

Humboldtian Imagery and “the Humboldt of Australia”¹

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ABSTRACT: When the great German geographer August Petermann called the botanist/explorer Ferdinand von Mueller “the Humboldt of Australia,” what did he have in mind? Elaborating the circumstances of his doing so gives us a new view of Alexander von Humboldt’s image among nineteenth-century scientists who declared themselves to be his followers and raises the question of how closely this might have corresponded with the notion of “Humboldtian science” that has been developed by present-day historians of science.

ON 8 JANUARY 1870, the German geographer August Petermann wrote from Gotha to Ferdinand von Mueller in Australia a letter of introduction for the son of the British Consul-General at Hamburg. The father, Petermann wrote to Mueller, was “one of the best friends of German Geographers and Scientific men, . . . who therefore will be sure to receive the sympathy of so great a patriot as yourself.” Hence he was confident that Mueller, “in his position as the Humboldt of Australia,” would make the son welcome (Petermann 1870).

Some years later, in a letter dated 16 December 1874, Petermann again used this imagery. On that occasion, Petermann thanked Mueller for instructing his protégé, the explorer Ernest Giles, to name in Petermann’s honor a prominent mountain range he had discovered in Central Australia: “At the first opportunity I have to put new names on the map,” he told Mueller, “you may be sure that I shall not forget that of my high patron in the Antipodes, my revered Australian Humboldt, and shall also think of the obliging Mr Giles” (Voigt 1996:127). It is not clear whether Petermann lived up to his promise. Earlier, in 1871, he had named a mountain on Spitzbergen after Mueller

(Voigt 1996:103); but there is no reference in the surviving correspondence to his later doing anything like that again. (There is a cataract in Brazil named after Mueller that might perhaps have been given its name by Petermann, but I have been unable to trace the circumstances of its naming.)

Petermann’s coupling of Mueller’s name with that of the German polymath Alexander von Humboldt provides the central theme of this paper. It has become commonplace among historians to represent much of nineteenth-century science as “Humboldtian.” And here we have one leading scientist applying the very label, not once but twice to one of his colleagues! My intention is to use what we know of the work of Mueller and Petermann, and of the connection between them, to elucidate Petermann’s usage—to shed new light upon Humboldt’s influence among his contemporaries and successors.

It is clear that Petermann intended to compliment Mueller. But if his linking of the two names were to flatter, he had to be sure that Mueller would see the connection as appropriate as well as pleasing. This prompts a question. Given the differences between the patrician Humboldt, securely located throughout his career at the heart of the intellectual world of the nineteenth century, and Mueller, the orphaned son of a Rostock customs official who had emigrated to distant Australia in 1847 and stayed there ever since, what parallels could Petermann possibly have had in mind, that he could expect Mueller also to recognize? What does

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his comparison say about his image of Humboldt, and of Mueller? And what does it tell us about "Humboldtian" science, as this term might have been understood at the time?

I add this qualification because Susan Faye Cannon has offered a characterization of "Humboldtian" science that has attracted considerable attention among historians of nineteenth-century scientific thought (Cannon 1978: ch. 3). This style of science, she has argued, was "the great new thing in professional science in the first half of the 19th century." Not for Humboldtians the easy generalizations of the casual observer, nor the "sterile accumulation of insulated facts" in the laboratory. On the contrary, Humboldtian science demanded careful and systematic recording of a range of variables in the hope that these could eventually be shown to be linked together as different aspects of large-scale (or even global) dynamical systems. The Humboldtian traveler always looked for relationships between phenomena; a trademark was the plotting of lines ("iso-lines") representing equal values of some physical variable or other on maps. Precision, whether of observation or of measurement, was a *sine qua non*.

Other authors have subsequently elaborated Cannon's idea. In particular, Malcolm Nicolson has highlighted the importance of botany, Mueller's science, in Humboldt's scheme of things (Nicolson 1987). What Humboldt advocated was not, however, the botany of Linnaeus, with its focus on taxonomy, but rather a botany that studied vegetation as a whole—that is, the relationships within and between plant communities. The Humboldtian botanist, on this account, is a plant geographer, concerned not so much to discover and identify new species—although this remained an important part of the task—but to explore the distribution of species and the connections between plant distribution and variables such as climate, elevation, and geological structure. More recently, Michael Dettelbach has suggested yet another feature of Humboldtianism, namely a determination to bring remote and uncivilized parts of the world under scientific law and order. "Contributing to Humboldt's

lines," he suggested, "was a philanthropic, even heroic act.... To extend the reach of mean values was to extend European civilization in its best and most progressive aspect" (Dettelbach 1996:301).

THE AUSTRALIAN HUMBOLDT

Humboldt's influence is apparent among many German scientists who traveled to Australia in the nineteenth century (Home 1995*a,b*). Mueller was perhaps the most notable of these, and he acknowledged a strong Humboldtian influence on his choice of career—recalling in later life how, during his student days, he was inspired by Humboldt's account of his travels in South America (Mueller 1887). Mueller was the principal speaker at a commemoration of Humboldt's life and work held in Melbourne on 14 September 1859, shortly after the great man's death; there he recorded how his reading of Humboldt's inspiring vision of an exact, unified science embracing nature in all its aspects had given direction to his life (Mueller 1859*a*). Under Humboldt's influence, the highest task was no longer to perfect individual disciplines, but rather "to explore the inner connection of the sciences, to discover their reciprocal relations, and thereby to extend the whole empire of knowledge simultaneously." The period in which he lived would thus be reckoned "the epoch in which the isolated scientific explanation was merged into a harmonious whole" (Mueller 1859*a*:20). Mueller included a quotation from Humboldt's *Cosmos* on the title page of his first major Australian publication (Mueller 1860–1862), and in a letter, he referred to Humboldt as "the greatest genius of this century" (Mueller 1859*b*). Late in life, Mueller was still espousing the Humboldtian creed: "the greatest triumph of sciences," he maintained in his presidential address to the Australasian Association for the Advancement of Science in 1890, "consists in bringing them into the fullest contact, somewhat in an Aristotelean and Plinian—or speaking of our own epoch—in an Humboldtian spirit" (Mueller 1890:5).

These points are revealing in the way they

emphasize the dream of unifying the sciences to embrace the Earth in all its aspects. The theme of the quotation Mueller extracted from *Cosmos*—"everywhere presses upon us the sense of the existence of Nature according to inner, eternal laws" (*Überall durchdringt uns das Gefühl des Bestehens der Natur nach innern ewigen Gesetzen*)—was of a piece with this idea, because it was these very "inner, eternal laws" that would emerge. However, having introduced the theme, what Mueller stressed in his 1859 address—by far his most extensive discussion of Humboldt's work—was the breadth of the great man's interests as displayed in his achievements as a scientific explorer. Mueller highlighted the romance of Humboldt's South American journey, noting the rich variety of tropical nature, the majesty of the Andes, the drama of an eruption of Cotopaxi, and Humboldt's ascent of Chimborazo. He listed Humboldt's comments on earthquakes and on the pyramids built by the Incas, his scientific survey of Mexico, and his visit to the United States. He also recounted Humboldt's later travels in Siberia. But it was the scientific character of Humboldt's journeys that in Mueller's mind set them apart from the travels of others. This, he said, "inspired me too to undertake investigations in the kingdom of nature, drove me too with endless longing into the far distance, in order to carry to the great master some perhaps valuable building stones for the palace of science" (Mueller 1859a). In this, Mueller perceived a moral benefit. Humboldt's greatest reward had been "to see, even during his lifetime, the strength of his influence in advancing the well-being and in the raising up of mankind, and to have called such a crowd of great minds to further research in all parts of the Earth" (Mueller 1859a).

Petermann and Mueller never met, but they exchanged letters for many years. Their surviving correspondence has recently been published (Voigt 1996). The earliest letter located dates from 1861, when Mueller sent Petermann a donation of £20 to the fund established to mount an expedition to search for the German explorer Eduard Vogel, missing in Africa; it seems that this was the first letter in the series. (Voigt reported,

however, that there had been earlier, indirect contact through Mueller's Hamburg friend, the botanist Otto Wilhelm Sonder, who on at least two occasions had forwarded publications to Petermann on Mueller's behalf.)

Mueller was a much more regular correspondent than Petermann: indeed, for long periods he made a point of writing to Petermann every month. Petermann's surviving letters to Mueller, on the other hand, are much less numerous and almost invariably include an apology for not having written more often. It is, however, clear from Mueller's acknowledgment that Petermann was also, and much more regularly, sending Mueller copies of his publications, including issues of the journal that he edited, his *Geographische Mittheilungen*. Mueller in return sent Petermann a range of Australian publications, including his own; and from the more geographically orientated of these, Petermann often included excerpts in his journal and also extracted details that he incorporated in the maps he was constantly producing.

What is the image of Mueller that Petermann acquired from these contacts? I have to say that, judging from Mueller's botanical works, Petermann would have had few grounds to attribute to Mueller the "Humboldtian" vision described by Cannon and Nicolson. By the late 1850s, after Mueller's remarkable success as botanist on Augustus Gregory's North Australia Exploring Expedition, he was treated more or less as an equal by the leading botanists of Europe. However, most of his botanical work, and certainly that on which his scientific reputation chiefly rested, was straightforwardly taxonomic in character. His publications included a plethora of separate papers describing new species, the number and distribution of which created bibliographical problems about which Joseph Hooker complained even in the 1850s—when what was later to become a flood, was still only a trickle. Petermann may have come across some of these, but probably only a small and random sample. Then there was Mueller's personal botanical journal, his *Fragmenta Phytographiae Australiae*, the first number of which appeared in

1858 and which eventually grew into an 11-volume publication (Mueller 1858–1882). Mueller made sure that Petermann had a full set. He likewise sent a copy of his *Plants Indigenous to the Colony of Victoria* (1860–1862) and also, beginning in 1863, volumes of George Bentham's *Flora Australiensis*, in the writing of which Mueller played a crucial role.

A smaller work of Mueller's, *The Vegetation of the Chatham-Islands* (1864), the only other separately published work sent to Petermann before the comparison with Humboldt, did indicate by its title a larger, biogeographical purpose in its concern to describe the plant community of these isolated islands southeast of New Zealand that Mueller himself never visited. However, from the actual contents of the book, this concern emerges only fleetingly and by implication, because in the main it is devoted to standard taxonomic descriptions of the species represented on the islands. Their interrelationships are only hinted at, and there is no discussion of either geology or climate.

From these works, Petermann would have been left in no doubt that Mueller was a major figure in the taxonomic botany of his day and a leading authority on the Australian flora. In general terms, this would have been known to Petermann from other sources as well, for he had his own well-developed links with the leaders of British science, after spending 10 years in Britain between 1844 and 1854. But regardless of Mueller's standing as a taxonomist, it could not have justified Petermann's comparing him with Humboldt—indeed, had Petermann intended to flatter Mueller for his taxonomic work, comparing him with Humboldt was not a very appropriate choice. Even if, looking back, we can see features of Mueller's work that fit with Nicolson's characterization of Humboldtianism as it applied to botany, for Petermann to detect them from the materials available to him, he would have had to be a remarkably perceptive reader indeed.

Two aspects of Mueller's botany, in particular, are consistent with Nicolson's requirements, though with respect to the first of them I speak only hesitantly. But I suspect that we may attribute to Humboldt's influ-

ence Mueller's strongly held commitment to the view that field observations of living plants should be a major consideration in determining species. In this he was opposed by his great English contemporary George Bentham and also by others in the Kew taxonomic tradition including Joseph Hooker. Bentham, for example, although acknowledging that field observation might be a useful aid, cautioned that "it often acts as a snare" because it rarely happens that enough related species grow close enough together to permit the kinds of comparisons that are possible in the herbarium, leaving the field worker forced to rely on "recollections of general impressions." Hooker concurred, writing to Mueller that "Every Botanist who has come to Kew to work, however experienced, has confessed that so large a Herbarium puts his materials & labors on a very different point of view from what he expected" (quoted by Stevens 1997: 353). In part, no doubt, Mueller's insistence was a strategic response to Kew's claim of ultimate authority over the Australian flora. But it was also much more than that. The question has always been a matter of debate among taxonomists. It seems to me that the stance Mueller took on the matter was probably a reflection of the fact that his botanical interests extended beyond taxonomy to plants as they occur in nature—that is, to Humboldtian concerns with vegetation.

On the second point, I can speak more definitely. During the early 1870s, Mueller became embroiled in a bitter dispute with local horticulturalists over his administration of the Melbourne Botanic Garden—a dispute that ultimately led, in 1873, to his dismissal from the directorship he had occupied since 1857. The dispute derived from the very different views of botanical research held by Mueller and his critics, and what the role of a botanic garden should be. In a recent paper, Stephen Jeffries argued persuasively that Mueller's position is best understood in terms of a commitment to a Humboldtian program of research that his critics simply failed to recognize (Jeffries 1997). The horticulturalists, steeped in the traditions of English gardening and the Kew style of botany, believed that Mueller's role as government bot-

anist should be confined to the classification of the local flora on the basis of the herbarium collections (his control over these being in no way affected by his dismissal from the Garden). The role of the Botanic Garden, in their view, was to raise plants for display.

Mueller, on the other hand, although not discounting the importance of taxonomic work, sought in true Humboldtian fashion to go beyond this, to an understanding of the relationship between potentially useful plants and their habitats, with the ultimate objective of assessing their suitability for acclimatization. Mueller saw the Botanic Garden as a primarily scientific institution playing a central role in this research on plant culture.

There is no doubt that Mueller was devastated by his dismissal from the Garden and believed that his ability to undertake the kind of research he had been engaged to do had been undermined. Jeffries showed how he was able to maintain this view, even though the years following his dismissal were, so far as his taxonomic work was concerned, the most productive of his whole career.

MUELLER AND HIS MILIEU

There are, then, good reasons for classifying Mueller as a Humboldtian botanist according to the criteria established by Nicolson, and for seeing Humboldtian ideals as integral to his conception of his science. Nevertheless, Petermann would have gained little if any inkling of Mueller's ideas on these matters from his publications, nor did Mueller address such matters in his letters to the geographer. Indeed, Mueller's letters to Petermann were not concerned with technical botanical issues at all.

We thus find ourselves confronting a paradox: in terms of our current notions of what constituted a Humboldtian, Petermann was right to link Mueller's name so strikingly with the master—but he had no way of knowing this. In fact, in comparing Mueller with Humboldt, Petermann was almost certainly referring to something else. And so it appears that the technical meaning we have

given the term "Humboldtian," however useful in historical analysis, might not coincide with nineteenth-century usage.

Petermann himself was, above all, interested in geography, and this topic dominates his correspondence with Mueller. As European knowledge of the world increased during the middle decades of the nineteenth century, Petermann charted its progress in his journal and on maps he prepared for the publishing company that employed him, Justus Perthes Verlag in Gotha.

In the first letter he wrote to Mueller, after thanking him for his donation toward the expedition to search for Vogel, Petermann asked Mueller to keep him informed on geographical developments in Australia. His letter gives a clear picture of how he built his journal. He complained that, isolated in Gotha, he found it difficult to keep up with what was happening and asked Mueller to help him acquire the latest exploration reports as well as maps, statistical reports, and the publications of local scientific societies, so that he could disseminate them in his journal (Voigt 1996:29–32). He received reports on this basis from almost all the governments of Europe and from those of Canada, the United States, Brazil, and several other countries, but very few from Australia.

Mueller set to work at once, arranging for the Survey Departments of the Australian colonies to send Petermann copies of all the maps they had, and forwarding to him recently published reports of exploring expeditions. Once established, the pattern continued, and Mueller became a major conduit of the latest Australian geographical news to Petermann.

Before his correspondence with Petermann, Mueller had established his credentials as a scientific explorer in the Humboldtian mold, having on three separate occasions traversed the rugged mountainous region of southeastern Australia and served as botanist on the highly successful expedition to Northern Australia, led by Augustus Gregory, that penetrated deep into the central desert before traveling 3000 miles overland to Brisbane. Mueller botanized busily all the way. Thereafter, he was justifiably regarded as an authority on exploration, and

his advice was sought by those planning expeditions. He became a great advocate and patron of further exploration in inland Australia—whether in the vast western deserts; or in North Queensland, in search of the naturalist-explorer Ludwig Leichhardt, who with all his party had vanished without trace after setting out in 1847 to cross the continent from east to west. Mueller kept Petermann fully informed and so impressed him with his standing as an explorer that when, in 1863, Petermann published a map showing what was known of the south polar region and an editorial advocating further exploration, he named Mueller as the man to take it on (Petermann 1863).

From Mueller’s letters, Petermann would also have learned that there was a romantic dimension. For several years in the 1860s, following the discovery in North Queensland of a tree on which a large letter “L” was blazed, Mueller promoted expeditions to search for Leichhardt. The blazed tree was perhaps the first real clue to the route he had taken. Mueller’s enthusiasm was driven, he said in public lectures as well as in his letters to Petermann, not just by a desire to know what had happened to Leichhardt, but by the hope—a faint one, he admitted—that some of the missing men might still be alive but marooned in a desert oasis from which they were unable to escape (Voigt 1996: 57–59).

There was also a moral dimension to Mueller’s enthusiasm, and this brings me back to Dettelbach’s comments about the moral overtones of the Humboldtian enterprise. So far as further exploration within Australia was concerned, Mueller repeatedly made it clear that his enthusiasm was driven by a desire to promote the economic expansion of the country. His support for the expeditions of Ernest Giles in the early 1870s, for example, in the frightful desert country west of the newly constructed north-south telegraph line through Central Australia—support that extended to Mueller’s committing large sums of his own money to the cause—was driven not just by scientific curiosity (Giles botanized for him whenever he could, as he went along) but by a vision of

opening up new stock routes between eastern Australia and the west coast. But both within Australia and in other parts of the world, Mueller also saw the penetration and colonizing of new territory as a special privilege that had fallen to nineteenth-century Europeans, not one just of taming these lands by bringing them within the bounds of scientific understanding, but one also of carrying civilization to the barbarous peoples who inhabited them. The Germans, he thought, had not yet adequately done their duty in this respect, and he urged Petermann to use his journal to advocate German colonies in Abyssinia, New Guinea, and the islands of the South Pacific. He even chided Petermann at one point for promoting German expeditions to the north pole rather than to such places where the civilizing mission was more obviously necessary (Voigt 1996: 98–99).

Although views such as these are consistent with those that Dettelbach has associated with Humboldtianism, it is unclear whether either Mueller or Petermann would have associated them particularly with Humboldt. I suspect that they have a much broader cultural basis than that. And so I am again led to question whether there is much connection between our fairly precisely defined historical category of “Humboldtian science” and Petermann’s calling Mueller the “Humboldt of Australia”—even though, as I have argued, our technical definition fits Mueller’s science.

Petermann’s phrase was, I suggest, intended in a more general sense. Socially, it was no longer as inappropriate as it once would have been, because Mueller had recently been given his “von” and then created a *Freiherr* by the King of Württemberg. Mueller was clearly a person with considerable standing in his own field of science; he had major achievements behind him as a scientific explorer; and now he was inspiring a new generation of scientifically oriented explorers to risk their lives elucidating the geography and natural productions of vast, uncharted regions of inland Australia. When one comes to think about it, it wasn’t such a bad comparison after all.

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