

## THE CULT OF RELICS: PASTEUR MATERIAL AT THE SCIENCE MUSEUM

by

LORRAINE WARD \*

In 1927 L. W. G. Malcolm, Conservator of the Wellcome Historical Medical Museum, enthusiastically reported to Henry Wellcome,

We are obtaining not facsimiles, but the actual material prepared by Pasteur. You will have, in the near future, a Pasteur collection which will be incomparable in the world, for in addition to these facsimiles from Paris, we have other material not in the Pasteur Museum.<sup>1</sup>

This controversial statement was the starting point for a study of the authenticity of what was potentially one of the most important groups of material in the Wellcome Collections now at the Science Museum. Yet the issue of authenticity seemed insignificant when examined in the context of the rationale behind this collection. The research for this initial study generated a large number of questions about the origin of museum collections and their relationship to the broader history of science. Why was Wellcome so interested in apparently trivial memorabilia? Why was there so much interest in this type of material in the 1920s? Why had Pasteur and his followers bothered to preserve what was often standard laboratory equipment?

Research in the Wellcome Institute archives revealed that most of the objects cannot be proved to be authentic originals. However, this paper will demonstrate that the significance of a museum's collection depends on issues other than authenticity. In this instance new light is also shed on the cult of Pasteur as a Great Man of Science. Pasteur himself referred to the adoration of great men as a cult, which is something deeper and more religious than the phenomenon of hero-worship written about by Carlyle.<sup>2</sup> Hero-worship involves the

\* Lorraine Ward, BA, MSc, Science Museum, South Kensington, London SW7 2DD.

I would like to thank Robert Bud at the Science Museum for encouraging me to write this paper; Julia Sheppard at the Contemporary Medical Archives Centre, Wellcome Institute for the History of Medicine; Annick Perrot at the Musée Pasteur; Bernadette Bensaude-Vincent for her comments; and Gerard L'E. Turner for inspecting the Pasteur microscopes.

<sup>1</sup> Uncatalogued material, Contemporary Medical Archives Centre, Wellcome Institute for the History of Medicine, 183 Euston Road, London NW1 2BE (hereafter CMAC). This and other excerpts are reproduced by courtesy of The Trustee, The Wellcome Trust. Report from L. W. G. Malcolm to Henry Wellcome, 5 July 1927; Wellcome was well known for deliberately collecting replicas, which did eventually include copies of Pasteur's apparatus because the originals were not available. Yet in the case of material relating to the great men of science, the drive was very much towards collecting original apparatus and personalia, as discussed further on in this paper.

<sup>2</sup> Thomas Carlyle, *On heroes, hero-worship and the heroic in history*, London, Chapman and Hall, 1904. Based on four courses of lectures given between 1837 and 1840, Carlyle's first chapter was about the Norse god Odin

adoration of extraordinary individuals who are admired for their achievements. A cult adds a religious dimension to this activity in three ways: firstly, it sanctifies the individual; secondly, it involves veneration by a group of disciples, whose function is to propagate the cult to ensure the immortality of the person worshipped (thereby ensuring some reflected glory for themselves); thirdly, the worship of the individual involves the collection and veneration of relics akin to those of saints. Decontextualized and placed upon a metaphorical pedestal, relics not only represent the achievements of the object of worship, but also become the objects of veneration themselves merely by association. The existence of vast amounts of attributed Pasteur material collected by Wellcome in France in the 1920s was a direct product of the cult of great men prevalent in nineteenth-century society. Pasteur apparatus and relics were amassed not only as accessories to the cult, but also as evidence of the truth of the great master's work, of his dramatic experiments, part of what Latour has defined as the "Theatre of Proof".<sup>3</sup> This acquisition process began with Pasteur himself and was continued by his disciples and then by Henry Wellcome and other medical museums. It was of the utmost importance to acquire as many as possible original, or what were believed to be original, relics.

Yet further research is needed on the cult of the Great Man of Science and of the place of Pasteur in it. There is little secondary literature on the subject, and recent works, notably those by Bruno Latour and Claire Salomon-Bayet, have concentrated on the "Pasteurization" of France, the acceptance of Pasteur's ideas and his promotion of them, but have not specifically analysed the cult that he had created around himself.<sup>4</sup> General works such as those by Dubos and Geison have touched on the subject but have not studied it.<sup>5</sup> More specific papers have been written by Bensaude-Vincent on Pasteur's relationship with the press, by Hansen on his legend in the United States, and by Lacombe *et al.* on the Pasteurian myth.<sup>6</sup> Carlyle equated the history of the world with the biographies of great men, but, as yet, little work has been done on what may often be perceived as hagiographic, popularist and lightweight stories as a *genre* which contributes to the cult status of scientists. Nor is there any analytical study of the movement for the publication and

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and the tendency of primitive people to deify men. His later chapters suggested that modern man no longer behaved in this way. This paper argues that the cult of great men in the late nineteenth century actually did involve the deification of individuals to the extent that their adoration became a cult.

<sup>3</sup> See Bruno Latour, *The pasteurization of France*, transl. Alan Sheridan and John Law, Cambridge, Mass., and London, Harvard University Press, 1988, pp. 85–7, for a definition and discussion.

<sup>4</sup> Latour, *op. cit.*, note 3 above, and Claire Salomon-Bayet (ed.), *Pasteur et la révolution pastorienne*, Paris, Payot, 1986, concentrate on how specific interest groups used Pasteur as a vehicle for their own ambitions but do not make a specific link to the cult of great men in general. Other individual studies about the creation of legends also revolve around the theme of the "uses" of the individuals to interest groups, for example, George Weisz, 'The posthumous Laennec: creating a modern medical hero, 1826–1870', *Bull. Hist. Med.*, 1987, **61**: 541–62, and L. S. Jacyna, 'Images of John Hunter in the 19th century', *Hist. Sci.*, 1983, **21**: 85–108. Both cases illustrate elements of cult veneration in the later nineteenth century, for example, propagation of the cult by a group of devotees, commemorations and erection of memorials.

<sup>5</sup> René Dubos, *Louis Pasteur: free lance of science*, New York, Scribner, 1976; Gerald L. Geison, 'Louis Pasteur', in C. Gillispie (ed.), *Dictionary of scientific biography*, 15 vols, New York, Scribner, 1974, vol. 10, pp. 350–416.

<sup>6</sup> Bernadette Bensaude-Vincent, 'Louis Pasteur face à la presse scientifique', in *L'Institut Pasteur: contributions à son histoire*, ed. M. Morange, Paris, La Découverte, 1991, pp. 75–88; Bert Hansen, 'La réponse américaine à la victoire de Pasteur contre la rage. Quand la médecine fait pour la première fois la "une"', in *ibid.*, pp. 89–102; Geneviève Lacombe, René Lafite, Marie-Catherine Putz, 'Le mythe Pasteur', *Jonas*, 1988, **4**(5): 9–22.

public presentation of archival and three-dimensional material of great men which took place during the late nineteenth and early twentieth centuries. There are potentially rich areas of research here which hitherto have been neglected.

This paper seeks to add a new dimension to the cult of Pasteur by placing the cult of material evidence in its wider context. First I will examine the phenomena of the cult of great men and of Pasteur, then we will see how this led to the cult of Pasteurian relics, which were collected by Henry Wellcome as part of his museum's aim of perpetuating the deeds of great men. This cult of science and of scientists has endured in the museum's collections up to the present day.

#### THE CULT OF THE GREAT MAN

*The life of Pasteur* written by his son-in-law René Vallery-Radot relates how Pasteur stayed on in Copenhagen after the end of the International Medical Congress in 1884 and,

... had much pleasure in visiting the Thorwaldsen Museum. Copenhagen, after showering honours on the great artist during his lifetime, has continued to worship him after his death. Every statue, every plaster cast, is preserved in that Museum with extraordinary care. Thorwaldsen himself lies in the midst of his works—his simple stone grave, covered with graceful ivy, is in one of the courtyards of the Museum.<sup>7</sup>

Four years later, at the opening of the Pasteur Institute, the inaugural speech of Professor Grancher, the Secretary of the Institute Committee, declared that,

... at no former epoch have great men been more beloved in France; that justice is already rendered to them during their lifetime, which is very much the best way of doing so ...<sup>8</sup>

Europe in the nineteenth century had indeed seen men of letters, arts and sciences honoured during their lifetime. Society placed great emphasis on individuals and individual achievements in an age of aspiration and competition, and reverence for such accomplishments was openly encouraged by governments. Disraeli, for instance, regarded a great nation as being one which produced great men. Politicians upheld such men as examples to, and leaders of, society, and scientists in particular tended to make excellent role models. They worked their way up from often humble beginnings<sup>9</sup> and their discoveries were perceived as being undisputed and of lasting benefit. Their work differed from that of other professions in that it appeared to be more solid and worthy, personifying progress in a way that ordinary citizens could both admire and emulate. Scientists were not considered to be prey to the vicissitudes and immorality of artistic or political life. Great men were showered with national and international awards, decorations, and sometimes high office. On their death they were awarded magnificent state funerals in the national shrine.<sup>10</sup> In

<sup>7</sup> René Vallery-Radot, *The life of Pasteur*, transl. R. L. Devonshire, New York, Doubleday, 1927, p. 402.

<sup>8</sup> *Ibid.*, p. 442.

<sup>9</sup> Individualistic determination was certainly essential to forge a successful scientific career in nineteenth-century France. See Robert Fox, 'Scientific enterprise and the patronage of research in France, 1800–1870', *Minerva*, 1973, **11**: 350–416.

<sup>10</sup> For example, Darwin was given a full state funeral and burial at Westminster, in spite of his family's desire to bury him at Downe.

England, Westminster Abbey was filling up with the remains of the great and good, whilst in France the secular Panthéon was dedicated to the nation's great men, the exterior proclaiming "*Aux Grands Hommes la Patrie Reconnaissante*".

In 1885, the year after Pasteur's visit to the Thorwaldsen Museum, thousands witnessed the state funeral of Victor Hugo. Hugo was buried in the Panthéon amongst rows of national heroes. This was the largest, most impressive and most emotional funeral yet held in Paris, and possibly in Europe. Ten years later, Pasteur's own state funeral would not only equal Hugo's, but in one sense surpass it. The Government wished Pasteur to be buried in the Panthéon, but his family insisted that he should be buried in the crypt of the Pasteur Institute. Why should Pasteur share a dark tomb with other great men in the national shrine? Why should he not rest in his own resplendent chapel in the building dedicated to his life and work, surrounded by mementoes of his achievements as well as by his living legacy and disciples? What better focal point for worship of a saint? Thorwaldsen was surrounded by his past, but Pasteur is surrounded by past, present, and the expectation of the future.

The last quarter of the nineteenth century saw the Third Republic of France avidly encouraging the cult of great men. To impress its ideology on the masses, it sanctified men of moral and material progress in order to show that men were great by merit, not by birth. Hero-worship was transformed into a cult, encouraged by an anticlerical government as an alternative to established religion. The status of the nation was reflected in its output and treatment of great men, who in turn maintained that their work should glorify their country. The philosophy of Positivism, as expounded by Auguste Comte in the mid nineteenth century, had encouraged the view that the achievements of individuals should be presented to new generations.<sup>11</sup> For example, Comte cited Lavoisier as a hero of Positivism, thereby contributing to the intellectual framework for the cult of Lavoisier in the nineteenth century.<sup>12</sup>

Instead of statues of royalty, statues of these men of progress adorned the new boulevards of Paris. This *statuomanie* accelerated during the final years of the nineteenth century, with the names of Hugo and Pasteur being commemorated in sculptures, plaques, streets, and schools in almost every town and village in the French-speaking world.<sup>13</sup> Their overtly patriotic stance during their lifetimes added to their status as suitable cult figures. Pasteur, for example, had proclaimed a deep bond between science and patriotism, and used science to glorify France.<sup>14</sup> The educational reforms instigated by Jules Ferry and others looked to technical and scientific education to produce good citizens, and to promote a political and social cohesion by hallowing the achievements of great men. Popular and didactic biographies and weighty collections of works of great men were published in ever

<sup>11</sup> It is interesting to note that Comte himself became the focus of a cult after his death. His followers spread the gospel of Positivism by commemorations, by erection of statues, and by turning his house into a kind of shrine.

<sup>12</sup> Bensaude-Vincent, 'Lavoisier: une révolution scientifique', in M. Serres (ed.), *Éléments d'histoire des sciences*, Paris, Bordas, 1989, pp. 363–85, on p. 382.

<sup>13</sup> Such monuments were often raised by public subscription and were the focus of ceremonies to provide a theatre not only for the honoured individual, but also for those honouring that person. Pasteur attended many such ceremonies in both capacities, for example as the subject of such honours at the unveiling of a plaque on the house where he was born (Vallery-Radot, *op. cit.*, note 7 above, pp. 376–8), and as a leader in providing honours at the unveiling of the bust of his friend the sculptor J. J. Perraud (*ibid.*, p. 421).

<sup>14</sup> *Ibid.*, p. 196. Pasteur lamented the fact that although France had more great men than any other country, her history of political instability had done nothing for the support of science or scientists. This idea reflected on the culture of the Third Republic.

increasing numbers. Groups of biographies with a unifying theme appeared, with titles along the lines of “Great Men of Science” rolling off the presses. The genre has endured well into the late twentieth century.<sup>15</sup>

Commemoration grew into sanctification as the aura formerly surrounding royalty and clerics was bestowed on great men of science. Scientists were now objects of veneration. The tradition of the formal reading of *éloges* at the Académie des Sciences had already established the authority and status of scientists within a hagiographic framework. In biographies the terminology became akin to that used in hagiographies of lives of saints. The two biographies written by Pasteur’s son-in-law, René Vallery-Radot, use religious terminology in describing his activities: *divine power, destiny, consecrate, homage, genius, shrine, venerate, legend, cult, temple, worship* are a few typical examples. Note the religious overtones of William Osler’s 1911 introduction to Vallery-Radot’s *Life of Pasteur*, where Pasteur’s position in Science is reminiscent of that of Christ:

In the nineteenth century renaissance she [Science] has had great apostles, Darwin for example . . . but after re-reading . . . the *Life of Pasteur*, I am of the opinion expressed recently by the anonymous writer of a beautiful tribute in the *Spectator* that he was the most perfect man ever to have entered the Kingdom of Science.<sup>16</sup>

#### CONSTRUCTING THE CULT OF PASTEUR: FROM DISCIPLE TO SAINT

Pasteur was not just a disciple in the cult of great men. He was a practitioner who tried to live up to the ideal that he venerated by constructing an image of saintliness around himself in terms of morality, passion for science and patriotism. Latour and Salomon-Bayet have shown how the hygienists and Pasteur’s disciples built on this image to portray Pasteur as the originator of modern science, the master of the laboratory, with the Pasteur Institute enshrining his legend as the benefactor of humanity.

Although Pasteur did take issue with aspects of Positivism, this philosophic rationale for perpetuating the deeds of great men became part of nineteenth-century culture. Let us look at how Pasteur constructed his own image. His own cult of great men was often referred to in his speeches and was well known to contemporaries. His speech at the tercentenary of the University of Edinburgh in 1884 was in effect a tribute to Dumas and scientists of the experimental method, who should serve as inspiration to students to worship great men and great things.<sup>17</sup> His biography states:

He looked upon the cult of great men as a great principle of national education, and believed that children, as soon as they could read, should be made acquainted with the heroic or benevolent souls of great men.<sup>18</sup>

<sup>15</sup> The evidence for this is on display on the shelves of any sizeable reference library, from Wilhelm Ostwald, *Grosse Männer*, Leipzig, Akademische Verlagsgesellschaft, 1909, to the popular bestseller by A. Feldman and P. Ford, *Scientists and inventors*, London, Bloomsbury, 1989. Nationalistic themes are very strong in such collections, which demonstrates the perceived link between nationalism and the achievements of a nation’s scientists. Such works are an intriguing area of study in their own right and have been neglected, again perhaps because of their popularist associations.

<sup>16</sup> Vallery-Radot, op. cit., note 7 above, p. xvi. The full passage from the *Spectator* describes the glories of Pasteur’s funeral chapel and the twice yearly ceremonies held there on the dates of his birth and death, but the author feels that even this opulence fails to do full justice to such a genius.

<sup>17</sup> *Ibid.*, pp. 387–8.

<sup>18</sup> *Ibid.*, p. 164.

His unremitting admiration of his early teachers and mentors in Paris, Biot and J. B. Dumas, led him to expect the same unconditional devotion from his own pupils. Busts, portraits and photographs of his mentors and colleagues adorned his study. He believed that scientists should be concerned with posterity rather than with the daily fluctuations of contemporary opinion. In the words of Pasteur, “The recompense and the ambition of a scientist is to conquer the approbation of his peers and of the masters whom he venerates”.<sup>19</sup>

Pasteur’s worship of great men also extended to historical figures with whom he identified. This was particularly evident in his admiration of Lavoisier. The cult of Lavoisier rapidly gained pace in the nineteenth century, and J. B. Dumas had long campaigned for the publication of Lavoisier’s scientific works, which he undertook during the 1860s.<sup>20</sup> He asked Pasteur to write a popular article on Lavoisier in 1865, to coincide with this initiative. He knew that Pasteur had closely read Lavoisier and considered that Pasteur himself epitomized Lavoisier’s experimental method. The published article tells us more about Pasteur than about Lavoisier. Like Dumas, Pasteur believed that Lavoisier was the unquestioned founder of modern chemistry; the so-called new “French School” of chemists did not exist, as later chemists were merely following the work of the great master; Lavoisier’s superiority lay in his experimental method and the precision of his instruments; rival claims and theories such as those of Priestley were utterly inferior, largely through lack of method.<sup>21</sup> The establishment of unquestioned authority, assertion of superior method, and denigration of any opposition were tactics that Pasteur had already begun to use, and continued to do so in greater and greater measure, to assert his own scientific supremacy and to create his own legend.

Lavoisier’s claim to any moral high ground had been tainted by his association with tax farming. A true great man is sincere,<sup>22</sup> and so Pasteur constructed an image of sincerity and saintliness by holding unimpeachable morals of loyalty to family, country, science, and religion. A man of science is a man of virtue, and a man of virtue, a man of modesty. Pasteur was very much a family man, proud of his humble origins. At the unveiling of a commemorative plaque at his birthplace in Dôle in 1883, he proclaimed that two of the most powerful driving forces in his life were love of science and the cult of the home.

He made frequent explicit public references to his overriding passion for science. Contemporaries had an image of a man who could not live without work. Science and the laboratory were still his main concern even when he was paralysed by his successive strokes or numbed by the deaths of his children, other members of his family and friends. Pasteur took awards for his work very seriously: “He always attached an absolute meaning to words and to things, not being one of those who accept titles and homage with an inward and ironical smile”.<sup>23</sup>

<sup>19</sup> *Ibid.*, p. 252.

<sup>20</sup> Bernadette Bensaude-Vincent, ‘A founder myth in the history of sciences? the Lavoisier case’, in L. Graham, W. Lepenies, P. Weingart (eds), *Functions and uses of disciplinary histories*, Dordrecht, Reidel, 1983, pp. 53–78, discusses Dumas’ deification of Lavoisier and his interest in the history of great men and great chemists rather than in the history of chemistry as a discipline.

<sup>21</sup> Louis Pasteur Vallery-Radot (ed.), *Oeuvres de Pasteur*, 7 vols., Paris, Masson, 1922–1939, vol. 7, pp. 271–81.

<sup>22</sup> Carlyle, *op. cit.*, note 2 above, p. 147.

<sup>23</sup> Vallery-Radot, *op. cit.*, note 7 above, p. 141. There follows a detailed description of the pomp and lavishness of the ceremony of 1 July 1867 where Pasteur received his medal for his work on wines, at a time when Pasteur’s work was little known outside scientific circles. Pasteur made a special trip from Alais to Paris for this occasion.

Pasteur made a point of accepting such honours in person, even in later life when his paralysis rendered him almost unable to make speeches. He used award ceremonies and other public occasions to provide a theatre for the glorification of science whilst maintaining an image of self-effacement. He regarded his medals as representing “homage before the shrine of France”.<sup>24</sup> To Pasteur, Science was the highest personification of nationality. In 1876 he unsuccessfully sought election to the Senate, not on the basis of party politics, but in order to represent Science. He coined his own election slogan of “*Science et Patrie*”, a phrase that was associated with him long after this episode. During the Franco-Prussian War of 1870–1871 he threw himself into studies on beer, purportedly to make a French beer far superior to that brewed in Germany. He published irate tracts on Germany, Germans, and German science, even publicly renouncing his honorary diploma from the University of Bonn after the German excesses during the Siege of Paris.<sup>25</sup> During the war, the Prussians had also invaded Franche-Comté and stationed themselves in his home town of Arbois. Like Victor Hugo, he declared his hopes and fears for the nearby disputed territory of Alsace-Lorraine. He lamented that this issue had dashed the hopes of peaceful co-existence that he had shared with “the great German scientist” Humboldt.<sup>26</sup> His stance promoted the popular view of scientist as patriot, and his anti-Germanic attitudes were glorified by his countrymen during the Franco-German tension and conflicts in the nineteenth and twentieth centuries.

Yet how was dissent dealt with? Pasteur’s actions in his own defence were a contrast to his reticence in openly promoting himself. Much has been written about Pasteur’s bitter polemics against Pouchet and Liebig, who had questioned his theories on spontaneous generation. Pasteur forced his opponents into what Latour has referred to as the “Theatre of Proof”. His critics were issued with ultimatums which necessitated proving the issue one way or another by means of a decisive experiment. His aim was to show up his opponents as poor scientists on the grounds of poorly designed experiments, poor technique, and ill-conceived ideas. His own technical superiority always gave him the upper hand. For example, during the spontaneous generation debate his biography says,

What he wanted was that the truth should have the last word. “What you lack, M. Frémy, is familiarity with a microscope, and you, M. Trécul, are not accustomed to laboratories!”<sup>27</sup>

Nothing less than total victory ever satisfied Pasteur. His vehemence in establishing his supremacy was excused by his followers on the grounds that it was done in order to establish scientific truth. He further asserted his supremacy by his apparent power of prediction of the outcome of experiments, for example at Pouilly-le-Fort in 1881, where the group of vaccinated sheep survived an inoculation of virulent anthrax culture, whereas the unvaccinated group died. His ardent disciple Bouley reported in the *Revue Scientifique* that,

<sup>24</sup> *Ibid.*, p. 159.

<sup>25</sup> It has been noted that, significantly, these treatises and exchanges, together with a few popular articles on great men such as Lavoisier, were virtually the only works that he published outside the specialist scientific press. See Bensaude-Vincent, *op. cit.*, note 6 above, p. 76.

<sup>26</sup> Vallery-Radot, *op. cit.*, note 7 above, pp. 461–2.

<sup>27</sup> *Ibid.*, p. 218.

### *Pasteur material at the Science Museum*

Pouilly-le-Fort is as famous today as any other battlefield. Monsieur Pasteur, a new Apollo, was not afraid to deliver oracles . . . the results proved with absolute certainty the truth of the law discovered.<sup>28</sup>

Yet where less disputable claims to his crown in the kingdom of science existed, Pasteur and his supporters could be highly disparaging or, at best, stonily silent. German laboratory science was a very real threat to his ideal of French scientific supremacy, so the work of Koch was rarely acknowledged.<sup>29</sup>

Pasteur's open encouragement of the cult of great men, and his perception of what an ideal man of science should be, reveals a deliberate construction of his own cult and image from an early stage. Yet, whilst he retained an image of modesty, he left others to build on his construction and to propagate it. After all, a cult should be promoted by its followers rather than by the object of veneration. Latour and Salomon-Bayet have demonstrated how the spread and acceptance of Pasteur's ideas depended on the support and work of his disciples and hygienists. Their contributions to the popular and scientific press led to the identification of the interests of the hygienist movement with bacteriology, which in turn was identified with the work of a single man—Pasteur. This work has shown how the general Pasteurian ideas expressed by his pupils and collaborators became merged into his own to the extent that one man's genius appeared to be responsible for a whole scientific movement. Thus, the view of Richet, the editor of the Pasteurian-hygienist *Revue Scientifique*, expressed in 1895 was commonplace: "Do we not know that every discovery in the domain of bacteriology emanates directly from M. Pasteur, just as every discovery in chemistry emanates from Lavoisier?"<sup>30</sup>

Latour and others have demonstrated how the laboratory became identified with Pasteur, and how he made this world his own. He ensured the continued association of his name with his science and his laboratory through his supporters. Absolute devotion of pupil to master, an authoritarian regime, and personal supervision of all minutiae characterized Pasteur's laboratory. Combined with his high technical competence and teaching ability, his regime ensured total dedication from his pupils.<sup>31</sup>

The foundation of the Pasteur Institute ensured his posterity not simply by its existence, but by bringing together his assistants in a laboratory environment where they could live and work together in pursuit of scientific ideals.<sup>32</sup> Pasteur had often fondly spoken of researches carried out during the summer at the Pasteur family home in Arbois, and in the

<sup>28</sup> H. Bouley, 'Les découvertes de M. Pasteur devant la médecine', *Revue scientifique*, 1883, 3rd series, 5: 439–43, p. 439. Latour has discussed this episode in detail (see Latour, op. cit., note 3 above, pp. 87–90).

<sup>29</sup> English scientists found the French anti-Germanic attitude rather unseemly. Tyndall, in his preface to Vallery-Radot's first biography of Pasteur, remarked that Koch was respected in England and much honoured in Germany; he felt that Vallery-Radot's disparaging remarks about such an eminent man were distasteful. See René Vallery-Radot, *Louis Pasteur, his life and labours*, transl. Lady Claud Hamilton, New York, Appleton, 1885, pp. xxxii–xxxiii.

<sup>30</sup> C. Richet, 'La sérothérapie et la mortalité de la diphtérie', *Revue scientifique*, 1895, 4th series, 4: 65–9, p. 69.

<sup>31</sup> Émile Duclaux, 'Le laboratoire de M. Pasteur à l'École Normale', *ibid.*, 1895, 4th series, 3: 449–54, gives a detailed account of the way of life in the laboratory.

<sup>32</sup> There is a parallel in German science which will not be dealt with here. The Pasteur Institute is particularly notable for its association with a scientist's name. Its foundation was followed by that of similar institutes such as the Jenner Institute (later re-named the Lister Institute), and the Koch Institute. Koch's remains, like those of Pasteur, were housed in a specially constructed mausoleum at the Institute.

years at the silkworm farm at Pont-Gisquet, in an atmosphere that was recreated at the Pasteur Institute. Its foundation symbolized the removal of Pasteur's own work from the restrictions imposed by the University and the State, and reinforced the concept of a genius and his science requiring its own home. Pasteur had earlier led a campaign to improve the financial provision for science, and for the funding for properly equipped laboratories. Pasteur's success with rabies vaccination—intended to be one of the main functions of the new Institute—produced a popular image of Pasteur as the Benefactor of Humanity and Saviour of Children. The Pasteur Institute enshrined this legend and became the focal point of cult worship.

Thus by 1895 Pasteur had established himself in the minds of his supporters as Lavoisier had established himself in Pasteur's own mind—as an irreproachable genius and patriot, sanctified and ready for lay canonization.

#### PASTEUR AS SAINT: THE CULT OF RELICS

Cults often require accessories, and thus devotees collect relics. The cult of Pasteur relics was an extension of the cult of Pasteur the great scientist. At the time of his death in 1895 his name was already immortalized in streets and public buildings. The Institute housed his magnificent tomb and many other mementoes which served to glorify Pasteur. His own chosen terminology persisted in both science and in popular culture; the terms *microbe*, *vaccine* and *pasteurization* were all promoted by pasteurians in preference to the “bacteriological” terminology favoured by Koch and the German school. Pasteur's work on children bitten by rabid animals had already created a series of legends built around him and was instrumental in securing his reputation in popular culture.<sup>33</sup> Towards the end of his life hagiographies were being produced by his immediate circle which followed the tone of tributes written about Lavoisier. His son-in-law, René Vallery-Radot, was largely responsible for these tributes. He wrote a biography with Pasteur's active supervision in 1883 on the eve of his rabies success, with an English translation rapidly following in 1885.<sup>34</sup> An expanded and updated version of this, the *Life of Pasteur*, was published in 1900 with an English translation in 1901, followed by successive reprints in both languages.<sup>35</sup> Recollections of Pasteur's life and work were published by his immediate associates such as Duclaux.<sup>36</sup> Pasteur's grandson, L. Pasteur Vallery-Radot, was also occupied in publishing the seven volumes of Pasteur's scientific works from 1922 to 1939, and the four volumes of correspondence from 1940 to 1951.<sup>37</sup>

The imagery of Pasteur was well known during his lifetime. The dramatic series of rabies vaccinations produced a flush of portraits, engravings, photographs and cartoons in

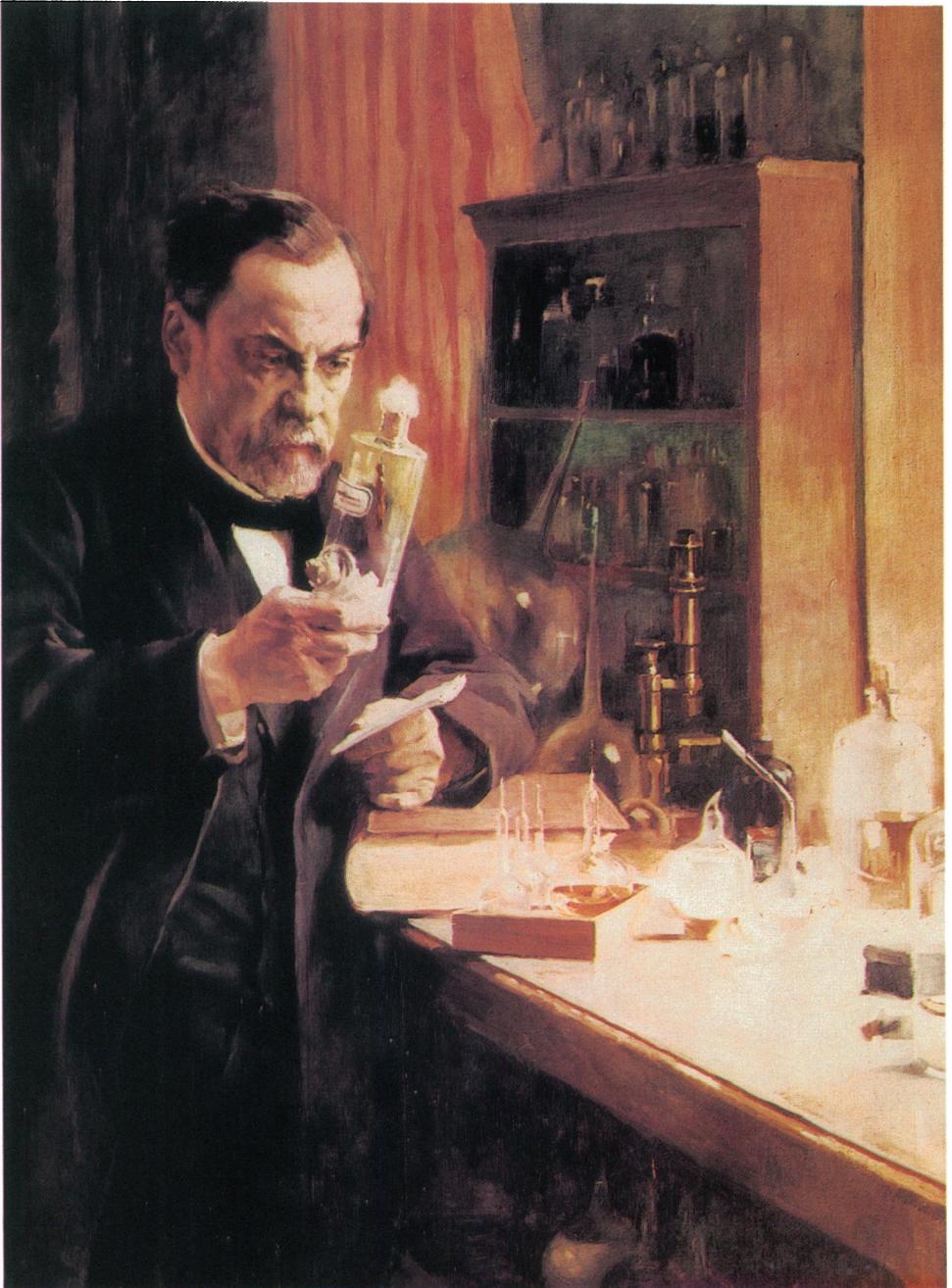
<sup>33</sup> The two main legends were those of the young boys Meister and Jupille, the first patients to be vaccinated for rabies by Pasteur after being bitten by rabid animals. They became role models for all young children and Pasteur remained in contact with them for the rest of his life. A statue of Jupille fighting a wolf was later erected outside the Institute, and Meister became the Institute's gatekeeper. There is also a legend connected with Meister's death; he reputedly committed suicide during the Second World War when the Germans ordered him to open the gates to Pasteur's crypt.

<sup>34</sup> Vallery-Radot, *op. cit.*, note 29 above.

<sup>35</sup> *Idem*, *La vie de Pasteur*, Paris, Hachette, 1900, and *idem*, *The life of Pasteur*, transl. R. L. Devonshire, 2 vols, London, Constable, 1901.

<sup>36</sup> Émile Duclaux, *Histoire d'un esprit*, Paris, Charaire, 1896, and *op. cit.*, note 31 above.

<sup>37</sup> Louis Pasteur Vallery-Radot (ed.), *op. cit.*, note 21 above, and *Correspondence de Pasteur*, 4 vols, Paris, Grasset, 1940–1951.



©Institut Pasteur.

The most copied and plagiarized image of Pasteur which stands out from the standard official portraits of great men. Albert Edelfeldt was a personal friend of Pasteur's son and painted several members of his family. He believed that, "La grande figure de M. Pasteur est un oasis dans le désert de la vie de Paris. Cet homme qui n'a pensé qu'à une chose, la science, et par là même à l'humanité . . ." (René Valléry-Radot, *Madame Pasteur*, Paris, Flammarion, 1941, p. 148).

the 1880s. Images and statues of the great man were in demand and were rapidly commissioned. In 1879 the brewer J. C. Jacobsen, owner of the Carlsberg brewery in Denmark, had already commissioned a marble bust of Pasteur from the leading French artist Paul Dubois, in honour of Pasteur's contributions to science—particularly those to fermentation and beer manufacture. In 1886 he also commissioned a larger portrait of Pasteur from the French “official” artist Bonnat, where a solemn Pasteur in Napoleonic pose rests his arm on his young grandchild Camille. The press carried images of sombre photographic portraits, whilst cartoonists portrayed him as a syringe-wielding Saviour of Children. Yet the most significant portrait was that of 1886 by the Finnish painter Albert Edelfeldt (see plate). This shows the scientist at work in the midst of his laboratory, his temple of the future, surrounded by scientific apparatus, notes in hand and staring intently at a flask containing the drying spine of a rabid rabbit. The image stresses that science was the source of his greatness.

The preservation of Pasteurian cult objects can be traced back to Pasteur himself. As discussed in the preceding section, he attached great meaning “to words and to things” as part of his image construction. In his very early days at Paris he caught, preserved and treasured the handkerchief which Dumas had used to catch carbonic acid “snow” during one of his demonstrations. He was careful to preserve his own creations which demonstrated his ability and achievements. Here Pasteur's activity goes beyond simple preservation of memorabilia into collecting evidence for the “Theatre of Proof”. As an admirer of great teachers and as a talented teacher himself, Pasteur was aware of the power of demonstration. His cork and, later, wooden models of crystal asymmetry were created to make visible that which was almost invisible. A large wooden set was commissioned in 1862 for Pasteur's renewed attempt at election to the Académie des Sciences because “incontrovertible arguments were required” in the light of debate by German mineralogists. An impassioned lecture and the crystals secured his membership in this theatre for the glorification of science. Yet the most powerful symbols of Pasteur's work were the series of flasks from his work on fermentation and spontaneous generation, used from 1860 onwards in his heated argument with Pouchet. During the debate Pasteur narrowed the field of discussion, issued challenges to Pouchet and designed sealed and unsealed flasks of boiled liquid which were exposed to the air at different altitudes. In 1864, at a public lecture at the Sorbonne, he described his techniques and brought along his flasks. What could be more demonstrative and convincing than a series of flasks with their liquid still untainted after many months and years?

In addition to these demonstration pieces, Pasteur and his immediate associates were responsible for the preservation of what could otherwise be described as standard laboratory equipment. Phials of tartrate crystals, silkworm specimens, glassware, apparatus and microscopes all reputedly survived the rigours of everyday laboratory life in most of the places with which Pasteur was associated. Items from his early career, like the tartrate specimens, could only have been prepared and preserved by the man himself, retained as evidence of what he was sure would be the source of his future greatness. All were souvenirs of the great master's work, representing the close attention he had paid to every aspect of what he later referred to as “the temple of the future”. There is a parallel with the preservation of the relics of a saint. In popular mythology first the microscope and then the hypodermic needle became the symbols of Pasteur's power to conquer the

invisible.<sup>38</sup> In the same way that, say, a Christian devotee may choose to be unconcerned by the vast numbers of reputed fragments of the True Cross, it did not matter to Pasteur's followers that there was never one microscope for one piece of work, nor equipment which could have been used by any number of laboratory assistants beside Pasteur. The important factor was that these items were believed to be associated with the great man, and had therefore been used and handled by the master.

The first official assembly of such items took place at the end of Pasteur's lifetime, at a gathering of his friends and colleagues:

On that day, Dr. Roux had arranged on tables, in the large laboratory, the little flasks which Pasteur had used in his experiments on so-called spontaneous generation, which had been religiously preserved; also rows of little tubes used for studies on wines; various preparations in various culture media; microbes and bacilli, so numerous that it was difficult to know which to see first. The bacteria of diphtheria and bubonic plague completed this museum.<sup>39</sup>

The gathering together of these items created a focal point for reverence, a sense of identity and source of inspiration for Pasteurians. Roux was also responsible for a large cabinet display of Pasteur relics at the Exposition Universelle in Paris in 1900. As director of the Pasteur Institute for over 30 years, Roux fossilized its administration, continuing to run it along Pasteur's lines. Like his former master, the saintly Roux was widely respected and his decisions rarely questioned. René Legroux amassed Pasteur personalia and apparatus at the Institute as an extension of the process begun by Pasteur and Roux.<sup>40</sup> As a devout admirer of Roux, he too lived in the shadow of Pasteur and his ideals. His personal enthusiasm for Pasteuriana was not unique, however. In the 1920s Pasteur material was still held in the École Normale in Paris, in Lille, and in the hands of individuals who had been associated with Pasteur.

The Pasteur Museum was opened at the Institute on 20 May 1936 in Pasteur's old apartment. Pasteur's grandson, L. Pasteur Vallery-Radot, had donated the old Pasteur family furniture, memorabilia and mementoes after the death of his parents in the early 1930s. Each item was replaced in its original position, creating the conserved atmosphere of a shrine. The year 1939 saw the inauguration of the *Salles des souvenirs scientifiques* within the museum, which comprises a chronological display of Pasteur's scientific apparatus. Both this room and the restored apartments were the result of the work of René Legroux, who loaned some of the items from the Institute in the late 1930s to create Pasteur museums in the *Maison Natale* at Dôle and the *Maison Familiale* at Arbois.

This phenomenon was not confined to France. In Denmark, the Carlsberg brewery still proudly proclaimed its admiration of the man; the Whitbread brewery in London carefully

<sup>38</sup> Early medals commemorating Pasteur's work tended to feature microscopes, such as that produced by the town of Aubenas. Later his work on vaccines was symbolized by the hypodermic needle, for example, it is featured in connection with his work on rabies in the decorative mosaics in his funeral chapel.

<sup>39</sup> Vallery-Radot, *op. cit.*, note 7 above, pp. 460–1.

<sup>40</sup> Legroux embarked on a traditional medical career, but, after helping out with lessons at the Pasteur Institute in 1906, he became fascinated by Roux and dedicated his career to the Pasteur Institute. He was best remembered for his teaching and technical abilities, and for setting up the microbial collection at the Institute.

### *Pasteur material at the Science Museum*

preserved the binocular microscope which Pasteur had advised it to buy in 1871;<sup>41</sup> and the medical institutions in America were seeking to acquire Pasteurian relics to add to their new collections which proclaimed their association with great men and great deeds. An exhibit of Pasteur relics at the Pasteur centenary celebrations was held at the New York Academy of Medicine in 1922, the catalogue of which begins:

The civilised world now speaks of the GREAT PASTEUR. The centenary of his birth has been celebrated in every country of the globe, as no other scientist or humanitarian has ever before been honoured.<sup>42</sup>

Amongst the mass of books, photographs, prints and busts, were four original objects loaned for the occasion by prestigious American scientists and institutions who had been presented with these articles by Roux and others for their educational value and for promoting the work of Pasteur.<sup>43</sup> To be chosen as the recipients of such hallowed relics was in itself a reflection of their own greatness, suggesting that they were the heirs of great men. Exhibitions provided a forum for proclaiming this association with prestigious contemporaries and for basking in the reflected glory. The catalogue provides a brief survey of three objects, a crystal model and two glass flasks. It then launches into an ecstatic description of the fourth item which was considered to be the highlight of the exhibition:

It is most precious,—a fine porcelain door knob taken from his room in his Arbois home . . . It invites concentration, for it seems not only to bear the finger-prints of the great master, but it symbolizes his life work . . .

Such collections bind together the Pasteurian cult of the home, of science and the laboratory, of patriotism and of great men. This is the background against which Henry Wellcome began to collect relics of French scientists in 1926.

#### WELLCOME AS DISCIPLE: THE PERPETUATION OF THE CULT OF GREAT MEN

The Wellcome Historical Medical Museum (WHMM) was inaugurated on 24 June 1913 at the 27th International Congress of Medicine in London. Henry Wellcome remains an elusive character whose views are largely deduced from archival fragments, from a few public statements, and from the creation and organization of the museum in which his was the guiding hand. Henry Wellcome's aims and motives in founding this museum have already been thoroughly examined by Skinner.<sup>44</sup> His ideas were formed in the 1880s and

<sup>41</sup> This microscope was very much a treasured possession. Its existence even featured in a Whitbread advertising campaign during the late 1940s which directly linked Pasteur's visit and advice with the resulting quality of Whitbread beer. During his lifetime Pasteur was considered to be the saviour of the brewing industry and was also courted by Youngers of Edinburgh. Ironically, Pasteur intensely disliked the taste of beer.

<sup>42</sup> *Pasteur centenary catalogue of objects*, New York, The New York Academy of Medicine, 1922.

<sup>43</sup> Roux and Calmette donated an original crystal model to the College of Physicians in Philadelphia for its educational value; Pasteur presented glass laboratory flasks to Harold Ernst of Harvard, and a sealed ballon liquid to Ernst LaPlace of Philadelphia; Pasteur's grandson, Louis Vallery-Radot, presented the Arbois door knob to Alexis Carrel.

<sup>44</sup> Ghislaine M. Skinner, 'Sir Henry Wellcome's museum for the science of history', *Med. Hist.*, 1986, **30**: 383–418.

changed little thereafter; his interests were largely anthropological; he saw much in modern science that he regarded as the repetition of ancient ideas, and believed that by studying the history of medicine, new fields of medical research would be suggested. Skinner has shown how his museum aimed to connect episodes in the history of mankind from prehistoric times to the present day, but he was isolated from mainstream movements in museums. He remained an amateur in both museum and scientific fields in spite of his election to learned bodies and of his pretensions to scholarship.

However, Wellcome, like Pasteur, was brought up on, and participated in, the nineteenth-century phenomenon of the cult of the great man as discussed in the first sections of this paper. Although the cult was better developed in France than anywhere else, Wellcome could not have been unaware of hagiographies, commemorations and other adulations of great men. He himself had gained a prestigious niche in the business world through individual determination, but he lacked the kudos of a scientist. His high position in scientific circles owed more to his philanthropic activities than to admiration of his research. Immortality would rest instead on the research institutions which bore his name, including the museum of medical history. Wellcome collected not only relics of great men of the past, but also those of contemporaries who aspired to greatness. His belief that any benefits to society would come through science corresponded to the progressive ideals of scientists and their supporters, as did his progressive evolutionary interpretation of science and medicine at the WHMM. It is suggested here that, by collecting relics of great men and by exhibiting them to an academic elite, Wellcome intended that some degree of their greatness should rub off on him,<sup>45</sup> and that his museum would be recognized as the international guardian of their cult. He would then be identified with their achievements. The 1913 handbook to the Museum stated:

It is also hoped to conserve the relics of workers and discoverers in various branches of Medicine and the Allied Sciences, and so hand down to posterity the names of those who in the course of time might be forgotten, thus rendering honour to whom honour is due. Relics and documents of this kind will form a permanent tribute to the work and memory of those who have distinguished themselves in various realms of science in past years.<sup>46</sup>

This motive became progressively more explicit in the many later editions of the handbook and related publications. These included a public request for those associated with great men to donate or loan relics to the Museum.

After the First World War, Wellcome's major collecting surge began. The Museum of 1913 had contained a handful of Jenner and Lister relics, plus a few relics and instruments of famous surgeons. By the time of its re-opening in 1926 after a complete reorganization, the themes of the life and work of great men had become much stronger, enriched by a wealth of new material. The portrait gallery had been transformed:

<sup>45</sup> Ibid. Skinner relates how the museum's exhibitions were in effect restricted to research workers and academics. Magnates such as Henry Ford established museums which illustrated their own progressive view of science and technology. Those who had reached the ranks of greatness would therefore be more likely to support and adulate someone who supported their own ideals.

<sup>46</sup> *Handbook of the Wellcome Historical Medical Museum*, London, Wellcome Historical Medical Museum, 1913, p. 7.

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An important section is being developed in this Gallery, to illustrate THE LIFE-WORK OF EMINENT PHYSICIANS AND SURGEONS. Portraits of men renowned for their work in various branches of medical science are hung in association with personal relics, instruments which they invented etc. It is hoped that this section will develop into an extensive series showing the developments of medicine and surgery in modern times. As the years pass by, the work of the men shown will thus acquire its true historical perspective.<sup>47</sup>

The gallery contained an enlarged section on Jenner personalia; a whole group of cases containing instruments and personal relics of illustrious physicians and surgeons such as Sir Rickman Godlee, Sir James Paget and many others; a case of medicine chests and memorabilia of great men such as Nelson, Washington and Wellington; a case of commemorative medals; a case entirely devoted to doctors' walking sticks and canes; and all around the walls, portraits of eminent physicians and surgeons throughout the ages. The Museum's sections on Lister and Pasteur were intended to interrelate closely. The great men themselves, their biographers and followers had always remarked on this mutual recognition of greatness. One had to become a disciple before becoming a cult figure, so the recognition of greatness in others was part of establishing a scientist's own credentials. In many ways the British cult of Lister can be perceived to be modelled on that of Pasteur.

The Lister Centenary Exhibition held at the WHMM in 1927 was Wellcome's extravagant monument to the cult of the great man. The official handbook to the exhibition starts with a brief hagiographic Life which parallels those written about Pasteur.<sup>48</sup> Lister fought against the ignorance of others; he indulged in bitter controversy only for the good of science and humanity; his work was all original, farsighted and ahead of its time; and his personality was the epitome of that of a devoted and sincere man of science. At the end are appended bibliographies, a list of all the honours and awards received by Lister, and a year-by-year list of all the dressers, house surgeons and other associates of Lister in all the establishments where he had practised. The handbook lists vast numbers of photographs of Lister, Lister's family, Lister's friends, Lister's colleagues, the places with which Lister was associated and so on. There were original diplomas, medals, letters, papers, books, sculptures, academic dress, door handles, chairs, microscopes, sterilisers, dressings, surgical instruments, replica experiments and the reconstruction of the Lister Ward. During the collecting drives abroad from 1927 onwards, Wellcome gave specific instructions to his agents to give out copies of the WHMM handbook and the Lister Centenary Exhibition Catalogue to persuade waverers of the benefits of donating relics of great men to his Museum.

Wellcome saw France as being an area of great interest to the WHMM as

... an immense amount of original research has been pioneered in France during the past several centuries, and I believe that a great number of the families of these research workers and or the institutions with which these workers were associated, possess objects of great interest in connection with the history of these sciences. And that these families and institutions will be glad to see these objects preserved in this International Historical

<sup>47</sup> *The Wellcome Historical Medical Museum*, London, Wellcome Historical Medical Museum, 1927, p. 49.

<sup>48</sup> *Lister centenary exhibition at the Wellcome Historical Medical Museum*, London, Wellcome Historical Medical Museum, 1927.

Museum where they will form a memorial to those scientists whose work has contributed so much to the advancement of knowledge for the world's benefit . . .<sup>49</sup>

Wellcome was conscious of keen competition from the growing number of medical museums in America, and wanted to acquire as many items as possible before these American museums snapped them up. He decreed that lists of eminent scientists and their relatives should be drawn up and those listed on them were to be contacted for donation of original relics.

With the large sums of money the Americans are preparing to expend, they are proposing to sweep Europe clean of historical medical material, and they may succeed unless we act quickly and thoroughly.<sup>50</sup>

The agent entrusted with the task of collecting this material was Captain P. J. Johnston-Saint, proficient linguist and *bon viveur*.<sup>51</sup> He had only a limited knowledge of the wide range of material that he was instructed to collect during his hectic travelling schedule, but potential donors responded well to his charm. Johnston-Saint's uncatalogued correspondence is very patchy, with varying quality of reporting, missing documents and sketchy lists of acquired material. He rapidly gained the confidence of two important figures, René Vallery-Radot and René Legroux, and explained the aims of the Museum to them. Both were committed to the immortalization of Pasteur and worked hard to supply Johnston-Saint with material. They also provided letters of introduction to influential figures who were known to hold personal relics of Pasteur and other scientists. Johnston-Saint swiftly shipped objects to London, where they were documented in very basic terms by largely unqualified staff because collecting, not cataloguing, was held to be the prime function of the WHMM. Where an original object was too expensive or unobtainable, Wellcome commissioned replicas in order to maintain the continuous evolutionary strand of history. Johnston-Saint, however, was delighted with the large number of original relics flooding into the Museum as a result of the publicity from its reopening in 1926;

I wonder what the College of Physicians of Philadelphia would say if they saw our material, not only that of Lister but of other distinguished people. They think so much of the small collection which they have, which only numbers about eight or ten articles belonging to Benjamin Rush, Jenner, Lister, Pasteur and Madame Curie.<sup>52</sup>

Wellcome's museum offered an incomparable international platform for the propagation of Pasteur's work and ideas, exemplified by the recent exhibition on Joseph

<sup>49</sup> Uncatalogued material in the CMAC: Wellcome's comments on a brief report by Johnston-Saint, 11 June 1927.

<sup>50</sup> *Ibid.*, letter from Wellcome to George Pearson, 19 August 1927.

<sup>51</sup> Captain Peter J. Johnston-Saint (1886–1974) could be best described as a somewhat dashing figure who undertook most of the foreign collecting for the WHMM. He was Wellcome's "Foreign Secretary" by 1928 and later became conservator of the museum from 1934 to 1947. His main languages were French and Spanish, and he later wrote accounts of his travels in France and Spain. The diaries of his collecting trips for the WHMM were dispatched regularly and he was obliged to send written reports to Wellcome. However, they reveal more about his personal charm and flamboyant lifestyle than about the objects collected.

<sup>52</sup> Uncatalogued material in the CMAC: letter from Johnston-Saint to Malcolm, dated 23 November 1926.

Lister. In the view of Pasteurians, Pasteur relics donated to Wellcome's museum would glorify Pasteur, glorify the Pasteur Institute, and glorify France before the world. France and French science was in need of self-esteem and support after the ravages of the First World War. The Institute would always remain the focus of the cult, but the gospel must be spread and therefore advantage must be taken of this offer to glorify French scientists. Eminent men such as Professor Lespieau of the *École Normale* also donated relics of their own work, thereby ensuring some immortality for themselves. Lespieau presented one of his five original Pasteur ballons containing untainted liquid, and his colleague, Poulenc, later donated a group of glassware items. At the Pasteur Institute, Legroux handed over what are thought to be a collection of original items, including silkworm and tartrate specimens. In Lille, Professor Pascal donated laboratory glassware and loaned further original objects for temporary exhibition at the WHMM. Relatives of Pasteur's associates who had fallen on hard times were also valuable sources of material. For example, Mme Marie Fournery-Magnan sold to the WHMM the microscope which Pasteur had used at Pont-Gisquet. In spite of the many doubts surrounding the authenticity of these items, the archival evidence suggests that the offers and acceptance of such relics were generally made in good faith on both sides.

More shadowy dealings took place with M. Nachet, owner of the great French microscope makers. Nachet sold and presented three microscopes and several microscope accessories, all reputedly made for Pasteur by his firm. One of these microscopes was alleged to be the original instrument used by Pasteur in his researches on fermentation and spontaneous generation, and has been exhibited as such up to the present day. It is in fact a very late-nineteenth-century instrument used by silkworm farmers to assess the presence of silkworm disease according to Pasteur's method. The many successive public exhibitions of this instrument indicate the willingness of Pasteurians, curators and the public to believe that this was Pasteur's original research microscope.

Finally, other objects were collected which were intended to enhance the collection of relics. These included a sequence of over 70 items of duplicate apparatus prepared by Legroux to illustrate the mastery of Pasteur's experiments. These are the only deliberately commissioned replicas, requested because the originals (in the Institute) were not available. There is no question of forgery, and they have always been clearly exhibited as replicas and invariably used for purely didactic purposes. Johnston-Saint also acquired books, manuscripts, photographs, engravings and commemorative medals relating to Pasteur. This sort of material was used, as in the Lister exhibition, to put the original relics into context.

Ironically, the Pasteur material was never displayed as the subject of a single exhibition during Henry Wellcome's lifetime, although much of it appeared with the Lister material in the WHMM. In 1947 a Pasteur exhibition, which had previously been shown at the Palais de la Découverte in Paris, was brought to England with the assistance of the French government and was displayed at the Science Museum. This largely two-dimensional display was swelled by a special exhibit by the WHMM which featured most of the relics collected by Johnston-Saint, all of which were clearly stated to be original objects. The replicas by Legroux were labelled as being copies. The content and style of the Science Museum's exhibition catalogue echo that of the WHMM Lister exhibition some twenty

years earlier. L. Pasteur Vallery-Rabot wrote the introduction, which was blatantly anti-Germanic and pro-British in tone, in his bid to secure Pasteur's immortality. He directly linked the inspiration that great men owed to each other, tracing a chain from Jenner to Pasteur to Lister to Fleming. In one sense this reflects Wellcome's ideas of linking the works of great scientists in one historic chain. During the German occupation in 1941, Vallery-Radot expressed his feelings for great scientists by invoking the cult of relics:

I wondered how I could give our British friends a token of my faith and admiration. I could only think of one way, to send to one of the greatest British scientists, my distinguished friend Sir Henry Dale, a souvenir of one of the greatest Frenchman, Pasteur, who had loved Britain as much as he hated Germany. I sent Sir Henry Dale a few lines written in Pasteur's own hand in 1856; it was his thanks for the Rumford Medal which he received from the Royal Society for his work on crystallography.<sup>53</sup>

#### CONCLUSION

A speaker at a Science Museum seminar on collecting policies in modern science and technology stated:

The provenance of most objects which science museums collect and display is seldom problematic . . . Because the value of scientific objects inheres mainly in their explanatory quality, there is less incentive to commit forgery and less reason to query what was the work of the Master rather than of his assistants. . . . many relics are relegated to trivial connections with the famous or to being the 'first' of their kind.<sup>54</sup>

This paper takes issue with this statement. Firstly, the motives behind the collection and display of the Pasteur material show that explanatory quality was not the prime consideration. Secondly, although this study has not unearthed any evidence of deliberate forgery, it has demonstrated a desire on the part of Pasteurians and collectors to believe deeply in claims to authenticity in the race to acquire as many relics as possible. Thirdly, connections with the famous are not necessarily in any way trivial. The existence of Pasteur material can be linked directly to the cult of great men. As the work of Latour and others has indicated historians of science have shown a universal tendency to concentrate on one person rather than on a group or on the background of scientific developments. The Pasteur memorabilia at the Science Museum are a direct product of the cult of great men, in which Pasteur and Henry Wellcome were active participants. Their collection, documentation and display ignore the possibility that the scientific apparatus collected was likely to have been used as much by the pupils as by the great master. Items of dubious provenance were repeatedly displayed as originals, because, like the relics of saints, their importance lay in the *belief* of the cult followers that they were genuine. The often tenuous connections and the background of the apparatus were simply not spoken of, so that for

<sup>53</sup> *Pasteur exhibition*, London, Science Museum, 1947, p. 3.

<sup>54</sup> David Lowenthal, 'Science museum collecting', in *Museum collecting policies in modern science and technology*, London, Science Museum, 1991, pp. 11–15, on p. 11.

over fifty years a mass-produced microscope of the 1890s was successively exhibited as a unique instrument used in a momentous discovery of the 1860s. Curators' attempts to present science to the public have invariably perpetuated the concept that one single instrument was used in one single momentous discovery by one single scientist. Scientists themselves do not seem to have disputed this view, for it gives an impression of progress in a manner which is likely to secure support for themselves in the future. Indeed, they have consistently added examples of their own material to science museums. Exhibitions centring on hallowed names are easier to create and more likely to attract attention than those which concern broad movements and anonymous participants.

In the late twentieth century these ideals are still very much in existence. Authenticity studies in themselves, by their very intention of separating the rogue material from the real thing, enhance further the importance of genuine relics and thereby perpetuate the concept of the great scientist. Pasteur domestic items and scientific apparatus are still exhibited side by side at the Science Museum, the Musée Pasteur, and the Pasteur family home at Arbois. The recent display of the work of the researchers of the Pasteur Institute at Garches also perpetuates these ideals by focusing on individuals, mixing their scientific equipment and personalia in the displays. Museums are invariably concerned with collecting original items and, in exhibitions about artists or writers for example, may feature memorabilia and original relics. Yet science museums have a particular tendency to portray the general history of science and technology through individuals, in spite of the academic discipline's movement away from this interpretation. Relics and personalia in any museum may give a heroic account of history, but science museums have elevated these to the status of objects of cult veneration. The various original Pasteur balloons serve to remind us of the "Theatre of Proof", while personal items from the Arbois door knob exhibited in 1922, to the inkstand at the Science Museum today serve to emphasize the veneration of the scientist as a person. An object handled by dozens of workers does not have the same appeal. Therefore a single scientist's discovery merits the exhibition of personal effects, but a discovery by a loosely-defined group of research workers does not.

This paper has chosen to examine the direct relationship between the cult of museum memorabilia and the cult of Pasteur. In casting new light on Pasteur as a great man, it reiterates the need for further research into the cult of the Great Men of Science and its perpetuation to the present day. When interpreted in their full historical context, museum objects are no longer merely vehicles of scientific explanation, but symbols of wider evidence for the history of science.

## APPENDIX

### The Pasteur material at the Science Museum

#### I. RELICS WITH CLAIMS TO AUTHENTICITY

##### 1.1. *Items from Mme. Fournery-Magnan*

The Magnan family owned Pont-Gisquet, the silkworm farm near Alais where Pasteur and his colleagues stayed and worked for long periods from 1886 to 1870. The Pasteurs, Magnans, and visiting researchers developed close personal ties and in 1870 Pasteur

arranged for one of his Hartnack microscopes to be given to the owner's daughter, Mathilde, as a souvenir of the time that he had spent with the family.<sup>55</sup>

From 1867, when he had established the nature of what he discovered were two distinct silkworm diseases, Pasteur fought to publicize and promote his method of identification of disease and the resulting preventative action that needed to be taken. The disease could only be detected in apparently healthy silkworms by the use of the microscope, a technique which he claimed was so simple that a woman or child could do it. He presented his work not only to scientific circles and the government, but also published articles in trade journals and regional newspapers advocating the use of microscopes by the farmers themselves. The economy of the Cévennes region was highly dependent on silkworm farming; what appeared to be an irreversibly collapsing industry in 1865 was rejuvenated and strengthened in the 1870s by the work of one man. Pasteur received awards and recognition for his work in France and abroad, but most importantly he was perceived in the Midi to be the saviour of the region, with the microscope his symbol. It is suggested here that this was in his mind when he presented the microscope to Mathilde. He returned in later years to unveil statues, give speeches, and receive awards, and the villa of Pont-Gisquet became renamed the Villa Pasteur.

Mathilde Magnan and her daughter Marie had fallen on harder times by the 1920s and were required to dispose of various items during the process of moving house. They hoped to sell the microscope to the Institute of Hygiene at Strasbourg for 5,000 francs in 1926; the Institute could not afford it and instead forwarded the news to the WHMM which purchased it for the asking price. Johnston-Saint's persuasive charms subsequently led the Magnans to donate a ceramic pestle and mortar, inkstand, and cups and saucers used by Pasteur during his years at Pont-Gisquet. Autographed books, visiting cards, and letters (not in the possession of the Science Museum) were also readily donated, as was material relating to Mathilde's brother-in-law Jules Raulin, Pasteur's first assistant.

### 1.2: *Items from the École Normale*

In November 1926 Professor Lespieau, professor of chemistry at the École Normale, showed Pasteur's attic laboratory and contents to Johnston-Saint. Lespieau had charge of several original flasks used by Pasteur in his work on spontaneous generation and fermentation in the early 1860s. He was eventually persuaded to donate one flask, bearing the inscription: 3 Août/1864/Fevier[?]/Eau de Levure, which had been left to him by his predecessor Gernez, one of Pasteur's assistants on this work.<sup>56</sup> This represented Pasteur's "Theatre of Proof". Lespieau later presented books and letters relating to Pasteur, in addition to original pieces of Henri Sainte Claire Deville's laboratory apparatus.

Items of laboratory glassware including ballons, bottles, and two pipettes were presented by a M. Poulenc of the École Normale. Again, Johnston-Saint does not detail these items in his correspondence and the only documentation that exists are the short, cryptic entries in the accessions register. Depending on how one interprets these

<sup>55</sup> Uncatalogued material in the CMAC. An original statement written by Mathilde Magnan and dated 21 July 1926 is packed with the microscope and declares that the microscope was used by Pasteur at Pont-Gisquet from 1868–1869. The microscope itself is inscribed E. Hartnack./Place Dauphine, 21./Paris, and its box is numbered 7017. The inscription, style, and box number all point to manufacture in the mid-1860s.

<sup>56</sup> *Ibid.*, WHMM report MM13, 18 January 1927.

ambiguous entries, they could have been used by Pasteur, could simply have come from his laboratory, or even been copies of the originals.

### 1.3: *Items from the Institut Pasteur*

Amongst the commissioned replicas prepared by Legroux are a large number of items which give the impression of being originals. Johnston-Saint's correspondence clearly states that samples relating to the silkworm researches, including a string of cocoons, twigs with cocoons attached and a bottle containing the remains of a diseased silkworm, were donated by Legroux as being the original samples which Pasteur himself had gathered.<sup>57</sup>

The other items are not mentioned in Saint's correspondence, although he often vaguely referred to the large amount of original material which he hoped to secure from Legroux at some unspecified date. The only documentation for these items are the original accessions register. They include what is claimed to be one of the earliest experimental Pasteur-Chamberland filters, which had been continually exhibited as an original object. There are also twenty-eight bottles of tartrate crystals and six bottles of amyl alcohol, all reputedly prepared by Pasteur and again repeatedly exhibited as original items. They all bear photographs of the original labels in Pasteur's handwriting; this may be either because they are replica items, or because the originals were so worn and illegible. The young Pasteur regarded his crystals as being the likely source of his future fame.

### 1.4: *Items from Lille*

In spite of the destruction of Pasteur's laboratory in Lille by the Germans during 1914, Johnston-Saint excitedly records how Professor Pascal, the Chair of Chemistry, uncovered several original items of Pasteur's glassware including four straight-necked ballons which were presented to the WHMM. Several original items including a microscope, balance, crystal models and ballons were borrowed for exhibition at the WHMM and returned to Lille at some later date.<sup>58</sup> Even if glassware had survived the German invasion, it is doubtful whether such standard pieces could necessarily be attributed to Pasteur himself. However, their very survival could be seen to demonstrate the triumph of the work of the great master over the invading German hordes.

### 1.5: *Items from the Nachet Microscope Collection*

Johnston-Saint and Nachet did business over a succession of visits and dinners, with Nachet making more of his collection available on each occasion. The references in Johnston-Saint's correspondence and in the lists of material do not correlate well with each other or with the microscopes. The correspondence suggests that on some occasions Nachet was offering what were purported to be originals, and on others offering to make up replicas from originals at the Institut Pasteur.<sup>59</sup> The first microscope purchased was

<sup>57</sup> *Ibid.*, Johnston-Saint correspondence, 1927.

<sup>58</sup> *Ibid.*, letter from Johnston-Saint to Malcolm dated 23 November 1926; WHMM report MM13 dated 18 January 1927.

<sup>59</sup> *Ibid.*, letter from Johnston-Saint to Malcolm dated 23 November 1926; report by Johnston-Saint on a visit to Paris, 17–27 May 1927; list of first purchases from the Nachet Collection dated 26 November 1927; list of items from the Nachet Collection dated 28 October 1927.

listed as being that which Pasteur used in his researches on spontaneous generation, yet inspection of Nachet trade catalogues show that this item is identical to one advertised as being particularly useful to silkworm farmers who wished to analyse cocoons according to the Pasteur method.<sup>60</sup> Items subsequently sold to the WHMM include an inclined model reputedly made for Pasteur in 1870, although the general style is of the 1870s to 1880s and its box may be of an even later date; a micrometer made for Pasteur in the 1860s (now no longer in the collection); a replica of a Hartnack microscope in the Institut Pasteur (now no longer in the collection). A condenser and *chambre humide*, both reputedly used by Pasteur, were presented to the WHMM. These last two were standard off-the-shelf items which would be difficult to authenticate. All items which remain in the collection have since been exhibited as originals.

## 2. COMMISSIONED REPLICAS

The replicas of Pasteur's experiments, which were personally prepared by Legroux with every attention to detail, remain the only examples of a conscious decision to make do with copies. This is because the Institut Pasteur held the originals and had no intention of letting go of them. They were acquired because they could serve the didactic purpose of teaching the detail of Pasteur's work and could fill the gaps in the otherwise continuous thread of material relating to Pasteur's life and work.<sup>61</sup>

## 3. OTHER ITEMS

Johnston-Saint collected various other items, largely two-dimensional, which did not become part of the Wellcome collections now held at the Science Museum. These mainly consist of photographs and engravings of Pasteur and his associates which were purchased from various dealers in Paris, for example, photographs of the Pasteur Jubilee at the Sorbonne and postcards of Pasteur's birthplace in Dôle. This is typical of the type of material used in illustrating the life of a great man, for example at the WHMM Lister exhibition in 1927, and at the Pasteur centenary at the New York Academy of Medicine in New York in 1922–1923.

<sup>60</sup> Alain Brieux and Gerard L'E. Turner (eds), *Maison Nachet: catalogues de fonds de 1854 à 1910*, Paris, Brieux, 1979, 1892 catalogue, item 11, fig. 9.

<sup>61</sup> Uncatalogued material in the CMAC: Johnston-Saint's report on his visit to Paris, 17–27 May 1927; Wellcome's report on Johnston-Saint's visit to Paris, 11 June 1927.