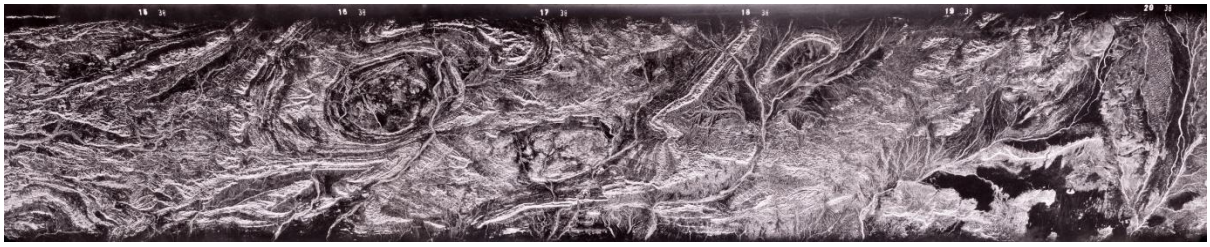
The RPS Imaging Science Group newsletter
New series 2, Issue 2, July 2025



Synthetic Aperture Radar image, NASA 1981. See the section on Good Picture 2025 for more information.

Welcome

Welcome to Issue 2 of the relaunched RPS Imaging Science Group newsletter. Thanks to some extra input from the membership, we have a slightly longer edition this time. Do keep this coming as the aim is to fill future newsletters with contributions from members.

This edition has a very similar structure to Issue 1,

- Event reviews. In this issue we have a review of The Photography & Video Show 2025.
- Future events. Here we feature Good Picture and the London Imaging Meeting 2025.
- Science in the Society. This edition brings an Imaging Science perspective on a recent meeting of the RPS Historical Group and an article on Evidence-Based photography in medical practice. I found the latter particularly thought provoking in the difference between facts, evidence, research and information.

  It would be good to hear from readers about conferences or meetings they attend.

- Member's projects. No members projects to feature this time. Hopefully this platform will provide a forum for members to show their work, completed or in progress.
- Literature reviews. Share with our membership what you are reading, explain what you have recently published or explore the publications from other RPS Special Interest Groups from an Imaging Science perspective. In this issue we have a paper from the RPS Imaging Science Journal taking on deep learning for art conservation.
- Yet to come. A new section with some suggestions on future content and events. It would be great to hear your thoughts for next time. I have started to receive feedback from members on content for the future. Keep this coming – this is your newsletter.

To reiterate, this is *your* newsletter so as editor I aim to include *your* content. I am particularly interested in exploring common ground with other RPS Special Interest Groups. In this edition we have a review of a Historical Group event and a feature on Medical photography. I hope that we can build on this for future editions.

I look forward to hearing from you. Send me a science image for the top of the newsletter.

Dr Alan Hodgson ASIS HonFRPS, Imaging Science Group newsletter editor

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Event Review

If you attend any imaging based event we would like to have a review from you. Equally, if you hear of (or are working on) an event that you feel would be of interest to the membership do pass on the details. In this issue we have a review of the Photography & Video Show from Tony Kaye plus advance notice of a meeting on Lighting and Imaging.

Overview of The Photography & Video Show 2025

The Photography & Video Show 2025, organised by Future who publish a number of photographic and video titles, was held from March 8th to 11th at the ExCeL London. It was a comprehensive event for photography, video, and content creation enthusiasts. Here is a brief overview of the show.

Exhibitors and Brands

Over 250 brands participated, including major names like Canon, Nikon, Sony, Fujifilm, and Adobe. Smaller, innovative companies also showcased unique products. Attendees could try and buy the latest cameras, lenses, tripods, and accessories, often at exclusive show prices.

Workshops and Talks

The event featured 500+ sessions, including live demos, workshops, and talks by renowned creatives such as Lindsay Adler, David duChemin, and Andy Gotts. Topics ranged from beginner fundamentals to advanced techniques in photography, videography, and post-production.

Interactive Experiences

The Creator Playground offered stylish shooting sets and opportunities to capture content. Photo walks around London allowed participants to practice their skills in real-world settings.

Special Features

New stages like the Fundamentals Stage for beginners and the Kit Stage for gear enthusiasts were introduced. There was a focus on analogue photography, with dedicated sessions and exhibits.

Networking and Community

The event brought together thousands of professionals, hobbyists, and content creators, fostering connections and collaborations. It was a vibrant celebration of creativity and innovation, offering something for everyone, from beginners to seasoned professionals.

Personal Observations

I attended on Monday 10 January and the show was pretty crowded. Like many shows it had a range of exhibitors from the small suppliers of frames, bags, to large software and hardware companies like Adobe, Canon and Nikon etc.

What struck me most was that analogue was far from dead. There was a stage devoted to talks about analogue photography which had presentations include those devoted to the choice of film, explanations of photochemistry, and historic processes such as the wet collodion process.

On the digital front there were a few retailers at the show and judging by the kit they were showing, DSLRs are very much yesterday's technology. Mirrorless interchange lens cameras and lenses designed for mirrorless systems dominated their stands.

Returning to analogue I was very intrigued by two films that Harman Technology the parent company of Ilford Imaging were manufacturing. They were:-

Harman Phoenix

This film is an unmasked C-41 processable, colour negative film and thus doesn't have the usual strong orange colour cast that is exhibited by Kodak and Fuji colour negative film. Additionally, it has very limited antihalation characteristics incorporated in the support. Looking at the sample prints from the film it definitely looks "very different". It displayed in some of the prints the crossed curve effect that might be expected based upon the published characteristic curve coupled with high contrast. It is best regarded as a special effects film.

Manufacturer's data sheet here.

Harman Red 125

This film is even more niche than Phoenix. It is also a C-41 processable film, but gives very strong red/red-yellow tones. I attended the Harman presentation and initially thought the film was coated with the layers in inverse order, ie. Red, Green, and Blue. However, in looking at the Harman data sheet for the film, it wasn't. It simply was reversed at time of spooling and was thus exposed through the base. The prints on display were certainly red. Again, but only more so than Phoenix, a specialist film.

Manufacturer's data sheet here.

Dr Anthony Kaye ASIS FRPS

Future event – London Imaging Meeting 2025

The RPS Imaging Science Group is pleased to pass on the following information from the Institute of Physics (IoP) about their London Imaging Meeting 2025, entitled: "Lighting and Imaging". This series of meetings, which was previously organised by the Society for Imaging Science and Technology (IS&T), is now organised by the IoP. The IS Group is a Cooperating Society for these meetings and has provided both an organizer and sponsorship for previous events. Other Cooperating Societies include the CIE and Colour Group (GB). As part of this sponsorship, members of our Group receive a significant reduction in delegate fees equivalent to full IoP members.

Full details of the event can be found here.

Details of the previous events in this series can be found here.

Dates:

8 September 2025: Summer School
9-10 September 2025: Technical Programme

Venue:

Institute of Physics, Caledonian Road, London.

If you attend this meeting we would like to have a review from you.

THE RPS ROYAL PHOTOGRAPHIC SOCIETY IMAGING SCIENCE GROUP

Good Picture – Online – 2025

An RPS Symposium

For over 20 years the Imaging Science Group of the RPS has hosted an annual series of 1 day symposia under the title "Good Picture" on selected technical aspects of Imaging. Unfortunately, due to ever rising costs, the Group is unable to continue to sponsor these meetings without unacceptably large increases in delegate's fees. Therefore the Group committee has decided to replace them with a series of shorter meetings via Zoom. These presentations and discussions will have three speakers providing photographic practitioners, keen amateurs and students with insights into Imaging. The Group is planning to run at least 2 of these meetings per year and they will be free to attend.

This event is scheduled for **Saturday 18th October 2025, 1.00pm – 5.00pm,** if you would like to register your interest please contact the organiser **Dr Mike Christianson** at **pandm.christianson@gmail.com**

Programme

Dr Avijit Datta
York St John University

Two Adjacent London Societies and Their Members' Influence on Colour Theory and Culture

Dr Datta will discuss the immense influence of polymath members of the Royal Society and adjacent Pall Mall club have had on the development of colour theory, art and culture. New techniques such as Hyperspectral Imaging and the use of lasers to uncover a perceived new colour will also be examined.

Adrian Davies MSc, ARPS
Freelance Photographer, Lecturer and Author

Photographing Plant Behaviour.

In a previous talk at this event Adrian showed how reflected and fluorescence UV photography could reveal invisible signals on flowers and other plants, to attract pollinators. In this talk Adrian will show how a range of photographic techniques can reveal various plant behaviours such as spore and seed dispersal, plant growth and movement.

Dr Alan Hodgson ASIS FRPS
Alan Hodgson Consulting Ltd

Photography by Synthetic Aperture Radar

Synthetic Aperture Radar has an interesting history as a photographic imaging technique, ranging from military to cultural heritage use. This presentation will explain the technique in a non-mathematical fashion, drawing on parallels with more familiar techniques such as aerial photography, holography and medical doppler ultrasound.

Science in the Society

Exploring the History and Impact of Photography

On Saturday 29th March 2025 I attended a joint event between The RPS Historical Group and the Wolverhampton School for Creative Industries, "Exploring the History and Impact of Photography". Here are the notes I took from an Imaging Science perspective.

Although this was a RPS Historical Group event it does illustrate the overlap with imaging science and the benefits of attending such meetings. I was also there to present my work on a Synthetic Aperture Radar image, one of the topics in the next Imaging Science Group Good Picture event. You will find details of the Good Picture event on the next page in this issue.

Simon Harris is an artist, Senior Lecturer and Course Leader for BA (Hons) Fine Art at University of Wolverhampton, exploring the creative relationship between printmaking, photography and painting. He used his work on screen print and darkroom prints as an example of his work. Using screen printing onto an aluminium sheet he is exploring reflection in the surface of a work and the creative possibilities this mirror-like gloss effect offers. This was a fascinating example of an image quality parameter (gloss) being explored for its creative possibilities outside of the usual approaches.

Roger Farnum and Harry Magee explored a work by Scottish photographer Thomas Annan, taking an interesting approach to image analysis. They explored a landscape image through the geometry of linear perspective in an attempt to elucidate the locations from which the original photograph was taken. Harry projected the skyline onto local maps to find the best fit. What struck me is that this is an analogous technique to plate solving techniques used in astronomy. This could become an interesting area to explore using AI as an imaging science tool into the future, exploring the provenance of landscape photographs. Watching how AI develops in terms of plate solving solutions could be an interesting exercise.

Continuing the theme of landscape photography, Geoff Blackwell presented on this topic reflected in postage stamp design. It is fascinating to see how the original image is translated into an engraving and the possibilities this raises for an interpretation of both perspective and image content.

Ron Callender presented a broad overview of the history of the presentation of colour, both as a projected and a printed image. Although starting in earliest times with neolithic drawing he swiftly moved into Newton's work Opticks showing colour spectra and leading into colour circles. He moved onto the work of Richard Waller and then onto Michel Eugène Chevreul with his work on simultaneous contrast. Chevreul is a fabulous character with further connections into photography and is a particular interest of mine.

Image credit: Michael Pritchard

Adrian Thomas presented a startling set of X-ray images dating back to the earliest days. He also brought along the hard copies in their original medical files. It was interesting to examine these from an imaging science perspective as you could feel the emulsion thickness and witness processing artefacts and delamination issues. His presentation also had an intriguing glimpse of an Ilford Process Plate box, denoting a connection between X-ray work and Process from a materials perspective, again a personal interest.

Alan Hodgson

Evidence-Based Practice and its effect on the medical photographer's continuing professional development

Evidence Based Practice (EBP) is a generic term defined by Dawes (1999) as:

"Evidence-based practice is the acknowledgement of uncertainty followed by the seeking, appraising and implementation of new knowledge"

The general meaning of evidence relates to the information that helps to establish facts from a range of sources. Whilst information is the basis for finding evidence and based on what is learnt during undergraduate or postgraduate training, workshops or in clinical practice, this information becomes *evidence* when it has been subjected to a particular set of criteria. Research is not information gathering or a transportation of facts from one location to another, thus research is not merely rewriting the works of others. EBP is simply a product of its time.

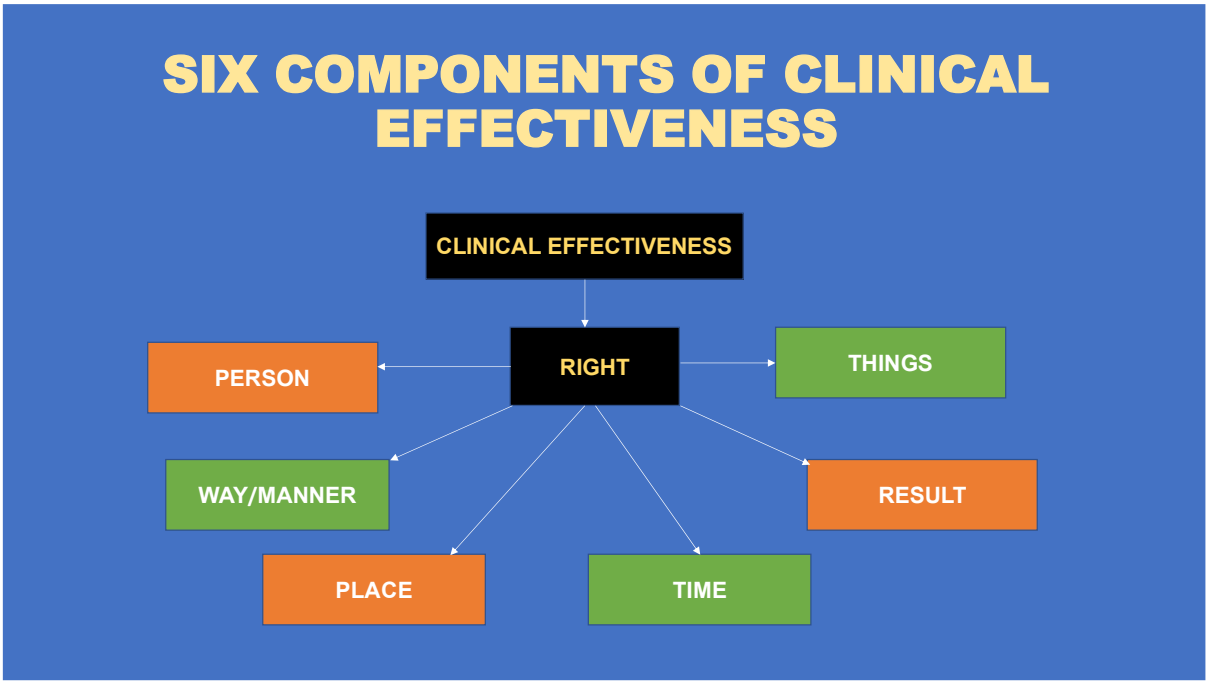
The first major influence of EBP is that we live in changing times, which is influenced by awareness of risk. The publication and formulation of various patient rights documents empower clients to question our actions. The overlap between management and EBP agenda was as a result of changes in public services. EBP takes a democratic approach and years of experience are not necessarily the yardstick by which professionals are judged. The most junior member of a profession can be skilled in identifying evidence.

Evidence-Based Practice enables practitioners to openly accept other and possibly more effective methods of care than those currently employed. Since the introduction of Continuing Professional Development (CPD) there is a demand for developing research-mindedness in the medical photography profession. It also provides the opportunity for interdisciplinary communication and as a result may promulgate an integrated approach to patient care. EBP relates to information which helps establish facts from various sources, information which helps influence and support conclusions having the attributes of explicitness and distinctness that applies to the processes and outcomes of health services. It means using evidence wisely in decisions you will make as a medical photographer about patient care.

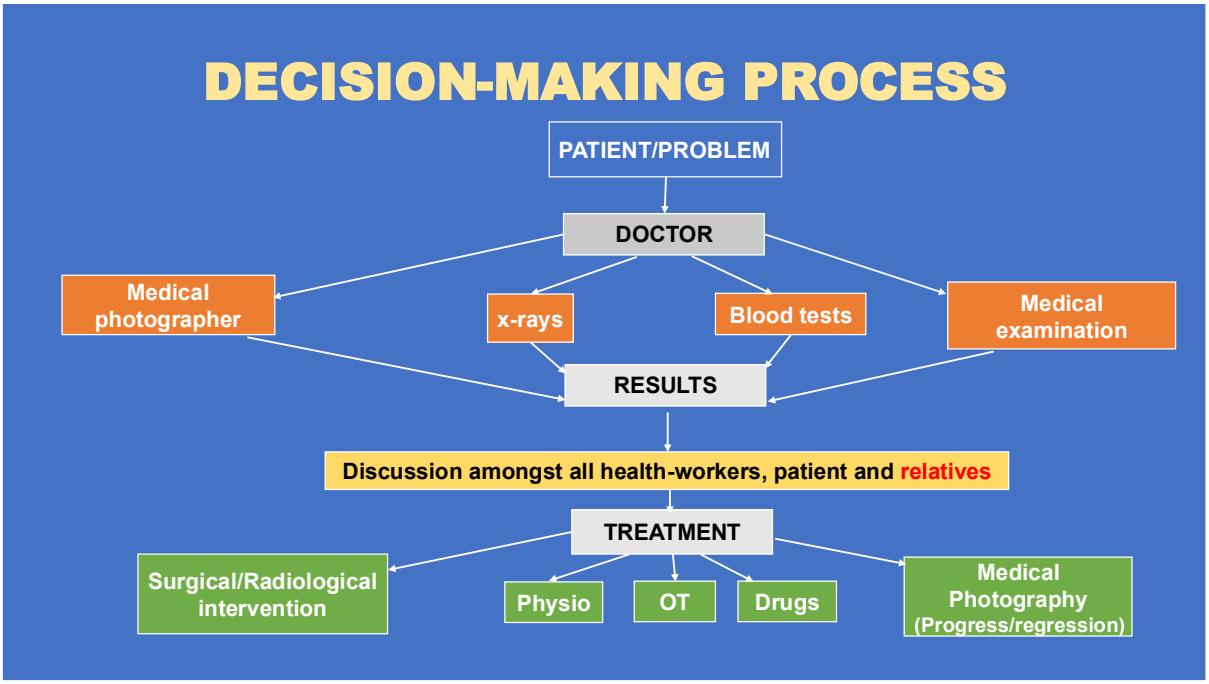
The topic of concepts and approaches to evidence-based medical photographic practice is chosen against the background of the vigorous adoption of EBP. In the context of EBP the word *concepts* would mean "what are the current ideas and understanding of EBP?" We need to understand how current practices in medical photography would need to change to meet the requirements of EBP.

The adoption of an EBP model is an important feature to ensure the medical photographer's continued success and growth. Unless we can persuade people outside our profession of our worth it may be difficult to have a viable future as a service. We may find that evidence we use is increasingly outcome driven in sympathy with the sector we work in. We may find that outcome become the drivers of the development and selection of processes we choose. This may lead to change in what we do, what we think we should do, and why we do it. It could well influence what we become. It can thus provide information about the occupation that is essential for the informed conduct of medical photography. We desperately need this at a time in our profession's history when we are discovering, defining and refining the uniqueness of our service and our professional focus. EBP approaches have the potential not only to inform and reform our practice, but to also to transform it. Any concept or procedure is based on the best available evidence, name EBP. In the past medical photographers were in a pure service delivery function and engaged in research to assist clinicians and professions allied to medicine. EBP encourages us to consider current questions and look to the past – things that have already been done – for the answers. EBP assists us to concentrate our thoughts and actions on what is right for our profession and the people we serve now and in the future. EBP will allow us to re-evaluate the medical photographer's role.

Clinical effectiveness needs six components. They are: the right person should do the right thing in the right place and at the right time in the right manner with the right results. "Right results" are synonymous with "outcomes"



Does this decision-making process identify an optimal management sequence based on sound evidence, reasonable logic and sensible utilities?



Compulsory Professional Development may assist providers of CPD programmes to adopt the principles of evidence-based education to assist in the process of enhancing all aspects of medical photography.

Hoosain M Ebrahim ASIS FRPS

Retired Medical Photographer

Literature reviews

In this issue we take a look at a recent paper published in the RPS Imaging Science Journal. Although my expertise is not in machine learning algorithms I have experience in photo conservation and so the title attracted my attention. So consider this review as coming not from a knowledge of deep learning algorithms but an interest in the imaging science of the application to photo conservation.

Qian Xie (26 Mar 2025): The application of deep learning in artwork conservation: techniques of image restoration and color recovery, The Imaging Science Journal, DOI: 10.1080/13682199.2025.2473198

Qian Xie comes from an art college in China, interestingly part of a University of Information Engineering. This art/engineering dual focus comes over well in this paper and it was the opening line that immediately caught my attention.

Artworks are precious legacies of human civilization.

Further these artworks "reflect the aesthetic concepts and cultural characteristics of different eras". I found this to be a useful and credible point of departure for this study.

Applicability to photographs

The focus of this paper is the restoration of image content of oil paintings, woodblock prints and murals, but the techniques described seem equally applicable to photographs. In this paper "image restoration refers to the prediction and filling of missing areas in an image" resulting from "cracks, fading, and damage due to natural aging and environmental erosion". Again, this is equally applicable to photographs such as degenerated cellulose acetate negatives and folded prints.

We should note that in this paper "image restoration refers to the prediction and filling of missing areas in an image, ensuring that the restored content is semantically reasonable and visually coherent to the human eye". So the ultimate arbiter of these algorithms should be the human visual system. I kept this in mind while reading the paper.

The GAN advantage

The paper reviews a number of deep learning digital restoration methodologies that can be used for cultural heritage preservation. It concludes that while "deep - learning - based methods have achieved good restoration results for general images" there remains "several challenges, such as insufficient detail recovery, poor overall consistency and visual realism of the restored images". As a result "an improved GAN - based image restoration model for artworks is proposed …to enhance the detail - capturing and reconstruction capabilities of artwork images"

The core message of this paper is that a Generative Adversarial Network (GAN) can "learn complex features and patterns in images through large amounts of training data" with "significant improvements in detail recovery". GAN use is shown to "perform well in complex image restoration tasks and generate realistic image content … and image super - resolution reconstruction". With the recent focus on energy efficiency it is also noted that a GAN can deliver "state-of-the-art performance across tasks with much lower computational costs". With the current focus on the carbon footprint of server farms this could prove to be a key metric for such solutions.

As an outsider to this community I noted that the GAN acronym was used from the outset with no attempt to expand or explain. Granted it is easy to look up but this tribalism of terminology increasingly makes new topics impenetrable to the outsider.

One recurring theme I note in the computer vision literature is a myopic perspective on imaging history. This paper notes that for image restoration "traditional methods include patch - based restoration and diffusion – based restoration", citing two references from the computation literature from 2022 and 2024. What is meant by "traditional methods" in this context appears to be computational methods before deep learning, which in this context "learn complex features and patterns in images through large amounts of training data". From my perspective the traditional method would have been image retouching to a physical print using artists tools, of which more later.

Methodology

This work used an interesting method to quantify the GAN based approach. Databases of murals and ancient painting images were sourced and digital masks were applied to these images in a random fashion covering 1 - 40% of the image area. The GAN was set to work restoring these but a comparison could then be made between the original and the generative data.

Two metrics were used to do the comparison. The first was a "mean squared error between the restored image and the true image", the second was labelled "SSIM (Structural Similarity) index considers brightness, contrast, and texture in the image… comparing the local patterns of pixel intensities between the restored and original images". These computational metrics also allowed for a balance to be made between restoration image quality and computational efficiency with examples given for various versions of the model.

The paper claims that "the restoration images of the algorithm in this paper accurately maintain colour and composition balance and better restore texture feature information".

The paper finishes with some other potential applications; "Improved GAN also has good application scenarios, such as repairing missing areas in medical scanning images such as MRI and CT, reducing artifacts, and improving image quality; Repair scratches and noise in video frames, maintain video integrity and visual quality, and more". I can see the potential for video enhancement for human viewing but I am more reticent of the use for images used for clinical diagnosis. Some of our medical colleagues may have an opinion to offer on this.

In conclusion

This is very much a computer vision paper and gives the impression that it is written with that community in mind. As an outsider I found the work interesting but had difficulty accessing the technical content because of the language and acronyms used. This balkanisation of knowledge is fine if the only target audience is the computer vision community but I believe this misses an opportunity for the application of this work.

As noted above there is the opportunity for this work to be applied in the photo conservation community. However, my experience is that community would have at least as much difficulty in accessing this work as I had. There is need for some technology translation here.

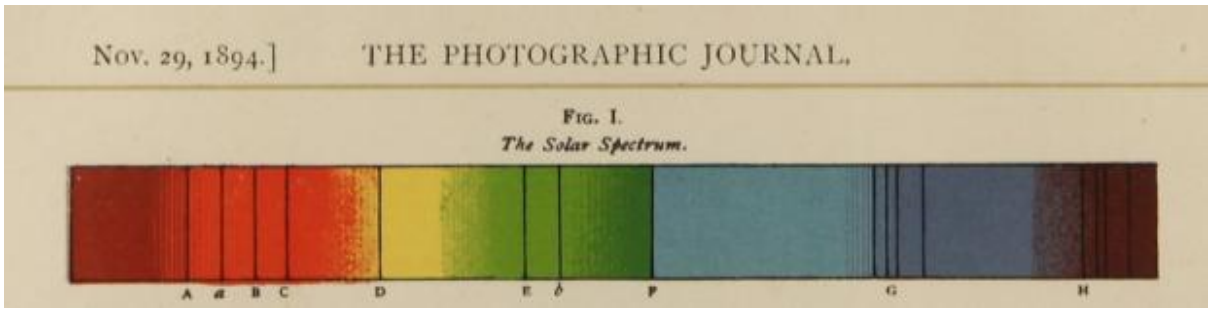
Before this work sees use in that community there is some additional evaluation to be done. As noted above the work contains metrics but they appear to be tailored to evaluating and tuning the GAN implementation. The final arbiter for restored artwork is the human eye, as noted above and in the paper. This work cries out for a subjective evaluation by human observers, perhaps against a gold standard of an expert retoucher.

If anyone else reads this paper I would be interested in comments on any of the above.

Alan Hodgson

Yet to come

Issue 1 raised a few points that could appear in future issues, specifically the article on Fraunhofer spectra.



A Fraunhofer spectrum illustration by H Dennis Taylor in 1894

The article touched on a number of early colour processes. I received a note from one of our HonFRPS members suggesting that something on Lippmann's colour photography would be of interest. If anyone has something to offer on this do let me know.

Secondly the article suggests that this could be a topic for an on-line Zoom event. This is now being planned for Q4 2025. Hopefully more details will be in the next newsletter.

I am interested in including imaging science perspectives on articles in the newsletters of other RPS Special Interest Groups. If you come across any of these and would like to offer your thoughts do send me a note. I recently read an article in the Digital Imaging Group publication DIGIT #104, discussing the use of the Freeware program Sequator to stack sky images. Something on these types of programs would be of interest, particularly the effect on overall image quality.

By the time you read this newsletter some of us will have attended the meeting of ISO Technical Committee 42 (Photography). We hope to bring you some feedback from that meeting in the next edition.

All for now – see you next time! Don't forget to send me your content and thoughts for the next issue. At the moment we are aiming for an October publication.

Dr Alan Hodgson ASIS HonFRPS, Imaging Science Group newsletter editor

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