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Critical Imprints

Volume III

DEPARTMENT OF ENGLISH
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Editor's Note

The third volume of *Critical Imprints* focuses on the nineteenth century, a period of rapid and sweeping changes in both India and Britain. Most, though not all, of the articles explore a variety of encounters between the two nations, often making use of resources outside the strict confines of literary studies. Many of the contributors are young scholars in their respective fields. This is in keeping with one of the founding aims of this journal.

This volume is dedicated to the memory of Professor Jasodhara Bagchi, who fostered an abiding interest in nineteenth century studies in the minds of generations of students in Kolkata.

Aditi Das Gupta
March 2015

Contents

The Aftermath of Digitization:

Studying the Synecdochic Photograph from the British Raj

VINAYAK DAS GUPTA

In *Camera Lucida,* Roland Barthes describes the photographic image as one invested with an 'evidential force'; it bears testimony to its subject and the time when the photograph was taken.[1] In this article, I would like to argue that in the second half of the nineteenth century, a particular kind of photograph appeared that attempted to capture the essence of its subject. The image spoke not only of what lay within its frame, but attempted to speak for the body of which the subject was representative. I would like to refer to this image as the synecdochic photograph. This article situates this specific form of the photograph in the context of the empirical discourse practised in South Asia at the time, and examines its role in the state-forming machinery of the colonial enterprise. The paper continues to assess the possibilities of analyzing digital collections using the synecdochic photograph; it argues that this form of the photographic image allows for an atypical mode of examination that is separate from other computerized image analysis techniques. The proposed axioms are illustrated through examples from *The People of India* volumes published between 1868 and 1875 by John Forbes Watson and John William Kaye.[2]

The past decade has seen a steady increase in digitization activities across the world. Both academic institutions and organizations involved in the preservation of cultural artefacts

have committed to this for two reasons—preservation and access.[3] While the pressure of technology may lead to questions on the viability of the digital for preservation, digitized material does indeed provide a wider range of access methods (access over internet, portability etc.) to enthusiasts and scholars alike. The process of digitization involves several steps; the artefact—whether it is a document, a photograph or an object of three distinct dimensions—is committed to the digital space using a digitizing machine, such as a digital camera, a document scanner, or a 3D scanner. Archives and cultural institutes follow careful, standardized guidelines while engaging in this process.[4] The digital copy is an impression of its original; while lacking its physical peculiarities, it provides a remarkable range of access methods. Consider, as an example, the Google Art Project: Google has partnered with hundreds of museums, cultural institutions and archives to host more than 40,000 high-resolution images of works ranging from oil on canvas to sculpture and furniture.[5] The average user, while connected to the internet, is able to explore these works of art sitting anywhere in the world. The digital copy brings with it a set of philosophical questions; these questions are, however, not too dissimilar from ones posed at other moments of technological change—the first printed book, the very first photograph or the pioneering shellac disc. How do we separate content from form? The digital copy lacks a cognizable shape, form or lineament. The digital collection is an assimilation of file names, and to recognize the individual objects, we must first be able to identify them. Consider a batch of scanned images that have been attributed a series of computer generated file names; without viewing the individual instances of those scanned images, we are unable to distinguish between them. Is there an experience of the digital entity beyond that moment of access? To provide access to the object, we must first be able to describe it. The digital photographic image, in a

similar manner, requires descriptives to be cognizable. The digitized photograph, in fact, has two layers of descriptives—the metadata and the caption. The metadata describes its ancestry, its taxonomy and its materiality; the caption describes its content. The digital archivist is faced with the considerable task of enveloping the object with tags and markers, making the object cognizable and thus creating its metadata. The access available to the digital object is often limited to what can be verbalized about the object. Then again, beyond preservation and access, the digital object allows computerized methods of analysis, thus augmenting the traditional modes of criticism that students of literature practise.

To locate the synecdochic photograph it is, first, important to examine the relationship between imperialism and photography. As British interests in India grew from commercial to political,[6] the government found it prudent to know more about the land it had colonized. Imperialism and photography intersect in the second half of the nineteenth century in colonial India. Both are concerned with possession—the former with territory and the latter with its subject. The need for systemized and structured knowledge became paramount to the state as it attempted to know and in turn control the colonized land and its people. In the eighteenth century, the conception of knowledge was rooted to the empirical experience of the world. As Matthew Edney explains, the acquisition of knowledge through experience took shape in the form of samples and specimen. He writes:

> In India, as elsewhere, the British assembled vast collections of mineralogical, botanical, and zoological specimens (some alive). In the human arena, the study of dress, society, tools and architecture was complemented by the collection of as many artifacts as possible, including manuscripts. Captain James Blunt even attempted to

> '*collect* a small specimen' of the language of a hill tribe in Ellore, but because his 'only method of *acquiring* this [specimen]' was to point to various objects, he was able to define only ten word pairs. The specimen was the fetish of the traveler. The result was the bewildering profusion of animals and birds shot in the hunt, jewelry, insects, and a myriad of other curios which were donated to the Asiatic Society in Calcutta or which found their way to the India Museum in London.[7]

The collected samples were housed within the walls of the museum; the specimen became the representative of the whole. The process of collection necessitated the physical extraction of the sample from its environment and consequent re-contextualization within the museum; this re-contextualization occurred through descriptive notes as the curator attempted to create relationships within the exhibited specimen, creating complex taxonomies.[8] While this was feasible for certain kinds of documentation, it proved difficult for objects that could not be removed from their environment. Terrains, buildings, monuments of historical interest, racial profiles and ethnic groups, amongst others, needed a different mode of investigation that could not be achieved through a mere collection of samples. Towards the end of the eighteenth century, the government attempted to document these through representations created by painters and draughtsmen.[9] These were often found to be too inaccurate or subjective for the purposes of scientific investigation towards which the state aspired. The emergence of photography was seen as a cure for this and the growth of photography in India[10] was significantly indebted to an active government sponsorship.

In 1861, Alexander Cunningham[11] presented a memorandum to the British government which expressed the need for the

knowledge and the custody of Indian antiquities for the success of the colonial project. Cunningham also underlined the importance of a systemized collection of evidence through both textual and visual means. He wrote, 'everything that has hitherto been done in this way has been done by private persons, imperfectly and without system.'[12] The system Cunningham envisaged was different from that of the self-fashioned pioneer exploring the virgin colonial territories. The relationship between individual exploration and state-sponsored projects is complex: the earliest British officers and civilians who came with a scholarly interest in India would engage in their studies in an individual capacity. Their work would subsequently be appropriated by the state which would in turn give shape to the earliest models of study of Indian heritage through Western scholarship. The beginnings of the study of Indian antiquities may be found in an earlier tradition of landscape painting. The career of James Fergusson[13] can be seen as the juncture where earlier modes of picturesque representation met scholarly documentation. Fergusson travelled extensively and undertook an exhaustive study of the buildings and monuments of India. He explored, as many had done before him, not in search of the picturesque, but in search of scholarly knowledge. The information he gathered during his travels would be the subject of his writings, published as the *History of Indian and Eastern Architecture* (1876). Fergusson placed considerable weight on his own powers of observation. His insistence on his exactness seems to indicate his need to distinguish himself from the travelling artists who came before him; his faith in the accuracy of his own delineations served to distance him from the likes of William Hodges and Thomas and William Daniell. Thus, it is not surprising that Fergusson was completely invested in the photograph as the ultimate form of documentation. He was convinced that, 'photographs tell their story far more clearly than

any form of words that could be devised…[forming] by far the most perfect and satisfactory illustration of the ancient architecture of India which has yet been presented to the public.'[14] Fergusson's faith in photography is resonated through the words of Gaston Tissandier, who gave primacy to photography over the painted picture:

> Again, what resources in the hands of an archaeologist are the views of buildings in distant countries. The marvels of Athens and of Rome, the inimitable richness of the monuments of India, the bold architecture of Egyptian temples, can be kept in his portfolio, not modified and disfigured by an untrustworthy pencil, but such as they are in reality with their beauties, their imperfections, and the marks of destruction which time has engraved upon them. Photographic prints are mirrors from which are reflected the banks of the Nile and of the Indus - the buildings and the landscapes of all the countries through which the camera has passed.[15]

A memorandum in 1869 on 'The Illustration of the Archaic Architecture of India' proposed the guidelines for a project on visual documentation.[16] It hailed the photograph as the most complete form of documentation for architecture while noting that coloured drawings were essential for capturing the finer details. While this memorandum concerned itself with precision, its aim was to conceptualize the entire field of Indian architectural study within an illustrated exercise. The final product of such a project would be a panoptic one while the monument remained on site. In theory the proposed memorandum sought completeness, in practice it fell short.

The camera captured whatever was placed in front of it. It was unable to omit, unable to censor; in a sense, it seemed the perfect

tool for documentation. However, the camera could only capture that which was present: a scene and moment chosen by the photographer from a million others. John Berger writes:

> Every image embodies a way of seeing. Even a photograph. For photographs are not, as is often assumed, a mechanical record. Every time we look at a photograph, we are aware, however slightly, of the photographer selecting that sight from the infinity of other possible sights.[17]

From different angles to different expressions, what the photograph captures is, at best, a part of the subject within its frame. The synecdochic photograph is similar to the samples and specimen preserved in the museum; it exists to illustrate the larger whole. The essential nature of the photograph is based on the unsteady notion that the imprint of an object or a human being is illustrative of the entity it is a part of. While a case could be made that the physical specimen guarantees its own authenticity, the photographic image is neither a complete representation of its subject, nor an illustration of the greater body. The purpose of the image, in this context, is grounded in a false logic. The synecdochic image also requires contextualization, or verbalization, to describe that which was not present within the frame. This is a particular trait of the synecdochic photograph. The textual descriptive accompanying the image is reminiscent of the annotations produced in the museum to describe the sample. The metaphor of the museum specimen rings true for the synecdochic image.

An example of this kind of photograph may be seen in *The People of India* volumes. These volumes, published between 1868 and 1875, contain 468 annotated photographs. The photographs were taken by a number of civilians and officers in the service

of the British empire. The annotations were produced subsequently, again, by a number of people. The photographs themselves cover a range of subjects, from individuals (deemed worthy of mention in such a publication), to ethnic groups, tribes and castes. The photographs, numbered and labelled, are meant to be read alongside their annotations. Each annotation has at least one accompanying image (sometimes multiple images) and places its subject within neat categories. The photographs are printed within oval frames, their subjects captured at close range; the portraits of individual representatives are stripped of props that would otherwise be associated with studio portraits of the time. The focus, quite emphatically, is on their physical characteristics, and the details of their attire. There are a few examples of photographs containing groups, mostly depicting tribes within their daily lives and environment. The book categorizes the captured subjects within certain criteria—religion, caste and location. The reductive nature of ethnographic studies is apparent as the tribes and castes are further classified based on their nature: the Nagas of Cachar are labelled as a 'marauding tribe', the Kookies of Cachar are described as robbers and so on. The reductive and disturbing nature of this work was recognized by Syed Ahmed Khan,[18] who, in a letter addressed to the Aligarh Scientific Society, in 1869, wrote:

> In the India Office is a book in which all the races of India are depicted both in picture and letterpress, giving the manners and customs of each race. Their photographs show that the pictures of the different manners and customs were taken on the spot, and the sight of them shows how savage they are—the equal of animals. The young Englishmen . . . desirous of knowing something of the land to which they are going . . . look over this work. What can they think, after perusing this book and looking

> at its pictures of the power or honour of the natives of India? One day Hamid, Mahmud, and I went to the India Office, and Mahmud commenced looking at the work. A young Englishman . . . came up and after a short time asked Mahmud if he was a Hindustani? Mahmud replied in the affirmative but blushed as he did so, and hastened to explain that he was not one of the aborigines, but that his ancestors were formerly of another country. Reflect therefore, that until Hindustanis remove this blot they shall never be held in honour by any civilised race.[19]

In the 'Little History of Photography', Walter Benjamin wrote that 'The peeling away of the object's shell, the destruction of the aura, is the signature of a perception whose sense for the sameness of things has grown to the point where even the singular, the unique, is divested of its uniqueness—by means of re-production.'[20] For Benjamin this may have suggested a revolutionary moment in history; for Khan it betrayed a representational uniformity that was potentially damaging. While much of these volumes deals with ethnic groups and tribes—their habits, customs, criminal tendencies, amenability to education etc.—there exist photographs (and textual descriptives) of some individuals. These individuals are named and represented as exemplars of the land. It is not surprising that most of those represented were important to the colonial enterprise in some manner or form. To cite an example, Cheboo-lama, the then prime minister of Sikkim, is afforded a photograph as he is deemed an important ally to the British government. It is important to remember that these volumes were published only a decade after the 1857 Uprising. The need for political allies was paramount at this juncture for the British government. These volumes not only served as an ethnographic study but also, in a subtle manner, exemplified those who had remained loyal

through those politically turbulent years.

How do we, as spectators of the photograph, read the image? The photographic image bears a likeness to its subject (icon) and is a physical extension of it (index). The photograph possesses an evidential force: it cannot be argued that what it captures, through the process of light falling on a photo-sensitive plate, was not there. The readings of a photograph are dependent on the layers of recognition that happen in the process of viewing the image. The recognition of the indexical contiguity is directly related to the spectator's familiarity with the photographic subject. As with all forms of art, the sensibilities and the sensitivity of the viewer guide how the art is absorbed. Photography in the nineteenth century in India found commercial success within the subcontinent and in Europe. Photography from the Indian subcontinent, at its inception, concerned itself with subjects that were varieties of the exotic and the unknown, yet within a recognisable (in terms of European aesthetics) framework.[21]

The evidential nature of the photographic image does not guarantee the familiarity of the subject to its viewer. Photographs depicting space (landscapes, architecture) and those with human subjects (portraits, ethnographic projects) were largely unfamiliar to their predominantly European viewers. Readings of a photograph rely on its viewer and the viewer's familiarity with the subject. The affect of the historical image, similarly, lies in the recognition of the layers of familiarity that it offers. Unlike Kristeva's description of Christian paintings,[22] the subjects in the images captured in the Indian subcontinent have no histories and no epic for an European audience. A tree would be easily recognised within the image; however, if the tree is indigenous to the Indian subcontinent, the particular species of it, would perhaps escape an European eye. In a similar fashion, terrains captured by Samuel Bourne on his excursions to the Himalayas, would offer a scenic panorama, perhaps wild and untamed; the

landscape is both familiar (in terms of aesthetic framework) and not familiar (in terms of specific locations). The interest that the viewer has in the image is dependent on the layers of familiarity that it offers. An extension of this recognition would be in the comprehension of the symbolic affect of the photographic image. Bounded within history, some photographs may possess meanings beyond the indexical: the lone man in front of a line of tanks becomes the symbol of the events that unfolded in Tiananmen Square in 1989. These offer a second layer of reading for the viewer. If the European audience in the nineteenth century is separated by space, we, at this juncture, are separated by time. Towns and cities have developed (or disappeared), practices have changed and the people in these historical photographs remain only in memory; what can we articulate about these people today? How can we speak of these images more than a hundred years since they were taken?

Current research in the humanities has placed importance on the production of thematic collections for scholarly research. Carole Palmer describes the need for such an approach in her essay, 'Thematic Research Collections' and writes:

> The creators of thematic collections are constructing research environments with contextual mass, a proposed principle for digital collection development that prioritizes the values and work practices of scholarly communities (Palmer: 2000). The premise behind the principle is that rather than striving for a critical mass of content, digital research libraries should be systematically collecting sources and developing tools that work together to provide a supportive context for the research process. For libraries, this approach to collection development requires analysis of the materials and activities involved in the practices of the different research communities served (Brockman et.

> al. 2001). Researchers are able to more readily construct contextual mass for themselves through highly purposeful selection and organization of content directly related to their specialized areas of research.[23]

Thematic collections produce a focused approach to research allowing individuals to concentrate on what is important to their study. To build thematic collections it is necessary to identify common links between the digitized objects. These links or themes can be created through computerized methods of analysis. Popular methods of computerized image analysis and image organization within the collection happen in two ways. The first is an analysis of the photograph itself; the second is an analysis of its metadata. The digitized image is made up of pixels. Computerized analysis of images makes it possible to detect objects including faces and human figures, to gauge the depth in a photograph and to explore the source of light and shadow amongst others.[24] The system used in all these forms of image analyses utilizes the intensity of each image pixel, complex algorithms on digital geometry and computer vision. The combination of multiple pixels forms a shape and the computer is taught to recognize it through what is termed machine-learning. In turn, the computer looks for a similar pattern in every subsequent image. This analysis is limited to what is present in the frame. In other words, the information gathered through the analysis of the pixels can reveal only what is in the image, and not what lies outside the frame. The second method involves an inspection of the metadata of the object. The archivist wraps the naked digital artifact in an envelope of tags and markers, thus making it cognizable for the machine. This is the metadata of the image, aimed to locate and describe the object. In a sense, the metadata of the object mirrors the traditional catalogue. The categories described within the catalogue are

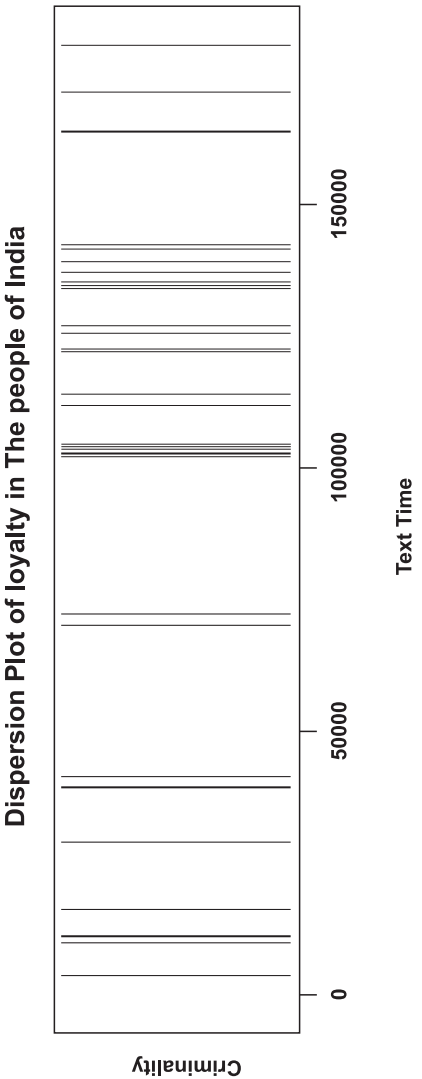
translated in the digital medium as metadata. Metadata standards establish a common understanding of meaning or semantics of data. This aids proper use and interpretation of the data by its owners and users. To describe an image there exist several standards—CDWA, VRA Core, NISO MIX etc. The metadata of the image allows the archivist to arrange the objects in the collections based on the tags that have been attributed to them. An excellent example of collection building for photographs through metadata is found in the Photogrammar project.[25] It extracts certain metadata fields to create visualizations for the photographic collections. However, this form of arrangement is limited to what the archivist can verbalize about the object, and for historical images it is difficult to read them within the conditions of the time. To gather contextual or paratextual data, a separate mode of analysis is required. Readings of the photographic image are not limited merely to the image. Victor Burgin proposes that it is very rare to encounter an image *in use* that is not pervaded by language in some shape of form. He argues that, 'even the uncaptioned "art" photograph is invaded by language in the very moment it is looked at: in memory, in association, snatches of words and images continually intermingle and exchange one for the other'.[26] In terms of photography, the caption attempts to verbalize that which the image cannot disclose; it seeks to draw the viewer's gaze to what is relevant to the photographic image. The combination of text and image provides a richer semantic understanding. The caption however is faced with its own set of peculiar problems. The explanatory text accompanying the photographic image either precedes or succeeds the photographic moment; either the photograph is born from the text, or (and in the case of most early photography) is a reaction to the photographic image. For the archival image, the caption may be attributed by the curator at the time it is committed to the digital archive or it may have

been inserted at some intermediary point in its history. This intermediary caption is of archival value as it may locate the image within the larger discourse of its history; the provenance of the caption determines its archival significance.

Computerized analysis of text is comparatively easier than the analysis of its pixels: it allows us to ask more human questions to the collection as a whole. The processing of text is done through a combination of textual markup (where words and phrases are identified to the machine) and term extraction (where the marked up words are extracted through computerized methods).The textual descriptive of the synecdochic image is suitable for text processing. The descriptive is longer than a caption (which might consist of only a few words) and is, in turn, attached to the image. Analysis of the descriptive, consequently, allows an examination of the photograph. Consider an example from *The People of India* volumes: if we were to pose a question to the collection regarding which tribes, castes or individuals were loyal, or politically useful to the British government in the nineteenth century, an analysis of the pixels of the images would reveal very little. However, an analysis of the textual descriptives may help to extract the images that contain political affiliations. Each annotation is connected to an image (at times multiple images) and if it were possible to locate the points where political affinity is described within these passages, it would make it possible to locate those particular images. Multiple methods exist to analyze text for the extraction of patterns and groups of words. For large datasets, topic modelling would be an ideal method. However, the length of the annotations does not allow for such a statistical method of analysis: the results derived through topic modelling would be misleading. To counter this, a different approach is presented; the investigation is carried out through a method of close-reading. To create such a system, the annotations are read closely and words and phrases that relate

to the concept of political loyalty are marked up through XML. Next, every annotation is pasted into a single text file. A computer program is written[27] that extracts the XML tags in the annotations and lists them in the positions that they occur with reference to the entire text (all the annotations taken as a whole). Figure 1 is a visualization of the points where the concept of political loyalty appears in the collection. Each spike has a unique number; the number corresponds to the word-token (each token is numbered) as it appears in the text. Working backwards, each location is then referred back to its attached image, and in turn the attached images are extracted. This analysis provides an interesting observation: the extracted images, with few exceptions, are largely of individuals rather than the tribes and castes that the volumes profess to document. In effect, it re-enforces the assumption that the inclusion of individuals in these volumes—exemplars of their regions—was the result of a politically motivated agenda.

The above example is one illustration of the powers of text processing applied to the synecdochic image. Other concepts may be extracted in a similar manner. Other forms of visualization (such as spatial mapping) may be created through a similar method of markup and extraction. The method this paper describes not only creates thematic readings for the digital image collection but also allows a more nuanced search and retrieval process. Abstract concepts, and historical contexts, that may not be in the metadata, become searchable within the image catalogue using this system. The little that we can articulate about the photographic image is derived from an understanding of the history of the object. How we proceed to classify the image, place it within numerous other photographs is dependent on how we recognise the photographer, the period, the photographic plate, photographic process and the photographic context. The history of the object is vital in our attempts to place it within the


Dispersion Plot of loyalty in The people of India
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structures of a digital archive. A problem that is persistent in issues of digital curation, specifically with historical artefacts, is related to the provenance of the caption. The inherited caption re-inserts the image into the larger discourse of history. The synecdochic photograph, and its inherited caption, allow us to locate it within the history of the colonial empire, and offer readings that may not be apparent through traditional forms of computerized analysis.

NOTES

1. Roland Barthes, *Camera lucida: Reflections on Photography* (New York: Hill and Wang, 1981), 89.
2. John Forbes Watson, John William Kaye, and Meadows Taylor, *The People of India: A Series of Photographic Illustrations, with Descriptive Letterpress, of the Races and Tribes of Hindustan: Originally Prepared Under the Authority of the Government of India, and Reproduced by Order of the Secretary of State for India in Council* (London: India Museum, 1868).
3. Preservation and access are two key terms in Digital Humanities.
4. Guidelines are available from cultural institutions like the British Library.
5. Google. Google Art Project, 'Accessed October 14, 2014, https://www.google.com/culturalinstitute/project/art-project
6. While British interests in India were always commercial, I refer to the transformation of the British East India Company to a colonizing power.
7. Matthew H. Edney, *Mapping an Empire* (New Delhi: Oxford University Press, 1999), 40.
8. Ibid. 40.
9. Following the arrival of the first British artist William Hodges in 1780, a steady stream of painters and draughtsmen visited India in search of the picturesque. In 1847, the Bombay branch of the

Royal Asiatic Society had formed a commission to list and document the cave temples of Western India. William Armstrong Fallon, a landscape painter was appointed to make accurate representations. However, it was soon understood that due to the size of the land, it would take an impossible amount of time and labour to accurately complete the job. See *Public Despatches to Bengal*, no. 1 of 1847, 27 January 1847, IOR/L/P&J/3/1021.

10. Christopher Pinney, *The Coming of Photography to India* (London: British Library, 2008), 17.
11. Alexander Cunningham was a British army engineer with the Bengal Engineer Group. His interest in archaeology would see him appointed as the archaeological surveyor to the government of India. He founded what later came to be known as the Archaeological Survey of India.
12. Charles Canning, 'Minute by the Right Hon'ble the Governor General of India in Council on the Antiquities of Upper India dated 22nd January 1862', in Cunningham, Preface to *Four Reports made during the years 1862-63-64-65:I* (Simla: Government Central Branch Press, 1871).
13. James Fergusson was a Scottish architectural historian who took an active interest in Indian history.
14. James Fergusson, First Report, December 26, 1882, in *Preservation of National Monuments: Reports of the Curator of Ancient Monuments in India, parts 1-3. 1881-1884* (Simla: Government Central Branch Press, 1882).
15. Gaston Tissandier, *A History And Handbook of Photography* (London, 1878), 318-19.
16. John Forbes Watson, *Report on the illustration of the Archaic Architecture of India* (London: India Museum, 1869).
17. John Berger, *Ways of Seeing* (London: British Broadcasting Corp, 1972), 10.
18. Syed Ahmed Khan (1817-1898) was a philosopher, social activist, and pedagogue.
19. Christopher Pinney, *The Coming of Photography to India* (London: British Library, 2008), 52.

20. Walter Benjamin, 'Little History of Photography' in *Walter Benjamin: Selected Writings,* vol. 2, ed. Michael W. Jennings, Howard Eiland and Gary Smith, trans. Rodney Livingstone et al., (Cambridge, Mass., and London: Harvard University Press, 1927-1934), 519.
21. Photography borrows its aesthetic frame from earlier traditions of painting. The picturesque mode is evident in the works of Samuel Bourne, for example. Studio portraits mirror portrait paintings, including the array of props that accompany the human subject.
22. Julia Kristeva, *Desire in Language: A Semiotic Approach to Literature and Art* (New York: Columbia University Press, 1980), 211.
23. Carole Palmer, 'Thematic Research Collections,' *A Companion to Digital Humanities*, ed. Susan Schreibman, Raymond G. Siemens, and John Unsworth. http://www.digitalhumanities.org/ companion/, Accessed: 24th March, 2013. Web.
24. See Kevin Karsch, Varsha Hedau, David Forsyth, and Derek Hoiem, 'Rendering Synthetic Objects into Legacy Photographs.' *ACM Transactions on Graphics,* (2011), http://web.engr.illinois.edu/~dhoiem/publications/sa2011_relighting_lowres.pdf
25. 'Photogrammar', accessed October 14, 2014, http://photogrammar.yale.edu/
26. Victor Burgin, *The End of Art Theory: Criticism and Post-Modernity* (Atlantic Highlands, NJ: Humanities Press International, 1986), 51.
27. The computer program used to create the examples is R.

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