

## **“CONQUERORS OF THE KÜNLÜN”? THE SCHLAGINTWEIT MISSION TO HIGH ASIA, 1854–57**

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“Every industrious and ambitious man of science ... is Humboldt’s son; we are all his family.”

Emil du Bois-Reymond to Carl Ludwig, 26 June 1849

“That’s always been my dream. To have the latest scientific equipment in the middle of nowhere.”

Michael J. Balick, in conversation with Claudia Dreifus, “New York’s a jungle, and one scientist doesn’t mind”, *The New York Times*, Tuesday, 6 April 1999, F5

“The real voyage of discovery consists not in seeking new landscapes, but in having new eyes.”

Marcel Proust

### THE PICTURE

Adolph Schlagintweit began his last watercolour on 5 August 1857. It took him five hours to finish, though he had been careful to get up early enough to fix the light of his painting at half past nine in the morning, a good time for depicting the slopes and contours of the mountains around him. He worked with his habitual care in rendering the details of the landscape in the panorama before him — the rock outcrops, the sparse vegetation, the fresh snowfall. From his vantage at the crest of the pass he could make out a line of peaks marking the Künlün mountains stretch away from either side of him. Below that the plain of Eastern Turkestan remained hidden by fog. It was a fitting scene. No European since Marco Polo had crossed through this region of Central Asia, and that was more than five hundred years ago.

Schlagintweit aimed to be the first Westerner to revisit the legendary city of Kashgar. If his goal was clear, his motivation was not. It is not enough for us to say, echoing G. T. Mallory, “Because it is there”. Much like the entire enterprise of scientific exploration, the meaning of Schlagintweit’s three-year trek through India and High Asia is anything but self-evident. It really makes sense only against the background of history, where, like Schlagintweit at his painting, we can locate and map and consider. This essay will illustrate the Schlagintweits’ mission by positioning it within three contexts: one of aesthetics, one of politics, and one of religion. In this way the story of the Schlagintweits can help reveal some of the strangeness and fascination behind the image of nineteenth-century science.

Schlagintweit was born in Munich on 9 January 1829 to a rich and innovative



FIG. 1. Hermann Schlagintweit, "Gaurisankar, or Mount Everest, in the Himalaya of Nepal", lithograph, June 1855 (Part I, no. 1 of Hermann, Adolph, and Robert Schlagintweit's *Atlas of panoramas and views, with geographical, physical, and geological maps*, which was part of their *Results of a scientific mission to India and High Asia, undertaken between the years 1854 and 1857 by order of the Court of Directors of the Honourable East India Company* (4 vols, Leipzig and London, 1861–66).

eye surgeon.<sup>1</sup> His mother died when he was only ten; thereafter, Adolph and his four brothers were tutored by Franz Joseph Lauth, later Bavaria's best Egyptologist. They received an outstanding education in painting and languages and science. None of the children showed any interest in medicine. Instead, the eldest distinguished themselves in science, showing such interest in the subject that Hermann, who had enrolled as a medical student to please his father, switched to physical geography after his first semester, and Adolph, who began his university training as a geologist at seventeen, had trouble finishing high school. They soon made a name for themselves with their researches in the Alps, publishing two monographs in 1850 and in 1854; these attracted the interest of Alexander von Humboldt, who arranged a three-year expedition to India and High Asia in 1854 paid for by the King of Prussia and the East India Company. Robert, who had accompanied Hermann and Adolph in the mountains during his vacations and done some research there on his own, was also permitted to join the expedition. After his return to Germany he was appointed assistant professor of geography at the University of Giessen, but, finding his students poor listeners, took to recounting his Asian travels to paying audiences in various lecture halls throughout Europe and the United States. He wrote several books about American railroads and died in 1885 as a result of pleurisy caught in San Francisco. He was fifty-two. Hermann, who had contracted malaria in India,

never fully recovered his health. He worked with Robert on the official report of the expedition at Schloß Jägersburg, the large estate near Forchheim they had bought to set in order the enormous quantity of material shipped back from Asia. Hermann also wrote a popular report of his travels, but this must not have sold very well, as he spent years trying to get the Bavarian government to purchase his collections. He succeeded only in disposing of some of the ethnographic objects. He died in a small apartment in Munich in the winter of 1882, aged fifty-five. Schloß Jägersburg was left to Emil. When he came to clear out Hermann's things, he found that all his scientific correspondence and plant specimens had moulded over. They ended pulped in the Forchheim paper mill. The last of the brothers, Adolph, realized his ambition on 26 August 1857 and made it to Kashgar. He was apprehended by Vali Khan, the local chieftain, and then killed. In 1887 Russian and Chinese authorities dedicated a monument to his honour near the site of his execution in a ceremony as tense as it was absurd.<sup>2</sup> The monument, which was nineteen feet tall and made of brick, later vanished. Floods were said to have washed it away.<sup>3</sup>

In all it is a sad story. The simplest thing would be to blame the Schlagintweits' misfortune on Alexander von Humboldt, for it was his example that they had always tried to match. The leading scientific figure in Germany during the first half of the nineteenth century, Humboldt has long been a subject of historical interest, in part due to disagreement over the significance of his work.<sup>4</sup> He has appeared many guises: Humboldt the Romantic, intimate of Goethe and Schelling, tracing ideal forms across the surface of the globe;<sup>5</sup> Humboldt the experimentalist, testing the limits of his equipment in the laboratory and in the field;<sup>6</sup> Humboldt the *Aufklärer*, seeking balance, reason, and utility in the world around him;<sup>7</sup> Humboldt the ecologist, spur to Darwin during his years on the *Beagle*;<sup>8</sup> Humboldt the sage, founder of modern geography;<sup>9</sup> Humboldt the reformer, liberal advisor to Prussian royalty, organizer of national congresses, and patron of German science;<sup>10</sup> and Humboldt the adventurer, addict to sensation.<sup>11</sup> Whatever weight we ultimately give each part, it is Susan Cannon's characterization of Humboldt's science, with its emphases on physical environments, accurate observations, and graphic data, that seems to fit the Schlagintweits best.<sup>12</sup>

The Schlagintweits' initial intellectual stimulus came from Humboldt's *Cosmos*, the first volume of which appeared in 1845 — exactly the time when Hermann and Adolph were developing their interest in science and started spending their summer vacations in the Alps. *Cosmos* was a strange piece of writing: part narrative, part encyclopaedia, part study, the whole work directed to support the contention "that one sole and indissoluble chain binds together all nature". The very first illustrations of this sublime principle were drawn, interestingly enough, with descriptions of mountains.<sup>13</sup> Comparing Humboldt's beautiful passages with sordid portraits of Munich — a city where matters of state were left to a reactionary and devout bureaucrat while the King conducted an obsessive affair with a Spanish dancer — it is easy to see why the two brothers escaped to the Alps whenever they got the chance.<sup>14</sup>

The Schlagintweits soon began publishing articles on their excursions in the local press. Hermann's report on the glaciers of the Ötz valley combined travelogue with analysis, much like Humboldt's *Views of nature*, and the narrative of Hermann and Adolph's ascent of the Monte-Rosa drew on the legend of Humboldt's climbs in the Andes.<sup>15</sup> In both these accounts the Schlagintweits helped to inaugurate a new type of travel writing, the mountaineering adventure. There had never been any past shortage of reckless ascents passed off as scientific inquiry — the Montgolfier brothers' balloon experiments in 1783, Horace Bénédicte de Saussure's investigations of Mont Blanc in 1786, and Alexander von Humboldt's nearly fatal climb of Chimborazo in 1802 were only the most famous — but the difference in the 1840s was that the public began to take these kinds of stunts seriously.<sup>16</sup> *Cosmos's* central message was that the scientific contemplation of nature was edifying, and if it was edifying to make sketches and collect samples and take readings in a valley, it was even more edifying to do these things on a mountain, where the view was better and the species were rarer and the measurements were harder.<sup>17</sup> The Alps at mid-century therefore became the focus of a kind of scientific craze, attracting naturalists, geologists, physicists, and even art critics. John Ruskin devoted almost an entire volume in his series on modern painters to Alpine geology.<sup>18</sup>

Ironically, the Schlagintweits' research aroused little interest from their professors in Munich. In July 1848 Hermann was granted a Ph.D. in physical geography, and half a year later Adolph received one in geology, but these credentials did nothing to improve their local academic standing. It is not clear why they failed to get ahead. It might have been due to their youth, or their confession, or their ambition, and then again, it might have been that they simply perceived better opportunities elsewhere. In any case, the two brothers moved to Berlin in May 1849. The city was then the most dynamic in Germany, and through new scientific organizations like the Berlin Physical Society the Schlagintweits found opportunity to meet their peers and publish their research.<sup>19</sup> In all they spent five years in the Prussian capital, apart from periodic trips to the Alps and one tour of Britain, where they visited Edinburgh's coal mines and London's luminaries.<sup>20</sup>

The most important contact they made in Berlin was Alexander von Humboldt. The first meeting was arranged for 14 June 1849. Humboldt had turned eighty that month; Hermann Schlagintweit was twenty-three, Adolph, twenty. Both parties were impressed. Humboldt wrote to the Prussian Minister of Education and smoothed the way for the Schlagintweits to receive their *Habilitation*, or license to lecture, at the University of Berlin.<sup>21</sup> In turn, the Schlagintweits compiled their Alpine researches into a large treatise and dedicated it to their new patron.

This work, which appeared in the autumn of 1850, founded the Schlagintweits' careers. The title alone made plain their intellectual debt: *Investigations in the physical geography of the Alps, in their relationship to the phenomena of glaciers, to geology, to meteorology, and to plant geography*.<sup>22</sup> Adolph covered the sections on plants and rocks; Hermann, those on ice and weather. Even with this division of labour, the *Alps* remained a book of Humboldtian ambition. In one comprehensive

volume, it attempted to analyse, fix, and reconstitute the characteristics of an entire region. In its reliance on precision instruments, its imaginative display of data, and its systematic treatment of topics it borrowed openly from Humboldt's account of his travels in the New World. It displayed the same, almost obsessive desire to measure everything that could be measured: the temperature, distribution, and purity of spring water, for instance, or the humidity, clarity, and colour of the atmosphere.<sup>23</sup> It also showed the same drive to generalize masses of observations into simple, intuitive relationships, such as the influence of glaciers on erosion or the variation of vegetation with altitude and climate.<sup>24</sup> Where the Schlagintweits' treatise differed from Humboldt's was in its exclusive attention to the natural world. The Schlagintweits eschewed all discussion of economy, society, politics, culture, language — in short, anything human — just as they avoided reference to themselves. What mattered to them were facts.

There is something deceptively simple in this interest. It is not at all like the interest in theory, where the Schlagintweits' contributions fit a standard pattern of debate. One typical example: James Forbes and John Tyndall spent years arguing over how glaciers moved — did they flow, or rather just melt and re-freeze?<sup>25</sup> The Schlagintweits, who seem to have been ignored by both British physicists, were of the opinion that glaciers cracked and slipped downhill.<sup>26</sup> Such scholarly contention is understandable, even if we choose to see it as proxy for a larger scientific issue like the mechanical theory of heat or which physicist was to be supreme.

Facts are another matter. At the most fundamental level, the Schlagintweits wanted an accurate picture of the world. This seems reasonable enough as an ideal, but it was one they pursued without irony. By "picture of the world" they meant exactly that. Landscapes, profiles, and sections littered the pages of their treatise. Quantity became quality. Every observation they made, every measurement they took, every sample they collected, added to the detail of their description. After a time one cannot help but wonder, what was the point of all these data? What did it matter if the height of an obscure peak was determined to a tolerance of ten feet? What difference did this precision make to anyone's ideas of nature? It was as if their desire for facts had exceeded any rational measure.

Historians have not lacked for explanations of why scientists like the Schlagintweits behaved as they did. Some simply attach descriptive labels: "mid-nineteenth-century realism" — "precision measurement" — and leave it at that.<sup>27</sup> Some resort to the idea of progress, where each new advance in knowledge or field of research or experimental design or manufacturing technique or disciplinary organization leads naturally to a world where people concentrate more and more on less and less.<sup>28</sup> Some stress industrialization, either pointing to the appearance of railroads and telegraphs and achromatic optics and precision engineering, or to the ways in which these technologies affected middle class values.<sup>29</sup> Some refer to structural shifts in society, like the growth of bureaucratic administration or capitalist markets or foreign colonies or something as mundane as the need of the British Admiralty to keep itself occupied in the wake of the Napoleonic

wars.<sup>30</sup> All these explanations are good, but they miss the primary character of the Schlagintweits' cultural context.

I am referring to what Matthew Arnold called “the sense in us for conduct, and the sense in us for beauty”.<sup>31</sup> Ethics and aesthetics did not stand apart from science in nineteenth-century Germany. More often than not they stood together. We need only think of Goethe, and of Einstein, and of all the figures in between, all those researchers and scholars who defined themselves through the creed of *Wissenschaft* and *Bildung*.<sup>32</sup> Most Germans treated science like a secular religion, and if they did not always believe with the fervour of a Steffens or a Büchner or a Haeckel, they approached the subject with deference and respect.<sup>33</sup>

The high tide of appreciation came between 1840 and 1880, that is to say, the period of liberal ascendancy. This was a time of great cultural expectations. Middle-class hope showed in the new market for art and music, the new construction of public museums and parks, the new expansion of the universities, and the new opportunity for travel. At the same time, science flourished in every institutional form — in exhibitions and lectures, in disciplines and societies, and in laboratories and journals. By itself, this confluence of private values and public participation proves nothing: it can always be argued that the public was several and that the actors were separate. But this was not the case. Throughout most of the nineteenth century, the class of Germans involved in all this culture was too restricted to be anything but élite — which is to say that the Schlagintweits saw the same kinds of people at meetings of scientific societies as they did at the opera, if only because almost everyone else was too busy or poor or tired to attend.<sup>34</sup>

My argument here boils down to two assertions, the first being that the Schlagintweits' interest in the true also expressed an interest in the good and in the beautiful, and the second being that this pattern of values can be matched to a distinct social class. If these assertions are correct, then we should be able to find at this time other instances of German scientists treating facts in a way that we usually associate with art. There are many, but let me point to one that is particularly apt: the graphic method of physiology.

What I am referring to is a set of instrumental practices developed during the 1840s and 1850s that attempted to provide a clear and direct display of life function.<sup>35</sup> Typically this involved recording the change over time in some physical variable, like body temperature (Wunderlich's fever curve), blood pressure (Ludwig's kymograph), blood flow (Ludwig's *Stromuhr*), muscle contraction (Helmholtz's myograph), nerve current (du Bois-Reymond's astatic galvanometer), or nerve signal (Helmholtz's ballistic galvanometer). The idea was to allow nature to speak directly, and accordingly, the language was visual: a graph tracing, a screen projection, a meter reading. The result, in du Bois-Reymond's characteristic hyperbole, offered “a performance fit for the gods”.<sup>36</sup>

Du Bois-Reymond generally meant what he said, but in this instance he may well have been joking. There is, after all, something intrinsically ironic about the graphic method. It is one thing to look at an inscription, and it is another to read it.

Direct is not the same as intelligible: Robert Frank has shown in his history of the electrocardiogram that it took years before clinicians learned to make diagnostic sense of the trace of a heartbeat.<sup>37</sup> Nor is direct the same as exact: even unambiguous facts like the existence and speed of the nerve signal proved easier to display than to measure, as the Schlagintweits learned from du Bois-Reymond and Helmholtz at meetings of the Berlin Physical Society.<sup>38</sup> In short, the utility of the graphic method to scientific investigation remained a premise, rather than a consequence. Researchers wanted pictures. Their reasons for wanting them were not entirely logical, which suggests that the pictures may have been an end as much as a means.

#### THE APPOINTMENT

In a way the idea for the Schlagintweits' trip to India had been Humboldt's all along. As a young man Humboldt had returned from his scientific travels to the New World eager to extend his research to the Old. There he could continue his systematic program of observation, gathering accurate regional data on climate, magnetism, topography, flora, fauna, race, language, religion, and culture, his ultimate aim being to discern the true aspect of the world. Humboldt believed that the forces at work in nature came in clearest focus at large scale. The scale he had in mind was nothing short of global. Having already investigated the Caribbean and the Americas, he planned a voyage east, sailing first to India, then crossing the Himalayas into Tibet and Central Asia. This was in 1808, when a lull in the Napoleonic Wars encouraged him in the enterprise. Friends reported him ensconced his rooms in Paris, eagerly studying Persian and geography in preparation for the voyage.<sup>39</sup> He prepared in vain. The completion of his writings on America took him years longer than he had expected, and renewed campaigns against Napoleon made travel impossible. In 1812 Humboldt tried and failed to direct a Russian expedition across Siberia via Kashgar and Yarkand to the Tibetan plateau. Six years later his brother's diplomatic connections secured him British support, but by 1821 the deal collapsed. No reasons were given for the reversal: the East India Company may have feared Humboldt's criticism of their colonial rule.<sup>40</sup>

Humboldt never saw the Himalayas and the Künlün. This lost experience seems to have been a source of great frustration to him, so great, in fact, that his references to it sound like he was talking about sex:<sup>41</sup>

Nothing in my life has filled me with more intense regret than not having personally penetrated those famed regions whose relationship to the Cordillera of the New World I wanted to explore.... That is man's fate: to stand at life's end and gloomily compare the little one has achieved with what one would have gladly undertaken to enlarge the field of the sciences.

Humboldt may have hoped that a direct comparison of watersheds in Asia with those in South and Central America would have established his name in the theory of mountains, a focus of study dominating Continental geology throughout the nineteenth century.<sup>42</sup> As it was, his contributions were minimal. His research

on the mountains of High Asia derived from the investigations of other, more fortunate explorers: Burnes, Cunningham, de Körös, the brothers Gerard, Hodgson, Hügel, Jacquemont, Lloyd, Moorcroft, Vigne, Webb, and Wood.<sup>43</sup> There is pathos in this attentive list of names. Humboldt wants us to recognize that any one of them might have been his.

The closest thing Humboldt came to realizing his dream was in 1829, when he was invited by the Russian government to investigate the discovery of platinum in Siberia. Mountains interested him far more than metal, however, and he arranged to study the Urals and the Altai as part of the mission. The journey lasted eight months and ventured as far as the Chinese border. Humboldt was addressed as “Excellence”. The hospitality accorded an official guest of the Czar seems to have compensated for the restricted aims of the expedition, if ‘restricted’ is a word that can plausibly characterize any trip requiring the use of 12,244 horses.<sup>44</sup>

Humboldt turned sixty on his Russian voyage. His health was still good — indeed, he lived on another thirty years — but the trip convinced him that exhaustive scientific travel was a business better left to younger men. In his final years he explored by proxy, the Schlagintweit brothers being the last and best of a series of protégés enlisted to satisfy his ambition. He also directed a good deal of his energy to the Magnetic Survey, the project that would employ the Schlagintweits throughout their travels in India and High Asia.

The Magnetic Survey — or “crusade”, as some contemporaries called it — was the largest scientific undertaking in the first half of the nineteenth century.<sup>45</sup> Its aims were simple and grand. A network of stations would be established around the world to observe and record variations in the strength and direction of the earth’s magnetism. Scientists in Europe would analyse the data for patterns and anomalies, the idea being that recognizable features would appear once enough information was gathered. And so, the Survey enlisted a small army of scientists, officers, surveyors, explorers, and “establishments”, i.e., trained native observers, to log magnetic readings several times each day. Back in England the separate observations were compiled, the objective being to transform the data into something worthy, like an aid to navigation, or at the very least, a better understanding of terrestrial physics.

Neither of these benefits ever materialized. This did not prevent Col. Edward Sabine from underwriting the Survey for years. The decision seems to have hinged on a matter of pride. As director of the Magnetic Survey, member of the Royal Society Council, scientific advisor to the Admiralty, and general secretary of the British Association for the Advancement of Science, Edward Sabine was a prominent figure in British science. Early in his career Charles Babbage accused him of falsifying data, exposing Sabine’s awkwardness with figures to the grandees of theoretical physics.<sup>46</sup> Sabine wanted revenge, and the Magnetic Survey gave him just the means he needed. No mathematical treatment could account for the Survey’s data, the sweetest and most notable failure being Gauss’s dipole model of the earth’s core.<sup>47</sup> Sabine’s crusade thus served to divert scientific attention away from abstract mathematics, a field in which he could not compete.



This is an important point. It was one thing for Alexander von Humboldt to defer to Gauss's superiority in physics — the grand old man of German science already had a long career behind him, and he could withstand deliberate slights, such as when Gauss refused to append the stations in his Magnetic Union to the international network of observatories that Humboldt was trying to co-ordinate in Britain, France, and Russia.<sup>48</sup> But Sabine had made no great discoveries, had not travelled anywhere exotic, and certainly had not done much to dispel the belief that he owed his scientific position to favouritism. He needed a triumph, one that Gauss could not hope to equal. Accordingly, he played to his strengths: power and organization.<sup>49</sup> Here he succeeded brilliantly, soliciting the Royal Society, the Admiralty, and the East India Company, institutions that commanded enormous prestige, and even more important, enormous capital.

The Schlagintweits' appointment to the Survey proceeded as follows. Four of the magnetic stations approved by the British government in 1839 were located in India, where, over the course of a decade, they had gradually fallen into a state of disrepair. There they remained until 1849, when the Royal Society finally prevailed on the East India Company to address their neglect. Lieutenant Charles Elliot, an engineer long experienced in supervising magnetic observations, was chosen to repair the Madras observatory and complete the Magnetic Survey of India up to the 37<sup>th</sup> Parallel.<sup>50</sup> Elliot had a reputation for thoroughness: his station in Batavia once recorded measurements every hour between three in the morning and nine at night over a period of nine months.<sup>51</sup> In 1852, having devoted an entire year to drafting a report of his data, Lieutenant Elliot took up his new commission, fell ill with a fever, and died.<sup>52</sup>

The chronology now accelerates. Elliot succumbed on 4 August, around the time that the Schlagintweits were finishing their Alpine researches. By then they had become good friends with Alexander von Humboldt, who arranged an audience with the King. The interview went well. Friedrich Wilhelm IV had an eye for beauty and grandeur, and having seen the Schlagintweits' drawings and watercolours, he warmed to the idea of an Asiatic expedition.<sup>53</sup> It all sounded so daring, and besides, he rather liked the "Siamese twins". Humboldt then wrote a letter to the Minister of Education recommending Hermann and Adolph for state support.<sup>54</sup> Karl Varnhagen von Ense, Humboldt's confidant, recorded the result in his diary:<sup>55</sup>

... [Humboldt] came about half-past one o'clock, and remained till half-past two o'clock, a mere visit, nothing of business; he felt the necessity of unburdening himself of many things ... he spoke with the utmost contempt of von Raumer, the Minister of Education, of his brutality and insolence, his hatred of all science, his pernicious activity. "The King", Humboldt said, "hates and despises all his ministers, but this one particularly, and speaks of him as an ass; what particularly nettles him is, that Raumer opposes all the King's wishes, and he keeps him in office nevertheless, as he keeps all of them, because he has them, and every change is a troublesome affair".

The case of the brothers Schlagintweit, Humboldt explained to Varnhagen, was

typical. “The King wished to aid them in their voyage to the Himalaya Mountains; the minister refused; the King ordered him to hear Humboldt’s opinion of the matter, which was a most favourable one, but Raumer insisted on his opinion, which, he said, was not changed by Humboldt. Then the King ... confessed himself to be powerless against his minister...”<sup>56</sup>

Humboldt, now in his eighty-fourth year, was not about to give up on his dream. Realizing that he could circumvent Raumer by transforming the expedition into an act of diplomacy, he went to the King and suggested that the Schlagintweits take over Charles Elliot’s work in India. Friedrich responded favourably. On 27 February 1853 he sent a letter to Christian Carl Josias Bunsen, his envoy in London, informing him that he was prepared to defray £200 per annum for three years, or one third of the estimated costs, provided that the British came up with the balance. Bunsen showed this proposal to Sabine on 18 April 1853. Within five days the two had worked out a preliminary agreement. Bunsen then submitted a formal petition to the president of the Royal Society, which was approved and forwarded with express recommendation to the East India Company. There Col. H. W. Sykes, the colonial administrator who had hired Elliot, rallied the Court of Directors to the Schlagintweits’ cause. On 18 May 1853 the East India Company declared their satisfaction with the plan of the mission.<sup>57</sup>

From all this it is quite clear that the Schlagintweits owed their posts in India to a network of patrons.<sup>58</sup> This is not to denigrate their own facility in self-promotion. Between March 1853, when he ignored his father’s advice and quit forever his parents, his lectureship, and his home town, and September 1854, when he embarked from Southampton on the steamer *Indus*, Adolph Schlagintweit lobbied nearly everyone he could think might help: in Berlin, Alexander von Humboldt, Friedrich Wilhelm IV, and colleagues at the Physical Society, the Geographical Society, and the University; and in London, Edward Sabine of the Royal Society, Col. Sykes of the East India Company, Roderick Murchison of the Royal Geographical Society, and Chevalier Bunsen and Baron von Cetto, the envoys of Prussia and Bavaria. His efforts paid off. As Faraday once remarked to Humboldt, the brothers had left “a long remembrance” on their first visit to Britain in 1850. This remembrance Adolph now turned to profit.<sup>59</sup> Robert would join the mission as assistant to his two older brothers, the Royal Society would add its name as official sponsor to those of the East India Company and the Prussian Crown, and most significant of all, the scope of the survey would be expanded. As Adolph explained in a draft of operations proposed to the India House,<sup>60</sup>

the *magnetical Survey* and its connection with the excellent observations of Capt. Elliot in the eastern Archipelago will require before all our most special attention. I may be permitted to state that we shall *both*, my brother Hermann and myself, be animated by the earnest desire to do credit to the Royal Society, who did us the honour to recommend this survey and our expedition, and to the Honourable Court of Directors, under whose enlightened patronage our researches will be undertaken.

With these magnetic measurements he proposed to unite “a regular Series of observations on the *Meteorology and the Physical Geography* of the country”, namely,

the temperature of the Air, the temperature of the Earth at different depths below the surface and the temperature of springs; the very important phenomena of atmospheric humidity at different heights; the optical phenomena of the atmosphere (polarisation, diaphaneity with Saussure’s diaphanometer); the atmospheric electricity (with Saussure’s and Peltier’s Electrometers); and the chemical composition of the atmosphere.

Adolph declared that he would direct his “peculiar attention to collect as complete a series as possible of observations on the *Geology of India and the Himalayas*”.

It will be very essential to ascertain the *elevation* of many important points by barometrical or in part by trigonometrical observations, and to work out *accurate sections* of the different routes and *geological maps* of where we may be able to make any longer stay. We shall endeavour as much as possible to collect *fossils*, for the accurate determination of the comparative age of the different sedimentary strata, and to ascertain their order of superposition.

He also mentioned his interest in “the geography of plants in its connection with the general physical phenomena of the country...”. In other words — and this was a point explicitly accepted by Edward Sabine and Joseph Hooker and Charles Darwin, the subcommittee appointed by the Council of the Royal Society to review the proposal — the Scientific Mission to India and High Asia was to be thoroughly Humboldtian.<sup>61</sup>

#### THE MISSION

Preparations for the voyage took over a year. Scientific equipment had to be ordered from craftsmen throughout Europe. Adolph’s draft proposal of operations closed with three pages that most resemble a list of Christmas wishes: magnetometers, chronometers, clinometers, barometers, thermometers, diaphanometers, electrometers, polarimeters, theodolites, telescopes, compasses, scales, chemicals, hammers, magnifying glasses, maps, books, and cameras.<sup>62</sup> Hermann saw to the construction of the instruments on the Continent while Adolph stayed on in England at Kew Observatory to train in the practice of magnetic observation.

Provision also had to be made for retrieving geological and botanical samples. The costs associated with this undertaking were considerable, but Friedrich Wilhelm promised to supplement the expedition’s budget with 3000 thaler a year. Humboldt lauded his king’s largesse, not merely for the sake of decency towards the British, but also to ensure that Prussia’s own natural history collections would not be left with a geographical gap. As he remarked to Bunsen, it was just as easy to collect for two capitals as for one, and besides, the British Museum had already received two

crates of alpine plants from his previous travels in America.<sup>63</sup>

For his part Robert rushed to finish his dissertation on the Kaisergebirge, the western group of the Salzburg Alps. He also helped Adolph produce relief maps of the Zugspitze and the Monte Rosa that set new standards in realism, based as they were on photographs of carefully illuminated plaster models.<sup>64</sup> The same cartographic technique can be seen in the atlas of the second volume of Hermann and Adolph Schlagintweit's treatise, *New investigations in the physical geography and the geology of the Alps*, a work that Adolph was determined to present to Friedrich Wilhelm before leaving for India.<sup>65</sup> The book appeared in late summer 1854, as did Robert's degree and all the expedition's scientific equipment. On 20 September the three brothers sailed from England.

Adolph was so preoccupied those last months that he forgot to take leave of his family. He apologised: "After a few years I will be able to hug you again all the more joyfully."<sup>66</sup> Cholera killed his father before his letter had a chance to arrive. In consolation Friedrich Wilhelm awarded both Adolph and Hermann the Order of the Red Eagle, Fourth Class, an honour the King had originated to distinguish the highest achievements in arts and sciences.<sup>67</sup>

What Adolph did remember was to arrange publicity for the expedition, not only in Germany, but also in England and France.<sup>68</sup> Good press created interest and flattered benefactors. Humboldt had spent his inheritance publishing the results of his travels. The Schlagintweits knew that it never hurt to cultivate sources of support, and throughout the course of the expedition they kept patrons and public informed of their progress. The pattern of transmission was simple. Every few months they sent news of their activities to Friedrich Wilhelm IV and the East India Company. These letters were communicated to the *Zeitschrift für Allgemeine Erdkunde*, the *Proceedings of the Royal Geographic Society*, and the *Journal of the Asiatic Society of Bengal* by Alexander von Humboldt, Col. Sykes, Roderick Murchison, and various colonial officials stationed in India. The popular press then summarized the accounts for their lay readers. Occasional scoops were awarded to select publications, like Abbé Moigno's *Cosmos*.<sup>69</sup> What strikes the modern reader is just how effective this system was. Mail travelled regularly and cheaply between England and India — in fact, any envelope labelled "On Service" was delivered free of charge.<sup>70</sup> The only precaution the Schlagintweits took was to have letter carriers travel from the field in pairs — mail tended to arrive at colonial stations more regularly that way.<sup>71</sup>

News of the Schlagintweits reached Europe shortly after their landing in Bombay. Except for a brief camel ride between Cairo and Suez, the three brothers sailed the entire length of the voyage. The only thing to distinguish this leg of the expedition from a tropical cruise was their preferred diversion: every few hours they measured the temperature, colour, clarity, and salinity of the ocean.<sup>72</sup> Samples of this water were later sent to Col. Sykes for chemical analysis, much to his delight.<sup>73</sup> The Schlagintweits did not report the temperature of the ship's champagne, 28°C, after the ice ran out. I can imagine the scene as the waiters, sweltering in their uniforms,

were presented with the thermometer reading.

Climate also dictated the course of the Schlagintweits' travels on land. The mountains to the north of India can be passed only in summer. Accordingly, Adolph's proposal of operations had allocated this season to their research in High Asia, the eastern Himalayas of Sikkim to be covered in 1855, the more central Himalayas of Kumaon and Gurwhal in 1856, and the western Himalayas of Ladak in 1857. "Under favourable circumstances" — meaning the receipt of visas — they would also journey to Nepal. No mention was made of Tibet, a country forbidden to foreigners.<sup>74</sup> The remainder of their time would be spent at lower elevations. Adolph suggested southern India the first year, followed by the central plateau and plains the second, and the regions near Delhi and Lahore the third.<sup>75</sup> It was patently obvious that this plan required the Schlagintweits to pass most of their time in areas familiar to their patrons, but there was no other way to complete the magnetic survey of India, and no one expected them to spend three years in the mountains, holed up in a remote village, idle, waiting for spring, like the natives.

The paths that the Schlagintweits actually followed corresponded quite closely with Adolph's plan (see Table 1). The main difference lay in the western Himalaya, which they explored more extensively than anyone previous, European or not. Caravan traders knew the terrain well, but they avoided glaciers and mountains. In contrast, the Bavarian scientists seemed happiest in this environment, for it was here that they could exercise their talent and training to greatest effect.

The four volumes of their official report make this point absolutely clear. The *Results of a scientific mission to India and High Asia* constituted a treatise of alpine science.<sup>76</sup> Everything discussed in their previous work — the itineraries followed, the instruments used, the positions mapped, the data collected, the land surveyed, the climate recorded, the peaks scaled, the glaciers traversed, the panoramas sketched, the samples taken, the inhabitants described — reappeared at much larger scale. Humboldt stated that "one sole and indissoluble chain binds together all nature". He might well have said "chain of mountains". Once the Schlagintweits saw the Himalayas, they seem driven to a frenzy of recognition.<sup>77</sup>

We can get a sense of the Schlagintweits' enthusiasm in the statistics of their travels. The three brothers covered over 18,000 miles, most of it on foot, across forests, plains, deserts, swamps, rock, and ice; left 106 folio volumes of magnetic and meteorological records, route surveys, and miscellaneous notes; made 749 sketches and paintings, including 484 watercolours, pastels, and oils, some of the panoramas up to twelve feet wide; collected 14,777 specimens, among them 9,577 rock and soil samples, 1,800 botanical species, 650 tree sections and seed varieties, 750 zoological preparations, 400 human skulls, skeletons, and facial casts, 202 sets of anthropometric data, 1,400 ethnographic objects, and 200 manuscripts and prints; and, on top of all that, set a new mountaineering altitude record, one terrifying even to the locals, of 22,259 feet.

These achievements were impressive. I do not mean to disparage when I point out that, as with most naturalists, they fell into two main categories: on the one

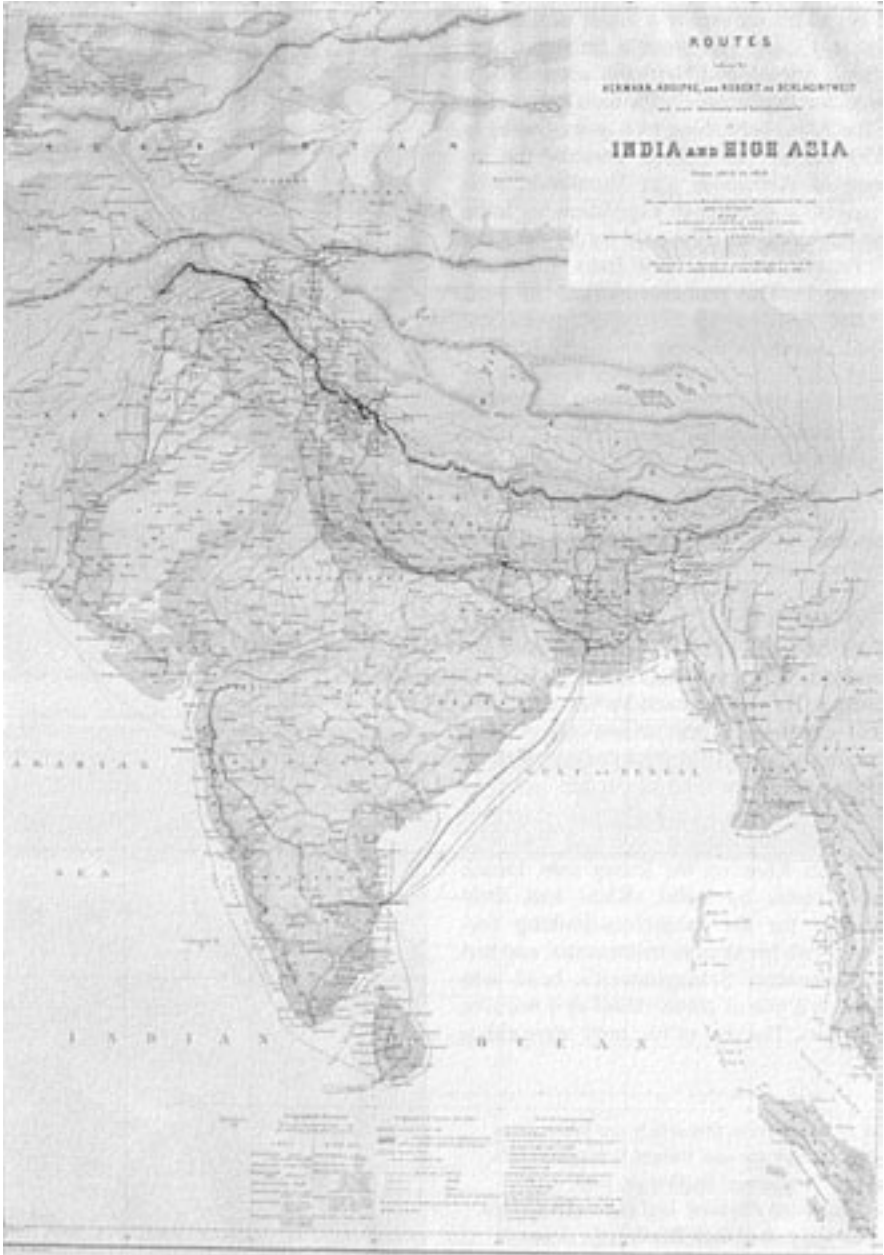


FIG. 2. "Routes taken by Hermann, Adolph, and Robert Schlagintweit and their Assistants and Establishments in India and High Asia from 1854 to 1858", Mercator map, 1:8,000,000, lithograph (*Atlas, Geographical Maps*, no. 1).

TABLE 1. Tabular Statement of the Routes Followed by the Messrs. Schlagintweit during their Researches in India and High Asia.

Year	Hermann Schlagintweit	Adolph Schlagintweit	Robert Schlagintweit
1854	The Dekkan and southern India; with his two brothers, via Poonah to Bellary; from there to Bangalore with Robert, from Bangalore he continued, alone, his researches down to Madras.	Plateau of Mahabuleshwar, the southern parts of the Dekkan, via Kaldjhi to Bellary with his two brothers; went alone by Cuddapah to Madras with a visit to the Diamond Districts.	The Dekkan and southern India together with his brothers on his way from Bombay to Bangalore; went by the Cormbatoor Ghat down to Madras.
1855	Bengal, the Himalayas of Sikkim, and eastern frontier of Nepal, the Naga and Kossia Hills, Assam, a part of Bhootan, the Delta of the Ganges, and Brahmapootra.	Bengal, Northwest Provinces, the Himalayas of Kumaon and Gurwhal; crossed the Himalayas into Tibet with his brother Robert, and examined the basin of the Sutlej and the sources of the Indus. Ascended on Ibi Gamin to a height of 22,260 feet (English). During the cold season visited parts of central India, the valley of the Godavery (Madras Presidency), the Neilgherries, and the fossiliferous strata between Trichinopoly and Cape Comorrin.	Bengal, Northwest Provinces, the Himalayas of Kumaon and Gurwhal; crossed the Himalayas with his brother Adolph into Tibet and examined the basin of the Sutlej and the sources of the Indus. Ascended on Ibi Gamin to a height of 22,260 feet (English). During the cold season examined Central India, Bundelkhand, the environs of Amarkantak, and the sources of the Nerbudda, Tons, Sone, and Johilla.
1856	Hindustan, Oude, the Himalayas of Kunower Spili, the salt lakes of Tibet, met his brother Robert in Leh and continued with him his researches across the chains of the Karakorum and the Kuenluen to Khotan (Kh. Yarkand). Returned to Ladak and travelled via Sooroo to Kashmir.	Part of Bengal, Sirmor, and Zanskar in the Himalayas, Balti and Gilgit in Tibet and the Mustah Pass on the Karakorum Range. Returned via Gurys into Kashmir and the northern Punjab.	Northwest Provinces, Surinore, and Lapoul in the Himalayas and Central Ladak; met his brother Hermann at Leh, and continued with him his researches across the chains of the Karakorum and Kuenluen into Khotan (Kh. Yarkand). Went from Leh by Dras to Kashmir and by the most northern route through Ibuzarah into the Punjab.
1857	Southeast Punjab, Central Nepal, Bengal. Left Calcutta for Europe on the 23 <sup>rd</sup> of April, making a stay of fourteen days in Egypt.	Northern Punjab (Peshawar), the hills between Kohat and Huzaiah, and a part of the Soelman Range. He is just now engaged in examining the Himalayas between Kangra and Kashmir, and will return to Europe at the end of December.	Travelled through the Punjab, Sind, Kutch, Kattewar, and Guzerat down to Bombay and Ceylon. Left Ceylon on the 11 <sup>th</sup> May for Europe.

The researches of Messrs. Schlagintweit extend from 5° to 37° N. Latitude, and from 68° to 98° Longitude East (Greenwich).

The total length of the different lines along which the researches were carried separately on amounts from an approximate calculation to 18,000 English miles.

[From Schlagintweitiana, II. 1. 43, Bl. 8, *verbatim*.]

hand, measurement and collection, and on the other, travel and exploration. The Schlagintweits excelled in both areas. With respect to the former, the meetings of the Berlin Physical Society had paid off. The brothers handled instruments as well as any laboratory scientist, eschewing the use of elegant, elaborate, and expensive apparatus simply because it was elegant, elaborate, and expensive. For example, in their determinations of altitude they found it far more effective simply to record the boiling point of water with their thermometers than to trust the opaque mechanism of their aneroid barometers. The same critical judgement carried over to their analysis of data. Whenever possible they repeated measurements under differing conditions, being certain to control for systemic bias, like periodic variations in air pressure.<sup>78</sup> They also estimated their margin of error through partial differential expansions of their formulae, a technique still far from common among experimental physicists.<sup>79</sup> I can think of no contemporary explorers who took equal pains to be accurate. Many of the Schlagintweits' results held good for a century.<sup>80</sup>

The Schlagintweits knew that their sophistication in measurement would be lost on all but a few. In consequence they laboured to render their data simple and clear. Tables, graphs, and charts followed explanations and summaries of their findings. The text also expounded their methods in great detail. If these glosses failed, the reader could always resort to perusing the series of coloured lithographs that filled the atlases accompanying each volume of their *Results*. More than anything else, these “panoramas and views” captured the Schlagintweits' experience of exploration. It is one thing to read about the heights of mountains, and altogether another to look at an exact profile of the horizon, every detail in the distant range sighted and marked and traced with the aid of instruments carried in the field.

Images like these served as virtual witnesses to the expedition. Whenever possible the Schlagintweits brought back samples of the things they saw. Each spoke for itself: “I am soil” — “I am a bone” — “I am a manuscript”. With a little encouragement and interpretation they could be made to speak more eloquently: “I am alluvial gravel from the floodplain of the Karakash River” — “I am the femur of a *Daphla* skeleton acquired in Assam from the aboriginal tribe” — “I am a Buddhist prayer book donated by the Chibu Lama in Sikkim”.<sup>81</sup> Landscape as a whole, however, resisted testimony and could not be communicated without the aid of pictures.

The relationship of language to images is not simple in any record of experience and certainly not in an expedition of this duration and scope. The Schlagintweits, as I suggested earlier, suffered literal-mindedness. When afforded the opportunity they described their experience in unending detail, regaling the reader with the minutiae, say, of their socks and shoes. Topical arrangement helped lend some structure to these ramblings; after all, socks and shoes were essential to the traveller, and anyone planning a trip to India might want to know everything about what the Schlagintweits wore on their feet, not to mention their legs, torsos, arms, and heads, and beyond that, what kind of money they kept in their wallets, what they carried with them, how they packed it, how they travelled, how many servants and guides



accompanied them, whom they met, what language they spoke, what they ate, where they slept, where they went, what route they took, what they saw, what the weather was like, and how they felt about it all.

The cure for this surfeit of information was to edit. This habit did not come easily to the brothers, though once after their return King Ludwig I of Bavaria inquired about their travels and Hermann could barely answer.<sup>82</sup> The plainest response to this question — which was a question they would often hear — would have been simply to list the expedition's major achievements:

1. *Orography* of the mountain ranges separating India from Central Asia — the Himalaya, the Karakorum, and the Künlün — with the Karakorum shown to be the watershed.
2. *Exploration* at high elevation, including plateaux, glaciers, and mountains, and especially the route between Ladak and Yarkand.
3. *Geography* of indigenous plants, animals, and peoples.
4. *Graphic displays* of the physical characteristics of the region, including geomagnetism, geology, climate, hydrography, elevation, and landscape.

This they seldom managed. Instead they defaulted to the reciprocal genres of panorama and tale to transmit their experience. I say reciprocal because the Schlagintweits wrote about what they saw and painted what they recognized.

The panorama, as Stephan Oettermann has explained so brilliantly, was a middle-class art-form. Theatre scenery worked its illusion from one perspective only. It was painted for the King's eyes alone; the rest of the audience saw a more or less distorted image — the worse the seat, the greater the skew. Panoramas, on the other hand, permitted a democracy of views. Several spectators could stand side by side and each one could see the curved canvas correctly, the single vanishing point replaced by a vanishing line that stretched horizontally across the picture frame.<sup>83</sup>

The panorama therefore functioned as a visual encyclopaedia. The viewers could explore the subjects painted from any number of angles, moving in, or back, or along, as they saw fit. The exercise was fascinating enough in itself, but to the practised eye the real interest lay in the choice of visual elements, the artist's subject headings, as it were. Here the Schlagintweits discovered that not all societies employed the same pictorial language. Native Indians appreciated their architectural views and individual portraits, but group arrangements and landscapes left them at a loss. In sketches without figures, buildings, or clear vegetation they often could not distinguish the sky from the ground. Contours confused them even more. Mountain peoples, on the other hand, took great interest in watching the Schlagintweits sketch and could readily identify objects from their outlines.<sup>84</sup> Hermann attributed their visual sophistication to the dictates of survival in the Himalayas, which also explained the enormous number of place-names in their dialects. Now, this is beginning to sound like the old saw about Eskimo words for snow. My point here is not so much that language and image follow one another, but that *all* vocabularies,

whatever the context, are paltry and conventional.

This rings truest in the dull reports that the Schlagintweits sent home. The experience of travel, however — even scientific travel — is crammed with interest. Had the Schlagintweits written as well as they painted, they might have conveyed their exhilaration. They could not. The tedium of their findings was only rarely relieved by narrative.

The thing that kept their few scattered stories from slipping into absurdity was the fact that they were absurd already. There was the Tale of the Daring Ascent with Three Goats, in which Adolph induced his guides to follow him over the comb of the Nanda-Ghat with the promise of a ritual sacrifice at the top.<sup>85</sup> There was the Tale of the Ferocious Encounter, in which Adolph barged into Tibet, whipped a Hunia guard in the face, and was escorted politely back to the frontier.<sup>86</sup> There was the Tale of the Malarial Boil, in which Hermann drifted down the Brahmaputra for forty-four days, feverish and paranoid, convinced that his servant had sliced wantonly into his back until he found a mirror and inspected the incision for himself.<sup>87</sup> There was the Tale of the Royal Welcome in Kashmir, in which the ageing king, Gulab Singh, invited the three brothers to the Palace Sheth-Bagh on the banks of the Jhilum, where they discussed their work and photographed the city and went on boat excursions with forty rowers, only to find their letters of credit cashed at a horrible loss when it came time to leave.<sup>88</sup> There was the Tale of German Engineering, in which a bribe of one thousand rupees and two years of negotiation by Lord Canning, Governor General and Viceroy of India, finally secured Hermann passage to Katmandu, where he entertained the evil and cunning despot, Jang Bahadur, with a demonstration of his pocket knife, a special order from Henschel in Berlin that came apart in three sections and sported forty blades and instruments.<sup>89</sup> These stories would have been funny if the brothers had any sense of humour.

Not all their adventures were absurd, however, as they found out the last time they saw each other. They met in Ravalpindi for a month in the autumn of 1856 to take stock of their travels and pack their collections.<sup>90</sup> Hermann and Robert had recently returned from a high-altitude trek into Turkestan that had nearly killed them. After this experience the two brothers had their fill of mountaineering and resolved to take it easier in the time remaining before heading home the following year. Hermann's malaria might have been running him down; any question whether to stay beyond the term granted by the East India Company was answered on 10 May 1857 by the Sepoy Mutiny, a rebellion of atrocious violence that took the British Army months to subdue. Robert departed for Europe on 14 May; Hermann, a little later. They met up in Cairo on 30 May and reached Berlin on 17 June.<sup>91</sup>

Adolph, in contrast, decided to return overland, crossing the Karakorum and the Künlün into Central Asia and then continuing on to Germany by way of Russia. The details of this journey can be pieced together from Adolph's diary and the reports and letters of the colonial official who interviewed the survivors.<sup>92</sup> It was not a happy endeavour. The untracked route over high mountains and desolate plains offered

only hunger, thirst, cold, and fatigue. Headache, shortness of breath, irritation of the lungs, spitting of blood, dizziness, and a “general lassivity” killed morale.<sup>93</sup> As Robert described in a similar adventure with Adolph the previous year,<sup>94</sup>

repeatedly did our attendants, who ought properly to have been our guides, throw themselves down on the deep snow, and declare that they would rather die on the spot than go even another step farther onwards; only by the application of force did we succeed in getting them to rise, although we ourselves felt not less discouraged, and only too often have followed their pernicious and ruinous example; indeed great moral courage is requisite to push on in such circumstances.

By the time Adolph reached the border of Chinese Turkestan, half of his party had mutinied and decamped. To make matters worse, a passing caravan of refugees informed them that Vali Khan, the Kokandi chieftain in Kashgar, had rebelled against his Chinese overlords and was terrorizing the region ahead.<sup>95</sup>

Why Adolph chose to press on at this point is unclear. Central Asia had long distrusted Westerners; now war threatened pillage, capture, and death. It made every sense to turn around. But Adolph also knew that this would be his last opportunity to visit Kashgar. If he did not take it, another would. He made up his mind. On 5 August 1857, he rose early, painted his last watercolour, and descended into Turkestan. His plan was to move quickly and avoid notice. It failed. Within three weeks a patrol of Vali Khan’s soldiers spotted him near Kashgar. They demanded his arms and took him to see their chief. There was no exchange; instead

the Khoja, who is described to be a man of infamous character, at once ordered his execution. The persons entrusted with this work endeavoured to bind Mr. Schlagintweit’s arms, but this indignity he successfully resisted; a blow was then struck with a sword, which took effect under his right ear; another was aimed at the left side of his head, but neither proving fatal, his throat was cut with a knife, which one of the executioners drew from his side. The head was then severed from the body.<sup>96</sup>

The remainder of the caravan were thrown in a dungeon. One was executed that evening; one was sold into slavery and eventually made his way back to India; the rest were rescued by Chinese troops after Vali Kahn’s downfall. In the oddest development, a Persian traveller discovered Adolph’s notebook at a tobacco shop in Kashgar.<sup>97</sup> He retrieved it with threats and bribes and also tracked down Adolph’s head to a spot under a melon tree. He then took it upon himself to walk to India where, like Peachy in Kipling’s “The Man Who Would Be King”, he presented Adolph’s remains to the astonished colonial administrator. Two medical doctors in Lahore examined the skull and determined “that it was *not* that of an *European*”.<sup>98</sup> The traveller was rewarded for his trouble nonetheless.<sup>99</sup>

## DECLINE AND FALL

The absolute value of the Mission to India and High Asia could be measured in the currency of attention: on one side, the attention paid by the Schlagintweits to the practice of exploration, and the persons they met, and the places they visited; and on the other, the attention paid to the Schlagintweits by indigenous peoples like the inhabitants of Bhútia, who considered them “born under a lucky star”,<sup>100</sup> or by native assistants like Dr Harkischen, who took careful measurements in Leh until 1858,<sup>101</sup> or by local officials like Dr Mouatts, Inspector of the Jails in Calcutta, who supplied them with prisoners to photograph, measure, and cast,<sup>102</sup> or colonial agents like Dr Macpherson, chief Medical Officer of the Indian Army, who lent them the official meteorological records of the various garrisons in India,<sup>103</sup> or metropolitan patrons like Sir Roderick Impey Murchison, who rehearsed their achievements every year to the Royal Geographic Society.<sup>104</sup>

If there is anything pitiable in the story of the Schlagintweits, it is the slow fall of this attention, both on their part and on the parts of others, until the brothers sank into oblivion. The symptoms of decline showed faint at first. Hermann and Robert thanked their patrons within hours of their arrival in Berlin before rushing off to Dublin to present their preliminary findings at the annual meeting of the British Association for the Advancement of Science.<sup>105</sup> Back on the Continent they checked on the 340 crates of their material shipped from India but decided to wait until Adolph’s return later that year before working through it. In the meantime they drew up a preliminary report on their mission for the French Academy of Sciences, published, no doubt, with the assistance of Alexander von Humboldt.<sup>106</sup>

By February of the following year Adolph Schlagintweit still had not shown up and the shipping company, which had already spent 4500 thaler to install the collections in Schloß Monbijou, was beginning to wonder when they would be paid.<sup>107</sup> They were not the only ones concerned by the Schlagintweits’ inaction. The East India Company had seen or heard little of the two brothers since they arrived in Berlin. To forestall further anxiety Hermann and Robert worked out a book contract in July 1858.<sup>108</sup> They agreed to publish nine volumes on their researches within an “estimated” three years. During this time the collections would remain in Berlin, to be eventually returned, excepting one set of duplicates, to England for deposit in the Company’s museum, the King of Prussia paying the expense of the transfer. The Company was to furnish the brothers with a “personal allowance” of £25 per month for up to three years as well as £150 every six months for assistants, assuming they were needed. A further £800 was allocated to produce the atlas. To top it off, the first sixty copies of the work would be subscribed.

This was a good deal. Three hundred pounds a year exceeded the earnings of most English clergymen and government officials; among the professions, only surgeons and solicitors earned consistently more.<sup>109</sup> In Germany the sum would go even further, translating into four thousand marks, a salary reserved for only the most prestigious occupations, like professor. Not to be forgotten was the income from the Schlagintweits’ inheritance, a considerable legacy made larger by the

certainty of Adolph's death. All told, Hermann and Robert Schlagintweit shared a fortune of sixty thousand gulden.<sup>110</sup>

This wealth enabled the brothers to live as they chose. Their choice said everything. Since their return the two had often visited Alexander von Humboldt. When he died on 6 May 1859 it almost seemed as if they wished to honour his memory through imitation. They bought a large estate, Schloß Jägersburg, in the countryside north of Nuremberg. They applied for and received a patent of hereditary nobility. They accepted honours, awards, and decorations, thirty-five in all.<sup>111</sup> They exhibited their paintings, photographs, and facial casts to rave reviews at the India House Museum in London.<sup>112</sup> They published a lyrical summary of their findings for the benefit of their German readers.<sup>113</sup> But mainly, they settled down with their notes and samples and wrote the results of their mission.

In this they most resembled their mentor. Humboldt sacrificed years of his life and nearly all of his money to publish the report of his travels. The Schlagintweits seemed intent on following his example. Their nine volumes proposed to cover "I. Astronomical and magnetic observations", "II. Hypsometrical and trigonometrical observations", "III. Topical geography, and route book of the Himalaya, Tibet, and Turkistan", "IV & V. Meteorology", "VI. Geology", "VII. Natural history: Botany & zoology", "VIII. Ethnography", and "IX. Geographical aspects".<sup>114</sup>

They finished four and gave up.

Reviews of the work varied. Those appearing on the Continent generally favoured the Schlagintweits' thoroughness, praising the quality of the production, the breadth of the coverage, and the scholarship of the treatment.<sup>115</sup> The response in Britain was more mixed. Everyone adored what they saw, whether maps, paintings, photographs, masks, artefacts, or specimens.<sup>116</sup> They were less impressed by what they read. *The Athenaeum's* criticisms cut the sharpest:<sup>117</sup>

There is ... a suspicion abroad that the [Schlagintweits'] appointment was one of the most gigantic jobs that ever disgraced the annals of science.

Our readers are aware that in former years we have shown the injustice committed in appointing not one, but *all* the members of a foreign family to a duty which some of our Indian officers were both anxious and competent to perform, — the absurdity of sending Messrs. de Schlagintweit to report on climates, rivers and mountains, with which we were already perfectly familiar, and re-make collections of natural history, which were actually rotting in the cellars of Leadenhall Street.... Well, the "results of the mission to India and High Asia" are now partly before the public, and the Germans have been amongst the first to perceive the disproportion between them and the lavish expenditure of money made to obtain them.

The reviewer especially deplored the costs the three brothers incurred in travelling separately, "still further increased by different parties of the establishment being despatched in various directions to gather information or specimens of natural history", particularly when "the only really new territory visited was that entered

after crossing the chains of the Karakorum”.

The corruption of their appointment and the waste of their travels shrank, however, beside the enormity of their incompetence:

There are people who believe that at least one of the nine large volumes of which the ‘Results, &c.’ are to consist may furnish convincing proofs that the authors really are what they profess to be — scientific travellers of the first order. Judging from the specimen before us, and what we glean from their previous publications, we do not share that belief. Dry technicalities will never pass off for the results of abstruse science. Always judging from what is already before the public, we hold the Brothers de Schlagintweit quite incapable of taking a comprehensive view of any given subject; and we presume that we are stating the general opinion of the scientific world correctly when we say that they can *take* observations, but not *make* observations. Place good instruments in their hands, and they will take astronomical, magnetic and meteorological observations with accuracy; but ask them to furnish a comprehensive account, founded upon their observation, or of what they might have seen with their naked eyes, and they will ... thoroughly disappoint you....

The review closed by pronouncing the work “unreadable”.

*The Athenaeum*’s attack put everyone involved with the mission on the defensive. Murchison, who had already been forced to apologise once before for ignoring British achievements in High Asia, maintained that he had merely echoed the recommendation of his “illustrious friend Baron Humboldt”.<sup>118</sup> He then turned the matter over to Sabine, who unpacked the entire process of the Schlagintweits’ appointment, noting that “it was understood from private information” that the Governor of India could not supply any officers for the post.<sup>119</sup> At this Hooker wrote a letter to the editor asserting that his nomination to the Royal Society subcommittee reviewing the mission’s objectives came *after* the East India Company had already fixed Adolph Schlagintweit’s appointment. Hooker recollected “the surprise and concern” expressed by his colleagues “that the Court of Directors should overlook the claims of many competent and deserving scientific men of their own service” and added that even though he had done his utmost to assist the Schlagintweits, the mission had turned out a disaster.<sup>120</sup> Darwin, the third member of the subcommittee, contented himself with a single comment: “What a row the affair has made.”<sup>121</sup>

The reasons for the British reaction can be surmised. Bias played a part, as when Hermann and Robert Schlagintweit were called to testify before a select parliamentary committee investigating the colonization of the Himalayas and Sir Erskine Perry simply cut them short.<sup>122</sup> Envy worked, too. Joseph Hooker, who was almost certainly the author of *The Athenaeum* review, more than matched the Schlagintweits in scientific accomplishment.<sup>123</sup> He had been appointed assistant surgeon and naturalist to H.M.S. *Erebus*, one of two ships under the command of Captain James Clark Ross chartered to find the south magnetic pole in 1839; after

his return he published six volumes on the flora of Antarctica, New Zealand, and Tasmania.<sup>124</sup> In 1847 he went to India and spent three years exploring, surveying, and collecting in Nepal, Sikkim, and Assam. His travel writings vied with those of Humboldt and Darwin,<sup>125</sup> and his botanical catalogues, the *Rhododendrons of Sikkim-Himalaya*, the *Flora Indica*, and the *Flora of British India*, remain classics of the type.<sup>126</sup> Yet Hooker never received any special favour. Until 1855, when he joined his father at Kew Gardens, insecurity and oversight tormented his career. The East India Company, for example, not only short-changed him a thousand pounds on his trip to India but also refused to underwrite his *Flora Indica*, preferring to buy up the remaindered copies on the cheap.<sup>127</sup> The Schlagintweits also dealt him quiet defeats, such as requesting his advice on an expedition he gladly would have led, or proving that they could climb and map and paint with far better skill. In 1858 Hooker was finally granted permission to retrieve the herbarium neglected in the cellars of the East India House. After thirty years most of the plants had mouldered. I can only imagine his outrage as he worked through eleven wagon loads of decaying material and saw eleven fresh crates arrive from his competitors in Berlin.<sup>128</sup>

Politics also hurt the Schlagintweits. The Indian Mutiny prompted Parliament to nationalize the East India Company in 1858. This act afforded Hooker some measure of revenge, at least to the extent that it put to an end any favours granted to the Schlagintweits under the old system of patronage. Between 1860 and 1865 Hermann and Robert repeatedly petitioned the India Office for a continuation of support; each time the British government reminded them, ever more coldly, that the original provision had been liberal enough.<sup>129</sup> For a while they enjoyed a measure of protection from Murchison, who turned Section E, “Geography and Ethnology”, into the most popular attraction of the annual meetings of the British Association.<sup>130</sup> There was, however, increasing antipathy to Murchison’s sensationalism, particularly from accomplished naturalists like Darwin, Wallace, Hooker, and Huxley, all of whom shunned the Royal Geographic Society as unprofessional.<sup>131</sup> By the mid-1860s the day had passed when Murchison could stultify Hooker with comments like “I find a feeling seeming to prevail against employing Germans in which I do not participate, ... indeed we have not better & fitter men ready”.<sup>132</sup>

The Schlagintweits also suffered from a more general decline in relations between Britain and Prussia.<sup>133</sup> The strain showed first in the Crimean War, and with Bunsen gone, Humboldt dead, and Friedrich Wilhelm abdicated, foreign policy fell to Bismarck. National rivalry eroded trust and turned science eristic. This could be seen in the exploration of Central Asia, where British memory of the Schlagintweits’ contributions all but faded.<sup>134</sup> Sir Douglas Forsyth led his diplomatic mission into Kashgar in 1873 — “not only the grandest ever seen in Eastern Turkestan but the biggest of its kind sent out from India for sixty-five years” — as if the Schlagintweits — and their critics — had never lived.<sup>135</sup> Forsyth’s itineraries presented the same routes in the same form as those

attacked by Hooker.<sup>136</sup>

In the end, though, most of the misunderstanding was cultural. What exactly did Hooker mean by “a comprehensive account”? My guess is a lucid story, something that could be read and grasped with ease. The Schlagintweits seemed to have construed another meaning to the phrase, rendering “a comprehensive account” more in the sense of an all-encompassing presentation. The essence of the difference was simple: the British inclined to narratives, and the Germans inclined to images. One view conceived of scientific exploration as a journey in time; the other, as a journey in space.

This is an impression. It would be foolish to argue that the British never painted and the Germans never wrote. The tale and the map remained ideals, but that was the source of their power: they informed beliefs of what made good science. “Life is too short and uncertain to encourage the undertaking of encyclopaedical publications by individuals”, James Forbes observed of *Cosmos*.<sup>137</sup>

There cannot be a doubt that what was truly valuable in Humboldt’s investigations might have been comprised in a fifth, if not a tenth, of the bulk, and published within a proportionally smaller compass of time. If a traveller narrates circumstantially and faithfully what he has seen and observed, expresses his own opinions, draws his own conclusions, and refers generally to the writings of his predecessors, so as to facilitate a comparison, and to exonerate himself from a just charge of endeavouring to throw them into the shade, he does all that can reasonably be required of him.

He certainly had a point. I also think that Humboldt composed his monumental treatise precisely because life is short and uncertain.

Hermann and Robert, as I mentioned earlier, never completed their *Results*. Adolph’s death left a gap in their expertise that was difficult to fill. To make matters worse, new investigations dated their findings, forcing them to revise and expand their manuscript. Eventually Hermann gave up on the project altogether. The closest thing to a synthetic treatment of the mission were the four volumes of his *Travels in India and High Asia*, published between 1869 and 1880.<sup>138</sup> This work crossed the genres of popular narrative and scholarly reference with little success. It was prolix and dull. Debilitated by malaria, Hermann Schlagintweit passed the quiet remainder of his life in Munich. He received his share of scientific honours and royal invitations, but for the most part he kept to himself, sick and forgotten, frequently changing address.<sup>139</sup> He died of a protracted illness on 19 January 1882.

In a weird gesture of remembrance he left his brain and skull to the Royal Anatomical Collections.

Hermann’s slump was characterized by stasis. The opposite marked his brother’s decline: an obsessive and frenetic record of travel that bordered on fugue. In 1864 Robert Schlagintweit accepted an appointment as assistant professor of geography at the Archducal Hessian University of Giessen. Academia seems to have horrified





FIG. 3. Hermann Schlagintweit, “The Chain of the Kuenlun, from Sumgal, in Turkestan”, lithograph, August 1856 (*Atlas*, Part IV, no. 29).

him. During his first semester break he agreed to recount his experiences in India to a few local societies. He never returned to his post. Within four years he had lectured 542 times in seventy-four cities across Germany, Switzerland, Austria-Hungary, and the Baltic provinces of Russia. In August 1868 he arranged an invitation to the Lowell Institute in Boston. There he began a nine-month circuit of seventy-six lectures in twenty American cities, making him the first German ever to engage in a public-speaking tour of the United States.<sup>140</sup> The experience was an enormous success, particularly among German immigrants in the Midwest.<sup>141</sup> Robert Schlagintweit realized a huge profit on his first American trip and returned to speak again and again, always the same lectures, the same props, over and over.<sup>142</sup> He saved every scrap of paper from these travels — letters, postcards, telegrams, newspaper stories, reviews, advertisements, posters, tickets, invitations, business cards, and bills — and had them bound in twenty-five folio volumes. Along the way he published seven tedious books on American railroads that read very much like the timetables and municipal statistics upon which they were based.<sup>143</sup> A recrudescence of pneumonia in 1885 finally put an end to him and his mania to live and relive his youth.

#### CONCLUSION

The significance of the Schlagintweits’ story eludes easy definition. It might help to state what their travels were *not*: European imperialism. Much to the Schlagintweits’ regret, Central Asian trade hardly interested the British. The East India Company was far more concerned with maintaining good relations with the Chinese. Even

the most aggressive of Indian Governors, Lord Dalhousie, abandoned efforts to build a road to Tibet after the Sepoy Mutiny.<sup>144</sup> Forsyth's missions to Yarkand in 1870 and Kashgar in 1873 may have helped Hooker lobby for the expansion of commerce, but ten years of negotiations with China brought little real gain.<sup>145</sup> In 1883, trade with Tibet still accounted for only one percent of imports and exports in the Punjab. As the Earl of Rosebery quipped, it appeared that the whole object of British policy in the region "was to make people drink Indian tea who did not like Indian tea and did not want Indian tea"<sup>146</sup>

What worried Rosebery was Russia. "The Great Game" accounted for most of Britain's activity in Central Asia. The danger is to trace this rivalry too far back in time.<sup>147</sup> The European race to carve up the world really began in 1878, at the Congress of Berlin; British interest in Turkestan dated only a decade earlier.<sup>148</sup> Much as I would like to believe it, the Schlagintweits were not secret agents.<sup>149</sup>

Of course it was not just wealth and power but also knowledge that enabled Britain to dominate India. Surely it is worth considering to what extent the Schlagintweits assisted colonial rule. The answer is little. Nothing of value ever came of the Magnetic Survey. If we take an uncharitable view of Sabine's motives, that was clear all along. The vitality of the Schlagintweits' findings can be gauged by the dust they gathered in Schloß Jägersburg. Information and control equate through utility. Hardly anything that the Schlagintweits discovered had any use.<sup>150</sup>

Imperialism is simply too rational an explanation for the Schlagintweits' behaviour. To my mind their mission seems closer to religious ritual. The voyage to India and High Asia initiated the brothers into the sacred world of science — it was a rite of passage, to use van Gennep's term.<sup>151</sup> Alternatively, their travels could be considered a pilgrimage. Year after year explorers traced and retraced their colleagues' footsteps. The Schlagintweits were no different: they went where the British went, and the British went where they went, a little farther every time.

The three interpretations I have considered in this essay — aesthetic, political, and religious — suggest a fourth: narrative. The story of the Schlagintweits' travels could take on any number of positive forms. It could be read as Romance: their longing to escape Munich, the lure of the East, the search for Paradise, once a real place. Hermann, Adolph, and Robert Schlagintweit never married. If they went to Asia for desire, they did not speak of it.<sup>152</sup> Perhaps their story is a *Bildungsroman*, the classic novel of psychological development. In their version, landscape mirrors self: the Mission to India and High Asia as Road Trip. Madame Blavatsky claimed to have visited Tibet in 1856. The Schlagintweits actually did. They experienced no awakening. Then there is hagiography, martyrdom, tragic loss. The facts of the Schlagintweits' lives, however, were too plain for legend. The best heroes are invented; all the Schlagintweits' documentation merely insured that they would be forgotten.

Meaning derives from contexts. In a literal way the Schlagintweits' task was meaningless, since all attempts to retrieve contexts of discovery are doomed.

Whatever Adolph learned stayed with him in Kashgar. I find it hard to believe that the Schlagintweits did not understand this. It is not an easy truth to express. Perhaps this is why Hermann remained silent before his king. In the end most things are better shown. Adolph Schlagintweit's last watercolour portrayed the landscape of his death.

#### ACKNOWLEDGEMENTS

Versions of this paper were presented in 1999 to the Princeton University History of Science Colloquium and the University of Colorado at Denver History Department Colloquium, and I am glad of suggestions offered there. Thanks go to Anthony Grafton and Nicolaas Rupke for commenting on drafts of this work. I am also obliged to the librarians and archivists at the Bayerische Staatsbibliothek, the Staatsbibliothek Preußischer Kulturbesitz zu Berlin, the Staats- und Universitätsbibliothek Göttingen, the Herzogin Anna Amalia Bibliothek/Stiftung Weimarer Klassik, and the New York Public Library for allowing me access to their holdings. The research for this paper was funded by the Volkswagen-Stiftung during a Postdoctoral Fellowship at the Institut für Wissenschaftsgeschichte der Georg-August-Universität in Göttingen. I gratefully acknowledge their support.

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Wo das Eis sich Berge türmt,  
 Wo die Sonne milder scheint,  
 Dahin sich mein Herz bestürmt,  
 Als des Schönen steter Freund.

 The poem actually rhymes in dialect. Stefan Schlagintweit, *op. cit.* (ref. 1), 11.

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35. Hebbel E. Hoff and L. A. Geddes, "Graphic recording before Carl Ludwig: An historical summary", *Archives internationales d'histoire des sciences*, xxii (1959), 1–25; *idem*, "Graphic registration before Ludwig: The antecedents of the kymograph", *Isis*, 1 (1959), 5–21; *idem*, "The technological background of physiological discovery: Ballistics and the graphic method", *Journal of the history of medicine*, xv (1960), 345–63; *idem*, "The beginnings of graphic recording", *Isis*, liii (1962), 287–310; *idem*, "A historical perspective on physiological monitoring: Sherrington's mammalian laboratory and its antecedents", *Cardiovascular Research Center bulletin*, xiii (1974), 19–39; *idem*, "A historical perspective on physiological monitoring: Chaveau's projecting kymograph and the projecting physiograph", *Cardiovascular Research Center bulletin*, xiv (1975), 3–35; Nancy Roth, "'First stammering of the heart': Ludwig's kymograph", *Medical instrumentation*, xii/6 (1978), 348; Stanley Joel Reiser, *Medicine and the reign of technology* (Cambridge and New York, 1978); Merriley Borrell, "The kymograph and the origins of the graphic method", *Electrical quarterly*, vii (1985), 2–3; *idem*, "Extending the senses" (ref. 27); *idem*, "Instrumentation and the rise of modern physiology", *Science and technology studies*, v/2 (1987), 53–62; *idem*, "Instruments and an independent physiology", in Gerald L. Geison (ed.), *Physiology in the American context, 1850–1940* (Bethesda, 1987), 293–321; *idem*, "Training the senses, training the mind", in W. F. Bynum and Roy Porter (eds), *Medicine and the five senses* (Cambridge, 1993), 244–61; Christopher Lawrence, "Physiological apparatus in the Wellcome Museum. 1: The Marey sphygmograph", *Medical history*, xxii (1978), 196–200; Audrey B. Davis, *Medicine and its technology* (Westport, 1981); Hughes Evans, "Losing touch: The controversy over the introduction of blood pressure instruments into medicine", *Technology and culture*, xxxiv (1993), 784–807; Soraya de Chadarevian, "Graphical method and discipline: Self-recording instruments in nineteenth-century physiology", *Studies in history and philosophy of science*, xxiv (1993), 267–91; *idem*, "Instruments, illustrations, skills, and laboratories in nineteenth-century German botany", in Renato G. Mazzolini (ed.), *Non-verbal communication in science prior to 1900* (Florence, 1993), 529–62; Robert G. Frank, Jr, "The telltale heart: Physiological instruments, graphic methods, and clinical hopes, 1854–1914", in William Coleman and Frederic L. Holmes (eds), *The investigative enterprise: Experimental physiology in nineteenth century medicine* (Berkeley and Los Angeles, 1988), 211–90; Olesko and Holmes, "Experiment, quantification and discovery" (ref. 29); Frederic L. Holmes and Kathryn M. Olesko, "The images of precision: Helmholtz and the graphical method in physiology", in M. Norton Wise (ed.), *The values of precision* (Princeton, 1996), 198–221; Robert J. Silverman, "Instrumentation, representation, and perception in modern science: Imitating human function in the nineteenth century", Ph.D. diss., University of Washington, 1992; Thomas L. Hankins and Robert J. Silverman, *Instruments and the imagination* (Princeton, 1995), 113–47; Robert M. Brain, "The graphic method: Inscription, visualization, and measurement in nineteenth-century science and culture", Ph.D. diss., University of California, Los Angeles, 1996; Thomas L. Hankins, "Blood,

- dirt, and nomograms: A particular history of graphs”, *Isis*, xc (1999), 50–80.
36. “Es ist ein Schauspiel für Götter, den Muskel arbeiten zu sehen....” Emil du Bois-Reymond to Hermann Helmholtz, 9 February 1852, in Christa Kirsten (ed.), *Dokumente einer Freundschaft: Briefwechsel zwischen Hermann von Helmholtz und Emil du Bois-Reymond 1846–1894. Bearbeitet von einem Herausgeberkollektiv unter Leitung von Christa Kirsten, mit einer wissenschaftsgeschichtlichen Einordnung in die naturwissenschaftlichen und philosophischen Bewegungen ihrer Zeit von Herbert Hörz und Siegfried Wollgast* (Berlin, 1986), 123.
  37. Frank, “Telltale heart” (ref. 35). See also Joel D. Howell, “Cardiac physiology and clinical medicine? Two case studies”, in Gerald L. Geison (ed.), *Physiology in the American context, 1850–1940* (Bethesda, 1987), 279–92.
  38. Du Bois-Reymond’s science is treated by Otto Merkelbach, “Zur Entwicklung der Beobachtung der aktiven elektrischen Erscheinungen im tierischen und menschlichen Körper”, in Karl Reucher (ed.), *Festschrift für Jacques Brodbeck-Sandreuter ... zu seinem 60. Geburtstag [18. Juni 1942]* (Basel, 1942), 271–97; Mary A. B. Brazier, “Rise of physiology in the 19th century”, *Journal of neurophysiology*, xx/2 (1959), 214–18; Karl E. Rothschuh, “Emil du Bois-Reymond (1818–1896) und die Elektrophysiologie der Nerven”, in Karl E. Rothschuh (ed.), *Von Boerhaave bis Berger: Die Entwicklung der kontinentalen Physiologie im 18. und 19. Jahrhundert mit besonderer Berücksichtigung der Neurophysiologie. Vorträge des Internationalen Symposiums zu Münster/Westfalia 18.–20. September 1962* (Stuttgart, 1964), 85–105; Christoph von Campenhausen, “Elektrophysiologie und physiologische Modellvorstellungen bei Emil du Bois-Reymond”, in Gunter Mann (ed.), *Naturwissen und Erkenntnis im 19. Jahrhundert: Emil du Bois-Reymond* (Hildesheim, 1981), 79–104; Timothy Lenoir, “Models and instruments in the development of electrophysiology”, *Historical studies in the physical and biological sciences*, xvii/1 (1986), 1–54; Edwin Clarke and L. S. Jacyna, *Nineteenth-century origins of neuroscientific concepts* (Berkeley and Los Angeles, 1987), 196–211; and Gabriel Finkelstein, “Emil du Bois-Reymond: The making of a liberal German scientist, 1818–1851”, Ph.D. diss., Princeton, 1996. For Helmholtz’s electrophysiological work, see Holmes and Olesko, “The images of precision” (ref. 35); Olesko and Holmes, “Experiment, quantification and discovery” (ref. 29).
  39. Beck, *Humboldt* (ref. 9), ii, 30; Alexander von Humboldt to Alexander von Rennenkampff, Paris, 7. 1. 1812, in Kurt-R. Biermann (ed.), *Alexander von Humboldt. Aus meinem Leben: Autobiographische Bekenntnisse* (Munich, 1989), 181–97.
  40. Humboldt considered the failure “a likely result of illiberal influences from the East India Company”. Beck, *Humboldt* (ref. 9), ii, 52; Biermann, *op. cit.* (ref. 39), 114. Biermann agreed: “Er blieb wegen seiner freimütigen Berichterstattung über koloniale Mißstände in Lateinamerika eine persona non grata; die Reise wurde nicht gestattet. Übrigens war die Ursache damals kein Geheimnis. 1849 sprach der englische Ingenieur-officier und Forschungsreisende Richard Strachey es in Kalkutta öffentlich aus, wer Humboldts Indienreise verhindert habe: ‘Englishmen alone need remember that he was prevented by them’.” Kurt-R. Biermann, “Alexander von Humboldt als Initiator und Organisator Internationaler Zusammenarbeit auf Geophysikalischem Gebiet”, in E. G. Forbes (ed.), *Human implications of scientific advance: Proceedings of the XVth International Congress of the History of Science, Edinburgh, 10–15 August 1977* (Edinburgh, 1977), 127–8.
  41. “Nichts hat mich in meinem Leben mit lebhafterem Bedauern erfüllt, als daß es mir nicht vergönnt gewesen, selbst in jene berühmten Regionen einzudringen, wo ich ihr Verhältnis zu den Cordilleren der Neuen Welt erforschen wollte.... Das ist das Geschick des Menschen: am Ziele seines Lebens stehend, vergleicht er nicht ohne Betrübniß das Wenige, was er geleistet hat, mit dem, was er zur Vergrößerung des Gebiets der Wissenschaften gern hätte unternehmen können.” Alexander von Humboldt, *Central-Asien: Untersuchungen über die Gebirgsketten*



- und die vergleichende Klimatologie. Aus dem Französischen übersetzt und durch Zusätze vermehrt von Dr. Wilhelm Mahlmann (2 vols, Berlin, 1844), ii, 611. Also quoted in Sven Hedin, *Southern Tibet: Discoveries in former times compared with my own researches in 1906–1908* (9 vols, Stockholm, 1916–22), vii, 162.
42. Humboldt's stated goal: "die schöne Aussicht, die Geognosie des Himalaya und Kuen-lün mit der der Andeskette vergleichen zu können." Beck, *Humboldt* (ref. 9), ii, 34. Cf. Mott T. Greene, *Geology in the nineteenth century: Changing views of a changing world* (Ithaca, 1982).
43. Humboldt, *Central-Asien* (ref. 41).
44. Beck, *Humboldt* (ref. 9), ii, 152. He groused anyway. "Ma santé se soutient, quoique tous les momens d'un voyage en Sibérie ne soient pas également doux, les horribles cousins, les secousses dans les quibitkas et les éternelles visites d'hommes en épées. C'est l'Orénoque plus les épauettes." Alexander von Humboldt to Wilhelm von Humboldt, Jecaterinburg c. 2/14 July 1829, *Briefe Alexander's von Humboldt an seinen Bruder Wilhelm: Herausgegeben von der Familie von Humboldt in Ottmachau* (Stuttgart, 1880), 190.
45. See Biermann, "Alexander von Humboldt als Initiator" (ref. 40); Peter Honigman, "Entstehung und Schicksal von Humboldts Magnetischen 'Verein' (1829–1834) im Zusammenhang mit seiner Rußlandreise", *Annals of science*, xli (1984), 57–86; S. R. C. Malin and D. R. Barraclough, "Humboldt and the earth's magnetic field", *The quarterly journal of the Royal Astronomical Society*, xxxii (1991), 279–93; John Cawood, "Terrestrial magnetism and the development of international collaboration in the early nineteenth century", *Annals of science*, xxxiv (1977), 551–87; *idem*, "The magnetic crusade: Science and politics in early Victorian England", *Isis*, lxx (1979), 493–518; James Gabriel O'Hara, "Gauss and the Royal Society: The reception of his ideas on magnetism in Britain (1832–1842)", *Notes and records of the Royal Society of London*, xxxviii (1983), 17–78.
46. Charles Babbage, *Reflections on the decline of science in England and on some of its causes* (1830; reprint, New York, 1970), 76–97; Cawood, "The magnetic crusade" (ref. 45), 503.
47. *Ibid.*, 516.
48. *Ibid.*, 512; A. T. Kupffer to Edward Sabine, St Petersburg, c. 21 July, 2 August 1849, "A letter from M. Kupffer, to Lieut.-Col. Sabine, For. Sec. R.S., on the establishment of a central physical observatory at St. Petersburg. Communicated by Lieut.-Col. Sabine", *Abstracts of the papers printed in the Philosophical Transactions of the Royal Society of London*, v (1850), 907–8.
49. The geodetic survey of Hanover had proved Gauss's talents in administration, but the German kingdom was not the British Empire, despite rumours to the contrary.
50. O. J. R. Howarth, *The British Association for the Advancement of Science: A retrospect 1831–1931* (London, 1931), 181–2.
51. Charles Elliot to Edward Sabine, Madras, 6 August 1849, "A letter from Captain C. M. Elliot, Madras Engineers, to Lieut.-Col. Sabine, For. Sec. R.S., transmitted through the Court of Directors of the East India Company. Communicated by Lieut.-Col. Sabine", *Abstracts of the papers printed in the Philosophical Transactions of the Royal Society of London*, v (1850), 908–10.
52. Captain C. M. Elliot, "Magnetic survey of the eastern archipelago", *Proceedings of the Royal Society of London*, vi (1851), 15–21; Obituary notice, *Abstracts of the papers printed in the Philosophical Transactions of the Royal Society of London*, vi (1852), 251–2.
53. Hermann Schlagintweit to Adolph A. Barth, Berlin, 21 March 1851, SD Asien 1855 (5), Bl. 18; Elizabeth, Queen of Prussia to Hermann Schlagintweit, Sanssouci, 8 July 1852, Bayerische Staatsbibliothek, Nachlaß Schlagintweit (hereafter: Schlagintweitiana), IV. 6. 1.
54. Humboldt to Raumer, Potsdam, 27 Nov. 1852, in Humboldt, *Vier Jahrzehnte Wissenschaftsförderung* (ref. 20), 158–9.

55. Varnhagen von Ense, 9 Sept. 1853, *Letters of Alexander von Humboldt to Varnhagen von Ense: From 1827 to 1858. With extracts from Varnhagen's diaries, and letters of Varnhagen and others to Humboldt*, transl. by Friedrich Kapp (New York and Leipzig, 1860), 282–3.
56. *Ibid.*
57. Polter, *op. cit.* (ref. 1), 79; Edward Sabine, “Scientific mission of MM. de Schlagintweit”, *The Athenaeum*, no. 1767 (7 September 1861), 319–20.
58. “Der magnetische Drang, den ich mich rühmen kann, in England eingepfzt zu haben, und der jetzt durch Sabine’s Meisterhand eine Leidenschaft ist, wird [den Schlagintweits] sehr helfen.” Alexander von Humboldt to Carl Bunsen, Potsdam, 1 Oct. 1853, *Briefe von Alexander von Humboldt an Christian Carl Josias Freiherr von Bunsen* (Leipzig, 1869), 168–70.
59. Alexander von Humboldt to Carl Bunsen, Potsdam, 1 Oct. 1853, *op. cit.* (ref. 58), 178.
60. Adolph Schlagintweit, London, 1854, *Schlagintweitiana*, II. 1. 43, Bl. 2r–2v.
61. Sabine, *op. cit.* (ref. 57).
62. Adolph Schlagintweit, London, 1854, *Schlagintweitiana*, II. 1. 43, Bl. 3r–4r.
63. Potsdam, 1 Oct. 1853, *op. cit.* (ref. 58), 178, 185.
64. Adolph Schlagintweit, *Relief der Gruppe der Zugspitze und des Wettersteines in den bayerischen Alpen. Nach aequidistanten Horizontalen aufgenommen und ausgeführt. Verhältniss 1: 50000. Galvanisirter Zinkguss von M. Geiss in Berlin* (Leipzig, 1854); *idem*, *Relief des Monte-Rosa und seiner Umgebungen. Nach Karten, Profilen und landschaftlichen Ansichten ausgeführt von F. Warnstedt. Verhältniss 1: 50000. Galvanisirter Zinkguss von M. Geiss in Berlin* (Leipzig, 1854). The Duke of Leuchtenberg also received the book. The Queen and Princess of Prussia, Alexander von Humboldt, and various friends received prints of Alpine panoramas. Hermann Schlagintweit to Adolph A. Barth, Berlin, 21 Mar. 1851, *SD Asien 1855* (5), Bl. 18.
65. Adolph Schlagintweit, *Neue Untersuchungen über die physikalische Geographie und die Geologie der Alpen. Mit einem Atlas von 22 Tafeln* (Leipzig, 1854).
66. “Ich werde Euch nach ein paar Jahren alle um so freudiger wieder umarmen können.” Adolph Schlagintweit to his parents, 4 Aug. 1854, Hofmann, *op. cit.* (ref. 1), 49.
67. David E. Barclay, *Frederick William IV and the Prussian monarchy, 1840–1861* (Oxford, 1995), 111–12.
68. “Note de M. de la Roquette sur les ouvrages offerts par MM. Schlagintweit et sur leur prochain voyage dans l’Inde, lue à la séance de la Commission central du 20 octobre 1854”, *Schlagintweitiana*, II. 1. 43, Bl. 6; Hermann Schlagintweit to Abbé Moigno, Berlin, 6 May 1853, *SD Asien 1855* (5), Bl. 77–78. Hermann Schlagintweit asked Moigno not to refer to him as “young” for “prosaic reasons”. Cf. “Variétés: Expédition scientifique de MM. Schlagintweit”, *Cosmos: Revue encyclopédique hebdomadaire des progrès des sciences et de leurs applications aux arts et à l’industrie*, vi (1857), 443–8.
69. Schlagintweit to Moigno, *op. cit.* (ref. 68); Hermann Schlagintweit to Eugène Arnault, Berlin, 6 May 1849, *SD Asien 1855*(5), Bl. 12–13.
70. Hermann von Schlagintweit-Sakūnlūnski, *Reisen in Indien und Hochasien: Eine Darstellung der Landschaft, der Kultur und der Bewohner in Verbindung mit klimatischen und geologischen Verhältnissen. Basiert auf die Resultate der wissenschaftlichen Mission von Hermann, Adolph und Robert Schlagintweit, ausgeführt in den Jahren 1854–1858* (4 vols, Jena, 1869–80; hereafter: *Reisen*), i, 260.
71. *Ibid.*, 259.
72. *Ibid.*, 78; Robert Schlagintweit, “On the temperature and density of the seas between Southampton and Bombay, via the Mediterranean and Red Seas”, *Proceedings of the Royal Society of London*, vii (1854–55), 242–5.

73. Humboldt to Bunsen, Berlin, 30 Dec. 1854, *op. cit.* (ref. 58), 189.
74. Adolph Schlagintweit, "Operations proposed to the India House", London, 1854, *Schlagintweitiana*, II. 1. 43.
75. *Ibid.*
76. Hermann, Adolphe, and Robert de Schlagintweit, *Results of a scientific mission to India and High Asia, undertaken between the years 1854 and 1858, by order of the Court of Directors of the Honourable East India Company. With an atlas of panoramas, views, and maps* (4 vols, Leipzig and London, 1861–66; hereafter: *Results*). Cf. Hermann and Robert Schlagintweit, "Die Ergebnisse der wissenschaftlichen Mission der Gebrüder H., A. und R. v. Schlagintweit nach Indien und Hoch-Asien, in den Jahren 1854 bis 1858", *Mittheilungen aus Justus Perthes' Geographischer Anstalt über Wichtige Neue Erforschungen auf dem Gesamtgebiete der Geographie von Dr. A. Petermann*, ix (1861), 268–75, and x (1862), 393; Robert v. Schlagintweit, "Physikalisch-geographische Schilderung von Hoch-Asien", *Mittheilungen aus Justus Perthes' Geographischer Anstalt über Wichtige Neue Erforschungen auf dem Gesamtgebiete der Geographie von Dr. A. Petermann*, x (1865), 361–77.
77. *Reisen* (ref. 70), ii, 14–15.
78. *Results* (ref. 76), ii, 48–64.
79. Olesko, *Physics as a calling* (ref. 32).
80. Kick, "Vor hundert Jahren im Himalaya" (ref. 1), 54–55.
81. *Reisen* (ref. 70), iv, 109–11; i, 556–61; ii, 206.
82. Anon., review of *Results* (ref. 76), *The Athenaeum*, no. 1764 (17 August 1861), 215–16.
83. Stephan Oettermann, *The panorama: History of a mass medium*, transl. by Deborah Lucas Schneider (New York, 1997), 22–32; *Reisen* (ref. 70), ii, 258.
84. *Reisen* (ref. 70), ii, 275–6.
85. Adolph Schlagintweit, "Fortsetzung der Nachrichten über wissenschaftliche Reise der Gebrüder Schlagintweit in Indien: Bericht an Se. Majestät den König Friedrich Wilhelm IV", *Zeitschrift für Allgemeine Erdkunde*, v (1855), 257–69; *Reisen* (ref. 70), ii, 324–8.
86. Adolph Schlagintweit, "Neueste Nachrichten über die Fortschritte der Gebrüder Schlagintweit auf ihrer Reise im Himalaya und in Tibet zum oberen Indus. Mitgetheilt von C. Ritter", *Zeitschrift für Allgemeine Erdkunde*, vi (1856), 314–29. Cf. Robert Schlagintweit, "English lectures on High Asia delivered during the years 1868 and 1869 in various towns of the United States of America. Third lecture", *Schlagintweitiana*, V. 2. 2.1, Bl. 122–39.
87. *Reisen* (ref. 70), i, 256–7.
88. *Reisen* (ref. 70), ii, 402–28.
89. *Reisen* (ref. 70), ii, 240.
90. *Reisen* (ref. 70), i, 369–72. Robert Schlagintweit und Hermann Schlagintweit, "Robert und Hermann Schlagintweit's Reisen im December 1856, Januar und Februar 1857", *Zeitschrift für Allgemeine Erdkunde*, n. F., ii (1857), 428–34. They packed and shipped eighty-four crates.
91. Hermann Schlagintweit to Alexander von Humboldt, telegraph message, Trieste, 8 June 1857, *Schlagintweitiana*, II. 1. 43, Bl. 390.
92. Hermann Schlagintweit, *Reisen* (ref. 70), iv, 215–84, gives the most coherent account, although he seems to enoble Adolph's murder. See also Hermann and Robert Schlagintweit, *Officielle Berichte über die letzten Reisen und den Tod von Adolph Schlagintweit in Turkistán. Berlin, den 2. Mai 1859. (Nur zur Privat-Vertheilung bestimmt.)* (Berlin, 1859); Adolph Schlagintweit, "Adolph's latest papers", *Schlagintweitiana*, II. 1. 46; Roderick Impey Murchison to Hermann Schlagintweit, London, 2 Nov. 1861, *Schlagintweitiana*, IV. 6. 1; William Hay to Robert Schlagintweit, Srinagger, 9 Sept. 1861, *Schlagintweitiana*, IV. 6. 1; *Results* (ref. 76), i, 42–65; ii, 526–46; iv, 466; Hermann von Schlagintweit-Sakünlinski, *Neue Daten über den*

- Todestag von Adolph v. Schlagintweit, nebst Bemerkung über mussalman'sche Zeitrechnung. Aus den Berichten der mathematisch-physikalischen Classe der k. bayer. Akademie der Wissenschaften* (Munich, 1869); Emil Schlagintweit, "Bericht über das Denkmal für Adolph Schlagintweit in Kaschgar", *Sitzungsberichte der Münchner Akademie der Wissenschaften, philologisch-philosophische Classe* (1890), i, 457–72.
93. Hermann, Adolph and Robert Schlagintweit, "Über die Höhenverhältnisse Indiens und Hoch-Asiens", *Zeitschrift für Allgemeine Erdkunde*, n. F., xii (1862), 28–29.
94. Robert Schlagintweit, "Fourth Lecture" (ref. 86), *Schlagintweitiana*, V. 2. 2.1, Bl. 10.
95. See Dr H. W. Bellew, "History of Kashgar", in Sir T. D. Forsyth, *Report of a mission to Yarkund in 1873, with historical and geographical information regarding the possessions of the Ameer of Yarkund* (Calcutta, 1875), 106–213, esp. pp. 188–9.
96. William Hay to the secretary to the government of the Panjab, 14 Sept. 1861, *Results* (ref. 76), ii, 544–5.
97. The proprietor was using its paper to wrap packets of snuff.
98. "Opinion of the civil surgeon, Lahór, dated 23rd November, 1860", *Results* (ref. 76), ii, 534–5.
99. William Hay to Robert Schlagintweit, Srinagger, 9 Sept. 1861, *Schlagintweitiana*, IV. 6. 1; *Results* (ref. 76), ii, 541–2.
100. "Die Bhútias zeigten sich über das Gelingen des Unternehmens höchst erfreut, aber gläubisch in hohem Grade, waren sie jetzt zu der Überzeugung gelangt, daß die Brüder einen ganz speciellen Glücksstern besitzen müßten...." *Reisen* (ref. 70), ii, 340.
101. *Results* (ref. 76), i, 37.
102. *Reisen* (ref. 70), i, 237–8.
103. *Reisen* (ref. 70), i, 234–5.
104. Roderick I. Murchison, "Address", *Journal of the Royal Geographical Society*, xxvii (1857), pp. xciv–cxviii, see pp. clvi–clix; xxviii (1858), pp. cxxiii–ccxviii, see pp. clxxxiii–clxxxix.
105. Hermann Schlagintweit to Alexander von Humboldt, 17 June 1857, *SD Asien 1855* (5), Bl. 71–72; Hermann Schlagintweit to Kultusminister Raumer, Berlin, 16 June 1857, *SD Asien 1855* (5), Bl. 84; Hermann Schlagintweit to Königliche Bibliothek zu Berlin, Berlin, 17 June 1857, *SD Asien 1855* (5), Bl. 73–74; British Association for the Advancement of Science, Dublin 1857 notice, 30 June (Sections E & A), 2 July (Section A), *Schlagintweitiana*, VI. 4. 8. See also Anon., "Twenty-seventh meeting of the British Association for the Advancement of Science", *The Athenaeum*, no. 1559 (12 September 1857), 1156; Robert von Schlagintweit, "Remarks on some of the races of India and High Asia (in connexion with casts exhibited)", *Report of the ... meeting of the British Association for the Advancement of Science*, xxx (1860), 175–6; Hermann Schlagintweit, "On ethnographical casts", *Report of the ... meeting of the British Association for the Advancement of Science*, xxxiii (1863), 146.
106. Hermann, Adolphe and Robert Schlagintweit, "Aperçu sommaire des résultats de la mission scientifique dans l'Inde et la haute Asie, confiée par S. M. le Roi de Prusse et la Compagnie des Indes", *Comptes rendus hebdomadaire des séances de l'Académie des Sciences*, xlv (1857), 516–22.
107. Humboldt to Raumer, Berlin, 8 Feb. 1858, in Alexander von Humboldt, *Vier Jahrzehnte Wissenschaftsförderung* (ref. 20), 155; Beck, *Humboldt* (ref. 9), 234–5.
108. India Office to Hermann Schlagintweit, 8 July 1858, *Schlagintweitiana*, IV. 6. 1.
109. Brian R. Mitchell, *British historical statistics* (Cambridge, 1988), 153, 702.
110. Körner, *op. cit.* (ref. 1), 65.
111. Czar Alexander II even granted Hermann Schlagintweit the title "Sakünlünski", or "Conqueror of the Künlün". Emil Schlagintweit, *ADB* (ref. 1), 346.
112. Hermann Schlagintweit and Robert Schlagintweit, *General index to the "Results of a scientific*

*mission to India and High Asia*" (Leipzig, 1860), Schlagintweitiana, VI. 4. 8.

113. Hermann Schlagintweit and Robert Schlagintweit, "Die Ergebnisse der wissenschaftlichen Mission der Gebrüder H., A. und R. v. Schlagintweit nach Indien und Hoch-Asien, in den Jahren 1854 bis 1858. I: Astronomische Positions-Bestimmung und magnetische Beobachtungen", *Mittheilung aus Justus Perthes' Geographischer Anstalt über wichtige Erforschungen aus dem Gesamtgebiet der Geographie von Dr. A. Petermann*, vii (1861), 268–75; Robert von Schlagintweit, "Angaben über die Entfernung zwischen den wichtigsten Städten in den westlichen Theilen des Himálaya, Tíbets und Central-Asiens", *Mittheilung aus Justus Perthes' Geographischer Anstalt über wichtige Erforschungen aus dem Gesamtgebiet der Geographie von Dr. A. Petermann*, viii (1862), 393; *idem*, "Physikalisch-geographische Schilderung von Hoch-Asien", *Mittheilung aus Justus Perthes' Geographischer Anstalt über wichtige Erforschungen aus dem Gesamtgebiet der Geographie von Dr. A. Petermann*, xi (1865), 361–77.
114. *General index* (ref. 112).
115. "Der Brüder Schlagintweit Reisen in Asien", *Allgemeine Zeitung* [München], *Beilage*, no. 71 (12 March 1861), 1157; "Das Schlagintweit'sche Werk über Indien und Hochasien", *Deutsche Allgemeine Zeitung* [Leipzig], *Beilage*, no. 85 (13 April 1861), 864–5; "Correspondance des mondes", *Cosmos: Revue des sciences et de leurs applications* (12 Nov. 1863), 400–4; "Nekrolog. Hermann v. Schlagintweit-Sakünlünski", *Die Wartburg* [Munich], ix (1882), 56–59. Cf. Schlagintweitiana, VI. 4. 8.
116. "Opinions of the Press", *General index* (ref. 112), 5–6.
117. Anon., review of *Results*, *The Athenaeum*, no. 1764 (17 August 1861), 215–16.
118. Roderick I. Murchison, "Address", *The Journal of the Royal Geographic Society*, xxviii (1858), pp. clxxxiii–clxxxix; *idem*, Letter to the Editor, in "Scientific mission of MM. de Schlagintweit", *The Athenaeum*, no. 1767 (7 September 1861), 319–20.
119. Edward Sabine, Letter to the Editor, in "Scientific mission of MM. de Schlagintweit", *The Athenaeum*, no. 1767 (7 September 1861), 319–20.
120. J. D. Hooker, "The Messrs. Schlagintweit", *The Athenaeum*, no. 1769 (21 September 1861), 374.
121. Charles Darwin to J. D. Hooker, Down, 24 September [1861], Frederick Burkhardt *et al.* (eds), *The correspondence of Charles Darwin* (Cambridge, 1985– ), ix, 277–8.
122. House of Commons, "Minutes of Evidence taken before the Select Committee appointed to inquire into the Progress and Prospects, and the best Means to be adopted for the Promotion of European Colonization and Settlement in India, especially in the Hill Districts and Healthier Climates of that Country, as well as for the Extension of our Commerce with Central Asia, Fourth Report", *Sessional papers, 1857–1858, Colonization and settlement (India)*, vii, no. i, 6 July 1858, 1–10, esp. par. 7087–104. Perry spent two years studying in Munich before serving as a popular Liberal judge of the supreme court of Bombay. He opposed both the East India Company and Lord Dalhousie's policy of annexation. It is not surprising that he found the Schlagintweits' enthusiasm puerile. *Dictionary of national biography*, xv, 924–6.
123. Leonard Huxley, *Life and letters of Sir Joseph Dalton Hooker, O.M., G.C.S.I., based on materials collected and arranged by Lady Hooker* (2 vols, London, 1918); Janet Browne, "A science of empire: British biogeography before Darwin", *Revue d'histoire des sciences*, xlv (1992), 453–75; Jane Camerini, "Remains of the day: Early Victorians in the field", in Bernard Lightman (ed.), *Victorian science in context* (Chicago, 1997), 354–77; Ray Desmond, *Sir Joseph Dalton Hooker: Traveller and plant collector* (Woodbridge, 1999).
124. Joseph Dalton Hooker, *Botany of the Antarctic voyage of H.M. discovery ships, Erebus and Terror, under the command of Captain Sir James Clark Ross, 1839–1843* (London, 1844–60), vi.
125. Joseph Dalton Hooker, *Himalayan journals: Notes of a naturalist in Bengal, the Sikkim and Nepal*

- Himalayas, the Khasia Mountains, etc.* (2 vols, London, 1854).
126. Joseph Dalton Hooker, *The rhododendrons of Sikkim-Himalaya, being an account, botanical and geographical, of the rhododendrons recently discovered in the mountains of eastern Himalaya, from drawings and descriptions made on the spot, during a government botanical mission to that country*, 2nd edn (London, 1849); *idem*, *Flora Indica: being a systematic account of the plants of British India, together with observations on the structure and affinities of their natural orders and genera* (London, 1855); *idem*, *The flora of British India* (7 vols, London, 1875–97).
127. Huxley, *Life and Letters* (ref. 123), i, 344, 358; ii, 146.
128. Ray Desmond, *The India museum, 1801–1879* (London, 1982), 63–65. Cf. Henry Torrens, *Travels in Ladāk, Tartary, and Kashmir* (London, 1862), 207–13.
129. India Office to Hermann Schlagintweit and Robert Schlagintweit, 21 July 1859; India Office to Hermann Schlagintweit, 27 July 1859; India Office to Hermann Schlagintweit, 5 Oct. 1859; India Office to Hermann Schlagintweit and Robert Schlagintweit, 25 Sept. 1860; India Office to Hermann Schlagintweit and Robert Schlagintweit, 9 Aug. 1861; India Office to Robert Schlagintweit and Hermann Schlagintweit, 10 Dec. 1861; India Office to Robert Schlagintweit, 29 Sept. 1864; Madras Government to Hermann Schlagintweit, Fort St George, 19 Dec. 1865, Schlagintweitiana, IV. 6. 1. See also Sir Henry Conyngham Montgomery to Hermann Schlagintweit, London, 9 Nov. 1860; Lord Derby (Edward Henry Stanley) to Robert Schlagintweit, London, 18 Mar. 1861, Schlagintweitiana, IV. 6. 1.
130. Robert A. Stafford, *Scientist of empire: Sir Roderick Murchison, scientific exploration, and Victorian imperialism* (Cambridge, 1989), 21.
131. *Ibid.*, 22; David N. Livingstone, *The geographical tradition: Episodes in the history of a contested enterprise* (Oxford, 1992), 156–72.
132. 19 Jan. 1854, in Stafford, *op. cit.* (ref. 130), 119. Murchison not only impugns Hooker, but also his friend and the botanist colleague, Thomas Thomson, who made it to the crest of the Karakorum pass in 1848. Thomas Thomson, *Western Himalaya and Tibet: A narrative of a journey through the mountains of northern India, during the years 1847–8* (London, 1852); Sir Rutherford Alcock, “Address to the R.G.S. delivered at the anniversary meeting on the 27th May, 1878”, *Proceedings of the Royal Geographical Society*, xxii (1878), 309–15; John Keay, *When men and mountains meet: Explorers of the western Himalayas, 1820–75* (London, 1977), 178–85. Thomson received a gold medal from the Royal Geographical Society in 1866.
133. Paul M. Kennedy, “Idealists and realists: British views of Germany, 1864–1939”, *Transactions of the Royal Historical Society*, 5th ser., xxv (1975), 137–56; David Newsome, *The Victorian world picture: Perceptions and introspections in an age of change* (New Brunswick, 1997), 97–115; Klaus Hildebrand, “‘British interests’ und ‘Pax Britannica’: Grundfragen Englischer Außenpolitik im 19. und 20. Jahrhundert”, *Historische Zeitschrift*, ccxxi (1975), 623–39.
134. See Keay, *Men and mountains* (ref. 132), 186–8, 225; John Keay (ed.), *The Royal Geographic Society history of world exploration* (London, 1991); *Oxford atlas of exploration* (London, 1997).
135. Keay, *Men and mountains* (ref. 132), 250.
136. Henry Trotter, “Narrative of geographical explorations made by Captain Trotter, R.E., and his assistants”, in Forsyth, *op. cit.* (ref. 95), 233–95.
137. He continued: “It may be left for other and systematic writers, or for himself, as a future and independent task when he changes the character of a traveller for that of a didactic author, to harmonize the entire body of scientific information to which he has contributed into a methodological whole: but first let him publish, speedily and at all hazards, what belongs to himself; — otherwise, ere he has finished, he may have spent his life, or his fortune; or (as is the present case) his own labours may be anticipated by other travellers whom his example

has encouraged, and whose publications has been more individuals and less tardy". [James Forbes], review of *Cosmos: A sketch of a physical description of the world*, vol i; *Quarterly review*, lxxvii (1845), 154–91, p. 156.

138. *Reisen* (ref. 70).
139. Hermann Schlagintweit to Wüstermann, München, 20 Nov. 1880, SD Asien (5), Bl. 92; Hermann Schlagintweit to Adalbert, Prinz von Bayern, München, 6 July 1874, 18 Feb. 1877, Staatsbibliothek Preußischer Kulturbesitz zu Berlin, Handschriftenabteilung, Nachlaß 141 (Sammlung Adam), 20.
140. Schlagintweitiana, V. 1. 5–8; Robert Schlagintweit, *Robert von Schlagintweits als Manuscript gedruckter und nur zur Privatvertheilung bestimmter Bericht über die 1000 von ihm zwischen Freitag dem 21. Oktober 1864 und Dienstag dem 2. April 1878 in Europa und Nordamerika gehaltenen öffentlichen populär-wissenschaftlichen Vorträge* (Leipzig, 1878).
141. He lectured fifty-six times in German.
142. \$3335 net. Schlagintweitiana, V. 1. 5, Bl. 17–19.
143. Robert Schlagintweit, *Die Pacific-Eisenbahn in Nordamerika* (Cologne, 1870); *idem*, *Die Prairien des amerikanischen Westens* (Cologne, 1876); *idem*, *Die Amerikanischen Eisenbahneinrichtungen* (Cologne, 1882); *idem*, *Neue Pfade vom Missouri-Strom zum Stillen Meere. Ein Wegweiser durch Kansas, Colorado, Neu-Mexiko und Arizona nach Californien* (Cologne, 1883); *idem*, *Die Santa Fe- und Südpacificbahn in Nordamerika* (Cologne, 1884); *Die Eisenbahn zwischen den Städten New York nach Mexiko, nebst einer allgemeinen Schilderung Mexikos* (Weimar, 1885); *idem*, *Die Pacificischen Eisenbahnen in Nordamerika* (Gotha, 1886). Also in this vein were his *Californien: Land und Leute* (Cologne, 1871) and *Die Mormonen oder Die Heiligen vom jüngsten Tage von ihrer Entstehung bis auf die Gegenwart* (Leipzig, 1884).
144. Alastair Lamb, *British India and Tibet, 1766–1910*, 2nd edn (London and New York, 1986), 48–67.
145. *Ibid.*, 105–35.
146. House of Lords, "The mission to Tibet", *Parliamentary debates*, 4th ser., cxxx, 26 February 1904, 1140–1.
147. As does Peter Hopkirk, *The great game: On secret service in high Asia* (London, 1990). See also Karl E. Meyer and Shareen Blair Brysac, *Tournament of shadows: The great game and the race for empire in Central Asia* (Washington, D.C., 1999); A. Huttenbeck, "The 'great game' in the Pamirs and the Hindu-Kush: The British conquest of Hunza and Nagar", *Modern Asian studies*, ix (1975), 1–29; K. Warikoo, *Central Asia and Kashmir: A study in the context of Anglo-Russian rivalry* (New Delhi, 1989). Cf. the classic accounts by Sir Sidney Cotton, *The Central Asian question* (Manchester, 1869); Arminius Vambéry, *Central Asia and the Anglo-Russian frontier question: A series of political papers*, transl. by F. E. Burnett (London, 1874); *idem*, *The coming struggle for India. Being an account of the encroachments of Russia in Central Asia, and of the difficulties sure to arise therefrom to England* (London, 1885).
148. Micha Glenny, "Only in the Balkans", *London review of books*, xxi/9 (29 April 1999), 12–14; Victor G. Kiernan, "Kashgar and Central Asia, 1868–1878", *The Cambridge historical journal*, xi (1955), 317–42; Raymond A. Mohl, "Confrontation in Central Asia, 1885", *History today*, xix/3 (1969), 176–83; S. C. M. Paine, *Imperial rivals: China, Russia, and their disputed frontier* (London, 1996).
149. Gerald Morgan, "Myth and reality in the great game", *Asian affairs: Journal of the Royal Central Asian Society*, lx (1973), 55–65. The exception was Mohammad Amin, whom I take to be Kipling's model for Mahbub Ali in *Kim*, Hopkirk and Morgan notwithstanding.
150. The Schlagintweits' case is easy. The relationship between knowledge and power in British India

- has never been straightforward. Matthew H. Edney, *Mapping an empire: The geographical construction of British India, 1765–1843* (Chicago, 1997); C. A. Bayly, *Empire and information: Intelligence gathering and social communication in India, 1780–1870* (Cambridge, 1996); Gyan Prakash, “Science ‘gone native’ in colonial India”, *Representations*, xl (1992), 153–78.
151. Arnold van Gennep, *The rites of passage*, transl. by Monika B. Vizedom and Gabrielle L. Cuffee (Chicago, 1960); Nicole Belmont, *Arnold van Gennep: The creator of French ethnography*, transl. by Derek Coltman (Chicago, 1979).
152. Ronald Hyam, “Empire and sexual opportunity”, *The journal of imperial and commonwealth history*, xiv/2 (1986), 34–90.