INTRODUCTION: TWO AVERAGE MEN

Progression to the Mean

In the last years of his life, Adolphe Quetelet (1796–1874) compiled *Sciences mathématique et physique chez les belges* (1866), a book he hoped would explain how his home country of Belgium had regained its status among the great scientific nations of Europe. Quetelet had been born into a difficult time in Belgian intellectual life, and he believed that the sciences in particular had struggled in the eighteenth century, first under the benevolent stagnation of Hapsburg oversight and then under the ruinous invasion and occupation by French revolutionary forces. While Belgian scientific life remained inert, however, he saw what he called 'an intellectual innovation of great importance, an innovation which perhaps has not been so noticed'. It was an 'innovation' Quetelet believed to be the key to Belgium's return to scientific prominence:

> The man of talent, in certain cases, ceased to act as an individual and became a fraction of the body that attained the most important results.[1]

Just a page later he reinforced the point that 'in the sciences of the new era ... *savants* have ceased to act as individuals'.[2] Quetelet was comparing the new form of science to the great 'geniuses' who he believed had driven scientific progress in Europe during the seventeenth and eighteenth centuries, a period when Belgium 'did not have the strength to take part'.[3] The book was intended as a corrective to this glum history, and it contained histories, *elogés* and recollections of the *savants* who had managed to elevate Belgian science and industry to the level of the great powers of Europe.[4]

For the reader who knows Quetelet best from his theoretical *l'homme moyen* (average man), the words above may have some resonance. The notion of an 'individual' as merely a 'fraction' of a larger body seems quite similar in fact to Quetelet's infamous Average Man, a statistical composite of individual traits that Quetelet believed would be central to a new science he called *physique sociale* (social physics). Quetelet had hoped for a quantitative science that would allow researchers to count, measure and predict human actions, and the Average Man was to be the 'centre of gravity' against which such predictions could be made. The beauty of the average

can be seen (in Figure I.1) as a kind of perfect physical and moral being. Quetelet had such high hopes for this imagined man that it led to one of the most seemingly bizarre statements ever made in the history of statistics and the social sciences:

> If the average man were perfectly determined, one could ... consider it as a kind of beauty. All that deviated [*s'éloignerait*] from what it resembled ... would constitute deformity and disease. That which did not resemble it ... would be monstrous.[5]

Contemporary critics derided the idea that deviation from the average was 'monstrous', and readers both sympathetic and hostile towards social physics have tried to make sense of it ever since. One possible theory is that such excitement for averages was an extension of an Enlightenment belief in egalitarianism, and indeed much of Quetelet's social physics picked up where the social mathematics of the 'last *philosophe*' Condorcet left off. Yet seen in combination with Quetelet's reflections on Belgian men of science, the above quote suggests that the idea of composite averages, of individuals 'ceasing to exist' as they become a 'fraction of the larger body', was a theme Quetelet returned to often, whether it was in the abstract realm of social physics or the practical realities of making Belgian *savants*. As this book demonstrates, in order to make progress in social physics, both the sciences of man and the men of science needed to strive to be average.

The primary goal of this book then is to present an analysis of Quetelet's professional scientific work and thought in the creation of these two kinds of average men. Quetelet worked during an era of specialization in the sciences, yet his interests cannot easily be contained within a few disciplines. Even avoiding anachronistic labels of Quetelet – of which sociologist, criminologist and climate scientist are all possible – his work covered an enormous range of topics in the natural sciences and what would become the social sciences. It would be possible to write the life of Quetelet as the story of a statistician, an astronomer, an institution builder, a mathematician, a social theorist, an educator, an economic theorist or even a frustrated poet. All of these narratives would be possible, and indeed some have been realized, but all would be incomplete.[6]

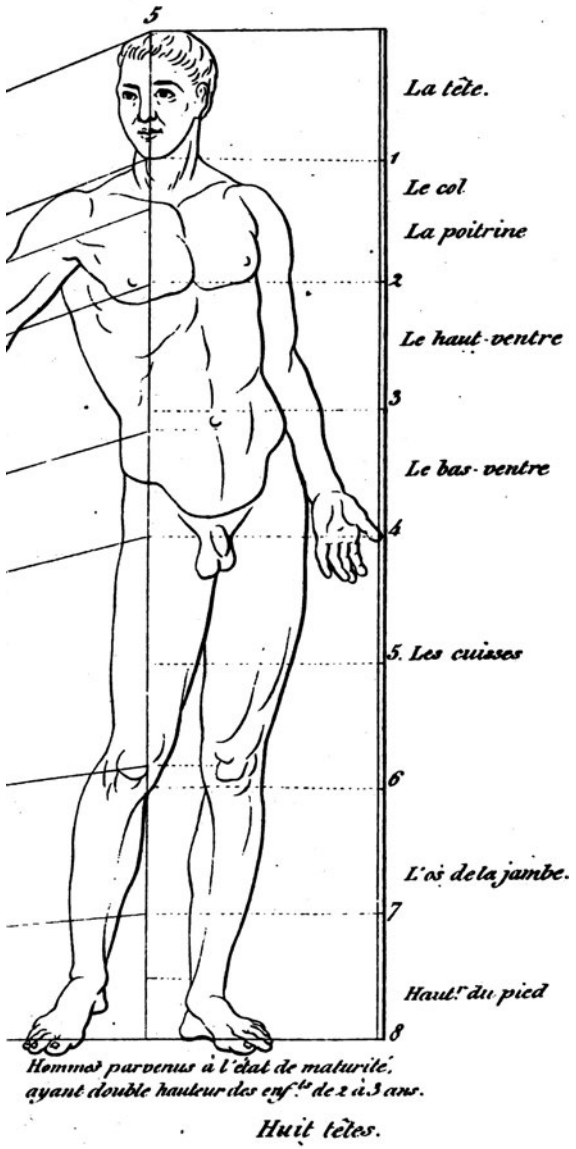

Figure I.1: **Average man (detail). This image demonstrates the harmony of Quetelet's ideal average man. Although the image depicts only a physically average man, Quetelet held out equal hopes for establishing an average man of moral and intellectual character. A. Quetelet, 'Sur le poids de l'homme aux différens ages',** ***Nouveaux mémoires de l'Académie royale des sciences et belles-lettres de Bruxelles*****, 7 (1832), pp. 1–44. Inset following p. 44. University of Wisconsin Memorial Library.**

This book too cannot escape the limitations Quetelet's long and productive life imposes on the historical researcher. The following is in some sense a biography but will pay almost no attention to Quetelet's family life. It is the story of the 'father of modern statistics' but will contain no equations. It is a history of a man whose most widely recognized 'discovery' today – the body mass index – was at the margin of his career and not popularized until a century after his death. It ignores much of his collaboration with Victorian statisticians and only briefly touches on his many projects to assemble a 'Global Physics', a tantalizing project that anticipated much of what today is grouped under the heading of climate science. For reasons explained below, the focus of the book will be limited to two interdependent aspects of his multi-faceted career: his creation of a controversial science of man – *physique sociale* – and his extraordinary work to create scientific institutions of observation at the same time.[7] Each, it will be argued, is impossible to imagine in isolation.

Initially, this book had been conceived only as an investigation into *physique sociale*, but after examining Quetelet's significant writings on the practice of science itself, it seemed clear that his *approach* to science was as valuable to understanding his career as his writings on social physics. Moreover, in examining the historical literature on Quetelet there appeared to be few efforts to examine *physique sociale* in connection with his various institutional roles: director of the Observatoire royal de Bruxelles, editor of the continental journal *Correspondance mathématique et physique*, permanent secretary of the Académie royale des science, des lettres et des beaux-arts de Belgique, state-sponsored traveler to observatories in France and Germany and correspondent to dozens of prominent nineteenth-century men of science. Yet as the sources of these various roles reveal, Quetelet's pursuit of large-scale projects for scientific investigation was not merely the means through which he accomplished theoretical research aims but, at times, appeared to function as ends in themselves. Though Quetelet did serious scientific research, it is hard to find an aspect of his career in which he was more successful, or one to which he was more dedicated, than in creating networks of scientific researchers. Though social physics is often the first thing mentioned in connection with Quetelet's career, this book suggests that even during its creation, it was only a part of his larger administrative concerns in Belgium.

Quetelet's plans for scientific research were directed from a number of influential posts in Belgium which connected him to a host of leading scientific figures throughout Europe. But they also required a particular kind of science worker, one that he admitted in *Sciences mathématique et physique* was very different from the natural philosophers of the seventeenth and eighteenth centuries. As seen in his proposals for institutions of observation and research, stated criteria for membership in a Belgian scientific elite and discussions with other *savants*, science worked best not in a laboratory or secluded study, but through the accumulation of large amounts of data from numerous observers. Because the new

worker who helped to gather this information was expected to be standardized, interchangeable and to exhibit none of the extremes of genius or eccentricity, Quetelet's ideal social physicist appeared to be another average man called for by *physique sociale*. As Quetelet readily admitted, and desired, the new man of science would mark a significant break with the *savants* of the past.

An 'Intellectual Odyssey' of Nineteenth-Century Europe

The creation of two average men was the result of one extraordinary life. Though the project to count and analyse all the experiences of human behaviour may make Quetelet seem a real-life Gradgrind, dedicated to only 'facts and calculations', he was far from the sombre and taciturn parody found in Dickens.[8] Born into one of the most disastrous periods in the troubled history of the Catholic Netherlands, Quetelet used his enthusiasm and energy to help transform his country from a cultural and intellectual hinterland into a significant industrial and scientific power. Quetelet entered the world just a few years after the nadir of Belgian intellectual life in 1794 – when the occupying French closed the University of Louvain and transported the school's library to Paris – but left behind a nation that was one of the most advanced in Europe. During his lifetime, Quetelet either personally created or helped to build nearly every scientific institution in Belgium and the United Kingdom of the Netherlands,[9] including many of the important institutions today. In the process of doing so, he also found time to develop the foundations of modern statistics and quantitative sociology, as well as being among the leading researchers in the new sciences of meteorology and terrestrial magnetism. In the social sciences, Alain Desrosières has written that Quetelet's work was among the most important developments of the nineteenth century, suggesting that Quetelet's 'mode of reasoning ... enjoy[ed] a posterity at least as important as that of more famous social thinkers', including 'Comte, Marx, Le Play [and] Tocqueville'.[10] Peter Buck has also claimed that 'as social scientists, it is with Adolphe Quetelet, and not seventeenth-century natural philosophers, that we share assumptions'.[11] It is certainly difficult to deny the truth of these statements in light of the current enthusiasm for Big Data and quantification in the social sciences and elsewhere, though Quetelet's 'mode of reasoning' should be construed broadly enough to incorporate his administrative work in standardizing scientific researchers alongside the ideas of *physique sociale*.[12]

There is another compelling reason to focus on these two aspects of his career at the expense of his more formal contributions to various disciplines: Quetelet's social physics and institution building put him at the centre of some of the most fascinating developments of nineteenth-century intellectual history and science. Attention to Quetelet's work and thought can engage the question of whether the revolutionary philosophies of the eighteenth century were subverted by the very

mechanism these systems believed would facilitate progress: applying the tools of the natural sciences to the study of mankind. While many Enlightenment writers felt that science would confirm a world ruled by order and harmony and set out the conditions through which progress towards these goals could be made, by the end of the nineteenth century scientific investigation seemed to reveal chaos at best and a new form of progress through savage competition at worst.[13] Particularly troubling was the turn in the 'sciences of man', which by the time of Quetelet's death in 1874 had transformed into nothing short of an apology for European imperialism and retained none of the universalist assumptions that Quetelet had inherited from his *philosophe* heirs. Quetelet was the clear and obvious champion of the statistical sciences of man favoured by Condorcet, yet ended up as a principal inspiration for the eugenicists Francis Galton and Karl Pearson. In *Prophets of Paris* Frank Manuel famously called a similar transformation from egalitarian to competitive progress 'one of the crucial developments in modern intellectual history', and Quetelet's story is central to understanding this turn in the nineteenth century.[14] While Manuel did not include the Belgian, ending with Comte as his last prophet, the historian Lawrence Goldman has proposed that 'Quetelet's personal intellectual odyssey [was] a model of the early-nineteenth century determination to construct a "natural science of society"'.[15] This book largely supports Goldman's claim, but goes beyond the history of ideas to suggest that it was in the practice of science itself where the most important developments occurred in Quetelet's 'odyssey' through the nineteenth-century sciences of man.

Attention to the relationship between Quetelet's own science of man and his proposals for scientific practice can also help illuminate the dramatic changes in research practice during the century. Most importantly perhaps is how the boundary between science and other forms of intellectual activity influenced the production of scientific knowledge.[16] Certainly, once science had freed itself from intellectual (if not political) constraints, the increase in scientific knowledge was extraordinary as the nineteenth century saw tremendous advances in the understanding of heat transfer, electricity, magnetism, optics and evolutionary biology.[17] Was the flowering of the sciences directly due to the development of professional organizations, or was it because of what those organizations isolated scientists from, i.e., the moral constraints and concerns of writers, intellectuals, theologians and social theorists? Conversely, what was the consequence for theorists in the tradition of the Enlightenment who wanted to merge values, literature and science? Such questions can be addressed by studying a man who began work in the eclectic tradition of the French Enlightenment and ended up as one of the most successful scientific administrators in Europe.

If Quetelet is so important in two of the crucial issues of nineteenth-century historiography – the turn in the sciences of man and the institutionalization of science – why then is he relatively unknown today in spite of the tremen-

dous growth of interest in the history of science in the past fifty years? Quetelet developed a massive network of correspondents throughout Europe including Villermé, Esquirol, Goethe, Humboldt, Laplace, Poisson, Gauss, Fourier, Arago, Bouvard, Malthus, Babbage, Herschel, Faraday, Maxwell, Forbes, Nightingale and Whewell. In America he was a regular correspondent with A. D. Bache and members of the American Philosophical Society; James Garfield praised his work on the floor of the United States House of Representatives. He was a member of over 100 professional organizations throughout Europe and the Americas and was responsible for founding not only the Brussels Observatory and countless other Belgian institutions but also the International Statistical Congress, which exists to this day. Yet outside of Belgium today his name is as rare as it was ubiquitous in the mid-nineteenth century, a time when his most popular work *Sur l'homme* was hailed 'as forming an epoch in the literary history of civilization'.[18] Why, despite a claim by George Sarton, the founder of the discipline of history of science, that *Sur l'homme* was 'one of the greatest books of the nineteenth century', has there not been a substantive work dedicated to Quetelet's life and thought since the early 1900s?[19] One possible answer is that Quetelet's long and successful career as a network and institution builder made him unsuitable to the two dominant trends of research in the history of science during the twentieth century: the old heroic narratives of the first half of the century and the post-war studies that sought either to complicate these narratives or create new heroes of unknown figures.[20]

Fortunately however, the discipline of the history of science has in recent decades begun to embrace scientific *praxis* as much as scientific ideas, and Quetelet has a claim as one of the more important enablers of scientific *practice* of the nineteenth century.[21] He played a crucial role in two of the century's most important scientific developments, both of which have somewhat confusingly been referred to as the 'second Scientific Revolution'.[22] Coined by Thomas Kuhn, the phrase was originally meant to encompass a series of changes of which 'one facet' was the vast increase in quantification. In the move towards quantification in the sciences, Quetelet was a participant at the end of a revolution, extending statistical techniques that had succeeded in other sciences into fledgling disciplines like meteorology and what would be known as the social sciences, including most notably his application of Gaussian distribution in astronomy to the study of social phenomena. At the same time, he and others helped create many of the statistical concepts that would feed James Clerk Maxwell's ideas on the development of molecular physics. The movement towards measuring with numbers began at the turn of the century with the mathematicians Laplace, Poisson and Fourier, three of the most important 'quantifiers' in Kuhn's story. Quetelet had in fact met all three of the quantifiers and it was just as Quetelet was creating *physique sociale* that Kuhn argued that the move from '*scientific law to scientific measurement*' was made.[23] As both theoretician and *propagandiste* Quetelet was one of the most prominent nineteenth-century savants in the move towards quantitative measurement.

Quetelet's role was even more noticeable in a different 'second Scientific Revolution', however, the one denoting the increasing professionalization of scientific practice.[24] Though considerable differences exist as to what professionalization was there is a general consensus that all sciences at the time were involved in developing forms of institutionalization to delineate their activities from other scientific and non-scientific activities.[25] As part of this programme, it was necessary to train and educate what Quetelet called a 'new class of men' to perform the duties of large scientific organizations.[26] As Quetelet claimed in two large volumes he published on the history of the sciences in Belgium, the transformation in the means of scientific production had profound consequences for the scientific worker.[27] The model man of science was no longer Voltaire's image of a solitary Newton divining the laws of the heavens, but rather the mass expeditions organized by the Académie française to determine the proper length of the metre. Quetelet believed that he had come of age at the end of an era of science driven by isolated geniuses and that future great discoveries would not be the work not of individual greatness, but of large-scale projects that would employ hundreds, if not thousands, of researchers. Quetelet's history and philosophy of science was not mere speculation, as he spent decades building institutions to conduct large research projects and a lifetime in Brussels teaching and training the men to fill the ranks of these groups. Though a movement of this size certainly had many participants, it would be difficult to find a more energetic and successful programme to organize European science along bureaucratic lines than what Quetelet conducted in Belgium between 1822 and 1835.[28]

Though Quetelet's embrace of what might be called bureaucratic science may not have the dramatic lure of Weber's 'disenchantment', Marx's dialectic of class struggle or Comte's grand stadialist account of historical development, this study of Quetelet's life and work takes seriously Desrosières's and Buck's suggestions above that Quetelet's ideas were among the most durable and lasting of the nineteenth century and that they may have more to tell us about the structure and organization of twenty-first century life and thought than much of the canon of nineteenth-century social thought. Yet it is only by seeing Quetelet's ideas, however inconsistent, alongside his practical vision of how large-scale institutions of science operated, that this importance can become apparent.

After Bielefeld

This change in focus represents one of several contributions this book hopes to make to recent studies of Quetelet. This current body of literature is a fragmented group that owes much of its confusion to two biographies written shortly after the turn of the last century.[29] Both books were concerned with placing Quetelet within a previously established narrative: for Frank Hankins it was the develop-

ment of statistical techniques; for Joseph Lottin, the development of social theory. Both would now be considered unashamedly internal histories, an approach that had both its advantages and disadvantages. While each study situated Quetelet firmly within the confines of disciplinary history, they obscured the diversity of his thought and avoided what was most interesting about his career: the overlap in his thought and science that developed as he created both a quantitative science of human behaviour and the institutions to count these actions. Tellingly, both authors made only passing mention of *Correspondance mathématique et physique* and treated his administrative career in biographical gloss. Matters were not helped when Maurice Halbwachs, an important disciple of Durkheim, argued just a few years after Lottin and Hankins that there was no sense of unity in Quetelet's ideas. Just a generation after Quetelet's death, the noted sociologist wrote that 'the different parts that we distinguish in Quetelet's work are not connected, and ... each must be the object of independent discussion'.[30]

In the century since Hankins, Lottin and Halbwachs, however, there has not been a single-author monograph dedicated to Quetelet, a surprising omission considering the excellent work that has been accomplished in the history of statistics in the past thirty years. The impetus behind the explosion of works on statistics itself was a conference held in 1982 at the University of Bielefeld in Germany and the resulting two-volume study.[31] Aside from the impressive collection of papers presented during this conference, many of the participants went on to write ground-breaking studies of statistical development.[32] In the years between the early biographies and the Bielefeld conference, there were also occasional journal articles that sought to situate Quetelet in various disciplinary histories, the very eclecticism of which practically begged for clarity.[33] While these works varied drastically in terms of methodology and argument, they shared two common characteristics. The first was that the portrayal of Quetelet was limited by the relative lack of attention given to Quetelet's powerful position in Belgian institutions. At the least there was a lack of integration between his ideas and the institutions he served. The second feature of this literature was that, paradoxically, given the diversity of the works, they all relied almost solely on the biographies of Lottin and Hankins in presenting Quetelet's thought and career. While some attention was given to a few of Quetelet's most prominent works (mostly *Sur l'homme*), the interpretation offered by Lottin and Hankins was rarely expanded upon and the full range and impact of Quetelet's career was often missed. Collectively, these papers brought needed attention to the importance of understanding the history of quantitative thought, not only as a crucial development in thinking about numbers, but also the role the quantifiers had in the development of the 'hard' sciences themselves. Yet while all of this literature acknowledged the importance of Quetelet's ideas for understanding larger issues in probability and statistics, the

understanding of the ideas themselves had hardly changed since the days of his first two biographies, published just four decades after Quetelet's death.

The failure of a fragmented approach was made clear in the publication of a series of talks during a colloquium held in Brussels on the bicentennial of Quetelet's birth.[34] Though the attention to discrete spheres of Quetelet's work did much to highlight knowledge in particular fields, the nature of the research made it difficult to say anything new about the man himself. Though each work provided a fine summary of one particular aspect of his career, there was no significant attempt at synthesis. Even when Quetelet's role as institution builder was recognized, there was no connection to social physics or any of Quetelet's other ideas.[35] There is of course nothing wrong with the approach of these essays if the goal was to understand the history of statistics, social theory or the creation of the Brussels Observatory, but they had the unfortunate side effect of forcing fragmentation on an interesting professional life.[36]

It might be said fairly that this book, through largely ignoring Quetelet's personal life, as well as his technical contributions to statistics and mathematics, similarly obscures the entirety of his work. It is also true that Quetelet's vast number of interests, writings and correspondents would make any one-volume biography necessarily incomplete. Yet in narrowing the focus to the relationship between Quetelet's *physique sociale* and his attempts to create institutions of science, it may be possible to recapture most clearly the attributes and ideas that made Quetelet such a figure of fascination and controversy in the nineteenth century. By doing so, it also may be possible to rethink some elements of nineteenth-century science and social thought. As should be obvious in the notes, but merits mentioning nonetheless, the task of providing this analysis has been made much easier because of the superlative work that has been done on Quetelet in the past three decades.

The 'Actualizer': Network Fields, Interaction Rituals and Friends

Because this book tries to situate Quetelet's project for social physics and institution building within the intellectual contexts of his time, a few words are necessary on the intellectual context in which *this* book has been written. It has been composed fortunately in the wake of a significant change in how the history of science has been written; fortunate, because it need not be consigned to categories of 'internal' or 'external' history, a dichotomy that many historians now find more problematic than useful in understanding the activities of the past.[37] Like anyone else, Quetelet drew inspiration, influence and ideas from both proximate and distal sources, and like anyone else, had his work both limited and expanded by friends, family, national self-conceptions and prevailing culturally and intellectually dominant trends. He was, to apply a designation that would have meant nothing to Quetelet but one he helped to make possible, highly socialized. So,

however, were many other people in the same situation, none of whom ended up as the father of a science of man and the virtual creator of a national scientific identity. Therefore, the particulars of Quetelet's life and work must be treated with equal measure to the various contexts in which he lived and worked. The following paragraphs contain a review of some of the ideas that have led to this approach.

In navigating between the Scylla and Charybdis and of *text* and *context*, Quentin Skinner provided an early articulation of a third way of approaching the ideas of the past.[38] Though primarily concerned with the treatment of political ideas, Skinner's complaint that 'the writers of the past are simply praised or blamed according to how far they may seem to have aspired to the condition of being ourselves' seemed an apt description of how scientists and natural philosophers were treated for most of the twentieth century.[39] Even more so than in Skinner's world of political philosophy, early historians of science often 'foreshortened' the past, so that only those ideas that remained of contemporary importance were recognized. Furthermore, an excessive focus on the *context* in which the works were produced (whether they be national, institutional or cultural), Skinner argued, turned the writer himself into merely a mouthpiece for his age, reducing original and provocative thinkers to spokesmen for whichever important *Zeitgeist* the historian wished to investigate.[40] Skinner's solution – a complete historicization in which texts and contexts are only read with regard to what they meant at the time – might impinge upon the historian's raison d'être, but it remained a needed corrective nonetheless.

Though Skinner provided a way in which historians could reconstruct intellectual ideas through a close attention to textual *meaning*,[41] he did not offer a fully articulated structure of how ideas were actually transmitted across time and space. Nor is it obvious that men of science operated in the same way as political philosophers. This project, however, was adopted by sociologists in recent decades who have built up (it must be admitted) a rather rigid set of social causes for the production of scientific ideas. Foremost among them has been Pierre Bourdieu, who greatly expanded the Foucauldian project to recognize the importance of intellectual 'fields' in creating ideas.[42] Such fields consisted not only of the content of a particular discipline, but the relationship between the content and the way it was transmitted, debated and received by members of a given community. For example, the intellectual content of physics is the explanation of motion, but an articulation of the 'field' of physics is impossible without examining the particular world – the university, the corporate research and development laboratory, the conference in Las Vegas – in which physicists worked and the means through which they articulated their ideas. Though Bourdieu denied the sharp ruptures that marked Foucault's *épistèmes*, he retained the notion that it was impossible to examine a given idea without recognizing the interconnected set of social relations and material concerns within which that given idea was formulated. There could be no 'free-floating'

ideas. Seeking his own reconciliation between the extremes of internal 'absolutist realism' and external 'historical relativism', Bourdieu posited a structure through which 'science' emerges through the competition of scientific workers over various professional and social resources.[43] Rather than ideas being derived from constant comparison of autonomous thoughts with an objective reality, success in science for Bourdieu depended primarily on how well individuals were able to exercise authority over a host of non-scientific factors.[44] Because no set of objective experiments could ever test the infinite number of possible scientific theories for a given phenomenon, consensus relied on bounding the possible. In an extension of Kuhn's articulation of paradigm resolution, Bourdieu argued that the ways in which boundaries are drawn must come from somewhere outside of the set of techniques considered as legitimate science. Science in this view became not the output of 'pure creators', but of 'actualizers who translate into action socially instituted potentialities'.[45] In evaluating Quetelet's contributions to the sciences, he might be best described as such an 'actualizer' rather than 'pure creator'. Though Quetelet was a gifted mathematician, his great successes (and failures) came about often through his ability to institutionalize ideas.

Since Bourdieu, the most extensive attempt to articulate a sociological theory of intellectual change has come from Randall Collins, who ventured to explain the history of thought since antiquity as the performance of the same scene over and over again on different historical stages.[46] It is a powerful argument with much explanatory potential but one that requires significant qualification if applied to the history of science, where his ideas have not had nearly the level of influence as Bourdieu's. In Collins's view, new ideas were almost exclusively the product of small, tightly knit and socially powerful intellectual networks. While it might make sense to see these groups as the ad hoc accumulations of influential and original thinkers, Collins seemingly put the cart before the horse, arguing that the social networks themselves produced individual genius: 'it is not individuals ... that produce ideas, but the flow of networks through individuals'.[47] Conversely, external (i.e., historical) explanations for new ideas were significantly underdetermined, since many people experience similar conditions yet few produce works of creative genius.[48]

In place of text and context, Collins inserted a series of local 'interaction rituals' through which certain groups gain influence in various societies. An important component in this view was personal contact, and Collins argued that the face-to-face exchange of social and cultural 'capital' was essential for intellectual transmission. In Quetelet's case, such direct encounters are crucial in understanding his work, as direct meetings with figures like Arago, Bouvard, Laplace, Gauss, Goethe and Humboldt, as well as less famous thinkers in Ghent and Brussels, played a profound role not only in introducing the young Belgian to new ideas but also to securing social capital in Quetelet's quest to convince governments to fund his many projects. In fact Quetelet relied as much on personal contacts as on sci-

entific justifications to argue for new Belgian institutions. Collins's networks were all between five and seven actors – what he called 'The Law of Small Numbers' – so that capital could not be dispersed too broadly among a number of figures, and the expansion and contraction of such networks was, for Collins, what produced thought. In Quetelet's life, such numbers would vary drastically, but as he moved throughout various circles in Ghent, Brussels, Paris and the many observatories in Germany, he found himself often in such small and influential groups.

Though there is much to dislike about the idea of some sort of Hegelian accordion producing the most important ideas in Western thought, the theory of 'network ideas' flowing through an individual seems a remarkably apt description of Quetelet's intellectual and scientific life. Perhaps it would be incorrect to characterize many instances of scientific activity in these terms, but for Quetelet, an appreciation of his immediate intellectual context seems warranted. As a gregarious, motivated and charming person, Quetelet strived throughout his life to join and establish various networks of scientific thinkers; correspondence and personal meetings were in fact his chief modes of scientific activity. While it is the argument of this book that Quetelet himself was important in nineteenth-century thought, it was not necessarily in his creativity but in the force and success with which he 'actualized' the ideas around him.

While Collins's ideas were intended to explain only philosophies, Stephan Fuchs subsequently adapted the theory to scientific thought. Though the 'Law of Small Numbers' would not appear to apply to most scientific work since the mid-nineteenth century, historians of science have documented numerous cases where scientific ideas had come about in conjunction with the pursuit of social and cultural capital.[49] Furthermore, an explanation of nineteenth-century science as the product of social competition would seem at this point far more compelling than a story of individual genius or socially determined automatons. Indeed, Collins's theory even allowed for a bit of history! Though he specifically denied any 'external' account', he did allow that 'large-scale political and economic changes indirectly set off periods of intellectual change'.[50] Though Collins hid his allowance of outside forces behind the term 'indirectly', in this context the term was meaningless. Either history intruded on the autonomy of the 'network' or it did not; whether it was direct or indirect is a semantic game.

While the many ideas proposed by sociologists of science and thought are compelling, this book is intended as more than a case study on one particular theory of transhistorical action. As such, the motley jargon – fields, ritual networks, etc. – will be dropped in the body of the text.[51] However, Quetelet's story *was* largely the story of a succession of groups, and whether one calls these groups 'ritual networks' or 'friends', they were a vital element of the story. In all his dealings with friends, colleagues, administrators, famous scientists, observatory directors or journal contributors, Quetelet always displayed a great spirit and optimism, and there is little question that these social talents were among his greatest scientific talents.

Quetelet's personality matters not just as colourful detail but because it was crucial to the development of his average men. Bourdieu, Collins and Fuchs drew attention to how *individual* disposition to scientific practice could determine scientific production and therefore *personality* might make a better label than *habitus*. In other words, the particular talents of the leader of a scientific project – whether in conducting experiments, formulating new hypotheses, deducing laws or (in Quetelet's case) organizing large groups of observers – often indicated the parts of nature which the leader found valuable, and hence, structured his description of reality. This can easily be seen in gifted experimentalists like Galileo or Boyle, whose talents were in creating novel experiments and who, unsurprisingly, focused on experiment as the defining feature of science. The overlap of interest and discovery can be also be found in the case of Einstein, a deep thinker who was gifted neither in traditional mathematics nor in conducting experiments, but who believed science was best practised as a form of philosophy and whose conclusions often shocked the talented mathematicians and experimentalists of his day.[52] Much like the artist who argues for the innate superiority of the medium in which she most excels, the 'scientific method' often ends up reflecting the practice in which the scientific researcher feels most at ease.

Quetelet's talents did not include conducting novel experiments or, to be sure, deep philosophical thinking, but in using his charm and enthusiasm to bring together large groups of data and people in order to determine trends and laws in social behaviour. It should not be surprising after all that a man who excelled at directing large research operations suggested that science operated best through the accumulation of large amounts of data. Yet this connection between thought and practice has not been sufficiently made in any history of Quetelet. In fact Bourdieu, in a *hypothetical* description of one of his scientific actors, provides perhaps the best analysis of Quetelet's practice and thought:

> Those who come to head the large scientific organizations are obliged to impose a definition of research implying that the correct way to do science necessitates the use of the services of a large scientific bureaucracy – endowed with funds, advanced technical equipment, abundant personnel – and to institute as the universal and eternal methodology the survey of large random samples, the statistical analysis of data, and formalization of the results – in short, to set up the standard most favorable to their personal and institutional capacities as ... the yardstick of all scientific practice.[53]

As we will see, Quetelet did indeed insist on an 'eternal methodology' as well as 'abundant personnel', and his appreciation of 'large random samples' did relate to the kind of science in which he just happened to excel.

Though the book rejects the notion that the history of thought (scientific or otherwise) is the same performance of 'network actors' on different historical stages, it takes seriously the suggestion that the composition of a network, the com-

petition that takes place within a given group and competition between groups, are vital parts of the story. In Quetelet's case we can see a succession of interactions with various networks, each of which would reflect and reinforce his evolving ideas. An excessive focus on outside 'forces' can simply be another form of historical determinism, however, so an attempt will be made to pursue three narrative strands: the historical conditions under which Quetelet worked, the composition of his immediate set of professional peers and the development of ideas in Quetelet's work.

An Overview

The multi-layered approach suggested above will be achieved through adjusting the level of abstraction throughout the book. The story of Quetelet's creation of two average men begins during a period described as 'The War of the Arts and Sciences' (Chapter One) when Quetelet was a young student deciding between careers in maths or literature. Belgian education was divided particularly by the new boundaries that were being created between science and art, and this chapter describes how Quetelet responded to the demands of his time. It is no secret that the creator of a statistical science of man read Condorcet and Laplace, but more surprising may be the young Belgian's appreciation for Romantic heroes like Chateaubriand and Germaine de Staël. Such a broad appreciation of art and science would not have been notable a century beforehand, but as this chapter demonstrates, the intellectual context in which Quetelet grew up was not well suited to continue such a broad course of study. To demonstrate the difficulties faced in the Low Countries in particular, the chapter concludes with the fleeting enthusiasm in the region for eclecticism and the possibilities offered by Victor Cousin's unique meld of art and science.

In Chapter Two, the focus moves in from the larger intellectual context to Quetelet and his close circle of friends in Ghent. Quetelet composed a large amount of poetry while simultaneously writing his dissertation in maths and often drew on his colleagues for support in the two projects. Yet not all of Quetelet's friends fared as successfully as he did, with several complaining about the conditions of employment in Belgian science. The eventual dissolution of the Ghent 'network' demonstrates that 'The War of the Arts and Sciences' was not simply about ideas debated by elites but an intellectual quarrel that had real consequences for young men interested in both mathematics and literature. This chapter finds evidence in Quetelet's poetry and opera librettos as well as in the troublesome outcomes for many of his friends for an increasing recognition of the strains in Belgian intellectual life brought about by the 'war'.

By 1819, when Quetelet left Ghent to take up a teaching position at the Athénée de Bruxelles, he had largely abandoned his plans to become a writer and had redirected his efforts towards making a career in the sciences. At age twenty-three, he had written next to nothing on statistics or probability, let alone the larger

ideas of social physics that would be his most lasting legacy. As Chapter Three shows, Quetelet's new interests were sparked by new networks and institutions in which he could become an 'actualizer' of scientific ideas. Two institutions in particular helped in the creation of social physics and the average man of science: the Académie royale des sciences, des lettres, et des beaux-arts de Belgique and the Observatoire royal de Bruxelles. Quetelet was responsible for the creation of the latter and the complete reformation of the former. Based on his correspondence with colleagues, *éloges* (eulogies) for academy members and his lectures at the *athénée*, this chapter explores how Quetelet began to conceptualize the new science workers for his institutions at the same time he also imagined the best means to convince state administrators of the importance of these institutions.

The pursuit of an observatory led Quetelet to a world of nineteenth-century science far removed from his small group of friends. As seen in Chapter Four, in just over a decade Quetelet went from sharing a small house filled with poets and artists to meeting some of the most famous men of science of the era. In 1823 he travelled to Paris to begin research in the city's famous observatory, meeting Laplace and Poisson, but also the co-directors of the observatory, Arago and Bouvard. In 1829 he toured observatories throughout Germany, meeting Gauss, Goethe and Humboldt. In between the two trips, he helped found a continental journal called the *Correspondance mathématique et physique* that accumulated statistical accounts and other scientific notices from a wide variety of administrators and researchers. Again, his great talent for organization and enthusiasm served him well, as he made contacts throughout Europe that he used to support his projects back home. More importantly, however, this chapter shows that Quetelet spent as much time learning how to administer and direct large-scale institutions as he did learning about the particulars of the sciences of astronomy or statistics.

In Chapter Five, the narrative breaks to examine the creation of *l'homme moyen* and social physics between the years of 1827 and 1835, an intense period of time in which Quetelet did the vast majority of his work on statistics. Though the work was inspired in part by a genuine interest in reforming state institutions, this chapter demonstrates that *physique social* would not have been possible without both the cultural context of the 'war' and the immediate concerns of Belgium and the United Kingdom of the Netherlands discussed in the previous chapters. The Belgian Revolution of 1830 and the related delays in the construction of the observatory played a part, but so too did the numbers themselves. By this point Quetelet had already begun to formulate the *real* average men that he needed to staff the institutions of Belgian sciences, but the delay in constructing the observatory forced him to look elsewhere for data. He found them in the letters to the *Correspondance* which included tables on births, marriages, criminal behaviour, heights and weights. Though the form of *l'homme moyen* and *physique sociale* certainly had an intellectual lineage tracing back to

Condorcet and other enlightened ideas for a science of man, the chapter demonstrates that Quetelet's original conception of social physics was driven by the contributions of his network of associates built up over the previous decade.

In spite of the fact that *physique sociale* was created during a relatively brief period of time and that Quetelet quickly returned to large-scale data collection of natural, rather than social, phenomena after the observatory was completed, the tendency in the early biographies of Quetelet was to view social physics though the lens of ideas rather than practice. Quetelet was immediately criticized because of the determinist implications of social physics, and much of the subsequent discussion of the project has concerned the implications on free will for those who are the subjects of social physics. There is no doubt good fodder for such discussions: Quetelet was notoriously loose with his descriptions of how his various 'constant' and 'perturbing' forces acted, and his regular citations of Laplace did little to quell concerns that social physics was 'fatalist'. Yet as seen in Chapter Six, the focus on free will distracted many contemporaries from the more practical consequences for the actual practitioners of social physics, including their modern heirs in the quantitative natural and human sciences. Therefore, this chapter examines how Quetelet's social physics was first received and explains why this early criticism endured into the twentieth century. It concludes with a reconstruction of a debate organized by Quetelet in 1848 over the deterministic implications of social physics, a debate where one commenter – the future prime minister of Belgium Pierre de Decker – tried to defend his friend Quetelet. In doing so he first articulated the sense that there was *another* average man to be found in Quetelet's plans for a social physics.

The Conclusion returns to the particular Belgian context for the creation of the average men of social physics and Quetelet's history of Belgian science. *Sciences mathématique et physique chez les belges* admitted that the Low Countries could not keep up in the era when science was defined by 'men of genius', but provided a template for how the country could excel in an international world of scientific institutions. The new form of science would require *savants* spread out over the world, and Quetelet called the men of science who would fill these positions 'the New Argonauts'. Quetelet's dreams of a *physique sociale* were never fully realized in Belgium, but many of his collaborative ideas found full fruition in fields like terrestrial magnetism and meteorology, and Belgium took up an important place in European science and politics. In just one example, Quetelet's 1853 International Maritime Conference in Brussels is generally considered to be the first meeting where global temperatures and meteorological data were compared, an acknowledged forerunner of the Intergovernmental Panel on Climate Change.[54] In a brief epilogue it is suggested that the average men of these institutions may even offer a new way of understanding the legacy of the movement that Quetelet so believed he was following: the Enlightenment project to create a science of man as predictable as physics and astronomy.

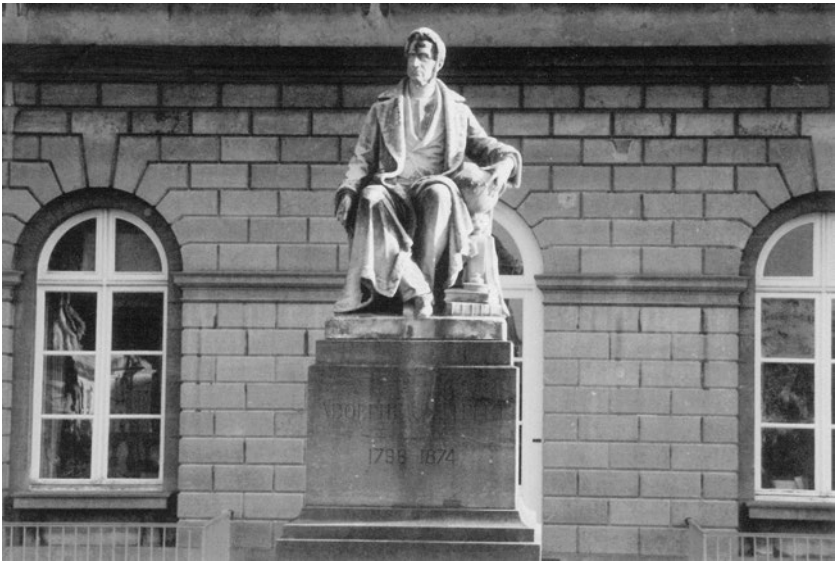

Figure I.2: **Quetelet statue and Académie royale. Quetelet's statue stands outside of the Académie royale de Belgique in Brussels, one of the many institutions of science he reformed or created in the 1820s. Much of his writing, from his poetry in the 1810s until his grand histories of Belgian science from the 1860s, is archived inside. One hundred yards to his left is the Palais Royale, where the kings and queens of Belgium still reside. Photo courtesy of the author.**

Though the temptation exists to connect these New Argonauts to the modern bureaucrats found in Brussels, those housed in imposing modern steel and glass just a few Métro stops from Quetelet's statue on the lawn of the neo-classical Académie royale (see Figure I.2), such a connection would require a far different book from the one that follows. Quetelet's story told here – a young poet from Ghent who helped build the modern institutions of Belgian science, corresponded with the great scientists of Europe, created the first statistical science of man and envisioned a new of man of science – is, I hope, interesting enough.