CHAPTER 7

Photography in the age of electronic imaging

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Photography in the age of electronic imaging

INTRODUCTION

Two decades have passed since it became possible to make photographs by digital rather than chemical means (see Box A). During the same period, amidst widespread transformations in media of all kinds, we have witnessed a number of convergences: between photography and computer-generated imaging (CGI), between photographic archives and electronic databases, and between the camera, the internet and personal mobile media, notably the mobile telephone.

The first edition of this book opened with a quote from a 1991 article (Bode and Wombell 1991) that warned that then emerging changes in the technology of photography were set to change its ‘very nature’. How the nature of photography has changed remains a matter of some debate, with conclusions ranging from the view that photography has become an archaic, if cherished, media form to a rather insouciant view that nothing has changed. This echoes wider debates about the impact of the computer and digitisation on the whole field of media and communications (Lister et al. 2008). Whatever the conclusion, it seems to be clear at the time of writing that digital technology is thoroughly assimilated to photography of all kinds; from the snapshot to professional photojournalism, advertising, fashion and artistic practice. In the period since the 1990s, ‘digital photography’ and ‘digital imaging’ have developed as major creative industries, and have become a taken-for-granted part of the media landscape. The once firm separations between older twentieth-century specialist divisions of skill and labour have become
Box A Analogue and Digital

Traditionally, images were analogue in nature. That is, they consisted of physical marks and signs of some kind (whether brush marks, ink rubbed into scored lines, or the silver salts of the photographic print) carried by material surfaces. The marks and signs are virtually inseparable from these surfaces. They are also continuously related to some perceivable features of the object which they represent. The light, for instance, cast across a rough wooden table top, becomes an analogous set of tonal differences in the emulsion of the photograph. A digital medium, on the other hand, is not a transcription but a conversion of information. In short, information is lodged as numbers in electronic circuits. It is this feature of digitisation which has meant that images can now exist as electronic data and not as tangible, physical stuff. Some of the key differences can be set out as follows:

<table>
<thead>
<tr>
<th>Analogue</th>
<th>Digital</th>
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<td>transcription: the transfer of one set of physical properties into another, analogous, set</td>
<td>conversion: physical properties symbolised by an arbitrary numerical code</td>
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<tr>
<td>continuous: representation occurs through variations in a continuous field of tone, sound, etc.</td>
<td>unitised: qualities divided into discrete, measurable and exactly reproducible elements</td>
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<tr>
<td>material inscription: signs inseparable from the surface that carries them</td>
<td>abstract signals: numbers or electronic pulses detachable from material source</td>
</tr>
<tr>
<td>medium specific: each analogue medium bounded by its materials and its specific techniques</td>
<td>generic: one binary code for all media, enabling convergence and conversion between them</td>
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Digitisation is also the effective precondition for the entry of photographic images into the flow of information which circulates within the contemporary global communications network. It is their translation into a numerical code that now enables them to be electronically transmitted. For the above reasons, questions have arisen about the place of images in time and space, where they can be said to actually exist, about how and where they are stored when in electronic form, how and by whom they can be accessed, used, owned and controlled.
permeable, especially between photography, typographic and graphic design, project management, editorial work, and still and moving image production. Even for those professional photographers who continue to use film for some of its distinctive properties, digital technologies and processes are now an essential part of their post-production practices.

For many others, digital technologies have replaced analogue processes: traditional cameras are replaced by digital and even virtual kinds, films by memory cards and hard drives, ‘wet’ physical darkrooms and optical enlargers by computers and software. At a consumer level, digital cameras and associated software have replaced the mechanical camera and film on the shelves of high street photographic retailers. Digital cameras of all kinds now far outsell those that use film, while photographic film itself has become an expensive niche commodity.

Cameras for the popular market possessing sophisticated facilities now approach the size of credit cards. In the form of camera-phones they are readily connected to the internet, allowing almost instantaneous transmission of images, often with related text and data, by e-mail and social network sites. They accompany their owners at work and leisure, acting as visual notebooks or diaries, and raise new questions about the propriety of when and where to take photographs (Okabe 2004). The snapshots once pasted into the traditional family photo-album are now stored in electronic ‘shoe-boxes’, the majority never taking a ‘hard-copy’ form, to be displayed instead on the screens of televisions, personal computers, or the LCD screens of the very cameras with which they are taken.

Existing and historical photographs are now stored, archived, circulated and accessed digitally. Many of the world’s photographs once held in specialist physical archives now exist as digital files on the servers of corporate online image banks. In film production, synthetic, computer-generated images are now seamlessly integrated with traditional cinematographic footage. In much advertising and fashion photography photographic elements fuse as a matter of course with digital processing, manipulation and retouching. The photographic images we see around us in magazines, books, newspapers, advertising hoardings, galleries, and on both enormous and tiny light emitting screens, are now normally digital. To ‘shoot’ on film and develop and print in wet chemical darkrooms are no longer the normal processes against which digital photography is compared as novel; they have become deliberate and increasingly specialist choices made ‘against the grain’ of the digital processes that have become the default state of photography.

Recent thought reflects a much more complex interplay between photography and digital image technologies (or ‘post-photography’) than was envisaged in earlier attempts (between the late 1980s and the mid-1990s) to assess and understand what the ‘digital’ meant for the ‘photographic’. The shift that has taken place from chemical to digital photography over 20 years now means that there is a whole generation of photographers and consumers
of photography for whom photography was always digital. For them, comparisons between digital and analogue photography have little basis in lived experience or practice (for a check list of differences see Box A).

The various versions of this chapter in the four editions of this book have shadowed these developments as they have taken place. In this sense, the history of this book is coeval with the history (if not the early industrial and scientific research and development) of digital photography to date. There will be readers for whom these debates are met for the first time, and others who are unaware of their history. For yet other readers who have negotiated the changes, whether as photographers, photography theorists, or all of us who consume and use photographs, there are still unsettled questions.

THE EARLY 1990S AND WORRIES ABOUT TRUTH

At the centre of early debate about the significance of digital technology for photography was an anxiety about the continuing value of photographic ‘truth’ and the status of photographic evidence. While most early commentators were careful to recognise that the very notion of photographic truth was, at the very least, contestable, the new ability to register an image on an array of light-sensitive charge-coupled devices rather than as chemical alterations to light-sensitive film, caused deep concern. In retrospect these fears for the integrity of chemical photography were largely misplaced. A red herring was thrown in the path of critical thought about new image technologies and their significance for photography. For example, from a more recent perspective, it is clear that the digital camera-phone photographs taken within the traumatic heat of the terrorist attack on London on 7 July 2005 (see Figure 7.11, p. 338) were received as ‘true’. They continued to be valued as evidence of events as much as the grainy black and white SLR images shot on the battlefields of the Second World War, in Vietnam in the 1960s, or the canonical documentary images of the Farm Security Administration in the 1930s. It has only subsequently become clearer where the real changes lie.

As the 1980s gave way to the early 1990s, developments in digital imaging that had been taking place in centres of research for military purposes and space exploration began to become available to professional and amateur photographers (Mitchell 1992: 3–19). As this took place, media scholars, theorists and photographers began to express their hopes and fears about the future of photography. Some of these initial responses were clearly caught up in the wider ‘new media’ and cybercultural discourses of the time in which both utopian and dystopian views of a coming media revolution were expressed.

We can gain a sense of these early responses by looking briefly at the thought of four commentators from the early 1990s. These raised, in order, (i) ethical issues for photojournalists (Ritchen 1990a); (ii) the relationship of photography to wider socio-economic change (Mitchell 1992); (iii) the idea of changing ‘scopic regimes’ or ways of seeing and imaging (Crary 1993);
and (iv) the place of photography within media history (Weibel 1996). The basic differences to which these theorists were responding are set out in Boxes B, C and D. These are between (i) chemical (analogue) and (ii) electronic (digital) photography and (iii) the simulation of photographic images by ‘virtual’ cameras and computer-generated images.

Ritchen, whose thinking is haunted by an almost Orwellian nightmare of a future world of digital illusions (1990a: 3), saw the substitution of chemical by electronic processes as leading to a radical increase in the degree to which a photograph could be manipulated. Fearing a world in which images would no longer be trusted to reliably inform us about the wider world, he searched for strategies which would enable photojournalists to ward off the digital

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**BOX B DIGITAL ENCODING**

The encoding of the ‘message without a code’ (Barthes 1977b: 36) – the conversion of original analogue photographs to digital images.

Digital technology facilitates the introduction of a matrix of tiny manipulable elements at the physical base of the photographic image. This amounts to an ‘infection’ of the stable analogue photographic image by an intrinsically fluid and malleable digital code.

The material basis of the chemical photograph, the photographic emulsion, is a granular structure of silver halides dissolved in gelatin and spread on to a plastic or acetate base. This emulsion holds the nearest thing there is to a photographic ‘mark’: the tiny light-sensitive grains of silver, the constituent bits out of which an image is configured. This material basis of the photograph has long been industrially produced. It is put in place by workers in the factories of Kodak, Ilford, Fuji or Agfa. The individual photographer has never had access to this level of signification, except to control the degrees of contrast that various intensities of light reflected from an object in the real world bring about within this granular field. It is this sense, that something pre-exists the photographer’s intervention in the forming of an image, that underpins our belief in the chemical photograph’s special claim to veracity.

The computer with its immaterial field of binary switches has unlocked this inaccessible level of signification. Chemical grain can be scanned by a set of linked Charge Coupled Devices to become digital pixel. Digital pixel can also be made to mimic chemical grain. In short, a code has been imported into, has translated and reconfigured, the granular field of the chemical photograph. With this code in place the photographic image (now strictly speaking the ‘photographic’ image) becomes manipulable to a fine degree.
undermining of their vocation. While he was well aware of the semiotic complexities and the politics of photojournalism, Ritchen viewed the post-production manipulations of photographs enabled by computers as raising ethical problems ‘with the greatest urgency’ (p. 29). In his view, because of the difficult and limited nature of the processes involved, traditional manipulations of chemical photographs had somehow been held in ethical check and were usually undertaken without ‘damaging the image’s integrity’. Now, the new digital image technologies meant that an ‘editor has the ability to reach into the guts of a photograph and manipulate any aspect of it’, much in the way that texts can be edited and the writer’s meanings effectively altered. This, proposed Ritchen, was the end of ‘photography as we have known it’.

More than the ethics of photojournalism were at stake for William J. Mitchell who took a wider and more draconian view. He proclaimed the dawning of a ‘post-photographic’ era in which the emerging new image technologies would unsettle our older, established beliefs in the status of photographs. In his view, digital image technologies would bring a 150-year period of ‘false innocence’ to an end; a false innocence belonging to the period during which chemical photographs provided us with images that we could comfortably regard as ‘causally generated truthful reports about things in the real world’ (Mitchell 1992: 225). The once fixed and stable images of

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**BOX C DIGITISING PHOTOGRAPHS: THE INITIAL IMPLICATIONS**

- A shift in the location of photographic production: from the chemical darkroom to the ‘electronic darkroom’ of the computer.
- The outputting of single photographic originals in an expanded range of ways, from ‘hard copy’ through transparencies and varying forms of print, to the computer and TV screen, and websites.
- An unprecedented ease, sophistication and invisibility of enhancing and manipulating photographic images.
- The entry of photographic images into a global information and communications system as they become instantaneously transmissible in the form of electronic pulses passing along telephone lines and via satellite links.
- The high-speed transmission of news images which are no longer containable within territorial and political boundaries.
- The conversion of existing photographs and historical archives into digital storage banks which can be accessed at the screens of remote computer terminals.
- The potential of the new information and image networks for greatly extending the practices of military and civil surveillance.
- The unprecedented convergence of the still photographic image with previously distinct media: digital audio, video, graphics, animation and other kinds of data in new forms of interactive multimedia.

See Wombell, P. (ed.) (1991) for an early recognition of the factors noted in Box C.
traditional photography had ‘served the purposes of an era dominated by
science, exploration, and industrialisation’. In this new era, he argued, we
would face a further challenge to ‘the fragile distinctions we were used to
making between the imaginary and the real’ (p. 225). Finally, in agreement
with Ritchen, he warned,

Protagonists of the institutions of journalism, with their interest in
being trusted, of the legal system, with their need for provably reliable
evidence, and of science, with their foundational faith in the recording
instrument, may well fight hard to maintain the hegemony of the
standard photographic image.

(Mitchell 1993: 7)

In an influential preface to a book that traced major historical shifts in ways
of seeing and image technologies, including photography, the art historian
and theorist Jonathan Crary also proposed that radical change in visual culture
was occurring (Crary 1993). Crary drew attention in particular to the
implications of computers being used to make images without reference to
an embodied viewer or photographer located in the physical world. He
observed that the new constructed ‘virtual’ visual spaces of computer-generated
imagery which were then emerging, were radically different from the ‘mimetic
capacities of film, photography, and television’ (1993: 2). Where photography
had depended upon ‘a point of view . . . located in real space’, the techniques
of computer imaging were relocating ‘vision to a plane severed from a human
observer’ (ibid.). Like Mitchell, but using a longer timescale, he too suggested
that we were witnessing a major historical rupture as the rapid development
of computer graphics brought about ‘a transformation in the nature of visuality
probably more profound than the break that separates mediaeval imagery from
Renaissance perspective’ (p. 1). (See Box D: Digital simulation.)

From yet another perspective, not that of photography or art history, but
new media studies (the theory and practice of the new digital media
t hemselves), photography was drawn into a new historical narrative. The value
of photography was reduced to the part it had played in history. It became
an historical actor which had a role in a teleological march of progress in
which all media were seen as part of an unfolding of possibilities that are only
now being realised in the present. Alongside Mitchell’s proclamation of the
end of an age of photographic innocence, and Crary’s sense of a new digital
renais sance, Peter Weibel (1996) claimed photography as the ancestor of our
contemporary ‘telematic’ culture. For Weibel, the invention of photography
in 1839 meant that image-making had been freed for the first time from a
dependence upon the hand. Later, images were further unfixed from their
locations in space by electronic scanning and telegraphy. It is in these
developments that Weibel traces ‘the birth of new visual worlds and telematic
culture’ (1996: 338). With the coming of transistors, integrated circuits and
silicon chips all previous developments are yet again revolutionised as the sum of the historical possibilities of machine-aided image generation are at last united in the multimedia, interactive computer. Finally, when joined with telecommunications networks we witness a liberation of ‘matterless signs’ spreading like waves in global space as a new era now dawns: that of post-industrial, telematic civilisation (p. 339).

Clearly, in these early assessments of the significance of digital imaging for photography, whether epochal (Mitchell and Crary), dystopian (Ritchen) or utopian (Weibel), the stakes were seen as very high!

THE HUMANIST RESPONSE

Neither the cybercultural euphoria nor the dystopian gloom which accompanied the ‘end of photography’ theme cut much ice with a number of other cultural theorists and media historians. In the later 1990s a set of counter-arguments were made in which the opposition of chemical photography to
digital photography on the basis of their relative claims to truthfulness was effectively demolished. The first line of argument was the simple, if not entirely adequate one, of dissolving the opposition by reminding us that manipulation was not a new capacity of digital image technology but had always been integral to photography.

This was clear in the very earliest uses of multiple negatives by photographers like Oscar Rejlander and in the openly manipulative, alternative traditions of photography, represented by photomontage and the work of the Dadaists and John Heartfield (Rosler 1991: 53). Indeed, all photographs are the result of decisions, choices, conventions and codes. Arguably, even the idea of ‘straight photograph’, in which the photographer avoids evident artifice, construction and manipulation as a matter of principle, does not, and cannot, mean an unmediated, uncrafted photograph or an image which is not the result of intention and shaping by the photographer. The very choice to work in this way, to avoid dramatic and rhetorical artificial lighting, for example, to resist any setting up and orchestration of the subject, or the many manipulations and devices of the darkroom, is itself the outcome of working with ideas and making choices within a wider set of possibilities. Photography is nothing if not a history of manipulated images (Batchen 2001: 137). As one critic has put it, ‘Digital technology does not subvert “normal” photography because “normal” photography never existed’ (Manovich 2003: 245).

The humanist subject

However, this reminder of the constructed nature of the photograph is not a complete answer to our question because none of the authors of the early responses that we looked at above actually held a naïve view of photography's realism. Why then, should there have been so much anxiety about the digital onslaught on photographic truth when that very notion had already been challenged throughout the history of photography, and especially in the twentieth century (Snyder and Allen 1975: 143–69)? As Sarah Kember asked,

> Computer manipulated and simulated imagery appears to threaten the truth status of photography even though that has already been undermined by decades of semiotic analysis. How can this be? How can we panic about the loss of the real when we know (tacitly or otherwise) that the real is always already lost in the act of representation?

(Kember 1998: 17)

One answer is that what was really at stake was a historical and psychic investment in photography’s ‘realism’. This requires us to recognise that photography is part of a scopic regime that is far wider and has a much longer history. We must consider the cultural identity of the ‘viewer’ who sees with the centred, focused eye of the camera, a way of seeing shaped over centuries. At the centre of this history of Western visuality stands the humanist self.
This is a conception of the human subject who is understood to be the rational centre of the world and the prime agent in seeking its meaning and establishing its order. The humanist subject searches for certain and objective knowledge through a disinterested and rational method of enquiry.

In her own reflection on the question, Kember stresses that this subject and this scopic regime are part of a larger scientific system and mode of enquiry, ‘fashioned in Enlightenment philosophy and by Cartesian dualism and perpectivalism’ (1998: 23). It is a system in which the viewer is understood as a centred, knowing subject coaxing information from a passive supine nature. She reminds us that however dominant this rational-scientific system and the centred humanist subject became over a period of some 500 years, this position was always unstable and gendered. It was gendered because typically the ‘knowing subject’ was figured as male and ‘supine nature’ as female – see Figure 7.2.

It was unstable, because it was a system that depended upon (and was simultaneously troubled by) a desire to exercise power and control over nature and over others. Seen in this context we can understand that our ‘panic’ about the computer’s threat to photography’s realism does not actually take place at the level of the image itself. It is cultural panic over the potential loss of our centred, humanist selves, with our ‘dominant and as yet unsuccessfully challenged investments in the photographic real’ (op cit. 18). The perceived threat is to our subjectivity, where a more fundamental fear is triggered which concerns ‘the status of the self or the subject of photography, and . . . the way in which the subject uses photography to understand the world and intervene in it’ (loc cit).

Dürer depicts one of many apparatuses in the history of art through which the appearance of the world was organised in relation to the position of the observer. It is an apparatus and a way of seeing which is later embodied in the camera. It also, as Lynda Nead observes, already positions the female as the object of the male gaze (Nead 1992: 11).
Photography, accordingly, depends not only on its technology or the way it ‘looks’ but also upon our historical, cultural and psychic investment in it as a way of seeing and knowing. It affords us a position, an identity, a sense of power, and it promises to fulfil a desire for security. Photography is more than its machines, it is also an ‘economy of photographic desires and concepts’ (Batchen 2001: 140). At the centre of this economy is a desire to be securely placed as observers in relation to objects which interest us. For over 150 years we have gone to photography to give us reports on nature, to produce knowledge of others, to arrest time, to document and remember, to bring the spatially distant closer (to travel in space). Overall, we have looked to photography to provide a picture of a reassuring world in which everything appears to stay in its time, space and place (Kember 1998: 2). As long as such interests and projects are pursued by human beings, then surely ‘a photographic culture of one sort or another’ will . . . endure despite the fact that computers may replace cameras and film (Batchen: 2001: 141).

Kember’s account of photographic realism as part of a long humanist investment, and Batchen’s concept of a ‘photographic economy’ which contains a set of enduring human desires and concepts, remind us of how unlikely it was that the foundational medium of modern visual culture would simply be swept aside by technological change. However preoccupied we have become with the technological and with signifying differences between photography and digital imaging we are also called to think about the strength of the human (humanist) values which will direct our use of either.

**Techno-progressivism**

Another line of argument drew attention to the ideological nature of the discourses of technological progress that framed uncritical celebrations of new image technologies. In the early responses, an obsession with technological difference (between chemical and digital photography) and the attempt to draw cultural conclusions directly from this, effectively meant that photography as culture (rather than as technology) was lost sight of. In the context of these discussions, the existential and affective power of photographs was obscured. A leading voice here was that of Kevin Robins. Drawing upon social constructivist and psycho-analytic perspectives, Robins argued that whatever might be new about digital image technologies, the idea of an ‘image revolution’ was an old and recurrent one. In the new accounts of digital imaging, Robins detected a continuation of a drive to rationalise images, primarily as a kind of information. Scientific rationalisation had been joined to photography in the nineteenth century when the search for disinterested and objective knowledge had taken a fiercely empirical turn and was extended to the study of the social, as well as the natural, world within the social philosophical framework known as **positivism**. This was characterised by an exclusive concern for empirically verifiable and measurable facts. A connection between
this ‘positivist’ method and the birth of photography has been frequently noted. As John Berger (1982) put it,

The camera was invented in 1839. Auguste Comte was just finishing his *Cours de Philosophie Positive*. Positivism and the camera and sociology grew up together. What sustained them all as practices was the belief that quantifiable facts, recorded by scientists and experts, would one day offer man such total knowledge about nature and society that he would be able to order them both.

(Berger and Mohr 1982: 99)

So, while Mitchell and Crary saw the new technologies as bringing about a historical break, Robins, while assenting to the increasing power and sophistication of new imaging technologies, argued that they are a postmodern form of this older drive to order and control the world through the ‘rationalisation of vision’ (1996: 153). New image technology, like the earlier positivist uses of photography to measure and collect facts about the world, now strives, through imaging the invisible (the cellular structure of the human body or distant stars) and via simulations built from data, to continue this rationalisation of vision. For Robins, a real problem here is the close association of such drives and discourses with a narrative of technological progress in which the ‘new’ is always better than the ‘old’ (p. 152). In this binary opposition, the photographic is automatically positioned as limited and inferior in contrast to the new possibilities afforded by digital imaging. Further, as this technological imaginary seeks a tidy, known and safe world it denies and represses much that is important about vision, images and photography:

The overriding concern is with formal and theoretical issues . . . . Strangely, we seem now to feel that the rationalization of vision is more important than the things that really matter to us (love, fear, grief . . .). Other ways of thinking about images and their relation to the world have been devalued (we are being persuaded that they are now anachronistic).

(Robins 1996: 158)

In the face of this digitally inspired reduction of how photography is understood, Robins urged us to remember not just photography’s role within cognitive processes, but also its emotional, aesthetic and political dimensions, exemplified in the writing of theorists of photography such as Benjamin, Barthes and Berger.

**Media archaeology and other histories of photography**

In the early responses to digitisation, photography and photographs were stereotyped and characterised in limited ways. Mitchell (1992), for example,
contrasted the provisional nature of digital ‘electobricollage’ with its practices of cutting and pasting, and of importing and combining images and image elements, with the carefully framed and composed unity of the ‘classic’ photograph. This, of course, was to take only one kind of photograph (Mitchell cites the high modernism of Edward Weston (1992: 5–7)) to stand for a diverse and untidy field of photographic image production that spans and enters into nearly every aspect of human life. This returns us to the notion of ‘normal’ photography – or the ‘normal photograph’ – discussed above. For most of us, the word ‘photograph’ is likely to conjure up a mental vision of small, discrete pictures printed upon paper of various qualities, whether these be snapshots, illustrations in magazines and newspapers, or framed prints hanging on the wall of a gallery. Such a conception of a photograph fits readily within the range of objects scrutinised by historians of art. They take their place alongside easel paintings, drawings and prints to be treated by an area of scholarship which studies flat, rectangular, material artefacts and their aesthetics and social contexts. However, the recent development of immersive, spectacular and interactive digital image technologies has opened up a new area of media history or archaeology in which antecedents for these ‘new’ forms are being brought to light (Huhtamo 1996). At the same time, the reception of, and cultural responses to, old media when they were new, the telephone (Marvin 1988), the cinema (Gunning 1991), and radio and television (Boddy 1994, Spiegel 1992), for example, have been recovered by media historians. Photography is no exception; its history is more than the history of a print medium. As Steve Neale has reminded us,

Photography was . . . only one of many instruments, institutions, and practices designed to engage, astonish and entertain the eye; only one of a vast array of machines for the production of spectacle.

(Neale 1985: 23–4)

While we may not readily associate the still photograph with spectacular effect, Steve Neale reminds us that the stereoscope was one of the most popular ways of viewing photographs in the nineteenth century (Batchen 1998). Projected images for entertainment (both painted and photographic) as in the Phantasmagoria, and other environments in which transparent and backlit images were presented to audiences (the Panorama, the Diorama, the Eidophusikon) were very much part of the culture in which photography emerged.

All of these machines were united by their ‘“astonishing” capacity for realism and painstakingly detailed representation’ (Neale 1985: 23–4). With their use of light and movement, they lured and manipulated the spectator’s gaze. With the coming of electricity and mechanical music towards the end of the nineteenth century these luminous photographic entertainments became the technical and cultural antecedents of cinema, which, in one of its earliest
forms – Edison’s Kinetoscope – was an arcade machine designed to be used by individual viewers (Neale 1985). Again, rather than emphasising a difference between our newer digital interactive media and a certain conception of photography, a wider view of photography’s history, indeed a different history, comes to light.

It is also important to remember that mediated and hybrid ‘photographic images’ have circulated throughout the twentieth century and that this has depended upon a convergence of photography with other print, graphic, electronic and telegraphic technologies. As John Tagg put it, ‘the era of throwaway images’ began in the 1880s with the introduction of the half-tone plate. It was this interface of the chemical photograph with print technology which ‘enabled the economical and limitless reproduction of photographs in books, magazines and advertisements, and especially newspapers’ (Tagg 1988: 56). In 1903 the telegraphic transmission of half-tone images became possible and the Daily Mirror launched a photo-telegraphy service as early as 1907 (Harvie et al. 1970).

Photographic images have seldom been met in isolation. They are embedded and contextualised in other signifying systems, primarily those of the written or spoken word, graphic design and the institutional connotations of power, authority, neutrality or glamour. As Barthes (1977a: 15) puts it, the photograph is at the centre of ‘a complex of concurrent messages’. In a newspaper these are the text, the title, the caption, the layout, and even the title of the newspaper or publication itself: a photograph can change its meaning as it passes from the page of the conservative to the radical press. Photography as
an element in a complex of ‘concurrent messages’ pre-dates the technological convergence of the new hybrid media.

The sheer number of photographs circulating in the world, and the frequency with which we meet them, is also a basis of their intertextuality. None is free-standing. Each one is a small element in a history of image production and a contemporary ‘image world’. Within this environment, the photographic image gains its meaning by a continual borrowing and cross-referencing of meanings between images. The still photograph quotes a movie, the cinematographer adopts the style of an advertising photographer, the music video mimics an early silent movie.
FURTHER CRITICAL ISSUES

Most discussions of ‘digital photography’ fail to remember that there is no single thing called photography, but there are many ‘photographies’ (Tagg 1988: 14–15). As a technology, photography has given rise to many different practices, uses and genres. However, many assessments about the ‘impact’ of digital technology have been flawed by a tendency to generalise about ‘photography’ as a whole. For instance, as we have seen, throughout the 1990s, a major concern was the apparent threat of digital technology to photographic ‘truth’; to the sense that photographs provided true and objective optical records of reality. While this claim or belief was only ever true of some kinds of photography (documentary, photojournalism, the biographical snapshot, and related forms of ‘straight’ photography where photographic realism and its use as evidence and testimony, were once particularly high) it was rapidly generalised to be a threat to ‘photography’ *per se*. It became a question about the very ontology of all photography. However, the new ability to manipulate and synthesise diverse photographic image elements could hardly be experienced as a threat to advertising, art or fashion photography. These are kinds of photography where an enhanced ability to manipulate the ‘real’ is sought after and welcomed; cases where celebration rather than regret would be more appropriate. We should also remember that if photography is not a monolithic process then neither is digital imaging or the application of digital processes to photography. While it is perfectly possible to consider the difference between the photo-mechanical process of traditional photography and the electro-mathematical processes of digital imaging as an ontological issue (that is, as a matter of fundamental differences in their mode of being) it is also necessary to deal with their use in social practice where such differences do not always have meaning. In fact, where ‘new’ digital media are concerned, the widespread transformations that they have brought about in traditional media are matched by an enormous range of uses. While they may do so in radically different ways, digital media can, and are, used to perform most of the functions of old media. It follows then that in investigating their relationships, different kinds of photography, and different affordances of digital image technology move in and out of the foreground of our attention.

Even where differences between chemical and digital processes are real in theory or principle they take little account of how we receive photographic images and how we use the technologies in question.

Reception

In Chapter 1 (pp. 30–3), it was noted that in his book *Camera Lucida*, Roland Barthes was interested in the act of looking at photographs rather than their production. He was interested in the meaning or indeed, the feelings, we have about photographs which remain of people, once known to us, after their death. In thinking about photography in this way we move
to consider the reception, rather than the production of photographs; and to reflect on our felt experience of images rather than the analysis of their signifying or technological means. When we do this, the difference between the chemical and the digital photograph again ceases to be important.

The significant differences between the purely photographic and the digitally registered photograph lie in the way it was ‘taken’, registered or transmitted, not simply the way it looks. Hence, in thinking about ‘pre-’ and ‘post-’ digital photography we are not always faced with evident and visible differences in the images themselves. This is because it is precisely one of the capacities of the new image technologies to register, carry, mimic, or simulate photographic images in increasingly undetectable ways. Over the last decade of ‘digital photography’ this has become more clearly the case. Far from always being used to produce images of a montage-like heterogeneity, digital imaging technology is just as likely to be used to make images that are as traditionally coherent in their pictorial unity and exhibit the pictorial values of traditional, chemical photographic prints. Similarly, in the case of the impact of digitisation on archive images, picture libraries and image banks, the critical issues are ones of access, transmission and the use of images which continue to look like photographs.

Digital photographs are intended to be received by their viewers as ‘photographs’ (Bolter and Grusin 1999: 105–12). It matters not whether an image was captured by the photosensitive cells of a digital camera (clearly a form of indexical registration), or, perhaps more surprisingly, was a conventional photograph that is subsequently scanned by a computer and altered, or is a combination of two digitised photographs and computer-generated elements. All of these images address us as photographs. Digital photographers want us to regard their images ‘as part of the tradition of photography’ (p. 105). These are all images that are advertised or presented to us as photographs. They are all intended to be part of the tradition of photography. When we see any of these images we see, phenomenologically, a photograph; an image that has all the marks of a photograph and calls us to read it as a photograph. It depends for the sense it makes to us on our ability as viewers to read photographic signs. Further, Bolter and Grusin argue, digitising the light that comes through the lens of a digital camera is no more or less artificial than the chemical process of traditional photography. A photograph’s tonal values may be altered by the algorithms written into computer software or by the length of time it is immersed in chemicals. It is a cultural judgement to say that one of the images is more true than the other. In short, ‘whether the image is mechanically or digitally produced is irrelevant’ (Kember 1998: 11).

The indexical nature of photographs (the causal, one-to-one relationship between the image and an object in the world) also only has a partial purchase on the difference between a photographic and a digital image. This is because many photographs do not operate, or are not valued, as indexes (even if they are). It is quite possible to ‘read’ photographs as other than evidence of
concrete things that existed in a specific time and place. For instance, ‘A photograph as used in an advertising design . . . does not say . . . this hat was in a room on May 12.’ Rather it simply represents ‘a hat’ or ‘a beach’ or ‘a television set’ without any reference to time and location. In such cases, the difference between certain kinds of photographs and paintings, let alone digital images, no longer holds (Manovich 2003: 245).

**Theory and practice**

Debate about digital photography has also suffered from a tendency to base arguments on abstract theoretical principles. In the mid-1990s, Manovich and others (see Robins 1995; Lister 1995; Kember 1998) pointed out the flaw of restricting the discussion of digital technology’s effect upon photography to its technical means alone. They objected, in particular, to the habit of inferring cultural consequences directly from technological differences. In ‘The Paradoxes of Digital Photography’ Manovich pointed out that two key points of difference between photography and digital imaging, while correct in technical principle, have no cultural significance (2003: 242). Neither now matter in practice.

In the first case, due to the file compression used in storing and sending digital images (a necessary and normal practice in digital production now central to the economy of new media) loss of data and degradation of the image routinely occurs as files are copied and circulated. Practically, it makes no sense to say that digital technology makes the ‘flawless replication of data’ (ibid.: 243) possible and that a digital image has no original or copies. In the second case, the high resolution achievable by modern scanners means that the amount of information or detail contained in a digital image records ‘much finer detail than was ever possible with traditional photography’ (ibid.: 243). Effectively, it surpasses human interest in that detail or our cultural need for it. This is a good case of abstract theory being correct in its own terms while shedding little light on practice. Mitchell’s ‘differences’ may be correct in principle but, ‘if we consider concrete digital technologies and their uses, the difference disappears. Digital photography simply doesn’t exist’ (Manovich 2003: 242).

**VIRTUAL, HYBRID, NETWORKED**

Fears for photographic veracity were ill-founded (certainly overstated) and have diverted attention from the major changes brought to photography by digital technology. These arise from its convergence with, rather than its displacement by, the computer and telecommunication networks.

**The virtual image**

Within digital visual culture it has become possible to ‘image’ the invisible, that which does not actually exist, and to render the fantastic ‘as if’ real (Shields 2003). In achieving this, the historically accrued ‘reality effect’ of
photography, the benchmark of the optically real, is essential to the credibility of the digital virtual image.

The computer is a kind of universal machine; it can assume the function of many other machines, including the camera, a machine that takes photographs. This capacity may be distributed across the silicon chips that compute the operations of a digital camera, which itself is connected as a ‘peripheral’ to the processing power in a PC, and to others such as scanners, printers and data-projectors. There may be an optical lens trained upon the world of physical things but it is deeply enmeshed in digital technology. In the case of the simulation of photographic images by 3-D computer graphics software, this optical relationship to ‘things’ in the world is replaced by knowledge of their physics and of photography (its optics) stored in the computer and its software. The computer knows what something in the physical world would look like if it were photographed. This last point alerts us to the fact that whatever else computer-generated ‘photographs’ represent they also, very frequently represent or refer to, the appearance of photographs (Batchen 2001: 140). Digital images become signs for photographs, which, as we discussed above, are themselves signs of the ‘real’.

The most notable examples of this are found in the employment of computer graphics in contemporary cinema. 3-D computer graphics as it is used in contemporary cinema has realist goals. In many cases, the aim is to make a fantastic proposition appear realistic. The standard of realism it seeks is ‘photorealism’ – the appearance of something when photographed. As Allen (1998: 127) observes,

In cases where a real-life equivalent is clearly impossible, such as the morphing effects in Terminator 2, the pictorial quality of the effect must be sophisticated and ‘photo-realistic’ enough to persuade the audience that if, for example, a tiled floor transformed into a human figure in real life, it would look exactly like its screen depiction does.

To achieve the seamless integration of computer-simulated scenes with cinematography, the clinical images produced by the computer are deliberately degraded and rendered ‘photographic’ by closely guarded algorithms which are the industry’s stock in trade (Manovich 2003: 247). These add ‘noise’ to the pristine computer image in the form of distinctive photographic qualities. If computer graphics succeeds in creating realist illusion it does so by borrowing 150 years of photographic history in which time we have come to accept the images of photography and film as images of the real (ibid.: 246). In this aspiration of computer graphics to be photo-realistic the photographic image is newly valued as the very sign of reality at the same time as chemical phototechnology is displaced in the technical production of the image (ibid.: 246–8).

Figures 7.5 and 7.6 are taken from an online advertisement. They are frames or ‘stills’ from a 360° Flash animation. This image of a Landrover is computer
generated, it is a simulation. A simulation is an artifact that can be experienced as if it were real, when no corresponding thing actually exists outside of the simulation itself (Lister et al., 2008: 114). On the other hand, the landscape (or its representation) against which we see the simulated vehicle is a photograph.

The image of the Landrover had to be computer generated because when the website was made the vehicle itself did not exist. When it was first released, this advertisement was advanced publicity for a vehicle that was not yet in production. The image of the Landrover would have been generated by a process similar to the following. First, a wire frame mesh is created as in the taped and gridded car in Figure 7.7 whereby many points on its surface are plotted and recorded in a virtual space constructed by a computer. Subsequently, this wire frame structure is then rendered and given a ‘skin’.

7.5 Image from online advertisement for Landrover (i)

7.6 Image from online advertisement for Landrover (ii)
However, such images tend to be hyperreal. In order to achieve a photo-
realism (the optical realism we have come to associate with photography)
‘noise’ has to be added to the computer-generated image. As the CGI
professionals put it, the image has to be ‘dirtied down’. This is done by adding
the characteristic signs of a photographic image: grain, a certain softness or
variability of focus, some depth of field, maybe a little lens flare, etc.
In the finished online advertisement, the viewer (or user) could use their mouse to spin the vehicle in 360 degrees. As the vehicle is spun, its location seamlessly changes. Now it appears in the cold crisp light of the Alps, then the warm tones of the Mediterranean coastline, now in a morning light, then in a late afternoon light. As the quality of light and the topography changes it is reflected in the polished body of the virtual vehicle. To achieve this, that is, to envisage the body of this virtual Landrover as if it were actually in a responsive relationship to its changing environment, a highly reflective metal sphere would have been taken to the desired locations to stand in for the
non-existent vehicle itself. The light reaching the sphere’s surface would then have been photographed in 360 degrees and the information imported into 3-D graphics software before being mapped on to the computer-rendered surfaces (the ‘skin’) of the virtual vehicle.

In this example, we see the reliance of CGI upon the technological characteristics and the rhetoric of photography in order to both convince us of the ‘reality’ of the product and to present it in a (photographically) seductive way. Such images are a hybrid of photography, CGI, and high-resolution digital video. In such images, photography, far from being redundant, is, in Manovich’s words, ‘glorified and immortalized’ by digital technology precisely as its own traditional technological means are set aside (Manovich, 2003: 246).

While an accurate quantitative assessment would be difficult to make, it is probable that the majority of photographs now made seldom take a hard-copy form; they are born digital, stored as digital files, and viewed on light-emitting screens. To view such images as prints has become a matter of choice (and if printed, the technology used is likely to be a laser or ink-jet printer rather than a photographic process). However, in these ‘networked’ images we can see the ongoing trajectories and transformations of several

![Image](image-url)
older kinds of photography; popular or ‘snapshot’ photography, surveillance, and advertising photography.

**Kodak and Nokia**

A celebrated moment in the history of photography was George Eastman’s invention of roll film and the ‘you press the shutter, we do the rest’ Kodak Brownie in 1899. By these means, photography ceased to be a difficult craft and was brought closer to the quotidian events and rhythms of everyday life. However, this sheer technological possibility did not actually mean that people knew what to do with the new Kodak technology or felt the need to take photographs of what they otherwise took for granted; the small events of their everyday lives. Hence, Kodak’s widespread advertising campaign – a highly gendered one, using the Kodak Girl – to create a market by associating snapshot photography with the celebration of the increasing leisure and consumption of the middle- and lower-middle-class family (Slater 1991). In the early years of the twenty-first century, the advent of the camera-phone, and the creation of a market and uses for the device, bears many similarities with the Kodak story. The camera-phone was not provided to meet an identified need or existing demand. The convergence of the mobile telephone with the photographic camera was not based on a widespread complaint amongst people that telephones did not take photographs! Nevertheless, in camera-phone photography, the family-centred and mainly private nature of twentieth-century chemical snapshot photography (enshrined in the family

![Powerpoint slide from Nokia’s ‘Imaging Development’ presentation](image-url)
album, and confined within the home) has largely given way to the practice of a semi-public or peer group display and online exchange of photographs. In 2006, it was estimated that the popular ‘photo-sharing’ site ‘Flickr’ had 4.5 million registered users, 17 million visitors a month and was storing 230 million of its subscribers’ photographs (http://www.techcrunch.com/2006/08/29/12-million-flickr-photos-geotagged-in-24-hours/).

The integration of mobile internet technology with picture and text messaging means that an image with caption attached can be posted on a website within seconds of the image being taken. Research into the aesthetic and social significance of this area of digital photography has hardly begun. However, as Rubinstein and Sluis point out, some significant changes in photographic practice are involved in digital, networked, snapshot photography which may be shifting our perception of photography (Rubinstein and Sluis 2008: 9–28). Indeed, as far as photography is concerned, it may be the ‘networked image’ which is a really revolutionary outcome of digital technology. Where, in earlier periods of digital photography the new technology simulated and mimicked photographic procedures and conventions, there are now real signs of a dramatic narrowing of the gap between professional and amateur (ibid: 13). On the other hand, the sheer number of photographs that can be taken, often in short periods of time, and without any cost, might seem a banal fact but must surely have meaning in terms of the kinds of images made. Still images are now made at a speed that matches the frames of a moving image and enter a flow of online images traceable by their ‘tags’ or metadata. As the founder of the photo-sharing site, Flickr, suggests, ‘the nature of photography now is it’s in motion. . . . It doesn’t stop time anymore, and maybe that’s a loss. But there’s a kind of beauty to that, too’ (quoted in Rubinstein and Sluis op cit: 22). The ‘delete’ button may be changing the relationship of photography to biography as images that might have been valued in retrospect, are now rapidly consigned to oblivion before history and nostalgia can do their work (op cit 13). The camera-phone LCD screen which replaces the traditional viewfinder acts as a new kind of interface between the photographer and their subject. It affords an ability to pre-visualise the image which was once the practised skill of the professional, and it changes the camera’s relationship to the human body and the subject of the photograph (op cit 12).

**Citizen (photo)journalist**

At several points in the history of twentieth-century photography, the democratic potential of affordable lightweight cameras has been celebrated as a way of placing a means of image production in the hands of ordinary people. Such a potential was the subject of a famous essay by the cultural and photographic theorist, Walter Benjamin (1982 [1934]) in which he envisaged the conditions under which the readers of a newspaper became its authors, reporters and photojournalists. The Workers Photography movements of the
inter-war years and countless community photography projects from the 1960s until today have been attempts to realise this potential (Dennet and Spence 1979). This potential has seen a new lease of life with the camera-phone, in the shape of the ‘citizen journalist’ (Allan 2006). As we saw in the 7/7 London bombings, the first 50 images reaching the mainstream media came from the camera-phones of people commuting to work (http://www.guardian.co.uk/technology/2005/jul/11/mondaymediasection.attackonlondon). In one of these chilling images the roof of the bombed bus has hardly hit the ground. A figure ducks. It was online within an hour.

**Surveillance**

In the daily newspapers these traumatic ‘snaps’ were swiftly followed by the surveillance image of the alleged bombers entering a railway station on the morning of the attacks. This image was retrieved after hundreds of hours of reviewing the vast amount of surveillance material which now ensures that we are each covertly photographed many times a day. One of the very first appropriations of photography, in the 1850s, was the effort of national and local state apparatuses to match the identities of its citizens to their appearance and to various systems of physiognomic measurement.

The modern states’ need to watch and catalogue the identities of its citizens and distinguish them from non-citizens (Gates 2005: 38), and to mark out what it perceived as deviance and risk, led to a special relationship between the photograph and the filing cabinet (Sekula 1986: 16; Tagg 1988: 75; Gates
2005). This is a relationship that now exists between the photographic image (now usually in the form of a video still) and the computer server. It has long been argued that there is something problematic, even self-defeating, about such practices of surveillance. This is due to the problem of managing the vast quantities of photographs compiled by criminal justice systems and other organisations, and the very fallibility of the human beings who are required to do the checking of face, body and identity. Since the attack on the twin towers of the World Trade Center in 2001 and the ensuing ‘war on terrorism’, there has been an enormous ramping up of investment in the development of machine-reading technologies. If the invention of photography in the nineteenth century saw the automation of picture-making, in the twenty-first century we now seek machines to look at those pictures on our behalf (Gates 2005).

**Archives and digital image banks**

Digitisation and computer networks have impacted upon the state of historical photographic archives. They have also transformed the sector of photographic production known as ‘stock photography’. Across the 1990s, there has been a concentration of photographs within two immense online image banks; those of Getty Images Plc and Microsoft’s Corbis, in what has come to be called the ‘visual content’ industry. ‘Royalty-free’ stock photographs (see Figures 5.3 and 5.4, pp. 216 and 219) are preconceived (they are not
7.13 Photography and anthropometric measurement: Alphonse Bertillon, c. 1880
commissioned for a particular task) and are sold for a one-off fee and for multiple use. It has been estimated that some 70 per cent of the images currently used in advertising and marketing, worldwide, are now purchased from these two image banks (Frosh 2003: 2). As Paul Frosh has observed, such images defy many of the traditional characteristics of a ‘good photograph’. They are designed to avoid any real-world specificity or strong markers of place, social class or ethnicity. They deal instead with ephemeral lifestyle concepts which are frequently changed and updated in the online catalogues through which they are accessed.

Such images are not bought for their unity or integrity, but to be changed and recombined. They are, after all, delivered to a PC and directly into image-manipulation software (Picture Manager or Photoshop Elements, for example). Indeed, as Frosh trenchantly observes (ibid.: 74), the famous observation that photographs are ‘messages without a code’ may need to be inverted in order

7.14 Filing card using Bertillon’s ‘anthropometric’ system, 1898
to understand these images. Such photographs are more like ‘codes without a message’; a kind of image ‘kit’, a multipurpose graphic substance, a collection of ‘info-pixels’ to be repurposed and changed. In this form, photographs have become a subset of that strange generic commodity in which whole societies are now said to trade – information (Frosh 2003: 197; Castells 2000: 77–147; Nunberg 1996: 110–11).

Online image banks, such as those of Corbis and Getty Images, have also been very active in acquiring historic photographic archives. Initially, the ability to digitise photographs was embraced as a marvellous opportunity to archive the vast historical heritage of photographs. In doing so they would be protected against physical decay, precious space would be saved in hard-pressed institutions, and hugely increased access would be provided online.

7.15 Marilyn Monroe on the set of The Seven Year Itch, directed by Billy Wilder, 1955
However, the construction of photographic archives in the digital age has not proved to be straightforward. The fate of the Bettman Archive, acquired by Corbis in 1996, has been instructive. This archive contained some 11 million photographs, collected over the early to mid-years of the twentieth century, containing famous images such as Figure 7.15 (Puglia 2003).

Corbis began scanning the contents in 1996 at a cost of $20 per photograph, stopping the process after scanning only the previously best-selling 225,000 out of the 11 million photographs. It has been estimated that if Corbis scanned every image in the archive it would take 25 years (Boxer in Puglia 2003). This can stand for a common experience repeated over again in libraries and archives worldwide. Questions arise, such as, ‘Which photographs will be selected for digital preservation? How carefully will it be done? What kind of facsimile will result?’ (Sassoon 2004). What kind of access to contents will be afforded by the kind of taxonomy and catalogue used? What will be the fate of those parts of the archive left only in physical form? (The non-digitised parts of the Bettman Archive are now stored in a disused mine where they exist in a cryogenic state at minus 20 degrees centigrade.) (Lager Vestberg 2008: 49–65) It is not difficult to see that in these processes of acquisition
and selection a kind of digital ‘editing of history’ is at stake. This can be understood as one facet of a wider predicament, sometimes referred to as a ‘digital dark age’, in which, as we move from one computer-operating system or storage medium upgrade to another, unprecedented amounts of information are being lost or trapped in obsolete formats.

Much of that which has been discussed in this chapter remains in flux. Although developments to date can be mapped and positioned socio-politically, we can anticipate further shifts as technological innovation and economic imperatives inter-relate with social change.