

© Malcolm Park – Excerpt from 2001 PhD Dissertation:  
*Ambiguity, and the engagement of spatial illusion within the surface of Manet's paintings*

### **Appendix 3**

#### **AERIAL BALLOONS AND PHOTOGRAPHY: Text**

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The proposals made in Chapter 5 that a number of the view fragments in *View of the 1867 Exposition Universelle* and *The Burial* had been made from aerial balloons and possibly recorded as photographs raise as many questions as provide explanations. And although the clear correlation of computer-generated views from elevated viewpoints with areas of both paintings enables the proposals to be more than speculation, it is acknowledged that the lack of photographic evidence limits their veracity. The histories of aerial ballooning and photography above Paris provide a limited chronological framework against which the dating of the paintings may be checked, but the evidence is at times contradictory. And in the context of such contradictions, and with such extensive archival photographic records of the period, the dearth of visual evidence of aerial photographs is intriguing.

Part of the reason for that may relate to the claims and counter-claims of photographers seeking notice and fame. And one of the most competitive, but also influential, players in the worlds of both aerial ballooning and photography was Nadar (pseudonym for Gaspard-Félix Tournachon, 1820–1910), whose colourful life and exploits were matched by his colourful, and often witty, prose. A close and loyal friend of both Daumier and Baudelaire and, importantly, a friend of Manet, Nadar seems to have epitomised the vitality and creative energy of the times in Paris, and was at the forefront in many of the developments made in both fields. The most successful portrait photographer in Paris in the late 1850s and 1860s, Nadar also invested in ballooning projects which were financial disasters. In many ways the details of Nadar's aerial photographic endeavours, their datings and circumstances, are critical in terms of both understanding the history of aerial photography in Paris and providing points of reference for the proposals made here.

In spite of contradictory information, the very first exposure of an aerial photographic image on a glass plate seems to have been achieved by Nadar, when accompanied by one of the Godard brothers<sup>1</sup> and after many failures, from a *ballon captif*<sup>2</sup> above Petit-Bicêtre in the Bièvre valley in late November, or early December, 1858. The details of Nadar's, at times comical, efforts to achieve that image are described in his memoirs of photography, Quand j'étais Photographe.<sup>3</sup> The occasion had been preceded by Nadar's application on 23 October for a patent for the mapping of land from a series of overlapping aerial photographs<sup>4</sup> and by an announcement in Le Monde Illustré of 30 October, stating:

La photographie réalise chaque jour quelque nouveau progrès, c'est-à-dire qu'elle opère continuellement de nouvelles merveilles. Hier, c'était des images photographiques des astres qu'elle soumettait admirablement amplifiées à l'étude de la science, aujourd'hui, c'est un boulet en plein vol dont elle saisit l'image. Que sera-ce demain? M. Nadar, qui a pris une si large part dans ces découvertes, se charge de nous l'apprendre, mais attendons quelques jours. Son ballon se prépare, et ce sera du haut des airs qu'il photographiera les aspects les plus saisissants, lacs, paysages, forêts, de nos sites et de nos cités. On avait des vues prises à vol d'oiseau que l'imagination seule avait entrevues, nous aurons cette fois des vues réelles, puisqu'elles ne seront autres que la nature se reflétant elle-même sur la plaque où elle vient se décalquer. Voilà aujourd'hui la grande préoccupation de la science et de l'art.<sup>5</sup>

Afterwards, the achievement was noted by the editor of The Photographic News in its issue of 3 December, 1858.<sup>6</sup> Even Henry Negretti, who in 1863 erroneously<sup>7</sup> claimed to be the first to have made an aerial photograph from a balloon ascent over London, acknowledged Nadar's flight, but claimed that "Messrs. Nadar and Godard... did not succeed in obtaining sufficient steadiness for their purpose."<sup>8</sup> In a rejoinder contesting Negretti's claims, Nadar stated that "The dates of my patents prove it, on the one hand; and, besides, I myself obtained, in spite of most detestable materials, results (a simple positive upon glass, it is true), above the valley of the Bièvre, at the beginning of winter in 1858"<sup>9</sup> Unfortunately, this exposed plate no longer exists. The complete technical aspects of the camera that Nadar used are not known, but the equipping of the balloon basket and the type of camera shutter were described by Nadar in his memoirs:

Au cercle de l'aérostas est appendue la tente, imperméable au moindre rayon diurne avec sa double enveloppe orange et noire, et sa toute petite

lucarne de verre jaune aphotogène qui ne me donne que juste la lueur nécessaire. – Il fait chaud là-dessous, pour l'opérateur et pour l'opération. Mais notre collodion et nos autres produits ne peuvent s'en douter, plongés dans leurs bains de glace.

Mon objectif verticalement amarré est un Dallmeyer, c'est tout dire, et le déclic de la guillotine horizontale que j'ai imaginée (– encore un brevet! –) pour le découvrir et le réopturer d'un trait, fonctionne impeccablement.<sup>10</sup>

The earlier failures experienced by Nadar had been caused by the hydrogen sulphide, present in the coal gas used for the balloon, desensitising the collodion plates which had been sensitised whilst in the balloon.

Notwithstanding a beginning in 1858, archival evidence of the developments in aerial photography, over Paris at least, during the subsequent decade surprisingly does not exist. A reference to that development and Nadar's role in it can be seen in Honoré Daumier's lithograph, *NADAR élevant la Photographie à la hauteur de l'Art* (1862, Fig.J2), published in *Le Boulevard*<sup>11</sup> some three years after Nadar's ascent above the Bièvre. This is the same year that Manet produced his first lithograph, *The Balloon* (1862, Fig.J1), depicting the festivities of the Fête de l'Empereur on 15 August at the Esplanade des Invalides,<sup>12</sup> and the etching as a proposed design for an album frontispiece (Fig.16), with its balloon depicting, as proposed by Nancy Locke, the first balloon flight of 1783 above the Butte aux Cailles.<sup>13</sup> Nadar's own endeavours increased dramatically in the 1860s with the construction in 1863 of *Le Géant*,<sup>14</sup> a large balloon twenty-two metres in diameter, and its first two flights undertaken from the Champ-de-Mars were made in the midst of great public interest in October, 1863 (Fig.J3). The second of these, on 18 October, ended in disaster with a crash landing near Neuberg.<sup>15</sup> Undeterred, Nadar made further flights until financial problems forced its sale in 1867 during the time of the Exposition Universelle. There were, however, many other balloons flown by many well known *aéronautes*, including Henry Giffard, Louis, Eugene, and Jules Godard, Charles and Camille Flammarion, James Glaisher, Wilfred de Fonvielle, and Gaston Tissandier. And although Nadar's *Le Géant* had been the largest balloon in the skies of Paris in 1863, a balloon constructed by the Godard brothers in 1864, *L'Aigle*, was much larger, with a diameter of thirty metres, confirming that the retrospective singling out of *Le Géant* as

the balloon of the Parisian skies may be symbolically apposite, but does not reflect the actual circumstances.

1867, the year of the Exposition Universelle held at the Champ-de-Mars, was a busy year for balloon flights above Paris. Flights were made by the Godard brothers from the newly re-opened Hippodrome at Place d'Eylau, with the first flight on 9 June, Ascension Day, and five others in June and July.<sup>16</sup> During the second of these flights, the balloon flew over the Exposition site on its way to Mainville in the Senart forest, and on a later undated flight it flew over Grenelle and Vaugirard in the early stages of a long flight to Angoulême. Even with no evidence of photographs, such flight paths could account for viewpoints SP4 and SP5 in the proposals for *View of the 1867 Exposition Universelle* in Chapter 5(B). Apart from the flights providing a free spectacle for the public on the ground, ballooning itself was also made more accessible to the public by means of paid ascents in securely restrained *ballons captifs*. During the Exposition, the Esplanade des Invalides became an important venue for balloons, with a fenced enclosure used as an amphitheatre for the activities. From that site *Le Géant* made three flights between June and August, the first while still owned by Nadar, and a smaller balloon, *L'Impériale*, was installed there as a *ballon captif*. The activities of either of these balloons above the Esplanade could account for viewpoint SP6 in the proposal for *View of the 1867 Exposition Universelle*, and the flight paths of two of the three ascensions by *Le Géant* could also account for the line of elevated viewpoints proposed for *The Burial* in Chapter 5(C).<sup>17</sup> But although the written descriptions of the flight made on 23 June are contradictory and provide tantalising possibilities for the proposals, no direct evidence of [an ascent](#) over La Glacière is described.

Another ballooning event of significance in 1867 was the establishment by Henry Giffard of a *ballon captif* on a site at No.42 Avenue de Suffren, adjacent to the Exposition on the Champ-de-Mars, for a period from 26 September to the close of the Exposition in early November (Fig.J4).<sup>18</sup> Such an installation demonstrates that, rather than being *Le Géant* as has been previously claimed,<sup>19</sup> the balloon with the cable seen in the upper right corner of *View of the 1867 Exposition Universelle* is clearly Giffard's

*ballon captif*. As noted in Chapter 5(B), because ascensions were never made in windy conditions or were quickly aborted whenever winds arose, the balloon would not have been seen in a position above the Palais de l'Exposition with its angled cable as depicted by Manet. Its inclusion in this manner points to the fact that the painting's composition, with Avenue de Suffren out of frame to the right, had been resolved prior to the installation of the *ballon captif* on 26 September. Unable to paint the balloon directly above its anchor point as would have been seen, Manet had set it above the Palais de l'Exposition with its angled cable signalling the position of the installation beyond the southern boundary of the Champ-de-Mars site.

With such exposure during these years of the 1860s, ballooning had captured the popular imagination, and the public perceptions are exemplified in an article responding to the move of the *ballon captif* from the site at Avenue de Suffren to the Hippodrome at Place d'Eylau, where it opened on 9 May, 1868. In an article in Science pour tous of 13 June, 1868, it was noted that

Le ballon qui a si vivement excité la curiosité pendant l'Exposition a changé de domicile; il habite maintenant l'Hippodrome et les Parisiens le voient presque tous les jours monter et descendre au-dessus de l'Arc de triomphe.

On a été plus de dix jours cependant sans apercevoir ce gros globe dessiner sa silhouette sur le ciel. Ceux qui ont l'habitude de marcher le nez en l'air, et ils sont plus nombreux qu'on ne le pense, commençaient à s'inquiéter sur le compte du ballon captif. Il manquait évidemment à la population des quais, des Ternes, du Gros-Caillou, de Montmartre, Batignolles, etc. Sa perspective fait bien à côté du dôme de l'Église russe, de la flèche de Saint-Augustine. Le ballon est presque passé à l'état de monument public, et nous sommes ainsi faits que notre œil est maintenant choqué lorsqu'il ne le rencontre pas à l'horizon.<sup>20</sup>

An ostensibly important development in aerial photography was also made in 1868 by Nadar from the Hippodrome *ballon captif*, when he successfully photographed the Étoile area around the Arc de Triomphe. On that occasion, at least two, and possibly three, glass plates were exposed, with eight images to each plate (Fig.J6).<sup>21</sup> The event was reported with an article, 'Nadar heureux' in Le Moniteur de la photographie on 18 July,<sup>22</sup> and noted to have taken place two days previously, that is probably 16 July, and later reported again with an article of the same title in Le Petit Figaro on 31 July.<sup>23</sup> The dating of the event has been subsequently confused with the '1858' dating of a print made

of one of the images which had been exhibited in the 1889 Exposition (Fig.J7),<sup>24</sup> and by Nadar himself, who, in his memoirs, stated

Dès les premiers jours du printemps suivant, – 1856, – j'obtenais à premier essai cette fois, avec une douzaine d'autres points de vue, un cliché de l'avenue du Bois de Boulogne, avec l'amorce de l'Arc de Triomphe, la perspective des Ternes, Batignolles, Montmartre, etc.

Ce cliché affirmait *premier*, malgré son imperfection, la pratique possibilité de la Photographie aérostatique: c'était avant tout ce que j'avais visé.<sup>25</sup>

With the opening of the *ballon captif* facility at the Hippodrome on 9 May, 1868, and the reported dating of of his achievement to be 16 July, no earlier dating than 1868 is possible for the event. And if the fanfare over such an achievement was justified, then it also may have been the very first use of a multi-lens camera in this way. On that basis, any similar multiple imagery of the Panthéon and Val-de-Grâce areas, as proposed to have been used by Manet in *The Burial*, or for that matter single images as proposed for *View of the 1867 Exposition Universelle*, could only have been available to Manet after that time.

Such a conclusion may not, however, tell the full story. In the midst of all the ballooning activity and photographic developments there are a number of aspects which raise some questions and highlight some anomalies. First, are Nadar's obvious errors in dating the event of 1868 as 1856 and the dating of an 1868 image as 1858, unintended oversights, attempts by Nadar to stake a claim in a rewritten history, or, as suggested by Jean Prinnet and Antoinette Dilasser, to connect it to his patent taken out in 1858?<sup>26</sup> Second, with such energies spent at that time in the development of photography in general and in aerial photography in particular, it seems odd that after Nadar's limited achievement in 1858, and the subsequent successes by James Wallace Black in Boston in 1860 and Henry Negretti and others in London c.1863, that Nadar's next real subsequent achievement did not occur until 1868, a decade later. Such a hiatus in such a dynamic environment of experimentation and endeavour seems implausible. Third, the 'cabin' beneath *Le Géant's* balloon had been fitted with a photographic darkroom when constructed in 1863, and yet no records exist of photographs taken between 1863 and 1867 from one of the largest balloons in use in Paris by the pioneer of aerial

photography. It is impossible to imagine that Nadar took no photographs from *Le Géant* during that period, or that if he did they were all unsuccessful. Fourth, the occasion of Nadar's achievement in 1868 with the very opportune journalistic recording of his exultant "Eureka!" is too much like a calculated publicity stunt, and one which was typical of Nadar's activities in seeking public exposure for his commercial activities. He had been financially ruined with *Le Géant* and was required to sell it the year previously, in 1867. Why he would have needed to orchestrate an event in 1868 which was incorrectly claimed to be historic and ensure that it received public attention is not clear, but the evidence indicates that the event was claimed to be something that it was not. And fifth, in spite of its play on the elevation of photography in general with that of the aerial balloon, the question can be asked if Daumier's lithograph of 1862, which depicted Nadar in a balloon photographing the cityscape of Paris, was only making a belated reference to Nadar's exploits above Petit-Bicêtre in 1858, over three years earlier, or did it imply later activities? It is also of interest that the Parisian panorama used by Daumier should show a view from an elevated position not dissimilar to those produced from above La Glacière as used by Manet in *The Burial*. Did Daumier conceive such an aerial image of the Parisian cityscape with what could be seen as the Val-de-Grâce dome on the left and the Panthéon dome on the right by imagination, translation from images formed at a lower level, or by means of an aerial photograph?

The technical circumstances of Nadar's achievement provide some clarification of the circumstances but not an explanation. The images achieved by Nadar were created with the exposure of the 24 x 30 cm glass collodion-coated plates,<sup>27</sup> and each plate, with eight images per plate, would have been exposed on eight separate occasions at a different area of the plate in a *carte-de-visite* camera, or similar, with four 'portrait' lenses of relatively short focal length, and fitted with a frame which held the sliding plate, viewfinder and shutter. The principles of this arrangement had been explained in 1862 by the inventor of the *carte-de-visite* camera, Disdéri (Fig.J5).<sup>28</sup> Rather than requiring to prepare eight separate plates with collodion, the use of such a camera and sliding plate provided the opportunity for eight sequential exposures of short duration (1-2 seconds)

on one prepared plate (preparation time: 4-5 minutes), with initially four exposures made on one half of the plate and then, after the plate has been pushed across in the frame, the four remaining exposures made on the other half.<sup>29</sup> Thus the means to achieve multiple images with short exposure times had been available from 1862, the year before Nadar's *Le Géant* had been constructed. Although it was not stated in the announcement of Nadar's apparent success in 1868, the real achievement of that event most probably was that it was the first image that he had been able to 'fix' as a permanent image. As a real innovator and one continually experimenting with photographic processes Nadar could have produced many negative images taken from *Le Géant* or other balloons prior to 1868,<sup>30</sup> but possibly had been unable to make them permanent enough for any public announcement.<sup>31</sup>

Obviously such a scenario is still somewhat removed from one in which Manet may have received from Nadar copies of deteriorating and disappearing images taken from aerial balloons in 1867 above the locales of the Exposition Universelle on the Champ-de-Mars and La Glacière. But it does provide an explanation for the dearth of images prior to 1868. In addition, the correlation between the sequence required by Nadar to make the exposures in 1868 and the one which would be expected to have taken place from the series of balloon viewpoints as proposed for *The Burial* in Chapter 5(C) is a surprising one. With eleven viewpoints forming a feasible balloon flight path, ten of them are set at regular intervals of approximately seventy to one hundred metres, a sequence which could be seen to represent the time intervals between each opening of the shutter of a camera attached to a balloon in flight.<sup>32</sup> In light of the correspondence between such circumstances in production of a series of photographic images from an aerial balloon, and the series of views within Manet's *The Burial* and *View of the 1867 Exposition Universelle*, seen from a series of elevated viewpoints as if from an aerial balloon, it seems likely to this writer that the full story of aerial photography in Paris during the 1860s has yet to be revealed.

Later developments in aerial ballooning shed little light on aerial photography until 1878. During 1869 the Godard brothers continued to make flights from the



Hippodrome and Gaston Tissandier made flights from the vacant Champ-de-Mars in the balloon *Pole Nord*. The Godard brothers and Nadar were involved with balloons during the blockade of Paris by the Prussians in 1870, with Nadar establishing a balloon corps at the Place Saint-Pierre on Butte Montmartre, initially for reconnaissance and later for communication purposes.<sup>33</sup> No note seems to have been made of aerial photographs taken from any of these balloon activities or, if taken, they do not appear to exist today as a record. The first aerial photograph after 1868 seems to have been one taken by the photographer Dagron from a *ballon captif* installed in the Cour des Tuileries, next to the ruins of the Palais des Tuileries, at the time of the 1878 Exposition.<sup>34</sup> And even that decade between those two events raises further questions about the limited evidence of aerial photographs. The earliest and most relevant aerial photograph after 1868 that has been found in the research for this dissertation is an anonymous photograph taken from above the Champ-de-Mars (Fig.J8), hand-annotated at 1885, and held in the archives of the Musée de l'Air et de l'Espace, Paris. It admirably illustrates how a view from a balloon at the heights proposed for the viewpoints in *View of the 1867 Exposition Universelle* and a number of those in *The Burial* would have appeared at that earlier time. [\[see 2013 Note\]](#)

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### Appendix 3

#### AERIAL BALLOONS AND PHOTOGRAPHY: Notes

DISSERTATION: Volume 2, pp.33–36

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#### [2013 Note](#)

An error was made in the original dissertation on page 270 with references made as if the *ballon captif* used by the photographer Dagron at the time of the 1878 Exposition and the one used in the Cour des Tuileries were two separate installations. They were the same *ballon captif*. The text has been adjusted.

If the 1885 date of Fig.J8 is correct, then the view for that photograph was from a balloon. It is interesting to note, however, that the construction of the Tour Eiffel began in January, 1887, and the image may be from the Tour during construction. Nevertheless, the image still presents a view of Paris at the time from an elevated position.

#### NOTES

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1. Nadar had taken his first flight with the leading French *aéronautes*, Louis and Jules Godard (Beaumont Newhall, *Airborne Camera: The World from the Air and Outer Space*, Hastings House, New York, 1969, p.19).
2. An aerial balloon restrained from the ground for controlled ascensions of limited altitude.
3. Nadar, 'La première épreuve de photographie aérostatique', in *Quand j'étais Photographe*, Éditions d'aujourd'hui, Paris, 1979 (Flammarion, Paris, 1900), pp.75–97.  
 In these memoirs, Nadar acknowledged the limited quality of the image but believed it to have been the first such image. In describing the development of the plate, Nadar wrote:  
 J'insiste et force: l'image peu à peu se révèle, bien indécise, bien pale, – mais nette, certaine...  
 Je sors triomphant de mon laboratoire improvisé.  
 Ce n'est qu'un simple positif sur verre, très faible par cette atmosphère si brumeuse, tout taché après tant de péripéties, mais qu'importe! Il n'y a pas à nier: – voici bien sous moi les trois uniques maisons du petit bourg: la ferme, l'auberge et la gendarmerie, ainsi qu'il convient dans tout Betit-Bi-cêtre [sic] conforme. On distingue parfaitement sur la route une tapisserie dont le charretier s'est arrêté court devant le ballon, et par les tuiles des toitures les deux pigeons blancs qui venaient de s'y poser.  
 J'avais donc eu raison!  
 (ibid., p.90).
4. See: Newhall 1969 (as in n.1), pp.19–20.
5. "F.G.", 'La photographie dans les airs', *Le Monde Illustré*, no.81, 30 October, 1858, p.287.

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6. The Editor wrote that "photography, hereafter aerostatic, may render great services in the taking of ground plans, hydrography, etc. There is no necessity for us to insist upon the importance of this scientific event" (The Photographic News, 3 December, 1858). Quoted from: Newhall 1969, p.27.
7. The claim ignored the achievement of James Wallace Black, who in 1860 successfully exposed six plates in photographing Boston from a balloon.
8. From an article written by Negretti which appeared in the Daily Telegraph and reprinted in The Photographic News. Quoted from: Newhall 1969, p.29.
9. Newhall 1969, p.29.
10. Nadar 1979 (as in n.3), p.85.
11. Published as part of a series 'Souvenirs d'Artistes' in Le Boulevard, 25 May, 1862. The existence of Daumier's lithograph at that date was used by Nadar in his memoirs to counter claims made in Les Inventions nouvelles that the first aerial photograph had been achieved by M. Paul Desmarests in 1881. Nadar wrote "qu'il soit besoin de renvoyer à l'année du Charivari où chacun peut retrouver la lithographie de Daumier reproduite sur la couverture de ce livre." (Nadar 1900, p.96).
12. As a contradiction of all previous speculative claims, the event was identified by Douglas Druick and Peter Zegers in their article 'Manet's *Balloon*: French Diversion, The Fête de l'Empereur 1862' (The Print Collector's Newsletter, v.14, n.2, May–June, 1983, pp.38–46).  
Apart from making that identification, Druick and Zegers provided a historical background to the use of a balloon on that occasion. From 1852, 15 August had been celebrated as the national holiday, and in Paris from 1855 to 1862 at two locations, the Barrière du Trône and the Esplanade des Invalides. From 1853 balloon ascensions had been part of the festivities, with only one ascent involved each year from the Esplanade, and usually between four and five in the afternoon.
13. See discussion, Chapter 5(C), n.71.
14. Initially conceived as a means to raise finances for heavier-than-air projects, *Le Géant* was financed by Nadar, constructed by the professional balloonists, the Godard brothers, and at 45 metres in height, 22 metres in diameter, and 6000 cu.metres in volume, was the largest balloon in the Paris skies in 1863. For further details of *Le Géant*, see: Nigel Gosling, "Félix Tournachon – 'Le bon Nadar' ", in Nadar, Secker & Warburg, London, 1976, pp.13–16.
15. On its inaugural flight on 4 October from the Champ-de-Mars, with Nadar and thirteen other passengers in its large 'cabin', the balloon travelled 45km. in five hours to Meaux. Prior to the ascent of the second flight on 18 October, the balloon was inspected by Napoleon III (Gosling 1976 (as in n.14), p.13). The flight, with nine passengers, including Mme Nadar and the Godard brothers, ended after seventeen hours in a crash landing near Neuberg (ibid., p.15).
16. J. Glaisher, et al, Voyages Aériens, Hachette, Paris, 1870, p.169.
17. For details of flights of *Le Géant*, see Fulgence Marion, 'L'aérostat "Le Géant" ', in Les Ballons et les voyages aériens, Hachette, Paris, 1869, pp.229–47.
18. See details in Chapter 5(B).
19. See discussion in Chapter 5(B), n.50 – n.59, inclusive, and Chapter 5(C).
20. Henri de Parville, 'Le ballon captif de l'Hippodrome', Science pour tous, no.28, 13 June, 1868, p.218.
21. Two 24 x 30 cm glass plates, each with eight images, and three individual images exist. One of the larger plates which has been reproduced on many occasions previously, is illustrated here (Fig.J6), and the other has only recently been illustrated in an article by Thierry Gervais ('Un basculement du regard. Les débuts de la photographie aérienne, 1855-1914', Études photographiques, no.9, May, 2001, Fig.2, p.92). Gervais also suggests that the three separate images could have come from a third plate (ibid., p.107-n.18). Some of the historical aspects researched and presented here are raised in the Gervais article, which only came to this writer's attention shortly before the printing of this dissertation.

It is of interest here to note that on the plate illustrated in the Gervais article the blurring of the image on the bottom row, second from the right, seems to have been created with a rotational movement of the camera in the one position rather than a sideways movement.

22. A. Gill, 'Nadar heureux', Le Moniteur de la photographie, 18 July, 1868, p.1074. Cited in Gervais 2001 (as in n.21), pp.93, 107-n.17.
23. The report in Le Petit Figaro stated:  
 Il y a quinze ans que ce garçon d'esprit et de talent revait de faire de la photographie en ballon...  
 Aujourd'hui voilà bien un résultat...  
 Je l'ai vu revenir de son expédition aérienne. Il était radieux, transfiguré. Il brandissait son cliché en criant: Eureka!...
- Above the text, one of Nadar's exposures was illustrated with a wood engraving and caption: "FAC-SIMILE de la photographie faite par NADAR, en ballon captif", (Le Petit Figaro, 31 July, 1868, p.3).
24. This annotated photograph is taken from one of the three separate images (see n.21), and claimed by Gervais to have been enlarged by Nadar's son, Paul, for the Exposition of 1889 and, with the agreement of his father, labelled the photograph: "Premier Resultat de Photographie aérostatique – Applications: Cadastre, Stratégie, etc. – Cliché obtenu à l'altitude de 520m par NADAR 1858". Hand annotations on the image include: "Montmartre", "Arc de Triomphe", and "Avenue du Bois de Boulogne".

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25. Nadar 1900, pp.96, 97.
26. Jean Prinnet, and Antoinette Dilasser, Nadar, Armand Colin, Paris, 1966, p.134. In their book, Prinnet and Dilasser raised and discussed many of the anomalies raised here about the dates and sequence of events in Nadar's involvement in aerial photography, but not with the specific purpose, as here, to try and understand the apparent hiatus in the development of aerial photography between 1858 and 1867 or to attempt to show that aerial photographs had been taken in 1867.
27. Information about the plates had been provided by the Archives Photographiques, Médiathèque d'Architecture et du Patrimoine, Caisse National des Monuments, Paris.
28. Disdéri, L'Art de la Photographie, Chez l'Auteur, Paris, 1862. The frame was described by Disdéri as:  
 "Un autre perfectionnement très-utile a été apporté à la chambre noire par une construction qui permet d'obtenir sur la même glace plusieurs images à la fois (fig.7)." (p.99)  
 "La figure 8 représente ce châssis. Il s'adapte à la chambre par sa partie antérieure B, à la manière des châssis ordinaires; V est le rideau à demi levé. O est l'ouverture destinée à laisser passer les rayons lumineux et que l'on munit de diaphragmes plus ou moins grands. Les cadres aa, AA circulent dans les rainures XX en demeurant toujours bien appliqués sur le fond plein du châssis. Le cadre AA contient la glace dépolie G, le cadre aa contient lui-même un nouveau cadre bb circulant de haut en bas, et renfermant la glace sensible L, recouverte de la planchette qui la protège. Le ressort r retient le cadre bb élevé par le tenon l, et permet de l'abaisser. Quand on veut faire huit épreuves sur la glace, on adapte à l'ouverture O, on lui substitute la glace sensible qu'on fait glisser à son tour avec le cadre aa: des divisions tracées en haut de ce cadre et qu'on fait coïncider avec le centre du châssis indiqué aussi, déterminent la position de la glace qui reçoit ainsi, lorsqu'on lève le rideau, l'impression lumineuse dans sa partie inférieure de droite, et on fait circuler le cadre aa quatre fois

successivement de gauche à droite, pour obtenir quatre épreuves dans la moitié inférieure de la glace. On abaisse alors à l'aide du ressort *r* le cadre *bb*, et l'on fait circuler quatre fois encore, de droite à gauche, le cadre *aa*. On obtient ainsi quatre nouvelles épreuves dans la moitié supérieure de la glace. Il est inutile d'ajouter qu'à chaque épreuve, à chaque mouvement, il faut baisser et lever le rideau." (pp.100–02)

"Le premier obstacle que l'on rencontre avec les appareils ordinaires, vient de l'obturateur de l'objectif qu'on ne peut mouvoir ni facilement ni commodément, avec lequel il est presque impossible de régler la durée de la pose, et qui, lorsqu'on a besoin de précipiter l'opération, communique à l'appareil tout entier un ébranlement fatal à la netteté de l'épreuve." (pp.102–03)

["Another very useful improvement to the chambre noire is a construction which allows you to obtain several images on the same plate (fig.7)." (p.99)

"Figure 8 represents the chassis that adapts to a carte de visite camera. You attach the chassis to the camera by its top side B; V is the shutter slightly raised, O is the opening which lets the rays of light through and onto which you attach lenses of varying sizes. The frames *aa*, AA move along the grooves XX. The frame AA holds the viewfinder G, the frame *aa* holds another frame *bb* which moves up and down and which holds the plate L in place, covered with a wooden plate to protect it. The spring *r* holds the frame *bb* at the top with the help of a catch *I*, and allows it to be lowered when necessary. When you want to have eight photos on one plate, you fit onto the opening O the lenses that correspond to this; you focus by sliding the viewfinder across to the opening O, then swap it for the plate which you slide across with the frame *aa*: there are subdivisions marked out on the top of this frame which you line up with those on the centre of the chassis, thereby obtaining the the image on the bottom right-hand corner of the plate when you lift the shutter, and then you move the frame *aa* along successively from left to right to obtain four images in the lower half of the plate. With the help of the spring *r*, you lower the frame *bb*, and then you repeat the process using the upper half of the plate. It is pointless to mention that the shutter has to be raised and lowered with each photo." (pp.100–02)

"The first obstacle that we come across with ordinary cameras comes from the shutter which cannot be used easily or practically and with which it is very difficult to control the exposure time, and which, when you need to use it quickly shakes the camera so much that the clarity of the photo is lost." (pp.102–03) ]

Translation: Julia McLaren

See Fig.J5 for a reproduction of Disdéri's illustrations fig.7 and fig.8.

29. Additionally, developing would have needed to be undertaken within 45 minutes, the time taken for washing would have been 1 minute, and that for fixing 2 minutes.

An understanding by this writer of the potential to make eight exposures in this way was gained from a discussion with Mr. Mark Osterman, of George Eastman House, Rochester, New York.

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30. During his life Nadar made many balloon flights, and despite the available records of the flights taken by many of the *aéronautes*, including many specifically made

for scientific experiments, it would seem that details of many of the flights made at that time, including those of Nadar, were not recorded.

31. Raised as a possible explanation by staff at the Archives Photographiques, Médiathèque d'Architecture et du Patrimoine, Caisse National des Monuments, Paris.
  32. No attempt was made with the computer-modelling to pre-determine the lateral positions of the viewpoint positions.
  33. For details of Nadar's establishment and supervision of the balloons, see: Gosling 1976 (as in n.14), pp.18–20.
  34. Gervais states that "Prudent Dagron réalise une photographie au collodion humide sur laquelle on distingue le pont Saint-Michel et le Panthéon. D'un format étonnant (28 x 22 cm), cette image est floue et accuse des déformations" (Gervais 2001 (as in n.21), p.107-n.19, and cites Gaston Tissandier, La Photographie en ballon, Gauthier-Villars, Paris, 1886, p.10. As the image is not reproduced, it is uncertain if Gervais had seen the image or was paraphrasing Tissandier's description.
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