These are largely teleological histories which describe a 'parade of technical forms'.¹⁰ While they recognise the interwar period as a busy time in colour photography, they tend to see it as laying the ground for the successful transparency films introduced by Agfa and Kodak, and for the arrival of colour photography as a popular format in the postwar period. In such accounts, Colorsnap is treated as a key example of the false starts in colour photography that plagued the 1920s and early 1930s and an object lesson in the perils of the rush to market an unready technology.

While attention to failure might give the lie to the idea of the heroic upward march of technological progress, Colorsnap's failure is instead used to reinforce the sense of the superiority of the technologies and businesses that did survive. In his *Arcades Project* notes, Walter Benjamin observed the tendency to oppose 'the "productive", "forward-looking", "lively", "positive" part of the epoch' with 'the abortive, retrograde and obsolescent', pointing to the dependence of ideas of progress on this negative image of moments or periods of decline and failure.¹¹ Here, rather than allowing the 'abortive' experiment that was Colorsnap to set the later successes of colour photography in high relief, I follow Benjamin in attending to the way such defunct and forgotten media and technologies might reveal 'the expression of the economy in its culture'.¹² My concern here is not with the causes of market and technological failure – or in economics as determining culture – but with what the broken promise of Colorsnap expresses and reveals about the culture of the market and of photographic innovation in 1928.¹³

Colorsnap was indisputably a flawed technology, and Colour Snapshots (1928) Ltd was an 'awful business' both in the literal sense and in the sense of a sorry affair. Its story involves poorly tested products, industrial mismanagement

6 – Edward F. Flammer and Halsey E. Silliman, New York, US Patent 1634659. The collotype process is described in Dusan C. Stulik and Art Kaplan, 'Collotype', in *The Atlas of Analytical Signatures of Photographic Processes*, Los Angeles: The Getty Conservation Institute 2013.

7 – Owen Wheeler, 'Progress in Colour Photography', *Science Progress in the Twentieth Century (1919–1933)*, 25:97 (1930), 91.

8 – According to Coote, 'results were not good'. Coote, *Illustrated History*, 50.

9 – Joseph Friedman, *History of Colour Photography*, 2nd edn, Boston: The American Photographic Publishing Company 1945; Brian Coe, *Colour Photography: The First Hundred Years, 1840–1940*, London: Ash & Grant 1978; and Coote, *Illustrated History*.

10 – Lisa Gitelman in Geoffrey Batchen and Lisa Gitelman, 'Afterword: Media History and History of Photography in Parallel Lines', in *Photography and Other Media in the Nineteenth Century*, ed. Nicoletta Leonardi and Simone Natale, University Park, PA: Pennsylvania State University Press 2018, 207.

11 – Walter Benjamin, *The Arcades Project*, ed. Rolf Tiedeman, trans. Howard Eiland and Kevin McLaughlin, Cambridge, MA: Harvard University Press, 459.

12 – *Ibid.*, 460.

13 – On failure, see Jennifer Gabrys, 'Machines Fall Apart: Failure in Art and Technology', *Leonardo Electronic Almanac*, 13:4 (2005), 9–16. My approach shares a media archaeological interest in obsolescent and failed media, and in integrating the history of photography and media; see Jussi Parikka, *What is Media Archaeology?*, London: Polity Press 2012; and *Photography and Other Media*, ed. Leonardi and Natale.

and flawed patents. But the larger context of Colorsnap's hasty arrival and dramatic departure was the short-lived speculative investment boom prior to the stock market crash of 1929. This was linked to a constellation of practices of patenting, finance and investment peculiar to 1920s Britain, which enabled specific ways of working and available careers, and underpinned the industries that supplied the materials and shaped the practices of vernacular photography.

New investors and ventures were spurred by a taste for innovation cultivated via the proliferation of brightly colourful commodities and technological novelties. In 1920s Britain, as Richard Hornsey argues, urban commerce gained a new glamour and theatricality, enhanced by the variety of new products on sale and by the presence, in stores and on high streets, of novelty entertainments such as the automatic photobooth.¹⁴ Tom Gunning writes that 'the "newness" of a new technology, its capacity to dazzle us, is always in some sense the product of the discourse surrounding it' – a discourse of modernity and novelty, propagated through exhibitions and advertisements, and other forms of promotion.¹⁵ Narratives of progress and innovation permeate writing about photographic technologies, but also the utopian fanfare that hails their arrival, and shape not only how we understand the past but how the present is experienced and a future anticipated.¹⁶

This study of Colorsnap draws on my research in the archives of the Ilford Ltd photographic firm. This revealed that Ilford invested in the tiny Colour Snapshots company and supplied it with its sensitised film base, and that Ilford's experts became involved in the company. Thus, the following account of Colour Snapshots (1928) Ltd draws on the business records of Ilford Ltd, as well as other archival sources including Kodak Ltd's research report on the Colorsnap process, and the archives of Boots the chemist, one of the major high-street photographic retailers in the period.

A Commercial Colour Print Process

Writing in 1940, Joseph Friedman observed that 'even colored transparencies, as made by Dufaycolor or Kodachrome, have only very limited uses. Colored prints on paper are what are really desired'.¹⁷ The long-established Lumière autochrome was not available in roll film form until the early 1930s – as Lumicolor or Lumière Filmcolor – and results could not easily be reproduced in print.¹⁸ Unfortunately, there is little research on any demand for colour negative film in the interwar period, but there are lots of reasons why prints remained more desirable than transparencies for the family photographer. Throughout the 1920s, high-street stores such as Boots had been heavily promoting picture frames and albums for the display and storage of photographs – Boots had over a thousand branches in Britain by 1935, most with photography departments. All of the paraphernalia associated with presenting and preserving prints was already in place. Transparencies required a completely different system, necessitating the purchase of more accessories, and they lacked the immediacy of prints.

Colour photography was also expensive. In 1910, an autochrome plate was reportedly four and a half times as expensive as its monochrome equivalent; by the mid-1930s, judging by the Boots price list, its descendent, Lumière Filmcolor, had widened that gap further.¹⁹ Colorsnap predated Filmcolor and all the other colour reversal or transparency roll films but despite publicity suggesting it would appeal to the photographer with a box camera (figure 3) it was also expensive: in June 1929, Boots announced that the prices would be between three to three and a half shillings for a film with four exposures, with developing and printing adding another two shillings to the price. These prices are similar to those of the mid-1930s colour reversal roll films – Lumière Filmcolor, Agfacolor, Dufaycolor, and Kodachrome – supplied by Boots, which all cost between half a shilling and a shilling per exposure.²⁰ In contrast, Boots price lists reveal that in the mid 1930s, black-and-white roll films retailed at around one shilling for eight exposures.

14 – Richard Hornsey, 'Francis Bacon and the Photobooth: Facing the Homosexual in Post-War Britain', *Visual Culture in Britain*, 8:2 (2007), 83–103.

15 – Tom Gunning, 'Re-Newing Old Technologies: Astonishment, Second Nature, and the Uncanny in Technology from the Previous Turn-of-the-Century', in *Rethinking Media Change: The Aesthetics of Transition*, ed. David Thorburn and Henry Jenkins, Cambridge, MA: MIT Press 2003, 43.

16 – Gunning writes that 'Every new technology has a utopian dimension that imagines a future radically transformed by the implications of the device or practice'. *Ibid.* 56.

17 – Joseph Friedman, 'Color Photography', in *American Annual of Photography 1941*, Vol. 55, ed. Frank R. Fraprie and Franklin I. Jordan, Boston: American Photographic Publishing Co. 1940, 228. In 1935, the Boots *Merchandise Bulletin* was still advising salespeople to clarify that Dufaycolor was a transparency, not print film, implying ongoing demand for colour prints. 'Photographic Department: Processing of Dufaycolor Films' *Merchandise Bulletin* (26 August 1935), 4411, Walgreen Boots Alliance Archive.

18 – Nathalie Boulouch, 'The Documentary Use of the Autochrome in France', *History of Photography*, 18:2 (1994), 143.

19 – According to the National Science and Media Museum blog, 'Their relatively high cost was the subject of frequent comment in the photographic press and clearly had some effect in limiting the process's wider popularity'. Available at <https://blog.scienceandmediamuseum.org.uk/autochromes-the-dawn-of-colour-photography/> (accessed 7 November 2020).

20 – Excluding processing, although Kodachrome included processing and postage in the price of twelve shillings and sixpence for an eighteen-exposure spool. Pre-war (late 1930s) undated Price List of Photographic Material, Walgreen Boots Alliance Archive, WBA/BT/11/37/1/27.



Figure 3. Colour Snapshots advertisement, May 1929. The figure on the right holds a box camera.

**TAKE IT
IN COLOUR!**

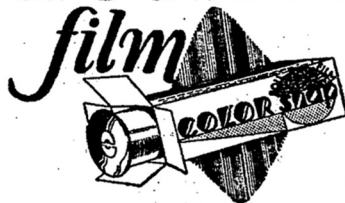
Colour snapshots are now within reach of everyone. You can take colour pictures as easily as you take ordinary ones.

But you get the hundredfold advantage of natural colour! As you see it—your print will portray it.

TAKE IT IN COLOUR!

You need no special camera or equipment to use Colorsnap Films. You take full, natural-colour snaps as you take any other snaps. Buy your Colorsnap Films. Take your snapshots in the usual way. Then take the spool to any authorised Colorsnap dealer and he will do the rest. The cost is little, considering what you get. Ask your dealer for list and information on Colorsnap Enlargements.

COLORSNAP



COLOUR SNAPSHOTS (1928) LTD., LONDON, W.1

- 21 – Sally Stein, *Harry Callahan*, Tucson, AZ: Center for Creative Photography 1980, 6.
- 22 – Pamela Roberts, *The Genius of Colour Photography: From the Autochrome to the Digital Age*, London: André Deutsch, 2007, 72.
- 23 – Scott Higgins, *Harnessing the Technicolor Rainbow: Color Design in the 1930s*, Austin: University of Texas Press 2007, 2.
- 24 – Sarah Street, *Colour Films in Britain: The Negotiation of Innovation 1900–1955*, London: Bloomsbury 2019, 10.
- 25 – Anne Hammond mentions exhibitions of colour collotypes between 1906 and 1916; see Hammond, 'Impressionist Theory and the Autochrome', 98. Boulouch write that one shortcoming of the autochrome process in France was that few journals could afford half-tone reproduction in colour; see Boulouch, 'Documentary Use of the Autochrome', 143.
- 26 – Regina Lee Blaszczyk, 'True Blue: DuPont and the Color Revolution', *Chemical Heritage*, 25:3 (2007), 20–25.
- 27 – *Bright Modernity: Color, Commerce, and Consumer Culture*, ed. Regina Lee Blaszczyk and Uwe Spiekermann, London: Palgrave Macmillan 2017, 12. The British Colour Council, 'a major effort to rationalize color selection for British industry based on the American trade-association model', dates from late 1920s and was incorporated in 1930; see Regina Lee Blaszczyk, 'The Color Schemers: American Color Practice in Britain, 1920s–1960s', *ibid.*, 201.
- 28 – 'Colour Snapshots Failure', *Financial Times* (20 December 1929), 14. Klein was the son of a Jewish German music critic and an English writer, who later changed his name to Cornwell-Clyne due to wartime hostility towards 'enemy aliens' in 1940. He published *Colour-Music, the Art of Light* (London: Crosby Lockwood and Son) in 1926 and *Colour Cinematography* (London: Chapman and Hall) a decade later.
- 29 – W. T. Hanson, 'Forty Years of Color Photography', cited in Stephen R. Milanowski, 'Factors Influencing the Neglect of Color Photography: 1860 to 1970', PhD thesis, Massachusetts Institute of Technology 1982, 118.
- 30 – R. J. Hercock and G. A. Jones, *Silver by the Ton: A History of Ilford Limited 1879–1979*, Maidenhead: McGraw–Hill Book Company 1979.
- 31 – See G. B. Harrison, 'The Laboratories of Ilford Limited', *Proceedings of the Royal Society, London*, 142:906 (1954), 9; and D. E. H. Edgerton, 'Industrial Research in the British Photographic Industry, 1879–1939', in *The Challenge of New Technology: Innovation in British Business since 1850*, ed. Jonathan Liebenau, Aldershot: Gower 1988, 106–34.

In 1928, the colour print processes used by professionals and keen amateurs were extremely expensive and very laborious. Generally, they were produced by taking three exposures on black-and-white film with colour filters on a conventional plate camera using a tripod, or by using the new, heavy one-shot colour camera, which took three simultaneous images. Printing would then usually be done using either the imbibition or the three-colour carbonyl transfer process, both of which were highly complicated. As Sally Stein writes, 'one could nearly make a painting in the time it took to produce a decent color print'.²¹ Pamela Roberts describes three-colour printing processes on paper as involving 'more than 80 precise and exact steps, none of which could be omitted, and it could take up to 10 hours to make a single print'.²²

The demand for colour was associated with modernity, with the growing consumer society of the 1920s, and the newly spectacular urban and commercial environment. Most movie films were coloured in this period: by the early 1920s, alongside 'natural' colour processes such as Kinemacolor, about eighty to ninety per cent of all prints of movie films shown in Britain were tinted or toned.²³ Sarah Street says that this proliferation of colour in the era of silent movies 'contrasts markedly with the period 1930–55 when colour was nowhere near as all-pervasive'.²⁴ Colour prints were regularly shown in exhibitions, and autochromes were shown in public lectures and talks. Books and magazines included half-tone colour reproductions of photographs, as well as colour illustrations, although the expense limited their use.²⁵ The introduction of new synthetic dyes in the nineteenth century, along with manufacturing processes that lowered the costs of colour reproduction, had already hastened the spread of colour in commodities and high streets before World War I, which as Regina Lee Blaszczyk puts it, 'sharpened the eye and whetted the appetite for colour'.²⁶ New artificial dyes combined with new materials made possible colourful rayon dresses, colourful window displays and even colourful foods. This blossoming of colour expanded with the growth of the department stores, cinema chains and chain stores, and of a lower middle class with money to spend on novelties.

During the interwar period, Europe increasingly adopted American colour practices and a sales culture that emphasised colour as an important aspect of consumer choice. As Blaszczyk's work shows, an 'American predilection for bright hues' and new 'colour management' techniques spread from the USA to Britain in the 1920s, and this new field of expertise 'aimed to make commercial color predictable and thereby more profitable'.²⁷ In Britain, one person making a name as a colour consultant was Major Adrian B. Klein, later known as Cornwell-Clyne, an artist who worked in camouflage during wartime, as a colour consultant to the calico industry, designed a colour projector for stage lighting and was also listed as a scientific consultant on Colour Snapshots' share prospectus. Later, he was on the payroll as controller of production technology, and became a director of Colour Snapshots' printing company.²⁸

Despite an evident desire and demand for colour, Stephen Milanowski argues that in still photography there was limited incentive for the big players in the industry to produce a popular and affordable process, given the huge profits reaped by black and white during the 1929 boom.²⁹ Yet firms were nevertheless financing research into colour processes, fuelled by the demand for reliable and practical cinema colour: the rapidly expanding Ilford company opened its research laboratory, Rodenside, in Ilford, on the eastern fringes of London, in 1925 and had been looking for a colour process since they had begun manufacturing film, in addition to plates, in 1921.³⁰ Kodak Ltd, the British subsidiary of Eastman Kodak, researched nascent colour processes at its research laboratory at Harrow, West London, which opened in 1928.³¹ Eastman Kodak already had the first version of Kodacolor movie film and was conducting ongoing research under the direction of

British chemist C. E. K. Mees (Kenneth Mees) at their research laboratory in Rochester, New York.³²

Ilford Ltd kept quiet its links with Colour Snapshots (1928) Ltd, reflecting the cautious and secretive approach of its wider business strategy in the period. The firm was coming to the end of a period of growth in which it had absorbed smaller British firms and their products through amalgamations and buy-outs, in a 'horizontal' expansion barely visible to consumers, since the smaller family firms it took over, companies such as Illingworth and the Imperial Dry Plate company, retained their original names and branding.³³ This strategy was partly a response to the British suspicion of monopoly: at the start of the 1920s, after a flurry of corporate amalgamations followed by recession, monopolies had become associated with price-fixing.³⁴ At the same time it allowed the company to have fingers in several pies, to capitalise on successful brands and test out the viability of products without staking their reputation. This appears to have been the strategy with Colour Snapshots – possibly Ilford hoped to gain a foothold in colour photography at no risk to itself and very little capital outlay.

The Rise and Fall of Colour Snapshots

The advertisements for Colorsnap roll film announced that 'Colour photography is here – for you' (figure 4). The slogan refers to the idea that colour print photography, 'not tinted afterwards, but *taken* in colour, *printed* in colour' (original emphases) would now be an affordable and practical process for snapshooters. It frames Colorsnap film as something expected and awaited, not disruptive and shocking but an almost inevitable arrival – finally, it is here!

Despite the flaws in the process, as already outlined, early reports were very positive. *The Times's* Scientific Correspondent, zoologist Peter Chalmers Mitchell, was shown what he considered to be 'amazing results' in May 1928, although he did not mention the company or the inventor, alluding instead to 'a small group of scientific and business men who have combined their efforts for several years, and have had a laboratory at work for two years continuously'.³⁵ When the company was floated on the London Stock Exchange in October 1928, the shares were heavily oversubscribed, and in December 1928 at the statutory meeting of the shareholders, the chairman described 'unabated' interest in the new product: 'The number of enquiries, from both the trade and the public, have reached a total which approaches five figures'.³⁶ The same month, Colour Snapshots held an exhibition of prints, which was reviewed positively in *The Times*.³⁷ At the time of the flotation, Boots the Chemist reported that customers were requesting Colorsnap film although the film had not yet been launched.³⁸

Nevertheless, there were early signs of problems. The December exhibition was organised in response to demand for some assurance about the quality of the product. Among the visitors were representatives of Kodak Ltd's research laboratory at Harrow, which undertook, the following February, to investigate the process, as yet not on the market. The report authored by Dr Walter Clark is damning. He claimed that the experts the company had sent did not really understand the process and concluded that there were serious problems with the film. Issues of quality had already been noted by Chalmers Mitchell in his early review of the process. He saw, but was not unduly concerned by, a slight softness or haziness in the results.³⁹ He also described the early printing process as a little unsatisfactory and remarked that, 'printing in colour on paper requires apparatus not in the possession or within the skill of most amateurs'.⁴⁰ Kodak Ltd's investigation found that problems with the film were linked to its thickness and the difficulty of the three layers remaining flat – and remarking upon the poor quality of the finished prints, Clark wrote: 'All were diffuse, and most of the colours

32 – See C. E. K. Mees, 'A Photographic Research Laboratory', *Journal of the Royal Society of Arts*, 68:3539 (1920), 702. For a detailed technical history of colour cinematography, see Adrian Cornwell-Clyne, *Colour Cinematography*, 3rd edn, London: Chapman & Hall 1951. For more recent, critical work on colour cinema, see Street, *Colour Films in Britain*; and Sarah Street and Joshua Yumibe, *Chromatic Modernity: Color, Cinema, and Media of the 1920s*, New York: Columbia University Press 2019.

33 – As Lutz Alt points out, this weakened Ilford Ltd's brand identity; see Lutz Alt, 'The Photochemical Industry: Historical Essays in Business Strategy and Internationalization', PhD thesis, Massachusetts Institute of Technology 1986, 141.

34 – 'The Trust Movement in Great Britain – Further Illustrations – IV', *Economist* (12 January 1924), 47–48.

35 – Peter Chalmers Mitchell, 'The Progress of Science, Snapshots in Colour, Process for Amateurs', *The Times* (21 May 1928), 23.

36 – 'Colour Snapshots (1928) Limited', 1178.

37 – 'Colour Snapshots', *The Times*, (10 December 1928), 8.

38 – 'Coloured Snapshots', *Merchandise Bulletin* (30 October 1928), 964, Walgreen Boots Alliance Archive.

39 – Mitchell, 'Progress of Science', 23.

40 – Ibid.

41 – Walter Clark, ‘Report on “Colorsnap” Process of Colour Photography’, *Harrow Research Reports*, 1:H84 (1 February 1929), 1, Kodak Limited Archive, British Library.

42 – Ibid.

43 – Nicholas le Guern details Clark’s visits to the Keller-Dorian works in Paris in January 1929, only just before the Colorsnap tests, with a view to the use of their reproduction process for Kodak’s new Kodacolor movie film. Nicholas Le Guern, ‘Contribution of the European Kodak Research Laboratories to Innovation Strategy at Eastman Kodak’, PhD Thesis, De Montfort University 2017, 246.

44 – ‘Photoettes: The Tripod – a Necessity’, *The Bee* (September 1927), 438. Even the fastest films available in 1927 were extremely slow by modern standards. *The Bee*, Boots’ in-house staff magazine, noted that most successful pictures by customers were exposed on a sunny day at around one-twenty-fifth of a second. At this speed, a tripod was advisable, and motion blur likely. Lenses on cheap box cameras were slow and poor quality. Films had greater exposure latitude than modern film, but exposure meters, where they were used, were fiddly and likely inaccurate.

45 – That is, prints made without an enlarger, on the same scale as the negative. ‘Easy Extra Photo Money’, *Merchandise Bulletin* (12 April 1932), 2497, Walgreen Boots Alliance Archive.

46 – Clark, ‘Report on “Colorsnap”’, 1 and 12.

47 – ‘Photographic Dept.’, *Merchandise Bulletin* (24 May 1927), 518, Walgreen Boots Alliance Archive.

48 – ‘Photographic Dept.: Colorsnap Film (3/-, 3/6) - Important’, *Merchandise Bulletin* (30 April 1929), 1168, Walgreen Boots Alliance Archive.

49 – ‘Photographic Dept.: Colour Snapshots’, *Merchandise Bulletin* (14 May 1929), 1185, Walgreen Boots Alliance Archive (original emphasis); ‘Snapshots in Colour’, *Merchandise Bulletin* (21 May 1929), 1193.

50 – ‘Colour Snapshots (1928) Ltd’, *The Times* (10 June 1929), 12.

false’.⁴¹ Clark had tested the process using a no. 1 Pocket Kodak. He suggested that it would be very difficult for amateurs to achieve good results, and concluded that:

The process is theoretically not sound; the process is not capable of yielding satisfactory colour prints even in the hands of experts; trouble is anticipated in practice through lack of contact of the roll-films components and in the low effective speed of the films; the process itself is not really understood by the Colorsnap experts; the method of processing is so uncertain and involved as to be of doubtful commercial value as a D & P [Developing and Printing] proposition.⁴²

Such concerns about quality need to be understood in the light of the simultaneous investigations by Clark and Kodak into other colour processes, and of the changing standards and expectations of mass amateur black-and-white photography in the period.⁴³ The 1920s amateur market increasingly included photographers who had little or no technical interest in photography, perhaps even using cheap cameras acquired with cigarette coupons and chocolates. In 1927, Boots noted that eighty per cent of customers used simple cameras on which the largest available aperture was f11, too small for low light, and that the limited light in Britain during most months and hours of the day meant long exposures that increased the likelihood of blur. Very few customers invested in a tripod or an exposure meter.⁴⁴ Despite Boots’ best efforts to promote sales of enlargements, many were happy with small contact prints, in which soft focus is much less evident.⁴⁵ Such customers already had fairly low standards and expectations of print photography, and might not be very exercised by the poor quality of Colorsnap prints. On the other hand, the poor sensitivity of the Colorsnap film aggravated their already slim chances of getting a decent exposure, even with the fast -by 1920s standards- Ilford film. Also, since Colorsnap was relatively expensive, and regardless of its novelty value, it may have appealed to a different, more discerning kind of customer.

Perhaps more concerning than low quality was the evident attempt by Colour Snapshots to mislead the public. Clark’s discussion with representatives of Colour Snapshots revealed, he claimed, that some of the best prints shown in the December exhibition ‘were not Colorsnap films at all, but three-colour carbon prints, while others were obviously retouched with brush and paints’.⁴⁶ Nor did the company deliver on promised deadlines. In February 1929, the film’s launch was promised immanently, according to the Boots *Merchandise Bulletin*. Yet only that month did the company purchase the British and European rights to Flammer and Silliman’s patent, for a cheap mass printing process, and only then did it set up a separate company, Photograde Ltd, to produce the prints. March came and went, and the film was still not available and neither had the developing and processing laboratory been completed.

The process was not widely promoted by Boots, one of the leading high-street chemists which was under US ownership during the 1920s. Boots was an official Kodak dealer that regularly urged its salespeople to ‘Push the Kodak film’, but which did stock a wide range of films by its competitors.⁴⁷ The company’s *Merchandise Bulletin*, a weekly magazine addressed to its salespeople, advised staff to only take Colorsnap orders at customers’ own risk as they would not be able to guarantee customer satisfaction.⁴⁸ The films eventually became available in May, but the Bulletin warned: ‘Colour Snapshots (1928) Ltd, can only supply Coloursnap [sic] Roll Film in *very small quantities*. We believe the real reason is that they are unable to develop and print them in a reasonable time’. Boots also refused to make window displays, citing a lack of confidence in the quality of the product.⁴⁹ In June, Colour Snapshots claimed it was struggling to keep up with demand and asked customers to use it ‘sparingly until the increased supply already arranged for is available’ (figure 4).⁵⁰



Figure 4. Colour Snapshots advertisement, 'Take it in Colour', 24 June 1929.

TAKE IT IN COLOUR!

Photographic science has leapt forward. Your snaps, taken in your camera—alive with new beauty. Just "click" the camera. Not tinted afterwards, but *taken in colour, printed in colour.* Colour photography is here—for you.

TAKE IT IN COLOUR!

You need no special camera to use Colorsnap Films. You take colour snaps as you take any other snaps. Buy your Colorsnap Films. Take your snapshots in the usual way. Then take the spool to any authorized Colorsnap dealer and he will do the rest. The cost is little, considering what you get. Ask your dealer for list and information on Colorsnap Enlargements.



COLORSNAP



COLOUR SNAPSHOTS (1928) LTD., 35 DAVIES STREET, LONDON, W.1

51 – Ibid.

52 – ‘An Old Bailey Acquittal’, *The Times* (24 October 1930), 11.

53 – ‘Snapshots in Colour: New Process for Amateurs’, *Sydney Morning Herald* (14 November 1929), 16.

54 – ‘Capital Issues’, *Economist* (6 October 1928), 614.

55 – By the 1920s, the view that the patent system needed reform was gaining traction; see Robert Burrell, ‘The Reform of the British Patent System’, *Journal of the Royal Society of Arts* 77: 4002 (1929), 923–952.

56 – The British government announced that it would be constructing the National Grid in 1926, the proposal for Battersea Power Station was made in 1927, and construction work began in 1929.

57 – Cornwell-Clyne, *Colour Cinematography*, appendices.

58 – Stathis Arapostathis, ‘Meters, Patents and Expertise(s): Knowledge Networks in the Electricity Meters Industry, 1880–1914’, *Studies in History and Philosophy of Science Part A*, 44: 2 (2013), 237.

59 – Tom Nicholas, ‘Does Innovation Cause Stock Market Runups? Evidence from the Great Crash’, *American Economic Review*, 98:4 (2008), 1371.

60 – A. Harris, ‘A Re-analysis of the 1928 New Issue Boom’, *Economic Journal*, 171:43 (1933), 453–55.

61 – Le Guern details the patenting practices in colour photography in the 1930s, and notes the role of the examiner at the British Patent Office in the 1930s being the third ‘expert interlocutor as part of a scientific collaboration in the patent drafting process’. See Le Guern, ‘Contribution of the European Kodak Research Laboratories’, Chapter 5; and *ibid.*, 284, footnote 154.

62 – Victor Gallafent stated that ‘barring one way of approach to the solution of a problem is a strong stimulus to a research worker to find another route’; see Victor Gallafent, ‘The Direction of Photographic Research’, *Photographic Journal*, 94 (April 1954), 118. At Kodak, the patent system guaranteed the company’s intellectual property, but its bureaucracy also constrained photographic research; see Le Guern, ‘Contribution of the European Kodak Research Laboratories’, 17 and 63.

63 – David Harvey, *Seventeen Contradictions and the End of Capitalism*, London: Profile Books 2015, 251. As Carolyn C. Cooper has argued, there is an ‘inherent tension’ between ‘patent monopoly as stimulation of invention and as restriction on innovation’; see Carolyn C. Cooper, ‘Making Inventions Patent’, *Technology and Culture*, 32:4 (1991), 839.

As 1929 ended, so did Colour Snapshots (1928) Ltd.⁵¹ The managing director, Arthur John Clark, resigned in November 1929 and was taken to court, but acquitted, for having transferred money from Colour Snapshots (Foreign) Ltd – which represented the foreign rights – to prop up Colour Snapshots (1928) Ltd.⁵² Both Colour Snapshots (Foreign) Ltd and Photograde Ltd were wound up in the early 1930s. Shares in Colour Snapshots’ overseas concerns continued to be promoted as late as November 1929, when the *Sydney Morning Herald* reported the arrival in Australia of two representatives of the company, Mr C. E. Ross and Mr S. G. Haslam, who announced, against all evidence, that ‘the process had been a great success in England’.⁵³

The Market in Patents

In many ways, Colour Snapshots (1928) Ltd was a product of the market in patents in the late 1920s. Even at the time, it was noted that Colour Snapshots was a company formed primarily to exploit certain patents, that this was not a good basis for investment and that the patent system needed to be reformed.⁵⁴ More and more patents were being granted: by the late 1920s, the British patent office was struggling to function, with a massive backlog of thousands of specifications being filed, and the arrears increasing at a rate of seventy-six specifications per week.⁵⁵ Military demand in the 1914–18 war, along with the expansion of the electricity supply, and protectionist legislation such as the 1927 Cinematograph Films Act had accelerated developments in media, including photography, and produced a proliferation of patents in these fields.⁵⁶ Cornwell-Clyne details the vast number of colour film-related patents in his book *Colour Cinematography*, first published in 1936.⁵⁷

This surge in patenting was also linked to the fact that patents were regarded by company promoters and investors as core assets of a company, and would be referenced in marketing to investors.⁵⁸ Intangible assets such as patents dominated the market in the months leading up to the September financial crisis in London, and the Wall Street Crash a month later, in October 1929.⁵⁹ Nearly all of the new companies launched onto the London Stock Exchange in 1928 were reliant on patents as assets. As with the patents that underpinned Colour Snapshots (1928) Ltd, generally these were new versions of older inventions. Many of them related to film, photography and other media: between 1926 and 1929, the London Stock Exchange saw a frenzy of speculative investment in companies touting new patented products in gramophone and radio, automatic photograph booths, colour photography, colour cinema and sound film technologies, and photo-telegraphy – wire photography or fax.⁶⁰

The use of patents as assets drove a thriving market for technical innovation in Britain, where independent inventors would patent their invention in the hope of selling or licensing it to one of the big companies.⁶¹ While some viewed the patent system as a strong stimulus to research in the photographic industries, especially in the case of colour film – Victor Gallafent, Ilford Ltd’s chartered patent agent, viewed it in this way – it was also being used by the major foreign firms’ British subsidiaries, such as Kodak Ltd, to suppress competition through the threat of patent litigation.⁶² The big firms would also use patents as a source of profit by collecting an income through their patents: David Harvey describes this as a ‘monopoly rent’.⁶³

Tom Nicholas argues that in 1930 independent inventors, most of whom identified their profession as ‘engineer’, produced a remarkably high number of patents, including many of the most highly cited ones. Writing about invention and patenting across a wide range of industries in Britain between 1880 and 1930, Nicholas claims that ‘innovation crucially depended on breakthroughs

from inventors functioning outside firms'.⁶⁴ In 1953, Gallafent wrote that freelance inventors were commonplace in photography in the interwar period.⁶⁵ This was not new: invention in colour seems to have taken place outside the established firms to an unusually large extent. Gallafent noted that Dr Rudolph Fischer, who first invented subtractive colour photography circa 1912, was an amateur or freelancer unconnected to the industry, as were Leopold Godowsky and Leopold Mannes, the professional musicians who in the late 1920s were working on the early version of Kodachrome, with investment from Eastman Kodak. However, 'amateur' or 'independent' in relation to the photographic industry does not signify a lack of formal training: Mannes and Godowsky were university graduates in physics and chemistry.⁶⁶

Nevertheless, this association with independent and amateur inventors made colour photography appear disreputable. In 1918, one writer described it as the world of 'arrant imposters [...] amateurs, tinkerers and handymen', and in 1938 D. A. Spencer, cited earlier, described colour as having been 'the happy hunting ground of the crook and the crank'.⁶⁷ Even Cornwell-Clyne wrote that in the field of additive colour processes 'confidence tricksters abound'.⁶⁸ Some independent inventors appear to have lacked any prior or subsequent reputation in photography: Coote mentions the reliance of Colour Snapshots (1928) Ltd on patents by Tarbin, 'who appears to have been a newcomer in the field' and who made no further patents in colour photography.⁶⁹ It is perhaps indicative of the status of patents as knowledge capital that the managing director of Colour Snapshots (1928) Ltd, Arthur John Clark, a chartered accountant, filed several patents remarkably similar to Tarbin's in his own name.⁷⁰

Today, not only the independence of the inventor, or their inexperience, but also the diversity of backgrounds reinforces the impression of 'cranks' and 'tinkerers'. The culture of invention and innovation in 1920s Britain meant that even quite established and reputable figures could have extraordinarily diverse careers and might appear as dilettantes or quacks from a present perspective. It was a period in which the boundaries between different fields were very porous, especially for upper middle-class men. Self-made, entrepreneurial and semi-independent inventors existed alongside the growing class of university-educated professional scientists. A research chemist or engineer in the photographic industries might have a university degree in their field, but many arrived via other routes, through industry, the arts and the military. This is even more true of company directors and technical advisors, including, for example, Cornwell-Clyne (Klein).

Nicholas le Guern argues that Kodak's Research Laboratories were initially intended to protect the company's intellectual property by taking innovation in-house and replacing the potentially leaky system of dependence on external inventors and advisors.⁷¹ Ilford Ltd, by contrast, was notorious for undervaluing its own chemists and relying on outside consultants.⁷² Yet the case of another key figure in Colorsnap reveals that the distinction between the independent inventor and the firm is hard to draw in the case of Ilford. Thomas Thorne Baker's patents formed key assets for Colour Snapshots, and he was one of the technical and scientific advisors listed in the publicity material and the prospectus of Colour Snapshots (1928) Ltd. He worked for the Imperial Dry Plate Company (then owned by Ilford) as a researcher or research director, until 1929, and was also on the payroll of Illingworth, another company under Ilford Ltd's control from the early 1920s. In 1927, Thorne Baker was appointed to a committee to help improve collaboration and rationalise operations between the partner companies, overseeing the exchange of confidential information between the companies, especially between the heads of the different laboratories.⁷³ In other words, he seems to have been simultaneously working for outside concerns and maintaining a trusted role within the firm.

64 – Tom Nicholas sampled patents from decade intervals between 1880 and 1930, using patent citations and renewals to assess the value or importance of a patent and thus the quality of research being done by independent inventors. See Tom Nicholas, 'Independent Invention during the Rise of the Corporate Economy in Britain and Japan', *Economic History Review*, 64:3 (2011), 997.

65 – Gallafent, 'Direction of Photographic Research', 118.

66 – Ibid. Le Guern, drawing on Brayer's biography of George Eastman, makes the point; see Le Guern, 'Contribution of the European Kodak Research Laboratories', 249–58.

67 – Marcus Lovelace in the 1918 *American Annual of Photography*, cited in Milanowski, 'Factors Influencing the Neglect of Color Photography', 118; and Spencer, *Colour Photography in Practice*, ix.

68 – Cornwell-Clyne, *Colour Cinematography*, 19.

69 – Coote, *Illustrated History*, 106 and 108.

70 – In August 1928 he filed patents for a tripack process in Austria, France and Denmark, and in October 1928 in Switzerland.

71 – Le Guern, 'Contribution of the European Kodak Research Laboratories', 14.

72 – David Edgerton argues that Ilford Ltd's conducted its search for a colour process outside the firm because it failed to invest in organic chemistry research among its own scientists; see Edgerton, 'Industrial Research', 123–24.

73 – Evidence of Thorne Baker's employment in the Research Department of Imperial Dry Plate Co. Ltd can be found in the archives of Ilford Ltd at Redbridge Museum and Heritage Centre, Ilford, Box 1375 90/359/B1/A25 and 359/B1/B12/1. The cash books of Illingworth reveal he was paid a salary by Illingworth from November 1925 to October 1928; see National Science and Media Museum, ILF 7/4/3. It is unclear how closely involved he was with Colour Snapshots and how his activities with that company connected to his role at Ilford Ltd.

Figure 5. Thorne Baker with his tele-photographic apparatus. Reproduced in *Scientific American* 102: 21 (21 May, 1910), 417.



74 - 'Kills Mites in Cheese: Thorne Baker's Latest Electrical Device Proves a Success', *New York Times* (22 September 1912), 4. Thorne Baker wrote at least ten books on photography, telegraphy, radiography and television, and was a prolific columnist for several newspapers and the photographic press from around 1900.

75 - It 'dominated the British market until it was replaced by the X-ray film in 1923'; see Hercock and Jones, *Silver by the Ton*, 117.

76 - In the late 1920s, he was involved in the purchase and development of the French Dufay process by UK company Spicers. On Dane and Co., see Eric Kindel, 'Cheap Jack Flash', *Eye: The International Review of Graphic Design* (Summer 2006), available at <http://www.eyemagazine.com/feature/article/cheap-jack-flash> (accessed 5 July 2020).

Thorne Baker's career itself is in many ways an expression of the market in patents. A widely respected pioneer in photography, with an extraordinarily long career, he registered numerous patents, most in the field of photography, and was described by the *New York Times* as 'the indefatigable Mr. Thorne Baker'.⁷⁴ As early as 1899, when he was only eighteen years old, he had applied for a patent for a method of tinting photographs. He had sold Ilford Ltd the formula for their hugely successful X-ray plate, marketed from 1907.⁷⁵ From early experiments in photo-telegraphy in 1907 (figure 5), his 1920s Izon wireless picture system and his 1915 X-ray intensifying screens to his patents underpinning the Dufaycolor system in the early 1930s and his postwar research at fluorescent inks manufacturer Dane and Co., Thorne Baker's inventive practice was widely known and often commercially successful.⁷⁶ Yet he also patented what now appear as bizarre and even dangerous historical curiosities, such as a means to intensively farm plants and chickens using powerful electromagnetic fields from a Tesla coil, techniques for

using radium waste in farming and radium bath salts – before the dangers of radium were widely recognised.⁷⁷

The patenting system enabled industrial scientists, manufacturing engineers and professional inventors – who may have not had a formal scientific training – to publicise their inventions and protect their intellectual property at little cost and without having to go through the possibly hostile peer-review of academic publishing.⁷⁸ As he maintained a parallel career as popular author and journalist, Thorne Baker was in the fortunate position of being able to advertise and promote his patents and inventions in the daily papers including *Time* and *New York Times*, in specialist journals like the *British Journal of Photography* and through demonstrations and public talks. To create media coverage he used publicity stunts, employing his own daughter Yvonne as an experimental subject in promoting his Tesla coil trials, claiming that like the chickens she would grow larger but also hopefully more intelligent. He knew how to attract headlines with phrases such as ‘Radium Radishes’ and ‘Electric Chickens’.⁷⁹

This diversity of patents in combination with entrepreneurship, self-publicity and work within the firm was not unusual in the culture of 1920s science, even if Thorne Baker was especially ‘indefatigable’. The photography industry was notoriously secretive, especially in relation to emulsion formulae as these were difficult, if not impossible, to protect with patents.⁸⁰ Patents offered a way for inventors and manufacturers to share some information publicly but a new invention had to be supported with publicity, otherwise, as George Eastman noted in 1914, ‘it might be hidden for a hundred years’.⁸¹

Shareholders and the Appeal of Innovation

Like Colour Snapshots (1928) Ltd, the majority of the new firms that were floated on the Stock Exchange in 1928 went bust in the Great Slump of 1929–33. Also like Colour Snapshots, many of the small companies of 1928–29 were entirely inexperienced and had not yet mass-produced a product, often being completely dependent on the success of one poorly tested system. Shareholders were sold a promise with little evidence of the company’s ability to realise it. An article in the *Economist* in October 1928 underlined the speculative nature of Colour Snapshots investments, noting that:

The popularity of amateur photography is undoubted, but the prospectus estimate of annual profits of £244,890 (on an authorised capital of £350,000) on the basis of a ‘rough calculation’ that 2 million people use snapshot cameras and that five per cent. of these will use 10 rolls of the company’s films a year – is at present merely an interesting arithmetical exercise.⁸²

In this the company was far from unique. The following month, the *Economist* commented:

The flood-tide of the new issues season is again at its height... this autumnal rush has seemed to include a more than usually large proportion of highly speculative enterprises born of the popularity of shilling shares, and nurtured by the boom in safety glass, gramophones, and photographic processes.⁸³

There were more ‘new issues’ floated on the London Stock Exchange in 1928 than in any other year between 1915 and 1986.⁸⁴ New issues or ‘Initial Public Offerings’ describe the moment a firm is first listed on the stock exchange through selling shares to outside investors. This flotation establishes the firm as a public company, enabling it to raise new capital to fund the business, or with more established firms, allowing the existing owners to withdraw or begin to withdraw from ownership. Investments in new issues are risky, especially if the firms are young and unproven, and the capital raised is known as risk or venture capital. A 1933 article

77 – In 1914, he patented ‘a soluble radioactive salt for use in preparing baths’ by adding radium-barium chloride to bath salts. His involvement in The Radium Salt Company is detailed in Lucy Jane Santos, *Half Lives: The Unlikely History of Radium*, London: Icon Books, 2020, 143–44.

78 – University-based scientists were less likely to use the patent system, since any subsequent litigation might endanger their reputation; see Arapostathis, ‘Meters, Patents and Expertise(s)’, 237; Jonathan Hopwood-Lewis and Christine MacLeod, ‘Patents, Publicity and Priority: The Aeronautical Society of Great Britain, 1897–1919’, *Studies in History and Philosophy of Science Part A*, 44:2 (2013), 219; and Stathis Arapostathis and Graeme Gooday, ‘Electrical Technoscience and Physics in Transition 1880–1920’, *Studies in History and Philosophy of Science Part A*, 44 (2013), 203.

79 – Even at the time, and despite its widespread acceptability, some radium experiments were perceived as ‘quackery’, although not necessarily for the reasons one might give today; see Santos, *Half Lives*, 144–45. For an entertaining account of Thorne Baker’s experiments, which misleadingly presents him as a ‘mad scientist’, see Alex Boese, *Electrified Sheep: More Bizarre Experiments from the Bestselling Author of Elephants on Acid*, London: Boxtree 2011.

80 – Although at both Kodak Ltd and Ilford Ltd, ‘there seemed to be no fundamental objection to publication by way of technical papers’ on topics other than emulsions; see Gallafent, ‘Direction of Photographic Research’, 108. On industry secrecy, see Le Guern, ‘Contribution of the European Kodak Research Laboratories’.

81 – Cited in Alt, ‘Photochemical Industry’, 230.

82 – ‘Capital Issues’, 614.

83 – ‘The Stock Exchange: Underwriting’, *Economist* (10 November 1928), 850.

84 – Alan David Chambers, ‘How Well Did the Stock Market Treat Industry? Evidence from Initial Public Offerings on the London Stock Exchange Over the Twentieth Century’, PhD thesis, London School of Economics and Political Science 2005.

by R. A. Harris in the *Economic Journal* identified 277 new issues in 1928, of which 109 could be described as truly new ventures. Harris describes these as follows:

The chief groupings among the 109 issues were: Gramophones and Radio, 21; Artificial Silk, etc., 10; Finance, 10; Films, Cinemas, and Theatres, 8; Portrait Machines, 7. Other interesting undertakings include Safety Glass, 4; Coloured Photography, 3; Automatic Vendor Machines, 2. One company was to equip a 'Mobile Seagoing Factory' to engage in fish-canning at sea.⁸⁵

85 – Harris, 'Re-analysis of the 1928 New Issue boom'.

Among the new companies, there was eighty-three per cent depreciation by May 1931, by which time of the 109 new companies at least seventy-five were wound up or valueless, including all seven of the 'Portrait Machine' (photobooth) companies.⁸⁶

86 – Ibid, 458.

The fate of these companies was not entirely predictable. In cinema sound, for example, companies failed, according to Robert Murphy's analysis, not because their systems were unviable or inherently flawed, nor due to lack of demand, but through a range of factors including unpreparedness, inexperience, limited capital, powerful US monopolies and inferior quality of manufacture. In other cases, demand was a significant factor, for instance in the case of the pricy Fultograph receiver, which cost the equivalent of two months' average salary. This was a device for receiving still pictures by radio, a precursor of the fax machine, based on Thorne Baker's Izon system. Fultograph sales were pitiful, despite support from the BBC which broadcast the illustrated radio programmes that the Fultograph would accompany from 30 October 1928.⁸⁷ In radio, foreign competition was key: the change from the crystal set to the valve radio during 1927–31 was accompanied by sweeping standardisation of components and large-scale mechanised production that made it difficult for small British firms to compete with the large foreign firms.⁸⁸

87 – By July 1929, only seven hundred Fultograph receivers had been sold, mostly as demonstration models. Sales were also hit by the announcement in March 1929 that the new medium of television would be supported by the BBC and Post Office. Russell W. Burns, *Communications: An International History of the Formative Years*, London: Institute of Electrical Engineers 2004, 473–74.

88 – Peter Scott, 'The Determinants of Competitive Success in the Interwar British Radio Industry', *Economic History Review*, 65:4 (2012), 1314.

Nevertheless, the question remains why investors were willing to take the risk with such speculative offers. One answer lies in the cultivation of an enthusiasm for innovation among potential shareholders, another in changing practices of investment. The promotion of Colour Snapshots (1928) Ltd to potential customers emphasised not pure innovation, but the availability of something long desired and expected. However, innovation is the aspect that Colour Snapshots advertised to investors: 'the first method of producing colour printed photographs using a standard camera' (emphasis added). Shareholders were investing not just in a product and a company, but in the concept of innovation itself. Investors were primed to value technological innovation by a fanfare built across a wide range of media during the late nineteenth and early twentieth centuries. The value attached to innovation from an investor perspective accorded with a growing economic consensus that competition in innovation is the driving force of capitalism – a position most associated with the economist Joseph A. Schumpeter.⁸⁹ For the investor, the thrill of the new was not tainted by the potential disruption that dogged every incremental technological change for the consumer, who had to switch from one type of radio set to another, one kind of camera to another. Innovation was associated positively with the figure of the heroic entrepreneur and with modernity. Even more than prospective customers, prospective investors appear to have been enticed by ideas of modernity, innovation and novelty. They were persistently addressed by advertisements emphasising the modernity of the 1928 new issues, and newspaper articles repeating the sometimes inflated claims of the companies regarding the popularity of products.

89 – Schumpeter's *The Theory of Economic Development* was published in German in 1911, and not in English translation until 1934, but these ideas were already in circulation during the 1920s. His theory remains a pillar of neoliberal economics. Against this, David Harvey argues that the competition in innovation is not a necessity of capitalism but a cultural preference of capitalists, and David Edgerton shows how innovation is dependent on state investment. See Harvey, *Seventeen Contradictions*, 93; and Edgerton, 'Industrial Research', 112–13.

Faced with such enticing future visions, investors failed to question the companies' ability to deliver on the promised technology, as well as consumers' willingness to accommodate it. This is partly because of a change in investment practices: the large number and low price of the Colour Snapshots shares (figure 6) indicates that, as with the other new issues of the period, investors were drawn from a wide and diverse pool. It was not simply the new shareholders' inexperience but also their volume that inhibited their ability to challenge the firm. Janette Rutterford and Dimitris P.

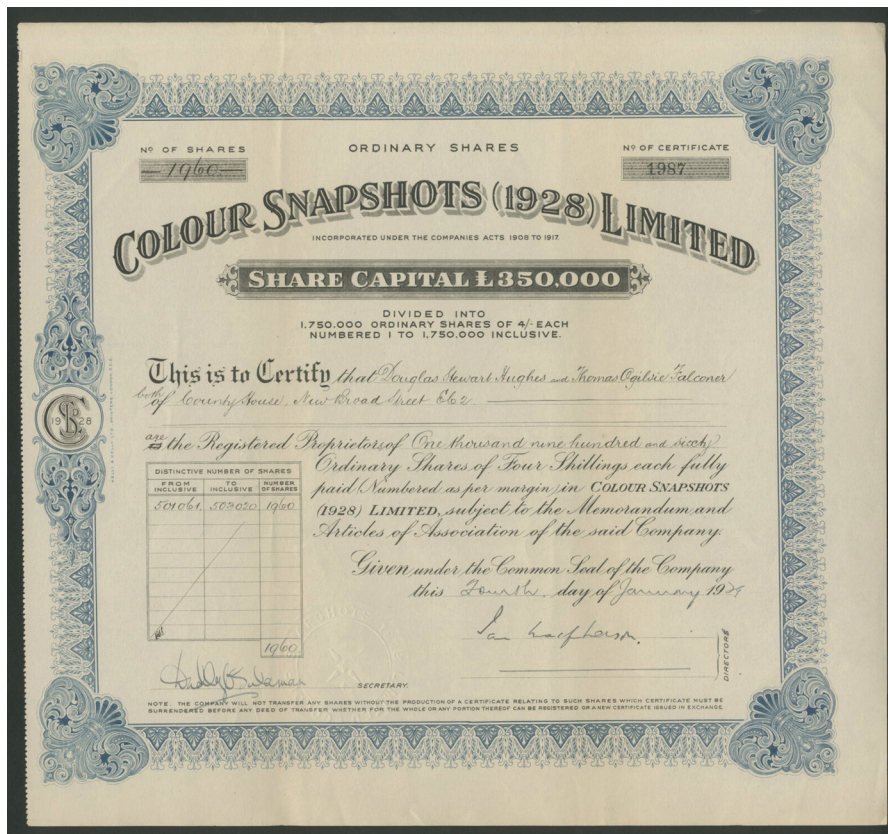


Figure 6. Colour Snapshots (1928) Ltd share certificate. Private collection.

Sotiropoulos explain that the shareholding class in Britain had expanded between the 1870s and the Great War, spurred on by the growing financial press, the rise of the company promoters who marketed new firms to potential investors and legislation such as the Married Women Property Acts of 1870 and 1882, which enabled married women to become shareholders. After the war, government war securities – certificates and bonds – had acclimatised more of the public to the practice of investing their savings. Rutterford and Sotiropoulos cite a 1920 study of Selfridge’s share registers which listed among the most recent investors ‘a cabinet maker, a gas collector, a clerk, a nurse, a housekeeper, a school mistress’.⁹⁰ Class and gender did not make shareholders automatically vulnerable to exploitation, but their quantity and greater geographical dispersion did. The sheer number of shareholders, each holding only a few shares, reduced individual shareholder influence on the company, while distance from the London Stock Exchange made them more susceptible to misinformation from a dubious financial press. The ‘scattered body of small holders’, as the *Economist* called them in 1929, facilitated more corruption and unaccountability from the firms, and enabled shady financial practices.⁹¹

Shady Promoters and Underpricing

If inexperience and reliance on untested patents are factors in the failure of Colorsnap, so was a lack of capital. Most of the analyses of the success and failure of the new media technologies of the 1920s emphasise problems with technical quality, poor industrial organisation, foreign competition and poor sales. They tend to agree with Geoff Brown’s diagnosis that these companies suffered ‘over-ambition, creative confusion, high start-up costs and the shadow of the world economic depression’.⁹² However, Murphy draws attention to the limited capital that these small firms held.⁹³ With patents as their core assets, they were quick to turn to the Stock Exchange.

90 – Janette Rutterford and Dimitris P. Sotiropoulos, ‘The Rise of the Small Investor in the United States and United Kingdom, 1895 to 1970’, *Enterprise and Society*, 18:3 (September 2017), 502.

91 – ‘Shareholders and Control’, *Economist* (30 March 1929), 691, cited in *Ibid.*, 517. See also Ranald Michie, ‘Gamblers, Fools, Victims or Wizards? The British Investor in the Public Mind, 1850–1930’, in *Men, Women and Money: Perspectives on Gender, Wealth, and Investment 1850–1930*, ed. David R. Green, Alastair Owens, Josephine Maltby, and Janette Rutterford, Oxford: Oxford University Press 2011, 157.

92 – Geoff Brown, ‘The Euro-British Flagship that Sank: The Short Life and Lingering Death of Associated Sound Film Industries, 1929–1936’, *Historical Journal of Film, Radio and Television*, 33:2 (2013), 187–213.

93 – Robert Murphy, ‘Coming of Sound to the Cinema in Britain’, *Historical Journal of Film, Radio and Television*, 4:2 (1984), 151.

94 – Chambers, 'How Well Did the Stock Market Treat Industry?'

The stock market flotation did not resolve this undercapitalisation. Colour Snapshots (1928) Ltd was heavily oversubscribed, meaning there were more applications than shares available on its first day of trading, and the company ended the day with shares worth more than they had been at the start. Rather than suggesting success, this is likely to be a sign of underpricing.⁹⁴ Company promoters underpriced shares as a means of creating demand, and the promoters themselves would often take shares in payment for their services, so they would profit while the company ended up with less capital than it needed. We can see this in the case of Colour Snapshots (1928) Ltd. Its authorised capital was £350,000 divided into 1,750,000 shares of four shillings each, but only £150,000 worth of shares (750,000 shares) were offered to the public. Of the other £200,000 worth, three-tenths went to Arthur John Clark, the managing director, and seven-tenths to the issuing house Beaconsfield Trust, directed by Louis Henry Jackson, the company promoter. As a result, and according to the winding up order, the company began its operation with just under £150,000 in capital.

Underpricing was a technique of 'shady' promoters. These were often unregulated outside brokers or sharepushers who were not registered members of the London Stock Exchange. They took advantage of a gap in the market produced by the refusal of the big merchant banks to invest in British industry, especially in small-scale concerns – companies valued at under £200,000. Capital shortages incentivised firms to issue shares in order to raise capital. Furthermore, the London Stock Exchange's weak regulation, its lack of transparency and the absence of any vetting of applications made these disreputable operations possible.⁹⁵ These promoters exploited the way that the large number of new issues by small firms produced a really confusing diversity for the first-time investor. Among their ruses was one used by Jackson, who followed the flotation of Colour Snapshots (1928) Ltd with the flotation of another company, Colour Snapshots (Foreign) Ltd, twenty-one days later. John Kinross, who worked for an outside broker in the City at the time, explains the approach:

One of the current tricks of this kind of issue was to exclude most of the overseas rights from the original company. If the public lapped up the original issue on these terms, another flotation for the foreign rights quickly appeared.⁹⁶

With Colour Snapshots (Foreign) Ltd, Jackson was not allocated shares directly but was entitled to one-fifth of the patent money that Clark received from the company. Clark and Jackson clearly benefitted from such arrangements. Parallels can be drawn with the sound film industry, where, as Murphy writes, the promoters of eleven companies 'together managed to increase the value of the shares they held by £388,897 while the value of the shares held by the public had fallen by nearly £500,000'.⁹⁷

Jackson was the promotor of Colour Snapshots and Wireless Pictures (1928) Ltd, the company which produced the Fultograph, as well as International Talking Screen Productions that was part of a group of companies called Audible Filmcraft, wound up in June 1931.⁹⁸ His subsequent career is not documented to my knowledge, but he is described in the published recollections of Kinross, whose description of their encounter is scathing. Visiting Jackson at the very moment he was in the process of floating Colour Snapshots (1928) Ltd, Kinross noted the enormous table that he presumed was 'supplied by Drages Ltd on hire purchase' – Drages was a well-known company that had built its reputation on 'furnishing out of income'. He also mentions a 'distinctly over-decorative young secretary, whose natural habitat was, at best, a film studio'.⁹⁹ The office, Kinross implies, is a facade set up to dupe naive investors. This description also implicitly associates Jackson with the illegitimate sharepushers of the period who tended to rent office space near the London Stock Exchange and furnish them lavishly. In a 2018 article on sharepushers in the interwar period, Matthew Hollow cites a statement from the director of the Metropolitan Police:

95 – David Kynaston, *The City of London Volume III: Illusions of Gold 1914–45*, London: Chatto and Windus, 1994; Matthew Hollow, 'A Nation of Investors or a Procession of Fools? Reevaluating the Behavior of Britain's Shareholding Population through the Prism of the Interwar Sharepushing Crime Wave', *Enterprise & Society*, 20:1 (2018), 4; and David Hochfelder, "'Where the Common People Could Speculate": The Ticker, Bucket Shops, and the Origins of Popular Participation in Financial Markets, 1880–1920', *Journal of American History*, 93:2 (2006), 335–58.

96 – John Kinross, *Fifty Years in the City: Financing Small Business*, Murray: London 1982, 74.

97 – Murphy, 'Coming of Sound to the Cinema', 152.

98 – Burns discusses this company and its liquidation; see Burns, *Communications*, 475.

99 – Kinross, *Fifty Years in the City*, 74.

They are usually much better furnished and set out than many genuine businesses. There are plenty of telephones, every office equipment that is either necessary or unnecessary is usually there, and there is a general air of wealth and prosperity about the place.¹⁰⁰

100 – Cited in Hollow, 'Nation of Investors or a Procession of Fools?', 151.



Figure 7. Unknown, Colorol colour photograph of a woman next to a bush, ca. 1930. The Kodak Collection at the National Science and Media Museum, Bradford, Object Number: 1990-5036/6071/67.

101 – Robert Murphy, ‘Fantasy Worlds: British Cinema between the Wars’, *Screen* 26:1 (1985) 11.

102 – Mr Justice Cave 1895, cited in Dilwyn Porter. “‘Speciousness Is the Bucketeer’s Watchword and Outrageous Effrontery His Capital’”: Financial Bucket Shops in the City of London, c. 1880–1939. In *Cultures of Selling: Perspectives on Consumption and Society since 1700*, ed. John Benson and Laura Ugolini, London: Routledge 2018, 112; and Hollow, ‘Nation of Investors’, 135.

103 – Hatry’s trial became symbolic of the corruption involved in the 1928–29 speculative share boom. Despite this, the City still regarded him with a degree of goodwill, as an established figure on the financial scene; see P. S. Manley, ‘Clarence Hatry’, *Abacus*, 12:1 (1976), 50.

104 – Coe, *Colour Photography*, 116.

105 – However, the photographic industry was less affected than many other industries by the economic stagnation of the mid 1920s and the Great Slump of 1929–33, partly due to its location in the relatively affluent Southeast and the suburbs of London, its sales to the military, health and aviation industries, and the fact that consumer photographic film belongs to the category of small consumables that continued to sell as the market in larger items declined.

106 – Manley, ‘Clarence Hatry’, 50.

As Murphy writes, 1919–29 was ‘the Golden Age of the fraudulent company promoter’.¹⁰¹ Jackson was clearly regarded, by Kinross at least, as one of these, although he was not a sharepusher in the definition Hollow gives, selling worthless or inferior securities, and nor did he run a bucket shop, which resembled betting shops with blackboards and ticker-tape machines and preyed on those with ‘money and no brains’.¹⁰² Nor was he a respectable trader who had gone off the rails, like the notorious brilliantly named fraudster Horatio Bottomley, or Kinross’s own boss, Arthur Wheeler, convicted of using clients’ money to pay off his own loans or the very established Clarence Hatry, promoter of the Photomaton photobooth machines among other things, who was convicted of faking share certificates and famously sentenced to prison in 1929 for forgery and fraud. Hatry’s group of companies failed with a deficit of £13 million in 1929, sending the stock markets into the tailspin that culminated in the Wall Street Crash.¹⁰³ Jackson had no prior reputation in the City, he appeared as if out of nowhere and vanished just as quickly, making only six issues before voluntarily liquidating his own company, the Beaconsfield Trust. He appears as a pure product of the financial bubble, appearing because conditions were right, because this was a way that money could be made and made quickly.

Colour Snapshots was too hastily launched onto the stock market, emboldened and enabled by the market in patents and lacking any other way to raise the capital to thoroughly research and develop the process. Jackson’s strategy of underpricing ensured that the company was undercapitalised. In the absence of the funds to realise the product it had so successfully publicised, the company attempted to license its patents or sell itself as a going concern to the big manufacturers, which explains why it was so slow to establish the printing company. At some point, Ilford Ltd must have made it clear that it would not take responsibility for the venture, and by early 1929 Colour Snapshots (1928) Ltd had made unsuccessful approaches to both Kodak and Agfa. Eventually, Colour Snapshots (Foreign) Ltd did succeed in licensing the patents to Agfa-Ansco in the USA, which produced a film called Colorol between 1929 and 1930, with better results, technically and aesthetically, than Colorsnap achieved (figure 7).¹⁰⁴

Conclusion

The blossoming of various new photographic concerns in the late 1920s came in the context of the boom in new technological start-ups, against the background of the growing power of large US and German firms, and an unstable world economy.¹⁰⁵ Evidently, there were serious difficulties with Colorsnap as a commercial concern and with the patents on which it relied. But its fate was determined by the financial dealings of the city of London, and the ways in which patents and share-issues were deployed within the new media bubble of 1928–29, as well as a climate of speculative investment that overvalued novelty and innovation.

Writing about Clarence Hatry, P. S. Manley notes that ‘To a large extent, any study of fraud is also a study of the art of the contemporary possible’.¹⁰⁶ The case of Colorsnap might also be understood in terms of ‘the art of the contemporary possible’. The questions it raises concern not merely whether a mass amateur colour print process was possible years before it actually arrived, but what possibilities might be explored and exploited through the patenting and marketing of colour photography processes in the period. The case of Colorsnap raises the larger question of what drives innovation in photography, successful or otherwise, and what kinds of activity shape the availability of photographic technologies and therefore of modes of picture making. The set of practices that made Colour

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Snapshots fail are not reducible to incompetence, misfortune, technical flaws or the unpredictable desires of consumers. Rather, they are opportunistic practices of invention, financing and speculation made possible by historical circumstance.

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