MANUFACTURING INDUSTRY:

TASTE AND SCIENCE IN MID-NINETEENTH CENTURY BRITAIN

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ABSTRACT

"Manufacturing Industry: Taste and Science in Mid-Nineteenth Century Britain" is about efforts to reconstruct industry to make it palatable to the English public and to enable the government to involve itself in the industrial sector. At a time when it was difficult to do so, taste and science became avenues for the government to insert control over the production sphere. Manufacture was represented as a product of taste and science and hence industrialization became culture.

Concerns about the wider social and intellectual ramifications of industrialization were brought forward by the 1835/36 Select Committee that inquired into extending art to the manufacturing population. It concluded that British manufacture was lacking in taste and initiated government measures that would redefine the role of industry.

Some of the efforts to redefine the impact of industry would come from the London based Society of Arts which in the 1840s was led by Prince Albert and the energetic civil servant Henry Cole. The Society promoted the Art-Manufacture movement which had as its object to persuade manufacturers of consumer goods to produce more tasteful products.

The Great Exhibition of 1851 initiated by the Society was intended to showcase taste, but that proved to be difficult. Resistance to holding the exhibition as well as the decision to use it to celebrate Britain's achievements determined the form and content of the exhibition. Nevertheless, in its aftermath, the Department of Practical Art was established where new strategies were formed to define the exact impact of taste and the exact measurements that needed to be taken to combat bad taste. As products of taste,

industrial manufacture was defined as having aesthetic, moral and social dimensions and pressures were put on manufacturers to take up the role as upholders of good taste. By defining and treating machine production as culture, the government institutions extended the role of mass production beyond mere economy.

The Great Exhibition was originally intended to promote both science and taste and with the surplus generated from the exhibition, the Royal Commissioners of 1851 sought to establish an institution of science and technology, but it would meet too much opposition. To reach its goals, the Commissioners prompted the establishment of the Department of Science and Art, but its initial policies failed. The Department then used exhibitionary strategies as well as examinations to promote science as a necessary knowledge. Science was promoted as culture to further the idea that it was necessary to establish a central institution of science. At the South Kensington Museum, the familiar was presented in an open, inviting setting to entice acceptance of the theoretical subcontext. In the 1870s, when it was accepted that the government initiatives to promote science were needed, the approach changed. However, the lower classes were still thought to benefit from museums which represented industry as the result of the production of art, science and machinery.

This study shows the importance of placing educational measures in their actual context rather than focusing on retrospective themes such as decline and progress. In the decades around 1850, the attempt was made to define industry as culture to transgress the prominent contemporary definitions which saw it in terms of the market or as a preeminence of the workplace.

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I would like to thank my supervisor Chris Kent for all his kind and wise support. I have also been a grateful recipient of graduate scholarships from the University of Saskatchewan and SSHRC. While researching in Britain, I found staff at the National Art Library, the Royal Society of Arts archive, the Imperial College Archive and Archive of the Royal Commission of 1851 very helpful. The staff at interlibrary loans at the University of Saskatchewan also deserves thanks for doing their best trying to find my sometimes obscure references. Finally, thanks to my partner Tom Hill for editorial, financial and emotional support.

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INTRODUCTION:

TAMING THE MONSTER

During the planning of the Great Exhibition, the following statement was made: "It was a question whether this Exhibition should be exclusively limited to British Industry. It was considered that, whilst it appears an error to fix any limitation to the production of Machinery, Science and Taste which are of no country but belong to the Civilised World, particular advantage to British industry might be derived from placing it in fair competition with that of other Nations."[1]

The first time I read this quote, it struck me as quite significant. Something very important is said here about the nature of industry. It reminded me of Plato's *Republic*, when Plato divided the state into three classes: the philosophers, the Guardians, and the "third class." He used an organic analogy in which the head with its reasoning represented the leaders, the heart and its loyalty represented the warriors, and appetite or the stomach represented the producers.

While in this quote pertaining to industry the image of the body is not explicitly used, I nevertheless think that given the properties we attribute to machinery, taste and science, one can easily come to see that when making industry equal to the production of machinery, science and taste, machinery represents the mechanics, science the intellect, and taste the senses or perhaps even the soul of the 'body' industry.

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[1] Quote attributed to Prince Albert. Cited by Cole at a meeting at the Mansion House October 17, 1849 and reported in the *Times*, 18 October 1849.

Some years before, Mary Shelley's Frankenstein had created a mechanistic being with intellect and senses. To me, the Great Exhibition is a sort of Frankenstein monster.[2] Here was a man-made creation which represented all of mankind's industrial efforts, and inside of it was the machinery crunching up the raw materials and spewing out enormous amounts of products.

Was the Great Exhibition a benign monster? Well, judging from the way many contemporaries saw it, it certainly was. They loved it. They thoroughly enjoyed the offerings of the monster and saw a great future in further development of the creature called industry. But one never knows with monsters. There always comes a time when one starts to ask oneself: who is the real master? Are the people serving the monster? Or is the monster serving the people?

This dissertation is about the attempts to control the monster called industry. There were those who had started to ask questions about the monster's true intentions and who sought not to destroy it but to control it by providing it with an intellect and with a soul.

This would prove difficult, and perhaps in the end, it was a partial failure. As I explain in my chapter on the Great Exhibition, if seen from the perspective of those who hoped to make industry equal to the products of machinery, science, and taste, the Great Exhibition cannot be considered a glorious moment in the annals of mankind. The monster, to use my own metaphor, could not be that easily controlled.

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[2] My own impressions of the Frankenstein monster are admittedly shaped by twentieth century cinematography. See Chris Baldick, *In Frankenstein's Shadow: Myth, Monstrosity, and Nineteenth-century Writing* (Oxford: Clarendon Press, 1987) for nineteenth century interpretations.

The literature on taste, science and machines of the period is extensive. The "monster"– the Great Exhibition – has been constantly interpreted and reinterpreted over the years. Jeff Auerbach, who himself has performed a reinterpretation in *The Great Exhibition of 1851: A Nation on Display* (1999), writes that the Exhibition came to be a symbol even before it was held and has continued to be so over the years.[3]

"Taste" in the sense used by Prince Albert above, meaning a capability to correctly design and decorate consumer products, has been treated by two main official histories. Quintin Bell and Stuart MacDonald both wrote on the Schools of Design and the Department of Science and Art, the two main institutions where governmental instruction in design would take place.[4] Both are quite critical about the methods used by the Design Schools and the Department of Science and Art which from 1853 ran the schools. They see the principles of design, as defined by Richard Redgrave, the Inspector General for Art, and others, as far too narrow, and the payment by results scheme, whereby instructors were paid according to the result of national examinations, as too constraining.[5]

Science has been more widely discussed, partly since scientific and technical education is a focus for those who have tried to determine "what went wrong" in terms

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[3] But while Auerbach is quite correct in interpreting the Great Exhibition as a multi-focused event his insistence on giving nationalism and internationalism priority seems forced. Jeffrey Auerbach, *The Great Exhibition of 1851: A Nation on Display* (New Haven: Yale University Press, 1999).

[4] Quentin Bell, *The Schools of Design* (London: Routledge and Kegan Paul, 1963) and Stuart MacDonald, *The History and Philosophy of Arts Education* (London: University of London Press, 1970).

[5] See also Winslow Ames, *Prince Albert and Victorian Taste* (London: Chapman & Hall, 1967) and, Nikolaus Pevsner, *High Victorian Design* (London: Architectural Press, 1951) for a description of consumer preferences at the time. Winslow Ames largely concentrates on the choices made by Prince Albert in the decoration and style of the Royal castles but he also outlines Prince Albert's role in the attempts to improve taste, especially after the Great Exhibition. Ames is a lot more generous in his assessment of the impact of Prince Albert and Henry Cole than is Bell. Ames finds the Design Schools and the Department of Science and Art a necessary stage in the further development of industrial design.

of Britain's loss of her industrial supremacy. Many consider education strictly as an economic category and, in light of what have been identified retrospectively as the needs of Britain, level blame at institutions and groups.[6] D.S.L. Cardwell's *The Organisation of Science in England* (1957, c1972), characterized as a seminal work on science and technical education,[7] deals roughly with the period 1815 to 1914. Cardwell finds that the social organization of science commenced around mid-century, but he considers the efforts of the Department of Science and Art, the focus of my discussion here, insignificant in this period. Rather, he considers the efforts of the Mechanics' Institutes and the Society of Arts to hold examinations more important. Cardwell ascribes the lack of success of the Department to the fact that while it catered to the secondary level, primary science education was lacking. As an institution to foster the kind of education that Cardwell and others imply was needed, the Department of Science and Art certainly failed.

David Layton has written extensively on science education and in *Science for the People* (1973) he devotes considerable space to discussing the Department of Science and Art, especially in the early years of its history, before the introduction of national examinations. Layton's perspective is not to find the faults of the system but to study the different motivations behind bringing science to schools. Layton studies the early

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[6] See for instance G. Roderick and M. Stephens (eds.) *Where Did We Go Wrong: Industrial Performance, Education and the Economy in Victorian Britain* (Lewes, Sussex: Falmer Press, 1981); Sidney Pollard, *Britain's Prime and Britain's Decline* (London: E. Arnold, 1989); W.D. Rubenstein, *Capitalism, Culture and Decline in Britain 1750-1990* (London: Routledge, 1993); Michael Dintenfass, *The Decline of Industrial Britain 1870-1980* (London: Routledge 1992) and David Edgerton, *Science, Technology and the British Industrial Decline 1870-1970* (Cambridge: University Press, 1996). For a discussion of some of this literature see J.F Donnelly, "Science, Technology and Industrial Work in Britain, 1860-1930: Towards a New Synthesis." *Social History* 16.2(1991): 191-201.

[7] Donnelly, ibid., 191.

advocates of science in education; Richard Dawes, Henry Mosely, and John Steven Henslow, as well as some of those figures who worked with the Department of Science and Art.

Some scholars have concentrated more on the system of examinations which the Department introduced in 1859, but which were employed by other institutions as well.[8] Generally, these authors on examinations tend, as do those writing on art, to see science education under the Department as too restrained. The system of national examinations, which for all intents and purposes was the extent of science education under the Department, did not go far enough. These authors argued that a more concentrated effort was needed.

A central figure in this dissertation is Sir Henry Cole, a civil servant who had a very great impact on the development of taste and science in the period. He was instrumental to the efforts of the Society of Arts to improve taste in the 1840s, he helped bring about the Great Exhibition and he ran the Department of Science and Art until 1873. Now, as then, Henry Cole is hard to avoid. Christopher Duke, who wrote a doctoral thesis on the Department of Science and Art, found himself "increasingly preoccupied with an able civil servant, Henry Cole, whose ideas, energy, and self-assertion, it appeared, largely molded the department, and so gave particular form to State aid for a branch of education."[9] Auerbach argues provocatively that as far as the

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[8] Roy MacLeod, (ed.) *Days of Judgment: Science, Examinations and the Organization of Knowledge* (Studies in Education Ltd. Driffield, N. Humberside: Nafferton Books, Printed by Chester: Bemrose Ltd, 1982); F.E. Foden, "Technical Examinations in England" *Paedagogica Historica* 6.1(1966): 68-97.

[9] Christopher Duke, "The Department of Science and Art: Policies and Administration to 1864" (Unpublished Ph.D. Thesis, University of London, 1966), 5.

Great Exhibition goes, Henry Cole was dispensable. The same argument cannot be made about Henry Cole's role in the Department of Science and Art.

Cole donated his papers and diary to the South Kensington Museum, the museum he had helped establish. At the V & A, Elizabeth Bonython has transcribed and indexed his diaries, and has also published a short book on Cole.[10] Here, Cole, his friends and acquaintances and pet projects are featured in a few paragraphs each. The image is of a spider weaving its web. A similar impression is created by Ann Cooper in her Ph.D. dissertation on Henry Cole, "For the Public Good: Henry Cole, his Circle and the Development of the South Kensington Estate."[11] Here she traces Cole's public works from 1823 to 1873, especially after 1852 when South Kensington became central to most of Cole's activities. She identified a group of people as the South Kensington Mafia, suggesting that Cole was the prime Mafia boss. The metaphor, although throwing some light on Cole's methods and his intense cultivation of friends with influence, seems to me somewhat exaggerated. Nonetheless, Cooper's work is so far the only biography of Cole and in it she has concentrated on his public work with the Records Commission, the Society of Art, various departments, the exhibitions and museums.

The Department of Science and Art, much like its director Henry Cole, has been left without an official history. There are two unpublished doctoral dissertations about the Department: Arnold Sidney Levine's "The Politics of Taste: The Science and Art Department of Great Britain, 1852-1873" (1972) and Christopher Duke's "The

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[10] Elizabeth Bonython, *King Cole: A Picture Portrait of Sir Henry Cole* (London: Victoria and Albert Museum, 1982)

[11] Ann Cooper, *For the public good: Henry Cole, his Circle and the Development of the South Kensington Estate.* (Ph.D. Open University, 1993).

Department of Science and Art: Policies and Administration to 1864" (1966). Duke has a two-part focus in his work: the day-to-day business of the Department and the policy of state-aided education. It is a thorough history, based mainly on PRO documents. Levine's thesis, with its broader focus and reliance on the material in the Victoria and Albert is on the whole less thorough on the discussion of the Department itself.

By contrast, the South Kensington Museum has attracted many publications. John Physic wrote a history of the Victoria and Albert Museum, concentrating on the development of the building itself.[12] Much of the history of the Museum is covered in *Survey of London.*[13] Both provide details about the construction of the museum and the involvement of Henry Cole. Attempts have been made at more analytical studies of the museum. I have benefited greatly from the theoretical discussions on the meaning and function of modern museums, some of them owing much to the theories of Gramsci.[14] The emphasis these authors have put on the educational and knowledge-producing role of the museum is a central ingredient in my discussion of the South Kensington Museum. Museums educate, refine, or produce social commitments and I analyze how the South Kensington Museum aimed to produce a commitment to a new way of viewing industrialism. With these theories in mind, I have in my study of the first years of the

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[12] John Physick, *The Victoria and Albert Museum* (Oxford: Phaidon Christie's, 1982).

[13] F.H.W. Sheppard (ed.), *The Museums Area of South Kensington and Westminster.* vol. 10 of *Survey of London* (London: Athlone Press, 1975).

[14] In a recent work published by the Smithsonian Institution, *Museums and Communities: The Politics of Public Culture*, Ivan Karp, one of the editors, in referring to an earlier volume in this series, *Exhibiting Cultures*, writes "the discussion of the poetics and politics of museum display illustrated how the selection of knowledge and the presentation of ideas and images are enacted within a power system. The sources of power are derived from the capacity of cultural institutions to classify and define peoples and societies." Ivan Karp and Steven D. Lavine, *Exhibiting Cultures: The Poetics and Politics of Museum Display* (Washington and London: Smithsonian Institution Press, 1991). Ivan Karp, Christine Mullen Kreamer, and Steven D Lavine (eds.) *Museums and Communities: The Politics of Public Culture* (Washington and London: Smithsonian Institution Press, 1992), 1-2. This volume incidentally features a picture of the Canadian Museum of Civilization on its cover and title page.

South Kensington Museum decided to look closely at the representation of science as part of the larger project by the Department of Science and Art.

In *The Birth of the Museum* (1995),[15] Tony Bennett uses Foucault's theories to, among other things, ascertain in what sense the public museum exemplified the development of a new "governmental" relation to culture in which works of high culture were treated as instruments that could be enlisted in new ways for new tasks of social management.[16] In another work, Bennett argues that one should view the cultural as a field of social management.[17] I argue that culture was used to manufacture acceptance of industrialism as interpreted by the Royal Commission of 1851. I have chosen to cite Raymond Williams and his interpretation when writing my chapters on taste and science. Williams has been criticized by fellow Marxists for seeing culture as an area from which to launch a critique of economic forces and state power. His friend and colleague, Terry Eagleton, has argued that culture cannot be separated from these forces, and in a more recent study, David Lloyd and Paul Thomas whole-heartedly concur, writing that culture serves the state directly.[18] They see the decade between 1860 and 1870 as the crystallization of the Victorian state, a time of convergence between the ideological

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[15] Tony Bennett, *The Birth of the Museum: History, Theory, Politics* (London and New York: Routledge, 1995).

[16] Henry Cole's South Kensington Museum is one of the museums he discusses in this work. To Bennett, the museum, and South Kensington Museum in particular, because Cole explicitly wanted working class families to visit the museum, was an institution for social management. Bennett argues that the museum, the exhibition, and later the department stores, not only ordered the objects; they also ordered the public that inspected these objects. The museum, therefore -- and this is Bennett's central thesis -- "deploys its machinery of representation within an apparatus whose orientation is primarily governmental. (*Birth of the Museum*, 46). Bennett, in the first chapter of the book, quite interestingly discusses the role of women in this "civilization" process. Commentators on both the Crystal Palace and the South Kensington Museum make much out of the women in the public space and Bennett discusses how this contributed to the "civilizing" nature of the museum.

[17] Tony Bennett, "Useful Culture" *Cultural Studies* 6(Oct. 1992): 395-408.

[18] David Lloyd and Paul Thomas, *Culture and the State* (New York: Routledge, 1998), 146.

formulation of the liberal thinkers and the institutions of the state.[19] Leaving the somewhat Hegelian paradox of the snake eating its own tail aside, I would concur that the period under discussion seems to find the state enlarging its role in culture especially when looking at education. My focus has been on a smaller group of individuals who worked out strategies to promote a view of industrialism that both converted art into a manageable social force and used culture to promote science.

This analysis argues that science and art were constructed as culture, and as such, became avenues for the government to insert some control over the production sphere. Culture was used to combat resistance to the attempts to insert the control that taste and science represented. The analysis is therefore at variance with that put forward by Martin Wiener in *English Culture and the Decline of the Industrial Spirit, 1850-1980* (1981), in which Wiener argued that in the nineteenth century, English culture was constructed as an opposite to industry.[20] However, in the period discussed here, the Government, through the Schools of Design and the Department of Science and Art, can be seen attempting to use exhibitions, museums and educational projects to further industrial Britain.

Though the preceding review of the relevant literature is not exhaustive, it shows how science, machinery and taste have generally been treated separately. Those who are interested in social management are less likely to segregate these areas, but they also tend to be less preoccupied with the content of the institutions that they study. It is my contention that the attempt to unite science, taste and machinery was undertaken first at

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[19] Lloyd and Thomas, 115.
[20] Martin J. Wiener. *English Culture and the Decline of the Industrial Spirit, 1850-1980* (Cambridge: Cambridge University Press, 1981).

the Great Exhibition and then in the Department of Science and Art and the South Kensington Museum in order to construct a new discourse on industry. As essential background for this celebrated cultural "event," I precede it with an examination of the efforts to exercise control of industrial production connected with the "taste commission" of 1835/36. That Select Committee on extending art to the manufacturing population, clearly expressed the need to control industrial production by influencing the producers.

However, my opening chapter starts with a more detailed discussion of how industry was portrayed at the time of the commission. When Prince Albert and the energetic civil servant Henry Cole deemed industry equal to the production of machinery, science and taste, they were trying to present a picture of industry that did not correspond with how many others saw it. To some, industry was an empirical project that occurred at the workplace and needed no directed infusion of science or taste. Others represented industry as part of a mechanistic universe encompassing everyone and everything but governed, not like Shelley's monster by impulses or urges, but rather by universal laws, making it impregnable to external influences or controls.

This chapter also makes evident that representations of industry cannot be discussed apart from politics, economy and culture. The question of intervention into the realm of production clearly impacts the discussions on liberalism and state intervention. Many historians and thinkers have pointed out that state control was never eliminated in Britain even at the height of liberalism. Some of these, whom I lean on somewhat in discussing representations of industry, have pointed out that new discourses

were created and helped introduce new means of control, particularly at a time of rising mass population. Mary Poovey has argued that new strategies were involved in the construction of "the social" as an area where intervention was considered legitimate.[21] Michel Foucault coined the term "governmentality" to denote reformulations to interpret the role of the state and the theories about state. Foucault has argued that in the nineteenth century, *laissez faire* meant "not to impede the course of things, but to ensure the play of natural and necessary modes of regulation, to make regulations which permit natural regulation to operate."[22] I propose that the arguments raised by both the taste question and the "science movement" were attempts to redefine the role of the state. The taste question in particular defined laws of design that the state was supposed to ensure were followed. Both these theories converge on my argument that culture, especially as defined by the taste movement, became an important discourse of control. It is the last topic, "culture," which particularly interests me in this connection. While the social might, as Poovey argues, be constructed because the political and economic spheres were protected from interference, the cultural was also ripe for defining. According to the immensely influential definition proposed by Raymond Williams in *Culture and State*, "culture" in the nineteenth century first

> came to mean ... 'a general state or habit of the mind,' having close relations with the idea of human perfection. Second, it came to mean 'the general state of intellectual development, in

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[21] Mary Poovey, *Making a Social Body: British Cultural Formation 1830-1864* (Chicago and London: Chicago University Press, 1995).

[22] Cited by Colin Gordon in "Governmental Rationality: An Introduction," Graham Burchell, Colin Gordon and Peter Miller, eds., *The Foucault Effect: Studies in Governmentality* (Chicago: University of Chicago Press, 1991), 17.

> a society as a whole.' Third, it came to mean 'the general body of the arts.' Fourth, later in the century, it came to mean 'a whole way of life, material, intellectual and spiritual'.[23]

Improving the taste of British manufacture was, I will argue, part of an attempt to appropriate the changing area of culture. At the same time, culture became a way to ensure control of the 'monster' industry when economy and politics, due to prevailing liberalistic doctrine, were closed avenues. Culture was therefore, in my mind, an area for the state to intervene in the production sphere at a time of laissez faire.[24]

In addition to taste, science was touted as a part of industrial production. I have chosen to discuss it in my fourth chapter, which largely deals with the efforts of the Royal Commission of 1851 to create an environment in which to establish a central science institution. Admittedly, there were powerful voices advocating to further science education long before the Royal Commission started to plan for its Instructional Institution. The British Association for the Advancement of Science, just to mention one, was established in 1831. Moreover, the nineteenth century, which was ripe with invention and inventors as well as groundbreaking scientists such as Charles Lyell, Charles Darwin and Lord Kelvin, has attracted numerous histories and studies on its scientific aspect.

However, some of the gist of my fourth chapter can be found in a comment to the Queen's throne speech in November 1852 when she announced the plans for the new

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[23] Raymond Williams, *Culture and Society 1780-1950* (New York: Columbia University Press, 1983), xvi.
[24] This is what Tony Bennett argues in his writings on the nineteenth century. In *Culture and the State*, Lloyd and Thomas points out that culture serve the state. Where Williams sees culture as opposed to society, Lloyd and Thomas find that in the nineteenth century culture came to represent the fundamental identity of human beings and the state through the cultural institutions became the guarantor of this identity. I agree with Bennett, Lloyd and Thomas that culture in this period becomes an area of state involvement.

Department of Science and Art, stating "The advancement of the fine arts and of practical science will be readily recognized by you as worthy of the attention of a great and enlightened nation. I have directed that a comprehensive scheme shall be laid before you, having in view the promotion of these objects, towards which I invite your aid and co-operation." These words prompted the *British Quarterly Review* to respond, perhaps tongue in cheek, that "This indicates a movement new to this country, and claims our closest attention. The word SCIENCE appears for the first time in our history in a speech from the throne."[25]

For all the importance that we now attach to science, it still lacked official backing at the time these words were written. The topic of this forth chapter is therefore, the efforts to construct 'industry' in a manner to allow government to promote science as one of the driving forces of industry. In spite of what it was intended to do, the Great Exhibition came to give the impression that theoretical science education was not a necessity. But as I argue, some of the same people who worked to put pressure on manufacturers to produce "taste" also wanted to further science as one additional element that would improve, or as I argue, control industrial production. Faced with the fact that localities in Britain did not line up to establish science schools, the new Department of Science and Art championed science by reconstructing daily life. Science was furthered not as theoretical knowledge, but as culture.

Machinery was the third element of Prince Albert's definition of industry. I have devoted no separate chapter to discussing machinery because, as I argue, there was to be an intimate relationship between the dissemination of science, art and machines.

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[25] "The Industrial College," *British Quarterly Review* 17 (Feb. 1853): 203.

Machines were to help produce the environment that would ensure better taste and were also, although to a lesser extent, to help further the idea that science was essential to every aspect of human life. The machine is in a way central to this discussion because we are dealing with an industry which was mass producing for a larger group of consumers. and concerns were mounting not only about the social effects of the factory system but the social and cultural effects of consumer society. The discussions on taste and science constructed machinery as advanced tools which. with state guidance, would produce goods that would help counter bad taste and lack of science.

This study is of course limited by the fact that I have chosen to discuss the issue in terms of a small group of initiators and the extent and purpose of their projects. There were others who sought to extend science and art teaching in the period as well and who were not included in the circle of acquaintances of Henry Cole. But while this study is not comprehensive, I will argue that at a time when it was not politically feasible for the government to either extend education or involve itself in the production sphere, this circle formulated new areas of concern which nevertheless allowed the government to attempt to direct the production sphere.

CHAPTER 1

"THE TASTE QUESTION:" MACHINES AS PRODUCERS OF CULTURE

In 1849, the *Art Journal* printed a letter from "Freemasons of the Church" entitled "Importance of the Study of Design" which outlined the role of art and taste:

> It then becomes necessary to investigate, understand, and act upon those broad fundamental principles which form the basis of all Art, and apply equally to every style past, present, or to come; for without a due observance of principles, ingenuity becomes perverted, invention runs wild, and then the types of past ages must be the molds in which alone the ever active mind of genius can pour forth its ideas with the certainty of their assuming shapes of beauty and dignity. ...
>
> Thus, taste has an Economic, a Moral, and Social value, for, it tends to increase production, it produces healthy feelings of content, and it renders men disinclined to disturb Law and Order.[1]

The authors of this letter make three important claims. First, they claim that art has principles that if duly understood can be universally applied; second, it is implied that these principles can be harvested in molds and mass produced; and third, that taste, the ability to recognize or apply these principles, has a wide set of very desirable functions. Two years before the Great Exhibition, such claims were common within the *Art Journal*, in the debate that surrounded the government-run Design Schools and in the

[1] *Art Journal* 40 (1849): 95.

Society of Arts , a small London-based society with Prince Albert as its president that by 1849 had begun to discuss holding a national or even international exhibition to promote taste. The importance of taste had also been discussed during the planning of the new parliament building, the establishment of the National Gallery, and in other areas which it was thought that a wider public would frequent. Some years before, in 1837, the Government had set up the Schools of Design that had as their purpose to train people to design better quality goods. Certainly if the authors were correct, and there were many who agreed with them, the wide function of taste would justify all attempts and expenses needed to improve design.

The discussions of taste, which became prominent in the 1830s with the Parliamentary Select Committee of 1835/36, to "inquire into the best means of extending a knowledge of the Arts, and of the Principles of design among the People" and which were constituted governmentally in the Design Schools, had implications for the representation of industry in British society. With the "taste question," the discourses on machinery and industrial production expanded into the realm of culture. These discourses were not merely theoretical additions pertaining to the understanding of the issue; they would, particularly after the Great Exhibition, mean practical and institutional changes that aimed at redefining the role of the government in relation to the sphere of production and made use of entertainment and instruction to further public acceptance of industrial Britain. Machines and art were explicitly linked in the discussions on taste because machines were furnishing the molds into which the principles of art could be poured.

This chapter discusses the development of the "taste" question, the significance of the debate and the measures taken to improve taste. There are several aspects to the taste question. The questions and doubts about the state of taste indicated concerns with the effects of industrialization and at the same time upheld the cultural values of things. However, these 'things' were now to a large extent mass produced consumer goods which meant that in order to further the cultural values of the things, one had to control the form of the "molds." As we will see, to improve taste the state first aimed to exercise more control over the instruction of the designers. This proved to be difficult and seemed to render few results. Another possibility that would emerge was to leave such powers of discretion to the consumers themselves. But for this to work the consumers themselves would need some instruction as to what were the best choices to make. Before the Great Exhibition, the state attempted to control the molds by improving the designs and the designers. These efforts were criticized by individuals who argued that the public itself needed to be better advised as to what choices to make and who advocated planned exhibitions of quality wares to educate consumers as well as producers.

Design therefore needed direction. But at the same time, economic policies and economic culture denied such direction by defining the production sphere as autonomous. The discussions on taste would widen the notion of what industrial production was and would establish a new discourse on machinery. It did not replace the existing discourses but it did make it possible to focus on a different aspect of industrial society , namely, the relationship between the products and the consumers.

Commodities were not merely the product of forces of the marketplace but had aesthetic and moral dimensions. Before taste, machinery had no apparent cultural dimension and was on the one hand represented as an advanced tool which throughout centuries had been refined and improved gradually by skilled workers and inventors. Machines were the product of skill. On the other hand, the dominant economic discourse of capitalism, political economy, saw machines as labour saving devices. Common to both conceptions is the idea that machines have their primary effect within the economic sphere. Their ability to produce goods is subordinate to their ability to project changes within the economic production structure itself.

Political economy constituted machinery within a framework of order and rationality. Though this was not the only discourse to interpret machinery, it had a strong logic. The machine and the economic system mirrored each other and sustained each other. Economy and society were both seen as machines that could work independent of interference. Adam Smith's *Wealth of Nations* (1776) shifted the mercantilists' concern with the economy from exchange of goods to production of goods. Increased wealth was primarily the result of rationalized production, not of favourable exchange. Within political economy, machinery had a one-dimensional role of a quantitative nature; it could enlarge or reduce capital and labourers. Machinery and invention were secondary for Adam Smith. To him, division of labour came first. Smith wrote: "the invention of all those machines by which labour is so much facilitated and abridged, seems to have been originally owing to the division of labour."[2] Thus, to

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[2] Adam Smith, *Wealth of Nations*, book I, chapter 1. (London: Methuen & Co. Ltd., 1904, 2nd. ed., 1920), 11.

Smith, rationalization of production is prior to invention. David Ricardo, one of the best known political economists, added a chapter called "On Machinery" to the third edition of his *Principles* published in 1821, in which he discussed the "machinery question."[3] It was also on the table at the London Political Economy Club, where most of the prominent economists of the time met, in its second year, 1822.[4] The "machinery question" dealt with the economic effects of machines. There was no doubt among the various political economists of the time that machines increased productivity. The problem was, however, whether or not machines were really beneficial to society at large. The question that was discussed at the Political Economy Club and also addressed by Ricardo in *Principles* was whether or not machinery created unemployment, or as the contemporaries would put it, lessened the demand for employment. In other words, within this type of economic discourse the machine is easily understood as a one dimensional player, a capital investment.

But machinery was also explained or understood by pointing to a parallel between the order of the factory and the order of the economy. Andrew Ure and Charles Babbage, defenders of the factory system in the 1830s and '40s, used political economy as their basic framework when defending machines and emphasized in particular the

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[3] Maxine Berg, in *The Machinery Question* (1980), discusses the connection between the Victorian debate over the meaning of machinery and the formation and development of political economy. There are some similarities to her approach in that of Michal Adas who in *Machines as the Measure of Man* (1989) argues that during early encounters between Europeans and other civilizations, technological advance became identified as a signifier of superiority. Machines with their measurable social and economic impact forced their discursive logic on systems that are in the business of interpreting the world. Berg sees a strong and clear connection between the development of the new discipline of political economy and the introduction of the new technology.

[4] A.K. Dasgupta, *Epochs of Economic Theory* (London: Blackwell Inc., 1985), 15. The Political Economy Club was founded in 1821 on the impulse of Thomas Tooke, a merchant who had turned political economist. Torrens, Malthus, Ricardo and James Mill were among those attending its first meeting. See Gary F. Langer, *The Coming of Age of Political Economy, 1815-1825* (New York: Greenwood Press, 1987), 72-74.

principle of division of labour. Machines facilitated division of labour, and division of labour was in essence the most effective economic system. In other words, the more rationalized the production system was, the better it was. Thus, the factory system itself justified the greater economic order just as much as the economic order justified the factory system. Babbage's *On the Economy of Machinery and Manufacture* presents a long list of axioms showing how the rationalization of the system was a defense for its existence.[5] The book consists of numbered paragraphs, 467 in all. Each of these paragraphs is presented either as an axiom, standing freely itself or corollary derived as a deduction from previous paragraphs. Hence, Babbage gave his work the form of a scientific treatise just as deductive as most works on political economy at that time. Not only did Babbage's defense of machinery share some of the arguments of political economy, it also shared their form. Andrew Ure's *Philosophy of Manufactures* defines the philosophy of manufacture as "an exposition of the general principles, on which productive industry should be conducted by self-acting machines."[6] The word "principles" is a key to understanding the machine and the system in which the machine functions. Economy, the society and the means of production were all machines, all self sustained and powered all by steam and coal. Order, or rationalization, is the primary mover, not the machine.

The paradigm of rationality and economy so central in Ure and Babbage was accompanied by a "practical" or "empirical" representation of industry, according to which machines were invented by the skill and ingenuity of individuals. This approach

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[5] Charles Babbage, *On the Economy of Machinery and Manufacture* (London: Charles Knight, 1835).
[6] Andrew Ure, *Philosophy of Manufactures* (London: Charles Knight, 1836; reprint London: Frank Cass, 1967), 1.

still focused on the productive capability of the machines and would continue to emphasize their utility in economic terms, but in defining the inventive process of machinery it placed less emphasis on principles and economic structures than on the work place.

Magazines like the *Mechanics' Magazine* or the *Civil Engineer*, both of which saw it as their purpose to encourage ingenuity by describing current inventions, held that British skill created and maintained the nation's industrial supremacy and could be encouraged by awarding patents to protect inventions and encourage profit or by offering direct prizes for ingenuity. Invention of machinery was the result of the practice of an art. The purpose of the *Mechanics Magazine* which was connected to the establishment of the Mechanics' Institutes, was to encourage this art. The first issue of the *Magazine* has an epitaph that reads:

> -Industry! rough power!
>
> Whom labour still attends, and sweat, and pain ;
>
> Yet, the kind source of every gentle art,
>
> And all the soft civility of life. [7]

It is not the clean and rational principles that are emphasized but the hard manual and mental work of the factory. This issue also discusses the career of James Watt: "His good fortune may encourage, and his perseverance instruct the present and all future generations of mechanics; and therefore, his biography has been selected, as it seems particularly well adapted, for the first number of a work which is to be entirely devoted

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[7] *Mechanics' Magazine*, No. 1, August 1823.

to their amusement and improvement."[8] The machines and inventions discussed in the magazine are the result of hard work and a good life. Machines are not studied or debated in any other relation; they are tools produced essentially by craftsmen. This mode of representation of machinery was popular and was encouraged by and reflected in practices such as providing prizes for inventions as the Society for Encouragement of Art, Commerce and Manufacture was doing in this period. Similarly, histories of the branches of art, like weaving and spinning, gave them long and distinguished genealogies. The first volume of the *Mechanics' Magazine* discusses a book on the Art of Weaving which starts its history of weaving with the Roman period.[9] This type of genealogy establishes the art of the branch as one of slow growth and steady evolution. Machines, including the steam driven ones, are part of a long history of tools and their improvement by those who handle them.

Discussing industry within the realm of skill did not necessarily conflict on all points with the representation of machinery within political economy. The paradigm of skill emphasized the importance and preeminence of the workplace and the shop, political economy the preeminence of the rational system of the economy. Both systems saw the machine as a primary tool enhancing production and both systems resented government interference. When the state in the middle of the 1830s tried to educate designers at government schools, many manufacturers would argue that persons not trained in the workplace would do little to improve products and that any effort to improve design that did not have a strong link to the places of production could not

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[8] *Mechanics' Magazine*, No. 1, August 1823, 1-2.
[9] *Mechanics' Magazine*, No. 7, December 1824, 219-224.

succeed. The necessary quality of skill was not theoretically attainable but needed the empirical experience only attainable at the workplace. Skill, therefore, as much as political economy was a deterrent to state involvement in the production sphere.

Yet at the same time, liberalism required means of governing that functioned at other levels than direct interventions and direct laws. As we shall see, taste emerged as one such way of ensuring values in a liberal society, and therefore intermeshed machinery and culture.

But before the establishment of the Design Schools, and for some time to come, any governmental involvement in the encouragement of production was looked at with suspicion. In 1828 there was an attempt under the auspices of George IV to bring the industrial exhibitions of the continent to Britain. The project, a permanent exhibition of goods and machinery located for a few years at Charing Cross, succumbed to a slow death due to criticism and diminishing interest. The arranging committee declared that such an exhibition "of specimens of new and improved productions of our artisans and manufacturers, conducted on a scale that should command the attention of the British Public, resident in and annually visiting the metropolis, would be highly conducive to the interest of the foreign commerce, as well as the internal trade, of the UK." And in the opinion of the committee, "such exhibition will not only prove a powerful stimulus in promoting the farther improvement of our already successful manufacturers, but will also bring into notice the latent talents of many skillful artisans and small manufacturers, now labouring in obscurity, and sacrificing inventions valuable alike to the country and to themselves, from wanting such an opportunity of introducing them to the British

Public."[10] Although the initial report in *The Times* seems quite favourable, the paper makes it clear that the projected benefits to encouraging new inventions will not come from this exhibition as British manufacture needs no encouragement.[11] But the paper still thinks that the exhibition will serve to "spread the taste for mechanical inventions amongst the higher classes and therefore create demand for them".[12]

The paper mentions some items of interest such as revolving window sashes, a chair that can be made into a bed and a washing machine. However, *The Mechanics' Magazine* severely lashed out against the exhibition. *The Mechanics' Magazine* believed that with patents being too expensive, most people would and could not exhibit inventions for fear that they would be stolen. And it seems that the so-called Royal Repository suffered from declining public interest. The exhibition was called a toy shop, and according to one later writer on the exhibition, the public walked around the unfortunate exhibition, selected all the weakest points, poked them without mercy and without judgment, knocked the exhibitors down, and leaped upon their models.[13] In 1833, the exhibition was moved from Charing Cross to Leicester Square and by that time received unfavourable comparisons with the privately run National Gallery of Practical Science" - the "Adelaide Gallery" in the Strand which featured many electrical machines, a noisy steam gun, and an electrical eel.[14] *The Times*, in June 1828, reported that the exhibition had enough curiosities to be of interest, but that did not seem to be the general

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[10] Cited from the *Mechanics' Magazine*, 29 April 1828, 195-96.
[11] *Times* 27 June 1828.
[12] *Times* 21 July 1828.
[13] International Exhibition of 1862, and John Hollinghead, *The International Exhibition of 1862: The Illustrated Catalogue of the Industrial Department*. Another title page reads: *A Concise History of the International Exhibition of 1862, Its Rise and Progress, Its building and Features, and a Summary of all former Exhibitions* (London: Her Majesty's Commissioners, 1862), 7.
[14] Ibid., 8.

opinion, which characterized it as a foreign institution which only would benefit France and Holland.[15] An attempt to portray a number of weavers in the act of weaving a piece of *Gros de Naples* seemed to have been considered especially distasteful.[16]

To hold exhibitions of machinery that illustrated the principles of machinery for instruction and amusement, as did the Adelaide Gallery in the Strand, was fine. But the Royal Repository clearly did not succeed in staying within the boundaries of correct representation of machinery. By promising economic benefits, the repository was accused of meddling in the autonomous sphere of the economy; and it would only encourage foreign production and not British production which in any case needed no encouragement. Showing work in progress seemed to have been revealing more about the production sphere than the common visitor would like to know.

Both theories, skill and political economy, explained machinery, though also limiting the range of possible explanations by focusing on machinery within the sphere of production. "Taste," when that issue rose to national prominence in Britain in the 1830s, broadened the range of discussion on industry to include the sphere of consumption and opened new ways to exercise control of the sphere of production.

Political economy and the parallels established between production and natural order, as evident in writings of Ure and Babbage, exhibit a theoretical advantage in terms of internal logic. But Britain faced structural and economic problems in incorporating the emerging mass society that challenged representations of an ordered system that worked with the sole help of an invisible hand. Mary Poovey, in her work *Making a*

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[15] Ibid., 7.
[16] Ibid., 7.

Social Body, argues that in the period after 1830 the idea of the social machinery of political economy was being challenged by an alternate way to see and represent society. In response to the complexity of the problems that faced Britain, society was by some represented as a body whose ailments needed intervention to combat them.[17] The "social body," as opposed to the "social machinery," allowed for compassion and intervention, though any intervention needed solid documentary statistical evidence of its necessity.

"Taste" also formulated an area of insertion and intervention rivaling the discourses on political economy as far as machinery is concerned and made different kinds representations of machinery possible. Previously, taste was a personal matter indicative of position in society - or class. But gradually through the 1800s, taste became a social concern. Taste was no longer defined as a personal matter, it was a national concern, and also a governmental concern.

In her essay "The Production of Abstract Space," Poovey argues that the imaging of the society as a body made it possible to highlight bodily processes.[18] I believe that the tendency to transfer "taste," as one such bodily process, to the whole of society in the nineteenth century might therefore be one further indication of this phase of what Poovey terms the British cultural formation. Those individuals and institutions that complained of a lack of taste in the whole of the British nation, were furthering the notion of society as a body rather than as a machine. The social body, in contrast to the

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[17] See for instance Mary Poovey, *Making a Social Body: British Cultural Formation 1830-1864* (Chicago and London: University of Chicago Press, 1995).
[18] Ibid., 25-54.

social machine, had the potentiality of taste but it needed to be encouraged, and restoring taste would help heal the deficiencies of the time.

As we will see, encouraging proper taste was by some thought to offer a means of healing many social ills. Connected with other areas of sensory perception and judgment, the ability to pass correct judgment on things, to buy the right kind of wall-paper, was also an indication of the ability to pass the correct moral and rational judgment. Thus, a person who could make the right consumer choices could also be trusted in terms of his moral and intellectual capacities. These arguments applied both to individuals and to collectives. Therefore, taste was closely related to the social issues of the day. For instance, the authors of the letter to the *Art Journal* quoted above argued that taste had the power to produce contentment and lawfulness, seen by many as much needed qualities in the 1830s and 1840s.

The concern about taste introduced a new element in the discussion about industry, placing in focus the products of industry themselves rather than, as with the "machinery question," the means of production. It was argued that some British products lacked the necessary quality to compete and that a lack of taste in the manufacturing class was predominantly the cause. Manufacturers who produced "bad" taste, as it turned out, not only made Britain less competitive internationally, but "bad taste" also contributed to social problems at home. Discussion about taste and concern about the competitive edge of British manufacture increased during the decades that I am concerned with here and would only be over-shadowed by the concern about "science" education after the Paris Exhibition of 1867.

The efforts that were put into improving taste had resulted in governmental involvement in many areas that were widely considered not proper. In discussing art education, both Quentin Bell and Christopher Frayling, prominent writers on art education, quote prime minister Melbourne telling the painter Haydon "God help the minister who meddles with art."[19] Yet the rhetoric of taste resulted in state consent to measures that encouraged stereotyping of art and introduced "true principles" of design favouring flat and geometrical patterns and shapes.

Taste authorized government interference in the production sphere. When eventually the state would decide to combat the decline of taste by educating the public, machines would be one of the means employed to advance consumer awareness of taste. Machines could mass produce the "principles of art" and bring culture to the people.

Though not the most prominent issue at the time, there were enough people who concerned themselves with taste and who helped found and support drawing schools or schools of design throughout Britain to provide instruction based on these notions. These schools had government funding, and because public money was being spent, the working of these schools drew the public eye and several government committees were formed to look into the matter. The schools, therefore, not only concretely worked to further certain principles of art education but their existence created a foundation for a national discussion and awareness of the state of "taste" in Britain.

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[19] Quentin Bell, *The Schools of Design* (London: Routledge and Kegan Paul, 1963) and Christopher Frayling, *The Royal College of Art: One Hundred & Fifty Year of Art & Design* (London: Barrie & Jenkins Inc., 1987). Frayling uses this as the epigraph of part one of his book and Bell for his fifth chapter.

The appointment in 1835 of a select committee to "inquire into the best means of extending a knowledge of the Arts, and of the Principles of design among the People (especially among the Manufacturing Population) of the Country" firmly introduced the issue of governmental dissemination of art in the arena of public debate and thereby diversified the discussion of industry considerably. The work of the committee led to the establishment of the Schools of Design by Lord Melbourne's second government in 1837. The schools were placed under the Board of Trade because their primary purpose was to further the competitive edge of British industry. In 1857,[20] the successor to the Design Schools, the Schools of Art, would be transferred to the Privy Council for education.[21]

The evidence given and the questions asked at the Select Committee meetings furnish interesting insight into the various notions of "taste." Although the commission was set up as a result of efforts by the historical landscape painter Benjamin Haydon, whose main motive was probably to quench the power of the Royal Academy of Art, with whom he had battled for quite a time,[22] the commission's work greatly transgressed the stated purpose of "investigating the Constitution, Management and Effect of Institutions connected with the Arts" and concentrated on how to advance art and the principles of design generally.[23] Many of the issues brought up in the

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[20] Done by Order in Council 25 February 1856.

[21] There are two major historical works on the Schools of Design; Quentin Bell, *The Schools of Design* and Stuart MacDonald. *The History and Philosophy of Arts Education* (London: University of London Press, 1970).

[22] See Bell op.cit and Quentin Bell, "Haydon versus Shee," *Journal of the Warburg and Courtauld Institutes* 22 (1959): 347-358.

[23] The 1835 session ended in September and in February 1836 a much smaller committee was appointed. Bell made the point that this commission had a much more radical complexion, and it heard the evidence relating to the Royal Academy. Bell, *The Schools of Design*, 54.

Committee's investigation would continue to be debated through the next couple of decades. Among the questions raised were what kind of instruction should an art school provide, how to account for French superiority in certain fields, and how to make art instruction relevant to the production of consumer goods. But other issues emerged that illustrate the intricate relations between manufacture, psychology, and culture.

Implicit in the select committee's appointment was the belief that there was a national deficiency in taste. By comparison, French design was deemed to be better. Although there were suggestions that consumers of higher standing should also have their tastes refined, most of the blame was put on the manufacturing sector and in particular the manufacturing classes. It seemed that it was their lack of taste that accounted for the inferiority of British design. Some of the explanation as to why they were singled out in this matter can be found in the formulation of the Committee's purpose,[24] but the pressing social concerns and the apparent hope that art would contribute to solving them might have led the committee to emphasize the role of the manufacturing population and in particular the workers.

The concern with declining or at least stagnating national taste was connected to an insecurity about industrialization as well as an increased awareness of its importance. The questions posed to J.C. Robertson, editor of the *Mechanics' Magazine*, and hostile to the project of the Committee, indicate that there was a belief that products of lesser taste could be detrimental to the nation's maturing taste. Robertson was asked "Do you suppose, if works of good design went into the market with works of bad design, that in

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[24] *An inquiry into the best means of extending a knowledge of the arts and the principles of Design among the people (especially the Manufacturing Population of the County).* P.P. (1835), V and P.P. (1836), IX.1.

the end the works of good design would not be preferred?[25] And again later he was asked whether he considered "that the multiplication and circulation of copies of good models would have a great influence in refining public taste, and producing improvements in work of design?"[26] If tasteful goods can improve taste, less tasteful goods can lessen it. Before the Commission met in its second sitting, in 1836, one of its members, Dr. Bowring, a leading radical MP, had visited France and reported on his findings when he was called in as the first witness of that session. One of the things that Bowring noted was that "the common beds and furniture of their[French people's] houses are much more graceful than in this county."[27] The French not only produced better wares but were surrounded by them too, which seemed to have a reciprocal effect. In Britain they made products of bad taste and surrounded themselves with them. The manufacturing system in Britain produced wares of lesser quality and the British nation was as a whole suffering for that reason. Richard Redgrave, a painter who taught in the Design School and was later head of its successor, the Art School, made this explicit in one of his addresses:

> When these influences[dominating currents] arise out of the purer and nobler qualities of man's nature, the style which they produce will be noble also, and being constantly around us, contribute in no small degree to raise the tone of individual and national feeling. The influence of a mean style, founded upon the ignoble or sensual qualities will in a like degree tend to degrade not only our taste but our moral intellect also.[28]

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[25] Q & A 1601, 1835.
[26] Q & A 1624, 1835.
[27] Q & A 8. 1836.
[28] Richard Redgrave, *Manual of Design: Compiled from the Writings and Addresses of Richard Redgrave, R.A.* and ed. Gilbert R. Redgrave (London: Chapman and Hall, 1876), 12.

Henry Cole, who would later head the Art Schools as well as of the Department of Science and Art and the South Kensington Museum, likewise emphasized the importance of decoration of everyday items. Cole felt that "there was scarcely a great mediaeval Artist, when Art was really Catholic, who did not essay to decorate the objects of every-day life. Beauty of form and colour and poetic invention were associated with every thing. So it ought still to be, and we will say, shall be again."[29] When Benjamin Robert Haydon started petitioning the Parliament for government aid to art in 1823, he had requested grants for historical pictures for public buildings. He advocated civic paintings in civic buildings and marine paintings in naval establishments, as opposed to filling these buildings with the portraits of officers and officials as was the contemporary practice.[30]

The taste question was founded on the belief that the environment produces psychological change. Art was thought to offer various softening effects. The *Builder* pointed out that there was a Platonic connection between good and beautiful: "The intimate connection which exits between the good and the beautiful, is not so obvious, but is none the less certain. The assertion of it has been duly scoffed at by those who could not understand it, but has now passed its probation, and is establishing itself in the public mind."[31] Thus, those who could appreciate beauty could also appreciate the right morals. Those who fought for a dissemination of art believed greatly in the powers of

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[29] Henry Cole, *Art Manufacture: Collected by Felix Summerly, Shewing the Union of Fine Art with Manufacture*. Pamphlet, Sixth Edition, December 1847, 2. National Art Library, Henry Cole Collection, Miscellaneous VIII.

[30] MacDonald, 60-61.

[31] Editorial Introduction, *Builder* 5 (1847): 1.

culture. A book on taste, published in 1843 under the pseudonym Fabius Pictor, held that:

> Nor is [pleasure] enough. That pleasure must be fruitful of utility and instruction....By presenting us with specimens of perfection, these arts ought to render us more perfect. By giving us good taste, choice, and order, they prepare us for an improved existence. They are, or should be, the eloquent records of real moral worth ; the charming guides which lead us on towards honour, glory, virtue, by ennobling and beautifying all that is great and good; whilst they make vice hideous, to make it more detestable.... [F]or beauty is the mainspring of real moral interest; and it will therefore be the triumph of art to consecrate the enchantment of its graces to the greatest blessings which can befall mankind - truth and virtue.[32]

Culture, of which art was surely an aspect, was therefore thought to be needed to soften the impact of industrialization and bring those outside the fold into mainstream society. To this end, several institutions were created during the next few years.

In addition to this culture coming from above and thus exerting its high influence over everybody, there were accompanying psychological explanations that accounted for its powers. Some saw a connection between drawing harmonious pictures, observing a harmonious relationships in nature, and behaving harmoniously. Harmony and geometrical patterns were fundamental. Richard Redgrave strongly emphasized such a relationship, writing that as nature is "governed by geometrical laws of development,"

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[32] Fabius Pictor, (pseud.), *The Hand-Book of Taste: or, how to observe Works of Art, Especially Cartoons, Pictures, and Statues* (London: Longman, Brown, Green, and Longmans, 1843), 13-14.

one who designs for "reproduction by manufacturing process" cannot find a better model.[33]

Denis Hay, who gave evidence to the Select Committee in 1836, firmly believed in the harmony in nature, especially as represented in primitive ornamental design.

> We all feel that a certain degree of order, harmony, or proportion of parts, is a necessary constituent of elegance in everything; but it ought always to be apparent and simple in works of an ornamental nature. From our earliest recollection we can trace a law of order and uniformity; and although in works of ornamental design we may thus adopt the forms of natural objects, they must be summarized by being arranged with some degree of regularity.[34]

For others, harmony did not necessarily come from nature, but was instilled in the minds of the individuals through early training. Robert T. Stothard, draftsman and artist, gave evidence to the 1835\36 Select Committee as to the formation of the mind and the importance of elementary drawing.[35] The mind was to be "correctly imbued with the principles of outline, light and shadow and colour, which should be studied from individual objects before drawing is carried into the more complicated branch of art."[36] Henry Cole wrote handbooks for children and workers to encourage them to correctly see shadow, line and form. To him, drawing should teach people "to see accurately and

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[33] Richard Redgrave, *On the Necessity of Principles in Teaching Design. Being and Address a the Opening of the Session of the Department of Science and Art, October 1853* (London: Chapman and Hall, 1853), 25-26.
[34] Dr. D. R. Hay, *A Letter to the Council of the Society of Arts on Elementary Education in the Arts of Design* (London: William Blackwell, 1852), 16.
[35] Q & A 280, 1836.
[36] Q & A 289, 1836.

to represent what they see accurately."[37] Because the mind, or brain as we would put it, was thought to have the capacity to transmit the ability to see and draw harmony to its moral and social centre, seeing and representing accurately were also thought to mean behaving correctly. Drawing became multidimensional in the opinion of those who wanted to extend the teaching of art to the lower class.

To combat bad taste. one of the things witnesses suggested was to make changes to the environment of the workers. It was mentioned that art galleries ought to be accessible to the lower classes. And it was mentioned that artful exteriors of public buildings and even the interior or exterior of factories would help combat bad taste. Dr. G.F. Waagen. Director of the Berlin Museum, recommended that to restore the "happy connexion" between art and manufacture, the people should be given the opportunity to see the best collections of objects of art in the particular branch which they follow. James Morris, a Member of the Committee and head of a large firm in London, stated that "There is no doubt that admitting the public at large, especially the working classes, to see fine collections of works of art, has been eminently useful, and that it gives them a taste for the high character of art."[38] The mayor of Coventry, George Eld, was confronted with a line of questions about whether the manufacturing artists in Coventry had access to paintings, museums for patterns, or a botanical garden.[39] *The Builder* wrote in 1847 that "the effect produced on national character by the contemplation of works of art - fine pictures, exalted statuary, or noble buildings - is very great; much

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[37] Henry Cole, *Speech at the opening of elementary drawing school at Westminster June 2, 1852,* Cole Collection, Misc. IX.
[38] Q & A 190, 1835.
[39] Q & A 508-512, 1835. He told the committee that there were no such institutions in Coventry.

greater than is generally supposed; and has been too long over looked in our country. The perfect and general recognition of it would lead to the free admission of the public to all national monuments and works of art, the adornment of cities and the exercise of greater care in the selection of design for public buildings."[40]

James Nasmyth, the manufacturing engineer from Manchester, suggested that machinery, especially its frames, should be constructed tastefully, which to him meant geometrically, or after ancient models. When asked "How would you carry into effect the combination of beauty of design with machinery and buildings as you have suggested?" he answered: "In the first place, with regard to machinery, I would show the means of combining the most beautiful forms and the most scientific applications of the materials employed in the formation of machinery with the greatest economy.[41]

Some machinery was constructed according to Nasmyth's suggestions. At the Great Exhibition in 1851 there was machinery that for instance followed the Egyptian or Gothic style. Machines often had Doric columns and a frieze with triglyphs and metopes.[42] Some years before, in 1842, Samuel Clegg Jr. published a work titled *Architecture of Machinery*, on the construction of frames, urging more economy of design and giving examples of well constructed and faultily constructed frames.[43] The author criticized some of the attempts that had been made to apply "patterns" to machines where the parts did not follow the form and distortion had been the result.

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[40] *The Builder* 5 (1847): 1.
[41] Q &A 294, 1836.
[42] See Nikolaus Pevsner, *High Victorian Design* (London: Architectural Press, 1951), 24-26 for some illustrations of these machines.
[43] Samuel Clegg, Jr., C.E., *Architecture of Machinery: An Essay on Propriety of Form and Proportion, with a view to Assist and Improve Design* (London: Architectural Library, 1842).

Machines needed to be constructed according to the correct principles of taste.[44] While Clegg argued that the more tasteful machines would sell best, Nasmyth thought the workers would be the major beneficiaries of being exposed to right principles of taste at their workplace. He also thought that manufactories' exteriors should be built in elegant taste "as it is not from the single exhibition of works of elegant design that taste is so much cultivated, as those larger and more common objects which are seen in manufacturing towns, namely, the chimneys and other conspicuous parts of manufacturing buildings."[45]

The other solution offered by the witnesses was to educate the workers in art or drawing. The two foreign witnesses, Dr. G.F. Waagen, Director of the Berlin Museum, and Dr Felix Bogarts, Professor of History at Antwerp, both thought drawing would "help propagate the arts among the people and increase taste."[46]

The Select Committee reported in August 1836. It concluded that instruction was needed in design, but provided no specifics. The government had already decided to establish the Design Schools. These schools were founded for the purpose of improving design and to disseminate art among the people, but conflicting purposes and ideals hampered their success. The modern usage of the word design, to construct, seems to have evolved later. At the time, design, translated from the French "dessin," meant a drawing or a plan. But to the British, it indicated a capability to translate the principles of art into something that manufacturers could use.[47] But whether design should include

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[44] Ibid., I.
[45] Q & A 322, 1836.
[46] Q & A 77 and 1497, 1835.
[47] Frayling, 16-17.

the technical or constructive part, the craft as well as the art, was not clear. Though a report written by William Dyce, a painter who went to Germany and France in 1838 to study their way of teaching design, recommended more technical instruction, little was done about it. On the other hand, Dyce also suggested a life class, drawing from live models which he did later set up.[48] It had been decided early on that it was not the schools' intent to educate artists, but the aims were confused.[49]

The Select Committee had not at any time tried to explain what constituted better taste. There were allusions to the need for harmony and functionality. For some of those who gave evidence to this committee, such as the writers of the letter to the *Art Journal* quoted at the top of this chapter, "art" was distinct from the "principles of art." Though there was not and perhaps never will be a clear formulation of what art is, many, and among them some of the stronger proponents of a union of art and manufacture, distinguished between those principles of art that can be learned and recognized by everyone, and art such as only the very gifted can create and appreciate.

Negatively, art proper was assumed by some to be too sensual and dangerous for most people, or at best just wasteful, while for others art proper had an aura of mystique giving it positive powers. The Design Schools which tried to teach some of this mystique, or at least were charged with it, came under much fire from different camps

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[48] W. Dyce, *The Report made to the Council of the School of Design by W Dyce on His Return from the Continent, April 27. 1838.* National Art Library, Handwritten MS.

[49] Frayling describes how design was a kind of language which mediated between the ornamentist, or the artisan concerned with the processes of ornament, and the manufacturer. Frayling, 16. In light of the confusion over what design was, the first phase of the school emphasized copying motifs from architectural detail.

because of their failure to stick with one type of teaching. The use of human models was especially strongly criticized.

The journal *The Builder*, an opponent of the Schools, attempted to establish its own designs schools in 1843, but was unsuccessful. Criticizing the Design Schools, the *Builder* wanted its schools to give the student basic and practical drawing lessons, and not fill the students' head with fancy. In its first volume, *The Builder* commented that at the schools "Sensual enjoyment and indulgence threaten to overcome the intellectual taste."[50]

The Design School in London had a humble beginning with only a handful of students in 1837. The classes were not free: a fee of four shillings a week excluded many of lower social origin. Over time it grew, and in the 1840s branch schools were established in the main manufacturing districts. The schools became a forum for discussions of the role of art. They were attended by controversy until the Department of Practical Art was established to run the schools.

The taste movement of this period established a site for discussing production, particularly production by modern means. Art filled a special place in this discussion. Not only was art work needed to improve the national character, art was needed to change the character of British production itself. And British production had a cultural, social and ethical significance. The "taste" question put the focus on the products of industry, rather than on the machinery or factory system itself. Rarely was it suggested that the production system itself could be to blame for the lesser quality wares. Instead cooperation with manufacturers was sought. Robertson, for instance, attributed the

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[50] Editorial Comments. *The Builder* 1 (1843): 274.

output of lesser quality wares to manufacturers simply filling a demand rather than to the inability of either manufacturers or machinery to produce on an equal level to France. The causes for the defect were to be found outside the factory system and a big dose of fine art was its remedy. If the British people received more art education or greater exposure to art, the products of industry would greater exhibit more taste. In not finding the methods of production to be the cause of the problem, this art movement was significantly different from the Arts and Crafts movement later in the century associated with William Morris. In this earlier Art-Manufacture movement, or taste movement, the ability to use machinery or other modern techniques to, for instance, reproduce or copy works of art was seen as an asset.[51] J.C. Robertson, not himself a supporter of design schools, when asked whether he thought "that our machinery and our capital offer to us a new mode of circulating a knowledge of the principals of art among the people, in the application of that machinery and that capital to embellish works," nevertheless answered that with encouragement and protection art could be better distributed using modern machinery.[52] The *Art Journal* ran columns throughout the period titled "Science applied to Art" on how modern inventions could assist art, and often praised their ability to reproduce works of art quickly and cheaply. "The whole tendency of modern invention," argued the journal, is "to facilitate the multiplication of copies"[53]

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[51] Henry Cole argued in his biography that he invented the term 'Art-Manufacture.' In a footnote Cole wrote "I believe I originated, in 1845, the term "Art Manufactures," Meaning Fine Art, or beauty applied to mechanical production." Henry Cole, *Fifty Years of Public Works of Sir Henry Cole, K.C.B. Accounted for in his Deeds Speeches and Writings*, vol. 1 (London: George Bell and Sonds, 1884), 103-104.
[52] Q & A 1664, 1835.
[53] "The Mutual Interest of Artists and Manufactures Art" *Art Journal* 10 (1848): 69.

The debate over design and the improvement of British manufacture would, as the Select Committee hearings indicated, shift the focus of industrial debate from machinery to production. The failure to clearly define what the role of design should be, indicated confusion as to the role of art in industry. It also hampered the movement, but in time those would arrive on the scene who were willing to define the relationship much more clearly. Design schools were one of the forums of discussion. But in fact, the impetus to raise the taste movement to national concern would rest with the London-based Society of Arts guided by Henry Cole.

Cole had been one of those who criticized the running of the Design Schools. He was instrumental in the setting up of a Select Committee and perhaps also in the formulation of its report in 1849.[54] A civil servant born in 1808, Cole was a crucial figure in the construction of the taste question both before and after the Great Exhibition of 1851. His own personality, views, and ambitions all contributed to furthering the taste question and the education of the public. At the time of the establishment of the Design Schools, Cole was an assistant keeper of the Public Records, but since the early 1840s he had been working with what he himself termed "art-manufacture." He would also be instrumental in bringing about the Great Exhibition.

Cole, the son of a retired army officer, had entered the civil service as a clerk to Francis Palgrave at the Records Commission in 1823 after attending Christ's Hospital School. Throughout his long official life he would be a shrewd and vigilant public servant. He loathed inefficiency. Efficiency, both of economy and labour, was always one of Cole's main goals. He had in 1826 become acquainted with John Stuart Mill's

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[54] Bell in *The Schools of Design*, strongly suggests this.

family. After being introduced to Mill, Cole would frequent the London Debating Society and became a member of a small group of men including Mill who came together to discuss problems of political economy and logic. Metaphysical subjects, such as the nature of the mind or of matter, were also often on the agenda. After these groups dissolved, Cole continued seeing Mill, their contacts subsiding after 1833. From Cole's diary, which is recorded in a telegraphic style, it is difficult to make out what the substance of their discussions together were.[55] But Cole frequented liberal /utilitarian circles and many of his early friends, such as John Stuart Mill, James Mill, John's sister Harriet Mill and Charles Bulwer, belonged to these groups. Cole met Jeremy Bentham through Edwin Chadwick in 1832.[56] It was perhaps within this group of friends that he formed some of his ideas on public service. Whereas Mill and Bulwer would become politicians, Cole never entered politics. He remained a civil servant, probably because his humbler background was not conducive to running for office. It was as a civil servant that he pursued the utilitarian goal of increasing the happiness of as many people as possible.

It was, however, the practical experience of trying to reform the Record Commission that taught Cole how to efficiently use the press and to appeal to the public

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[55] The following may serve as an example of a more elaborate diary entry by Cole, Nov. 12, 1831 "Walked home with John Mill. That no general principles of government can be formed suitable to all ages. That the present system of Government was like that of a man who should fence round his fields and leave the corn to sow itself & the ground to be tilled by itself." Cited from Anna J. Mill "Some Notes on Mill's Early Friendship with Henry Cole," *The Mill Newsletter*. 4.2 (1969): 6. The reference to the means of travel or transport is typical of Cole. Many of his diary notes start "Walked to town..." Cole records his public involvement, his dinner or tea dates, his meetings with friends or important people. He records what books he was reading, and his walks and trips. And on Sundays he mentions time spent with his children.

[56] HCD, 6 May 1832.

for the projects he was engaged in. These projects were never merely personal, though Cole not infrequently gained from them.[57]

Cole had stopped working for Palgrave in 1832, perhaps because of a frustration over pay and prospects but gained a post with the Record Commission from which he was arbitrarily dismissed in 1835 after a quarrel with one of his superiors. However, he cultivated his friendships and through Charles Bulwer, a Liberal MP, was able to have a Select Committee set up that looked into the Record Commission.[58] Cole argued during its proceedings that the Commission had to be made more accessible by abolishing search fees and providing better public access. When the Public Records Office was established in 1838 Cole was allowed to resume his work.[59]

In the middle of 1830s Cole became engaged in the campaign for penny post and was successful in a Treasury competition for the best method of implementing the form of the Penny Post, sharing the prize with three others. In October 1838, he was given permission to help Rowland Hill in drawing up the new scheme.[60] In working for these reforms, Cole drew support not only from his friends and associates, but also by addressing the public in articles in journals. Here Cole was always on the side of public interest: one of his favourite phrases about any of his projects was that it would "prove a source of great social and moral benefit to the whole Community."[61] In this manner he

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[57] He also used his friends of influence to acquire posts for other friends and family members.
[58] Select Committee on Management and Affairs of Record Commission, P.P. (1836) XVI.
[59] John D. Cantwell, *The Public Records Office 1838-1958* (London: HMSO, 1991), chapter 5. Perhaps because he could better control them, Cole preferred to employ workers (i.e. untrained personnel) rather than clerks at the Records Office. One of Cole's quarrels with Palgrave concerned the pay of the workers. Palgrave was concerned that this should not be too high or rival that of the clerks. Cole also gave the workers more beer than Palgrave approved of. Cole's use of workers at the Public Records Office parallels Cole's later use of military personnel at the South Kensington Museum.
[60] Cantwell, 46-47.
[61] Cole Collection, Misc.3, Draft of Petition for the Penny Post.

formulated public needs, promulgated these needs and then worked to fulfill them. He wrote for journals and newspapers, sometimes using friends' names. He was also involved in editing, first in 1837-38 with *The Guide*, a radical newspaper, and later briefly as editor of the *London and Westminster Review*. In the late 1840s, he edited his own creation, the *Journal of Design*. Public exposure was always foremost in Cole's mind.

In his early career as a civil servant, Cole exhibited a certain ruthlessness, efficiency and cunning in involving the public in his own projects and using and perhaps manipulating public inquiries to further these projects. These were traits that would serve him well in his dealing with art and manufacture. Cole's work in the civil service left him with time to pursue some of his other interests. Perhaps it was his elegant penmanship-- Cole had gained his position as secretary to Palgrave by achieving a medal in handwriting -- that inspired his continued interest in form and drawing.

Cole's marriage brought him many children and in his time with them Cole discovered that there was a need for illustrated story books for children. In the early 1840s, he established his own company and under the pseudonym "Felix Summerly" published a series of illustrated children's story books, *Summerly's Home Treasury*. These books were illustrated by prominent artists of the time, Mulready, Webster, Cope, Redgrave and Horsley, and brought Cole into contact with a new group of people whose friendships he would continue to cultivate over the years. As Summerly he expanded his field and published handbooks to attractions of art and science in London and its surroundings. Cole's work for the *Railway Chronicle* was also to provide illustrated

maps and guides to what one could see from a train window while traversing the British landscape.[62] The Railway guides would point out interesting buildings, castles, bridges and the like. The guidebooks not infrequently pointed out the value of the place of visit in terms of what kind of experience the visitor should have. His *Handbook on London* declares that the principal object of the Zoological Garden is "An extensive Collection of Live Specimens in the Gardens, which are shewn under the most favourable circumstances of space, cleanliness, and safety. The Garden is tastefully displayed; and when the flowers are in blossom the whole is a most delightful exhibition of the wonders of the Creation."[63] Cole's handbook encouraged the traveler to visit places where machinery was on display such as, for instance, the Gallery of Practical Science at Lowther Arcade, Strand, which featured "Models shewing the improvements going on in Mechanics. Lectures and various Illustrations are given in Chemistry, Electricity, Hydraulics, etc."[64]

Another of the Summerly projects was publishing drawing books for workmen as well as children.[65] Cole's sketching books were aimed at teaching the student, child or worker, to observe and copy. Imagination was not one of the qualities to be conveyed. In an advertisement for "Text Books for Art Workmen" the workman is urged to first learn to draw and use a pencil to grasp the principles of light and shade, after which he can proceed to perspective.[66]

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[62] This Journal was published by the C.W. Dilke editor of the *Athenaeum*.
[63] Cole Collection, Misc 7, *Hand-Book for Holidays spent in and Near London.* edited by Felix Summerly London: George Bell, 1842, 28.
[64] Ibid., 27.
[65] *First Exercises for Children in Light, Shade, and Colour* was published in 1840.
[66] Publicity leaflet in Cole Collection, Misc. 8. It is joined with the Sixth edition of *Art-Manufactures. Collected by Felix Summerly. Shewing the Union of Fine-Art with Manufacture* dated December 1847. After perspective followed General Study from and Observation of Nature; Principles of Form; Natural

If we can trust Cole's own account of things, he was working on a short guide to Westminster Abbey, sketching the figures in the Abbey, when he first started to reflect on the relationship between taste and public art. Cole felt that while the Medieval Church had provided ordinary people with art and furnished the appropriate taste, now the public was deprived of taste. In the church, "beauty of form and colour and poetic invention were associated with every thing."[67] It was this Cole sought to recreate in what would occupy the rest of his public and, one might assume, private life.

Beginning around 1846, Cole, whether as a result of his Westminster visit or not, transformed his Summerly story book enterprise into producing consumer goods designed by prominent artists. The production system was to replace the church as the primary mediator between art and the public.

The Art-Manufacture movement was thus conceived, and Cole energetically used Summerly to improve national taste. Cole himself frequently visited manufacturing districts, became acquainted with pottery manufacturer Henry Minton, and designed a teaset that Minton produced. The teaset, exhibited at Society of Arts Manufactures Exhibition in 1846, won a prize and considerable popularity and Cole was introduced to the Queen and Prince Albert.[68] In his autobiography, Cole wrote that this teaset was "a

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Objects applied to Ornament; Colour; Anatomy of the Human Form; Anatomy of Beasts, Birds, &c. Artistic Botany and finally Ornament Generally.

[67] Cole Collection, Misc. 8, Publicity leaflet for Felix Summerly Art Manufacture. *Art-Manufactures. Collected by Felix Summerly. Shewing the Union of Fine-Art with Manufacture* (Sixth edition, Dec. 1847).

[68] Cole had been first introduced to Prince Albert 1842 when the Prince Consort inspected the stores of public records. Elizabeth Bonython, *King Cole: A Picture Portrait of Sir Henry Cole* (London: Victoria and Albert Museum, 1982), 34.

link in the chain of circumstances leading to the great Exhibition, which sowed the seed for the beginning of the South Kensington Museum itself."[69]

The first of these circumstances was meeting John Scott Russell, an engineer.[70] Russell had in 1845 accepted the secretaryship of the Society of Arts which was at that time in a shambles.[71] Cole's diary indicates that Cole and Russell discussed the Society's affairs and that Russell might have brought back to the Society some of the results of these discussions.[72] Meeting Scott Russell and the Dilkes brought Cole into an entirely new circle of people, such as engineers, scientists, publishers and eventually also Prince Albert and Queen Victoria. Cole was very skilled at cultivating his friendships. He visited his friends on the way to or from work; he had them over for breakfast on Sundays; he dined with them and he attended their parties.

The Society of Arts represented an entirely new venue for Cole and his projects. Developments in the Society furthered the attempts to introduce the principles of art into industry and therefore to widen the discourse on machinery. When the Society began to undertake to unify Art and Industry around 1845, it was smaller and less significant that it had once been. Just a few years earlier, there had been some discussion about whether

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[69] Cole, *Fifty Years* I, 106.

[70] Cole met Scott Russell through their mutual dealings with the *Railway Chronicle*, a weekly journal initiated by the editor of the *Athenaeum*, Charles W. Dilke. Cole had collected information about public buildings having archeological and picturesque character and produced descriptive notes on places of interest along the railway routes. His friends from Summerly, Mulready, Horsley and Redgrave illustrated the charts. Cole had shown Scott Russell and Dilke his charts for the guidance of travelers and the *Railway Chronicle* agreed to publish them.

[71] George S. Emmerson, *John Scott Russell: A Great Victorian Engineer and Naval Architect* (London: John Murray, 1977), 29-32. Russell and Cole became friends and Cole gradually became more involved in the publishing of the *Railway Chronicle*. Russell became engaged to work as Railway Editor for the *Daily News* and brought Cole in there as well. Cole had also around the same time accepted a commission to conduct the promotion of the narrow gauge. At the time the narrow gauge competed with I.K Brunel's broad gauge.

[72] Bonython, 32

to abandon it totally,[73] but gradually, with managerial changes and a change of purpose, the Society solved its financial and membership problems.

The Society of Arts, established in 1754, had as its mandate to encourage the progress of Agriculture, Fine Arts, Industry and Commerce in the Kingdom and its Colonies. The Society distributed awards as a means to achieve its goal. Several of these awards, in the form of medals and prizes, went to industry. The Society attempted to foster invention by rewarding the inventors. Yet since the Society did not reward inventions that were patented, in the nineteenth century its impact in the field was small and insignificant and in the 1830s it almost faltered. Scott Russell, Cole, and his associates, many of whom Cole brought in as members of the Society, worked to further inventions on a different level.

Whereas the Design Schools, in attempting to improve design, put the focus on the product of industry and those who produced it, the Society of Arts, under its new leadership, furthered a union of industry and art and an involvement of the public on a more direct level. This would serve to heighten the attempts to promote machinery and products of machinery as a means of preventing working class alienation.

Cole's and Russell's re-invention of the Society of Arts was a gradual process and until Cole's leadership was firmly established, the Society underwent a time of 'crisis', perhaps unavoidable in a period of reorientation. Cole and Russell would use the Society to foster education and public involvement on a large scale. Their agenda of

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[73] Royal Society of Arts (RSA) Archives, Minutes of Council 2 Oct 1849-Dec 1850, Meeting of the Council March 30, 1850. John Scott Russell stated that "In 1844 it was proposed to dissolve the Society of Arts and let the House."

a "unification" of art and manufacture severely limited the range of the Society by tying up much of its resources, but it also opened up new interests.

The Society of Arts had promoted industrial production and art separately. There were several committees, each of which represented a branch of industry or art. Every year each of these committees would formulate criteria for a prize to be competed for, and winners were chosen in the different groups. There would typically be sections for fine art, agriculture, chemistry, machines and trade.

The Society rewarded art and machinery separately. There was a clear distinction between fine arts and mechanics. Machines or mechanical inventions were rewarded largely according to their economic impact. Fine art medals were for work of artistic quality, where the art had educational and moralistic purposes. In other words, machines belonged to the sphere of economy, fine art to the moral and aesthetical side. The Society of Arts had previously encouraged production not by encouraging consumption, but by encouraging invention and commercial structures. The Society was therefore immersed in the practical or empirical paradigm. The challenge of the new influx of Cole supporters into the Society was a challenge to that paradigm. There was no bridging of machines and art until the Society started to experiment with exhibitions in the mid-1840s.

In 1844, two continental exhibitions were held, one in Berlin and one in Paris, and the Society's Secretary , Francis Wishaw, thought the Society should also hold one. In December that same year a small exhibition of inventions and pictures was held in the

Society's building, visited by about a hundred people.[74] The following year the Society attempted a more ambitious exhibition, seeking the approval of its new President, Prince Albert. The exhibition was not intended as a show but as a place for manufacturers to educate themselves about what was going on elsewhere - a trade convention.[75] But as with the Royal Repository some years earlier, there was no interest among manufacturers for a trade exhibition. John Scott Russell, when later writing the history of the Society of Arts exhibitions, explained that "This attempt failed. The Public were indifferent -- Manufacturers lukewarm -- some of the most eminent even hostile to the proposition. The Committee neither met with sufficient promise of support in money, sufficient public sympathy, nor sufficient co-operation among Manufacturers, to see their way to success. The attempt was abandoned."[76] But with John Scott Russell as secretary, the drive for exhibitions continued. He had become acquainted with Cole who perhaps had a hand in steering the Society on a new course.[77] Cole became a member of the Society in 1846 and the first Art-Manufacture exhibition was held in the summer of that year.[78] In addition to the role of Cole and Scott Russell in changing the course of the Society, it is customary to give some of the credit for this to Prince Albert who became the

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[74] Derek Hudson and Kenneth Luckhurst, *The Royal Society of Arts, 1754-1954* (London: John Murray, 1954), 188-9. When later the Society was writing its own history in order to prove that the Society originated the Great Exhibition, or more particularly that Cole originated the idea of exhibitions within the Society, Wishaw pointed to this pre-Cole exhibition as evidence that the origin of exhibition was non-Colean.

[75] RSA Archives, Minutes of Society 1845-46, Committee for Misc. Matters resolution adopted on May 28, 1845.

[76] RSA Archives, Society Meeting Book Session XCVI, Special General Meeting February 8th, 1850.

[77] Cole's diary indicated that he and Russell discussed the Society at the end of 1845. Bonython, 32.

[78] Exhibiting goods for a prize fund set up under Scott Russell's initiative in late 1845.

President of the Society in 1843. He shared in the ideal of doing public good and was an active promoter of art manufacture.[79]

The rise to prominence of Art-Manufacture within the Society of Arts did not go smoothly. Art-Manufacture was not an established concept. Moreover, the whole idea of extending taste required the involvement of the public to peruse and purchase the products. Exhibitions of goods were relatively risky ventures in England. The fate of the Royal Repository was a constant reminder of that, yet there were positive precedents in the trade exhibitions held in Dublin. The Society, therefore, held the first of its annual exhibitions of Art-Manufacture in the Society's house in John Adams Street in 1847. The exhibitions were small, but it seemed easier to find contributors to them and the exhibitions were well received in the press. The *Civil Engineer* wrote about the 1848 exhibition that

> The Exhibition at the Rooms of the Society of Arts deserves particular notice, because it shows that the workmen of this country have taste and artistic skill, as well as mechanic proficiency. This is the second exhibition of this kind, and it shows very great progress, that whereas before, manufactures had to be begged and sought to send their works, they have this year sent them freely and with good will. This is going forward in the right path for its shows that the manufactures now feel an earnest in the cause, and that gives us another body of yoke-fellows.[80]

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[79] Henry Trueman Wood said about Prince Albert that he "continuously impressed on the Society the necessity of its taking steps to improve the condition of the artistic industries of the country..." Cited from Bonython, 5

[80] *The Civil Engineer and Architect's Journal, Scientific and Railway Gazette*, XI (1848): 101.

The exhibition was only one of the means by which the Society of Arts hoped to extend Art-Manufacture. The Society also proposed to work for a national gallery for British artists and to further the project of employing famous artists to make artwork that could be mass produced and sold to members of the lower classes.[81]

Henry Cole, by suggesting friends and associates as members of the Society, managed to build formidable backing for his ventures.[82] He was first placed on the Committee of Fine Arts and Manufacturing where he proceeded to continue the work of imbuing manufacture with the principles of art. Until the situation in the Society of Arts was resolved by a coup in 1851, there would be a continual conflict between those who wished to see the Society continue as before and supporters of the new Art-Manufacture.[83]

Exhibitions had been launched to promote more "tasteful" production and to insure that the public would learn to differentiate between what was tasteful and what was not. The strategy involved both the manufacturers' and the publics' discriminatory powers. In 1848, the secretary argued that the exhibitions worked by "bringing together the productions of Manufacturer, Artist and Chemist and showing to each the point of excellence to which works in their particular branches have attained and the point from

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[81] RSA Archive, Minutes of Council I, Dec. 46 to Oct. 49 Cole's proposal for a national gallery, January 27, 1847.

[82] Bonython, 5.

[83] Cole's diary from 1846 onwards gives some indication of a conflict. Cole seemed to have wanted to strengthen the role of the Council considerably. On February 2, 1848 he notes that " Council empowered to make alteration &c." He wanted to "reduce numbers of certain Committees." (HCD 12 April 1848) In 1848 Cole was a member of a committee appointed to "assist the Secretary in reorganizing the Secretarial Department of the Society." The committee suggested to reorganize the duties so that the secretaries reported to the council and that the council be ensured the business it directed to the committees were in fact followed. (Loose paper at the RSA archive (D12/512)) In his diary he notes on January 31, 1849 "Council of Socy. Secretary Committee, report passed. Stormy discussion: walked home."

which they must start in order to attain to a higher excellence."[84] The Catalogue of the first exhibition of Select Specimens of British Manufacture of 1847 argued that "One great object of the Society is to spread the knowledge of all that is most perfect and best in the works of our Arts and Manufactures as widely as possible. It is an universal complaint among manufacturers that the taste for good Art does not exist in sufficient extent to reward them for the cost of producing superior works; that the public prefer the vulgar, the gaudy, the ugly event, to the beautiful and perfect: that a subject with bright colour and costly gilding is preferred to one of a more chaste design, symmetrical form and subdued elegance."[85]

Art-Manufacture, therefore, put the emphasis on the consumers and their taste. It brought in a new player – the public. Production was to be encouraged by educating the public in its new role as discriminating consumers. It was this particular feature of taste that introduced new roles for consumers. Their aesthetic judgment and level of sophistication were to be factors in the marketplace. Art and design were to be encouraged in public displays which enticed the consumers to make right choices.

The possible value of such an arrangement was not readily appreciated by the manufacturers themselves. The Society still had problems attracting exhibitors for its 1847 exhibition. Art-manufacture was in need of manufacturers' support and perhaps, not surprisingly, there was a reluctance to display works just as there had been to display inventions in the Royal Repository. Only gradually would the manufacturers recognize

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[84] RSA Archive, Meetings of the Society Session XCIV (1847-48), Secretary's Report March 8, 1848.
[85] Society of Arts, *Catalogue of the Select Specimens of British Manufacture and Decorative Art. Exhibited at the House of the Society of Art, London in the month of March, 1847*, 4. RSA Archive, Collection of printed materials.

the advantages of displaying their products. The 1848 exhibition was more extensive than the 1847 one.[86] The secretary report for 1848 argued that "The exhibition was thus far successful in bringing together not only the Artist and the Manufacturer, but at placing both in the favourable view of the public -- the practical patron of the works of both --and to raise up a public capable of appreciating them."[87]

From 1848 to 1851 there was what one might call a paradigm conflict in the Society of Arts between the group that wanted to encourage manufacture by encouraging ingenuity and those who wanted to encourage it by educating the public. One of the first signs of the conflict was a complaint that Art in conjuncture with manufacture took up too much of the Society's agenda.[88] The Society's minutes were silent about such a conflict but reported that steps were being taken to facilitate an exhibition of Mechanical Models.[89]

In 1849 the Society's Finance Committee, headed by Thomas Webster, a strong agitator for reform of the patent laws, recommended discontinuing the exhibitions and initiated a showdown between the two factions in the Society.[90] Such a reversal of the Society's policy would have resulted in the end of public involvement in the Society's affairs.[91]

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[86] While in 1847 the manufacturers sent in their goods only reluctantly, in 1848 they "made great exertion to co-operate with the views of the Council in making the Exhibition as brilliant as possible." RSA Archive, Meetings of the Society Session XCIV (1847-48), Secretary's Report March 8, 1848.

[87] Ibid.

[88] At the end of November, 1848, the *Civil Engineer* reported that there had been complaints that too much attention had been put on art *The Civil Engineer*, XI (1848): 380

[89] RSA Archive, Meeting book 1848-49.

[90] RSA Archives, Minutes of Council 2 Oct. 1849-Dec. 1850, Report read in front of Special Council Meeting December 19th, 1849.

[91] I interpret this ensuing conflict as an ideological one. Wood writing on the Society has chosen to see the conflict as a personal one between a Cole faction and a Webster faction. Webster at the same time suggested discontinuing the *Transactions*, the journal put out by the Society at the time which informed the

The power of the Art-Manufacture faction was centred in the Council of the Society. It set the agenda and its members were elected by a general assembly every year. To curtail the power of the Art-Manufacture group in the Society, Thomas Webster and others suggested that the council should be elected by standing committees which should each appoint two members to the council.[92] The Cole faction interpreted this attempt to change the bylaws of the Society as an attack on the policy of holding exhibitions, the reason being that many of the Cole faction were members of the Fine Arts Committee. If they were only be allowed to send two members to the council, the other committees which included, Agriculture, Chemistry, Colonies and Trade, Manufactures and Mechanics, would hold the power in the council.[93] This change in policy would not only curtail the power of certain individuals, but of the whole agenda determined by the very active Fine Arts Committee. There was little doubt that the change meant reverting to the old policy of rewarding inventions rather than trying to promote better taste. Some of Cole's friends wanted to resign from the Council after the decision to call a meeting to change the constitution.[94] But Scott Russell and others planned a coup for the upcoming elections and circulated a list of names that they believed should sit on the council.[95] They won and many of the old guard members lost

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public of its activities. It seems to me to be a clear reversal of all policies of openness that had been the "new course" of the Society.

[92] RSA Archive, Minutes of Council 2 Oct 1849-Dec 1850, Meeting of the Council March 30, 1850. See also call to meeting on March 4 signed 30th January to "consider the constitution, nomination and mode of appointing and selecting the Council of the said Society" Minutes of the Society Session XCVI (1849-50).

[93] See also RSA Archive, Minutes of the Society Session XCVI (1849-50), Special General Meeting Friday 8th Feb 1850 called together "for the purpose of ascertaining & considering the position of the Society of Arts with respect to the Industrial Exhibition proposed to be held in 1851."

[94] The motion to alter the bylaws was carried on March 4th and Samuel and Richard Redgrave decided to resign. HCD 4 March 1850.

[95] The memorandum circulated by Scott Russell read: "In 1844 it was proposed to dissolve the Society of Arts and let the House, but fresh vigour was infused into the Council and the Society has become one of

their positions on the council, though some, like Thomas Webster, would come back. By ensuring support for their agenda, the Art-Manufacture supporters could continue the quest to improve public taste. In 1851, Cole was elected chairman of the council and in the following years would have full control.

Though the internal problems within the Society of Art might not seem important to our quest for changing representations of industry, the Society nevertheless provides us with an important arena for studying the differences between the two representations discussed in this chapter. I have argued that the Society of old focused on the machines themselves and encouraged inventions of new machines or processes. The Society had worked within the parameters of the empirical discourses where the focus was put on the skill of the workplace. When Henry Cole became a member, or perhaps through the more subtle influence of Prince Albert, the issue of taste emerged as a dominant force which would on the one hand require a dialogue with the public and on the other with art. When industrial products are presented as art and the consumers offer aesthetic judgment, a new discourse on industrial production becomes evident. The products were not valued because of the sophistication and rationality of the machines or the skills of their makers, but according to their moral and aesthetic impact on those who bought them. That impact was termed "taste," a certain level of refinement vaguely defined and communicated through the products. In the more integrated nineteenth century, some had been struck with the fact that lack of refinement transcended all social borders, (a

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the most flourishing in London by the adoption of a new policy. If you approve this policy which in any opinion has saved the Society and led to the foundation of the Great Exhibition of 1851, but which is now much endangered :- I hope you and friends you can influence will attend...and support a Council list proposed by the Advocates of that policy." RSA Archives, Society Meeting Book Session XCVI, Special General Meeting Friday 8th Feb 1850.

realization comparable with the one made about cholera a few years later). Culture, therefore, became nationally important and exhibitions were thought to be the primary means to make the consuming public respectable members of society.

The Great Exhibition, originated by the Society of Arts and the subject of the next chapter, launched the exhibition strategy at a national level. But for all the success that the Great Exhibition brought to the Society of Arts, the exhibition took on a life of its own. It turned out to be about a lot more than taste. The new Art-Manufacture movement required a new set of criteria for judging. The public involvement meant that there was no central authority. As the Great Exhibition proved, judgment was not easily controlled. The problems that the Society faced in the 1840s with reluctant or uncooperative producers, was primarily one of control. The Society assumed itself to be able to judge between what was tasteful and what was not. The manufacturers, as the many discussions regarding the Design Schools suggested, would prefer to let the public be the judge. One of the lessons learned from the Great Exhibition, as we shall see, was the need for a discourse to solve the problem.

CHAPTER 2

THE GREAT EXHIBITION: A REPOSITORY OF WONDER

This exhibition furnishes striking proof of the concentrated power with which modern large-scale industry smashes national barriers everywhere and increasingly levels out local peculiarities concerning production, social relations and the character of each individual nation. By displaying the total mass of the productive forces of modern industry crammed into a small area at a juncture when the modern bourgeois set-up is already undermined on all sides, the exhibition presents at the same time the material that has been generated amid these precarious conditions, and that continues to be generated day after day for the construction of a new society. With this exhibition the world bourgeoisie is erecting its Pantheon in the modern Rome, the Pantheon wherein the gods it fashioned for itself are put on show with self-complacent pride ... The bourgeoisie sets out to celebrate here its greatest festive occasion at a moment when the collapse of all its splendor is imminent.[1]

Many Victorians, like Marx and Engels above, thought that the Great Exhibition represented a focal point of some sort. In the words of Thomas Hardy, the Great Exhibition was "a precipice in time." In his 1892 short story "The Fiddler of the Reels," one of the characters, an old man, stated that "The only exhibition that ever made, or

[1] "KM and FE Revue, S bis Oktober 1850," *Neue Rheinische Zeitung*; here translated by Lux Furtmüller in Werner Plum, *World Exhibitions in the Nineteenth Century: Pageants of Social and Cultural Change* (Bonn-Bad Godesberg: Frederich-Ebert-Stiftung, 1977), 21-22.

ever will make, any impression on my imagination was the first of the series, the parent of them all, and now a thing of old times - the Great Exhibition of 1851, in Hyde Park, London. None of the younger generation can realize the sense of novelty it produced in us who were then in our prime."[2]

The Great Exhibition was the result of efforts and initiatives of the Cole faction of the Society of Arts. In 1848, after the Society had held its first successful art-manufacture exhibition,[3] the Society sent a deputation to the Board of Trade and "submitted a plan by which the Schools of Design, The Society of Arts and the Government might jointly co-operate to bring about the important object which all have in view - namely to promote the union of art with manufacturers to cultivate the public taste, and to improve and disseminate the products of national industry."[4] The proposed exhibition had as its purpose to continue the work of the Society on a larger scale. It was a plan for a controlled exhibition where the School of Design and the Society of Arts would have full control over the selection of the items to be exhibited. The plans took a different turn in 1849 when a couple of members from the Society visited the French Exhibition of Industry in Paris, and the idea of an international exhibition was first conceived.[5] When they returned to London, the planning for "a festival such as the world never before has seen"[6] was initiated with a visit by some Society members to

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[2] In "The Fiddler of the Reels" written for the Chicago Exhibition of 1892 and collected in *Life's Little Ironies* (London: MacMillan and Co., 1915), 179.

[3] In January that year Cole had contacted Lefevre who was chairman of the Head Government School of Design to discuss plans for a national exhibition. HCD for January 19 and 29, 1848.

[4] RSA Archive, Meetings of the Society Session XCIV (1847-48), Report from meeting March 8, 1848. RSA Archives.

[5] See Yvonne Ffrench, *The Great Exhibition: 1851* (London: The Harvill Press, n.d.), 19.

[6] Henry Cole, *Times*, 18 October 1849.

Buckingham Palace on June 30th, 1849.[7] The new international exhibition would outgrow the initial plans for a carefully controlled exhibition. Now the object changed. The proposed exhibition would not only exhibit taste, but machinery and science as well.[8]

But a unified purpose of machinery, science and taste would not be represented easily under the same roof. There was not a unified way to represent industrialism. The previous chapter discussed how machines, within the paradigm of political economy, were repressed in favour of an emphasis on order, while others preferred to see machines as the result of the accumulated empirical knowledge of the manufacturing branch -- skill. The taste question, as we have seen, raised the question of regulating production so that ideas and concepts potentially inherent in produced things could be better distributed. Social harmony and moral behaviour could be improved by ensuring that standards were kept in manufactured consumer items. The Society of Arts and Henry Cole had attempted to ensure higher standards by encouraging artists to produce for the mass market, and the Government run Schools of Design tried to improve taste by educating designers. The work of the design schools was not successful as manufacturers did not look favourably on the government trying to decide how they should design their products. The Great Exhibition was the first large scale launching of the goals of the taste movement, but it did not go according to plan.

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[7] Ffrench, 22.

[8] The plan was first discussed with Prince Albert June 30, 1849. Ffrench, 22. In Cole's words, what was said at the meeting was that "It was a question whether this Exhibition should be exclusively limited to British Industry. It was considered that, whilst it appears an error to fix any limitation to the production of Machinery, Science and Taste which are of no country, but belong to the Civilised World, particular advantage to British industry might be derived from placing it in fair competition with that of other Nations." Cited by Cole at a meeting at the Mansion House, October 17, 1849 and reported in the *Times* 18 October 1849.

Seen from the perspective of the Art-Manufacture movement, the Great Exhibition was no success. Nevertheless, the Great Exhibition was a watershed in British history. Marx and Engels, as quoted above, are quite typical in their rhetorical use of the Great Exhibition, as a convenient exemplification of a singular important point of their theory. For those who look at the contemporary literature on the Great Exhibition, it will soon become clear that many found it a convenient event to support their contentions, whether political, religious, or social in nature. As far as the attempts to change cultural attitudes to machines and industrialization are concerned, the exhibition was a convenient starting point. The exhilarating response to the Exhibition helped an enthusiast such as Cole to achieve more prominence for his projects. A separate government department would be created to deal with the national design question and enthusiasts, Prince Albert among them, would help plan projects to further industrial education and the values of industrial society.

The rather tumultuous pre-history of the Exhibition, from the summer of 1849 to the spring of 1851, helps us to some extent to understand the eagerness with which the Exhibition was later used to justify industrial society. After all, the framework used to present industrial goods was very successful and influenced the later cultural representations of machines. In celebrating themselves in this great festival, the Victorians celebrated industry. Cole had argued that with art-manufacture he wanted to recreate the cultural role of the medieval church where "beauty of form and colour and poetic invention were associated with every thing."[9] And the Crystal Palace was to a

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[9] Cole Collection, Misc. 8, Publicity leaflet for Felix Summerly's Art Manufacture. *Art-Manufactures. Collected by Felix Summerly. Shewing the Union of Fine-Art with Manufacture* (Sixth edition, Dec. 1847).

certain extent a church filled with consumer items for sale at the market. The success of the Exhibition seemed to be in part due to the sheer magnitude and multitude of material items on display in the Crystal Palace. Like the churches of medieval time, the building that housed the Exhibition stood out in its sheer volume. It constituted a magical framework which conferred a special significance on the exhibited items.

While *The Times* had pointed out that in the area of taste the British had the most to learn from an international exhibition,[10] and it was with the intention of promoting taste that the Society of Arts had initiated the Great Exhibition, the Exhibition was in its first major presentations to the public, proposed to be held in the general spirit of capitalistic competition. Prince Albert explained that history had reached the point of "realisation of the unity of mankind" and that it was technology and industry that had made this possible. At the same time "the great principle of the division of labour, which may be called the moving power of civilisation, is being extended to all branches of science, industry and art."[11] The Great Exhibition was to provide "a true test and a living picture of the point of development"[12] It was also claimed that an exhibition would "direct the minds of the whole world to the peaceful pursuits of industry and by friendly competition and generous rewards would more closely than ever cement the amicable relations of all the nations of the earth."[13] The Exhibition would be a "pacific

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[10] *Times*, 20 October 1849.
[11] Speech by Prince Albert cited in Theodore Martin, *The Life of The Prince Consort*, vol. 2 (London: Smith, Elder, & Co., 1876), 247-248.
[12] Ibid.
[13] Stated by the Lord Provost of Edinburgh at a meeting with members from the Society of Arts. Repeated in a speech by Cole October 17, 1849. *Times*, 18 October 1849.

congress."[14] "Nothing would more tend to remove the prejudices of each country," boasted Mr. Joseph Hume, "than the extension of that free trade."[15]

Hence, from the very beginning, the Exhibition was justified ideologically. It would promote competition, capitalism and free trade. Even if it were to ensure mutual benefit for Britons and foreigners, it was also made clear that in an international showdown, Britain would come out on top. Support outside of London was hailed as "evidence of the extraordinary progress of public opinion and of the rapid extension of enlightened views and of liberal principles."[16]

It is not surprising that the decision was made to present the Exhibition in these terms. After all, taste as an issue had few selling points. Those who promoted it were convinced that taste was lacking and it would be difficult to sell an exhibition to the manufacturers of goods to promote a deficiency. As it turned out, it would not be easy to sell one that promised to promote free trade either.

The Great Exhibition, already in the planning stages, was clearly promoted as a socially cohesive project. Provincial groups of workers and industries were encouraged to contribute money to a fund. Newspapers reporting on these contributions helped promote the idea that the Great Exhibition was a unifying project.[17] However, not everybody agreed initially.

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[14] *Times*, 20 October 1849.
[15] *Times*, 18 October 1849.
[16] *Times*, 26 January 1850.
[17] Thus, before the appointment of the Royal Commission, the Society of Arts had formed local committees to promote the idea of the exhibition. The Official Catalogue mentions that upward of 330 such committees were established in the United Kingdom. Great Exhibition (1851 : London, England), *Official Descriptive and Illustrated Catalogue* London : Spicer Bros., 1851 (ODIC), 18.

The Times would be foremost among those who criticized the project. However, *The Times'* initial reaction to the proposed Exhibition had been positive. In 1849, when France was still in tumult, *The Times* characterized the Exhibition as one that would further understanding between the nations and be quite a different gathering than that which had lately met at Paris, "surrounded by fortifications and a hundred thousand men."[18]

Starting in January 1850, after the founding of the Royal Commission of 1851, *The Times'* comments and reaction changed. No longer was the Exhibition considered in relation to France, but as an internal matter. *The Times* raised the question of how it could be financed and built in the short time available. But the major concern seemed to be that the Exhibition had turned into "a job in the interest of a few individuals."[19]

The planners of the Exhibition, however, put strong emphasis on how this was a national endeavour in which all classes were involved. The traveling Commissioners seemed to increasingly emphasize how the Exhibition would benefit all classes and how all classes had to co-operate to make the Exhibition a reality. A resolution from a meeting of the inhabitants of the Tower Hamlets read

> That while the exhibition will undoubtedly benefit all classes, it is especially calculated to promote the welfare of the working classes, both by offering examples of different kinds of workmanship, and in stimulating production by the exhibition of various forms of beauty and excellence, and it is therefore worthy in the highest degree of the assistance and co-operation

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[18] *Times*, 18 October 1849. See also *Times*, 16 November 1849 for more of the same.
[19] *Times*, 14 January 1850.

> of the Tower hamlets, which contains so large a portion of the industrious classes of the metropolis.[20]

At another public meeting a few weeks later, the same message was voiced. Richard Cobden was present at this meeting and put forth a resolution which proposed that "funds should be provided by the voluntary subscription of all classes."[21] A few days later, the leader in *The Times* warned against so readily accepting that the Exhibition would benefit everyone. It suggested that people take the trouble to consider "the real intention and objects of the exhibition."[22]

The issue around which the discussion about the Exhibition would be centred was its proposed site. Protecting Hyde Park and the elms became a symbol for the opposers, the space of green that they wanted to protect from the onslaught of modern industrialism. The Building Committee of the Royal Commission officially recommended Hyde Park as the most suitable site. Immediately, Lord Brougham spoke against having the Exhibition in Hyde Park because the erection of a building to house the Exhibition would choke "one of the lungs in this great capital."[23] Lord Brougham stated that in principle he was not against arranging an international exhibition, but that it would not be beneficial to the manufacturing interests because they would "lose a great deal" since prices would be depressed. The implication is clear: an Exhibition would not benefit anyone and the manufacturing interests were mistaken to embrace it.

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[20] *Times*, 12 April 1850.
[21] *Times*, 3 May 1850.
[22] *Times*, 6 May 1850.
[23] *Times*, 20 March 1850.

There seems to be a tendency among recent writers either to overlook the opposition which the Exhibition encountered or to ridicule those who opposed it. But neither approach can explain away the resistance at the time. Those who were opposed were critical of the core elements of the exhibition -- free trade, the principles of political economy, and the success and importance of the manufacturing sector. Skepticism about this project was rooted in a belief clearly contrary to that which the Commission wanted to portray. In the end, there was a reluctance to let the planners of the exhibition get away with promoting their idea of national unity as one centred around the efforts of the manufacturing industry.

There was also uneasiness about the unpredictable gathering of so many people in affluent areas of London. Allowing workers to come to London would be "a most serious evil to themselves and to all concerned,"[24] wrote the *Blackwood's Edinburgh Magazine*. Some feared the "rogues" and "vagabonds" that such an arrangement would attract.[25]

Though the Corn Laws and the Navigation Acts had recently been repealed, protectionism still had its supporters. Their mouthpiece, the *Blackwood's Edinburgh Magazine*, which opposed the Exhibition as late as September 1850, clearly identified the proposed Exhibition with the issues of class and free trade. In its September 1850 issue, it addressed the problem of funding and pointed to the fact that the public

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[24] W. E. Aytoun? "The Proposed Exhibition of 1851," *Blackwood's Edinburgh Magazine* 68 (Sept. 1850): 282.

[25] Letter to the *Times*, 21 June 1850. See also petition "signed by the inhabitants of Knightsbridge and Kensington-Gore" published in the *Times*, 27 June 1850.

subscriptions were lagging behind the projected expenses of the Commission.[26] The magazine attributed this to a lack of enthusiasm among the manufacturing and working classes.[27] *Blackwood's* regarded the reluctance to contribute as "a distinct acknowledgment of the utter failure of the system of Free Trade."[28] And, while the Commission continually held that the Great Exhibition was a national undertaking and put considerable effort into promoting it throughout the country, *Blackwood's Magazine* questioned this perception.

> It is certainly ... no spontaneous movement on the part of the British nation - no anxiety to contribute to a scheme, which either is or is not calculated to be of advantage to the general interests of the county....There is nothing in the world to prevent people from holding such an exhibition, or from throwing away their money upon any whim which they may magnify into a national object.[29]

According to *Blackwood's*, the Exhibition was not only "fenced by the exclusiveness of private enterprise," but had also "been adopted by the Ministry and by the Legislature so far, that the Tariff is to be relaxed in favour of foreign articles intended for competition at the show."[30]

Punch also questioned whether the Exhibition was really of a truly national character, though in quite a different manner. One of its issues featured a drawing

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[26] Which was true. But the issue of funding was solved by then as the Commission had obtained guarantees and could obtain loans from the Bank of England.
[27] "The Proposed Exhibition of 1851," 278-290.
[28] Ibid., 280.
[29] Ibid., 279.
[30] Ibid., 279.

entitled "Specimens from Mr. Punch's Industrial Exhibition of 1850"[31] which depicted workers put under little glass mantles with a distinguished looking gentleman watching and pondering their significance. Furthermore, *Punch* published a poem titled "The Exhibition of Industry -- a Hint" which recommended that not just "peace" and "commerce" should be celebrated at the Exhibition, but also the labourers who are truly to be thanked for the riches of the nation.[32] Another of *Punch*'s drawings depicted a pathetic looking Prince Albert with a hat in his hand trying unsuccessfully to collect money for the Exhibition.[33] In contrast, The *Leader*, a radical middle class newspaper which had previously referred to the proposed building as a "Hall of Industry," perhaps as an allusion to the Owenites' or the Chartists' Halls of Science, believed that the efforts to stop the Exhibition were the works of "some nobleman," chiefly because by holding it in Hyde Park millions would go into the pockets of the middle and working classes.[34]

Objections to the use of Hyde Park were raised in Parliament by the likes of Colonel Sibthorp and other protectionists, but some radicals also objected to any interference with Hyde Park and invoked provisions that denied the right of the Crown to erect buildings in Royal parks.[35] *The English Republic*, a journal considerably more radical than any MPs, indicated in its May 1851 issue its opposition to the Exhibition by ironically asking "is not this triumph of Peaceful Trade an immense advance beyond the

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[31] *Punch*, vol. 18, January-June 1850, p. 145.
[32] Ibid., 141.
[33] Ibid., 224.
[34] *The Leader*, 20 June 1850.
[35] Christopher Hobhouse, *1851 and the Crystal Palace* (London: John Murray, 1937), 19; and C. R. Fay. *Palace of Industry, 1851: A Study of the Great Exhibition and its Fruits* (Cambridge: University Press, 1951), 9.

old triumph of Royal War? Truly so. When men have learned to organize theft, it is manifest that they are outgrowing the mere *brute*."[36] Ernest Jones, the Chartist leader, predicted that the Exhibition would result in failure because it would not prove to be as lucrative for the middle class (London shop keepers, for instance) as its supporters hoped. Jones claimed that "a vast majority of the resident inhabitants of London are leaving London ... because London will be very full" and those who would come would not spend any money.[37]

The attacks against arranging the Exhibition in Hyde Park would further increase after the Building Committee published its design for a building, which consisted of 19 million bricks and was to be four times as long as Westminster Abbey with a dome nearly double the size of that of St. Paul's.[38] Though the Commissioners argued otherwise, most people thought the proposed building suggested permanency, rather than the temporary character originally promised.[39] *The Times* warned the Prince, who still suffered from the reputation of being a meddlesome foreign upstart, of the effects of being connected with such an unfortunate project.[40] *The Times*' warning came only a little over a week before the Parliament would debate the issue of allowing the Royal Commission to use Hyde Park. Worse still, one of the strongest supporters of the project, Robert Peel, died only days before Parliament was scheduled to debate the issue

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[36] *The English Republic*, Vol. 1, p. 193.
[37] Ernest Jones, *Notes to the People. May 1851-May 1852*, vol. 1 (New York: Barnes & Noble, 1986), 15. There was no uniform left wing opposition to the Exhibition. As noted above, *The Leader* clearly supported it, so did for instance *The Pioneer* and *Robert Owen's Journal*.
[38] Ffrench, 74-75.
[39] A memorandum prepared by the Commission by order of the House of Commons, July 1, 1850 makes it clear that the Commission still intends the building to be temporary. Published in the *Times*, 3 July 3 1850.
[40] *Times*, 27 June 1850.

and to consider whether the government should sanction the use of Hyde Park. On the day after Peel's death, Prince Albert wrote in a letter to Baron Stockmar that he feared they were "on the point of having to abandon the Exhibition."[41] In a letter the next day, Prince Albert complained that "the whole public - led by *The Times* - has all at once made a set against me."[42] The Commission had practically issued an ultimatum: it was Hyde Park or nowhere. But even if Colonel Sibthorp called the Exhibition "the greatest trash, the greatest fraud, and the greatest imposition ever attempted to be palmed upon the people of this country,"[43] the outcome of the debate in Parliament was quite different from what the Prince feared.[44] *The Times* lamented the fact that this "monster exhibition" was allowed to take place in Hyde Park.[45]

The protests would not die down immediately however.[46] Even after the popular new plans for the Crystal Palace were published, *The Times* kept criticizing the Exhibition. In the middle of July it referred to the building as "a monstrous Green-house" and a "monster conservatory." It raised doubt as to whether a glass house would give adequate protection and be able to withstand the British climate.[47] Sibthorp had prayed for a storm to destroy the glass house but storms would come and go while the glass house stood firm. July 1850 was in many ways a turning point for the Great

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[41] Martin, *The Life of The Prince Consort*, vol. 2, 290.
[42] Ibid., 290-1.
[43] Report in *The Times* 5 July 1850.
[44] Peel's role as a member of the Commission was brought up by some of the speakers supporting the Great Exhibition. By a large majority of 166 to 47, the Commission was allowed to use Hyde Park. In the House of Lords, Lord Brougham decided not to carry forward his motion of opposition.
[45] Leader in *The Times* 5 July 1850.
[46] Colonel Sibthorp addressed the House on July 12 to say that he had heard that the expenses of the proposed Exhibition would be far higher than previously predicted. And on the 15th, *The Times* reported that the newly established "Committee for the Protection of Hyde Park" had submitted an application to the Attorney-General to stop the proposed building in Hyde Park. This application was denied. Ffrench, 96-97; *Times*, 15 July 1850.
[47] *Times*, 15 July 1850.

Exhibition. After Paxton's design was accepted, the funding seemed secure and on July 30th the Commissioners took possession of Hyde Park and the building of the Crystal Palace would commence. *The Times'* leaders were fairly quiet about the Exhibition for a while, then gradually the newspaper became an outspoken proponent of the Exhibition.

The resistance to the Exhibition shows that industrial manufacture did not constitute a national interest but was thought of by many as a separate interest. The work for those who wanted to constitute a national unity around manufacture and free trade would be left to the aftermath of the exhibition. But the Great Exhibition was itself a success. Cole, in the official announcements cited above, referred to the exhibition as a unique event and a festival.[48] When the Exhibition was underway, *The Times,* whose editorial position had vacillated much in the period between June 1849 and May 1851, would pick up on this metaphor and though not directly calling it a festival observed that

> we read in Arabian fables that magicians could place before enchanted spectators the visible treasures of the universe. These very treasures are now laid bodily at our feet by no other magic than that of national power....Not five years' travel nor a thousand pounds could enable a man to see what one shilling has now brought before his eyes; and one of the most striking morals of the Exhibition is that suggested by the astonishing influence which must have been exercised in amassing the collection. The spectacle was intended to be little more than a magnified "exposition" on the original French pattern. It has turned out to be such a wonder as the world never saw.[49]

Considerable compromise and perhaps some luck contributed to making the exhibition such a huge success. When the scheme of holding an International Exhibition began to

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[48] Speech at the Mansion House, 17 October 1849.
[49] *Times*. 28 May 1851.

take form, the first goal was to round up support. In the early stages of planning, some of the Society of Arts skeptics declared that an exhibition on the national level would require the support of the manufacturers[50] and when members of Parliament were approached, many, such as Sir Robert Peel, declared their support on condition that the manufacturers were behind such an arrangement.

Consequently, some members of the Society of Arts started to tour the country to round up support for the project. They were met enthusiastically in some industrial centres and it seemed that, on the whole, local support would be easily attained. At least that is what the press reported. [51] John Scott Russell, the secretary of the Society of Arts, toured the European centres to find out what their attitudes would be. Without contributors there would have been no exhibition and the manufacturers were, despite successes, wary. The Society of Arts knew from their own experience that the manufacturers were not always willing to support exhibitions.[52]

One obstacle was the memory of the National Repository, the first attempt twenty years earlier to hold a national industrial exhibition, which proved a failure in terms of the interest of both the public and the exhibitors. The audience it catered to seemed uninterested in the attempt to bring together the representation of work and mechanical

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[50] Mr. Hickson considered that unless the whole of each particular trade agreed to send specimens to such an Exhibition he did not consider that such an Exhibition would be successful, and he did not consider that the English manufacturer had the same inducement held out to him to manufacture fancy articles, as did the French. RSA Archives, Council meeting, Minutes, July 26, 1849.

[51] Ffrench, 27-28. *The Manchester Guardian* reported in September that four members of the Society of Arts had visited "the principal manufacturing towns of Lancashire and Yorkshire in order to ascertain the views of the leading manufactures upon the subject (i.e. arranging a general exposition of Industry)." *Times*, 6 September 6 1849. The Library and Archive of the RSA contains a bounded collection of papers by John Scott Russell. Here the results of the touring and its reports can be found.

[52] As discussed in the previous chapter, the first of the Society's Annual Art-Manufacture exhibitions had problems finding exhibitors.

contrivances, while the manufacturers were reluctant to bring products to the exposition for fear of being copied by the competition.[53] The *Mechanics Magazine* continued to oppose the Great Exhibition on the same grounds as it had opposed the Royal Repository, making explicit references to that fiasco and refuting the claim that an exhibition could have any positive effect on British industry since it needed no encouragement.[54]

One of the reasons for the success was the lucky choice of building to house the Exhibition. A glass house was built which seems to have been the perfect building to display consumer goods.[55] It was cheap, could be built quickly and be removed easily afterwards. Even though it was neither crystal nor a palace, the building itself contributed decisively to making the Exhibition great. The building, erected in 17 weeks, was of glass, iron and wood. It was huge, simple, cheap, and caused all who saw it to marvel. This was "a building remarkable not less for size than for the beauty of mathematical proportions and rectangular outlines."[56] In January 1851, when the building had taken shape and after it had withstood all the challenges that *The Times* among others had predicted it would not, the paper hailed it as an achievement and as an example of what Britain could do.

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[53] International Exhibition of 1862, and John Hollinghead. *The International Exhibition of 1862*, 7.
[54] *Mechanics' Magazine*, no 1379 12 Jan. 1850 (pp. 29 onwards).
[55] Joseph Paxton (1801-1865), the architect, was the son of a small Bedfordshire farmer. Worked as an undergardener for the Horticultural society at Chiswick in 1824 when he was made headgardener to Duke of Devonshire at Chatsworth. He built green houses and other buildings for the Duke and quickly became a very famous gardener with influential friends. Paxton also made a fortune in railway shares and became a railway director, and founded the Daily News. Between 1854 and 1865 he represented Coventry in Parliament.
[56] *Times*, 15 January 1851.

> We are able, at a few months notice, to build an edifice of indestructible materials, and of great beauty and strength, capable of containing and displaying to advantage specimens of nature and art from all the countries and cities of the world; with space for forty or fifty thousand spectators to move freely among them.[57]

The building itself became perhaps the most important exhibited item. It was an example of the capacity and potentiality of British achievement, but in the many praises given to the Crystal Palace one can see that it is the achievement that was celebrated, not the potentiality. Henry Mayhew felt that "one glance was quite sufficient to account for the greatness of the nation to which it belonged.[58] And the designer, Joseph Paxton, became a symbol of the self-made man, since he started out as "an ordinary gardener's boy"[59] and achieved fame and success. Thus, the Crystal Palace was thought to be more the result of practical thinking than of theory and science, and thereby, in a nutshell, incorporated the British self-image of a practical people who could outstrip their more theoretically oriented neighbours. This was certainly not lost on *The Times*, which, pursuing the horticultural metaphor of the greenhouse, saw the Exhibition as a "seed-plot" of nations and predicted that from it "many a new idea will strike and take root,"[60] especially among the working classes. At the same time, however the paper rejected calls for better education of the lower classes, claiming that the Great Exhibition was an example of the fact that the English system worked. The workers did not need theoretical education which only served to confuse them; what they needed was

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[57] *Times*, 11 January 1851.
[58] Quoted in George W. Stocking Jr. *Victorian Anthropology* (Toronto: Maxwell Macmillan, 1987), 4.
[59] Depiction by the Queen in her Exhibition Journal.
[60] *Times*, 26 May 1851.

experience and practice. Thus, even though the Exhibition raised some questions about technological education in Britain, it also seemed to furnish a reason to continue the status quo, because, as one writer to *The Times* argued, a system that had produced the Great Exhibition could not be wrong.[61] The Exhibition Catalogue likewise perpetuated this impression in its presentation of the cotton industry, declaring that "No other manufacture represents this country in a position so important and influential, and in none has any department of industry attained, within the same interval of time, proportions so vast, and relations so powerful. The cotton manufacture may be justly regarded as an evidence of the mechanical capabilities of this country."[62] "Unmatched is England,"[63] declared the *Westminster Review*.

The Exhibition received the manufacturers' support. But it would not promote taste and science, but would rather celebrate the status quo. It celebrated what Britain was and it celebrated how it got there. It celebrated the absence of government institutions, of science schools or schools of design. It became to a large degree, a glorious celebration of what I have called the skill or empirical paradigm of representing industrialism.

Goods at the Great Exhibition were confidently represented as products of skill, not with a didactic or pedagogical purpose of seeking to unify of art and industry as in the small Society of Arts exhibitions. Since the British government would not step in and finance the exhibition, support was needed from manufacturers and as a result more controversial representations were replaced by celebratory ones. In the Crystal Palace,

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[61] See letter to *The Times*, 8 September 1851.
[62] *ODIC*, II, 479.
[63] "Industrial Exhibition," *Westminster Review* 55 (July 1851): 394.

skill and free trade would be the dominant features represented. In order to show the superiority of the British and the benefit of free trade to all of mankind, elements that could throw a critical light on industrial production, as did the "taste-question," were filtered out. While there was considerable confidence in British supremacy when it came to the areas of machinery and ingenuity (i.e. practical science), there was less confidence in the area of taste, and the Exhibition would make little effort to encourage taste or to promote objects that the organizers deemed worthy simply because they clearly expressed the union between art and manufacture. The fourth section of the Exhibition, "Fine Arts, Sculpture, Models, and the Plastic Arts generally," was described as "departments of art which are, in a degree, connected with mechanical processes which are applicable to the arts, but which, notwithstanding this, still preserve their mechanical character."[64] In other words, it was not art but chemical and mechanical processes that were on display. The third section, consisting of manufactures, was intended to illustrate the operation of human industry upon natural produce, and nowhere was it indicated to what extent these objects might be or not be tasteful. Even if the criteria for prizes awarded within this category included "beauty of design in form , or colour, or both,"[65] it was made clear that this was in reference to utility, not to culture.

Theoretical science was not prominently exhibited. The contributions were divided by nationalities and into 30 classes based on "commercial experience,"[66] a system that was thought to be more precise than the one suggested by Prince Albert of

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[64] *ODIC*, 819.
[65] *ODIC*, 31.
[66] *ODIC*, 22.

four classes of raw materials, machinery, products and sculptures.[67] Theoretical science was represented in class X, Philosophical Instruments, which contained some scientific instruments for the measurement of time, space and physical forces, including clocks and watches. Some instruments that illustrated the laws of mechanical and physical science were also on display alongside musical instruments and surgical instruments. The Official Catalogue commented that those contemplating the importance of class X should understand that "the genius of this country, so remarkable for development in mechanics applied to commercial purposes, is not less successful in its application to the higher pursuits of experimental and practical philosophy."[68] It was not the science in itself that was on display but the practical ability of British manufactures to construct the scientific instruments. There were nevertheless, important discoveries and applications on display such as electricity, telegraph and photography. But in quantity, with only 126 exhibits, it was a rather insignificant part of the Exhibition. Another small section located on the gallery, class 2, Chemical and Pharmaceutical products, also represented science. Those who were better acquainted with industrial production, with processes like the preparation of dye or other materials used in industrial production, as was Robert Hunt, keeper of Mining Records at the Museum of Geology, who reported on science at the Exhibition for the *Journal on Art*, would certainly observe applications of science; but the Great Exhibition was not organized to highlight science.[69] Charles Babbage,

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[67] *ODIC*, 22

[68] *ODIC*, 405.

[69] Robert Hunt, "The Science at the Exhibition," in Art Journal Special Issue, *The Crystal Palace Exhibition: Illustrated Catalogue, London 1851* (Reprint by New York: Dover Publications, Inc., 1970).

who advocated the need for more theoretical science, was disappointed by the failure to more explicitly use the Exhibition to show how science benefited production.[70]

In addition to science and taste, Prince Albert had mentioned machines as a third element to be highlighted at the Exhibition. Unlike science or taste, machinery was very prominent at the Crystal Palace which provided a venue to represent their value to industry. The Official Catalogue pronounced that "the activity of the present day chiefly develops itself in commercial industry,"[71] and though it was commercial industry that the Exhibition served to highlight and promote, commercial industry and commodities were placed in a narrative context with a beginning, middle and end represented by raw materials, machines and commodities respectively. Machinery was a significant part of this story and provided some useful examples of how science and skill might be presented to the public successfully.

Machinery, with the main subdivisions of machines in motion and machines at rest, was represented within a narrative and was preceded by the section for raw materials, "the foundation of the present commercial and productive greatness of Great Britain."[72] Machinery was followed by commercial products, the bulk of the exhibitions. Initially it was predicted that the machinery section would not generate much interest among the public. But this proved to be a mistake.[73] The Great Exhibition was a striking demonstration that machinery could be exhibited to the general population with as much interest and learning as was conveyed to the working

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[70] Charles Babbage, *The Exposition of 1851: Or, Views of the Industry, the Science, and the Government of England*, 2nd. ed. (London: John Murray, 1851).
[71] *ODIC*, 1.
[72] *ODIC*, 119.
[73] Fay, citing a prediction by the reporter of the *Daily News*.

populations that visited the exhibitions of the Mechanics' Institutes. Seeing the immense machines and seeing them at work visibly impressed the spectators.

Class 5, Machines for direct use, the prime movers of industry, was according to the catalogue "the most important series exhibited."[74] Its importance was reflected in the amount of space it was allotted. Although the hand- and machine-made commercial objects were initially the prime attraction of the Exhibition, machines themselves had a dominant presence in the production of the spectacle, a point made clear in the Exhibition narrative. They were not necessarily in the Crystal Palace to attract paying customers, who were thought to be primarily interested in the products. They were there to convey the political message of what it was that sustained the spectacle. Thus, the space the machinery occupied, and the noise and smells that they must have made, surely made it clear to the public that they were the fundamental driving force of production. Mayhew and Cruikshank, in *The Adventures of Mr. and Mrs. Sandboys*, wrote that "the chief centres of curiosity are the power-looms, and in front of these are gathered small groups of artisans, and labourers, and young men whose red coarse hands tell you they do something for their living, all eagerly listening to the attendant as he explains the operations, after the stopping of the loom."[75] Girls were watching lampshades being made out of hemi-spherical sheets of paper. Of the machinery in motion section, *The Times* declared in a self-congratulatory manner:

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[74] *ODIC*, 209.

[75] Henry Mayhew and George Cruikshank, *The Adventures of Mr. and Mrs. Sandboys*, quoted by Humphry Jennings, *Pandaemonium, 1660-1886: The Coming of the Machine as Seen by Contemporary Observers*, Mary-Lou Jennings and Charles Madge (eds.)(London: Andre Deutsch, 1985), 258.

> as we anticipated, though opposed by the forebodings of some contemporaries, the department of machinery has proved to be an object of paramount attraction in the Exhibition. Crowds may be seen at all hours of the day collected round the various machines which form such important agents in our manufactures...[76]

There was a considerable difference between the way the Great Exhibition represented machinery and the way machinery had been represented to the more affluent London public in the period after the failure of the Royal Repository. The Adelaide Gallery and the Polytechnic were most important places to showcase inventions considered entertaining by virtue of being extraordinary or novel. The Adelaide Gallery, or the National Gallery for Practical Science, Blending Instruction with Amusement, with all its curiosities seemed to provide a much more agreeable place to socialize for the upper classes than did the Royal Repository. It was started by the Society for the Illustration and Encouragement of Practical Science, "a group of enterprising men," in 1832.[77] The Gallery, as its Catalogue of May 1836 makes clear, was certainly a place for blending instruction with amusement. Its advertisement page proclaimed that the Society would receive for exhibition models, specimens of new inventions and works of general interest. The public display "must tend to the amusement, if not in all instances, to the instruction of every visitor."[78]

To achieve these goals, a rather eclectic assortment of exhibits was put together. The Gallery contained, among other things, specimens of artificial stone for ornamenting

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[76] *Times*, May 17, 1851.
[77] Characterization by Richard Altick, *The Shows of London* (London: Belknap Press, 1978), 377.
[78] Society for the Illustration and Encouragement of Practical Science (Incorporated by Royal Charter, October 1834), *The Adelaide Street Gallery for the Exhibition of Objects Blending Instruction with Amusement: Catalogue for May, 1836* (London: William Clowes, 1836).

pleasure, some pictures, a model of Newcomen's Steam Engine and a model of a steam engine with a separate condensing chamber. The Catalogue provided a narrative of the history of the steam engine. There was also an electro-magnet and an electro-magnetic machine. Among the main attractions of the Gallery was a steam gun which loudly demonstrated its power to the public by firing "a current of seventy balls in four seconds."[79] There were some fossils, the head of an albatross,[80] and after 1838 a forty-inch electric eel.[81] The Gallery provided lectures and shows, the catalogue of 1836 referring to one show which used a big microscope as a prop. Gradually, however, the instructional aspect of the Gallery seems to have given way to amusement. The Exhibition Catalogue of 1862 was more than pleased to note that the Gallery had gradually sunk into a casino, and had become an echoing desert.[82] The Adelaide Gallery had a rival in the Polytechnic Institution which featured a similar assortment of curious items and examples of modern ingenuity. Its prime attraction was a diving bell. The public could visually observe how it worked, or if particularly adventurous, as was Prince Albert, even be part of the demonstration when the diving bell was submerged into a tank.[83] Both institutions were commercially driven and seemed in the end to be forced to give more weight to amusement than to instruction.[84]

Such scientific demonstrations were primarily to entertain those who were curious and willing to pay. In contrast to the National Repository, these institutions

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[79] Cited from the 1834 edition of the Catalogue by Altick, *Shows of London*, 378.
[80] *The Adelaide Street Gallery...: Catalogue for May, 1836.*
[81] Altick, 379.
[82] International Exhibition of 1862. *The Illustrated Catalogue of the Industrial Department*, 8.
[83] Altick, 382-386.
[84] Altick, 387-388.

showcased the spectacle of science and machines, not their social utility or even their economic possibilities. For instance, Perkins's steam gun at the Adelaide Gallery had as its sole purpose the entertainment of the audience. There were no attempts to encourage or even suggest social relevance of the inventions and therefore, no reason for the mistrust and contempt that met the Repository which had attempted to show new improvements for an explicit commercial purpose and to demonstrate work in progress. The space for the public to peruse the mechanical and scientific wonders was that of the grand theatres and shows. In such settings machines could either be pure entertainment or incitements to ingenuity, or ideally, both. Only by taking the machines out of their practical social, historical and material contexts were they made socially presentable.

The people behind the Adelaide Gallery and the Polytechnic, however, such as engineer Thomas Telford, the advocate of popular technical education Sir George Cayley, or the American entrepreneur and inventor Jacob Perkins, cannot be considered disinterested in promoting the tools of machinery for the London society. Promoting interest in industrial society could bring political benefit to causes they supported, such as repeal of the corn laws and other free trade measures. Being enthralled by the spectacle of what science or engineering were capable of served the purpose of capturing public interest in technology and British industry.

These galleries displaying mechanical ingenuity but lacking any explicit, articulated political and propaganda purpose, stand in sharp contrast to the exhibitions directed at the manufacturing classes, the latter which had a more general propagandistic purpose and worked under different rules. The Mechanics' Institutes held many

industrial exhibitions where the social and material context of production was displayed with the machinery. In a *Handbook on Mechanics' Institutes* of 1839, the authors suggest that exhibitions should be encouraged as a "means of exciting the interest of the labouring classes,"[85] something that suggested an intent to persuade the manufacturing population to accept the values and purpose of industrial success. In defining a museum that would be useful to workers, the authors wrote that it would "mean a repository which enables the lecturer to place not only the description of a thing before his auditory, but the thing itself. It will therefore comprise, among other things, specimens, such as geological, mineralogical, and chemical; models, as those illustrative of the mechanical powers, of machines and of architecture; maps, globes, &c.; casts of statues; prints, medallions, &c."[86] *The Leeds Times* wrote about that city's 1839 Mechanics' Institution Exhibition that "the exhibition, more specially the mechanical part of it, is calculated to illustrate how intimately the greatness and prosperity of our country depends on its mechanics and artisans."[87] And at these exhibitions it was not uncommon to see working machinery operated by the workers themselves. The workers were presented with a spectacle representing their value as participants in industrial society, but at the same time, providing the workers with objects, paintings and sculptures that promoted cultural values and identities of the upper classes. Two years earlier the directors of the Manchester Mechanics' Institution said of their Christmas Exhibition that "the Directors are desirous of affording to the working classes a convenient

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[85] B. F. Duppa and T. Webster, *A Manual for Mechanics' Institutions* (London: Longman, Orme, Brown, Green, & Longmans, 1839), 79.
[86] Ibid., 69.
[87] *Leeds Times*, 20 July, 1839. Cited by Toshio Kusamitsu, " Great Exhibitions before 1851," *History Workshop Journal* 9 (Spring 1980): 79.

opportunity of inspecting the present state of our arts and manufacture and to present them with a source of rational and agreeable relaxation."[88] The author of the Handbook mentioned above described the exhibition of the Manchester Mechanics' Institution of 1839 as follows: "the three first rooms were set apart for the exhibition: the long class-room was devoted to models of machinery and apparatus; the drawing class-room was laid out for specimens of natural history; and the reading room for paintings and works of art."[89] This is not unlike the general divisions that Prince Albert would suggest for the exhibits in the Crystal Palace. The Great Exhibition's monstrification of the objectives of the smaller exhibitions by the Mechanics' Institutions seems a clear indication that its goal was to educate about the values of industrial society, not to encourage taste and educate manufacturers and consumers about correct production and consumption.

The success of the Great Exhibition indicated that machinery could be exhibited within a cultural context surrounded by art, manufacture, and sculptures and be socially acceptable to all classes. Machines had a socially cohesive potentiality. This was a lesson not lost on those who were looking into promoting taste and science after the exhibition had closed its doors.

Previously, machinery or industry itself had not enjoyed a unified discourse concerning its role or utility. Machines were not normally termed a progressive catalyst of development, though they might be considered indicators. But in the Crystal Palace, the nations were characterized not by their military, cultural or political achievements,

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[88] From *Manchester Guardian*, 9 Dec. 1837. Cited by Kusamitsu, 70.
[89] Duppa and Webster, *A Manual for Mechanics' Institutions*, 79-80.

but by their industrial development. The many different objects in the Crystal Palace, from all corners of the world, highlighted not only the superiority of the English manufacturers but also brought home the point that industrial interests in Britain herself were not merely a sectional aspect of British society but one which determined the British position in the world. The most progressive nations used machinery. Thus, the principal mover of civilization was technology. The Great Exhibition conferred meaning on objects that made it possible to recontextualize the discourse on machinery and discuss it within an evolutionary framework.[90] Machinery was thus given new potential meaning linked to historical change and the progress of civilization. The Exhibition accomplished what it had set out to prove. The *Edinburgh Review* wrote that the Great Exhibition was an attempt "to seize the living scroll of human progress."[91] Not only did it seize it; it also redefined it.

But the third element of the Great Exhibition was of the greatest importance for those interested in furthering a unified culture. The Great Exhibition in itself produced or gave prominence to a particular discourse on machinery, but the many attempts to find relevance and significance in the Crystal Palace led to a multitude of narratives in which commodities gained a greater importance. One such narrative was that of historical materialism. The Great Exhibition showcased things. All sections of the world were represented by products of industry. Charlotte Bronte described her visit to the Exhibition on June 7th, 1851 as entering a bazaar where she was enthralled by both the multitude and magnitude of items:

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[90] As argued by George W. Stocking Jr., *Victorian Anthropology*..

[91] Review of "Official Catalogue of the Great Exhibition of the Works of Industry of all Nations" in *Edinburgh Review* 96 (1851): 562

> It might be called a bazaar or a fair, but it is such a bazaar or fair as Eastern genii might have created. It seems as only magic could have gathered this mass of wealth from all ends of the earth - as if none but supernatural hands could have arranged it thus, with a blaze of contrast of colours and marvelous power of effect. The multitude filling the great aisles seems ruled and subdued by some invisible influence. Amongst the thirty thousand souls that peopled it the day I was there not one loud noise was to be heard, not one irregular movement seen; the living tide rolls on quietly, with a deep hum like the sea heard from the distance.[92]

One of the names used to characterize the palace was Bee-Hive and this metaphor more clearly makes the visitors to the glass building part of the experiment. In the Crystal Palace the values of modern society were played out as the many millions of visitors partook in the admiration of the products of modern industry. Within this context of supply, represented by the things on display, and demand, represented by the visitors, the machines were less prominent. But their mere presence was an indication of the origin and values that sustained this gigantic theatrical marketplace. The novelty and often the very lack of utility of the items displayed were part of the richness and flavour of consumer society as represented at the Great Exhibition. Buying was not just for the sheer necessities of life; it was entertainment and it was socialization.

Most importantly, the Great Exhibition was a spectacle that perpetuated with immense success an image of British society as an industrial society where the things of industry told the history of not only the British nation, but the whole world. William Whewell saw in the Crystal Palace a simultaneous gathering of civilizations in their different stages: youth, middle age and maturity. To him the Crystal Palace, "by

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[92] From a letter of Charlotte Bronte to her father, *Pandaemonium*, 261-2.

annihilating the space which separated different nations, [produced] a spectacle in which is also annihilated the time which separates one stage of a nation's progress from another."[93]

The order imposed on the British section was contrasted to the lack of such order in the goods from the other countries. As the arrangers had hoped, the Exhibition gave ample opportunity for the British to compare their own industry with that of the rest of the world and thus, indirectly came to sustain a materialistic discourse of historical development. *The Times* described the Exhibition as a geographical world tour in which England was at the centre, occupying the whole west wing, while the rest of the world was scattered around.[94] The Great Exhibition made industry representative of the nation, as all the countries were characterized by their industry. In the Crystal Palace it was not their military achievements but their industrial achievements that signified the character and advancement of the respective nations. Throughout the time the Exhibition lasted, *The Times*'s leader would continue to emphasize this point. For the British, and particularly for the British working class, the Crystal Palace was "a mere lesson in industrial and social geography,"[95] "a tour through all nations and climes."[96]

On opening day, *The Times*'s leader proclaimed "Till this day it had never yet occurred that the nations of the earth should meet by their representation, and combine in a common act."[97] This, the newspaper concluded, was due not to British power as much as it was to her men of peace representing the industry and talent of their fellow citizens.

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[93] Quoted in Stocking, 3-6.
[94] *Times*, 1 May 1851.
[95] *Times*, 2 May 1851.
[96] *Times*, 12 May 1851.
[97] *Times*, 1 May 1851.

The coming together of exhibitors from all over the world was a contribution to England's greatness. The many different objects in the Crystal Palace from all corners of the world highlighted not only the superiority of the English manufacturers, but also the ideology of the English.

There were also those who drew another philosophical conclusion from the comparison. *The Times* frequently emphasized how the Exhibition, through "close comparisons between the industrial products of different countries," showed how some nations suffered because "the competitive principle is absent."[98]

The considerable fascination with the Crystal Palace's machine-made beauty contributed strongly to this reformulation of reality. It could hardly be lost on those who found their way to the Crystal Palace that the works of all nations were exhibited in a place which was alternatively referred to as a "temple" or a "palace" and visited by kings and queens from all over the world. In this setting, where the displayed objects were ordered, set on pedestals, and illuminated, raw materials, machines, and manufactured objects were reconstructed into a new reality. The temple or palace conferred a new meaning on the objects. They became objects of wonder, objects that required a second look, objects that demanded respect. Moreover, the ordering of the exhibited objects into raw materials, machines, manufactured objects, and art, was significant in itself. Even though the spectators would not necessarily see the objects in this order, the press and the detailed official catalogue guided interpretations of visual images and emphasized the point that the production process was being celebrated. In these written accounts the audience was provided with the official pre-history of the Great Exhibition,

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[98] *Times*, 2 October, 1851.

describing the involvement of the monarchy, and a romantic story detailing the background of the Crystal Palace. The written impressions, therefore, paralleled and enforced the visual ones.

In addition to epitomizing the economic structure of Britain, the categories of the Exhibition also epitomized its imperial structure. The colonies and dominions were seen as valuable for the production of raw material, not for their manufactured products which were characterized as less developed. The people were brought into a palace which came to stand as a metaphor for Britain. And the values of the Crystal Palace became the values of the nation.

The Great Exhibition was not merely great because it showed off England's industry, it was also great because it came and went without any "incidents." Several critics had predicted them: disturbances, riots and even worse. But instead, people of all classes gathered peacefully in the big glass palace. And perhaps more importantly, the Royal Family could be observed studying the wonders in the industrial palace at the same time as other more common ticket holders. This undoubtedly added to its mystique. *The Times* would run numerous descriptions of how the Queen and the common man would pass each other in the Crystal Palace. The paper quoted a French observer who wrote that "certain it is that this festival would fall in solemnity and grandeur were it not presided over by the Queen." The opening ceremonies, to this observer, represented "the true pomps and ceremonies of ancient Royalty," and, he continued, "from the first hours of morning we have seen a whole people, from every quarter of this immense city, rush to the rendezvous given to it by its Queen and with

unanimous eagerness patiently await her on her passage simply for the delight, the joy, of presenting her its homage, of testifying its respect."[99] He compared it to the way Royalty was treated in France. The author of *The Lily and the Bee* makes a similar point. addressing the French audience:

> See, see, embodied to your sight!
> England's dear Epitome,
> And radiant Representative!
> All hearts in hers; and hers, in all:
> Britain, Britannia: Bright Victoria,
> all!-[100]

The Crystal Palace was filled with people who could observe the Queen on her visit. Even though the Exhibition was not free, one shilling days were introduced after three weeks, enabling poorer people to visit London and the Exhibition. Many took the opportunity, encouraged by their employers or by their parish priests.[101] The shilling visitors were generally more interested in the home productions rather than the foreign sections, and were especially eager to visit those departments that showed them their own individual trade.[102] It was particularly the shilling visitors' presence that made *The Times* leader writer reflect that the "ideas suggested by this marvelous exhibition are

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[99] Quoted in *The Times*, 12 May 1851.
[100] Samuel Warren, *The Lily and The Bee. An Apologue of the Crystal Palace of 1851* (London: William Blackwood and Sons, 1854 [1851]), 6.
[101] *The Times* noted June 13 that there were "nearly 800 agricultural labourers and country folk...headed by the clergymen of the parishes" visiting the Crystal Palace on June 12th.
[102] Ffrench, 261.

almost without end or limit."[103] It was also their presence that made the Exhibition successful and added to its mystique and importance, particularly its political importance. *The Times* stressed the importance of "the multitudes daily brought up from the provinces for one brief visit to the Exhibition," stating that their peaceful participation and their looking at the same objects as the more affluent members of the British nation meant that the British system was a success. There were no riots and there was little crime but the Crystal Palace was filled with an astonishment which had no class boundaries.

The peaceful gathering of peoples from all corners of the island was crucial to the success of the Exhibition. Politically, the year 1851 was not a promising candidate for introducing the age of equipoise. A religious issue, which may not have been very serious but which at the time created much stir and a public outcry, dominated the political picture early in the year. It was brought on by the Catholic Church's decision to restore a regular Roman Catholic hierarchy in England. Some felt that this was a starting point of a Catholic siege of Protestant England and wanted the papal interests curbed. An Ecclesiastical Titles Bill was introduced by Prime Minister Russell which helped to alienate some of the Whig ministry's supporters in Parliament, the Irish contingent and the Peelites. The Whig ministry missed the support of these two groups later when the Russell government fell on a motion seeking to make the condition of the franchise the same in the counties as in the boroughs. There was no one to replace the government and Russell had to be reinstated. But it was apparent that this was a very unstable

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[103] *Times*, 29 May 1851.

government.[104] However, that same year, on October 14, the day before the closing of the Crystal Palace, the historian T. B. Macaulay noted:

> I shall go to the final ceremony, and try to hear the Bishop of London's Thanksgiving, in which I shall very cordially join. This will be remembered as a singularly happy year of peace, plenty, good feeling, innocent pleasure, national glory of the best and purest sort.[105]

Contrary to what one might think, the Great Exhibition probably benefited from the turbulent political setting. Art and industry came to represent national unity and calmness that the political arena failed to provide. In a time of seeming political uncertainty, the Great Exhibition was evidence that England nevertheless had a stable foundation.

The Great Exhibition was a national celebration, and the willingness to regard it as such must be seen in context of continental revolutions, internal social problems and even the political instability created by the split of the Conservative party between free trading Peelites and protectionist Tories. The Great Exhibition where commodities were represented was the true embodiment of the nation. As such, there would be a similarity between the representation of goods in the Crystal Palace and within the Art-Manufacture movement. The "taste-question" had rendered things bearers of culture and so did the Great Exhibition. Its fame and popularity would bring more credence to the parallel than ever. But because the Great Exhibition served to highlight and celebrate the state of British production, it not only left little room for the criticism implicit in the

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[104] Asa Briggs, *1851*. London: The Historical Association, 1951; reprint, 1972.
[105] From *Life*, Quoted in Ffrench 274.

taste movement, but it was a setback for those who argued for the necessity and importance of theoretical and practical education.

The Great Exhibition left the Royal Commission with a surplus of over 180 thousand pounds which it pledged to further the goals of the Great Exhibition. Yet the Great Exhibition celebrated itself more as an end of history, than a formative beginning of anything. After the Exhibition, there would be warnings about national deficiencies in science and taste in the Jurors' reports and in some of the lectures, but the Exhibition did not further the cause of those who wanted more government-aided science or taste education.[106]

Nevertheless, in the aftermath of the Great Exhibition there was room for a more directed public presentation of culture, in which education would prevail over showcasing. The Great Exhibition proved to be a socially cohesive instrument. All segments of society peacefully gathered to study the products of industry. "The Exhibition will bring more people together from different parts of our own empire and more of different classes than ever met before," wrote one journal, and they "will all look with similar pleasure on common objects, and, by their common enjoyments, will be more closely amalgamated than hitherto."[107] It was therefore prominently in the area of establishing governmental institutions to further public spectacles and social cohesiveness that the efforts of the Royal Commission would prove easiest and it would

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[106] These calls for national action can be seen in *Lectures delivered before the Society of Arts on the Results of the Great Exhibition* published in two volumes.

[107] *The Economist*, May 17, 1851. Cited from Utz Haltern, *Die Londoner Weltausstellung von 1851* (Münster: Verlag Aschendorff, 1971), 227.

provide it with a niche from which to promote an educated public more conscious of what industrial Britain ought to mean.

In London, in May 1851, while working at the British library, Marx anxiously awaited Engels' arrival from Manchester so that they could visit the Great Exhibition together. Engels came on the 31st, and before he left two weeks later, the two social revolutionaries had taken in the sights of Hyde Park. Together, with the other visitors, the two would have seen "the modern Pantheon" in which, as would also be the case in Marx's *Capital*, machinery played the crucial role in forming the surroundings of the masses.

CHAPTER 3:

CREATING A DISCOURSE ON TASTE: THE DEPARTMENT OF SCIENCE AND ART.

The Great Exhibition, that marvelous wonder that appealed to so many, closed in October 1851. But during the exhibition many enterprising individuals and companies had jumped on the bandwagon by selling exhibition memorabilia[1] and the celebratory mood was not willingly abandoned. The international crisis in the East, that would shatter the hopes about international understanding through free trade, still seemed distant and high expectations could still be attached to international trade.[2] Some kept writing treatises on how beneficial the exhibition had been while others would try to keep its spirit alive by keeping the Crystal Palace standing in Hyde Park. The Palace would be moved but hope remained of maintaining its collections. Both the government and the Royal Commission of 1851 bought items from the Crystal Palace for future exhibitions and museums.

This chapter will discuss the Department of Science and Art as one such project to harness the spirit of the Great Exhibition for educational and socializing purposes. The Department of Science and Art, first set up in 1852 as the Department of Practical

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[1] A glance at the ads in London-based newspapers published during the period is a convincing evidence of the entrepreneurial spirit at work. Thomas Hardy writing on the Great Exhibition makes his character "an old man" reflect back on his exhibition experience remembers all the "exhibition" items that he could purchase. Hardy, "The Fiddler of the Reels," 179.

[2] See for instance Cole, "The International Results of the Exhibition of 1851." in *Lectures on the Result of the Great Exhibition of 1851* (Series 2, London: David Bogue, 1853), 417-452.

Art, and expanded to include science the next year, was a prime example of a project that would seek to continue the work of the Great Exhibition. To explore the theoretical underpinning and practical realizations of such projects, this chapter will focus on discussions of art and manufacture in the Department of Science and Art, the Museum of Ornamental Art, and on the theoretical ideas of those who influenced the direction that these institutions would take: Henry Cole, Richard Redgrave, Owen Jones and A.W.N. Pugin.

Historians writing on the Department of Science and Art have tended to be quite critical of its role in art education. The department was very small, did not command many resources, and attempted to teach design by making students learn how to copy geometrical figures leaving little to individual initiative, talent or creativity.[3] But the importance of the Department is not to be found in its accomplishments, but in the reasons for its creation and in what it attempted to do. In controlling the design of consumer items, the Department of Practical Art made an attempt to formulate the reality of the British population since the philosophy of the Department was deeply rooted in a conviction that the items produced on a massive scale in factories were crucial in forming the temperament, intellect and social behavior of those who would consume these articles. Thus, the question of design was, in the wider sense, a question of power. The department attempted, by encoding goods with the right messages, to control this stream of knowledge.

Furthermore, though indirectly, the Department presented a deep-seated understanding of the power of the industrial sector and the means of mass production. It

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[3] Quentin Bell, Stuart MacDonald, and partly also Frayling

had a rhetorical power to formulate the reality of thousands of people. The real power of machinery lay not only in its economic abilities but in its abilities to forge culture, either by improving it or by degrading it. In its interpretation of industrial society, the Department of Science and Art narrowed the "taste-question" definition of art but broadened the purpose of its project. As I will argue in this chapter, the Department of Science and Art attempted to control production by formulating an exact knowledge of design. The Department created a discourse on industrial production which changed "taste" into a measurable and controllable knowledge.

After the Great Exhibition, the Design Schools were reorganized. The Department of Practical Art was established to be responsible for the schools and also to train art teachers. Henry Cole, who had engaged himself strongly in the criticism of the running of the Schools of Design, and who had perhaps been instrumental in forming the damaging report of the 1849 Committee on the Schools, was offered the leadership of the Schools.[4] They were to become a separate Department under the Board of Trade, with a new leadership structure.

The Department of Practical Art had several aims when it was founded, of which perhaps the most important was to further the work of the Schools of Design. It also supported the provincial art schools, of which there were only 23 in 1852 but gradually growing to 120 by the time Cole retired in 1873, and maintained centrally set standards.[5]

To justify the creation of the Department, which had its critics, Cole attempted to make the schools as self-supporting as possible while at the same time increasing their

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[4] Monday 26 Jan, 1852, HCD.

[5] The Department helped guarantee the salary of a teacher, and providing books and material at half their cost. Thus both a lot of the cost and the full initiative would have to come from the localities themselves.

public utility. Part of the public engagement of the new Department could be found in its role of educating art teachers. A post of Teachers' Training Master was established to visit the National and Public Elementary Day Schools and instruct teachers in elementary drawing as well as to supervise instruction in the local schools. By 1854, it had been decided to require all apprentice or pupil-teachers to take one examination in drawing each year. The Inspector of the Council of Education visited schools annually and it was decided that drawing examinations should take place during these visits. The examinations were corrected by the Department and prizes were awarded.[6] A further and more lasting facet of the efforts to make the school a more public utility was the establishment of a museum of manufacture and an arts library in London. The Museum, which also had a loan collection, extended its usefulness to the provinces. To offset the criticism made against the Schools of Design, that design could only be learned in the workplace, technical classes were established. Yet the technical classes which were reported on at length in the first report were not successful, for students, equipment and space were all wanting. Though the Department of Practical Art was reorganized to include science only a year after it had been established, Cole continued, until he retired, to be responsible for art in the new Department of Science and Art and the directions that he and Richard Redgrave initially established would remain in place. The methods for teaching art would be adjusted slightly, but even after Redgrave retired in 1876, his system remained for some years.

Cole's assuming leadership over the Design Schools was a clear indication that the taste movement would realize its aims. Taste, which had been formulated as a moral

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[6] Stuart Macdonald, 161-62.

problem, now had the apparatus, mechanism, and administration capable of carrying out the required measurements. The Department of Practical Art changed some of the premises of the taste question by defining the relationship between taste and products as a merger, rather than art merely smoothing over the effects of industrialization. This change was defined not as a matter of art proper, or imitative art as it was often called, but as a matter of principles or laws.

Though small in scale and resources, the Department of Practical Art signaled a new approach in attempting to deal with mass society. The initiatives to forge social cohesion by using art and manufacture had hitherto been largely private. Now the government put its stamp of approval on Cole's attempts to educate and, more importantly, create a population which shared the same standards. Not surprisingly, therefore, the lessons of the Great Exhibition would be one of the determining factors in shaping the Department of Practical Art.

The Schools of Design had turned out to be something of a nightmare for government, not because they had meddled in art but because they had meddled in industry. The Schools of Design did not seem to produce results quickly enough to justify public expenditure. Some of those who testified before the 1849 Select Committee stated that education in the Schools of Design did not qualify students for designing for the mass market.[7] Cole himself argued before the Committee that the Schools had not produced one good designer.[8] Most of these deep-rooted problems

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[7] Select Committee on the School of Design, 1849. Evidence by Robert Kerr of Paisley (Q & A 2164-66) and Mr. Wakefield of Glascow (Q & A 1061-64).

[8] Select Committee on the School of Design, 1849, Q&A, 1993.

were centered around the question of leadership. Therefore, it is not surprising that the political leadership envisioned a new administrative system for the schools.

The Great Exhibition was viewed as a testament to British greatness but it did not directly advance arguments that manufactures and taste must be improved. Nevertheless, the Crystal Palace exhibition had proven that consumer items were potential bearers of ideas; so many had attached so much meaning to the event. However, given the conglomerate of opinion -- religious, social, political, imperialistic and personal -- it would be necessary to define this meaning more clearly, especially for those who hoped to build on its success. The critics of British taste had in its aftermath pointed out that as far as general design was concerned, Britain still lagged behind the continent.[9] But their opinion was not as prominent as the celebratory one. The social implications of the Great Exhibition were more widely agreed upon. All of Britain had been brought together in a peaceful gathering by the products of industry. It is therefore not surprising that the attempts to harness its success and preserve the moment of celebration and nationhood would centre around exhibitions of industry.

A permanent Royal Commission was created to decide how to use the surplus to further the ideas of the exhibition. Five thousand pounds were allotted by the government to buy items from the Exhibition that would promote public taste. This indicated an attempt to officially define the role of the Great Exhibition. The Royal Commissioners also bought items from the exhibition for the purpose of furthering science and ingenuity. The Department of Practical Art was another such project to

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[9] Richard Redgrave, *Report on Design: Prepared as A Supplement to the Report of the Jury of Class XXX. of the Exhibition of 1851, at the Desire of her Majesty's Commissioners* (London: William Clowes and Sons, 1852).

harness the cooperative spirit of the Great Exhibition. It was a long-term project to use manufactured items to create a feeling of unity and belonging. As already established by the taste question, taste had moral and social implications as well as economic ones.

One of the most striking features of the Great Exhibition had been that all involved showed by their conduct correct social judgment in spite of all the predictions about social unrest. The Department of Practical Art was to "lay the foundation of correct judgment, both in the consumer and producer of manufactures."[10] Through the production of tasteful items by factories which had learned about taste, the public could peruse consumer items that would further social cohesion in their own neighbourhoods. In this sense, by dispersing tasteful items all over Britain, the machines of mass manufacture would take over the role of the dismantled Crystal Palace.

The years before the Great Exhibition had been spent searching for an appropriate way to adequately answer the concerns raised by the "taste committee" of 1835/36. In the many different approaches tried there seemed to have been little consensus about how to ensure better industrial products. The public debate that surrounded the Schools of Designs similarly indicated that this was no easy task. The "taste question" deemed manufacture an important tool for distributing higher aesthetic standards among a larger part of the population. Thus, for some of those concerned about British education, manufacture was a vehicle for ensuring better social behavior. Industry and machines were rendered a moral tool, rather than a cause of the distress. This trend would continue after the Great Exhibition, but taste would be differently defined by the Department of Science and Art. One of the results of the Great

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[10] *First Report of Department of Practical Art*, 2. P.P. (1852-53). LIV, p. 2.

Exhibition was to help overcome some but not all of the problems that surrounded the attempt to teach design by giving the leadership of the schools to Henry Cole, who had a quite clear ideological purpose in mind and the energy and will to carry out his ideas in practice. Cole had made it part of his aim to criticize the art schools,[11] but being one of the initiators of an international exhibition and by channeling much effort into ensuring its success, he seemed to have earned his right to try to make the struggling design schools work. And as with most things that Cole did, he succeeded by putting in place a system that, although not lacking in controversy, was consistent and fertile.

The taste question sought to improve the quality of industrial work and, after 1850, had a prominent tendency to standardize aesthetic judgment. Henry Cole several times lashed out against the aphorism "to every man one's taste." To him there were clear rules to follow that could be learned by everybody. Thus, the institutions he headed, the Department of Practical Art and the Museum of Ornamental Art, sought primarily not to teach techniques, or even in the end design, but to teach guidelines for what people should purchase. When he took over, Cole officially proclaimed that principles of design existed, and consistent with his earlier work for art-manufacture, he declared that anyone could learn what these principles were, and after some training reproduce them. He announced at the opening of the Elementary Drawing School at Westminster, the first new school to be opened under his direction, that the now-defunct Schools of Design had not admitted that principles of design existed. "Manufacturers were therefore slow to recognize them, and were not prepared to value any result of the schools." The public was "allowed to remain uneducated in art and uninformed of the

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[11] Bell, *The Schools of Design.*

existence of principles of art which might assist in judging such correctly."[12] These principles favoured order, geometry and certain elements of functionality, and in the eyes of those in control of practical art teaching during this period, this approach would provide the right answers to the taste question. Their view that nature could be reduced to geometrical principles and reproduced as ornament was theoretically easily adapted to the industrial process. Espousing such a clear definition of what was involved in design eliminated many of the problems faced by the Design Schools. Taste had a clear, science-like structure.[13] Thus, after the Great Exhibition the relationship between taste, art, and industry became somewhat differently nuanced. The principles of design allowed for clarity and intensity, but also shifted the focus from art being a guiding and softening force on the effects of industry to art becoming an easily analytical discipline whose virtues could be transferred to industry. Therefore, there were considerable changes in approach and intent. And with clearer purpose and increased public involvement, the new Department of Practical Art set up to administer the Design Schools forged a clear intention to merge the values of industry and art, rather than merely softening industry's effects by mediation with arts.

The principles of design were based on the writing of design theorists who proliferated in the 1840s and 50s and gave design a slightly different meaning, although the primary idea that art could have desirable social effects remained central. Henry Cole's utilitarian conviction, that taste was objective and would be universally shared

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[12] Henry Cole, "Elementary Instruction. Addresses at the Opening of an Elementary Drawing School at Westminster." *First Report of Department of Practical Art*, Appendix II, 55.

[13] As we will see Redgrave's 23 points of art education is the primary means the Department proposed to educate both designers and the public about correct principles. Redgrave also used the term "science" to refer to his system of art teaching. Redgrave, *On the Necessity of Principles in Teaching Design*, 24.

given the proper exposure, shaped the Department's curriculum. Cole himself had, in his drawing handbooks for children and workers, emphasized the importance of starting with simple copying as a means of learning about harmonies in nature. Cole also believed firmly that once you knew how to observe, your ability to reproduce was only a matter of time and not of talent. Cole's own publication, The *Journal of Design*, published between 1849 and 1852, was full of samples and descriptions of why certain designs were more tasteful than others and once one recognized the characteristics of taste, one could reproduce it. The first issue of the journal in March 1849 explained how the journal aimed "to improve design, through holding up good examples."[14] Some of the examples came in the form of attached samples of calico and other cloth. Having a standard, a method and a goal seems to have agreed very much with Cole's personality as well as making his government department viable in the eyes of the public by providing measurable objectives. While Henry Cole's own ideas of efficiency and the importance of proper methods would certainly make the art schools different from the Schools of Design, the more aesthetic premises for art teaching were probably derived from the design theorists of the time. A.W.N. Pugin and Owen Jones, the main design theorists to influence the Department of Science and Art, both had very clear notions of what was acceptable design and what was flawed design. The theoretical viewpoints of both men were both indirect commentaries on and representations of, industrial Britain.

To historians today, Pugin was a leading figure and even an initiator of the Gothic Revival -- a term later coined to describe a period in 19th century British design when the decorative aspects of Medieval structures were widely imitated. This trend had

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[14] *Journal of Design*, 1.1 (March 1849): 4.

been apparent since the 18th century, and Pugin's contribution was to become the movement's central figure, providing its philosophy.[15] Pugin as a theorist was, of course, not uncontroversial. His conversion to Catholicism opened up charges of "Popery," that prevalent British prejudice which considered the Pope as perpetually aiming to interfere in both church and state generally. A review in *The Quarterly* of Pugin's work *The True Principles of Pointed or Catholic Architecture* (1841), pointed out that one had to be very careful to weed out all Popery in Pugin's work, although his principles were sound and just.[16] But for the topic under discussion, Pugin's influence can hardly be overestimated. The ideas put forward in *Contrasts* (1836), *The True Principles* (1841), and *Apology* (1843), can be found echoed in the writings of the Department, in the justification for the South Kensington Museum, and in both Redgrave's and Cole's addresses and publications.

In his early writings, notably *Contrasts*, Pugin pondered the loss of taste in the present day, at first blaming this decay on Protestant destruction and an absence of Catholic feeling among those teaching art.[17] But Pugin turned from being accusatory to attempting to restore taste through discerning what the important elements of the gothic were. In his first important theoretical work, *The True Principles of Pointed or Catholic Architecture* (1841), Pugin claimed to have discovered the reasons why Gothic art is the most true and beautiful. Design had two important rules, he stated:

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[15] Kenneth Clark, *The Gothic Revival* (London: Constable, 1950), 164-203.
[16] Michael Trappes-Lomax, *Pugin: A Mediæval Victorian* (London: Sheed & Ward, 1932), 164-65.
[17] His first publication after he converted to Catholicism was entitled *Contrasts: Or, a Parallel between the Noble Edifices of the Fourteenth and Fifteenth Centuries and Corresponding Buildings of the Present Day; Shewing the Present Decay of Taste* (1836). I am using the 1969 Humanities Press reprint of the second edition published with a new preface in 1841.

> 1st, that there should be no features about a building which are not necessary for convenience, construction, or propriety. 2nd, that all ornament should consist of enrichment of the essential construction of the building.[18]

Pugin's principles could easily be applied to general design as well, as his own discussions of the horrors of contemporary design in wall paper, upholstery and curtains demonstrated. "Nothing can be more ridiculous" wrote Pugin "than apparently *reversed groining* to walk upon, or highly relieved foliage and perforated tracery for the decoration of a floor"[19] When Pugin argued that "The external and internal appearance of an edifice should be illustrative of, and in accordance with, the purpose for which it is destined,"[20] he defined what would later become the creed for the Department of Science and Art. Design had to be functional and part of the essence of the thing designed. The beautifying part should be intrinsic to the thing and not added to conceal its utility. These ideas helped create a workable and concrete theory on which to base the highly authoritative and structured Department. They appeared in Cole's *Journal of Design*, where it was stated that "*ornament is not, neither can it be, in its right office, principal*; but that being the decoration of an object it must necessarily be secondary to the thing decorated."[21]

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[18] A. Welby Pugin, *The True Principles of Pointed or Christian Architecture: Set Forth in Two Lectures Delivered at St. Marie's, Oscott* (London: John Weal, 1841), 1.
[19] *True Principles*, 26.
[20] Ibid., 35-36.
[21] *Journal of Design*, 1.2 (April 1849): 56.

In Dickens' *Hard Times*, a government officer, -- perhaps modeled directly on Henry Cole -- "a professed pugilist always in training and always with a system to force down the general throat" scolds a school girl for wanting flowers on her carpet.[22]

> Your are not to have, in any object of use or ornament what would be a contradiction in fact. You don't walk upon flowers in fact; you cannot be allowed to walk upon flowers in carpets. You don't find foreign birds and butterflies upon your crockery. You never meet with quadrupeds going up or down walls; you must not have quadrupeds represented upon walls. You must use,' said the gentleman, ' for all these purposes, combinations and modification (in primary colours) of mathematical figures which are susceptible of proof and demonstration. This is the new discovery. This is fact. This is taste.[23]

Although this is somewhat exaggerated for satirical purposes, both Pugin and the Department would argue that correct taste meant, among other things, that one does not have flowers or reliefs on carpets.

Owen Jones, who shared with Cole and Pugin the duties of selecting items for the Museum of Ornamental Art, was the other major influence on the theoretical foundation of the Department of Science and Art. Jones had been responsible for the internal decorations of the Crystal Palace where he had hung coloured banners from the roof, a design that had been thought of as highly successful.

From Henry Cole's diaries, it seems that when he was offered the position of head of the Department of Practical Art, he wanted to have Owen Jones on his staff or at

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[22] This identification was done by K.J. Fielding, "Charles Dickens and the Department of Practical Art" *Modern Language Review* 48 (1958): 270-77.

[23] Charles Dickens, *Hard Times* (New York: Holt, Rinehart and Winston, Inc., 1958), 6-7.

least to cooperate with him. [24] Jones would, however, work for the new Crystal Palace company at Sydenham where the building was eventually moved.[25] And it was while working there that he wrote his most famous work, *Grammar of Ornament*. Jones' ideas were in one sense of wider scope than Pugin's. Jones' theories had an anthropological and a historical dimension. He found design to be an important signifier for cultural development. The *Grammar of Ornament* is a selection of twenty various styles of Ornament starting with savage tribes, proceeding through the ancient cultures and ending with Medieval, Renaissance, Elizabethan, and Italian ornament. The book is still being reprinted because of the extensive collection of ornaments illustrated in colour which makes up the main bulk of the work. The organization of the book follows to a large extent the organization of the Fine Art exhibition at the Crystal Palace in Sydenham.[26] The last chapter, 'Leaves and Flowers of Nature,' is an attempt to show that contemporary progress of Ornamental Art "may best be secured by engrafting on the experience of the past the knowledge we may obtain by a return to Nature for fresh inspiration."[27] Thirty-seven "General Principles in the arrangement of form and colour," or "propositions," open the work. Some of them are consistent with Pugin's rules that

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[24] The entry for 26 Jan 1852 discusses the establishment of the new department and then a possible visit by Cole to Bradford. It reads: "Saw Mr Labouchere by appt at Bd of Tr: The Ch: of Ex: & he had agreed to enlarge the Sch: of D & change its name:... Was an experiment.... Cd I undertake Inspection of Country Schools? Said he wd make out the Minute. I asked him if I might go to Bradford. Rather surprised at proposal to have Owen. Wd consider." Manufacturers in Bradford were planning to set up a drawing school. Cole and Owen went to Bradford on January 30. HCD.

[25] According to a guidebook on the Crystal Palace, Owen and another of Cole's close friends and supporters, Digby Wyatt, had been commissioned to travel around Europe to collects items for the fine art collection planned at the Crystal Palace. *The Crystal Palace and Park in 1853. What has been done, what will be done. Addressed to Intending Exhibitors* (London: William S. Orr and Co., 1852).

[26] *The Crystal Palace Sydenham; Its History, Dimensions, Contents, and General Arrangements* London: W.J. Adams, [1854].

[27] Owen Jones, *Grammar of Ornament* (New York: Portland House, 1986 [1856]), 2.

while construction should be decorated, decorations should never be purposely constructed.[28]

The word "grammar" in its title is significant. Jones saw design as a language rather than a truth but the implication was still that as truths could be discovered, so could language be learned by everyone. Language is also a tool to interpret the world and it contains structures which communicate the knowledge. The grammar of design was contained in the laws of harmony. Languages themselves might be very different but they would all contain structures of order. Consequently, there is no a significant difference between the principles of design and language of design. Richard Redgrave, responsible for art education at the Department of Practical Art, used both phrases in his writings about design. A similar emphasis on structures is evident in Cole's early books on drawing. The first stages of learning how to draw were observation and the stylistic reconstruction of this experience. Once the basic skills were learned, drawing itself would come naturally. Drawing was compared to writing. Once one knew the alphabet, one could easily form the words. "All can be taught to write," wrote Richard Redgrave, "that is, that the eye can be taught correctly to perceive, and the hand be made obedient to describe, certain forms. And *drawing* is but the extension of this correct perception and hand-power to other and more complicated forms and relations."[29] Thus, design was an analytical discipline.

Redgrave, a painter and a member of the Royal Academy who had taught in the Design Schools and was a close friend of Cole, authored many of the Department's

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[28] Proposition 6.

[29] Richard Redgrave, "Address of Art Superintendent," *First Report of Department of Practical Art* App II, 61

statements about design and design education. Until he retired in 1875, he was responsible for Art Teaching and was one of the examiners of the department. Redgrave followed Pugin and Owen in most of the opinions he expressed about design. He believed that ornament had to be functional and that there were principles of beauty.[30] But Redgrave, to a larger extent than the two other theorists, formulated ideas about why designing for mass production would necessarily be different from art proper. Redgrave did not publish a book on design but his opinions can be found in the many lectures or other addresses in his name written while he was working with the Department of Science and Art.[31] Redgrave, unlike his Department of Practical Art colleague Gottfried Semper, did not emphasize the need to understand materials and did not see the need for Semper's technical classes, but he did demonstrate an awareness of how the means of production, machines in particularly, constituted design as a discipline which was unlike traditional handicraft and unlike art proper. When using new means of production, true art or imitative art as he calls it, will be lost once the attempt is made to copy it on surfaces of cloth or other items.[32] On the other hand, imitation, or the copying of thousands of the same item, was in Redgrave's mind not what an artist should be doing but rather what a designer would hope to achieve. "This state of modern manufacture," wrote Redgrave, "whereby ornament is multiplied without limit from a given model, by the machine or the mold, ought at least to awaken in the manufacturer a sense of the

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[30] The "Address of Art Superintendent" in the First Report of The Department of Practical Art is a good source of the Department's and Redgrave's proximity to Pugin. Jones' *Grammar* was published later, but Jones had expressed his opinions in Society of Arts publications and they were aquatinted through the Society.

[31] After his death, however, his son published *Manual of Design*, a compilation of all his addresses and writings. Richard Redgrave, *Manual of Design: Compiled from the Writings and Addresses of Richard Redgrave, R.A*, ed. Gilbert R. Redgrave (London: Chapman and Hall, 1876).

[32] Richard Redgrave, *On the Necessity of Principles in Teaching Design*, 21.

importance of the first design."[33] Modern design has a property different from its predecessors and it is this propensity for repetition that makes the Department necessary.

> As the machinery by which the art is reproduced act by a constant repetition, a geometrical distribution of forms is more or less a necessity which cannot be overcome. As the tints must be laid on separately and successively, and cannot be softened or blended, the simplest combination of tints and colours must be sought for rather than the more intricate; a circumstance also called for by the market offered for such goods.[34]

Redgrave added that one would not attempt to reproduce a painting by Turner as a wall hanging since wall hangings would be made to fit to the wall while a Turner painting would require being "enclosed, isolated, and surrounded, if with a surface decorated at all, with one which is quiet, unobtrusive, and given repose to rest the eye...."[35]

The principles of design, as understood and adopted by Redgrave, adjust the item to be produced to the production process while at the same time ensuring that the produced items were properly suited for their intended function. Though the modern situation required different considerations, such principles had always been at work. The present, however, had strayed from these principles, which account for the lack of taste in products:

> An examination of the examples of old times in our Museum, and the prints and drawings in our library, will show, that in the best periods of the art of all styles and in all nations these principles have been the rule, and a departure from them the exception - the bizarre

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[33] Redgrave, *Manual*, 62.
[34] Redgrave, *On the Necessity of Principles*, 22
[35] Ibid., 23-24.

> productions of a passing fashion, as ephemeral as the whim that produced them - and the like fate will be the case with the lawless designs of our day when knowledge and scientific principles shall spread and be better understood.[36]

Design, as interpreted by the Department, was therefore a science and a branch of knowledge. However, morality was still at the base of the question of principles. And the arguments raised by the 1835/36 Select Committee, that the environment effects behavior and that appreciation of harmony in nature was socially desirable, were still prevalent among those who supported these efforts. Cole, in one handwritten memo from 1853, probably notes for a speech he was going to deliver, speculated that the difference between "our" home and those of people in lower circumstances is related to the surroundings.[37]

> The eyes & ears of our friend in Jennings' buildings have no better tastes than his nose & mouth have. He is not sensible of symmetry in form and harmony of colour and his hearing is deaf to Handel... If we each of us compare our own tastes with his, we do not hesitate to pronounce that he has no good ones - but gross and untrained tastes. And we cannot but admit that they have scarcely advanced beyond those of the savage.... [38]

Establishing drawing schools and teaching about taste generally would refine the dweller in Jennings' buildings. Art could play a prominent social role and it could be

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[36] Ibid., 24

[37] The *Presscuttings* in the National Arts Library Archives contains a clipping for the *West London Guardian* from May 2nd, 1853 which probably refers to this speech on behalf of the Kensington Parochial Institute. (Spine Marked November 1852- October 1853)

[38] Henry Cole, *On Public Taste In Kensington*. Handwritten MS dated 5 April 1853. V&A-NAL. Henry Cole Collection Miscellaneous XI.

distributed by the manufacturing industry. Those beliefs remained at the core of the reasons given for providing art teaching. Both the means and the products of industry were capable of playing a part in educating people about correct choices and correct behavior. But design and its principles were different from art as a civilizing force. One of the effects of design principles was to be found in the way design was taught at the Department. It made it equally easy to define incorrect principles of design. In other words, it made disciplining much easier. Control was the central element of the new Department of Practical Art.

While the Great Exhibition had celebrated ingenuity with discrimination in selection,[39] the Department of Practical Art and the Museum of Ornamental Art sought to control and direct. In the many statements that Cole wrote for the Department of Practical Art, he made it clear that the department was linked to formulating and projecting taste primarily to a larger group. Its primary object was "laying the foundation for correct judgment, both in the consumer and the producer of manufactures."[40] The emphasis was clearer than that of the Schools of Design which aimed at educating designers. Now, the existence of clear and undeniable forms and ideas that could practically be achieved was strongly emphasized. The Department attempted to structure the experience of those exposed to its activities so that their personal, moral, and aesthetic judgments would correspond with the goals set by the Department.

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[39] The dominant means were space allotment. The local committees had to decide what would be sent to the Crystal Palace.

[40] First Report of Department of Practical Art, 2

The art schools became increasingly more theoretical in nature. The technical classes put in place to please those who argued that design could not be taught as a theoretical discipline were shelved after a few years. The technical aspects of design were not important to Cole. His goal was always ideological and propagandistic. And the Department's philosophy of design deemed ideas superior to the material forces of technology. The Department had a larger educational purpose which would become more evident as it became responsible for other areas of public education such as educating teachers in drawing. The main goals were to create the standards and maintain them in manufacture by distributing the appropriate casts and models, instructing teachers. and enlightening the public through exhibitions and museums. Cole wanted to make the general public understand taste and having to give up the technical classes was probably not too great a loss for him. In fact, the way the Art Schools were run, they hardly taught any design at all; most of those who would study at the department never got beyond drawing from flat or round models.

The primary reason why art teaching at the Department was reduced to mere copying from models can be found in the course outline used by the Department. Redgrave, superintendent of art, devised a step by step program by which the student would learn to become a designer.[41] The structure of the art curriculum reflected Redgrave's opinion that ornamental ware should look to what was general in nature, symmetry and balance, rather than art which sought to imitate nature. Ornamental art was therefore to be a structuralized and idealized representation. Learning to draw geometrical figures from flat and round models was therefore essential. The National

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[41] Redgrave, *Report on Design.*

Course for instruction in teaching put emphasis on geometrical forms and the property of space. The course was divided into twenty-three stages and the students were supposed to exhibit work on the different stages to show the progress. The first twenty one stages were strictly imitative and sought to teach the students skill -- not to use creativity. Only for the two last stages were students free to present their own creations rather than merely imitations of other works and only a small minority of the students reached that stage.[42] The system was set in place for all schools and survived both Cole's and Redgrave's tenure. The National Competitions were another important facet of the system. The students' works were exhibited and prizes were awarded to those judged to be of most merit. These exhibitions and prizes were reported on in the press and the winners of a medal gained a maintenance allowance or free-studentship. In 1863, National Scholarships were introduced. Probably as a result of this system, the students at the art-schools would spend considerable time working to obtain medals.[43] Redgrave and three other members of the Royal Academy judged these works every year. They all seemed to share Redgrave's ideas that ornamental art was separate from art proper, and were all quite content to award prizes to those who were the best imitators.

The models that the students copied for their work were distributed centrally at half price to the local schools and the system, therefore enforcing one standard or the one idea of taste that Cole wanted to foster. The rigid central control of the art schools was furthermore strengthened by the payment on results scheme which was already partially

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[42] The list of stages published in the First Report of the Department of Practical Art. On the progress of the art students see Stuart MacDonald, chapter 9.

[43] MacDonald (194-5) provide examples of students who would use several year on a single drawing to prepare for the national competition.

introduced in the 1850s and fully after 1863. This scheme had its origins in the difficulty of justifying public expenditure without being able to point to concrete results. The Committee of Council on Education resolution which introduced the scheme revealed some of the intention behind payment on result. Payment would only be provided to those who deserved and needed it.[44] In the first few years, Cole wanted to make the schools self-supporting, ensuring that part of the salary of the Art master came from fees, and part was based on how many certificates his students obtained. Payment by results ensured standards and rigidity in the art-schools.[45] It had become easier to ensure national standards.

The art-teaching of the department was consistent with its theoretical underpinnings: the belief that products were constructed by ideas rather than by materials and that if made by ideas they could be guided by ideas. The Department of Science and Art and both Pugin and Owen believed that ideas were superior to the machines and would be able to control the products of the machine.

One of Pugin's biographers, Michael Trappes-Lomax, explained how as a young man, Augustus Welby Northmore Pugin, future architect and design theoretician, spent some time in Salisbury, became infatuated with the cathedral there, and developed a love of Gothic art. And even if this was not a contemporary version of Pugin's story, the intimate link between divine religious inspiration and design theory, so apparent in Pugin's discovery of the true principles of design and architecture, suggests to us a need

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[44] Confer Science and Art Minute 441 cited in MacDonald, 212.

[45] The Scheme was introduced in elementary schools by Granville as Lord President of the Committee of Council on Education and Robert Lowe the Vice-President. Payment on result is discussed in more detail in A.S. Levine, *The Politics of Taste: The Science and Art Department of Great Britain, 1852-1873* (Ph.D. University of Wisconsin, 1972), 161-213 and Stuart MacDonald 207-225.

to structure the theories of art and design in this ritualized form. It can be no coincidence that Henry Cole claimed that it was a visit to Westminster Cathedral that opened his eyes to the ideas of art- manufacture. In the end, both these figures so central to the formation of art studies and the South Kensington complex claimed divine inspiration for their ideas, or at the least structured the narrative of their own discovery within this ritual setting. In this manner, even the strongly structuralized concept of design so apparent in the Department of Science and Art which virtually eliminated human creativity, could claim divine inspiration. The Department of Science and Art, in attempting to structure modern society to fit a formula that could be widely applied by using modern means, worked within an old and accepted mode of legitimizing its project. That this coating facilitated the acceptance of the norms and ideas is made clearer when the reception of the art program is compared with the reception of the science program. Science, for all its claims to increase economic prosperity of the nation, could not as readily be presented to the public at large precisely because it was difficult to formalize its educational projects within a religious frame. In fact, the opposite was the case, as science was too readily connected with materialism.[46]

Like Cole, Pugin also emphasized the role of the medieval church as once having been the true bearer of culture and ideas of taste. In the past, the church had educated the people about the values of art. Pugin believed that the gothic churches were erected by faith and thereby encompassed the true principles of Christianity. This made these

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[46] Lyon Playfair received a warning from Lt. Grey, secretary to Prince Albert, stating that it was important not to alarm the religious world by education schemes which may shipwreck his [Albert's] plans. Printed in Thomas Wemyss Reid,. *Memoirs and Correspondence of Lyon Playfair*. Reprint by Jeminaville, Scotland: P.M. Pollak, 1976 [1899]), 137-38.

architectural structures perfect communicators of faith and truth.[47] Things or buildings were bearers of thought.

Pugin likened the church to the mechanics' institutes of his day. But where the mechanics' institutes were poisoning the minds of the operatives with radical doctrines, the medieval church was "*the great and never failing school.*"[48] The church not only showed evidence of artistic work where mind and art were in harmony, but through its architecture taught the public about harmony and truth. It is this perceived perfect harmony that, in the mechanistic age, the Department of Science and Art sought to recreate through the employment of mechanical industry.

The narrative frameworks of both Pugin and Cole presented the principles of design as truth revealed to them in a church setting. They felt this 'truth' could be broken down into an analytical system of principles of design. Thus, one can perhaps go further and draw the conclusion that spirit, truth, and beauty follow simple laws -- so simple and clear that they can be mechanically reproduced with modern machinery. Putting aside the implications for the spirit of this kind of analysis and concentrating wholly on its implication for the mechanistic, we see that the mechanistic is not at all antithetical to the spiritual. On the contrary, it is implied that they can work together in perfect unison. The spirit can, through design, be merged into everyday products and be widely distributed. Art and the mechanistic are fully compatible and both meet in the design of everyday products. Within this framework therefore, industrial machines played an important role as modern conveyers of truth and were not cast in alienating

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[47] Pugin, *Contrasts*, Chapter 1.
[48] *True Principles* 27

and dehumanizing terms. A strong belief that design was true and right permeated the thinking of Cole and Pugin and gave credence to the Department's attempt to structure surroundings with the help of industrial machinery. The "great school of mankind" for modern times was not to be the church but the factory.

Owen Jones, the other major inspiration for the theoretical writings on design, had a secular framework for his theory. Rather than constructing design in a religious framework, he used history. *The Grammar of Ornament* is a discussion of the facets of design in major civilizations over time. Yet taste is, as *The Grammar of Ornament* suggests, timeless. Primitive nations as much as civilized ones were capable of possessing taste. Unlike science or technical skill, taste, according to Jones, was therefore not a direct product of historical development. In fact, the more primitive the people the more easy it is to see "the evidence of mind."[49] In a discussion of ornament of "savage tribes" -- tribes in New Guinea and Friendly Islands group, and natives in New Zealand -- Jones stated that, in contrast to modern ornament, their ornament was always true to purpose, a quality that we know was essential to these theoreticians. He was particularly pleased with Arabic and Indian ornament which exhibited all the principles of unity and truth lacking in modern European ornament.[50] Redgrave, in *On the Necessity of Principles in Teaching Design* (1853), provided an Aristotelian-like explanation of why taste did not signify development. Redgrave wrote that when one looks at a field of flowers and does not take into account the shadows and depth, one sees an arrangement of colour. And this arrangement of colour is more real and true than

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[49] Owen Jones, *Grammar of Ornament*, 14.
[50] Ibid., 78

are the individual and accidental variations of the different flowers. The general is more real than the specific:

> All who have attentively examined Nature for themselves, out of doors, in a sunny daylight, when the true beauty of flowers is most fully displayed, will be sensible that the general impression they make on the eye, apart from their close examination, is that of simple masses of form and colour, with little perceptible light and shadow.... This explains the reason why a child, a peasant, or any uncultivated person, draws a flower geometrically rather than perceptively, in its true rather than its accidental form.[51]

Although history is Jones' context, he saw design as a primary aspect of mankind. However, at the same time, Jones made clear that the capability of greatness had to be genuinely part of the make-up of the civilization. The soul of the nation, so to speak, had to sustain the ornament. Merely to copy another culture's ornament was an indication of a culture in decline. Ornament, therefore, was an expression of the health of a nation. In Jones' opinion, as civilizations decayed there was a corresponding decay in ornament and taste. A new culture which borrowed design patterns and style from a decaying neighbour might, if it could not bring a creative approach to the material, just continue its decaying tendencies as was the case with Assyrian ornament, according to Jones. The ability to design correctly is therefore, an indicator of the greatness of a civilization.

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[51] Richard Redgrave, *On the Necessity of Principles*, 27-28.

As Jones' last chapter makes clear, he believed that with a solid knowledge of the essentials, modern ornament could proceed in the right direction. It was not essentially the means to mass produce that accounted for the lack of taste in modern times. The power to change taste resided in the mind, not in the means. He shared with Cole and Pugin the conviction that learning what is right and correct would enable designers to create right and correct products. His last proposition read "No improvement can take place in the Art of the present generation until all classes, Artists, Manufactures, and the Public, are better educated in Art, and the existence of general principles is more fully recognized."[52]

The Department of Science and Art worked precisely to make these principles more fully recognized by imposing a very structured curriculum and through public presentations of student work and museum items. They wanted to provide the public with a common language with which to represent and to understand their surroundings. Jones' definition of correct ornamental style was the dominant tenet of the Department's teaching. Design should predominantly be flat and geometrical.[53] The emphasis that the Department put on copying owed much to the idea that an exercise in hand-eye coordination was the best way to learn how to reproduce the language of ornament.

In *Grammar*, Jones made production for general consumption and use an indicator of the health of the nation. At the time, history proper was constructed largely as being driven by individuals, war or political ideas; the surroundings of common

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[52] Jones, 8.

[53] Jones, *Grammar* Propositions, 8 and 13 and in "Observations" in *Catalogue of Museum of Manufactures* published as Appendix V to First Report of Department Practical Art. Owen writes quite critically about too "highly wrought imitation of natural flowers, with their light and shade, struggling to stand out from the surface on which they are worked" (p. 231)

people were of little importance. In Jones' history, however, the ornament and design of common items were the important indicators of the state of the nation. His history was therefore, though he did not use the word, a construction of culture. And construction of culture was, both rhetorically and practically, the project of the Department of Science and Art. The rhetorical construction in the published statements by Pugin, Jones and Redgrave was concomitant to the practical construction of the cultural surroundings of a larger mass of people. Moreover, emphasis on principles extended the role of both art and manufacture. Art was fully capable of touching everybody. Its message was not mysterious but easily accessible and easily distributable. Art was not defined as antithesis to science or to the mechanical, but rather as incorporating the same basic features of order and harmony. In focusing on principles of design, the department attempted to create a new form of culture with a base forged in a commonality between art and industry.

Practically, the Department's goal was to expose the public to the right taste. Cole explicitly stated that it was more important to educate the public than the artisans about good taste,[54] and the efforts of the Department for the twenty years are probably best understood in that context. Redgrave concurred:

> The great effort is now made toward a wide-spread development of art education in Great Britain -and this not alone for the upper and middle classes, but for all, even the poorest, must tell upon the rising generation. Once properly instructed, there is very little doubt that the plain good sense, the energy of will, and the dislike of mere display of our countrymen will result in works of much higher excellence in decorative art than has yet been attained in

[54] Cole, "Elementary Instruction," App II to *First Report of Department Practical Art.*

> this country. The artisan will thus be empowered to add to his admitted manual dexterity and thorough workmanship, the knowledge and taste that will enable him to join beauty to excellence, and to carry out the labours which the advanced taste of the general public will demand at his hands.[55]

Many communities established drawing schools. By the time Cole retired, there were around twenty Drawing Schools in Britain and Ireland. And though the numbers were not substantial, those who attended the drawing schools were exposed to a rigid system for achieving taste and to national standards of what were acceptable renditions.[56] The annual exhibitions of students' work likely advanced these ideals to larger elements of the population. The examinations of teachers in public school may have been an even more significant contribution towards ensuring national standards of taste. George Wallis, a temporary Special Superintendent of the Exhibition of Works of Art-Manufacture, wrote in the Introduction to the Catalogue for this exhibition of 1858 that by the time the Department of Practical Art was established "it had become clear that the healthful supply of decorative manufactures of good taste must rest wholly upon the public appreciation and demand for them."[57] As proof that the indirect strategy of "bringing Art instruction to bear upon national industry, and especially in seeking to maintain an Ornamental bias in the course of studies" had worked, Wallis used the example of the lace trade of Nottingham. "Manufacturers who have not actually employed students of the School as designers acknowledge that the character of the

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[55] Redgrave, *Manual*, 16-17.
[56] The *Twenty-second Report of Science and Art Department* P.P. 1875, XXIII, claims that in 1874 over 21,000 received art education in the Provincial Art Schools.
[57] George Wallis, *Introduction to the Catalogue of the Exhibition of Works of Art Manufacture*, (1858), 5. NAL.

designs produced within the last five years has been altogether changed through the influence of the designs manufactured by those who have employed the talent developed in the School of Art."[58]

It seems to be unclear how many successful designers were educated by the Design Schools and it is even harder to measure the School's effect.[59] Wallis, in the paper mentioned above, conceded that by 1858, in some areas such as Birmingham, "great technical knowledge is necessary to[achieve] successful results." And for calico prints, one of the primary industries targeted by the Department, Wallis wrote that "nothing except the creation of a demand for a better character of design by the public is ever likely materially to improve calico prints"[60] In *History and Philosophy of Art Education*, Stuart MacDonald analyzes the student body of the Central School in London and concludes that most of the male students were "general fee-paying students" who probably aspired to become artists, and not designers.[61]

But as far as intent is concerned, Cole never missed a chance to use his students in public works and it is fitting that almost before the Department was formalized, the art students were busy helping to design the Duke of Wellington's funeral car. Cole might have liked to make the governmental art schools directly responsible for all government

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[58] Wallis, op.cit, 6-7.

[59] Some notable artists did study at the art schools such as Luke Fildes and Kate Greenaway. After Redgrave retired in 1875, a turn to a more creative approach took place with the appointment of Edward Poynter in his place.

[60] Wallis, op cit., 7-8. Wallis also cites from the *Report of the Local Committee of the Birmingham School of Art* which states that "On analysing the occupations of 4,938 students, who passed through the classes of the School during the fourteen years since its establishment in 1843, there are found 81 modellers for manufactures, 100 brassfounders, 268 japanners, 249 engravers, 158 jewellers or silversmiths, 200 die sinkers, 50 glass painters, 113 chasers, and 106 engineers, machinists, or engine-fitters." p., 8. If Wallis is correct that would mean that 1325 or 37% of those 4938 students were accounted for, which seems to be a pretty good result

[61] Stuart McDonald, 172-74.

sponsored design, but Government commissions were very few. Cole did however, make use of the students in the decoration of the South Kensington Museum.[62]

The openly public projects that Cole initiated were important venues for arousing public awareness of taste. The Department's museums were as central to its purpose as the teaching. Cole, Redgrave, Owen and Pugin had been appointed to buy items from the Great Exhibition that would further the achievements of the Exhibition. They not only picked specimens "exemplifying some right principle of construction or of ornament, or some feature of workmanship", but also items which were of "rude workmanship" or "defective in the principles of their design."[63] The structure of the Museum of Ornamental Art was highly didactic. It was not there to entertain but to educate about the principles of design. The Catalogue of the Museum from 1853 requested that the public "not ... look at the articles in the Museum as mere objects of "vertû" or curiosity, but to examine their beauties or defects with reference to the principles laid down."[64] The Museum was to be used by the students at the school and it was free to the general public who could buy the catalogue that explained whether the items had adhered to the principles of design. The observation on chintzes read:

> The use of imitative floral ornament is peculiarly unsuitable on account of the folds, the taste is to cover the surface almost entirely with large and coarse flowers - dahlias, hollyhocks, roses, hydrangeas - or others which give scope for strong and vivid colouring, and which are

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[62] Appendix I of the Report from the 1849 Select Committee on the Design Schools contains a Report from Cole where he discussed "the Benefits which the School of Design would derive from making Designs for Manufactured Articles used in the Government Departments."

[63] "Catalogue of the Articles in the Museum of Manufactures" included as Appendix V in First Report of the Department of Practical Art, 229

[64] Department of Science and Art, *A Catalogue of the Museum of Ornamental Art, at Marlborough House, Pall Mall* (London: George E. Eyre and William Spottiswoods, 1853), 7.

> often magnified by the designers much beyond the scale of nature (see Nos. 11-16). These are not only arranged in large groups, but often cover the whole surface, in the manner of a rich brocade. Nothing can be more erroneous, or more essentially vulgar, as would at once be evident did not fashion blind us for a time, and a feeling for costly labour and difficult execution prevail over the truth and good taste.[65]

There is no doubt which particular items were considered vulgar since the numbers were provided. The Catalogue citing Owen, Pugin, Richard Waagen, and Redgrave also included a list of these principles of Decorative Art. For garment fabrics, the first principle read, "the ornament should be flat, without shadow, or the appearance of relief."[66]

The Museum had, when it opened in 1852, a room where false principles were exposed-- "a room devoted to a collection of articles such as are of daily production, which are only remarkable for their departure from every law and principle, and some from the plainest common sense, in their decoration"[67] -- and it was this room that was nicknamed the "Chamber of Horror." In it, carpets which were direct imitations of nature, represented landscapes, sky, water, or architectural scrolls in high relief, were displayed. The Museum received mixed reviews. Some sang its praises, such as the *Observer* which remarked:

> It was amusing to hear the people admire the 'false principles' when they first entered the room; from an impression that the articles were hung up there in commendation....

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[65] *A Catalogue of the Museum of Ornamental Art*, 1853, 7.
[66] Ibid., 6.
[67] Ibid., 7.

> Most of the visitors were confounded by this ominous label of false principles, even those who recognized the truth of the objections could not understand why a rose, for instance, so beautifully copied, could be false; and, we believe, for the first time in their lives they began to think about art and its meanings. When they entered the second room, containing metal works, woven fabrics, &c., exhibited for their beauty of design, or excellence of manufacture, their exclamations of delight were loud and numerous, as though some hidden sentiment had for the first time been touched; and to see them linger in the room and apparently leave it with regret, was very pleasant to us who were standing by. The Queen's porcelain attracted much notice. [68]

However, in a story from *Household Words*, Mr. Crumpet, a fictional observer who visited the chamber became shocked when he realized that his own trousers pattern was on display in the museum but could not use his handkerchief to dab his forehead as its design, a wreath of coral, was of a false design. The story is not just a satire of the museum; it ends with a speech by Crumpet's friend Frippy which praised the efforts of the Department:

> A little precise knowledge of some true principles of design is wanted just now, quite as much by manufactures as by the public. The schools of design connected with that department of Practical Art and its Museum in Pall Mall will lead, I have no doubt, to great improvement hereafter; and I much like the idea of the Chamber of Horrors that you speak of, backed, as it is by an instructive catalogue. But, trust me, Crumpet, I shall not get myself as you have done, into a state of mental apoplexy. We say in this country that there's no accounting for tastes, and it will be many years before mere abstract principles of choice in ornament can become familiar - I will not say to us, but to our children. In the meantime we

[68] NAL Archives, Presscuttings November 1852- October 1853, *Observer*, 9 January 1853.

must live happily in the endurance of worse daily sights than check trousers and clumsy paper-hangings. ...[69]

Cole was enthusiastic about the room but the British manufacturers "exposed" were less thrilled and the chamber of horror would not be a lasting feature of the Museum. The efforts to use instructive examples in teaching principles to the public as well as students would be a lasting feature of the efforts of Henry Cole, but the negative exposure of individual manufacturers would cease.

The Museum attracted many visitors. Albert and Victoria had visited it privately and Victoria had let the Department pick artifacts from some of the rooms at Buckingham Palace.[70] The museum, an important means of displaying correct principles to the general public, was also important as a centre for the Loan Collection: a circulating collection established in 1854 allowed part of the central collection to be transported to any public or private institution willing to cover the cost. According to Cole himself, by the time he retired in 1873, the collection had been to 195 localities and seen by over four million visitors.[71]

The increased openness was also reflected in the policies regarding the Arts Library which originated in 1842 and furnished the students at the Design Schools with examples of past and present design[72] Previously open only to students, when located at

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[69] "The Chamber of Horror," *Household Words* December 4, 1852, 270.
[70] Cole, *Fifty Years*, I, 284-5.
[71] Ibid., 286-8.
[72] Eva White, *From the School of Design to the Department of Practical Art: The First Years of the National Art Library 1837-1853* (London: National Art Library publication 1994), 3.

Marlborough House, the library became part of the Museum and was accessible to the public for a fee.[73]

The principles of design were, therefore, a vehicle to forge a wholesome and attractive culture for the masses and to define its content. The Department of Science and Art's definition of culture included the production of machines. But this approach did not go unchallenged. Culture was being alternatively defined as a challenge to the growth of the manufacturing sector of British industry. This idea of culture, argued Raymond Williams in *Culture and Society*, was in part formed as a reaction to industry. Culture, originally referring to organic growth, came to be regarded as a force in opposition to modern mechanistic society. In the Romantic thinkers and in Carlyle, culture stood as a dynamic force to counter the mechanical direction the world seemed to be taking. And, argued Williams, it was because industrialization threatened these qualities of life that culture would be defined as an absolute. The Romantic movement therefore interpreted art and music as indicators of the health of a nation. Culture was open to various definitions, which might include as art, history, music or, according to Matthew Arnold, the author of *Culture and Anarchy*, "a pursuit of total perfection by means of getting to know ... the best which has been thought and said in the world."[74] Raymond Williams made the point that to Arnold, as to many of his predecessors who had worked to define culture, culture stood in opposition to anarchy, the possible outcome of industrial society as exemplified for Arnold in the Hyde Park riots which preceded the 1867 Reform Act.[75]

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[73] *First Report of the Department of Practical Art.*
[74] Matthew Arnold, *Culture and Anarchy* (Cambridge: Cambridge University Press, 1957 [1869]), 6.
[75] Raymond Williams, *Culture and Society* (New York: Colombia University Press, 1983).

However defined, art was often the central ingredient of culture -- the soul of the nation and the true indicator of its character. John Ruskin, the art and social critic, was one who attempted through his writings to define the value of art for mankind. Art was an expression of the social, political and ethical life of a country.[76] John Ruskin was an outspoken critic of the Department of Science and Art, and on several occasions he openly challenged its methods. He denied that there were two forms of art -decorative art and fine art. Fine art can only be one thing, he announced at an address delivered in Manchester in 1859.[77] His message at Bradford the same year was that design could simply not be taught.[78] Ruskin believed emphatically that design could not be improved independent of a general improvement of society.

But while Ruskin implied that a societal change was necessary for the improvement of the arts, most of those who advocated an infusion of art into practical science, starting with the 1835-6 Select Committee on Arts and Manufacture, seemed to think that the standards could be heightened by a central diffusion of taste. The concomitant harmonious, intellectual, moral, and practical development of the nation would follow. The general ease and frequency with which the Victorians copied and combined styles in their architecture and design seems to indicate a similar belief in the value of copying previous greatness.

Both Ruskin and the Department of Science and Art were opposed to excessive copying of previous styles. Their solutions were, however, quite different. While the department sought to map out the principles that should guide design, Ruskin, who

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[76] John Ruskin, *Lectures on Art*. Here cited from Williams, 136.
[77] John Ruskin. "The Unity of Art", *Two Paths* (Boston: Dana Estes & Company, 1897).
[78] Ruskin, "Modern Manufacture and Design," *Two Paths*, 67.

opened his own drawing schools, wanted talent to be the guiding principle in the teaching of artists and designers. But the main difference between the two sides was that while Ruskin would consider the machine alien to his quest, the Department of Science and Art made industry and mechanized production producers of culture. Today we are more willing to consider material life part of our definition of culture, but culture, as first defined, stood in opposition to materialism. Matthew Arnold was hostile to incorporating qualities of industry, finding that the middle classes often harboured materialistic values that were alien to culture. He argued that such qualities as self-reliance, wealth and political participation, though not necessarily alien to culture as he defined it, were not to be pursued if they excluded searching for perfection, which could best be reached by intellectual means.[79] But the Department of Science and Art's theory of art still held that the principles of design were superior to material conditions. In other words, material items in themselves were culture only when they were infused with the correct values. As Owen Jones argued, ornament, wall-paper, chairs and bookcases were subject to the principles and were therefore, potential cultural items. The Department of Science and Art had an inclusive definition of culture which broadened its meaning and made the modern production process a partner rather than a foe.

Many manufacturers also rejected the Department's attempt to define the role of manufacture in society. Williams, in *Culture and Society*, explained that those who sought a special role for art often pleaded for the state to ensure the strength of the

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[79] Though Arnold makes concession to other activities, he is by defining perfection as a quest to know, clearly suggesting that the knowledge can best be achieved by reading. His definition of a cultured human being seems to be closer to the eighteenth century "man of letters" that the ideal put forward by Plato in the Republic.

nation's culture. The Department of Science and Art's definition of the extended role of common items in education and social life likewise extended the role of the state to influence and control the producers of these items. And that attempt at control was strongly rejected in many circles.

The Department, in accordance with its views on taste, sought to decide for producers what should be made. Many irritated producers countered that they merely fulfilled marketplace demand. A remonstrance against the Department of Practical Art, published in 1853, stated "that is best which sells the best."[80] Edmund Potter, a calico manufacturer from Manchester and a sponsor of the Drawing School there, argued in a published reaction against the Second Jury Report of the Great Exhibition that there was no need to despair on behalf of the British cotton industry. They had, he argued, made it without the aid of the state, and that would also be how the industry would continue to prosper. Potter wrote:

> The same self-interest and individual energy will still arise to watch for and reward every chemical and mechanical discovery, and to carry on the same progressive improvements in taste and execution which have marked, more strongly in this country than in any other, the progress of the trade for years past. Every advantage of locomotion our competitors may gain will surely be ours also, perhaps to more than an equal degree. I know not, then, why the position we have attained should be held to be in so critical a state. The results of the

[80] Argus (pseudonym.), *To Manufacturers Decorators, Designers and the Public Generally. A Mild Remonstrance against the Taste-Censorship at Marlborough House in Reference to Manufacturing Ornamentation and Decorative Design* (London: Houlston & Stoneman, 1853), 6.

> Exhibition, certainly, to those who possessed a real knowledge of the trade, apart from what was to be gained there, were not those to induce timidity or fear. [81] ...

Redgrave countered these arguments, holding that the Department's mandate was not to interfere but to educate. Elevating taste worked to increase competitiveness:

> With this there can be neither the wish nor the slightest power to interfere, except by that legitimate teaching which will raise the public taste, and with it the taste requirements, of the mass of our consumers and prepare men qualified to gratify it; and although we never can subscribe to the maxim, that "the only legitimate standard of Taste is the demands of the market," there is no doubt that such is substantially the only legitimate source of production. Let not this, however, be supposed to interfere with the dissemination of a sounder and truer taste, preferable to a less variable standard, and which will raise our public in the scale of nations and the value of our manufacturers in the civilized capitals of the world, enabling them to rank as high for beauty and design as they now deservedly do for all other manufacturing excellence.[82]

However, opposing the Department of Practical Art was not simply a question of promoting the principles of liberalism over the principles of design. Defining industrial production as culture provided the state with the means to interfere in industry. Potter, "Argus,"[83] and many others sought to define industrial production as belonging only within the sphere of economy. Potter, for instance, argued that "there are no legitimate

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[81] Edmund Potter, *A Letter to One of the Commissioners for the Exhibition of 1851: Being Remarks on that part of the Second Report of the Commissioners which Recommends the Teaching of Practical Design as Applied to Calico Printing by the State* (London: John Chapman, 1853), 5-6.
[82] Redgrave, *On the Necessity of Principles*, 31-2.
[83] Argus was the pseudonym for the author of *The Remonstrance against the Taste-Censorship at Marlborough House.*

standards of taste or design, *except the demands of the day*, for each particular country or class, varying according to means, climate, complexion, and the thousand prejudices of fashion and custom."[84] By defining and treating machine production as culture, the Department of Science and Art extended the role of mass production to include social and ethical concerns and thereby made it difficult to limit production solely to the economic sphere. Defining culture, as the Department did, was an attempt to forge a new kind of relationship between art, industry and the government. Control and power were central elements of the Department of Science and Art.

The Department solved some of the problems of the "taste question" by formulating a discourse on taste. The philosophy of the design theorists went beyond the taste question in clearly defining where the problem was located, namely in false design. To counter this, the Department adopted the principles of design. Design was therefore to be understood as a universal, whose internal rules would have to be learned and followed. Failure to do so was not only evidence of bad taste, but would result in society's failure to progress. Given the wide social, moral and ethical role of art, the attempt to control this channel of information was an attempt to control the population comparable to the legal or educational system. Culture was clearly being fashioned as a governing tool-- a field of knowledge, a science. Ornament was therefore not only a question of taste; but also a question of power. The principles of design were a means to exert control over the environment and mind of the British population.

Art is not about 'taste' in the modern meaning of the word, but is rather about power (also in the modern sense) to insert your visions into the buyer/user directly.

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[84] Potter, 22.

While Redgrave was not always optimistic about the new means of production, when "the varying mind has no share in their production, and man himself becomes only the servant of the machine," he strongly believed in the power of the artifact or consumer item to transfer meaning.[85] Culture was based on a convergence between the values contained in art and even religion with the new consumer society. In this sense, the Department of Science and Art was part of a struggle to define the meaning of culture in modern industrial society.

[85] Redgrave, *Manual*, 61

CHAPTER 4

INDUSTRY AS RHETORIC: THE ORIGINS OF THE DEPARTMENT OF SCIENCE AND ART AND THE PROMOTION OF SCIENCE

In the previous chapters, I have argued that the Select Committee on Arts and Manufacture of 1835-36 helped to make taste a national question. It was held that art had multiple social and moral effects and, consequently, that a wider distribution of art would help working people adjust better to the social and economic reality of the time. In the late 1840s and in the 1850s, some theorists of design claimed to have discovered the principles contained in fine art which needed to be distributed in machine-produced consumer items around the country in order to have an impact on the masses equivalent to fine art. Quality ware was not only a question of better competition and a growing economy, it was also a question of social integration and the condition of the nation. The Great Exhibition had been important in helping spread this message. After the Exhibition a new Department of Practical Art was established to enhance the taste of British production.

There was sufficient interest in Great Britain to establish drawing schools around the country which gave rudimentary instruction in drawing and ornamental art to assist in the production of quality products. But even more important than the schools were the factories themselves. It was the actual production of consumer items imbued with the right principles that would be the most important tool in elevating the taste of the masses. The productive sphere and the growing sphere of factory production were in

this manner thought to be potential allies of those who sought to promote a certain morality. In theory, these ideas about using principles of design to convey important social messages through consumption meant to a certain extent that the production sphere would come under governmental control as it was the Department of Practical Art which had the expertise to determine what constituted true taste.

In March 1853, the Department of Practical Art was reorganized as the Department of Science and Art. Ostensibly, the rearrangement of the department was to improve the competitive edge of British industry, as both art and science would increase quality and ingenuity. The Department of Practical Art had constructed art as a knowledge of analytical principles that could be distributed by the production sector and, therefore, rendered art similar to science and an integration of the two disciplines easier to achieve. The Department of Science and Art would teach producers theory that was intended to help them produce better wares and, at the same time, be a primary teacher of discipline and order to both the producing and consuming classes.

The principles of design were also, I have argued, a way to foster a common culture. Consumer products themselves were items of cultural importance. Defining factory production in this manner was an attempt to formulate a national culture which included the production sphere but also rendered it subject to theoretical control.

The addition of science to the department was another step, I will argue, toward constituting a new common culture in which industry claimed to be a primary national concern while new structures of control were introduced. In this chapter, I will discuss how and why it was attempted to impose these structures in the first few years after the

Great Exhibition. The establishment of the new Department of Science and Art must be understood in light of attempts to broaden the views of science and to facilitate its general acceptance as useful and necessary knowledge. According to the Department of Practical Art, industry would distribute the proper tasteful products to the consuming society. Proponents of science argued that science was necessary for industry to prosper and for the nation to compete internationally. The theoretical science promoted was a rational discourse that distributed authoritative patterns. The imposition of principles of art was an attempt to force elements of control on the industrial sector. Science, a similarly structured knowledge within a system of rationality, ultimately rendered machines less as tools and more as vessels for laws. Ornamental art had promoted the role of machines to that of allies in the quest to educate and socialize the masses. But industry was not an equal partner; it was made subject to the principles of design. The Department sought to control information inherent in products and, therefore, also those who produced them. This chapter will look at how theoretical science, which was closely linked with political economy, would favour systems over shop floor skills.

My discussion is based on work and initiatives by the Royal Commission of 1851, the Society of Arts and the Department of Science and Art. While the Department was the only government institution of the three, there were individuals, notably Prince Albert, Henry Cole, Lyon Playfair, and Earl Granville, who were members of, or who had influence in, all three groups. They all played important roles in the formation of science education in the 1850s. The Royal Commission had the ideas, the Society of

Arts the ability to test them, and the Department of Science and Art made them government policy.

The Department itself is important as it was an early example of state intervention in a period when science education was primarily left to voluntary institutions. It has been argued that at this time, around 1850, there was little inclination among producers to acknowledge a major role for abstract science.[1] On the other hand, scientists working in academic institutions such as the Royal College of Chemistry or the Schools of Mines asserted that their pure science had economic importance.[2] There was a gap between the manufacturing industry, which continued to rely on skill, and the scientists who were increasingly unhappy with their lack of status in society. The Department of Science and Art, with its attempts to create public interest and attract public attention to its causes, would be a forum for facilitating a message about the general economic value of science. Moreover, the Department used means and methods which sought to heighten the role of an authoritative approach to industrial production. Even if we believe that in the end such an approach is necessary for the success of a modern industrial society, it is important to understand the reasoning behind the decisions of the time. This chapter will not seek to prove that the Department was detrimental to the decision to restructure the educational system that came as a result of the Second Reform Act and the disappointing showing at the Paris Exhibition of 1867. It will, however, seek to understand how theoretical science was promoted at a time

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[1] J.F. Donnelly, "Science, Technology and Industrial Work in Britain, 1860-1930: Towards a Synthesis," *Social History* 16 (1991): 191-201.

[2] Donnelly, 194. See also Hannah Gay, "East End, West End: Science Education, Culture and Class in Mid-Victorian London" *Canadian Journal of History* 32 (1997), 153-183.

when the role of the state had to be minimal and when there still was divided opinion about the role of science and its effect on the masses.

While Art was made acceptable by a romantic perception of its moral powers, science did not as yet have such powerful connotative associations. Though some claimed that science was essential for international competition, it was not as readily accepted as it is today. The Great Exhibition itself was a powerful demonstration of this fact. The praises of British achievements that followed in the wake of the Great Exhibition did not generally credit this achievement to science. It was more common to hold that art, in the old sense of handicraft or skill, was the cause of Britain's industrial success. Faced with the proposal to encourage technical education, a correspondent with the *Journal of the Society of Arts* wrote, "We have never tried anything of the sort without its being followed by a disastrous break-down. We have taken and still hold the highest place as an industrial community, without any such aids."[3] In response to a Society of Arts circular on industrial education, a respondent declared that

> Two of the most important manufactures in England, viz. cotton and earthen ware, have reached their present position without any advantageous aid; while France with her scores of Gobelins, on which thousands have been lavished, cannot compete with us in the production of articles used by the millions, from which, after all, the profit of trade arises, for continued observation has convinced me that works of high merit are rarely remunerative.[4]

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[3] Letter from a member of the Society, *Journal of the Society of Arts* 1 (1852-53): 80. (Hereafter *JSA*)

[4] Society of Arts, *Response to Society of Arts' Circular on Industrial Education* (1853) Reissued in 1857 under the title *Middle Class Education and Class Instruction in Mechanics' Institutions Considered in Two Reports of the Society of Arts* (London: Longman, Brown, Green, Longmans and Roberts, 1857), 111.

Moreover, the very popular books by Samuel Smiles continually argued that personality, family values and thrift were the main reasons behind the individual success of inventors such as Telford and Stephenson.

It has been common to discuss science and technical education in Britain in light of the present. Our society is one dependent on and dominated by technical and scientific advancement. When we look back, Lyon Playfair, Charles Babbage and others who argued for the need to encourage such pursuits before a system was set in place, often seem like heroes championing the right cause.[5] These champions of science even become tragic heroes when we take into account that Britain's loss of industrial supremacy at the end of the nineteenth century is often attributed to the failure to establish scientific and technical institutions.[6] However, the mid-nineteenth century was very diverse in defining what the values of society were, and industry did not, as of yet, claim a central position. The discussions that preceded the Great Exhibition were, as I have shown in a previous chapter, definite indications of that.[7] A central position for science and industry had to be forged as it was not economically obvious. Industry was in this sense, therefore, not a national concern. What makes the middle of the nineteenth century so fascinating (to me) is the attempt to construct science and industry nationally. As we saw in a previous chapter the union of art and industry undertaken by the Society of Arts was an attempt to heighten the role of industry in society. The essence of the Department of Science and Art would be to further science, again in conjunction with

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[5] D.S.L. Cardwell's *Organisation of Science in England* (London: Heinemann Educational, 1972) is one example where Playfair is cast as a hero.

[6] Confer for example G. Roderick and M. Stephen (eds.) *Where Did We Go Wrong? Industrial Performance, Education and the Economy in Victorian Britain* (Barcombe, 1982).

[7] See previous chapter

industry. I have, therefore, undertaken to consider the efforts of Lyon Playfair as argumentation in light of how he, in conjunction with the Royal Commission of 1851, attempted to use education to redefine the general values of society. And if we understand culture as expressions of the meaning and value of life, the primary role of the Commission's work and of the Department of Science and Art, would be to redefine culture.[8]

The constructions of science were varied. Scientific explanations for what we now deem natural phenomena and human development were prevalent in the nineteenth century. To some science provided evidence of the existence of a natural order and the existence of a god. But science could also be used to sustain ideas hostile to the establishment, as Desmond Morris has demonstrated in *The Politics of Evolution* (1989). As late as 1862, a witness for the Clarendon Commission, an investigation into management and revenues in public schools, declared that "the theory of geology cannot be received by mere boys without a violent disturbance of their religious belief."[9] Others found that science was dangerous to social stability, due to its connection to materialism and political events in France.[10]

When the British chemist Lyon Playfair, appointed head of Science in the newly established Department of Science and Art, informed Prince Albert that several outstanding men had offered prizes for the best lectures given in the new training

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[8] This definition of culture is provided by Raymond Williams, *The Long Revolution* (New York: Harper and Row, 1966), 41.

[9] *Parliamentary Papers* (1864) XXI, Q & A 4750. Letter from assistant master at Eton to the Secretary of the Commission.

[10] Cardwell, *Organisation of Science in England*, 32. Cardwell cites Patrick Colquhoun, the magistrate and political reformer who warned that science "if universally diffused, would speedily overturn the best constituted governments on earth." Cited from Patrick Colquhoun, *A Treatise on Indigence* (London 1806), 148-9.

schools, he announced that it would be better if the lecture series were given under the name "Knowledge of Common Things," as the word science could be offensive.[11] Victorian science was, therefore, clothed in many euphemisms.

The obvious importance of and interest in science in Victorian Britain, with its orthodoxies and heterodoxies, made it difficult for the government to encourage scientific education. The introduction of science into elementary schools was slow and was dressed in religious and inspirational cloth. Some argued that children should be taught the biological sciences to acquire a love of nature which might incite a later interest in science.[12] The Revds. Henry Moseley and Richard Dawes, who were the primary leaders of the movement for science in the elementary-school curriculum in the 1850s, promoted science at this level primarily because they thought that children of the lower classes would be more responsive to a curriculum that was less reliant on linguistic skill and better related to a culture they were familiar with. They sought to train them in elements of mechanics or the principles of agricultural chemistry to strengthen their reasoning powers while at the same time providing knowledge that would be applicable to their everyday experiences.[13] Thus, in teaching the biological or physical sciences, the primary goal did not seem to be to increase scientific knowledge but to use elements of science to teach reasoning skills or reverence for nature and God.

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[11] Playfair to Grey 19 March, 1853. WINDSOR ARCHIVES, on permanent loan to the 1851 COMMISSION ARCHIVE, from the ROYAL ARCHIVES at Windsor (hereafter WA)Letters vol. 11, no. 65.

[12] This view expressed in the 4th Report of the Department of Science and Art (1857), p. xxxi.

[13] David Layton, "Science in General Education: The Rise and Fall of the First Movement: 1851-1857," *Journal of Educational Administration and History*, 5.1(1973) 12.

It was widely believed that practical science had been progressing without institutions. And it could be argued that theoretical science was dominated by amateurs often funded by their own wealth or by interested sponsors.[14] Moreover, practical science with links to the industrial sector was not generally deemed teachable without interfering in a sphere where the state had no business.[15] Captain John Donnelly, R.E., who was a secretary to the Department of Science and Art, argued in 1867 that the state would undersell manufacturers if it established its own trade schools, indicating that he believed that technical knowledge was produced at the workshop.[16]

The scientific schools at the time were usually originated or run by groups excluded from the Universities, most notably dissenters and members of the middle class whose ambitions did not include becoming gentlemen. The Mechanics' Institutes encouraged useful knowledge among the artisans. The London Mechanics' Institute opened in 1823 and offered lectures on chemistry, mathematics, hydrostatics, applied chemistry, astronomy and electricity.[17] The movement spread quickly, indicating that there was widespread belief in the expected economic and social benefits of science education.[18] However, the effectiveness of the movement seemed to have tapered off.

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[14] For instance, on the top floor of his house, Sir Walter Trevelyan had a museum containing a valuable collection of minerals, birds, and shells.

[15] Stephen F. Cotgrove in *Technical Education and Societal Change* (London: George Allen & Unwin, 1958) argues that before the 1880s the concept of technical science was muddled. Citing evidence before the Royal Commission on Technical Education of 1867, Cotgrove concludes that there was no explicit distinction between technical and scientific instruction in the 19th century. He writes "For all practical purposes, then, technical education in the 19th century meant the teaching of science." 36.

[16] J.F.D. Donnelly to the Select Committee on Scientific Instruction (Samuelsen Committee) P.P. (1867-68). XV, Q&A 309 and 313.

[17] Cardwell, 41.

[18] Cardwell. 42-43.

By mid-century, the Mechanics' Institutes had become less utilitarian and were chiefly offering entertainment to attract working class members.[19]

Many of the individuals who had worked to establish the Mechanics' Institutes were also behind the establishment of the London College in 1826.[20] The College was to be open to those groups excluded from universities, members of all religious denominations and of the middle classes. The King's College was opened some years later by Anglican interests to rival the London College. Both colleges offered instruction in natural sciences.[21]

The Royal Institution, incorporated in 1800 to diffuse the knowledge of science and to facilitate the general introduction of mechanical invention, offered popular lectures and featured a laboratory where some famous scientists worked. In addition, the government supported educational scientific institutions in areas of considerable economic importance to Britain. In 1851, the Government Schools of Mines and Science Applied to the Arts, where Lyon Playfair, Henry de la Beche, Edward Forbes, A.C. Ramsey and T.H. Huxley would teach, opened. The Museum of Economic Geology had already been established in 1845.

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[19] Steven Shapin and Barry Barnes have argued that the cosmology underlying technological processes was taught to Institute members in such a way as to ensure that there would also be a more ready acceptance of the industrial system's place in it. Steven Shapin and Barry Barnes, "Science, Nature and Control: Interpreting Mechanics' Institutes," *Social Studies of Science* 7 (1977), 31-74. John Laurent, on the other hand, holds that scientific education offered through the Mechanics' Institutes was used by working-class people for their own purposes -to develop an alternative social and economic philosophy which fostered the growth of revolutionary socialism. John Laurent "Science, Society and Politics in Late Nineteenth-Century England: A Further Look at Mechanics' Institutes," *Social Studies of Science,* 14(1984), 585-619. Some of the discrepancy between these two viewpoints might stem from the fact that they are discussing two different time periods. Laurent particularly concentrates on the period after 1850. As I will suggest later in the chapter, the new strategies used by the Mechanics' Institutes after 1850 quite successfully captured the spirit of self-reliance while still retaining the potentiality of bringing workers to accept industrialism and modern capitalism.

[20] Both Jeremy Bentham and Lord Brougham were involved here.

[21] Cardwell, 45-50.

Chemistry certainly had important industrial purposes, but it was primarily its importance to agriculture that prompted the opening of the privately funded Royal College of Chemistry in 1845. In the 1840s, the work of the German scientist, Baron Liebig, and his British students, generated much interest in Britain. Liebig's interest was primarily in organic chemistry and he argued that what made plants grow was not organic matter, such as manure, but individual chemical components. In short, he postulated that it would be possible to produce artificial fertilizer. Playfair, who translated Liebig's work on organic chemistry into English, obtained his Ph.D. in Giessen, Germany under Liebig. Liebig's organic theories became very popular in Britain where they challenged the spectre of Malthus and increasing grain imports.[22]

Both chemistry, which had agricultural ramifications as well as industrial importance, and geology, useful in the imperialistic search for raw materials as well as internally, were constituted national interests. The propaganda value of the two disciplines in furthering science as a general and necessary pursuit is apparent and they were both incorporated into the Department of Science and Art in 1853.

The British Association for the Advancement of Science (BAAS) had been organized in 1831 to advance the interest and status of science in Britain after much concern about the state of British science. David Brewster, one of the founders of the association, used the opportunity of a review of Charles Babbage's *Reflections on the Decline of Science in England* to call attention to the lack of respect offered science and scientists in Great Britain.[23] At the first meeting of the association, concerns were

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[22] Robert H. Kargon, *Science in Victorian Manchester* (Baltimore: John Hopkins University Press, 1977), 101-108.

[23] Brewster's review was in the *Quarterly Review*, vol. xliii, pp. 305 et seq.

expressed that societal perceptions of science had been declining since the time of Newton.[24]

Even before the Exhibition had ended, the Prince Consort and associates were pondering on how to best continue its spirit. Charles Babbage, a strong proponent of science education, published *The Exposition of 1851: Or, Views of the Industry, the Science, and the Government, of England* to reaffirm the need for science instruction as he had done twenty years before in *Reflections on the Decline of Science.*[25] The Great Exhibition, argued Babbage, should first of all convince everybody of the value of science to the enhancement of the economy. Lyon Playfair, who at the time was in close contact with Prince Albert, gave several speeches in its aftermath where he addressed the need for technical and scientific institutions in Britain.[26] Playfair argued that the advantageous abundance of raw materials in Britain would be eclipsed by the advance of knowledge in other nations.[27] But to no avail. The Great Exhibition was primarily a celebration and voices of dissent did not register as loudly as those that praised Britain's achievements. Henry Cole, in his contribution to the Society of Arts' lectures series

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[24] O. J. R. Howarth, *The British Association for the Advancement of Science: A Retrospect 1831-1931* (London: BAAS, 1931), Chapter I.

[25] Charles Babbage, *The Exposition of 1851: Or, Views of the Industry, the Science, and the Government, of England*, second edition, with additions (London: John Murray, 1851). This work is mainly a diatribe against all those who had not supported his quest for funding to continue his work on the calculating engine.

[26] Lyon Playfair, "The Study of Abstract Science Essential to the Progress of Industry, being the Introductory Lecture to The Government School of Mines, in 1851" in *British Eloquence. The Literary, Political, and Sacred Oratory of the Nineteenth Century: Literary Addresses delivered at Various Popular Institutions*, 2nd series (London and Glasgow: Richard Griffin and Co., 1855), 47-86; Lyon Playfair, *Science in its Relations to Labour. Being a Speech Delivered at the Anniversary of the People's College, Sheffield, on the 25th October, 1853* (London: Chapman and Hall, 1853).

[27] An identical argument was made by Prince Albert in a private Memorandum from August 1851 cited in Thomas Wemyss Reid, *Memoirs and Correspondence of Lyon Playfair*, 131-133.

"Results of the Great Exhibition," argued that international cooperation might be the best way to increase scientific knowledge.[28]

The Exhibition had created a considerable surplus and the Royal Commission of 1851 originally established to arrange the Great Exhibition was, with a supplementary charter, given wide powers to manage the surplus. The Commission included such politically powerful members such as Lord John Russell, Lord Derby, and William Gladstone. It was chaired by the Prince Consort who had encouraged the work for a "union between art and industry" through the London Society of Arts, and was also interested in encouraging science. He seems to have felt that part of his duty was to bring more interest to technical and scientific education in Britain. A German himself, he was enthusiastic about projects in Germany and delighted by the establishment of the School of Mines and the Royal College of Chemistry.

Lyon Playfair was made Gentleman Usher to the Prince Consort after the Great Exhibition, which meant that the close cooperation between the two would continue the push to achieve the goals of the Commission of 1851.[29] It is fairly obvious that the speeches that he gave shortly after the Great Exhibition were made with the project of the Royal Commission in mind. His work for the Great Exhibition, which earned him much praise and brought him in contact with many important public figures of the time, helped his public and political career. In addition to the Prince and to Playfair, Lord Granville, whom Prince Albert called the "only working man of the Commission", was another individual whose influence helped to shape the policies undertaken by the

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[28] Henry Cole, "The International Results of the Exhibition of 1851" in *Lectures on the Result of the Great Exhibition of 1851*, series 2 (London: David Bogue, 1853), 417-452.
[29] Reid, 123-24.

commission. If he did not help formulate ideas, he, as a prominent politician in the Liberal Party, could help put them into practice. Granville's position within the government, at the Board of Trade, and later the Education Department at Whitehall, was clearly important to the work of furthering science education.[30] Granville's family fortune was based on mining and manufacture and he seemed to have shared many of the Prince's ideas about the role of art and science in society. He was also a friend of Cole, who often visited Granville at his house in Chiswick.[31] Prince Albert's private secretaries, Colonel Phipps and Charles Grey, worked closely with the Commission. Grey would become secretary for the Commission in 1869 when he replaced Edgar Bowring who had been an effective secretary from 1851.[32]

In a memorandum of August 1851, Prince Albert outlined his initial ideas for the surplus. Carefully, without putting undue emphasis on theoretical science, he wrote:

> I would buy that land [the Gore Estate, now known as South Kensington], and place on it an Institution embracing the four great sections of the Exhibition, i.e. raw material, machinery, manufactures and plastic art. The Institution I would devote to the furtherance of the industrial pursuits of all nations.[33]

During 1851 and 1852, the commission debated how to best "embrace the four great Sections of the Exhibition." Though both Cole and Playfair thought that creating a

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[30] Granville wrote Prince Albert after the House of Commons turned down the National Gallery removal bill to tell him to still tread warily. Granville to Albert (copy and excerpts) July 5, 1856. WA, Letters, Volume XIII, no. 29.

[31] Lord Granville, a Whig and a free trade supporter and was minister of education from 1859 to 1864.

[32] F.H. Sheppard, *Survey of London* vol. 38 "The Museums Area of South Kensington and Westminster," (London: Athlone Press, 1975), 49-50.

[33] Memorandum from August 1851, cited in Reid, 131

university might be the best way, Prince Albert made it clear that his responsibilities with Cambridge and Oxford made this impossible.[34]

The idea put forward by the Prince and also by the Commission was to create a new institution in London where many existing learned societies would relocate. The Commission proposed in its *Second Report*, published at the end of 1852, to locate various institutions and museums in one centre to facilitate communication between them and build upon what had been in their eyes the essence of the Great Exhibition -- a conglomerate of cooperation for the common good.[35] It was to be a place for the great minds of the country to gather for discussion, to hold lectures and to do research. Already at the end of September 1851, before the official closing of the Exhibition, Playfair suggested to Phipps that it was time to solicit the opinions of the various institutions as they were just starting with new meetings after the summer hiatus.[36] Phipps answered that Albert saw no harm in "endeavouring to ascertain the disposition of the leading members of the learned societies to some system of combined action and centralisation."[37]

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[34] Imperial College Archives, Playfair Collection, Phipps to Playfair, August 19, 1852. In the Henry Cole Collection there is a memorandum "The University Academy: Or Universal Association for the Advancement of the Industry of All Nations." Cole's concept of the University Academy is limited. He writes that "It is proposed to make the university the means of collecting information of the discoveries and new applications of Raw Materials, the inventions in Machinery and the general progress of manufacturing Industry of all Nations, and examining all questions scientific, moral and commercial connected with industry. To publish annually the information thus collected." Henry Cole, Miscellaneous 11. (1852). Cole also brought up the idea of a university in his contribution to the Society of Arts lecture series, *The Result of the Great Exhibition*. Henry Cole, "The International Results of the Exhibition of 1851," 417-452.

[35] Second Report of the Commissioners for the Exhibition of 1851, P.P. (1852-53), LIV. The report lists around one hundred metropolitan institutions which shared the "object of diffusion of scientific principles amongst those engaged in their practical application." (13-14).

[36] Imperial College Archives, Playfair Collection, Playfair to Phipps, September 25, 1851.

[37] Phipps to Playfair, September 27, 1851. Cited in Reed, 135-36.

However, the plan to centralize the cumulative technical knowledge to the new institute was thoroughly rejected by the various societies. There was fear of meddling and undue direction and, although not openly expressed, the jealousies between the societies themselves must have dampened enthusiasm for such a project. Thus, it soon became clear to the Commission that securing support for the project would be an uphill battle. If the commissioners had believed that in the wake of the Great Exhibition there would be a belief in the need for cooperation, they were quickly proved wrong. The private institutions would not relocate to South Kensington. And an umbrella institution of this nature would not be established.[38]

But it was more than mere jealousy and privilege that worked to counter the Commission's plans. The Great Exhibition, a wonder with many meanings, was something to admire and be proud of. The Victoria & Albert Museum contains a large collection of pamphlets and publications about the exhibition and the tone of the majority of these is enthusiastic. One essayist wrote, "We are upon the eve of an event which may certainly be looked upon as the greatest wonder of the world - one which seems to grow in grandeur the more we contemplate it, and which becomes more surprising the more familiar we are with it."[39] In one guide book, one can read that in spite of all the fancy of foreign products, English manufacture is to be commended for

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[38] One writer to the *Times* complained that the societies had not been consulted on the issue and that a move to South Kensington would be very impractical due to the distance. "The Learned Societies of London." *Times*, 23 December 1852.

[39] Rev. J. C. Whish, *The Great Exhibition Prize Essay*, 4th ed. (London: Longman, Brown, Green and Longmans, 1852), 1.

its cheapness.[40] Those who did not read may have listened to a sermon similar to the one following:

> This great exhibition of the skill and industry of all nations we regard as the inauguration of that system of commercial policy, so successfully and happily carried out by one of England's noblest statesmen. The progress of Free-trade legislation offers the strongest motives for congratulation and Religious thankfulness, not only as diffusing happiness and plenty among the multitude of our own country, and stimulating the great cause of social industry, but as helping to promote the principles of universal Peace, and to bind all men together by a community of interests.[41]

When the commission contended that "no measures could be so strictly in accordance with the ends of the Exhibition as those which may increase the means of industrial education, and extend the influence of science and art upon productive industry,"[42] it was at odds with the feeling of joy and pride in British achievement. The plans of the commission soon came into disrepute. The Great Exhibition had been a compromise. It had taken a lot of work to convince manufacturers and producers that such an exhibition would be in their best interests. The arrangement of the exhibition had not only made it easy to classify all the objects into a system, but it was also in itself relatively

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[40] Robert Stephenson, *Great Exhibition; Its Palace, and its Principal Contents with Notices of the Public Building of the Metropolis, Places of Amusement, etc* (London: G. Routledge and Co., 1851). Stephenson wrote: "And it is with no little pride that we reflect upon what the English manufacturer has done in this way immeasurably beyond the manufacturers of any other county, for the amelioration of the commercial world. All the more important articles of daily necessity - cottons of every description, woolens of all kinds, cutlery and tools, books and engravings- have been produced cheaper and cheaper by them, till the very humble and poorest begin to partake of enjoyment once only known to the richer classes of society." 48.

[41] Thomas L. Marshall, *Moral Aspects of the Great Exhibition of 1851: A Sermon, Preached in the High Street Chapel, Warwick, on Sunday, May 4th, 1851* (Warwick: H. Sharpe, 1851), 8-9.

[42] WA, Letters of the Royal Commission, Volume IX (1851-1852), no. 14, draft report to the queen.

uncontroversial and accommodated everyone, whatever their views on education and science. It is not surprising that the commission would continue to bring up the four categories when they discussed their own project. But the institution that was initially suggested was obviously taking the "spirit of the Great Exhibition" in a different direction. Manufacturers expressed considerably less enthusiasm for the extended influence of science upon industry than they had for the Great Exhibition.

Edmund Potter, a calico printer from Manchester, who had taken great interest in the Schools of Design, stated in his response to the Society of Arts Circular on industrial education that "I differ from the policy of attempting industrial educational that, I consider, ought to be left to private and individual interest; any other teaching I conceive will be unsound, forced, and at variance with a sound commercial policy and competition."[43]

The project was rather sneeringly referred to as Albertopolis, an appropriate designation. As the Acropolis had been a religious centre and guarantor of truth, the new institution with its experts would make manufactures subject to their theory. Commenting on Edmund Potter's *Letter to One of the Commissioners for the Exhibition of 1851*,[44] the Manchester *Examiner* argued:

> What Mr. Potter seeks to impress upon the Royal Commissioners is the absurdity and impracticality of a costly scheme for teaching what can be learnt nowhere but in the

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[43] Society of Arts, *Response to Society of Arts Circular*, p. 177.

[44] Edmund Potter, *A Letter to One of the Commissioners for the Exhibition of 1851: Being Remarks on that part of the Second Report of the Commissioners which Recommends the Teaching of Practical Design as Applied to Calico Printing by the State* (London: John Chapman, 1853).

> workshop, and through the medium of that personal expertise which comes from close and constant familiarity with all varieties of tastes and markets, and the changes of fashion....
>
> Mr. Potter has done good service to his "order" by vindicating them from somewhat pert and gratuitous disparagement; for men who seldom travel beyond the studio or the lecture-room, are not exactly qualified to become critics and censors of the presumed incompetence of our great manufactures to carry out their processes, and manage their own business.[45]

Another opponent of the scheme pointed out that "The tendency of all collegiate systems is to dogmatize, and dogmatisms are fatal to progress." The workplace would supply all education needed, for "when labour commences, scholastic instruction terminates."[46]

David Layton has argued that after the 1850s 'science of common things' declined as science gradually became more theoretical and abstract.[47] Accordingly, in the 1850s, when it was attempted to diffuse science to a larger part of the population, science was still to be linked to knowledge of practical things and tied to the experiences of common people rather than abstracted into categories and taught as theory. This process, Layton argues, had matured by 1870. But I contend that the change from knowledge of common things to abstract science should not be thought of as merely a natural step or process in the development of mankind. Rather, the two reflect different knowledge systems -- one where knowledge is created by and kept relevant to daily experiences and one where knowledge is hierarchically structured and institutionalized and takes precedence over practical science. Institutionalization of knowledge to

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[45] NAL Archives, Presscuttings, Miscellaneous November 1852-October 1853, Undated presscutting from the *Manchester Examiner*.
[46] Correspondence to the Society of Arts, *JSA* 1 (1852-53): 80.
[47] See David Layton, *Science for the People: The Origins of the School Science Curriculum in England* (New York: Science History Production, 1973).

"assist" industry meant structural changes that eroded the 'workshop' role of industry. As the correspondent to the *Journal of the Society of Arts* mentioned above noted, "in learning to earn his bread by his own industry, the boy becomes a man. He will give or take information upon equal terms, but he can no longer be taught."[48]

Charles Babbage, who has been touted as one of the early defenders of science, argued in *Reflections on Science*(1830) and again in *The Exposition of 1851* that the economy would improve if science was dispersed because he strongly believed science to be a rationalizing instrument. In *On the Economy of Machinery and Manufactures*, a defense of political economy, Babbage argued that while applied science and abstract science both play a significant role within the economic system, abstract science is the higher form of learning.[49] It is clear from *On the Economy* that Babbage understood machines as part of a rational production system rather than mere tools. To him, as to Adam Smith, the crucial element was division of labour. Division of labour as a principle preceded industrialization according to Babbage.[50] Babbage advanced an understanding of machines in which their inherent power to change depended upon the system of production and not on the worker or the machines themselves. Science as theory could and should be separated from practice, according to Babbage, as knowledge, like the production process itself, would benefit from division of labour. Babbage wanted to elevate the status of abstract science, which he and the founders of BAAS agreed was dismal. But abstract science is not only a branch of knowledge but also a matter of power in the Foucauldian sense. Those who appropriated the knowledge

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[48] Correspondence to the Society of Arts, *JSA* 1 (1852-53): 80.
[49] Charles Babbage, *On the Economy of Machinery and Manufactures* (1835), 379.
[50] Babbage, *On the Economy of Machinery and Manufactures*, 169 and 173.

of the workplace would also have the power to dominate it. The workplace, rather than being the creator of knowledge, was to Babbage the ideal but dependent partner. In this manner was it attempted to objectify and discipline the science of the common man.

In the Royal Commissioners' attempt to establish an institution of theoretical science, theory was extracted from praxis, not because that would be more effective, but because theory was primary to practice. The lessons of modern industry, as undertaken by the progressive thinkers who surrounded Prince Albert, were not to be found in technology or machines but in mental processes.

The kind of science that Playfair advocated, and that Charles Babbage had advocated before him, subjected industry and machine manufacture to a rationality with parallels to political economy and utilitarianism. The similarity between this type of rationality and the way art was made subject to "principles of design" in the Department of Practical Art is very striking. In both instances, the essence of knowledge was distilled from the practical process and furthered as a theory that could only be learned independent of practice and was superior to the knowledge acquired at the work place.

But it is not sufficient to understand the proposed institute as merely a think tank. The "union of art and manufacture," acclaimed by the Society of Arts in the 1840s, continued to figure in the Prince's plans. South Kensington, as envisioned by the Prince Consort, was not merely to be a place of technical and scientific learning: it would also be a centre of art. The Commission suggested moving the National Gallery to South Kensington. The building in Trafalgar square was not popular and there were concerns that the pollution of Central London might harm the pictures. Placing art in suburban

Kensington provided an opportunity for the Commission to further its goal of a national culture. As with the Great Exhibition, South Kensington would be a centre which the public would be brought to appreciate the role of both art and science. However, mere "appreciation" was not the ultimate goal of these efforts; displaying fine art as well as machinery and manufacture would serve to continue encouraging belief in the values of science and manufacture for the whole country. South Kensington would be a cultural centre, seeking to form and maintain an identity for the British nation in which industry, machinery, art and manufacture all played an important role.

The attempted relocation of the National Gallery to South Kensington was a hard fought battle.[51] The Commission offered a site for the Gallery and a Select Committee on the National Gallery of 1853 accepted the Commissioners' offer of site. However, many disagreed. Even those who might agree that an instructional institution would be a good thing, opposed placing fine art out in the periphery.[52] The *Daily News*, which tended to support education, expressed a quite significant opinion.

> Probably nothing can be better calculated to supply these wants [of improvement in science and art indicated by the Great Exhibition] than the creation of great industrial schools, such as those which it is now proposed to establish, at an enormous public expense; and, therefore, as we trust that we may assume, free of access to the poorest mechanic who may wish to

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[51] The Select Committee on the National Gallery which reported in 1853 accepted the offer by the Commissioners of a site at South Kensington.

[52] The main reasons for moving the National Gallery, as expressed by witnesses to both the Select Committee on the National Gallery (1853) and the Royal Commission on the National Gallery (1857), was want of space and fear that impurities in the air might harm the pictures while those opposed feared that the distance to South Kensington was too great. The Gallery was not moved after the 1853 recommendation because the Select Committee had recommended a commission be appointed to consider the question of combining the artistic and archaeological collection in the British Museum with the National Gallery. That Commission was not appointed until 1857 by which time the government opposed a removal to South Kensington.

> share the benefits of their instruction. But how this object is to be assisted by the presence of the collections now located at Trafalgar-square and in the antiquity departments at the British Museum we are at a loss to conceive. There is a decided line of demarcation between the fine art, properly so called, and the "useful" and merely "ornamental" arts. We do not pretend to deny that high qualities of intellect and taste may be and are required for the right exercise of the latter; but the fine arts begin with *imagination*, which is just the point where the useful and ornamental arts terminate...The people of London must not be robbed of their pictures to decorate some costly workshop out of town.[53]

In other words, there were limitations to the plans for a common culture. Imagination was not for artisans but to be preserved for those who could appreciate it. The pictures in Trafalgar square were not to be considered nationally common but as belonging to "the people" of London who had the proper taste to appreciate them. The same "people of London," who would not travel to a "workshop" in South Kensington to look at *their* pictures, considered useful products to be the appropriate stimulus for the producing classes. In spite of the general praise at the Great Exhibition, culture or fine art was not a solidifier but created barriers between the different classes. The "unions" of manufacture and art or art and science sought for by Cole, the Prince and those who supported their project, strove to bring down these barriers.

Concurrent to the Commission's promoting its surplus scheme were other related discussions about the nature and role of culture. One such discussion concerned the use of the parks in London, and another other, Sunday openings of national institutions such as the British Museum or the National Gallery. There were heated debates in the press

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[53] NAL Archives, Presscuttings, November 1852- October 1853, *Daily News*, December 8 1852.

on these topics. Bishops objected to having entertainment in national parks after military bands entertained visitors to the parks in London on Sunday afternoons in the spring of 1856.[54] A National League for Sunday Openings was formed and petitioned that "visual education would be the most practical means of rendering our working population not only more elevated in artistic taste, but more intelligent as citizens, and in every way better as men."[55] The opponents raised the argument that workers needed to visit church. There were those who thought that the mingling of the classes was not right. According to the *Times*, Edward Baines of Leeds had commented on military bands playing in the park on Sundays, stating that

> The strains of martial music may cause the pulse to bound and fire the imagination, and they are wholly out of accordance with the sacred repose of the Sabbath. It is, however, their fascination which here constitutes their chief danger. Crowds are such to follow them, and among these crowds, arrayed in their Sunday finery, thousands of young girls and young men, with no more than the average amount of vanity and weakness, will be brought into circumstances of extreme peril. At these places I fear, thousands of Sunday scholars will first learn to desert the schools and places of worship, and to enter on the downward path of folly and vice.[56]

One has to remember that in the Crystal Palace the high admission fees had been maintained on weekends. When the South Kensington Museum opened in 1857, it

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[54] NAL Archives, Presscuttings, May 56-May 57. The clippings concerning the band in Kensington Park are from May 1856. The *Times* discussed the Sunday Bands issue in several articles between May 6 and June 2, 1856. On the second Sunday of May, over 200,000 people visited Kensington Gardens, Regent park and Victoria park.

[55] NAL Archives, Presscuttings, Miscellaneous January 55-April 56, *Morning Post*, 17 October 1855.

[56] "The Bands in the Park," *Times* May 14, 1856.

would be the first to offer longer opening hours to cater to the lower classes as well as the more affluent ones. In June 1857, however, the House of Commons inflicted a major blow to the Commissioners' surplus scheme by opposing the relocation of the National Gallery.

Not only was it difficult to claim that fine art was for workers, but it was hard to claim that science was for workers either. Its precariousness had already become clear at the end of 1851 when Playfair was criticized for his undue emphasis on the need for science. Grey urged him to tread carefully.

> You know the interest His Royal Highness takes in this Question, and that he is as anxious as you can be that the present movement in favour of the extension of Science to productive Industry should not be allowed to fall dead. But the mode of best effecting this object requires most careful consideration.
>
> What has just happened to you shows that great danger to be apprehended if any suspicion or alarm should arise in the mind of the Religious World. Eager as the desire for instruction and knowledge may be, with all the increased force which that desire has acquired from the results of the Exhibition, I doubt whether it could enable you successfully to resist a cry of "godless instruction".
>
> Already you have been brought upon your knees, and the question is whether your repentance, however deep and sincere, will avail you. [57]

Unable to immediately build on the success of the Great Exhibition, the Commissioners sought to build support for their scheme through other means, first

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[57] WA, Letters of the Royal Commission, volume IX (1851-1852), no. 30, Grey to Playfair, Nov. 18, 1851.

through a press campaign. Henry Cole had during his campaigns for the reform of the Record Office and the Penny Post used the press to his advantage. In December 1852 Playfair told Grey.

> it is time to act upon the Press. I have already taken steps with regard to the Examiner, Literary Gazette, Illustrated London News and Morning Chronicle, and by Saturday I shall be in possession of information as to how public opinion is likely to go with us. The Societies are dead against us just now, but for that I care nothing... Would you kindly write a note to Cole (as a Suggestion from H.R.H.) asking him to see Mr. Delane or Mr. Morris of the Times. He is known to both and often exerts influence upon that paper and can scarcely refuse to exert it if H.R.H expresses a wish to that effect.[58]

Cole did visit *The Times*, but the paper remained critical of the surplus scheme.[59] Public opinion did not seem to agree with the Commission. It is probably not going too far to label the surplus scheme a failure. The difficulty of promoting science, the lost battle for the National Gallery and an unfortunate partnership with a government preoccupied with war in the Crimea, were probably the main reasons behind this failure.[60] In the end, faced with inactivity and failures, the Commission was left with the option of building support for the work through long-term projects.

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[58] WA, Letters of the Royal Commission, volume X (1852-1853), no. 86, Lyon Playfair to Grey, 5 December 1852. Letter from Cole to Grey, from December 8 states that he will see Morris and Delane. (no. 90).

[59] WA, Letters of the Royal Commission, volume XI, no. 44, Cole to Grey, 4 February 1853.

[60] Prince Albert himself was one of the reasons the Royal Commission did not reach its immediate goals. The importance stressed by Grey of not offending religious interest; Prince Albert's role in the universities; and his unpopularity in some circles; seemed detrimental to the project that the press negatively referred to as Albertopolis. In addition, after 1852, there was a partnership with the government where the Treasury held half of the property under its direction for use by those institutions of art and science that were more immediately dependent on governmental support. This partnership tended to delay any plans especially when the Crimean war commenced. However, both the relocation of the Department of Science and Art to South Kensington in 1856 and the opening of the South Kensington Museum in 1857 were a result of this

One of the lessons learned from the Great Exhibition was that products of art, industry and science were loaded with meaning. James Nasmyth, in answering a Society of Arts circular on industrial education, commented that

> I conceive it to have been in the way that the Great Exhibition must have produced the great and good result, which there can be no doubt it has some: and, as a means of improving the taste and knowledge of the working classes, I know of no more effective mode than this of presenting to their observation well-selected specimens of whatever is excellent in workmanship or design; such objects, with, as before said, printed descriptions appended to each, directing attention to the various points of their excellence, would produce the most gratifying results. The discoveries which would result among the visitors to such exhibitions or museums of manufacture and art, would perform the function of a lecture to perfection, while the vast expense of any staff of lecturers would be avoided. I have more faith in what the eye can do for the improvement of taste, than what enters the ear.[61]

The Commissioners' Second Report published at the end of 1852 announced the commencement of a trade museum.[62] The museum at one point was to have three parts: a collection of raw material and fabrics; a collection of tools, scientific apparatus, models of all kinds, ships, bridges, houses, railways, machines and the like; and a collection of actual machines to be kept permanently at work, as were those in the north-western division of the Crystal Palace.[63]

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partnership. The failure of the House of Commons to move the National Gallery to the site soured the partnership and when the Prince in 1858 asked the Treasury to dissolve the partnership, that was easily agreed to. See also *Survey of London* vol. 38, 60-61.

[61] Society of Arts, *Response to Society of Arts Circular on Industrial Education*, 170-71.

[62] Royal Commission, Second Report, p. 31

[63] WA, Letters of the Royal Commission volume X (1852-1853), item 70, Press clipping from the Athenaeum.

The Commission had already bought items or had items donated from the Great Exhibition which were stored at the Kensington Palace and were to be the nucleus of a Trades collection. The Great Exhibition had achieved its goals through consumer items. The Trades collection was to be a permanent museum with much the same purpose which would hopefully create an interest in science and technology. Its importance was twofold. Firstly, the building of the collection offered ample opportunity to contact producers and gain their support and trust.[64] Secondly, the trade collection became important because the explicit statements that the commission made about their goals and plans met so much opposition. The growing importance of museums was evident in the Commissioners' Third Report, published in 1856. While the Commissioners' Second Report dealt only briefly with the trade museum, the Third Report discussed it in more detail and allotted it much more space. The things collected were now to subtly convey their message. Expressions such as "knowledge of common things" or "Animal Product Collection" replaced the word science. Professor Solly of the Society of Arts, who put together part of the collection, stressed the importance of openness. Manufactures clothed their trade in mystery while "it would be far more to the interest of the manufactures if they were more willing to profit by the experience of others, and less fearful and jealous of the secrets of their craft."[65] The trade collection should by contrast show raw materials and processes from all over the world and illustrate the

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[64] Bowring writes to Grey that the Trade Collection offers the opportunity to make contact with City men. He had written the *Economist*, a paper he felt had much influence on them and Playfair was at the time lecturing in the City. WA, Letters of the Royal Commission, volume XI (1853-54), no. 12, Bowring to Grey 4 January 1853. Albert thought that the failure to achieve their goals as outlined in the Commissioners' Second Report was because "The Prince has not now the industrial classes, in the same way [as during the Great Exhibition], with him because they are not sufficiently advanced...." WA, Letters of the Royal Commission volume XIII, 1856, no. 32, Phipps to Cole, 18 August 1856.

progress of the industry.[66] The Animal Products Collection was briefly exhibited in the spring of 1855 at the Society of Arts' model room in John Adam Street.[67] It would become part of the South Kensington Museum when it opened in 1857 and finally be transferred to the Bethnal Green Museum in 1872.[68]

It is also not surprising that the Commission planned to exhibit machinery too. Machines had been marveled at by most levels of society. The upper classes enjoyed visiting museums and places of entertainment which featured technical wonders. The working classes, it was thought, enjoyed inspecting the machines. And the court of machines had reportedly been one of the most popular at the Great Exhibition. The fact that the private Crystal Palace company had a machine court at Sydenham attests to its popularity.

In the spring of 1853, the *Daily News* revealed that the Commissioners had tried to extend the interest in exhibiting machinery to several industrial centres of Britain.

> It is understood that the Commissioners of Patents, with whom the Board of Trade has entered into communication on the [establishment of a Museum of Inventions], are fully alive to its importance, and that Professor Woodcroft is, under their direction, making every exertion, and with great success, towards collecting such models of inventions and works having reference to them, as may form a nucleus for the contemplated National Museum and Library of Inventions at Kensington. Temporary accommodation will be provided by the

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[65] Edward Solly, "The Mutual Relations of Trade and Manufactures," *Journal of Society of Arts* 2 (1854-55): 492.

[66] Solly loc.cit.

[67] In 1855 after the exhibition at the Society of Arts there was some uncertainty what would happen to the collection. Paxton had offered to take over the collection and move it to Sydenham. NAL, Cole Collection, Correspondence box 15, Playfair to Cole, 12 July 12 1855.

[68] The next chapter will discuss the South Kensington Museum and its collections in greater detail

Patent Commissioners and by the Royal Commission, until the question of the erection of an appropriate building for the due display of the collection is decided.[69]

Prince Albert had contacted Bennet Woodcroft, now Assistant Commissioner of Patents having previously been Professor of Descriptive Machinery at the University College, at the end of 1852.[70] Woodcroft, also a member of the Society of Arts, had collected models for quite a time and bought up part of the collection of models that the Society disposed of in 1850.[71] Woodcroft, himself of manufacturing background, would contact manufacturers and attempt to form local committees in towns that would work towards the formation of a Museum of Inventions.[72]

As with the trade collection generally, the planned museum of invention was a platform from which to create connections and build support. The same strategy had been successfully used before the Great Exhibition when Henry Cole and Scott Russell had traveled around encouraging the formation of local committees while gathering support for the Exhibition.

In addition to animal products, it seemed that the collections of minerals at the Museum of Geology, plants in the botanical garden in Kew, and ornamental art at the Museum of Manufacture in Marlborough House, were to accompany the display of inventions at the Trades Museum. To build the collection, the Commission would

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[69] NAL Archives, Presscuttings, 1852-53, *Daily News*, 3 May 1853.
[70] On Woodcroft see John Hewish, *The Indefatigable Mr. Woodcroft: The Legacy of Invention* (London: British Library, 1980).
[71] WA, Letters of the Royal Commission volume X (1852-53), no. 99, Minute of Conversation between the Prince and Professor Woodcroft concerning a Patent Museum and the Education of Manufacture, 29th Dec, 1852.
[72] Hewish, 20.

utilize the Society of Arts primarily because of the lack of resources and manpower available to the Commission,[73] but also because the Society of Arts seemed to retain a better reputation than had the Commission.[74] In spite of the fact that some members of the Society thought they had a claim to some of the Exhibition surplus and therefore did not want to cooperate with the Commission, several projects important to the Commission were initiated by the Society.[75] The Society of Arts helped establish the Patent Museum by launching a search for pictures and paintings of famous inventors "whose inventions have had an important and beneficial effect in improving the condition of the people generally, and in advancing science, and in whom, consequently, all should feel an equal interest."[76]

Before the Great Exhibition, the Society of Arts had largely encouraged art, industry and commerce by awarding prizes and by disseminating information through meetings and speakers. After Cole had become a major influence in the Society, it had concentrated on fostering a union of manufacture and art to heighten the taste of British production. After the Exhibition, the Society would again change its direction, becoming increasingly interested in education of the lower classes. One of the contributors to the *Journal of the Society of Arts* argued that "by encouraging education ... the Society assists in cultivating the very soil from which springs every rational enterprise; in arousing the spirit that inspires all invention, and animates every

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[73] WA, Letters of the Royal Commission, volume XI, no 12, Bowring to Grey, 4 January 1853.

[74] The Second Report suggested a partnership that the Society of Arts agreed to and Solly commenced by putting together a collection of Animal Products. Correspondence between Solly and Bowring to that effect published in *JSA* 1 (1852-53): 306.

[75] The Society started building up the Animal Products collection in the summer of 1853 (See Report by Solly *JSA* 2 (1853-54): 521-524. A circular listing items of interest sent to the Institutions in Union by Solly included bats, guano, beetles' wings and crabs' eyes. *JSA* 2 (1853-54): 363.

[76] Letter from Grey to the Council of the Society of Arts printed in *JSA* 2 (1853-54): 106.

department of art and industry."[77] And in defending the turn to education, a sub-committee reported that "considering how immediately the spread of scientific and artistic knowledge, especially among adults, must tell upon the quality and character of our manufactures it appears that any practical means which can be devised for the spread of such knowledge comes quite within the object which the society is incorporated to promote."[78]

The Society was in this period led by Henry Cole, who was anxious that the Commission's decision to cooperate with the government might backfire. Cole's own projects were dependent on a good relationship with the Prince, whose favours Cole often sought and obtained, and he did not hesitate to work to create voluntary support for the Commission's project. The Society of Art became in the period up to 1860 a sounding board for the Commission's projects. Many of the important personalities, such as Playfair, Cole, Prince Albert and Bennet Woodcroft were active in both areas. Being a private organization, it had more leeway in trying out new ideas. Lyon Playfair wrote quite enthusiastically to Phipps about a survey the Society was undertaking on education that he believed might prove very useful for the commission.[79]

The Society of Arts also recruited two very influential members in Harry Chester and William Booth who were both highly interested in education. While Booth was a champion of examinations, Harry Chester was a public servant working as an assistant-secretary under James Kay-Shuttleworth on the Committee of the Privy Council on Education. He was one of the founding members and the President of the Highgate

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[77] M.A. Garvey, "Education, as a Science and an Art," *JSA* 2 (1853-53): 114.
[78] Society or Arts, Minutes of Council, 13 February 1852.
[79] WA, Letters of the Royal Commission volume XI, no. 33, Playfair to Phipps, 28 January 1853.

Literary and Scientific Institution, and hoped that education might bring about social harmony and disarm the threat of Chartism.[80] He suggested in a letter to the society in November 1851 that the Society of Arts could serve as a central body connecting the various Mechanics' Institutions. Shortly afterward, he became a member of the Society and became Chairman of the Council in 1853.

In order to sound out opinions about education and initiate the union of Mechanics' Institutions, the Society created a committee "to take into consideration, and to report how far and in what manner, the Society of Arts may aid in the promotion of such an education of the people as shall lead to a more general and systematic cultivation of arts, manufactures and commerce."[81] The Council minutes (RSA Archives) from 1853 indicate that Lyon Playfair also worked on the committee. The circular reassured readers that by industrial instruction the committee would "not mean to indicate a system which would substitute the school for the workshop, or the college for the factory. They would never accept attendance at a lecture session in lieu of an apprenticeship. They believe that the practice of an art, or the manipulation of a trade, are best learned as realities as the stated occupation of everyday life."[82]

The union became a reality in July 1852, and annual meetings took place to attempt to form a common strategy.[83] There is a possibility that the union of Institutes

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[80] J.S. Hurt, "Harry Chester (1805-68) (I): The Early Years," *Journal of the Royal Society of Arts* 116 (1968): 156-160.

[81] Society of Arts, *Report of the Committee appointed by the Council of the Society of Arts to inquire into the Subject of Industrial Instruction.*

[82] Society of Arts, *Report of the Committee ... to inquire into the Subject of Industrial Instruction.*

[83] On the Union, see A.D. Garner, "The Society of Arts and the Mechanics' Institutes : The co-ordination of endeavour towards scientific and technical education, 1851-1854," *History of Education* 14 (1985):255-262; and W.B. Stephen, "The Society of Arts and the Warrington Mechanics' Institution" *Journal of the Royal Society of Arts* 111 (1963): 240-3, 420-4.

was to prepare for the Instructional Institute planned for the Gore estate. The Second Report of the Royal Commissioners made explicit mention of the Union and listed all the institutes and societies (over 200) that had joined up to that point.[84] When the Department of Science and Art was announced, the *Journal of the Society of Arts* published letters that at least discussed the possibility of converting the members of the Union into Government managed schools.[85] Playfair, one of the co-secretaries of the new department, visited mechanics' institutes and brought up the possibility of some kind of cooperation.[86] However, even though the Department of Science and Art and the Royal Commissioners might have contemplated scooping up the Mechanics' Institutes into the new Department, there seems to have been considerable resistance to government influence within the Union. During the Second Conference of the Institutes, held in June 1853, it was made clear that any direct influence from the Government was out of the question, but it seemed that Playfair and Cole were both eager to provide materials for industrial instruction.[87] At a dinner hosted by Earl Granville following the conference, Playfair made it clear that what mattered was the wish to introduce science into elementary education.[88]

The Society of Arts also lobbied the government for another project dear to Henry Cole, namely the reform of the patents laws. The patent laws had been debated

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[84] Second Report, p 12. Appendix D lists the institutions in union with the Society of Arts.
[85] Excerpt from *Liverpool Mercury* published in the *JSA* 1 (1852-53): 332.
[86] The excerpt from the *Liverpool Mercury* mentions a visit by Dr. Playfair. *JSA* 1 (1852-53) 333.
[87] Letter in the *Liverpool Mercury* quoted above is strongly disapproving of any government control. Possible assistance from government and the Department of Science and Art is mentioned at the meeting (352), but the speakers who brought up the issue seemed to be adamant about the importance of keeping an independence for the Unions. *JSA* vol. 1(1852-53): 341-355.
[88] Speech by Playfair quoted in *JSA* 1(1852-53): 355-6.

for several decades.[89] The Society of Arts had a Committee for the Legislative Recognition of the Rights of Inventors whose First Report was published as an appendix to the report of the 1851 Select Committee of Patents.[90] Thomas Webster, the London patent attorney who had been reelected to the council after being excluded in Cole's coup of 1850, Henry Cole, and Bennet Woodcroft gave evidence to the Select Committee of 1851. The Patent law was amended in 1852 and provided for the appointment of commissioners and the establishment of routine administrative procedures. This would make it easier to pay for patents and give security to the inventor from the first day of application. The Patent law would, however, continue to be controversial. The Society Arts had argued for, and the new law allowed for, protection for inventions. Some opponents of the Bill argued that Patents equaled monopoly and should be abolished.[91] There were many arguments on both sides of the issue,[92] but the one of particular relevance to this discussion was the belief that protection for inventions would ensure openness. One defender of the patented invention argued that

> The secret invention is as much a monopoly as any patented invention or more so with this single difference, that the one must inevitably revert to the public, which the other , whatever may be its values, is in a position to die with the inventor. And indeed there can be no doubt

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[89] Moureen Coulter, *Property in Ideas: The Patent Question in Mid-Victorian Britain* (Kirksville, Missouri: The Thomas Jefferson University Press, 1991).
[90] Select Committee on the Patent Law Amendment Bill and Patent Law Amendment (No. 2) Bill. P.P. (1851) XVIII, Appendix C and D.
[91] See Victor M. Batzel, "Legal Monopoly in Liberal England: The Patent controversy in the mid-Nineteenth Century," *Business History* 22.2 (1980): 189-202.
[92] Coulter, chapter 3.

> that the advancement of many branches of manufactures has been materially retarded by the discouragement generally given to secret inventions.[93]

The disadvantages of secrecy were pointed out by both Cole and Webster in front of the 1851 Select Committee on Patents.[94] Their concern was not unfounded. The government had had to put in place patent protection before the 1851 exhibition because so many manufacturers were unwilling to put their goods and machinery on display. The advantage of patent protection, as of other projects that Cole was involved with, was clear as he was under the impression that many manufacturers tended to protect their new inventions and improvements by being secretive. He believed, as did the author quoted above, that patents allowed for more openness among manufacturers and therefore increased their incentive to participate in educational projects of the nature that Cole advocated. The lack of a good patent law for designs and inventions provided those who held the work place to be the main site for invention with one more argument. In 1852, the Society started to publish *Premium Lists*, which contained information about manufacturers and products competing for prizes, and trade reports with statistics and other information collected from businesses.[95] The Society had at this point thirty standing committees each representing one of the categories at the Great Exhibition. And one of the acknowledged purposes of the list was to bring "the various Committees

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[93] Cited by Coulter, 93 from Henry Dicks, *Patent Monopoly as Affecting the Encouragement of Improvement, and Progress of Science, Arts and Manufactures* (London, 1860).
[94] Q &A 42, 1851.
[95] See *JSA* 1 (1852-53): 2 and Society of Arts, *List of Trades, or Distinct Branches of Industry Carried on in the Metropolis, Divided into the Thirty Classes Adopted by the Royal Commissioners for the Exhibition of 1851* (London: Society of Arts, 1852).

into direct contact with the producer, the person whom it is desired to assist, and from whom mainly any useful information can be obtained."[96]

Those who at this time advocated science education believed in the name of division of labour that knowledge would best progress if it was transferred from the workplace to institutions. In order to achieve this goal, the Commission thought it necessary to keep a constant pressure on manufacturers. It was in this class, in particular, that the Commission saw the key to ensuring the success of their plan.[97] Ensuring that patent laws were maintained to make it easier to be open about inventions and new designs was not enough. It was therefore necessary to keep exhibiting machinery and products of machines as proof of the correctness of their argument. When Prince Albert met with Bennet Woodcroft at the end of 1852, it was clear that the manufacturers were the primary concern of the planned museum of exhibited machinery

> H.R.H. questioned Professor Woodcroft very closely as to his opinion on the probable advantage to be derived from the adoption of the Plan hinted at by the Exhibition Commrs., to have a place where models of new inventions might be deposited and preserved ....
>
> Professor Woodcroft thought the importance of such a plan could not be over estimated, and fully confirmed, what H.R.H. stated he had before heard, that our Manufacturers, even the greatest of them, were, as a Class entirely ignorant of the principle and nature of their own work - given as an instance, his opinion that the Manufacturer of the Articles themselves, could not explain the difference between a Twill and a Satin, or what caused the difference.

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[96] Cole Collection, Miscellaneous 7, *List of Trades*.

[97] Confer WA, Letters of the Royal Commission volume XIII, 1856, no. 32, Phipps to Cole, 18 August 1856, "The Prince has not now the industrial classes, in the same way [as during the Great Exhibition], with him because they are not sufficiently advanced..."

> HRH was anxious to ascertain how far the proposal of the Commissioners would meet with the favour and support of the Manufacturers - and Professor Woodcroft undertook to ascertain this privately.[98]

Machines and products of machines were to sell the ideas of the new "unified" industrial culture where logic had not prevailed. Machines were rhetorical tools to establish a unified industrial culture. The Society had held annual exhibitions of machinery in its house on John Adams Street and Cole favoured the establishment of a national institution where patented inventions would be deposited and exhibited.[99] Exhibitions were a means of exposure -- to ensure openness and facilitate the transfusion of information.[100]

The Patent laws were to provide the right conditions to ensure manufacturers' cooperation; the exhibition of machinery and industrial products were to provide the rhetoric; and the establishment of the Union of Institutions by the Society of Arts would attempt to rationalize and standardize education for those artisans or members of the lower middle classes who were involved. The Department of Science and Art was another educational project which, by promoting rationalized and standardized programs, sought to discipline knowledge and thereby enable the transfer of power to central institutions.

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[98] WA, Letters of the Royal Commission volume X, no. 99, Minute of Conversation between the Prince and Professor Woodcroft concerning a Patent Museum and the Education of Manufacture, 29 December 1852.

[99] Chairman's (Henry Cole) report to the Council *JSA* I (1852-53): 4.

[100] The *Journal of the Society of Arts* argues that if a collection of models of all inventions could be gathered it would "afford a ready means of ascertaining what had previously been done in any given direction." JSA I (1852-53): 593.

The Department was established in an effort to create long term support for the Exhibition surplus scheme. An 1852 working draft by Charles Trevelyan and Stafford Northcote of the Board of Trade and Henry Cole about the proposed new department, argued that in light of "Public attention having recently been directed to the importance of cultivating a national acquaintance with science and art in their relations with industrial pursuits, it has been determined to establish a system of education calculated to awaken a general interest in the pursuit of these branches of human knowledge, and to give facilities for their acquisition."[101]

Even before the creation of the Department of Practical Art, there were ideas that a scheme similar to the Design schools could be tried for industrial instruction. In August of 1851, Playfair had written Henry de la Beche, his superior at the School of Mines, and told him that the Schools of Design "might be centres of education, to which other branches were to be attached."[102]

On his travels, Playfair seems to have solicited opinions about such a scheme. In November 1851, he wrote from Sunderland that he found the interest in schools of industry growing:

> Yet I believe that these efforts will produce dead-born offspring because there is no official person to make a Movement at the right time by turning it in a practical direction and encouraging the voluntary efforts now arising. The Council of Education is not the body, its sympathies not being in this direction.

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[101] Henry Cole Collection, Miscellaneous X, Draft by Northcote and Cole, 31 March 1852 entitled *Report on the Department of Practical Science and Art.*

[102] Playfair to Sir Henry de la Beche, August 20th, 1851. Cited in Reid, 134-5.

> The more I think of it the more am I convinced that the Schools of Design could be put into efficiency as the first Step to enlist the Sympathies of the Provinces, without which no large Movement in favour of Industrial Education will succeed, and without which a Central Institution will languish and ultimately die of a Decline....[103]

By the end of 1852, after their plans had been published and when it was clear that establishing an amalgamated institution on the Gore Estate would prove difficult, Playfair revived his ideas about using the Schools of Design, now the Department of Practical Art, to further science as well as design. Prince Albert had already mentioned something similar to Cole earlier in the year when Cole visited him to discuss the Department of Practical Art. According to Cole's diary, Cole visited the Prince with Bowring, who was secretary to the Royal Commission, and the Prince asked Cole "Was I quite in earnest abt the Sch of Design. Would I work to connect it with his proposed Institute. He wd assist in lending Marlborough House."[104] Playfair wrote Grey in December and proposed a new Department to be headed by Sir Henry de la Beche, with Playfair as a "worker."[105] When Bowring later discussed this scheme in a letter to Grey, he made clear that he thought a Department of Practical Science would work wonders in gaining support for the Surplus Scheme.[106] When the new Department was established, with Cole and Playfair as joint secretaries, it was established as a result of incremental problems faced by the Royal Commission.[107]

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[103] WA, Letters of the Royal Commission volume IX, no. 29, Playfair to Grey 18 November 1851.
[104] HCD, February 19, 1852.
[105] WA, Letters of the Royal Commission volume X, no. 97, Playfair to Grey, 12 December 1852.
[106] WA, Letters of the Royal Commission volume XI, no. 12, Bowring to Grey, 4 January 1853.
[107] In a letter to Cole, Phipps reminded Cole that "You will remember that your own & Lyon Playfair's opinion was that we have hardly brought up the education from the bottom to a state in which it would bear the superstructure of the Commissioner & the Prince's more immediate plan." WA, Letters of the Royal Commission volume XIII, no. 32, letter from Phipps (copy of) to Cole, 18 August 1856.

While Cole would be responsible for the art section, Playfair's main responsibility was to care for the institutions that now came under the Department: the Schools of Mines, the Royal College of Chemistry, the Museum of Practical Geology, the Geological Survey of the United Kingdom, the Museum of Irish Industry and the Royal Dublin Society. The new arrangement caused many problems.[108] Sir Henry De la Beche was opposed to having someone else head the Schools of Mines and this caused a rift between Playfair and his previous chief.

Yet, caring for these institutions was not the main goal for Playfair when he became secretary for the Department. He envisioned the creation of scientific institutions paralleling the schools of design in the provinces and industrial centres. Cole, Northcote and Trevelyan had noted that while the goal was to encourage an interest in scientific instruction, "The mode in which it has been proposed to attain these objects is, the encouragement of schools of science and art in all parts of the country in which an interest can be roused, and the establishment of central institutions in the Metropolis."[109] However, that did not happen. The local initiative needed for such measures was not there initially.[110] In 1859, there were only four science schools under the Department.[111] The Department would seek other ways to promote science

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[108] Cole's diary alludes to some of them. On January 6, 1854 Cole wrote that "P [Playfair] said Jermyn Street Professors thought the Training Class a conspiracy against them on our part." Some days earlier (on the fourth) Cole noted that De la Beche had objected to the use of the Theatre for distributing medals. In the summer of 1854 Cole handed in a resignation and Playfair seems to have also threatened to leave.

[109] Henry Cole Collection, Miscellaneous X, Draft by Northcote and Cole 31 March 1852 and entitled *Report on the Department of Practical Science and Art.*.

[110] Cole notes several times in his diary during 1854 that Playfair thinks the science part of the new department a failure. On August 4, 1854, Cole notes "Chadwick came & discussed Playfair's offer to take the Secyship of Bd of Health. Playfair sent letter to Cardwell offering [to resign] on three grounds. 1. Cardwell's speech in Com: on Estimates: 2. Treasury report 3. Hopelessness of progress in Science." On November 17, Cole writes that "Playfair said Cardwell admitted that Science was a failure."

[111] F.E. Foden, "Technical Examinations in England," *Paedagogica Historica*, 6.1 (1966): 75.

education. Playfair left the Department in 1858 for a university post in Edinburgh but had already started planning to make examinations a primary priority for the Science division of the Department. A full system of examinations was offered in 1860.[112] To make this financially viable, the Department instituted the "payment on results" scheme, whereby teachers were paid according to how many of their pupils passed exams. In addition to supervising the exams, the Department would also educate most of the science teachers.

Examinations for the general public were initiated by the Society of Arts. At a time when national examinations were rare, The Society of Arts inaugurated an examination system when it held their first successful examinations in 1856 for fifty-two candidates.[113] Harry Chester, who strongly believed in the role of self-improvement as a socially cohesive force, had been one of the driving members who suggested that the examination system be tried. The Reverend James Booth, who suggested the founding of the *Journal of the Society of Arts* and was elected member of council in 1852, had since the mid 1840s been "almost obsessed by the idea of examinations."[114] A possible third inspiration was James Hole, an honorary member of the Yorkshire Union of Mechanics' Institutes whose Society of Arts Prize Essay, *On the History and Management of Literary, Scientific, & Mechanics' Institutions* of 1853, suggested that the most efficient way of turning the Institutes towards their original purpose of self-

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[112] Michael Argles, *South Kensington to Robbins* (London: Longmans, 1964), 20-21.

[113] Examinations were offered in Mathematics, Book-keeping, Mechanics, Chemistry, Physiology, Botany, Agriculture, Geography, English History, English Literature and Composition, Latin and Roman History, French, German, and Free-Hand Drawing. By 1869 there were 36 subjects and 2,315 candidates entered. F.E. Foden, "Technical Examinations in England , 72-73.

[114] F.E. Foden, "The Reverend James Booth and the Genesis of the Society's Examinations" *The Journal of the Royal Society of Arts* 118 (1970), 646.

improvement for the lower classes would be to institute examinations.[115] Examination was in its infancy at this time, but grew in acceptance in the 1850s. The Education Department held examinations for teachers and school masters. The Civil Service Commission was just set up in 1855 to supervise a system of limited competitive entry into the lower grades of the Civil Service.[116] Jeremy Bentham had recommended the testing of public servants by an "Examination Judiciary" and has been argued to be an inspiration behind the examination thinking of the 1850s.[117]

The ideal of Bentham and the Civil Service Commission was to ensure high quality candidates for state service -- to foster merit over privilege. Interestingly, the reasoning for instituting the exam scheme among the lower classes was similarly argued. Exams would not only renew the teaching purpose of the Mechanics' Institutes by stimulating the lower classes "in the cultivation of their minds after the labour of the day,"[118] but by being encouraged to obtain certificates they would prove their willingness to be included in civilized society. Harry Chester of the Society of Arts thought that while the upper classes had a diploma from a university to indicate their abilities to take part in the running of the country, a certificate from the Society of Arts examination would show the workers' ability to compete in the labour market.[119] J.W. Hudson, in his 1853 publication *The History of Adult Education*, argued that individual

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[115] James Hole, *An Essay on the History and Management of Literary, Scientific, & Mechanics' Institutions; and Especially How far they may be Developed and Combined so as to promote the Moral Well-Being and Industry of the Country* (London: Longman, Brown, Green, and Longmans, 1853; reprint London: Frank Cass, 1970,) 62-63.
[116] J.S. Hurt, "Harry Chester (1806-68): (ii) The Middle Years," *The Journal of the Royal Society of Arts* 116 (1968): 262-264.
[117] Jeremy Bentham, *Constitutional Code*, volume I, eds. F. Rosen and J.H. Burns (Oxford: Clarendon Press, 1983), p. 316 (IX.16.A17). F.E. Foden, "Technical Examinations in England," 71-72.
[118] Harry Chester to the Select Committee on Civil Service Appointments Q &A 4104. PP (1860), IX.
[119] Ibid.

man lived in a savage state "but placed in a large assemblage of superior minds, he is acted upon by spiritual influences."[120] Thus, while the obtained certificate did not necessarily make the workers more qualified in their fields, it indicated a willingness to obtain general values and operate within the general rules of "civilized" society. Exams for the people did not only indicate the level of learning of the different candidates: their role as functional selectors was insignificant compared to their perceived role as social regulators.

However, as far as the Department was concerned, the importance of examinations did not lie primarily in their moral and civilizing value. With the failure of the establishment of local science schools, examinations of adults were to be the means to bring scientific topics to the public. Lyon Playfair wrote in 1857 that "the first requirement in the education of the working man is ... to explain to him the natural laws upon which his labour depends."[121] In Playfair's mind, the purpose of knowledge was to enable the worker to understand the theoretical framework of his daily existence. Both the Department and the Society of Arts held examinations on theoretical topics rather than technical or practical ones. Knowledge, as promoted by the Department of Science and Art, held theory superior to practice.

In 1859, approved assistance was given to Practical and Decorative Geometry (involving Machine and Mechanical Drawing and Building Construction), Physics, Chemistry, Geology, Mineralogy and Natural History. In 1864, the Department added

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[120] J.W. Hudson, *The History of Adult Education*, new impression (New York: Augustus M. Kelley, 1969), 26.

[121] Lyon Playfair, *Introductory Address (no. 3) on Scientific Institutions in Connection with the Department of Science and Art* (London: Chapman, 1857), 19.

Mathematics, Navigation, Nautical Astronomy, Steam and Physical Geography. Principles of Agriculture were added in 1876. Over time, chemistry and physic were divided into subcategories. The most popular subjects were physics, mathematics, chemistry, and hygiene after it was introduced as the last subject in 1883. Since examiners' assistants were expected to mark 12 papers an hour, questions had to allow for few deliberations and straightforward answers.[122]

Examinations were a means of standardizing what is useful and required knowledge, and were therefore an excellent disciplinary force to establish this kind of truth. As suggested by Foucault, and argued more explicitly by others, examination relying on objectivity and measurement is inextricably interwoven with modern science and its techniques.[123] The Department could therefore, when adopting the practice by the Society of Arts, use this system not only to promote scientific topics but also to promote scientific techniques. Moreover, examinations not only established truths, but established the Department as a originator or guarantor of truth. In the period before state intervention became accepted, examination created a role for the state in science education and circumvented some of the difficulties involved.

Thus, the values of industrial society, as understood by Babbage, Playfair and Prince Albert, could successfully be communicated and imbued by general examinations. If the primary role of an Industrial Institute was to separate the

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[122] Harry Butterworth, "The Science and Art Department Examinations: Origins and Achievements" in *Days of Judgment: Science, Examinations and the Organization of Knowledge*, ed., Roy MacLeod (Driffield, N. Humberside: Studies in Education Ltd, 1982).

[123] Foucault, *Discipline and Punish*; Keith Hiskin, "Examinations and the Schooling of Science," *Days of Judgment*, 213-236; M.F.D Young, "The Schooling of Science, in *Explorations in the Politics of School Knowledge*, eds. G. Whitty and M.Young.

knowledge of modern industry from its practice or the workshop, the introduction of science exams in the Department of Science and Art was an important step in that direction. Examinations were the practical way to carry out the measurements called for by Babbage and Playfair. To successfully distribute theoretical scientific knowledge was a means of establishing a dominant discourse on industrial society.

Examinations tapped into the feeling of self-reliance and independence while at the same time imposing disciplining measures on the working population. Exams would for the next few years be equivalent to consumer goods as a means to impose a value system on the population. Exams would be what the public would voluntarily digest in an attempt to enrich themselves while the authorities ensured that they were well made to ensure the wanted result. The drawback of the system was that it was voluntary. The relative number of candidates was small and only grew rapidly in the last three decades of the century. In November of 1864 and 1865, when twenty-three subjects were offered, 3644 and 4592 candidates were examined. The Department held two examinations a year at this time. In these two years, inorganic chemistry, animal physiology and descriptive geometry were the most popular subjects.[124] While the numbers were not significant, the strategies were put in place at a time when organized state education was in its infancy. The state, through this Department, could have a personal impact on individuals of a magnitude that it is hard to measure. Receiving a diploma from the school for art or science put a visible manifestation of the state in their hands, perhaps for the first time.

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[124] Appendix B to Thirteenth Report of the Department of Science and Art, 1866, 38-39.

The experiences of the Commission of 1851 and their surplus scheme show the difficulty involved in constituting a new industrial culture in which science played a more prominent role.[125] As the plans for a central institution failed, attentions shifted toward encouraging the growth of industrial society by focusing attention on the lower classes, encouraging lectures, distributing reading material, and holding examinations in different fields. The motivations for the Department of Science and Art were different from those of the Mechanics' Institutes which focused on the self-improvement of the working classes. Underlying their efforts was the belief that the nation's health and developmental potential depended on the reliance on common belief and common perception in a value system that favoured order and rationality. There is a clear parallel to the belief expressed in the Department of Practical Art that the health of the nation depended on a strong common culture where industrial production enforced values of rationality and functionality in consumer products. The Department was dissolved in 1902 but by that time a state system was in place which included specialized institutions, grammar schools, technical schools and universities. In the 1850s and early 1860s, art and science convened in one department to define the role of the workplace and met in an effort to build learned institutions that would give a theoretical framework to industrial production.

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[125] The Society of Arts had always had to work hard to convince manufactures and inventors about openness, something alluded to when the planning of the fifth annual exhibition inventions were to take place. *JSA* 1 (1852-53): 593. These exhibitions would cease in the mid 1850s due to lack of interest.

CHAPTER 5
CONSTRUCTING AN INDUSTRIAL CULTURE: THE SOUTH KENSINGTON MUSEUM AND THE DISPLAY OF SCIENCE

The popular arrangement, and the instruction given viva voce is what gives a vital power to this new method of study. We have long perceived that merely allowing crowds to pass through rows of glass cases produces but little effect; but when the attention is roused by the easy communication of knowledge, and the desire for information is awakened, then the happiest results follow, and the wonders of art and nature are no longer a mere show, but kindle that animated intelligence which produces the noblest moral and intellectual results. Viewed thus, the opening of this museum must be considered an important epoch for the people (The Advertiser, June 22, 1857)[1]

The commencement of this "important epoch for the people" took place at the end of June 1857 when the South Kensington Museum opened after several years of planning and construction. It was placed on the 1851 Commissioners' property in South Kensington and housed in an iron and glass building that became known as the "Brompton Boilers." The Commissioners' property at this time also housed the Department of Science and Art and the Metropolitan School of Art. Henry Cole, the secretary of the Science and Art Department, who in the 1840s had undertaken to unify art and manufacture, was the director of this new museum.

[1] NAL Archives, Presscuttings, Misc I March 56-Febr 59, *The Advertiser* 22 June 1857.

While calling its opening a commencement of an epoch might be an exaggeration, the South Kensington Museum was an important part of the efforts to construct an industrial culture which included science, art and machinery. It became a visualization of the policies of the Department of Science and Art. When the museum opened in 1857, it had seven main collections. In addition to ornamental art, and the Sheepshanks collection of British art, the museum housed a set of exhibits reflecting the ambitions of members of the Royal Commission to construct science within the realm of culture to make it more palatable to the people. The trade collection had two sections: the Animal Products section, which Edward Solly of the Society of Arts had assembled; and the Food Collection which was put together using the latest theories on the connections between food and energy. The Education Collection consisted of books and apparatus from the 1854 Society of Arts education exhibition. In addition to these main exhibits, the Archaeological Collection and the Building Collection were included primarily to improve taste and impart knowledge of new materials. The Economic Museum was an interesting assortment of household items assembled primarily for the lower classes so they would learn how to best get by with limited means and still keep clean and healthy. The building also hosted the Museum of Patents.

But in spite of the great variety at South Kensington, the museum was no curiosity cabinet; it presented the familiar in a new setting. And in sharp contrast to the Crystal Palace exhibition, the setting was not wondrous but a disciplinary one. In fact, the order was primary to the objects in the museum. In explaining how the museum worked, Cole wrote:

> Models of patented inventions, specimens of animal produce, architectural casts, objects of ornamental art, and sculpture, cannot be arranged as closely as books or prints in a library. They require to be well seen in order to make proper use of them; and it will here be a canon for future management that everything shall be seen and be made as intelligible as possible by descriptive labels. Other collections may attract the learned to explore them, but these will be arranged so clearly that they may woo the ignorant to examine them. The Museum will be like a book with its pages always open, and not shut. It already shows something like the intention which it is proposed to carry out. Visitors may see in the system of labeling, especially in the Animal Collection, how instructive everything may be made. What would be otherwise passed unheeded or despised thus becomes a subject of interest.[2]

And woo to examination was what the museum did. It was the familiar that the visitors came to see. Henry Cole explained to one of the many government committees to which he gave evidence that many women came to South Kensington with their babies to measure the babies' toes against those of a statue in the museum.[3] And this is in essence what the museum was all about. It aimed to establish an authority on the familiar.

A primary feature of this new museum was its accessibility. The museum sought to attract the uninitiated. It was free three days a week, it had long opening hours, and it would become the first to use electrical lighting. It had refreshment rooms, omnibus service and, in time, a train station. Though arguments had been made that the distance from central London to the Brompton area would be too great for the museum to be

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[2] Henry Cole, "The Functions of the Science and Art Department," No 1 of a series of *Introductory Lectures on the Science and Art Department and the South Kensington Museum.* London: Chapman and Hall, 1857, p 16. (Here cited from the proof in NAL. Cole Collection, Miscellaneous 10).

[3] Cole before the Select Committee on the Patent Office Library and Museum 1864, Q & A 2407.

popular, people flocked to it. In 1858 over 450,000 visited the museum and the numbers for 1859 were over 475,000.[4] In spite of its location, more people visited the South Kensington Museum than the British Museum or the National Gallery which were more centrally located. Judging from reviews and simultaneous attendance counts, most interest was in the art collection -- ornamental art and the collection of pictures in the Sheepshanks Gallery -- but there was also considerable interest in the science collections.[5]

Though machines proper could only be perused in the Patent Museum, also located at South Kensington, the South Kensington Museum was an industrial museum. On the one hand, industrialization was made palatable to the viewer. In a clean, well-lit atmosphere of rational amusement, the viewer could study the manufacture and the end products of industry devoid of its noise, smell and social effects. And on the other hand, it sought to leave an impression of modern society in which science played a primary role. The primary feature on display was knowledge as understood by the contemporary scientists and design theorists. It was not to be a place where you went because you wanted to indicate refinement, but to partake in a learning process. Thus, while in the Crystal Palace machinery had been prominent both in the space it occupied and because of the noise of the running steam engines, the South Kensington Museum repressed the

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[4] *Guide to the South Kensington Museum*. No 9 Oct, 1860. NAL.

[5] A simultaneous registration was taken in 1859 counting how many people were in the different sections of the museum.

Art Section	256
Education Collection	140
Sheppard Collection	201
Architectural Collection	76
Food and Animal Collection	284

Select Committee on the Patent Office Library and Museum, 1864. Q & A 2403.

role of the machine considerably. Here it was process that was on display. The motor was not the machine but the rational system of production and the science that smoothed and fueled it.

By presenting familiar objects of industry as signifiers within an artificially created institutional framework, the museum underlined their irretrievable otherness, their separation from the world of lived experience.[6] The objects were classified into a new order and received significance from order imposed by the museum rather than familiar daily life. Hence, the baby's foot would only receive its worth and relative value in comparison with the artificial one. The work of a museum like the South Kensington Museum was done once its public compared their non-institutional surroundings to the model they had seen in South Kensington.

When the museum opened, such institutions were already a prominent feature in Western civilization where art and artifacts as well as collections of nature such as in the Botanical gardens or the Museum of Geology were exhibited. In Britain, the state ran art and historical or ethnological institutions like the British Museum which was the first such state-run institution open to the public. Museums displaying the wonders and work of the new system of production were also relatively prevalent.[7] Nevertheless, in his work *The Birth of the Museum*, Tony Bennett, an historian who has written extensively

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[6] For similar arguments see Daniel J. Sherman and Irit Rogoff, eds., *Museum Culture: Histories, Discourses, Spectacles* (Minneapolis: University of Minnesota Press, 1994).

[7] In Britain there were private museums and galleries that displayed machinery and technical wonders. The Society of Arts had a collection of models available to the audience. Some of the Mechanics' Institutes displayed machines. The French Académie des Sciences collected machinery from the end of the seventeenth century. In Sweden, a museum with a collection of machines, the Swedish Royal Model Chamber, came into being in 1748. Eugene S. Ferguson, "Technical Museums and International Exhibitions" *Technology and Culture* 4 (1965): 30-46. However, Altick argues in *Shows of London* that by the mid-nineteenth-century, the more utilitarian museums displaying technology and science were facing problems due to waning public interest.

on the role of the modern museum, considers the South Kensington Museum as the first such public institution to seek to attract the lower classes and to have served as an inspiration for the relenting British Museum which finally in 1883 "embarked on a programme of electrification to permit evening opening."[8]

Bennett, though inspired by Foucault, draws mainly on Gramsci's theories about the ethical and educational functions of the modern state in arguing that museums played a pivotal role in the formation of the modern state by forming a new set of relations between state and people where the state was the educator:

> Yet the important characteristic of the public museum as compared with its various forebears consists in the fact that it deploys its machinery of representation within an apparatus whose orientation is primarily governmental. As such, it is concerned not only to impress the visitors with a message of power but also to induct her or him into new forms of programming the self aimed at producing new types of conduct and self-shaping.[9]

As I have argued in an earlier chapter, the emergence of taste, as an area of concern for the early Victorians, provided the state with a valid though not undisputed area of insertion into the productive sphere by defining machine production as culture. The principles of design used by the Department of Science and Art further strengthened the role of the state as a guarantor of correct taste. The Department also tentatively attempted to increase the role of the state in the dissemination of science. I agree with Bennett that the South Kensington Museum, like the Department of Practical Art and the

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[8] Tony Bennett, *The Birth of the Museum* (London: Routledge, 1995), 71.
[9] Ibid., 46.

Department of Science and Art, constituted the State as educator before a modern mass educational system was established and thereby broadened the function of the state under the laissez faire system. My object here is to consider in more detail the content of the educational system that was set up at the South Kensington Museum. The South Kensington Museum did not only structurally set up a system of education, but also had a content which I will argue played a significant part in transmitting the role of theoretical science to a group of people who would not otherwise be subject to it.

The idea to build a museum on the Commissioners' estate had been brought up already in the Second Report of 1852 and further developed in the Third Report. In light of the difficulties experienced by the Commissioners in establishing an educational school or university that would aim to further technological instruction, an educational museum had become an important part of their attempt to create the conditions that would allow for their wider goals.[10] In June 1855, the Commission decided to erect a temporary "iron house" on the estate to house the diverse and growing collections.[11] The Parliament voted £15,000 for the purpose.[12] *The Builder* was critical of the structure and called it ugly and disfigured. Its nickname, "the Boilers," stuck and the iron building would be known as the Brompton Boilers until dismantled and moved to Bethnal Green in the 1870s.

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[10] The delays in commencing with the construction of a building were due to the indecision of the government on whether to move the National Gallery to South Kensington. Meanwhile, the Museum of Manufacture, which had slowly been growing since the days of the Design Schools, was running out of space in its temporary home in Marlborough House and the Commissioners themselves were slowly gathering items that were to be part of a trade and educational collection crucial to their plans. Henry Cole and Prince Albert, president of the 1851 Commission, had traded plans about buildings on the estate.

[11] Cole, *Fifty Years of Public Works*, vol I, p. 323.

[12] John Physic, *The Victoria and Albert Museum: The History of its Building* (Oxford: Phaidon, 1982), 24-25.

Considering the intentions behind the collection, it is not surprising that the Commission opted for a functional building. Their deteriorating partnership with the government seriously delayed their plans and it was important for their wider goals that something be erected on the site. The importance of the Boilers was that for the first time the Commissioners and Henry Cole would have a centre in which to showcase their plans and intentions to the public. The Crystal Palace had been a functional building, easily erected and easily removed -- so was the Boilers although its construction totally lacked the spectacular effects of the Crystal Palace. Just as the Crystal Palace had featured a clear thematical structure with raw materials, machines, manufacture and sculptured art, the South Kensington Museum also had clear themes in its arrangement. The Crystal Palace had been magnificent as a functional building allowing the visitors to see and be seen in an open, lighted structure and it inspired the public discussions on the choice of building for the collections.[13] But the poorly constructed Boilers with water leaks and overcrowding satisfied neither the public nor the learned journals, although the refreshment room, which even served alcohol, and the electrical lighting, which allowed for evening opening hours, were novel and lasting features of public museums.

Ostensibly, the Commission had started its collection in order to form a trade museum to instruct the public to become better producers and consumers. But when the Boilers opened, it was much more than a trade museum and more in line with the general strategy of the Department to further science in a package with art.

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[13] "Construction and Decoration of the Royal Panoptical Institution," *Civil Engineer* 16 (1853): 204 discusses the merit of museum architecture.

Foucault has argued that it is a characteristic of the modern period that various disciplinary methods are used to make the unruly populace governable. These methods were primarily to transform existing political or economic problems into technical and moral problems for social administration. In *Discipline and Punish*, Foucault held that the modern prison served as one such articulation of power by abandoning previous open and spectacular displays of punitive authority in favour of using surveillance and coercive technologies to punish criminals. A new institution, the prison, was created and with it, sciences such as criminology. Focusing on art museums and art history, Douglas Crimp in "Museum's Ruins," argues that the museum should be considered another institution to organize knowledge and form new power relations and disciplines.[14]

While the art museum has proven to be a lasting institution that can still, as Crimp argues, be said to uphold certain art forms and disciplines, the South Kensington Museum of 1857 was a transitory institution. The combination of science and art under one roof aimed at a reformulation of the classifications of the time. Art was to be transmitted through principles of design to all those who lacked the refinement to appreciate fine art but still, for moral or economic reasons, needed to have correct taste. Science on the other hand, was displayed under the same roof as art in part to provide it with the air of refinement and respectability and thereby further the cause of those who believed that there was a need to promote national institutions for science. However, it was in the efforts to construct daily life as imbued with science that we most clearly see the attempt to form disciplines.

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[14] Douglas Crimp, "On the Museum's Ruins" in *The Anti-Aesthetic: Essays on Postmodern Culture*, ed. Hal Foster (Washington, D.C.: Bay press, 1984), 45.

In 1853, when the Commission had published its first plans for a museum, Edward Forbes,[15] a scientist at the School of Mines, delivered a lecture on museums in which he outlined their functions.

> Museums, of themselves alone, are powerless to educate. But they can instruct the educated, and excite a desire for knowledge in the ignorant. The labourer who spends his holiday in a walk around the British Museum, cannot fail to come away with a strong and reverential sense of the extent of knowledge possessed by his fellow-men. It is not the objects themselves that he sees there and wonders at, that make his impression, so much as the order and evident science which he cannot but recognize in the manner in which they are grouped and arranged. He learns that there is a meaning and value in every object however insignificant, and that there is a way of looking at things common and rare distinct from the regarding of them as useless, useful, or curious, - the three terms of classification in favour with the ignorant. He goes home and thinks over it; and when a holiday in summer or a Sunday's afternoon in spring tempts him with his wife, and little ones to walk into the fields, [he realizes] that he has acquired a new interest in the softness, in the flowers, in the creatures of all kinds around him. He can look at them with an inquiring pleasure, and talk of them to his children with a tale about things like them as he had seen arranged in order in the Museum. He has gained a new sense, - a thirst for natural knowledge, one promising to quench the thirst for beer and vicious excitement that tortured him of old.[16]

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[15] Edward Forbes, *On the Educational Uses of Museum: Being the Introductory Lecture of the Session 1853-1854 at the Metropolitan School of Science applied to Mining and the Arts* (London: HMSO, 1853). This lecture is clearly in line with the Royal Commissioners' policy. Forbes mentions the need for institutions that exhibit work of machines, agriculture and trade and also hints at the plans of such an institution. He also calls Prince Albert "one of the most enlightened of princes." (12)

[16] Forbes, 9-10. Thomas Greely in *Museums and Art Galleries* (London: Simpkin, Marshall and Co., 1888) leans heavily on Forbes in his chapter "The Place of Museums in Education."

Forbes points to two important features of the future South Kensington Museum. The ordinary will, after a visit to the museum, enter a new realm of experience. In 1857, when the South Kensington Museum opened, it displayed "the ordinary." One could see skin, bones and stones, food and plants. In the museum, even something as ordinary as water was the object of analysis. Thus, in the spare time when the workers were having their cultural experiences, they would see their own world mirrored, but the realm of display would subject ordinary objects to the gaze of special scrutiny. In the introduction to *Museum Culture: Histories, Discourses, Spectacles*(1994), Sherman and Rogoff make the observation that

> Museums invariably base their enterprise on a certain notion of objects and on a system for classifying them. Classification functions through the imposition of order and meaning on objects and through the positing of objects as triggers of ideas.[17]

The South Kensington Museum clearly structured its collection to organize viewing and establish the dominance of theoretical knowledge. The organization of the things was meticulous. Big labels were attached to the items outlining their place within the larger order, while colours were used to distinguish between the different topics. Coloured backgrounds, arrows, and printed guides channeled the visitors in the right direction. Daily life and the ordinary were disciplined by the labels and order imposed on them by the museum. "In the Economic Museum," wrote one reviewer, "there is a most valuable and instructive collection of animal substances applied to domestic art and

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[17] Sherman and Rogoff, eds., *Museum Culture*, xii.

manufacturing processes; and these ... are arranged in admirable scientific order, leading so gradually through a regular chain of objects, that a valuable amount of scientific knowledge is as if it were unconsciously attained."[18] The purpose was not to provide specific knowledge to an already initiated group or to amaze by spectacles, but to generate a universal knowledge or truth. To enter this museum, one did not need prior refinement or taste as would be the case in an art museum, or perhaps even also the British Museum. Here one came with an open mind and through labeling acquired that which one lacked. Henry Cole stated that the museum should be like an open book--accessible and yet full of guidance.[19] And according to one observer, the "greatest commendation must be reserved for the object-cases, fitted up with natural productions and wrought materials. So far as it is desirable for people in general to know the origin and nature of the common things, about which so much has been lately said and written, object lessons are better able to convey that information than any mere book learning."[20] The South Kensington Museum was an institution that organized daily life into knowledge and its purpose was to create a new discourse of common things.

In addition to being open long hours and free, the museum was illuminating as well as illuminated. Henry Cole was very proud of the lighting of the museum.

> The working man comes to this Museum from his one or two dimly lighted, cheerless dwelling-rooms, in his fustian jacket, with his shirt collars a little trimmed up, accompanied by his threes, and fours, and fives of little fustian jackets, a wife, in her best bonnet, and a

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[18] NAL Archives, Presscuttings, Misc I March 56-February 59, *Advertiser*, 22 June 1857.
[19] Henry Cole, "The Functions of the Science and Art Department," 16.
[20] Leisure Hour, *Introduction to South Kensington Museum*, 7 April 1859, 234.(V&A-NAL).

> baby, of course, under her shawl. The looks of surprise and pleasure of the whole party when they first observe the brilliant lighting inside the Museum, show what a new, acceptable, and wholesome excitement this evening entertainment affords to all of them. Perhaps the evening opening of Public Museums may furnish a powerful antidote to the gin palace.[21]

Carol Duncan argues that museums function as sites of quasi-religious rituals of secular citizenship.[22] Henry Cole opined that the museum might serve as an initiation into the world of enlightened citizens. In many of Cole's and other contemporary's statements about the perceived role of the South Kensington Museum, it is clear that there were high cultural pretensions involved.[23] Cole was not humble about the role he perceived public museums to play. He likened them to the churches of the middle ages. People would visit the museum to get an antidote to Satan as they once had by visiting the church.[24] In one of Cole's later speeches, in which he compared the present Britain with the declining Roman Empire, he found several signs of decline and one of the prominent ones was drunkenness. Again, Cole saw the museum as a salvation for the individual as well as the nation. "The Museum," Cole stated, "will certainly lead him to wisdom and gentleness, and to Heaven, whilst the (Gin Palace) will lead him to brutality and perdition."[25] The museum was to be the church of the present, more secular world where the worker came for salvation from the earthly hell of the public houses.

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[21] Cole, "Introductory address on the Functions of the Science and Art Department." Delivered November 1857. Cited from Henry Cole,. *Fifty Years of Public Works*, vol. 2, 293.
[22] Seth Koven, "The Whitechapel Picture Exhibition and the Politics of Seeing," in *Museum Culture*, 34.
[23] Compare Edward Forbes quoted above. The same sentiments are evident in Thomas Greeley's work *Museums and Art Galleries*..
[24] Mr. Cole's Speech at the Distribution of Prizes to the Students of the Nottingham School of Art (15th January 1873). Cited from Cole,. *Fifty Years of Public Works*, vol 2, 346-347.
[25] Cole, "Address delivered in the Liverpool Institute, 8th Dec, 1875" Cited from Cole, *Ibid.*, 368.

And as the church of the Middle Ages had served all sections of society, the opening hours, the low prices and the refreshment rooms of the South Kensington Museum were used to attract visitors of all classes. There was an art collection for the more affluent and refined. Henry Cole was aware of who held the purse strings in the country and used art and valued manufactures from Britain and the continent to attract them. The museum also served as a resource for the students at the art schools and some of the efforts to collect casts or originals from Europe were for the benefit of the students in their quest to change the taste of British consumers and producers. It was into this "Medieval Cathedral" that science was placed so that some of its grace would reflect upon the discipline.

The "properly arranged" collection of manufactures showcased the correct principles of design as the Department of Science and Art had defined them.[26] Correct principles of design were to help consumers and manufactures buy or make mass-produced consumer items which maximized the perceived harmonizing elements of art proper to correct moral and social behavior. And as long as industrial unrest was defined as a moral or social failing, a proper dose of conditioned art or education was by many thought to be an adequate remedy. The primary function of the manufacture collection, wrote Ralph Worum in 1855, was to be an "agent for conveying palpable ideas to the mind of the artizan."[27] *The Builder*, for all its initial hostility, was quite positive toward the collections and saw evidence that this particular purpose was fulfilled:

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[26] Cole Collection, Misc. 10, Department of Practical Art to Charles Trevelyan 31 March 1852.
[27] Department of Science and Art, *An Account of the Library of the Division of Art at Marlborough House: With a Catalogue of the Principal Works* (London: HMSO, 1855), 3.

> Crowds continue to flock to Brompton, and it is pleasant to notice that on the public days a large number of those for whose especial use this collection is arranged are in attendance: in the fine arts department intelligent workmen may be seen examining and comparing the ancient wood carving and other works, with the French and English modern productions.[28]

The part of collection which did not teach about correct principles of art tried to convince the visitors that science was crucial to their daily life, be that in working, taking in sustenance or spending free time. One reviewer of the museum wrote "Should you wish to learn what to eat, drink, and avoid, pay a visit to the South Kensington Museum"[29] ."It seems almost a truism," wrote Cole, "to say that the successful results of all human labour depend upon the right application about the laws of science."[30] The collections that probably most clearly conveyed the message of the role of science in both production and in daily life was the Animal Products Collection and the Food Collection. The Animal Products collection was originally supposed to be a third element of a larger trade collection which also consisted of minerals exhibited by the Museum of Geology and Useful Plants exhibited at the Botanical Gardens at Kew. These collections would not be united.[31] At the Edinburgh Museum of Science and Art, which was also under the direction of the Department of Science and Art, there would be a closer fulfillment of the initial plans of the Royal Commission as laid down in its

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[28] *Builder* 15 (1857): 460.
[29] *Leisure Hour*, "Introduction to South Kensington Museum," April 7, 1859.
[30] Cole, The Functions of the Science and Art Department, 8.
[31] A catalogue of the Animal Products Collection from 1860 refers to the collection as "one of three Public Museums devoted to the exhibition of the Industrial Products of the Mineral, Vegetable, and Animal Kingdoms. Department of Science and Art, *Catalogue of the Collection of Animal Products*, South Kensington Museum (London: HMSO, 1860), 1.

second and third reports.[32] However, when exhibited at the museum without its counterparts, the animal products became less a professional collection for industry and showed the role of science and industry in the life of ordinary people. "This well-arranged collection," wrote *The Builder*, "will be the means of diffusing more useful knowledge."[33] The collection featured samples of animal products, fur, hair, bones, and meat in their various stages of production and showed how industry metamorphosed these items into useful products.[34] The cases and sections of divisions and subdivisions contained detailed descriptions of the items, the production processes, and the names of the companies engaged in the production. The guide to the animal products instructed the visitor to first read the label before he or she proceeded to study the item on display.[35] Not only did the progression of the fabrication guide the visitors around the collection, but there were two printed guides available as well-- one shorter and cheaper and a more extensive guide which "may be studied at leisure with advantage."[36]

In addition to illustrating the role of science in daily life, the labels and guides provided statistics showing the import and export value of the products. The commercial value of the products illustrated their monetary contribution to the nation. Presented as an afterthought, the 1857 *Guide to the Animal Products Collection* let it be known that "the aggregate value of the articles dealt in, exceeds 136 million sterling,

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[32] Department of Science and Art, *Edinburgh Museum of Science and Art: Catalogue of Industrial Department*, 2nd ed. (Edinburgh: Neill and Co., 1869).
[33] *The Builder* 15 (1857): 523.
[34] Cole told the 1860 Select Committee on the South Kensington Museum that the Duke of Richmond who had donated some of the wool to the museum commented after seeing the arrangement that "this was an amount of scientific information which, till the creation of the collection, he had never been able to arrive at all." Q & A 301.
[35] South Kensington Museum, *A Brief Guide to the Collection of Animal Products* (London: 1857), 1.
[36] Ibid.

employs a large amount of capital, and gives busy industrial occupation to thousands of persons."[37] By extension, therefore, the arrangement indicated that science was also a creator of wealth. "There are few things in which the public have so great and general interest," wrote the guide, "as the trade and commerce in Animal Products applicable to Manufacture and other purposes; the varied uses to which many of them are turned, the continually changing sources of supply, the quantities consumed, prices, preparation, and so on."[38]

While the role of the machine was not specifically emphasized as it had been in the Crystal Palace, the contribution of machinery was not ignored in this arrangement. For example, the guide, when dealing with silk, an animal product and a textile, pointed out what kind of machines were used in its manufacture. The difference is that while the noisy machinery section had stood out as spectacle at the Crystal Palace, in the Boilers machines were just a part of the rational method of production.

The Food Collection was more limited in scope than the Animal Products collection, but it was second to the picture galleries as the most popular collection in the museum.[39] It was also almost the perfect collection for the museum's purpose, showing the economic, social and personal utility of one of the most elementary things in a person's life -- food. In the presentation of the collection, Playfair's hand and indirectly those of his German mentor Professor Liebig could be more closely observed. The

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[37] Ibid., 16.
[38] Ibid., 15-16.
[39] This is at least Cole's opinion. Select Committee on the South Kensington Museum (1860), Q & A 312. The dietary content of food was also presented in a lecture series by Dr. Pettigrew all over the country including at Mechanics' Institutes. Select Committee on the South Kensington Museum (1860), Q & A 320-21.

purpose of this collection was to provide a scientific illustration of how the body used the different elements of food. The cases with the exhibited examples listed the chemical composition of the food, their preparation and uses. The visitor to this collection in 1857 could compare the different examples and their relative nutritional value.[40] Professor Liebig's theory about the two major forms of organic matter was followed. Liebig thought that organic materials consisted of nitrogenous matter which was tissue forming and amylaceours and saccharine bodies which were heat givers.[41] Consequently, in 1857, the public would learn that food had three basic components: heat givers, flesh formers and minerals.[42] Fat was considered the most important heat giver, followed by alcohol, starch, sugar, and flesh. According to the guide, the value of a food's source of heat was dependent on its "relative richness in carbon and hydrogen."[43] In the Museum, one would learn that out of 100 parts of wheat, 14 were water, 14.6 made flesh, 69.8 made heat and 1.6 were earthly matter that went in the bones.[44] Later, when Huxley and Frankland were the primary scientists assisting with the collection, heat givers were called force producers and the guide provided

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[40] While at South Kensington the food collection showcased the importance of chemistry as a science, and also hinted at the social and national importance of food analysis in determining the diets of prisoners and soldiers. Thomas Greenwood, who visited the food collection when it was in Bethnal Green, did not much care for it. He especially found the listing of dietary requirements for prisoners suspect, wondering whether it was targeted directly to the workers. Greenwood,. *Museums and Art Galleries*, 264-5. Certainly his comment has some merit, as the prisoner's diet was calculated to get the maximum of work for the minimum of expense.

[41] Lyon Playfair, *On Food of Man in Relation to his Useful Work* (Edinburgh: Edmonston and Douglas, 1865), 3.

[42] There were two general classes: "Necessary" and "Auxiliary". The first category was divided between minerals, which included water; heatformers, fat and sugar; and flesh formers which were fibers. In the Auxiliary group there were stimulants; alternatives, which were acids and alkaloids; narcotics and accessories, included cellulose, gum and gelatin.

[43] Department of Science and Art, *A Guide to the Food Collection in the South Kensington Museum* by Edwin Lancaster (London: HMSO, 1859), 13.

[44] Cole giving examples from the exhibits to the 1860 Select Committee on the South Kensington Museum (Q & A303). The Potato was according to the same display a much poorer food source consisting of 75 percent water with only 1.4 percent of fleshbuilders and 22 percent of heat givers.

information as to how much mechanical work would be enabled by the different foods.[45] Not only was the chemical analysis a testimony to the value of science in daily life, but the display also strongly suggested that the human body worked like a machine and that food was its fuel.[46] One newspaper called food "fuel yielding materials."[47] The guide of 1891 which distinguished between the combustible elements carbon and nitrogen and incombustible element such as water, salt and minerals, made this comparison explicit.[48] But even at the time, when the metaphors were from the technology of the steam engine, food was the fuel of the human machine or as the 1859 guide put it "[a]s a fire cannot burn without a supply of fuel, neither can the human body live without its daily supplies of food."[49] And if you were interested you could find out how much fuel you needed, as the dietary requirements of different individuals, workers, females, and boys were also provided.[50]

Science was also the guiding principle behind the Economic Collection put together by Thomas Twining for the purposes of educating the poor to make good

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[45] Department of Science and Art, *Inventory of the Food Collection Arranged in Alphabetical Order* (London: HMSO, 1869). But Playfair knew the contributions of Joule and Thomson to physiology. (See discussion following lecture at the Society of Arts. *JSA* 5 (1857): 269-279).

[46] Playfair considered heat givers as "fuel" and the animal body as a machine. Playfair, *On Food of Man*, 4.

[47] NAL Archives, Presscuttings, 59-61 pt. 1, *West-Middlesex Advertiser* reviewing a lecture on food given by Lankaster, May 14, 1859.

[48] Department of Science and Art, *A Brief Guide to the Various Collections in the Bethnal Green Branch of the South Kensington Museum* by Charles H. Derby, 2nd ed. (London: HMSO, 1891), 31.

[49] Department of Science and Art, *A Guide to the Food Collection in the South Kensington Museum*, by Edwin Lancaster (London: HMSO, 1859), 2.

[50] While the display at South Kensington did not discuss it, there was some scientific debate about what exactly the dietary requirements were. One theory, based on measurements of urine, held that a person using his mental abilities would require more heat givers than one working using his muscles. This theory is referred to by Playfair in *On Food of Man*, 5, who does not dispute it but uses similar logic to discuss what the dietary needs for flesh formers are for the two groups. The conclusions of Playfair and Dr. Haughton of Dublin, whose work Playfair discussed, are that a worker doing manual work should eat grains, beans and legumes while one doing mental work requires more fat. In this instance at least the science was confirming the social practices of the time.

consumer choices.[51] While the idea of a collection seems to have originated in the Society of Arts early in the decade, Twining assembled the collection himself and it was exhibited in Paris during the French Exhibition of 1855.[52] The collection not only showed what sort of dwellings to live in, what were durable fabrics, or what to eat, but it also taught about science since these facts of life were presented as a knowledge of common things or a science of every-day life.[53] Twining's museum was moved to the Polytechnic Institution before it was stored at Twickenham, not as a museum but as a reference for those interested in establishing similar museums in their own communities.[54]

While the food and animal products collections were the most prominent demonstrations of the preeminence of science to man and woman, machines in the museum were not there to promote science. The moving machinery section in the Crystal Palace had been very popular, and when the Crystal Palace relocated to Sydenham the machinery was thought to be a significant part of its success. But at South

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[51] A Report by Twining, published in the *Journal of the Society of Arts* explained in much detail the commencement and purpose of this collection. *JSA* 5 (1857): 421-423.

[52] *Guide to the South Kensington Museum*, no. 1, 20 June 1857, 9. NAL.

[53] [Thomas Twining], *Handbook of Economic Literature. Being a Descriptive Catalogue of the Library of the Twickenham Economic Museum or Repertory of Useful Knowledge for Every-Day Life*, part I "Domestic and Sanitary Economy," (London: C Witing, 1862), 3.

[54] [Thomas Twining,], *Handbook of Economic Literature*, part I and *The Economic Museum: or Museum of Domestic and Sanitary Economy* (Twikenham, S.W. London: Simpkin, [1864]).
The *Journal of the Society of Arts* reported when the collection opened at the Polytechnic Institution that the essential feature of the collections was "its system of instructional labelling." At this time there was great hope that this collection would become an internal information centre of usefulness – "a medium of interchange between Great Britain and the Colonies, and other countries, of inventions, contrivances, publications, and authentic information bearing on the physical and intellectual improvement of the people" "The Economic Museum," *JSA* 7 (1859): 169.

Kensington, machines were not central in their presentation of industry.[55] As already pointed out, the museum emphasized processes rather than tools of production.

When it opened, the patent museum was under the authority of Bennet Woodcroft of the Patent Commission[56] and contained models, drawings, descriptions and patent specifications. The Commissioners of 1851 had hoped that machines, when exhibited "under scientific superintendence," would confer great benefit upon the interests of science and commerce.[57] They thought the museum would be more in line with the Conservatoire des Métiers in Paris which exhibited models for the purpose of illustrating the progress of mechanics and was accessible to the general public.[58] But the Commissioners of Patents wanted the collection to be similar to the American Patent Office with model rooms for skilled workers and inventors to consult previous inventions. The guide announced that the museum illustrated the progress of inventions to the wider public and was to be a place of reference for mechanics, engineers and inventors.[59] Not surprisingly, the development of the steam engine was the best illustrated. In the centre of the museum stood item number one, William Symington's steam engine, the "parent engine of steam navigation" patented in 1787.[60] The *Guide* suggested that the visitor compare Symington's engine with the model of the newest

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[55] Cole's evidence before the Select Committee on the Patent Office Library and Museum 1864. Q & A 2306ff.

[56] But the Royal Commission of 1851 had been a factor in its establishment. Bennet Woodcroft of the Patent Commission, a collector of models of inventions and a member of the Society of Arts had received encouragement from Prince Albert who in the name of the Royal Commission of the Exhibition of 1851 instructed him to sound out manufacturers' interest for a patent museum. "Obituary" [of Woodcroft]. *Engineer*, 14 February 1879 and John Hewish, *The Indefatigable Mr. Woodcroft.*

[57] Cole before the Select Committee on the Patent Office Library and Museum 1864. Q & A 2308ff.

[58] Ibid., Q & A 2306.

[59] *Guide to the South Kensington Museum*, no. 1, 20 June 1857, 4.

[60] *Descriptive Catalogue of the Museum of the Commissioners of Patents at South Kensington. Open to the Public daily, free of charge* (London: George E. Eyre and William Spottiswoode, 1857).

wonder, the *Great Eastern*, also on display.[61] The Patent Museum, in trying to be both utilitarian and public, proved to be highly unsatisfactory.[62] And after a crisis in the spring of 1858 the Patent Museum gained a separate entrance and the Kensington Museum guides remained silent about the collection.[63]

One reviewer of the museum thought that by showing the many uses of glass, once the object of import duties, the museum was a testimony to the principles of free trade. He also asked the audience explicitly to look at the items for their strategic importance.

> Glancing next at the various screws, and models of screws, employed instead of paddle-wheels to effect propulsion of steam-vessels, there may not be much, if anything, to interest the mind, according to the opinion of a non-reflective observer. But when one comes to

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[61] *Guide to the South Kensington Museum*, no. 1, 20 June 1857,

[62] This is clear from the evidence before the Select Committee on the Patent Office Library and Museum when both sides expressed their dissatisfaction with the Patent Museum. Cole cites figures from previous years which indicate that though the Patent Museum was free at all times, far fewer people visited the Patent Museum than the rest of the collections. Cole says that "during the last few months 163,662 person visited the South Kensington Museum on free days and 29,069 on student days. While in the same period 20,064 visited the Patent Museum." Q&A 2323. The Patent Commission also objected to the fact that its patrons would have to pay to enter the museum on "student days." NAL Archives, Presscuttings, Misc I March 56-Feb 59, *Enquirer* 26 March, 1858.

[63] Moreover, there were differences between Cole as superintendent of the South Kensington Museum and Bennet Woodcroft. In a letter to Cole, Playfair discussed the potential uses of the patent museum rejecting a suggestion, that might be Cole's, to make the museum more like the architectural museum and suggesting that he could make the museum considerably more interesting. Henry Cole Collection, Correspondence Box 15, Playfair to Cole March 18. (No year is given, but it is probably from 1858 since Playfair is still involved in the South Kensington Museum). In the spring of 1858, the Commissioners of Patents threatened to remove most of the collection. On the 18th of March, Cole noted that the removal of the Patent Museum had been averted. HCD, 18 March 1858. But the differences between the two seemed to have been personal rather than ideological. At least Woodcroft, an inventor himself, took great interest in the history of machines and their makers. He spent time collecting models and stories about inventors and engineers. In the museum there were also portraits of inventors and Woodcroft's antiquarian interest in the history of inventors and inventions was clearly visible. Woodcroft was of the opinion that the great contributions of many individuals to the progress of invention were being ignored and forgotten. Through the museum, the portraits, and his books, Woodcroft hoped to heighten interest in the engineering profession. Woodcroft's testimony before the Select Committee on the Patent Office Library and Museum, 1864 and John Hewish, *The Indefatigable Mr. Woodcroft*.

> think that these little screws have not only changed the construction of every war ship, but have materially disturbed the relationship previously existing between the efficacy of maritime Powers, these screws become interesting.[64]

However, since labels denoting who the inventor was, and the use or process involved, were less elaborate and more factual in the patent museum, it would be far more difficult for the general public to arrive at similar conclusions to this particular reviewer. The two purposes of the museum, that of record and that of historical account, were not commensurable. The Patent Commission reorganized their library collection in the 1870s and the collection of historic engines was handed over to the South Kensington administration in 1884 to be united with the collection of machines and models. But now there was little space to represent science. While the Department used its crammed collection to lobby for more buildings and space, the government kept telling the Department to weed out its science collection. The models would not become totally accessible to the audience until after the first world war.[65]

Despite the personal concern of Bennet Woodcroft, interest in representing a history of invention remained low. While the *Mechanics' Magazine* hailed the efforts of Woodcroft to preserve and present the history of machines, the patent museums would remain the only place at South Kensington where the history of machines could be

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[64] *Leisure Hour*, 28 April 28 1859, 266. NAL.

[65] ED 84-8 contains some of Donnelly's objections from May 1889 to the many requests he had received from the Treasury to weed out the collection of machines and scientific apparatus. He claims the museum had done what it could to hold the collections to a minimum and he countered the claims by referring to the many commissions which had recommended the establishment of a museum of science. It is obvious that at this time machines had received importance and meaning that was not so apparent earlier – they are now of historical and national importance. There is a greater awareness that a national self could be created around a machine like the Rocket. (ED 84 is kept at the NAL Archives)

studied. Despite Woodcroft's efforts, the museum's representation of machines seemed half-hearted. But over time, the collection of machines and models at the South Kensington Museum grew by donations.[66] And a separate collection was assembled with "the view of affording in the best possible manner information and instruction on the immense variety of machinery in use in the manufactures of this country."[67] But machines at the South Kensington Museum continued to be represented in terms of their utility rather than their historical and national importance.

The Education collection at the South Kensington Museum, yet another Society of Arts' project, also featured machines.[68] This collection was

> arranged so as to enable all persons engaged in teaching to see, collected together in one group, the most recent, the best, and the cheapest forms of apparatus and means of imparting knowledge in its several branches-with the prices of the specimens.[69]

The Education Division was in many ways a curious collection, for the museum was almost a department store. The items, whether books, models or other teaching equipment, came with price tags and information on where they could be purchased.[70] Manufacturers of equipment for teaching had not only samples on display but also

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[66] The Department's work was to operate a naval school and at the end of the 1860s the admiralty donated models of naval ships and drawings to the Museum. Department of Science and Art, 16th Report, 1868-69, 385.

[67] Department of Science and Art, *Catalogue of Machinery, Models, &c., in the Machinery and Inventions Divisions of the South Kensington Museum with Descriptive and Historical Notes* by E.A. Cowper (London: HMSO, 1890).

[68] In 1854, the Society had held an exhibition in London of Educational materials and objects from this collection were transferred to South Kensington Museum in 1857.

[69] *Guide to the South Kensington Museum*, no. 1, 20 June 1857, p. 3.

[70] South Kensington Museum, *Catalogue of the Educational Division of the South Kensington Museum* (London: HMSO, 1857), iii.

catalogues that could be perused. In addition to general subjects and some specialties such as teaching for the deaf and dumb, the collection was well stocked in science and art, the subjects promoted by the Department. The science section was ordered by topics such as mechanics, physics, chemistry, electricity, botany and geography.[71] When the Boilers were dismantled in 1867 the education collection lost a permanent site and was stored in hallways or moved into temporary rooms on the other side of Exhibition Road. The collection grew by various additions over time, from the international exhibitions of 1862 and 1871 when there was a class dedicated to education, and the Special Loans Exhibition of Scientific Apparatus of 1876.[72]

But while the collection was substantial, its context was education not industry.[73] The collection was not for the general public but for teachers. Perhaps the presence of so much material on teaching would not only help teachers but also promote an interest in providing science and technology in schools, but the collection was not arranged for that purpose. Science, it seems, was best taught indirectly in a familiar context such as trade and imperialism with the Animal Products collection. The South Kensington Museum sought, as Cole had said, to "woo into examination" by enticing the public with everyday products. It was not a collection that would represent science directly.

The South Kensington Museum of the late 1850s and early 1860s emphasized the role of science in daily life alongside collections of taste. The 1860 Select Committee on

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[71] *Guide to the South Kensington Museum*, no. 1, 20 June 1857, p. 3.
[72] South Kensington Museum, *Catalogue of the Naval Models in the South Kensington Museum* (London: HMSO, 1865).
[73] A publication from 1879 mentions upwards of 39,000 volumes of educational books, and some thousands of scientific apparatus, models and appliances for educational purposes. Department of Science and Art, *Memorandum upon the Formation of the South Kensington Museum* (London, 1879), 6-7.

the South Kensington Museum reported enthusiastically on the science collections, declaring them to be of great interest to the public and useful to commerce.[74] The museum had also proven wrong those who thought that a museum situated on the periphery of London would not succeed, and the Select Committee recommended that other similar institutions ought to be located in the suburbs of London. But the South Kensington Museum changed in the period after the 1860s, and would give a lot less space and attention to the science collection. As the South Kensington Museum gradually expanded, it was the rapidly growing art and ornamental collections that would move into the attractive space at the new permanent buildings now the Victoria and Albert Museum.[75] In addition to the Sheepshanks Gallery, the site also housed the Vernon and Turner galleries. More permanent buildings were under construction to house the paintings. The distinction between an art and a science collection was first made in the guide of 1860. And gradually, the unity of purpose that had existed between science, taste and machinery was dissolving. The museum had been a heterogeneous collection with one overall purpose but came to be one which many felt no longer belonged together. In the 1870s, shortly before his retirement, Cole referred to the South Kensington Museum as an accidental accumulation. But there had been a common purpose -- to create a unified culture for all, and to establish the conditions for the building of an industrial institution with a public as well as a professional purpose.[76]

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[74] Select Committee on the South Kensington Museum (1860), Report, vii.

[75] It is hard to point to a time when it would be accurate to say that the V & A was actually completed, as it has been and continues to be a building in change. However, when it officially opened as the Victoria & Albert in 1909 it was at least completed externally.

[76] *An Official Record of the Opening of the Bethnal Green Museum by H.R.H. The Prince of Wales on Behalf of Her Majesty the Queen, on Monday the 24th of June, 1872* (London, 1872), 13.

The Animal Products collection and the Food Collection had been the primary means for the commission to increase the interest in science among common people, but gradually the administration departed from this purpose, opting instead for professional collections of munitions, naval architecture and machine models on the one hand, and a more valuable and elaborate collection of art and art manufacture on the other. Visitors who came to the South Kensington Museum in the late 1860s after the quadrangle was finished, would not have the same experience as in 1857. They would not have to look at the food collection or the animal products collection in order to see the art. There was an increased separateness between the two.

There were probably two reasons why this happened. When the science section of the Department of Science and Art started their evening lecture and examination system it was felt to be a much more efficient tool to convey the need for theoretical science and rationalization than the many collections at the South Kensington Museum. Instead of being directed to the general public, the science sections in the museum developed into aids for the teaching of science.

And secondly, Playfair's alarming letter about what he considered a very poor showing for British industry at the 1867 Paris Exhibition created increased interest in technology and education, and it was no longer necessary for the South Kensington Museum to continue to pursue this line. In addition, scientists were lobbying for a museum of a more technological nature and received some sympathy in response to these requests. The Devonshire Commission (1874) suggested that a "Collection of Physical and Mechanical Instruments" be assembled and merged with the collections of

the Patent Museum and the Scientific Department of the South Kensington Museum to form a single museum under the Minister of State. The idea was to provide a nucleus of objects which could inspire good practice, and also compensate for the lack of apparatus available to many institutions by means of a system of loans. The 1851 Commissioners offered to provide a building for this proposed museum. Their offer, repeated several times, was eventually refused. However, in 1876 the South Kensington Museum presented an Exhibition of the Special Loan Collection of Scientific Apparatus. A large proportion of the science community became involved and when the exhibition was over, many of the objects were donated to the South Kensington Museum.[77] In 1885, after the Patent Museum was acquired by the Department of Science and Art, it was decided to designate the science collection the Science Museum. In the 1890s the education collection was discontinued but the categories used for the examination system as well as some of the instruments and models were retained and the science collection became divided into Mathematics, Mechanics, Physics, Biology, Chemistry, Geological Physiography and Nautical Astronomy. In 1893 the Director of the South Kensington Museum retired and was replaced by two equal Directors, one overseeing the Art Museum and one the Science Museum.[78] The museum was named the Victoria and Albert Museum in 1899, but it was still not clear that the science section was a separate entity. That was definitely established when it was officially opened as the Victoria and Albert a decade later.[79]

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[77] Stella V.F. Butler, *Science and Technology Museums* (Leicester: Leicester University Press, 1992).
[78] South Kensington Museum, *Guide to the South Kensington Museum* (London: HMSO, 1894).
[79] Butler, *Science and Technology Museums*.

But at the same time as the South Kensington Museum was becoming more professional, arguments were made that Metropolitan London should have its own public museums. At South Kensington, in May 1865, it was decided that there ought to be a museum in the East, North and South of London as well, but it was up to the local authorities to initiate the establishments of these museums.[80] However, only in the East would there be such a museum. Already in 1861 a committee from East London waited on the First Commission of Public Works, asking for the assistance of the Government to establish a museum in the East End.[81] Lord Ebury and Lord Shaftesbury also worked hard to establish a museum or library adapted to working class needs.[82] The many requests and meetings seem to have been the main reason the Boilers were moved to Bethnal Green and the food and animal products collections located there. It is also likely that the scare of 1867, when Playfair argued that the rest of the world was surpassing the British and commissions were set up to study the level of technical and scientific education in the country, was what finally caused the branching out of the South Kensington Museum.[83] When the decision to branch out to the working class districts had been taken it was argued that a museum "adopted for the improvement of the working classes" should be placed in a neighbourhood accessible to them, be open in the evening, have convenient and comfortable refreshment rooms, and be made "*educational in the widest sense of the word.*"[84]

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[80] *An Official Record of the Opening of the Bethnal Green Museum*, 13.
[81] V &A Archives, ED84 240, Memoranda from the London County Council, 24 October 1893.
[82] Ibid.
[83] *Report of the Proceedings at a Deputation of His Grace the Duke of Marlborough, ... on the Subject of the East London Museum* (London: Willis and Sotheron, [1868]) NAL. The Report mentions both the conclusions drawn from the Paris exhibition and the Samuelsen Committee.
[84] *An Official Record of the Opening of the Bethnal Green Museum*, 14.

The animal products and food collections were educational in the sense of fostering a need for knowledge and a sense of the role of science in daily life. The argument had been made that the reason the collections ought to be moved from the South Kensington Museum was that it had "been long felt that the accidental accumulation, in one spot, of heterogeneous Collections, more or less distinct in character, was inconvenient, and that the Collections might be better developed separately, each one having its special objects and features."[85] But when the Bethnal Green Museum opened in 1872, it housed just as much art as it did science. The Guide to the Branch museum from that year allotted only five out of thirty-two pages to discussing the science collection.[86] The rest discussed the loan collection and the picture gallery. It seems that Cole's idea of the museum as a secular church was also transplanted to Eastern London. It was a place in which to absorb the goodness of an atmosphere of sculptures, renaissance art and paintings. Along with a collection featuring examples of Economic Entomology, there were paintings and other fine art objects on loan from Sir Richard Wallace. In fact, the Bethnal Green Museum would continue to feature loan collections from royalty and aristocracy to accompany the animal products, food and insects.[87] By 1912 the science collection in Bethnal Green was in essence much the same as that which had been put together for the South Kensington Museum in 1857.[88]

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[85] Ibid., 8.

[86] *Guide to Bethnal Green Branch of the South Kensington Museum* (London: Spottiswoode, 1872).

[87] The guide from 1891 tells us that the main court featured paintings, furniture, Porcelain, silver plate, and other art objects. The science collection still consisting of the animal products, food and entomology is in the galleries. Department of Science and Art, *A Brief Guide to the Various Collections in the Bethnal Green Branch of the South Kensington Museum*, by Charles H. Derby, 2nd ed., (London: HMSO., 1891).

[88] ED84 240. Food and Animal Products Collections stayed the same, but there had been some visiting collections. The basement held a collection of Waste products and in 1874 Col. A. Lane Fox's

One 1872 review of the museum declared that it was art that played the primary civilizing role of the museum.

> Science is at present represented by "the animal products collection," "the food collection," and important series of examples of "economic entomology;" while art, thanks to the generosity of Sir Richard Wallace, is exemplified by treasures of almost unexampled beauty and value. It is pleasant to be able to report that the people in whose interest this noble undertaking was started, have proved themselves able to appreciate their privileges. The galleries have been thronged by eager visitors who show by their quiet demeanor and intelligent remarks, that the labouring classes of this country are amenable to the rising influence of the arts. The number of visitors in the first six months after the opening was 850,000.[89]

Frances Borzello, in *The Relationship of Fine Art and the Poor in the Late Nineteenth Century England*,[90] argued that especially in the two last decades of the century there was a particular wish to treat social ills by presenting fine art in working districts. A shared aesthetic experience would overcome all difficulties. We have seen that Henry Cole also tended to believe that if the people living in working class districts only had taste, their conditions would improve, and it is not surprising that the Bethnal Green Museum, rather than becoming "educational in the widest sense of the word," chose fine and applied art as its medium in this working class district.

Anthropological collection had opened there. It showed some skulls, weapons and art of savages. Col. A. Lane Fox, *On the Principles of Classification Adopted in the Arrangement of his Anthropological Collection.* Imperial College.

[89] J.B. Atkinson, *Bethnal Green Museum.* Article for the *People's Magazine* April 1873 (208-211) NAL.

[90] Ph. D Thesis, University College London, London University 1980.

Those who argued that Bethnal Green needed a museum which was more in character with the community met with deaf ears. The South Kensington project was reluctant to present machinery or technology as anything other than that which would lead to a centralization of knowledge.[91] The South Kensington Museum or Bethnal Green Museum did not teach workers the value inherent in the work they did, but rather put them face to face with their apparent inadequacy. The working class was not to be constructed within the framework of the skills of their own experience but were to be presented with a need for refinement and theoretical science.

The South Kensington Museum underwent changes, and though the Bethnal Green Museum retained the character of the old idea of presenting a uniform cultural collection, the collections of the museum at South Kensington became more professional and separate in character. The models of ships, the munitions and arms collections and the growing collections of models of machines were tools in the teaching of the Department of Science and Art. However, when considering the lack of a full commitment to a science museum, one needs to take into account the fact that the original purpose of the South Kensington Museum and its trade and educational division was to present common items so as to give an impression of the absolute presence of science in the lives of ordinary people. It was not intended to illustrate principles of science or the working of machinery. It aimed at a discourse of rationalization that gave credence to a way of thinking about industrial production as one emanating from a rational economic order.

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[91] A Memorandum from the Technical Education Board of the London County Council signed by Sidney Webbs stated that what the council wanted was a trade museum, showing the trades in the area, featuring machinery, a school and lectures. ED84 240.

CONCLUSIONS

CULTURE VS. INDUSTRY?

In *English Culture and the Decline of the Industrial Spirit, 1850-1980,* Martin Wiener argues that culture stands in opposition to industry. In nineteenth century Great Britain, culture was detrimental to industry and sowed the seeds of decline even before Britain had reached its peak in the nineteenth century.

> The industrial revolution was thus not only revalued, but also redefined as a characteristically un-English event. Industrial values - the worship of machinery, efficiency, and material wealth - had never conquered (many insisted) the inner sanctum of the English character.[1]

To Wiener, the reactionary becomes equivalent to the cultural. Those who sent their children to one of the ancient universities rather than to the progressive colleges and used their earnings to invest in land rather than in industry, did so for cultural reasons.

I once attended an historical colloquium where the speaker, a graduate student, argued that historians should be more concerned with gray than black and white. I did not think then and I do not think now that gray is always preferable. While it might be true that it is not always right to present history in terms of progress against regress, good against evil, men against women, people against the state, and so on, it is often the dramatic juxtaposition of opposite forces that fascinates us. Though the lines are

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[1] Martin J. Wiener, *English Culture and the Decline of the Industrial Spirit, 1850 -1980* (Cambridge: Cambridge University Press, 1981), 88.

probably always drawn too sharply, we, at least the westerners among us, tend to see the world as Hegel did, more clearly in black and white than we do in the more detailed gray. But if we choose this mode of representation, what do we designate white and what black? Wiener has chosen to draw the line between culture and industry.

The aspect of nineteenth century cultural formation that I discuss did not place industry against culture. The Department of Science and Art attempted to find a medium between the social force of the growing industrial population and the inadequacies of political economy, and "taste" became one such avenue. "Taste," though based on an old notion of a correspondence between product and ideology, cannot automatically be designated aristocratic.

In "manufacturing industry" to consist of the products of science, machinery and taste, Henry Cole and associates attempted to formulate a concept of culture as a place to transcend barriers maintained by the laissez-faire ideology.

In *English Culture and the Decline of the Industrial Spirit,* Wiener pitches Sidney Webb against William Morris.[2] The 1850 equivalents of Webb and Morris might be Henry Cole and Lyon Playfair, since Henry Cole and William Morris both stressed the role of art and Lyon Playfair and Sidney Webb wanted more technical instruction. But as this dissertation has argued, art and science, or culture and industry, were not necessarily opposing forces. Playfair and Cole worked together in the same department. Moreover, Cole makes a very poor William Morris. Taste and the principles of design were not about preserving old handicraft work structures, but about merging "correct judgment" with new production methods. Cole wanted to work within

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[2] Wiener citing David Marquand, 165.

the existing structures of production, but we have seen that the proposed measures interfered with the ideology of those producers who did not want to relinquish such powers to the state.

In placing culture opposite to industry, Wiener and others isolate the "industrial spirit" from its social consequences. The taste movement, on the other hand, made industrialization a more significant part of the fabric of human life. To this end, manufacture was deemed culture - vital to the health of the nation and therefore, also open to interference. Culture and the industrial spirit would therefore not necessarily be opposing forces; culture, as the Department of Science and Art constructed it, included industry. Industry produced culture because it produced consumer items which were bearers of meaning.

Bad taste and a corresponding moral failure, and perhaps even social degradation, were therefore ramifications of industrialization and the fact that the arts-manufacture movement would focus on mass-produced goods as an avenue to correct these failings, meant that they saw industry not as limited to political economy or work place, but as having moral and aesthetic consequences. The Design Schools and the Department of Practical Art were the governmental institutions put in place to improve industry.

Wiener studies the elites and finds that they often misplaced their allegiances, choosing aristocracy over industry. Science was not prioritized because the goals of the capitalist class were those of the leisured gentleman. In support for his argument, Wiener cites evidence from the science and technology commissions that were launched after the "scare of 1867" initiated by Lyon Playfair who used the Paris exhibition of that

year to "prove" that what he had argued since the 1840s was indeed true: Britain in not emphasizing science and technology was losing the industrial race.[3] Playfair had not been fighting against "aristocratic" culture. His brand of theoretical science, the one he had worked hard to "sell" and which he argued had practical and economic importance, did not appeal to all manufacturers because by specializing knowledge it shifted the control of production processes from the workplace to the institutions. Some manufacturers would not relinquish their control, especially not to the government. Their concerns were not with a race, though producers were well aware of their competition, but were with power. As far as the work of the Science and Art Department is concerned, the obstacle to increased education was not culture but power and ideology.

In the aftermath of the Great Exhibition, the Royal Commissioners of 1851 planned to erect a new institution in London that would further science and technology. When this institution and the early plans failed, the Commission attempted to reinstate the cooperation they had enjoyed with the manufacturers during the Great Exhibition, by attempting to involve manufacturers in further exhibitionary and educational institutions which ostensibly focused on the improvement of the working classes. But the Department of Science and Art, established to further the plans of the Commission, failed in its first few years. Playfair, who headed the science division, became quite disillusioned with the project. This forced the Department to choose strategies which focused on the lower classes in order to establish a general acceptance of the role of science in industry. The form of science education now introduced was what was

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[3] Wiener, 16-21.

possible within the different ideological constructions of industry. At mid- century, the Department of Science and Art was allowed to intervene if it could morally improve the poor or workers. Disciplining or educating the public, the lower classes, and consumers generally, became the main strategy during the middle decades of the 19th century. The Department established the South Kensington Museum which furthered science as essential knowledge. It also used examinations which initially were thought to promote acceptance of the role of theoretical science. This, I have argued, constitutes using culture, the workers' free time and personal development, to further the viewpoint that science was essential to industry. The Department was attempting to establish acceptance of their interpretation of industry as the product of science, taste and machinery. For the material discussed here, the appropriate line is not between culture and industry, but rather between state and knowledge. The Royal Commission of 1851 and the Department of Science and Art attempted to insert their view of industry through the creation of knowledge and asserted their right to formulate this knowledge at a time when it was not agreed that these powers belonged to the state. Culture, rather than being an entity opposed to industry, was in this context a concept that was being constantly redefined.

The so-called failure of the British to establish technical institutions so that they could hold on to their industrial supremacy has been much debated. Though this analysis does not go far enough to provide any definite conclusions, it suggests that technical instruction was not primarily a question of the industrial race. Technical instruction for some was a question of appropriation of knowledge. If it was directed to

the working class to foster improvement and respectability, it was acceptable, but not if it was to actually teach a trade. Others, Henry Cole, Harry Chester among them, felt that the social integration of the working class was the primary issue. Science, as it was thought of by the Department of Science and Art, was an instrument to ensure government involvement in industry and was guided by concerns other than to maintain industrial supremacy. One might better understand and appreciate these efforts if they were placed in their true context.

The mid-century construction of industry as the product of taste, science and machines disintegrated. As the century progressed, specialization and professionalization became more evident. The South Kensington Museum ideal of presenting science and taste together disintegrated and science was presented in its own area, while the South Kensington Museum became a museum of ornamental art, which the Victoria and Albert Museum still is. Though I have not made it a primary objective to discuss these later changes, I would suggest that the reality for cultural creation changed from the mid-century to the end of the century. Professionalism of science and franchise extensions allowed the creation of schools and institutions for technology and science.

Moreover, the labourers had representatives who now negotiated with the state for benefits, rather than raising the spectre of a revolution. Cole's notions of the benefits of a unified taste seemed less relevant. On the other hand, Cole had wanted a more open and public society which made it easier for the lower classes to partake in the public life that might be reserved for the upper classes. Championing the refreshment-rooms at

South Kensington as well as the work to open public water closets in London[4] were means to ensure public involvement. The entertainment available to the working classes at the end of the century might be less wholesome but it did ensure increased participation and less social alienation.[5]

The reconstructions of industry would continue on other fronts, however. Martin Wiener chastises Arnold Toynbee, the author of *Lectures on the Industrial Revolution*, for his historical reinterpretation of the industrial revolution which casts it in a negative light.[6] But Toynbee was in a sense a new Cole, (Toynbee would, however, die shortly after delivering his lectures, still a young man) only he used history, rather than art-manufacture, as an avenue to reinterpret and stretch the definition of liberalism. Toynbee argued that economic liberalism was a product of history and not the other way around. By making economy subject to history, Toynbee hoped to include the many who he thought felt excluded from industrialism. If economy was historic, it could again change to include the consuming and producing classes.

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[4] These water-closets were supported by the Society of Arts but closed as they could not be economically sustained.

[5] Such entertainment included fairs which were entertaining rather than openly ideological or shopping. See for instance Thomas Richards, *The Commodity Culture of Victorian England: Advertising and Spectacle, 1851-1914* (Stanford: Stanford University Press, 1990) or Tony Bennett, *The Birth of the Museum*. On the other hand, Peter Bailey in his study of leisure, has concluded that working class leisure in the latter part of the century had a stronger "class character." The leisure was less susceptible to bourgeois influence. Peter Bailey, *Leisure and Class in Victorian England* (London: Routledge & Kegan Paul, 1978), 177-183. At the same time, working class culture might appear less threatening.

[6] Wiener, 82.

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