



Figure 1. *Monocle Right Eye, Portrait of J.M. Whistler*
Mortimer Menpes
Great Britain/Australia 1855-1938
Lithograph; 34.5 x 23.0 cm
Art Gallery of South Australia, Adelaide
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DISCOVERING THE SCIENTIFIC FRAME OF MIND IN THE LATE-VICTORIAN ARTISTIC EXPERIMENTS OF JAMES MCNEILL WHISTLER AND STANHOPE FORBES

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Scientific connections are not integral to the current study of late Victorian painting. George Moore, critic and author of *Modern Painting* (1893), seemed to speak for his contemporaries as well as current scholars when he wrote that "differentiat[ing] between art and science is like drawing distinctions between black and white" (134). This seemingly dichotomous relationship between science and art contrasts markedly with that of the romantic period when the artist-cum-scientist was a common occurrence¹⁶ and with the mid-Victorian years when the hegemony of the Ruskinian/Pre-Raphaelite approach encouraged scientifically close examination and descriptions of the natural world. During the ensuing decades, various forces helped to disengage the earlier partnership of science and art in favour of art's independent formal and technical aspects; these forces included continental education, the ideas of William Morris and the second generation Pre-Raphaelites, and new exhibition opportunities like the Grosvenor Gallery and the New English Art Club. In the 1880s no English artist, for instance, rivalled the American Thomas Eakins in incorporating scientific studies of anatomy, light, mathematics, perspective and photography into a series of canvases.

While the interests of artists and scientists seemed to diverge in the last years of the century, science had acquired an unprecedented cultural authority and now touched almost every aspect of late Victorian life. A plethora of literature catering for professional and popular audiences of all ages brought science into the daily lives of men, women and children throughout Britain. In her autobiography, Beatrice Potter Webb claimed that western science in this period had become "by far the most potent ferment at work in the mental environment in which I was reared" (128). She refers to the "cult of science," and the "idolization of science" (126-27), a situation predicted by Norman Lockyer, the editor of *Nature* in 1870 (Yeo 696). Scientific approaches were encouraged as models for diverse areas of life, such as statesmanship, business administration, individual behaviour, and even sports like fishing, boxing and swimming (Turner 596, Yeo 696). Recent scholarship on the work of George Eliot, Samuel Butler, Joseph Conrad, Conan Doyle and H. G. Wells, among others, is focusing attention on the centrality of scientific thought and methods in the literary work of the period. In contrast, art historians and historians of science have yet to investigate with equal seriousness the impact and repercussions of a strongly science-oriented culture on later Victorian visual arts, particularly on those artists associated with new directions.

¹⁶ Examples include George Stubbs, Joseph Wright of Derby, Alexander Cozens, Philip de Loutherbourg, R. P. Bonington, Samuel Palmer, John Linnell, J. M. W. Turner, John Martin, John Constable.

The linkages between science and two prominent later Victorian art movements, aestheticism and *plein airism*, have not yet been explored. One reason for this is that both movements have been interpreted as important challenges to the continuing tradition of Victorian realism, a tradition which was already associated with scientific studies. In the voluminous literature on James McNeill Whistler (Figure 1), the American expatriate is seen as the leader of the English "Art for Art's Sake" camp and his art epitomises the Aesthetic Movement's alternative approaches to the mid-century Ruskinian/Pre-Raphaelite mindset. Whistler's critics, most notably Ruskin, attacked Whistler's nocturnes of the 1860s and 1870s precisely because they lacked the representational and finished qualities such critics expected from painters who had spent the requisite study and time in recreating scenes of the natural world on canvas. Ruskin's famous complaint in his July 1877 issue of *Fors Clavigera* about Whistler "flinging a pot of paint in the public's face" (Merrill 47) aptly summarised his scorn for Whistler's seemingly haphazard process. Whistler's own piquant quotes about the independence of artistic creation from the dictates of nature, such as "nature is very rarely right" and "seldom does Nature succeed in producing a picture" from his 1885 "Ten O'Clock" public lecture (143), seemed to dissociate the painter from the scientific investigative spirit of the age. However, these frequently repeated modernist maxims have overshadowed other statements by Whistler that can lead to fuller and qualifying interpretations of his interests and goals. While Whistler's efforts to link his art with music have become integral to Whistlerian studies, his frequent use of scientific references in his writings and the links between his art and scientific concerns of the day have been overlooked.

In the case of the continentally trained *pleinairists* or outdoor painters, such as Stanhope Forbes, Frank Bramley, Elizabeth Armstrong, George Clausen and H.H. La Thangue, recent research has focused on the affiliation these artists had with the French naturalist and impressionist movements and on their youthful challenges to accepted English styles and techniques rather than on specific connections to cultural trends, including scientific ones. In the mid-eighties, Stanhope Forbes assumed the leadership of the *plein air* art colony in Newlyn, Cornwall, a *juste milieu* group which sought to utilise traditional genre and landscape subjects and styles while incorporating foreign stylistic and contextual approaches which challenged the status quo.¹⁷ Forbes was the first from Newlyn to become an associate of the Royal Academy (1892); in contrast, Whistler ceased to exhibit there in 1872 and was never nominated for membership. Forbes knew and worked with Whistler through various London exhibition societies, but the two were not friends, and Forbes's career differed markedly from that of Whistler. Forbes was not as innovative an artist, nor was he as flamboyant a public figure in communicating his philosophy. Though Forbes discouraged his fiancée, the Canadian artist Elizabeth Armstrong, from associating with Whistler's circle, Forbes's public statements of these years and his paintings reveal his debts to Whistler's example as well as his own independent absorption of the later Victorian scientific approach to the natural world.

¹⁷ His 1885 Royal Academy piece, *A Fish Sale on a Cornish Beach*, helped catapult Forbes, as well as *pleinair* issues and the Newlyn art colony, into the London art arena.

This article examines some of the ways in which Whistler and Forbes, as leaders in their respective movements, reflected, and identified with, the progressive, scientific spirit of their age through their artistic roles, techniques and philosophies. Twentieth-century historians have accorded Whistler his assumed role as innovative provocateur within the English art establishment and its expectations for the behaviour, styles and subjects of artists. Whistler relished the part and he developed it in complex and imaginative ways, utilising his appearance, demeanour, associates, professional and personal environments, art and speech. Though neither Whistler nor Forbes, nor their contemporaries, explained the progressive stances of these painters in terms of the later nineteenth-century scientific mindset, the parallels between them are striking in hindsight, particularly when compared with the artistic orientations and *modus operandi* of prominent but more conservative painters like Edward Poynter, James Hook, Edwin A. Abbey, Peter Graham, Lawrence Alma-Tadema and Walter Sadler. One central difference between these two groups is that both Forbes and Whistler rejected the earlier, but still current, belief that by recording natural facts in a technique that maximised deception and minimised the viewer's awareness of the artist's presence and process, one worked in a scientific mode. Whistler repeatedly referred to his own approach as scientific, yet he and Forbes deliberately created a tension between the represented facts of the scene and the artists' recreation of it. Through their respective styles they acknowledged on canvas the scientists' view of the world as a place subject to continual change, ambiguity and interpretation; and they implied that the natural world consists of other than visible, static phenomena.

Like their peers in the scientific world, they were seriously concerned with method and though this is certainly true for most artists on some level, Whistler and Forbes differed from the aforementioned contemporaries by foregrounding their working processes as integral parts of their work. They embraced public lectures as a means of educating outsiders about their new aims and techniques; they cared about differentiating amateur work, criticism and workplaces from those of professionals; and they believed in the value and necessity of professional contacts outside Britain for inspiration, education and progress. Though these parallels between their art and the scientific cultural climate of their day were in part conscious and in part unconscious, nevertheless, these traits set them apart from more conservative painters and contributed to the public's perception of them as modern artists who moved forward by wedding newer ideas with older traditions.

Whistler's links with science are openly evident in his writing and speeches. In another paper, I trace Whistler's use of this language and explore his shrewd reasoning in relating positive qualities of the scientific enterprise with his own endeavours ("Whistler's Savvy Promotion"). In the two primary expositions of his artistic philosophy, the *Art and Art Critics* essay of late 1878 and the "Ten O'Clock" lecture of 1885, he deliberately incorporated generalised scientific terms and references to scientific professions in order to modify his reputation as a joker and dandy to that of respected innovator. In his earlier essay, for example, I argue that Whistler hoped to create an association in his audience's mind between his art and the work of the esteemed "man of science," to validate his work and ideas as serious; and to further set himself apart as a future-oriented and authoritative leader in the arts. Whistler cleverly used the word "unscientific" to describe amateurs and critics, like Ruskin, who

approached art without the study and experience Whistler deemed essential for professional competence in both art and science (Lochnan 234-35, Whistler 33).

There is no evidence that Whistler and Forbes were any more conversant with scientific theoretical advancements or the increasingly specialised literature of science than the average person or public figure, but as educated and involved citizens they would have absorbed a basic understanding of scientific method, language and achievements and been familiar with the widely available popular science literature. Whistler had personal connections to scientific endeavours, having studied mathematics, chemistry and physics at West Point, though he excelled in none of them. Forbes grew up in a railroad family and maintained close contact with relatives who led professional lives in industry and business. His letters to his mother confirm that he was an avid reader and closely followed contemporary events through the newspapers and journals: for example, in *Cornhill* or *The St. James's Gazette* he could have read popular science articles by Grant Allen, among others (Van Arsdel 16-17).

The educational experiences and artistic philosophies of Forbes and Whistler profited directly from the increasing internationalism of the Europocentric art world. Forbes completed his artistic training in Paris with Léon Bonnat and spent almost four years working in France before settling in Newlyn. Whistler's artistic ideas stemmed from his varied experiences in at least half-a-dozen countries and his exposure to a wide range of western and non-western artists and movements, including Japanese arts; contemporary Frenchmen Gustave Courbet, Alphonse Legros, Edouard Manet and Claude Monet; and English painters Dante Gabriel Rossetti and Albert Moore. In their respective campaigns to break down the English art establishment's isolationist mentality, Forbes and Whistler sought inspiration in the comparative receptivity of the scientific community. They both understood how quickly scientific knowledge lost its individual and national stamp and became the property of all scientists, and both voiced their frustrations with the contrasting situation in the art world. In a speech to the Third Art Congress in Birmingham in 1890, Forbes told his audience: "Surely art should be universal, and know nothing of geographical divisions. That our artists should hesitate to learn from their Continental brethren seems to me as though the scientists of France were to refuse to accept the laws of gravitation on the ground of Sir Isaac Newton being an Englishman and a foreigner" (6). Four years earlier, Whistler had voiced a similar sentiment about the universal ownership of knowledge: "There is no such thing as English Art. You might as well talk of English Mathematics. Art is Art, and Mathematics is Mathematics" (171).

While the scientific community's international network, collaboration and congresses facilitated progress and made possible such efforts as charting the earth's magnetic elements (Taton 550), the English art establishment rebuffed attempts to dilute the supposed "Englishness of English art" with foreign infusions of techniques and subjects. As the scientific disciplines assumed intellectual leadership through their international contacts, the battles of Whistler and Forbes to establish overseas connections, to promote common aesthetic principles and respect for differing traditions by forming associations of multi-national artists, met with resistance. During Whistler's brief and controversial presidency of the Society of British Artists, he tried to reduce its nationalist orientation and inject new life into its exhibitions by inviting Monet, his Australian follower Mortimer Menpes, the American Waldo Storey and the Belgian

Alfred Stevens to exhibit (MacDonald 50). However, his opponents had him ousted in spring 1888 after less than two years in office. In 1886, Forbes and many of the Newlyn colonists helped create the New English Art Club, a society established to "protest against Art traditions that have become obsolete, and against methods of practice that are inconsistent with modern aims and modern aspirations" ("A New Art Club" 252). The founders considered calling their organisation the Society of Anglo-French Painters (Watney 24), as most members had been trained abroad and were oriented toward continental approaches. Whistler exhibited there, as did a number of his followers. Forbes, Thomas C. Gotch and other Newlynians were also instrumental in establishing contact with colonial artists abroad. During their leadership of the fledgling Anglo-Australian Society of Artists between 1885 and 1889, their ultimate aim was to promote cross-cultural artistic exchanges; subsequently, as the Royal Academicians gained control, a more imperialist agenda materialised.

The individual reception accorded Forbes and other continentally trained *pleinairists* further illustrates the negativity directed toward efforts to internationalise the arts by wedding English and European ideas. The cross-channel artistic dialogue had escalated during the Franco-Prussian War as realists and impressionists like Monet and Camille Pissarro sought refuge in London. By the late seventies, the exodus of young English artists to the art centres of Antwerp and Paris had reached alarming proportions, according to many Royal Academicians and critics. In Paris, and in the summer art colonies of Brittany, English painters absorbed the French Naturalist approach, particularly as practised by Jules Bastien-Lepage. Foreign handling became increasingly visible in the London and provincial exhibitions, eliciting consternation and disapproval from both traditionalists and nationalists. In order to attract purchasers, Forbes felt compelled to tone down the foreignness of his subjects and style. A comparison between his 1881 *A Street in Brittany* (Walker Art Gallery, Liverpool), with its French-derived zooming perspective, blue tones, square brush marks and unsentimental, non-narrative approach, and the darker and more anecdotal, *The Health of the Bride* (Tate Gallery, London), painted in Newlyn eight years later, clearly illustrates the changes Forbes felt compelled to make in order to earn a living as an artist.

Walter Sickert, an early follower of Whistler, criticised Newlyn works like *The Health of the Bride* for their dependence on facts, implying that Newlyn's vision was outmoded. Compared to Sickert's own work of the time, for example, *Gatti's Hungerford Palace of Varieties*, c.1887 (Art Gallery of New South Wales, Sydney), Forbes's approach seems tight and factual, but in contrast to much contemporary genre painting, he is less interested in static detail and is more concerned with current naturalist qualities of shifting light effects and changing gestures and moods. In this regard, Forbes's interests mirror those of his *pleinair* peers, and they parallel developments in the scientific community which in the second half of the century continually introduced fresh discoveries about the flux of matter.

The connection between mid-Victorian painting's hard-edged realism and the age's tremendous interest in and respect for scientific and industrial achievements has frequently been noted. Mid-century artists like William Holman Hunt and William Powell Frith placed enormous emphasis on facts as truth and, as Richard Altick writes, "devalued the importance of individual perceptions" as a means of "conform[ing] to the

scientific spirit of the age" (273, 275). Though academic realism or photorealism persisted in Europe and America into the twentieth century, the concept of fixed and stable realities, both visible and invisible, was gradually challenged by scientists, artists and the conditions of urban and rural existence. French philologist Ernest Renan noted about his era: "Now everything is considered as in the process of formation" (Briggs 345). Rapid change in all aspects of life was a new phenomenon for people to cope with. Biology, in particular, examined, measured and explained transitions from one state of matter to another, and replaced geology at the top of the scientific hierarchy. Biologists focused attention on theories of evolution, and raised questions about the relationship of human beings to extinct animals and future life forms. For the late Victorians, the present became inextricably linked to the past and to the future and, not surprisingly, some artists followed that development in conceiving their painted world. French photographers, print makers and artists, like Charles Daubigny and Manet, were particularly quick to experiment with translating the new pace, appearance and sensation of changing modern life into their art.

The new emphasis on change, on conceiving one moment in a continuum of moments, can be seen by comparing the fixed scenes of Hunt with the looser, more suggestive brushwork, awkward movements and unusual angles introduced by the Impressionists to convey contemporary life witnessed on the move. The exposure of Whistler and Forbes to continental artistic ideas increased their receptivity to the concept of flux which was being so widely discussed in the scientific literature in England. In 1883, Ruskin praised Hunt's truthful depiction of light, stating that the pigments "produce the same impressions upon the mind which were caused by the light itself" (qtd Tate 108). Monet, Forbes and Whistler would have disagreed with Ruskin that Hunt's work was truthful to nature and human visual experience. Several decades of both artistic and scientific investigation into the process of seeing influenced painters like Whistler and Forbes to acknowledge that the eye cannot take in Hunt's quantity of information equally and simultaneously. Since sight reveals continual flux, they introduced those states of transition into their work.

As early as the 1850s, Whistler had become interested in the science of optics through his studies at West Point and his association with his brother-in-law, Seymour Haden (Dorment 14). Lessons gleaned from photography and the work of German scientist Hermann Helmholtz are evident in the etching *Black Lion Wharf* from the Thames series of c.1860. Instead of treating all forms equally, Whistler focused on objects in the distance, leaving the rest of the forms blurred or incomplete (see Lochnan 95-100). In his later writing, he vociferously objected to "purposeless copying" of a scene and the inclusion of unnecessary detail (145). Whistler's nocturnes of the 1870s, for example *Nocturne: Blue and Silver—Chelsea* (1871; Tate Gallery, London), convey the fleeting beauties of an evening scene through suppressed detail, silhouetted forms, subtle shifts of blue and green tones, horizontal brushwork, and rhythmically placed points of light.

Like the earlier Impressionists and Whistler, Forbes and the *pleinair* naturalists tended to focus the viewer's attention not on permanent edges and interiors of forms, but on the less distinct and more transitory qualities of light and atmosphere which surrounded and transformed them, as in Forbes's early Newlyn work, *A Fish Sale on a Cornish Beach* (1885; City Museum and Art Gallery, Plymouth). During their training

on the continent, the *pleinair* painters observed how the Dutch Hague School painters and French artists like Jean Cazin utilised a grey palette to suggest that atmospheric envelope. Following their example, the English painters combined low tones with Bastien-Lepage's square brushmarks to soften forms surrounded by air. Together, these techniques helped convey the ephemerality of nature without resorting to the Impressionists' more radical broken brush work and brilliant, contrasting hues. Forbes's words of 1890 sound particularly Whistlerian: "For beauty lies as much in the light, the atmosphere which surrounds all things, as in their actual form and fashion" ("Treatment" 2). *A Fish Sale's* transitory qualities reflect new, scientific understanding of the natural world by Forbes and his generation, just as the static and comprehensive detail of Frith's *Life at the Seaside (Ramsgate Sands)* of 1854 reflects his. Astute critics such as Oscar Wilde and Alice Meynell educated their contemporaries about the respective roles of Whistler and the Newlynians in teaching others to see visual realities that had hitherto been unobserved. In 1889, Wilde was among the first to acknowledge Whistler's accomplishment in revealing to his own, and later generations, the poetic ambience, the transient mood of the Thames on an overcast or foggy evening (Dorment 20); Meynell applauded the Newlynians' precise observations of Cornish light, their search for accurate atmospheric tones and their resulting deviations from "the fictions of ordinary English painting" (99). The language of these critics helped their audiences to make connections between the shared investigative approaches of artists and scientists in "observ[ing] and interpret[ing] natural phenomena," which, according to physicist James Maxwell, was "the aim of physical science" (Turner 589). After Whistler's death, his biographers emphasised the artist's scientific concerns.¹⁸

Whistler's minimalist grey, blue and green tonal studies of London's subtler atmospheric nuances actually paralleled scientists' explorations of invisible matter and forces. A considerable amount of late-Victorian scientific investigation concerned matter one could not see with the naked eye: the research of biologist on cells and micro organisms; of chemists on atoms; of physicists on heat, electricity and light waves; and the interest of astronomers in the stellar universe. The general public had to accept scientific explanations of this invisible world on faith since they lacked the expertise, the experience and the equipment to verify the findings themselves. Nevertheless, in *The Fairy-land of Science* (1879), Arabella Buckley encouraged her popular audience "to open their eyes and look" and "to use their imagination to see the invisible in the visible" (Gates). Whistler's nocturnes demonstrate how an astute individual could practice this advice, and in one of Whistler's most reproduced passages from the "Ten O'Clock" lecture, he wrote about the invisible world which was visible to him:

And when the evening mist clothes the riverside with poetry, as with a veil, and the poor buildings lose themselves in the dim sky, and the tall chimneys become campanili, and the warehouses are palaces in the night, and the whole city hangs in the heavens, and fairy-land is before us—then the wayfarer hastens home; the working man and the cultured one, the wise man and the one of pleasure, cease to understand, as they have ceased to see, and Nature, who, for once, has

¹⁸ I have discussed this point in my article "Whistler's Savvy Promotion" (14).

sung in tune, sings her exquisite song to the artist alone. . . . To him her secrets are unfolded, to him her lessons have become gradually clear. (144-45)

Since Whistler's egotism allowed him to believe that he possessed perceptive qualities far superior to the general public who read Buckley and then viewed his work, he felt compelled to educate others about his accomplishments; Whistler's lyrical language, however, tends to distract the reader from the astuteness of his vision. Strangely, Ruskin, who loved the ephemeral qualities of late Turners, found Whistler's "truth" false.

Whistler's nocturnes also parallel another scientific concern of the day: infinity and the incomprehensibility of space and time dimensions. Consider the following: "From so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved" (qtd Bowler 136). Those words are not Whistler's but Charles Darwin's. They appear in the conclusion of the *Origin of Species* (1859), but they apply to many of Whistler's water scenes of the 1870s and '80s. Whistler's nocturnes contrast strongly with those of his rival, Atkinson Grimshaw. Grimshaw was familiar with Whistler's work and his poetic verbal description of the Thames, but chose to paint in a more photographically derived style (Robertson 118, 122). While Grimshaw's oils of the harbours of London and northern English cities exemplify Ruskin's advice, inviting the viewer to examine details of signs, shop fronts and architecture, Whistler's barely perceived forms invite reflection on the future and the unknown, as did the findings of biologists, astronomers and physicists. Even today, to contemplate infinity one can look at a night sky, or study biological evolution, or spend time with a Whistler nocturne.

Whistler and Forbes, like many of their contemporaries, must have been enthralled by the new scientific explanations of nature's logical organisation and interrelated parts. In their own art they too sought a greater unification of the painted surface than that of the work they saw in London exhibitions. The Whistler-Newlyn contingent criticised British subject painters, like Marcus Stone, for their lack of such admirable unity. British pictures are "like worms," complained Philip Wilson Steer, a Whistler admirer. "If you cut them up into half a dozen pieces, each bit lives and wriggles" (qtd Robins 78). The continentally oriented artists rejected such divisionism and instead sought ways to heighten the cohesiveness of their pictures. Whistler's subtle but masterful linear designs, and his and the *pleinairists'* unifying palettes and regularised markings of the brush, visualise modes of construction that science had shown to be natural and valuable. In Meynell's seminal article written on the Newlyn School in the *Art Journal*, April 1889, she singled out the colonists for their unifying light and contrasted the Newlyners' approaches with the fact-plus-fact approach which "has been the aim of the greater part of the English school of this century" (98-99).

Compositional structure is at the heart of Whistler's work. From the mid 1860s, when he began working with Albert Moore, Whistler seemed very focussed on what Thomas Huxley called "the rational order which pervades the universe" (qtd Gilmour 135). Whistler's perfectly calculated horizontal and vertical grids and his acute sense of tonal and spatial balance can be interpreted as visual equivalents for the natural structures and cohesiveness being discovered by scientists. One takes in Whistler's

works as a whole rather than part by part: he drapes his atmospheric haze over this subtle visible structure as glass covers a twentieth-century steel skyscraper. For Whistler and Forbes, these formal harmonies could be spoken of as the laws of Art. Forbes even sounds like Whistler when, in his 1890 speech on his artistic philosophy, he discusses "the laws which govern design and composition all spring[ing] from nature" (5), but the design in his work is not as original or sophisticated as Whistler's. The pyramidal arrangement of the three figures in the centre of Forbes's *A Fish Sale on a Cornish Beach* is a case in point: compared to the linear and tonal complexities of *Arrangement in Grey and Black: Portrait of the Painter's Mother* (1871; Musée d'Orsay, Paris) or *Nocturne: Blue and Silver—Chelsea*, Forbes's composition seems elemental and more dependent on previous artistic examples.

Neither Whistler nor Forbes wanted their art to be at the mercy of chance. Both sought to control closely the materials, processes and outcomes of their work and in this way their approaches have affinities with methodological control of scientists over all possible variables. Whistler, in particular, carried control over the variables to an extreme. His obsession with unity through compositional balance extended to every one of his artistic endeavours including his dress, his private spaces and his public exhibition rooms. He even colour-coordinated the accessories and attendants' clothes at his exhibitions, and he endlessly revised before endlessly rehearsing his "Ten O'Clock" lecture (Wortley 48). Laura Wortley believes that Whistler's "exquisite perfectionism was in itself a weakness, causing him to continually correct or obliterate his achievements so that he inhibited his own progress" (50). Whistler was also notorious for delaying the completion of a work, causing problems with patrons and gallery directors.

Forbes, too, became greatly concerned with control, hence his focus on grey days and interior subjects. His letters to his mother are replete with complaints about maintaining control over subjects, models, weather and spectators. While French *pleinair* painters generally accepted the inevitable difficulties of working outdoors, Forbes quickly became unwilling to let himself be dominated by the vagaries of the outside environment. By 1889, he had moved into Newlyn's first glass studio in order to stabilise his working environment and to allow himself the space and safety to pursue his lengthy preparatory work. Gabriel Weisburg compares the glass studio to a "scientific lab—where models could be studied dispassionately" (24). The difference in national temperament between the French and the English may be explained, in part, by the dominant role played by the scientific frame of mind in England and the prominence given to the scientific method as an adaptable *modus operandi*, suitable for a wide range of professions, including artistic ones.

Although Whistler firmly believed that the artist's long labour should not be paraded in public view (as it was in much realistic painting and manufactured arts of the day)¹⁹ he did make his method visible and prominent. Whistler vociferously opposed deceiving the viewer with a false three-dimensional world on canvas with no evidence of a creator. Instead, Whistler's viewer is consciously aware of the flatness of his canvas, the prior movements of the painter's hand and brush across the surface and the imposed compositional structure. This displaying of the artist's presence is the

¹⁹ See "Proposition—No. 2" (Whistler 115-16).

antithesis of the approach of Grimshaw, Poynter or Alma-Tadema's approach and it links Whistler more closely with late nineteenth-century scientific acceptance of controlled process as an integral part of one's work. Forbes and many of his Newlyn peers approached their art in the same honest way. Their trademark square brush marks earned them the title the "square brush school"—it was a label initially tinged with derision. Whistler and these English naturalists were attempting to create a delicate balance between real-life subjects and an expressive personal approach.²⁰ In place of a story or morals or edification, which Whistler stressed belonged to literature and not painting, "style," Gerald Needham explains, "became the carrier of expression" (96). This is a change from the mid-century "devalu[ing] of individual perceptions" mentioned earlier (Altick 273).

The emphasis of scientists on individual creativity and of artists on self-expression helped shift attention away from the earlier moral and spiritual dimensions of their endeavours. At the same time, science and art became substitute teachers of traits once considered the purview of established religion. Official religions did not play a large role in the lives of the artists discussed here, but these groups absorbed the Protestant work ethic into their own ethos. Scientists actually promoted their discipline as one focussed on developing the ability to work hard, to overcome obstacles and to eliminate error (Turner 598). The *pleinairists* certainly felt the same way but they were not as publicly vocal about the benefits of their profession. However, when they did write and speak publicly, and when others wrote about them, the physical challenges and perseverance required by their *pleinair* approach are not only introduced but discussed as a sign of the artists' merit over traditional studio-bound landscape and genre painters. The Whistler-Ruskin trial, and Whistler's satirically written account of it in *The Gentle Art of Making Enemies* (1890), revolve around the perception of Ruskin and others that Whistler "knock[ed] off" (Whistler 4) his canvases in unacceptably short periods of time. Whistler's witty responses seemed to support their charges, for in his attempt to dissociate himself from the Victorian equation of work with fastidious detail, Whistler camouflaged his meticulous method. Only later, particularly after his death, did those who knew and worked with him, like Menpes, reveal his actual gruelling work-habits and perfectionism.

Among the thousands of artists who submitted their work each year to the London and provincial exhibitions, Whistler's contingent and the *pleinairists* were minority groups, and as such they felt the need to join together for professional and personal support. The Newlyn colony was just one of a number of artist colonies which sprang up in these years. Another colony was at St. Ives, Newlyn's neighbour to the north: Whistler, Menpes, Forbes and Armstrong all spent time there in the mid 1880s. In London, new and revised art organisations arose to meet the demand for alternative exhibition spaces. Whistler's brief transformation of the Society of British Artists and the New English Art Club have already been mentioned. The efforts of artists to take more control over their destiny may have benefited from examples of the scientific community's own process of adaptation. As scientific disciplines became increasingly specialised, new international conferences, journals, professional organisations and

²⁰ Needham believes that the central problem for realist or naturalist artists was to balance fact and style (96-98). In place of fact/style one could substitute nature/artist or control/temperament.

clubs, for example, the famous X Club attended by Herbert Spencer, developed to cater for their particular needs (Webb 130).

Inevitably for both artists and scientists, the gap between the knowledge and experience of amateur and professional groups widened, and a sense of superiority developed on the part of the professional elite. The latter increasingly felt that one had to be a member of the select group in order to understand and evaluate its achievements. Forbes actually divided his work into two groups, one for the appreciation of artists and the other for the "B.P." or British public, and he selected his exhibition sites according to the character of their audiences. Whistler's avoidance of the Royal Academy, his condescending and arrogant behaviour and his sarcastic words exemplify this trend of distancing the general public from interfering in matters in which they were considered to be novices. A comparison with science enabled him to make his point that only peers, not inexperienced artists and literary critics, were capable of evaluating one's work: "An inroad into the laboratory would be looked upon as an intrusion but before the triumphs of Art, the expounder is at his ease" (33). Articles in *Nature* paralleled the sentiments voiced by Whistler, particularly with regard to governmental decisions on scientific matters by men without any significant scientific training (Turner 595-96; 598-99).

Whistler's heyday in the public arena "peaked in the mid 1880s" (Lochnan 236), and by the early nineties he was beginning to receive significant positive recognition. Reading Webb's comments about the later Victorian men of science, it is easy to replace them with Whistler's name and still have her thoughts make sense: "For who will deny that the men of science were the leading British intellectuals of that period; that it was they who stood out as men of genius with international reputations; that it was they who were the self-confident militants of the period" (126-27). Whistler did not mind provoking controversy, a novel stance in the English art world at that time. It is possible that Whistler derived vicarious support by observing the public disagreements of scientists, particularly over evolutionary theories. For a person of Whistler's strong personality support may be too strong a word, but perhaps he received internal confirmation that his behaviour was not only right but necessary. He made himself into a leader, a spokesperson for artistic causes, and he surrounded himself with like-minded artists. His circle varied during the last twenty years of his life, but at various times it included Sickert, Steer, Menpes, Wilde, Theodore Roussel, Sidney Starr, Fred Brown and Joseph and Elizabeth Pennell, his biographers; when he resigned from the Royal Society of British Artists, twenty-five artists followed him (MacDonald 53). The admiration of some followers bordered on hero worship. Katharine Lochnan writes that Roussel was "so full of respect . . . that he always went bareheaded in [Whistler's] presence" (231). Nevertheless, the group's cooperative spirit and willingness to learn from each other made a striking contrast to the fiercely independent and secretive working methods of other British artists, behaviour which was satirised by Whistler. Forbes's letters reveal how the Newlyn colonists tried to maintain an open, sharing community and to keep inevitable jealousies and competitions to a minimum.

Whistler worked hard to expand his forum beyond his London studio and the exhibition halls. Deanna Bendix devotes the first chapter of her new book, *Diabolical Designs*, to Whistler's manipulation of the press for disseminating his message and promoting his career. Though the public lecture was also a common means of

communicating one's views—Huxley, popularly known as Darwin's bulldog, set a particularly prominent example—Whistler's choice of this medium to improve his reputation was a novel approach for a painter to take. This step was undoubtedly prompted by his personal rivalry with Ruskin, Wilde and Haden, an amateur etcher, all of whom had used the public lecture as a means of educating the public on their areas of expertise. By publishing his words and those of his critics in book form, however, he moved beyond the usual battleground of artists. In an artistic world fraught with overwhelming competition, Whistler fought with his natural skills of intelligence, wit, hard work, daring and skill, and he survived: he even applied that famous phrase, "survival of the fittest," to one of his efforts (Whistler 205)! Shortly after the "Ten O'Clock" lecture Forbes was asked to give two public lectures in which he represented the Newlyn *pleinairists* and spoke about their historical and philosophical development; in both cases Whistler's unforgettable evening performance was undoubtedly the model: though Forbes lacked his predecessor's panache.

Whistler and Forbes thought about the progress of art differently from many of their contemporaries in the scientific and artistic communities, who equated the progress of the nation with progress in their respective fields. Whistler's emphatic refutation in the "Ten O'Clock" lecture that national greatness in one area begets it in another (155-56) deliberately attacked the nationalistic fervour and competitive concerns of his contemporaries. But Whistler's pronouncement that art cannot progress should not be taken at face value. True, he did not accept that a nation's art inevitably refines itself and improves with the passage of time, in a Spencerian linear mode. Yet he and Forbes did feel that their own art made advances over what had come before and, in this sense, that they were individually progressive. In 1903, near the end of his life, Whistler told the Pennells that "art is a positive science, one step in it leading to another" (Spencer 49). For this reason he criticised Manet, the acknowledged leader of French modernism, for depending too blatantly on the art of the past (Spencer 49). In contrast to Manet's art, Whistler thought his own work looked less derivative and evidenced more prominent advances or fresh insights into artistic production. Forbes's stated attitude toward progressive art and his role in the process are more straightforward and less connected with establishing his place in the artistic firmament: for him progress meant a more truthful approach to contemporary rural life through choice of subject, style and working methods. He still introduced sentiment, anecdote and moral qualities into his work, characteristics which sharply divided him from the renegade Whistler.

After Whistler's death, Sadakichi Hartmann claimed that "Whistler once said he would like best to paint for an audience that could dispense with the representation of objects and figures, with all the pictorial actualities, and be satisfied solely with the music of color"(5). Whistler never took that twentieth-century step of focussing on the visual elements alone, without any reference to real objects. Instead, he continued the nineteenth-century habit of basing his art on natural scenes he had experienced, but he expended considerable effort in the 1870s and '80s pushing his audiences to broaden their expectations for the visual arts. As part of that process, both Whistler and Forbes (but Whistler in particular) drew consciously and unconsciously on the example of science, a discipline which was steadily garnering the respect and authority they desired for their own ground-breaking work and reputations as artists. In doing so they

continued a tradition of allying science and art, a tradition that weaves its way in and out of the history of western European art. In the Renaissance period, the link is clearly visible: Leonardo and Michelangelo were men of science as well as painters and sculptors. Just before the Victorian era, Constable wrote with conviction that "painting is a science, and should be pursued as an inquiry into the laws of nature" (Eitner 65). To George Moore it seemed that the division between art and science widened significantly during the mid to later Victorian period but, in reality, his view overstated the situation. Actually, the weakening of the Ruskinian/Pre-Raphaelite approach to art did not break the existing linkage of science with art; rather, that linkage took new forms. Though Whistler and Forbes lacked the technical knowledge of a John Brett or the investigative attention to detail of a Constable, Hunt or Frith, the thread of science winds through their methodology and language, approaches toward the general public, international orientation, and acceptance of change and uncertainty. By creating associations between themselves and those involved in science through their words, art and professional stances, Whistler and Forbes kept the thread moving into the twentieth-century, when it was picked up by the cubist and futurist artists of the World War I period.

Whistler would not have understood Darwin's belief that practising science killed the scientist's ability to appreciate poetry (Woodring 227). Whistler and Forbes probably felt a kinship with the disciplined, intelligent, trained, experienced and sometimes misunderstood "men of science." The parallels with their own careers and tactics, though neither limitless nor inclusive, are striking, and serve to demonstrate that even Whistler and Forbes, leaders of new artistic movements, were affected by the predominant scientific frame of mind of the later Victorian period.

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