CHAPTER 17

William Burchell in Southern Africa, 1811-1815

Malgosia Nowak-Kemp

Following its discovery by Bartolomeu Dias in 1488, the Cape of Good Hope soon became a regular stopover for vessels travelling on to the Far East. The earliest accounts of the territory date from around 1500, and the many encounters that followed combined to generate the classic image of the Cape and Table Mountain as well as providing descriptions of its people, its flora and fauna (Huigen 2009: 199).

There were many reasons for European interest in Southern Africa. In the minds of some it was a land of dangerous animals and equally dangerous people, of extreme heat and drought; for others it conjured up the opposite – the epitome of paradise. One of the early nineteenth-century African explorers, John Barrow, wrote: "though known anciently, it is still known but imperfectly; so that the old Greek maxim, adopted in after-ages by the Romans is equally applicable at the present day as it was two thousand years ago, *Africa semper aliquid novi offert*" – Africa never fails to present something new to the inquisitive traveller (Barrow 1806: v).

In Britain an Association for Promoting the Discovery of the Interior Parts of Africa was set up in 1788, with the objective "to investigate, as to the nature and history of those parts of the world, which have not, to our knowledge, been hitherto explored". Since "almost the whole Africa, [is] unvisited and unknown", the Association declared, "of the objects of inquiry which engage our attention the most, there are none … that so much excite continued curiosity, from childhood to age; none that the learned and unlearned so equally wish to investigate, as the nature and history of those parts of the world, which have not, to our knowledge, been hitherto explored" (Anonymous 1790: 3). An additional source of fascination, was the spectre of slavery and the horrors associated with it (Barrow 1806: v).

The ensuing attention directed towards Southern Africa rendered this relatively small territory symbolic of the whole continent in the eyes of many, forming a prism through which Europeans saw the whole of Africa (Huigen 2009). The establishment of Cape Town by the Dutch in 1652, as a supply station with the various facilities needed by the travellers, the relative freedom of that part of the world from disease, the absence of political conflicts and the open spaces devoid of impenetrable forests, ensured that Southern Africa

 | DOI 10.1163/9789004323841_018

became very attractive to explorers – much more so than the central, equatorial regions.

By the early eighteenth century exploration of the interior of Southern Africa had begun, partly on the initiative of the Dutch East India Company (for primarily economic reasons) but also by individuals for scientific purposes (Huigen 2009). Explorers arrived in considerable numbers – Peter Kolbe (1675-1725), Captain Henri Hop, Carl Peter Thunberg (1743-1828), Francis Masson (1741-1805), Johann Reinhold Forster (1729-1798), Robert Jacob Gordon (1743-1795), Anders Sparrman (1748-1820), William Paterson (1755-1810), and François Le Vaillant (1753-1824) in the eighteenth century, to John Barrow (1764-1828) and Hinrich Lichtenstein (1780-1856) in the early 1800s – but the information reaching Europe remained misleading and often contradictory, not only on matters of geography but also concerning the people and animals living there. While most early explorers observed and reported on everything – weather, astronomy, geology, mineralogy, geography, botany, zoology, and the indigenous tribes – they usually favoured one field of interest over others: Kolbe's forte was astronomy, Thunberg put his efforts mostly into the description of plants, as did Mason and Paterson, while Sparrman and Gordon concentrated on animals, Le Vaillant on birds, Barrow on geography and on political, administrative and economic matters. In Southern Africa, there was always something for everyone. Then in 1811 the mantle of Southern African exploration was taken up by a young Englishman, William Burchell.

William John Burchell

William Burchell (Fig. 17.1) was born in Fulham, London on 23 July 1781 to the wealthy owner of "The Fulham Nursery and Botanical Gardens" (Cleverly 1989: 1). Well educated at the Raleigh House Academy in Mitcham, Surrey, he mastered Latin and French and his English writing has been "ranked among the classics of English travels, from its simple, vigorous, and truthful style" (Poulton 1907: 7). At fifteen he received lessons in art and aquatinting from a Frenchman, James Merigot, and in the principles of perspective from an Irishman, John Claude Nattes (Buchanan 2015: 21). Two years earlier, he mentioned in a letter to his father the botany lessons delivered by his Latin teacher (Cleverly 1989: 3) and asked for a book, but "Linnaeus's System of Botany I would much rather have" (McKay 1935b). He maintained his interest in plants by training at nearby Kew Gardens where he met William Hooker and many visiting botanists (Stewart and Warner 2012: 1). He was elected a Fellow of the Linnean Society in February 1803 on the strength of his knowledge of botany (Buchanan 2015: 25),

FIGURE 17.1
William Burchell. Etching by Mrs Dawson Turner from a drawing by J.S. Cotman. Burchell is shown in 1816, a year after his return from Africa. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

and a year later his father offered him a partnership in the family business: Burchell refused, explaining that his knowledge was "free, without any need for payment"; he continued that "to claim a share in those profits to which you only are entitled would be repugnant to my feelings" (McKay 1935b).

Determined to make his own fortune, he entered into a partnership with William Balcombe whose firm Balcombe Traders was an official purveyor to the East India Company at St Helena (Cleverly 1989: 5). Burchell had scarcely arrived on the island, in 1805, when the partnership was terminated, but happily he was offered the position of schoolmaster, to teach ancient and modern languages, mathematics and the art of drawing. Later, in 1809, he was appointed naturalist to the East India Company. During his stay on St Helena he met General Janssens, the retired Dutch Governor of the Cape, and Dr Lichtenstein, a naturalist and a physician on the General's staff, on their way back to Holland; he received from them letters of introduction to various persons of influence in the colony (Burchell, *Travels in the Interior of Southern Africa,* vol. I: 14).[1] In

1 Henceforth in this paper, Burchell's *Travels* will be referred to by volume and page number only.

January 1808 Burchell was sent seeds and plants by the Revd Hesse from Cape Town, and he reciprocated by forwarding some plants from St Helena. In January 1810, Hesse wrote that Lord Caledon was desirous to know if Burchell would accept the post of "Botanist to the Cape Colony" and nine months later the Secretary of the Cape, a Mr Alexander, stopped at St Helena on his way to England and presented Burchell with another set of letters of introduction to people at Cape Town. Well primed in this way, Burchell decided to end his affairs on St Helena and on 26 November 1810 he sailed for Cape Town with the intention to explore the interior of Africa, although he had decided not to accept the post of Botanist to the Colony (McKay 1935b: 691)

His plan was to travel unaccompanied, except for a small number of hired Hottentots, and to follow in the footsteps of Truter and Somerville in 1801 (Williams 1859: 33; McKay 1941: 62) and of Lichtenstein in 1805 (Williams 1859: 33; McKay 1941: 62). After going northwards to Litakun, he intended to turn towards the west coast and from there sail back to St Helena. However, on learning of difficulties with hostile tribes and arid land that he would have to cross, he decided to postpone any decision about the direction of travel until he had reached Litakun. Burchell anticipated that this expedition would last two years, but neither the prediction of the route nor the length of his travels would prove accurate. He set off on 19 June 1811 towards Tulbagh, then having crossed the Cape Colony boundary arrived at Klaarwater on 30 September, having covered 800 miles of inhospitable terrain on the journey. After spending some time in Klaarwater, he set out towards Graaff Reinet, about 600 miles away. On 25 April he left Graaff Reinet to travel back to Klaarwater, from where he set off to explore the unknown "interior of Africa".

After travelling to Litakun and further north – to territory never before visited by Europeans – he returned to Klaarwater and, in March 1813, re-entered the Cape Colony. Reaching the Colony's southern parts, he remained there until his return to Cape Town in April 1815, having covered 4,500 miles in four years. During his travels he scrupulously recorded everyday events in his journals, and later published them in the two volumes of *Travels*. Unfortunately, the second volume of his *Travels* ends at the beginning of August 1812 and the one surviving journal covers only the period up to early September 1812, after which information on his movements is sparse. McKay reconstructed the route of Burchell's later travels through a meticulous analysis of the data on the labels of his natural history specimens, the dates of his drawings and sketches, and his map entries (McKay 1941: 62) (Fig. 17.2).

In 1825, ten years after returning home from Africa, Burchell set off again, this time to explore Brazil. After his return from South America in 1829, he spent many years working assiduously on his collections but published

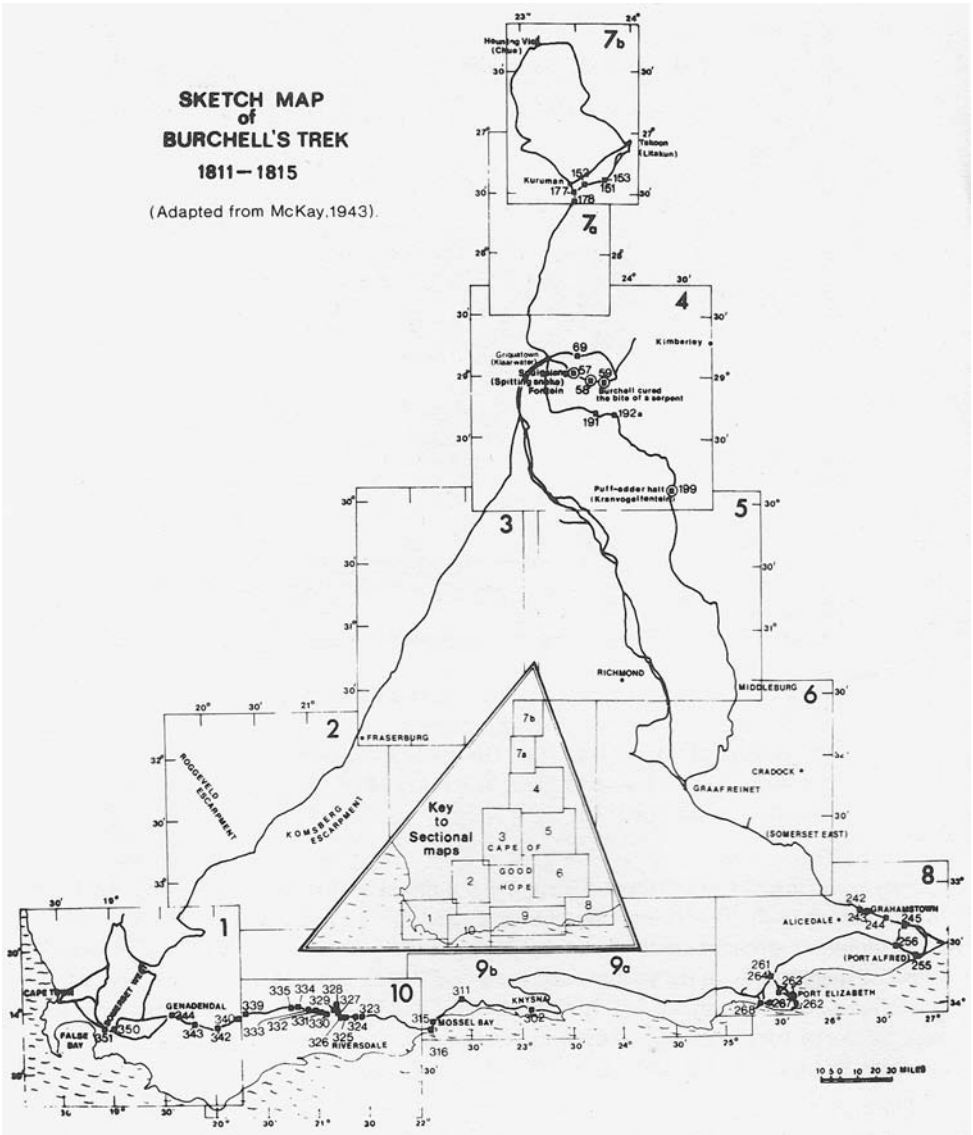

FIGURE 17.2 *Burchill's travels in Southern Africa.* From K.C. Davies's "Burchell's serpents" (1980). COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

comparatively little. Although in 1832 he was made a Life Member of the British Association for the Advancement of Science and in 1834 was awarded a doctorate *honoris causa* in Civil Law by the University of Oxford (Poulton 1907: 44), his work remained largely unrecognized. He committed suicide in 1863, at

which point his sister donated his animal collections and archives to the University Museum in Oxford, and the plants to Kew Gardens.

Planning the Expedition

The success of any exploration or expedition depends on many factors, including securing the finances, organizing appropriate modes of travel and planning the route – not to mention the need for a knowledge of botany and zoology and the methods of collecting and preserving the fruits of the labour. The logistics of shipping the material home have to be planned and later, after the traveller's return, the publication of memoirs is highly desirable – not only to bring new knowledge to the public but also, frequently, to generate some pecuniary return.

Finances

The possibilities of financing both travel and collecting were substantially increased in the eighteenth century, when the traditional forms of patronage by wealthy individuals was augmented by the rise of institutions like the Royal Gardens at Kew and the British Museum. Service in the Army or Navy would, as a matter of course, enable free travel and long overseas stays, and consequently opportunities for collecting in faraway places. There were also positions to be sought in administration in the new colonies and in organizations like the East India Company (Farber 1985), or participation in government-sponsored scientific expeditions. Burchell characterized his own expedition as follows, in the preface to his *Travels*:

> The travels … were undertaken solely for the purpose of acquiring knowledge: and it having been thought possible that the communication of facts observed during these researches might contribute some small portion towards the general stock of information, they are here laid before the Public. As they commenced with a mind free of prejudice, and in the purest spirit of independence, as they have been conducted, and so they are now concluded … (vol. I: 3).

Other factors were, of course, also involved: his disappointment in a failed business venture, disagreements with the governor of St Helena and with the East India Company over his employment, housing and remuneration, and – not least – the embarrassing and humiliating end to his engagement when his fiancée eloped with the captain of the ship bringing her to be married. All

these provided powerful reasons to leave the island and to embark on the perilous journey. There was also another important reason, as he explained in a letter to his mother:

> You know perhaps better than me that no opportunity is at present likely to offer in England for employing myself to advantage … I was only wasting my life in living any longer at St. Helena therefore ashamed at returning home after having spent six years and done nothing, I have thought it a duty to find for myself some employment in which I might either do some good for others or gain some credit for myself … I expect at my return to receive a proportionate reward. It is the only speculation I can have it in my power to make, as the expences [*sic*] of it will swallow up my little all; therefore if the result of it should disappoint my expectations, nothing more can be done: I then must look another way and lament that my love of science should be the only thing that keeps me poor. However I do not consider myself out of the way of making money, when I think of the value of what I shall be able to obtain in my journey. I have been informed that a skin of the Camelopard [giraffe] which was shot in that country where I am going to, was sold in England for fifteen hundred pounds, and though I cannot hope that if I bring one home it will sell for half that sum, yet should I be fortunate as to discover the Unicorn, which has been supposed to exist in this part of Africa, I have not the least doubt of making five times that sum. At any rate if what I collect, together with my writings and drawings, should all arrive safe in England, I do not fear to reimburse myself for my expences [*sic*] (vol. II: 423).

Although the family was wealthy, the costs of mounting a two-year expedition, as Burchell at first planned, must have been substantial and possibly well above the family's ability to underwrite it. There was a suggestion that Burchell might have been at least partially financed by the British administration in Cape Town to try to discover the fate of a previous expedition (Cleverly 1989: 18): it was only two years earlier that Dr Covan and Captain Donovan of the Cape Garrison set off towards Mozambique and nothing had been heard of them since. The mystery surrounding the disappearance of the group caused problems for Burchell, not only from Hottentots who were unwilling to accompany him into unknown and dangerous territory, but also from missionaries who for their own reasons advocated an abandonment of his plans and reacted badly when Burchell declined to act on their advice.

There were certainly costs he had to deal with on his arrival in Cape Town. True, he had letters of introduction to the Governor and although at first he booked himself into the "English Hotel", he was invited to lodge with the Revd C.H.F. Hesse – the same Hesse with whom he had corresponded while at St Helena (vol. I: 14). The costs of bed and breakfast were about 1 rix dollar a day during Le Vaillant's times (Le Vaillant 1790: I, 32), thus staying with Hesse for seven months probably saved him a certain amount of money. He was also lucky in being English, as according to Le Vaillant:

> Strangers are generally well received at the Cape by those who are in the Company's service, and by some others who are private people, but the English are adored, either on account of the familiarity between the manners of the two nations, or of their very much affecting to be generous. It is an undoubted fact, that, whenever they arrive, everyone is eager to offer them lodging. In less than eight days everything becomes English in the house upon which they have fixed their choice; and the master, the mistress, and even the children, soon assume their manners (Le Vaillant 1790: I, 41).

However, there remained considerable costs of preparing for the venture – not only those for the wagon itself, but also the oxen, staff, provisions, ammunition, books, tools and instruments.

The Cape Wagon, Oxen, Staff, and Baggage

The wagon was one of the most important factors in the success of the expedition. It provided living space, sleeping and working areas, storage for food, equipment, and all the specimens collected during the voyage. The Cape wagon – the only viable mode of transport of goods in the rough terrain of the Cape – was a formidable vehicle, far superior to any European carriage. It was designed to carry heavy loads, to protect merchandise and to withstand the rigours of long and difficult journeys. Burchell clearly acknowledged its virtues when travelling through a particularly difficult terrain of solid rock surface:

> I now could clearly perceive that a good and strong-built vehicle, is one of the most important of the preparations for such an expedition. Besides the strength of workmanship, the greatest attention is necessary to be paid to the quality of the materials; that the wood be well seasoned and of a sort which will not easily split. Much of the safety of the waggon depends on the nature of the iron; this should be of the tough and mal-

> leable kind, rather than the hard, which being generally of the quality termed 'short', is very liable to break asunder (vol. II: 187).

Burchell paid 585 rix dollars – about £88 at that time – to Mr Kilian of Cape Town, for the vehicle (vol. I: 108). The wagon, numbered 342, was of the largest kind – but not unusually so for the period (McKay 1935a). It was 15 feet long and 5 feet 6 inches high. The mechanism of the axletrees and other underparts consisted of many elements, made from different woods, all designed to be dismantled with relative ease. According to Burchell:

> The principal and very important advantage of a Cape-built waggon consists in its sides, bottom, and carriage, not being joined together; a construction admirably well adapted for rough and uneven roads, by admitting each part to play freely, so as completely to avoid that straining and cracking to which solid built waggons are subjected, when travelling over irregular ground (vol. I: 110).

The tilt (tent, or cover) of the wagon was specially designed by Burchell and differed substantially from the standard (McKay 1935a) being of much lighter construction thanks to a frame made from bamboo (vol. I: 109). It was covered by three layers of different materials; the inclusion of sailcloth as the uppermost covering was especially important during the rainy season, as it ensured the tent was watertight. Le Vaillant reported double sail-cloth as a covering of his own two wagons (Le Vaillant 1790: I, 112).

Burchell also designed the interior fittings of the wagon. Five large cases were constructed to fit the floor area exactly, leaving only a small space in which to sit down. A mattress was put on cases at the front end, with a curtain that separated the sleeping quarters from the rest of the wagon. For Burchell the wagon offered an advantage over travelling on a horse: "as a traveller desirous of observing the features and productions of a strange country, I abhorred galloping horses and would have preferred sitting behind a team of my own oxen whose steady pace seemed to have been measured exactly to suit an observer and admirer of nature" (vol. II: 122).

The wagon was pulled by a span (team) of oxen consisting of ten animals. Normally ten was enough to pull a loaded wagon but when crossing particularly difficult terrain, sixteen or even twenty oxen were required. To control them, extremely long whips up to 30 feet in length were used (vol. I: 41). The process of making whips, their shape and the material used for them (hippopotamus or rhinoceros hide), was carefully investigated and noted by Burchell (vol. I: 64). At first he purchased twenty oxen, with ten pulling the wagon and

ten kept spare. Other travellers took a similar number: Le Vaillant had thirty, ten pulling each of his two wagons and ten kept as a reserve (Le Vaillant 1790: I, 116). The price considered fair was 300 rix dollars for a span and by this time Burchell had spent "six hundred pounds sterling for his wagon, with its contents, and the oxen that drew it" (vol. I: 122).

To take care of the animals four Hottentots were employed: one to drive the wagon, one to guide the oxen by walking in front of the team, and two to take care of the animals and other duties. There were exact procedures to be followed when hiring Hottentots: an agreement had to be signed in triplicate in the presence of an official: one to be kept by the hirer, one by the person hired and one to be lodged with the administration (vol. I: 132). By January 1812 the Hottentot group was enlarged to eight, but in the following months the number fluctuated, reaching fifteen on the return journey.

As an insurance against failure to secure fresh meat, Burchell purchased a flock of eighteen sheep that followed the wagon and were periodically restocked whenever possible. In addition to the oxen and sheep the expedition was accompanied by horses and a pack of dogs. In May 1812 the party consisted of "fifteen men, one woman and her child, four horses, eight oxen, thirteen sheep, nineteen dogs, besides two puppies of an excellent breed" (vol. II: 130). Just a month later the number of dogs swelled to twenty-five. A good pack of dogs formed a necessary part of any expedition, their role being to act as an early warning system against hostile tribes or dangerous animals (vol. II: 174). Burchell opted not to follow Le Vaillant in taking with him a fully grown cock – a natural clock to wake him in the morning (Le Vaillant 1790: I, 138).

The list of goods taken by Burchell was impressive but necessary, for every article had its purpose: carpentry tools, spare parts for the wagon, clothing and blankets, kitchen equipment, rice, bread and biscuits, flour and wheat, wine, rum and brandy, water-casks, tar, pitch, grease and resin, an iron melting-ladle. Arms and ammunition were of the utmost importance both for protection and hunting, and Burchell took with him: "six muskets, and powder horns … large rifle, carrying a ball of the weight of two ounces, two cases of pistols, and belt, a cutlass, musket balls, four barrels of gunpowder, bags of shot, of all sizes, gunflints, and bullet-moulds, lead and tin, in bars" (vol. I: 119). The inner walls of the wagon were used for the attachment of bags that contained items frequently needed, such as muskets and powder-horns (vol. I: 120) (Fig. 17.3).

Other things like "a large assortment of stationary [*sic*], and every requisite for drawing in water and body-colours; together with prepared canvas, and the articles used for painting in oil" were clearly needed to satisfy his needs as an artist and as a recorder of his discoveries. As a proud Englishman, Burchell took with him the "English colors" which he raised every Sunday at the

FIGURE 17.3 Inside of my African Waggon*, by William Burchell*. Burchell completed the painting (48.5 × 34.6 cm) between February and April 1820 and exhibited as no. 868 at the Royal Academy in the same year. According to Burchell, the sketch took him four days and the painting twenty-seven – altogether 120 hours. Some of the specimens visible in the painting are: a tortoise *Chersina angulata* OUM 8608 – whole specimen collected on 10 October 1814; *Hippopotamus amphibius* OUM 19174 – hippopotamus tusk; *Loxodonta africana* OUM 10115 – elephant molar; a sable horn; baboon skull; one of the crimson-breasted shrikes; snakes; butterflies; and plants. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

campsites, "hoisted upon a tall bamboo-cane and fixed at the hinder part of my waggon" (vol. II: 301). He also included smaller chests, reams of paper, a large tin collecting box – the vasculum – a chest of medicines, a press and spare deal packing-cases (vol. I: 120).

Some part of the goods in Burchell's stores represented articles intended for exchange or as gifts to secure the goodwill of the tribes encountered. The colour of the porcelain and glass beads taken by him is noteworthy: white, black and light-blue were considered to be the most attractive, and red the least desirable (vol. II: 400).[2] But by far the most attractive articles were tobacco,

2 Twenty years earlier Le Vaillant had written that only red and white were favoured since the other colours, not clearly visible on dark skin, were less sought after (Le Vaillant 1790: II, 10).

snuff and brandy, and many favours were secured by offering these not only to the Hottentots but also to tribes that did not come into frequent contact with Europeans. Burchell was certainly not the first one to rely on them in his travels (Le Vaillant 1790: I, 115).

With so much baggage needed for the expedition, the wagon was vastly overloaded and just three days into the journey it sank into wet sandy soil. In pulling it out of the mud the leather ropes were damaged and the wooden pole broken. It was decided that an additional, smaller vehicle was needed: a new wagon was purchased, not only to take some of the load, but to give Burchell some privacy from the rest of the group and to keep his main wagon clean without any "disagreeable goods". It was to serve "the purposes of short journeys, or of fetching home large game shot at a distance from the principal wagon" and that "a light vehicle of this size would be found useful; and therefore, to increase its lightness I had the sides enclosed with reeds instead of boards' (vol. I: 133).

Burchell deliberately took with him no travel books written by other explorers, so as not to be influenced by them, but his library still extended to some fifty volumes. These included "various works on zoology, minerology, natural philosophy, mathematics, medicine, &c … among which were Linnaeus, *Systema Natura*e, ed. Gmelin; Linnaeus *Species Plantarum*, ed. Willdenow; Fabricius, *Species Insectorum*; Jussieu, *Genera Plantarum*, ed. Usteri; Forster, *Enchiridion Historiae Natura inserviens*; Tilesius, *Fuci*; Portugese Dictionary by Anthony Vieyra; Dutch Dictionary; Nautical Almanacs; "Atlas Céleste de Flamstead; par Fortin, (avec un Planisphère des Etoiles Australes, dressé par M. l'Abbé de la Caille)" (vol. I: 119; Sotheby's and Davy 1865).

The "being not influenced" and recording only what they saw or experienced themselves represented a common thread running through the narratives of many travellers. Each one of the explorers claimed to be the carrier of the truth – the only truth – and it was common for authors to criticise their predecessors' works or to accuse them of copying the works of others – or merely of obfuscation.[3] The satirist Jonathan Swift said, "with much sarcasm and some truth" (Williams 1859):

Thunberg reported blue, white and red as the most desirable (Thunberg 1986: I, 170) and Andersson advised that the black were favourites with the Namaquas but white, pink, green and blue with other tribes (Andersson 1856: 334, 473).

3 Andersson wrote proudly that he had been able "to ascertain the truth respecting much that at first appeared obscure and doubtful" (Andersson 1856: iv). Lichtenstein, although noting the criticism by many authors of their predecessors, set himself to "correct whatever has been erroneously represented by other writers" and chose for the title of one of his chapters: "Upon Mr. Barrow's Exaggerations respecting the Barbarity of the Colonists" (Lichtenstein 1812: xi-

> Geographers in Afric maps
> With savage pictures fill their gaps;
> And o'er uninhabitable downs
> Place elephants for want of towns

Burchell did borrow a copy of Barrow's (1806) *Travels* to read on the voyage to Cape Town (McKay 1935b: 691) and later rather unwisely described Barrow's work (and especially his maps) as unreliable and fantasy-driven. That provoked a bitter response and the ensuing feud may well have been the principal cause of Burchell's failure to win the recognition of the Royal Society and the Geographical Society (Stewart and Warner 2012).

Preparations

Burchell, like Le Vaillant before him, decided to travel without European companions, and spent the seven months of his stay in Cape Town learning the South African and the Hottentot versions of the Dutch language in order to communicate within and beyond the Cape. During this time he also made many short expeditions to Table Mountain and the surrounding areas, and on 8 April he set off on an exploratory investigation, towards Tulbagh. The trial journey led him to the decision that Tulbagh should be the starting point of his main expedition.

Having been granted permission by the British Governor to travel to the Colony's northern boundary, Burchell set off on 19 June 1811. His delight and excitement at leaving Cape Town and being able to encounter the native peoples, plants, birds and quadrupeds in their natural environment was palpable, and it made this the happiest time of his life. He recalled: "Nothing but breathing the air of Africa and actually walking through it … can communicate those gratifying and literally indescribable sensations' (vol. II: 314).

---

xiii, xix). Barrow himself criticized all the previous map-makers of The Cape (Barrow 1806: viii-xiii). Le Vaillant expressed harsh opinions of Sparrman for his description of reebock, "some supposed native customs" and other reports (Le Vaillant 1790: II, 125, 132). Sparrman on the other hand questioned Kolbe's account, especially his description of the rhinoceros which is "merely the echo of certain ignorant inhabitants of the Cape, whose information cannot be relied on" (Sparrman 1786: II, 91).

Scientific Work

In preparing for the expedition, Burchell had sought to learn what he could of the geography of his planned route, consulting maps and gathering information about the distances between the settlements. Only a few years earlier, in 1797, Lord Macartney, on becoming the English Governor of the Cape, had been confronted by the surprising lack of information about the distance between Cape Town and Graaff Reinet: "neither the direction nor the distance of Graaf Reynet were known to any of the inhabitants" (Barrow 1806: xiv, 2). Estimates ranged from 500 to 1,000 miles and the journey time varied accordingly. Macartney set off to survey the area and his expedition included John Barrow, Macartney's private secretary. To measure the distance travelled, Barrow noted the time it took to cover the distance between two points whose positions he had ascertained with the use of a compass (Barrow 1806: xiv).

Burchell adopted a similarly simple and reliable method: he counted the number of revolutions of the wagon's large-diameter wheels over a pre-determined distance. These measurements were repeated throughout the day, in order to ensure the accuracy of the figures over changing terrain. From this data he could easily calculate the distance covered, "by counting the number of times the wheel revolved, which were marked by a leathern thong that always remained tied round one of the spokes"; an estimate of the hourly speed could similarly be deduced "from the observed number of revolutions made in one minute; or, which is preferable, if circumstance would permit, in five." All the observations were written meticulously in a small book, "which I always carried in my hand, or in my pocket; and in which short notes were made to assist my recollection in the evening, when I sat down to record [them] in my journal" (vol. I: 204). Later on, Burchell observed that the wheels performed another function: they acted as a very unscientific yet reasonably accurate hygrometer. With the increasing dryness and rise in temperature, the iron bands that acted as tyres slowly expanded, whereas the wooden parts of the wheels, even though constructed from the best seasoned wood, dried and shrank, resulting in large gaps that had to be plugged by wedges of wood. The process was reversed when the temperatures and humidity changed in the course of the seasons (vol. I: 199).

Constrained by the shortage of space, Burchell decided not to use alcohol in the preservation of specimens, contrary to the recommendations of most instructions for natural history preparation in the field (see Appendices). He explained:

> The mode of travelling, and want of room in my wagon, did not admit of carrying with me all that was necessary for preserving in spirits objects of Natural History. The bulk, the weight, the breaking of bottles or the leaking or evaporation of kegs, had deterred me in Cape Town from making any provision for this purpose. Resolved however to neglect no object which my time, or circumstance might present an opportunity of collecting, and bringing home, I found myself, in many instances, taught by necessity, methods and contrivances which I might not otherwise have discovered; not only in the department of Natural History, but in many other affairs belonging to an expedition of this nature (vol. I: 325).

Collecting

Burchell, a most enthusiastic follower of Linnaeus, must have read the great man's opinion that 'There is no place in the world with so many rare plants, animals, insects and other wonders of Nature as Africa, and it seems to have been concentrated to the Cape". He would also have been well aware that several of Linnaeus's students had gone there to study natural history (Branch 1999), the best-known being Carl Peter Thunberg and Anders Sparrman.

He clearly articulated his Southern African trek's objectives:

> It must not be supposed that these charms [the pleasure of Nature] are produced by the mere discovery of new objects; it is the harmony with which they have been adapted by the Creator to each other, and to the situations in which they are found, which delights the observer in countries where Art has not yet introduced her discords. To him who is satisfied with amassing collections of curious objects, simply for the pleasure of possessing them, such objects can afford, at best, but a childish gratification, faint or fleeting; while he who extends his view beyond the narrow field of nomenclature beholds a boundless expanse, the exploring of which is worthy of the philosopher and of the best talents of a reasonable being" (vol. I: 349).

Plant Collection

Certainly more of a botanist than a zoologist, Burchell devoted a considerably greater proportion of his time in Southern Africa to collecting and describing plants rather than animals. At Cape Town he had set out to collect as many specimens of the local flora as possible, in order to allow him to concentrate on

the non-Cape species during the expedition. On 5 December 1810, during his first field trip around Table Mountain and just a few days after his arrival, he wrote: "I need only state that in the short distance of one English mile, I collected in four hours and a half, one hundred and five distinct species of plants, even in this unfavourable season" (vol. I: 19). Two days later, another day of rambling brought forty-three species (vol. I: 19), 109 species three weeks later, and on one day alone, 24 January 1811, 148 new ones were added, by then making it 521 species in all with 1,133 individual specimens collected and preserved (vol. I: 37).

He pronounced: "the lovers of science would, I doubt not, be surprised not only at the unexampled number of species growing in so small an extent of country, but at the number of undescribed plants that were still to be found in a tract, over which so many collectors have rambled" (vol. I: 112). He commented: "such is the perverse nature of man's judgement, that whatever is distant, scarce and difficult to be obtained, is always preferred to that which is within its reach, and is abundant, or may be procured with ease, however beautiful it may be. The common garden-flowers of Europe are highly valued … while they [inhabitants of the Cape] viewed all the elegant productions of their hills as mere weeds" (vol. I: 21).

Burchell noted the different numbers encountered at different times of the year in the same locality: in September only six, while in the following February fifty-eight (vol. I: 370). He believed that a list, or a catalogue of plants growing in different areas, their time of "flowering, seeding and leafing, in which plants are at that season", together with a brief note of "some of the more remarkable particulars, their utility in various points of view", ought to be undertaken by future travellers (vol. I: 370).

On 20 February 1812 Burchell's botanical catalogue had reached no. 2,102, of which 964 species had been collected in the vicinity of Cape Town and the remaining 1,138 since leaving it (vol. I: 379). There must have been many duplicates, for he states that he had at the same time dried 5,051 specimens. It seems scarcely surprising then, given the numbers of specimens being collected, that preparation of the material soon became rather tedious:

> 9th Sept. 1811. After this I was obliged to dedicate a couple of hours to the business of putting dry paper to my botanical specimens; which being a mere mechanical employment, and recurring almost every day, became already a most irksome task, yet one which was absolutely indispensable (vol. I: 206).

The same sentiment coloured his entry for November 1811 when preparing to leave Klaarwater he wrote that the "arrangements of my observations and notes; the ordering and packing up of my collections; and the regulating and disposing of the mass of objects which had accumulated during my last excursion … the want of some intelligent assistant, to relieve me from the more laborious department of it, was now very sensibly felt" (vol. I: 329). And in his diary, in August 1812: "I find so much work to be done in my waggon in preparing and packing what I collect that it is impossible for me to go in search more than every third day." At the same time he acknowledged that the domestic duties of a traveller are "too important to be neglected, although very far from being an interesting or agreeable occupation in the midst of pursuits of science: but it was soon discovered to be, in my present situation, a duty of the first importance, and one which consumed a large and valuable portion of my time" (vol. I: 330).

In the preservation of plant specimens Burchell employed the standard sixteenth-century method of Padua University professor Luca Ghini (1490-1556) and used by plant collectors ever since. Its core principle was a gradual removal of moisture from the plant's tissues with the aid of paper, while at the same time, by using a press or simple weights, exerting pressure on the specimen until it became flat. The process was repeated until the plant's total desiccation after which it was fixed to a clean sheet of paper, where the specimen's date, locality and other information was recorded. In the early times of collecting, the sheets were bound into volumes, just like books, but later on it was found more practicable to keep the sheets separate so they could be easily rearranged whenever necessary (MacGregor 2007: 129). This method was advocated by all the older and contemporary instructions and guides to collecting, and indeed it is still used today.

In Burchell's painting of his wagon (see Fig. 17.3), a large press with its two screws, full of layers of paper most probably containing many specimens, is clearly visible; and just behind it, underneath the British flag, a few freshly collected stalks of grass and flowering plants are seen protruding from the necessary piece of equipment for any plant collector, a tin collecting box, called a vasculum.

The drying process, as well as the drawing and sketching, required a considerable amount of paper, making it a very precious article. Burchell notes that by the time he had collected and dried over 1,000 plants, he had also made about 110 drawings (vol. I: 354) (Fig. 17.4). In 1813 he had to ask the Revd Hesse for a consignment of paper to be forwarded to Algoa Bay to await his arrival there.

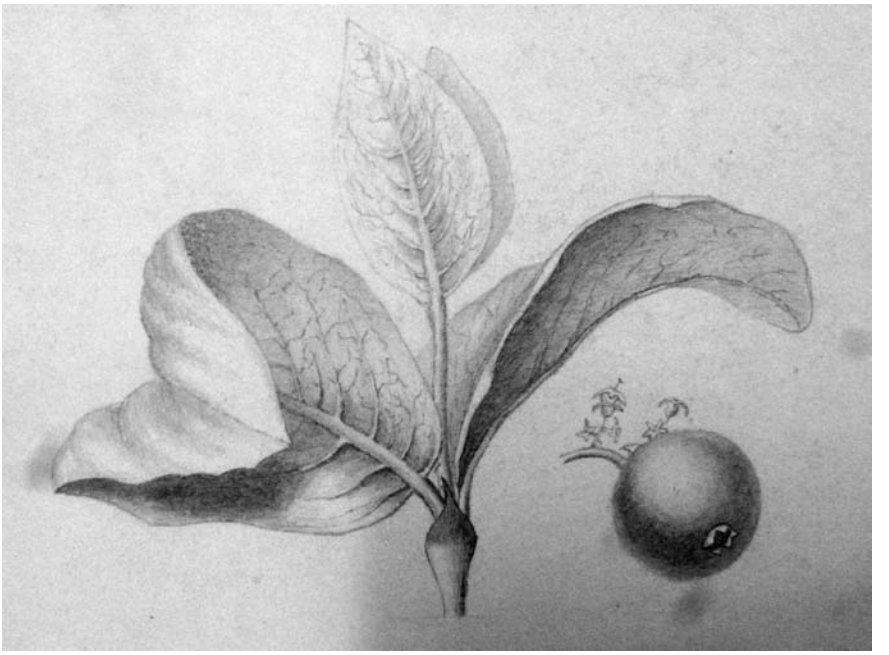

FIGURE 17.4 *Drawing of* Vangueria infausta *Burchell, African medlar*. "At Sensavan I first met with a shrub remarkable for being regarded by the Bachapins as bewitched or unlucky, and therefore unfit to be used as firewood … This shrub is otherwise remarkable, as possessing botanical character or complexion, different from that of the general botany of these regions, and indicating certain affinity with that of the island of Madagascar." *Travels*, vol. II: 184. The name "Vangueria" has Malagasy origins, and refers to the belief that using it for fire was unlucky – hence the species name "*infausta*". Cat. Geogr.2629. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

When unable to use the traditional method of preservation, Burchell invented a new method of keeping the specimens. While travelling in the Cape, he collected a large number of flowers and shrub branches. Not being able to dry these by the usual method, he gathered the material into bundles each 3 feet long and a 1 foot in diameter, tying them tightly and wrapping them in strong paper. This material remained undisturbed for eight years and when back in England Burchell reported that "every specimen was found to be in as good condition as if it had been dried in the regular manner, and to be fit for every purpose of scientific investigation." Many plants – especially those with hard leaves – were preserved better, or retained more of their natural form, than those preserved according to the traditional method. To add these plants to his herbarium at Fulham, Burchell simply relaxed them in a damp cloth so

the slow action of increasing humidity made them supple enough for arranging and pressing. He expressed regret that during the expedition he had been uncertain how successful this method was going to be: had he known how well it would work, he would have preserved many more specimens in this way. His advice to any traveller faced with a similar situation was to use a pasteboard box with many holes pierced in its sides for good ventilation: the box, when full of plants, was to be enclosed in another, rigid wooden container, in order to protect the contents during transport. He cautioned, however, that "it should never be resorted to when the regular mode is practicable" (vol. I: 97).

He also expressed regret that he had been unable to preserve any of the succulents he found in the Karoo, and that lack of time prevented him from making drawings of "all those plants which, from their fleshy nature or delicate substance, cannot well be preserved in a herbarium" (vol. I: 152). On another occasion, in January 1812, he bemoaned his inability to add to the collection since it was so dry that everything was completely parched, excepting the shrubs and trees (vol. I: 354).

Burchell's work on his plants, apart from collecting, drying and pressing the specimens, included the compilation of very comprehensive documentation. He showed a great propensity for making detailed lists of his work, materials purchased, letters sent, expenses, etc., and he was even more particular about the details of his plants and other specimens. Each item was given an individual label, stating its number, locality and date of collection. Although some localities or "stations" appeared more than once (as visited on different dates), their total number was 488 (McKay 1941: 68). Thanks to this careful listing of places and dates, it is possible to trace Burchell's itinerary beyond the date of the end of his *Travels* and the date of his surviving journal (McKay 1941: 62). It was not unusual for Burchell to note also the precise time of collecting a specimen. The numbers run from no. 1 – gathered on the 5 December 1810, so his first day of collecting when he arrived in Cape Town – to no. 8,729, dated 1 August 1815 (McKay 1941: 68). He also listed the plants in a separate volume titled *Catalogus geographicus plantarum Africae australis extratropicae*, arranged according to dates and places of collection. Not every label had the genus and species name of the specimen, as sometimes Burchell could only give it a generic name, but he included any other information that he thought might be of interest to other travellers. After his return to England he sought the advice of Sir James Edward Smith, purchaser of Linnaeus's herbarium and later founder of the Linnean Society of London, who proved helpful with some uncertain identifications (vol. II: 188).

Burchell, like Le Vaillant before him (Le Vaillant 1790: I, 156), availed himself of every opportunity of sending specimens and drawings to Cape Town to his

agents Messrs Rankin & Scott, an eminently sensible practice that saved space in the wagon for new specimens and reduced the risk of their wholesale loss or damage (vol. I: 120). Whenever he came across a Boer or a missionary who planned a visit to Cape Town, Burchell would pass on a package and letters to be delivered to the agents. Only once in his four years of travelling was a consignment of plants lost and never recovered. The specimens – collected in the summer of 1811 between Tulbagh and Karoo Pass – were supposed to be "forwarded from one field-cornet to another, till they reached Cape Town"; Burchell delivered them to a Boer called Piet Mulder together with a letter to the agents, but neither the letter nor the package (containing 585 specimens) was ever seen again (vol. I: 178). At another time, June 1812, he left in Klaarwater a chest with specimens of birds, insects, plants and drawings with a Mr Kramer to be taken to Cape Town, a service for which he paid 36 rix dollars, only to discover later that the chest was never transferred due to the lack of space (vol. II: 161).

Burchell's interest in and his wide knowledge of plants were employed in many ways during his four years of travels. He frequently commented on various aspects of plant anatomy, physiology, habitat, and both traditional and possible new usage. He noted the adaptations made by plants to dry climate, and he also was an eager student of indigenous peoples' knowledge of plants.

He noted on one occasion that "a curiously shaped pebble … proved to be a plant, and an additional new species to the numerous tribe of *Mesembryanthemum*; but in colour and appearance bore the closest resemblance to the stones, between which it was growing." He ventured: "the intention of nature, in these instances, seems to have been the same as when she gave to the Chameleon the power of accommodating its colour, in a certain degree, to that of the object nearest to it, in order to compensate for the deficiency of its locomotive powers … and this juicy *Mesembryanthemum* may generally escape the notice of cattle and wild animals" (vol. I: 217). He observed: "many curious and minute plants will escape detection unless sought with more than ordinary attention: and that by sitting or standing still and carefully looking around, many may be discovered, which otherwise would have been passed unheeded and unknown" (vol. II: 238).

He was the first European to use a local plant to combine with conventional European medicine in successfully treating a severe wound: the leaves of *Diosma serralifolia*, steeped in vinegar, were used to clean, disinfect and heal the hand of one of his Hottentots, extensively injured in a gun accident (vol. I: 331).

He was intrigued and impressed by the Bushmen's ability to find plants with tubers or roots that provided a source of drinking water (vol. I: 173). He learned from his Hottentot companions about the flowers of one small shrub, *Poa spinosa,* which they used as a yellow dye. Burchell experimented and discovered

that the corolla of the dried flowers "being infused in a small quantity of warm water, gave out very readily a strong color, approaching to what is called Raw Terra di Sienna, but brighter." He also discovered that:

> … being a vegetable color, it possessed the advantage of flowing freely from the pencil or pen, and might be used as a very pleasing yellow ink. Some trials which I then made, have remained two years, without fading or losing any of their original brightness. A permanent vegetable color of this quality would, perhaps, be useful in the arts; and the collection of it might be a source of advantage, the more profitable, as being from land at present useless to man. Some other plants of the same natural order, which I afterwards met with, afford a dye equally good (vol. I: 152).

Pursuing his investigations into the economic value of other plants, he noted the edibility of gladioli bulbs (vol. II: 415), the cultivation of "Caffre corn", and an unusual-looking kidney-bean that could only be eaten when perfectly ripe, and various species of water melons (vol. II: 413). He reported that ashes of *Salsola aphylla*, L. or *Caroxylon Salsola*, Th. were being used as an alkali in making soap (vol. I: 291) and that one of the species of acacia exudes large amounts of very good and clear gum just like gum arabic. Knowing that England imported annually about 500 tons of gum arabic from Senegal, he concluded that the material could provide a valuable income to the Cape Colony (vol. I: 298). He was also interested in obtaining a licence to harvest and export a Cape Town lichen, orchilla, as a source of violet, mauve and purple dye (McKay 1941: 72).

Burchell was fascinated by the poisons employed by the Bushmen and the procedure they used in obtaining them – especially from the bulb of *Amaryllis toxicaria*. Although he discovered that "the Bushmen endeavour to conceal from strangers a knowledge of the different substances which they use, [and] it is not easy to find out exactly what they are", he managed to learn which plants were involved and how the substances were obtained (vol. I: 372). He noted that they thickened the bulb's juice by boiling or exposing it to the heat of the sun, the resulting thick liquid being mixed with snake venom or that of "a large black species of spider of the genus *Mygale*" until a half-viscous, gummy compound was obtained (vol. I: 372). He suggests that plants that possess an acrid thick juice capable of being thickened, such as *Euphorbias* (*E. mauritanica*), several species of different genera of Amaryllidae, and Apocyneae, could have similar properties. He noted the Bushmen's beliefs about the different ways the two poisons act: the poison of serpents attacks the blood, while the poison of plants "corrupts the flesh" and causes "great pain and heat of the

wound; and all the inflammatory symptoms". He even tasted the mixture by touching a tip of a poisoned arrow with his tongue; he found it of a "highly acrimonious" taste. He ventured on the two-fold nature of the possible antidote:

> … one to counteract the serpent venom, such as the *Liquor Ammoniae* (ten drops in two ounces of water); the other to resist the power of the vegetable poison, yet at the same time not of such properties as to impede the action of the former. It would be perhaps advisable to administer these remedies both internally and externally as a topical application; for which latter purpose they might be prepared of greater strength (vol. I: 373).

As well as being interested in the indigenous plants, Burchell wanted to know if any foreign species would thrive in Africa. He sowed seeds of cotton in the missionaries' garden in Klaarwater in 1811, and was pleased to see them flower when he came back in January 1813. He offered some vegetable seeds, quince, almonds and peach stones to Hottentots for cultivation (vol. I: 255) and himself planted onions and potatoes and sowed seeds of cabbage, lettuce, radish, endive, scorzonera, basil, tamarind, melons, and Nankin cotton in "the valley, close by the water, in fine mould" at "The Garden" in August 1812 (Poulton 1907: 34) (Fig. 19.4).

At the end of the four-year journey his manuscript *Clavis Geographicus ad Herbarium Africanum* gives the final number of plant specimens he collected in Africa:

Specimens dried at Cape Town	4,000
Cape Town to Litakun	5,024
Litakun to Algoa Bay	10,507
Algoa to CapeTown	20,840
	40,371 plus additional circa 10,000

Apart from the plants for the *hortus siccus*, he also collected seeds of over 2,000 plants and 276 bulbs (McKay 1941). One plant, a South African wild pomegranate, *Burchellia bubalina*, has been named after him.

Reptile Collection

Burchell's interest in reptiles was stimulated by observing the Hottentots' dread of snakes, seeing the devastating results of snake poisons and the desirability of antidotes. He observed:

> No part of Natural History is less studied, or more in want of regulation, than the Order of Serpents, and if Travellers could be persuaded to try [his] method … the combined results of their collections would, most probably, very soon dispel this confusion, and raise the study of *Ophiology* to a level with that of Quadrupeds, or Birds (vol. I: 326).

Most of the eighteenth- and early nineteenth-century guides to preserving small quadrupeds and snakes in the field, including those by Petiver, Lettsom and Donovan, recommended pickling as the best method (Lettsom 1774: 18, Donovan 1794: 4, Stearns 1952). The lack of space, the danger of spirit evaporation and the risk of breakage to glass containers made this totally impracticable for Burchell's African travels, and he was determined to find some other ways of preserving them, since "naturalists cannot fail to have remarked that the different branches of the science are more studied and better understood in proportion to the facility with which the objects of each branch are collected and preserved" (vol. I: 326).

In November 1811 his party of Hottentots killed a large puff adder measuring 7 inches in circumference and 3 feet 7 inches in length. Burchell provided a morphological description of this "*Vipera inflate*", now *Bitis arietans* (vol. I: 324), describing it as swarthy, with white and black lines that curve all over the body. Because of its substantial girth it was easily recognized and identified by both Bushmen and Hottentots. "Its venom is said to be most fatal, taking effect so rapidly as to leave the person who has the misfortune to be bitten no chance of saving his life, but by instantly cutting out the flesh surrounding the wound" (vol. I: 324). On 22 August he wrote in his diary that he had heard of "a large sort of serpent with two tails. It does not kill by bite or poison but with its tails. It is so large as to twine round a hut & which it crushes together with the people in it in the manner of the Boa constrictor". Burchell was determined to preserve the puff adder's skin – and no doubt would have been pleased to have that of the two-tailed snake, had he managed to catch one – and he experimented with a number of new methods.

After several trials he adopted a method that every plant collector knew well – to treat the snake skin as one would treat a large leaf or a plant itself. He was not the first one to use it for non-plant material: it had already been suggested as a way of preserving skins of fish (Gronovius 1742: 57, Lettsom 1774: 18) and, more surprisingly, Le Vaillant used it for his bird specimens (Le Vaillant 1790: I, 9). Burchell employed two different cuts for the de-fleshing process, both running from the point of the tail to the head: one involved a longitudinal medial cut along the abdominal surface in the middle of the ventral scales, and the other a lateral longitudinal cut at the side of the body, when the scales

displayed a special pattern that could be useful in the identification process. The second method was, according to Burchell, not as attractive as the first, as it lacked the eye-pleasing symmetry, but it could, "for the purpose of science and examination, be preferable" (vol. I: 326). All the flesh had to be carefully removed, as close to the head as possible, but the whole process was undertaken without much difficulty. The skin was opened flat and, with the inner side down, put on a sheet of large strong paper, then treated exactly as a plant specimen. Sheets of paper were used to absorb the skin's moisture and the specimen was put into the press, leaving the head out so as not to crush the skull. Burchell applied a simple method of attaching the skins to the strong white cartridge-paper paper:

> … by the assistance of a short roller, or cylinder, held in the hand, and on which the skin and paper are gradually rolled. By these means, only one part of the skin coming on the paper at one time, the due stretching and placing of it is managed with the greater exactness: but it should not be so much stretched as to leave a space between the scales, as this would very much derange the natural pattern of its colouring (vol. I: 326).

Although at first he worried that this treatment could cause the colour or markings to fade or disappear, he was pleased to find that skins were preserved with "all the clearness and beauty of the living animal". Furthermore, the skins needed no antiseptic treatment, nor any varnish for protection; there was also no need for any paste or glue, as the freshly removed skin had a jelly-like substance on the inner surface that provided all the adhesiveness needed (vol. I: 325). The sheets of paper were annotated with all the information available to Burchell at that time, just as the herbarium sheets were. In his notes Burchell used the letter S for Serpents, together with a number – S.1, S.2 and so on – to help group related snakes together. He also added dates of collection, common or Cape-Dutch names, and a Latin (or in some cases English) description of the specimen (Fig. 17.5). He was clearly rather proud of his method, stating:

> The peculiar advantages of this method of preserving serpents are: that their natural colours are perfectly preserved; by being quite flat, a large collection may be put in a small compass, or they may be kept in portfolio with all the ease of drawings, which they in some respect resemble; but with an infinite superiority in exhibiting their marks with a correctness not to be imitated by the pencil; of whatever length, they may be all folded like a map to one size; their lightness renders them so portable as entirely to do away the great objection to which bottles of spirits have

FIGURE 17.5 Hemachatus haemachatus (*Bonaterre, 1790*), *the rinkhals, ringhals, or ring-necked spitting cobra.* Burchell named it *Coluber "Ring Hals slang"* and classified it as belonging to group S (Snakes) 11, as indicated on the brown paper. The white label, with text in Burchell's hand, informs us that the snake was caught in October 1813. OUM 13232. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

> always been liable with travellers; the only provision required to be made for such a collection be merely that of paper; the facility with which they may be examined and compared; by lying flat upon white paper, they no longer have that alarming and forbidding appearance which a serpent in its natural form presents to most people, but are, on the contrary, pleasing objects. If that revolting sensation, which seems a common feeling, can be once overcome, every person will readily acknowledge that the hand of Nature has not painted the skins of snakes with less beauty than the plumage of birds (vol. I: 326).

Not surprisingly, Burchell included two snake skins in his *Inside of my African Waggon* painting (see Fig. 17.3). One, preserved according to his method, can be seen in the middle of the painting, next to the British flag; another – no doubt awaiting treatment – hangs on the wall of the tilt on the left of the picture. There is another reptile in the picture – a tortoise *Chersina angulata*, collected on 14 October 1814, shown perched on a hippopotamus tusk, next to an elephant molar.

There are fifty-six individual skins of about twenty species of Burchell's reptiles, mostly snakes with just two skins of a limbless lizard *Acontias,* surviving in the Oxford University Museum of Natural History (OUMNH) today. Some of the skins were wrapped in heavy, coarse brown paper, presumably to help with further drying and to protect and cushion the specimens during travel through rough African terrain. A number of them are mounted on thin, weak sheets of paper – some even on newspaper pages (Davies 1980: 464) – proving that however much paper Burchell carried in his wagon, it proved insufficient for all his needs.

Unfortunately, his method of ventro-median cuts destroyed some of the diagnostic features in a few specimens which, together with the skins' shrinkage, caused some difficulties in identification (Davies 1980: 464). Without this innovative method, however, what is today the oldest collection of Southern African snake skins would probably not exist.

Burchell's sand lizard, *Pedioplanis burchelli,* is the only reptile that currently carries Burchell's name.[4]

Bird Collection

During four years of African travel, Burchell collected 540 specimens of 265 species of birds. Several African birds are named after him: Burchell's

4 *Chamaeleo burchelli* and *Tropidosaura burchelli* were further named in his honour, but subsequently were synonymized.

glossy-starling (*Lamprotornis australis*), Burchell's courser (*Cursorius rufus*), Burchell's gonolek (*Laniarius atrococcineus*), Burchell's sandgrouse (*Pterocles burchellii*) and Burchell's coucal (*Centropus burchelli*).

From the beginning of his expedition Burchell displayed a marked hesitation in killing birds merely for the purpose of adding them to his collection (as opposed to obtaining them for the pot). He frequently wrote about their plumage and as a musician he clearly appreciated their songs. On 18 July 1811 he wrote:

> Their elegance and beauty, added to their soft, delicate, warbling notes, engaged my admiration and attention for a long time; and it was indeed with reluctance that I permitted my desire of having this bird in my collection, to overcome my natural feelings and induce me to kill it. With much less hesitation, I plucked some of the flowers from which they had been sipping (vol. I: 159).

and again:

> It is not easy to supress that natural reluctance we feel at taking away the life of anything so innocent and pleasing as the bird that entertains us by its happy warbling. On this account I never shot but one individual of that species (vol. I: 346).

In this, his predecessor, Le Vaillant, displayed a totally opposing attitude: "I brought down, without mercy, everything that presented itself before me"(Le Vaillant 1790: I, 182) and "my Hottentots begged me to spare it [the honey guide]. A new species, however, was to be added to my collection, and I killed it" (Le Vaillant 1790: I, 372).

Throughout his narrative Burchell commented repeatedly on the attractiveness of African birds – especially sugar-birds, the Derrick cuckoo, hoopoes, and falcons – and on the usefulness of some birds as a food source or, as in the case of swallows, as indicators of the presence of water (vol. II: 15). He keenly observed the birds and wrote down anything unusual or interesting:

> August 1st 1811 Speelman, who always brought home anything which appeared to him curious, one day came with a bird (*Picus terrestris* B. – Le Pic Laboureur – Le Vaill., Ois. D'Afr., pl. 254) which he had taken out of its hole in the side of a high and abrupt earthy bank. The noise it made was something like that produced by filing the teeth of a saw. The habits of this bird, in hollowing out for itself, a hole in the earth, instead of one in

> the trunk of a tree, is a singular anomaly in the *woodpecker* tribe (vol. I: 174).

This skin still survives in the OUMNH and is the type specimen of the species. It carries Burchell's no. 11 with OUM no. 2072, and is the only specimen of *Picus terrestris* collected by Burchell during his travels (Fig. 17.6).

On 25 October 1811 he came across one bird he particularly admired – the crimson-breasted shrike. He described it thus: "*Lanius* (*Lanius atro-coccineus*) very much resembles *L. barbatus* of Gmel. Sys. Nat. (the *Gonolek* of Buffon, and of le Vaillant) an exceedingly handsome bird having the under part of the body of the brightest scarlet, and all the rest of the finest black, excepting a white stripe down each wing, and a few faint white marks on the back" (vol. I: 269). Soon afterwards, on 9 November, he once again describes it as "that beautiful bird, the *Lanius atro-coccineus*"(vol. I: 305). His only ornithological scientific paper, published by the *Zoological Journal* in 1824 (Burchell 1824-1825), had this bird as its subject. There are four extant specimens of this species in the OUMNH: Burchell's no. 83/ OUM B/2142; Burchell no. 100/ OUM B/2144; Burchell no. 137/ OUM B/2141 (Fig. 17.7) and Burchell no. 276m/ OUM B/2143. All of them are considered syntypes (Davies and Hull 1983: 330). The crimson-breasted shrike is also featured in Burchell's painting *Inside of my African Waggon* (see Fig. 17.3 where, obviously freshly shot, one is seen lying on a case in the middle of the wagon).

He was clearly delighted when, on 28 October 1811 at Klaarwater, "among the number of interesting birds here procured was that singular one the *Spoonbill*" and a day later "a variety of *birds* not seen before and some which proved perfectly new to the science" (vol. I: 346). On the same day he obtained "kite, kestrel, butcher-bird, hoopoe, bee-eater, goat-sucker first shot at this place, the green and gold cuckoo, two kinds of crows, Cape pigeon (Namaqua dove), Guinea dove, turtle dove, Cape lark, sacred vulture, and "besides these we shot specimens of new species of Snipe, Rail, Orioles, Shrikes, Swallow, Thrush, Barbets, Plovers, Flycatchers, Sparrow, Grosbeak, &c. To which list may be added a considerable number of the birds already mentioned in the preceding part of this journal" (vol. I: 347).

He was a keen observer of the birds he encountered, and while near Litakun he came across vultures feeding on one of his dogs, killed in a wagon accident. He wrote:

> Vultures have been ordained evidently to perform very necessary and useful duties on the globe … however purblind we may be in our views of their utility. To those who have had an opportunity of examining these

FIGURE 17.6 Geocolaptes olivaceus, *OUM B/2072, type of* Picus terrestris (*Burchell, 1822*), *ground woodpecker.* The only specimen of this species collected by Burchell, and although the his original number is missing it is presumed to be specimen no. 11, collected on 1 August 1811 at 32046'45", Karroo. *Travels*, vol. I: 245. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

FIGURE 17.7 Laniarius (Lanius) atrococcineus (*Burchell, 1822*), *OUM B/2142 (83); B/2143 (276m); B/2141 (Burchell's no. 137), crimson-breasted shrike or the crimson-breasted gonolek. Syntypes.* Burchell first collected it in 1811, near the confluence of the Vall and Orange Rivers. As it was coloured red and black he named it *atrococcineus* and considered it as one of the most striking birds he had encountered in Africa. The one on the right, OUM B/2141, was most probably mounted, since leg wires are still present. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

> birds, it need not be remarked how perfectly the formation of a vulture is adapted to … that of clearing away putrid or putrescent animal matter, which might otherwise taint the air and produce infectious diseases (vol. II: 233).

He also commented on the vulture's place and role in nature:

> But so nicely is the mutual relation of all things balanced, that none of these animals, not the domestic dog, show the least inclination to take away the life of these birds. For this reason, they are, in every country it would seem, tolerated by man, and sometimes treated even with respect. They have an extent of privilege, which their associates, the hyenas have not; because they never harm the living (vol. II: 233).

He noted that their flesh smelled "strongly like a carrion, and no other animal, however pressed by hunger, will eat it; a quality of importance to their preservation: for, were it eatable, they would be exposed to destruction while in the exercise of their duty, which, often obliges them to feed in company of hyenas, and other beasts of prey which occasionally satisfy their hunger by a dead carcass" (vol. II: 233).

After killing one female vulture, Burchell carefully measured the carcass, noted the 7-foot wing-span, the colour of the skin of the trunk, neck and feet, and the colour of feathers of the different parts of its body (vol. II: 235). He made a drawing of the head to add to his written description of the species (Fig. 17.8). He also decided to add the skin to his ornithological collection but the whole skinning operation was in his own words "disgusting". Although he employed an assistant to help out with this process, the smell was so appalling that they could not finish the job in a single day; both felt so nauseous that they had to postpone the process to be completed the following day (vol. II: 235).

To make sure that he obtained a sufficient number of species from every locality, Burchell did not procure all of the birds on his own, but asked the other members of his group to contribute:

> Speelman and Phillip were employed in exploring the banks of the river, for birds. The former was the keener sportsman in this department, added to my ornithological collection more than any other of my Hottentots. Juli, however in this respect, was very little inferior to him, either in the number, or in the value and rarity, of the objects which his zeal and industry procured for me. I ranked myself only third, and Phillip as the fourth; but the rest of the people were at a great distance behind, and most of them were unable to boast that they contributed even a single bird (vol. II: 346).

FIGURE 17.8 *Drawing of* Trigonoceps occipitalis (*Burchell, 1824*), *white-headed vulture;* Vultur occipitalis, *now* Trigonoceps occipitalis (*Burchell, 1824*). "We shot one of the vultures: it was a female, and measured seven feet from the point of one wing to that of the other, when extended … Before the skin was taken off, I made a drawing of the head" *Travels*: II: 235. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

Later on in the journey Burchell became dissatisfied with the slow growth of his collections and noted in his journal: "In order to encourage Speelman in being diligent to shoot birds for my collection I have promised him a Rix dollar for every dozen the skins of which I shall preserve." In August 1812 he went even further with a promise of tobacco and soon noted that Kees killed a specimen of "Mutacilla 205".

It seems that Burchell employed only one method of acquiring the bird specimens – shooting – but in one instance he reported a Hottentot killing a bird with a stone. In contrast, some years earlier, Le Vaillant, apart from using snares, succeeded in developing a totally novel way of obtaining bird skins. He put a small amount of gunpowder into the barrel of his gun, followed by a piece of candle rammed down to seal the gunpowder, then topped it up, to the muzzle, with water. When fired, the water jet stunned the bird and Le Vaillant

got skins unblemished by blood, or holes or tears caused by a bullet or shot (Le Vaillant 1790: I, 176).

Burchell wrote in his *Travels* that he usually skinned the birds himself, noting the preparation of a large blue crane in January 1812 and of a heron in July 1812. He was upset when he lost a small pocket-knife that "was composed of various articles of convenience, some of which were of great service in the operations of preparing the birds for my collection". He followed the advice commonly given in field manuals and keenly inspected the carcasses of shot birds. In the intestines of *Himantopus melanopterus* "a *Taenia*, or tape-worm was found, nearly a foot in length, three-tenths of an inch broad, and one-twentieth thick; each joint being no more than one-twentieth of an inch long" (vol. I: 199).

After removal of all the organs, muscles, brains, eyes and tongue, the skin was cleaned and sun-dried. It seems that Burchell made no use of arsenical soap in his travels, as he asked Swainson for the recipe in 1824, some years after his return from Africa (Davies and Hull 1983: 321). As he was deprived of the chemicals normally recommended for the conservation of natural history specimens, he experimented, and using his extensive knowledge of plants, tried to find new substances for the preservation of skins.

In his journal entry for 11 August 1812 he notes using the seeds of *Tarchonanthus* for the stuffing of birds' skins. *Tarchonanthus,* a shrub he found growing abundantly near the Gariep [Orange] River, has seeds that resemble the seeds of the cotton plant. Burchell observed that many species of this genus gave off a strongly resinous smell, especially *Tarchonanthus camphoratus,* and many animals avoided eating it. He concluded that the leaves and stems must contain toxic or unpleasant substances with all-important anti-insect properties. Indeed there is one surviving bird skin specimen in the OUMNH, *Saxicola torquata* B/2110, whose body cavity is filled with the seeds of this shrub (Fig. 17.9) and a quantity of these seeds were found amongst other South African specimens (Davies and Hull 1983: 318). Burchell used the seeds for several purposes: to give insect-repellent protection, to act as "a good absorbent" and to provide the padding or filling-out of the skins (Davies and Hull 1983: 319). This was an important function, for Burchell noticed that skins could soon become damaged by lying loose in the wagon and he mentions being employed himself in "packing up my birds".

Although he was convinced that his bird skins were well enough preserved to withstand the passage of time, it later transpired, that this was not so. On returning home, Burchell arranged for some of the specimens to be stuffed and mounted; the whole collection was then put into boxes, securely enclosed, and "papered up". John Edward Gray (1800-1875), assistant keeper of zoology at the

FIGURE 17.9 Saxicola torquata (*Linnaeus, 1766*), *African stonechat.* The specimen (OUM B/2110) has lost its Burchell number so that when and where it was collected is unknown. Clearly visible are the cotton-like seeds of *Tarchonanthus camphoratus*, their rounded yellowish shape showing inside the bird's skin. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

British Museum, reported how he and Dr Rüppel visited Fulham on two occasions in 1834 to see Burchell's African birds: on the first occasion they could not open the boxes, which had been so securely nailed down that without appropriate tools it proved impossible; on their second visit, this time armed with a hammer and chisel, they managed to gain access to the containers, but were dismayed by what they found:

> … the box containing the Vultures … was most carefully packed, but when opened it contained nothing but the naked skull, arm and leg bones, all the rest had been eaten up, and this was unfortunately the state of all the boxes of African birds which we examined much to our grief and disgust: for the remains showed that Burchell had collected in the early part of the century many species which were described for the first time by Dr Ruppel half a century later (Gunther 1980: fol. 29).

Throughout his travels Burchell noted the growth of his collection. He wrote: "since I left Cape Town … my collections in Natural History have been made, and are daily increasing. They at this time amount to 163 birds of 29 different genera" (vol. I: 354). Soon after he increased it to 169 specimens of 81 species of birds, "all shot since leaving the Groote-Doorn river in the Bokkeveld Karro".

Burchell used Linnaeus's *Systema Naturae*, edited by Gmelin, Le Vaillant's *Oiseaux d'Afrique* and sometimes Temminck's *Manuel d'Ornithologie* as his main ornithological texts, but the descriptions in his *Travels* were not "intended as specific characters, but are given merely as the most obvious of striking features, in order to convey to the zoologist or botanist some idea of the more remarkable objects. Neither was it thought requisite, in the present work at least, to adopt every innovation in nomenclature" (vol. I: 504). At an early stage he planned to publish a number of scientific papers with the description of new species of birds: "I formerly thought I should be able to manage the ornithology of my African travels myself", he confessed, but soon he realized that the task would be impossible to discharge on his own. In the end he published only one paper and most of the new species were described by his good friend Swainson (Davies and Hull 1983: 321).

As with his botanical specimens, Burchell identified the bird specimens with numbers, localities and dates. He noted the first specimen of every species he collected, and any consequent acquisitions were referred to the number of the first one, meaning 'as for' (Davies and Hull 1983: 322). He gave the Dutch names and – whenever he could identify them – the Linnaeus *Systema Naturae* name, and any given by Le Vaillant too: hence "Suiker-vogel (Sugerbird), (*Nectarinia chalybea; Certhia chalybea*, Linn. Syst. Ed. Gmel. Vol. I: 475

– *Le Sucrier à double, Le Vaill., Ois. D'Afr.,* tome VI: pl. 178)". In some cases he also added a name given by Buffon (vol. I: 269).

After Burchell's death his sister presented the collection of bird skins to the University of Oxford: 432 survive, and Davies and Hull with Benson accorded type or possible type specimens to twenty-one of them (Davies and Hull 1983: 323).

Mammal Collection

The collecting of quadrupeds was never easy and Donovan in his *Instructions for Collecting and Preserving various Subjects of Natural History* warned:

> Although quadrupeds constitute one of the most important divisions of Natural History, we have scarcely any collection in this country that includes more than a very partial selection of the smallest kinds; indeed the many insurmountable difficulties which would offer to a collector in this department, independent of an immense expence [*sic*], will even deter the most affluent, from an attempt that must be ultimately unsuccessful (Donovan 1794: 1).

It is scarcely surprising, therefore, that Burchell, primarily a horticulturalist, considered the acquisition of mammals less important than collecting plants and bird skins – perhaps with the sole exception of the giraffe. Ironically, though, Burchell's name will live forever in association with his discovery and naming of the white rhino (*Ceratotherium simum* Burchell, 1817), sassaby (*Damaliscus lunatus* Burchell, 1823), blue wildebeest (*Connochaetes taurinus* Burchell, 1824), black-footed cat otherwise known as small-spotted cat (*Felis nigripes* Burchell, 1824) and his reporting that there were more than one species of zebra: the mountain zebra, the plains zebra and the now extinct quagga.

At the beginning of his travels, Burchell decided that he would collect large mammals only towards the end of his journey, so as not to burden himself with specimens that took up too much of the precious space in his wagon and too much time in preparation.

On 14 November 1811 Burchell's party killed a male and female quagga. He wrote in his *Travels* that this was the very first skin of a quadruped he had collected – that of a female. He had to show his Hottentots how it ought to be cut, "so that, if it should hereafter be stuffed, it might appear as little injured as possible; otherwise their mode of going to work would soon have made it useless for this purpose" (vol. I: 313).

It was Burchell who recognized that there are two species of rhinoceros and noted that local people, well aware of the differences between these two,

accorded them different names. Burchell learned from his Hottentot companion, Speelman, about the acuteness of the rhino's sense of smell and hearing, and also of their short-sightedness which made it possible for hunters to survive an attack. The first species he encountered was the black rhino, when Speelman shot two individuals on 6 March 1812 (vol. II: 52). As a good post-Linnean naturalist, he was careful to take the measurements of one of the animals: "the length, over the forehead and along the back, from the extremity of the nose to the insertion of the tail, was 11 feet and 2 inches of English measure, but in a direct line, not more than nine feet three inches. The tail, which at its extremity was flattened vertically, measured 20 inches; and the circumference of the largest part of the body, 8 feet 4 inches." He also examined its mouth: "'I found, agreeably to common opinion, no incisive or fore teeth in either jaw; in the upper jaw on each side, were five large grinders and a smaller one at the back; but in the lower, there were six grinders besides the small back teeth." Incredibly, as he ran out of ink, he wrote the details "with the animal's own blood" (vol. II: 54). He noted that during the four-year period, his party of Hottentots killed ten black rhinos and one of a smaller size was presented to the British Museum in 1817. The other species, the white rhino, was seen by Burchell on 16 October 1812 at Chue Springs, Bechuanaland. He wrote in his *Travels*: "The new species … I have named *Rhinoceros simus* from the flattened form of its nose and mouth, by which, and by its greater size, and the proportions of its head, it is remarkably distinguished from the other African species" (vol. II: 54). He also made a number of sketches of the animal (Fig. 17.10).

Later, on his return to Fulham, Burchell sent a letter to de Blainville in Paris, with a description of the animal and a drawing (Rookmaaker 1998). The letter was published in the *Bulletin des Sciences, par la Société Philomatique* (Burchell 1817), with the animal's morphology, measurements, and a comparison with his earlier measurements of the black rhino. The new species, *R. simus* (now *Ceratotherium simum*) was a much bigger animal, with a longer tail and larger circumference. Burchell wrote that the animal inhabited big arid plains, and visited the springs not only to drink the water but also to wallow in the mud to cover its skin as a protection against the sun. Its mouth also differed in shape from the black rhino as it fed on grass and not on shrubs. In not including any details of the rhino's internal organs, Burchell's account differed from that of Robert Jacob Gordon who, in 1779-1780, undertook a detailed anatomical study of the black rhino. Gordon gave not only a description and drawing of the animal, but he dissected, described, and sketched the head, eyes, tongue, gut, liver, spleen and penis and wrote about heart, lungs and kidneys (Cave and Rookmaaker 1977). Three years earlier, in 1775, another African traveller,

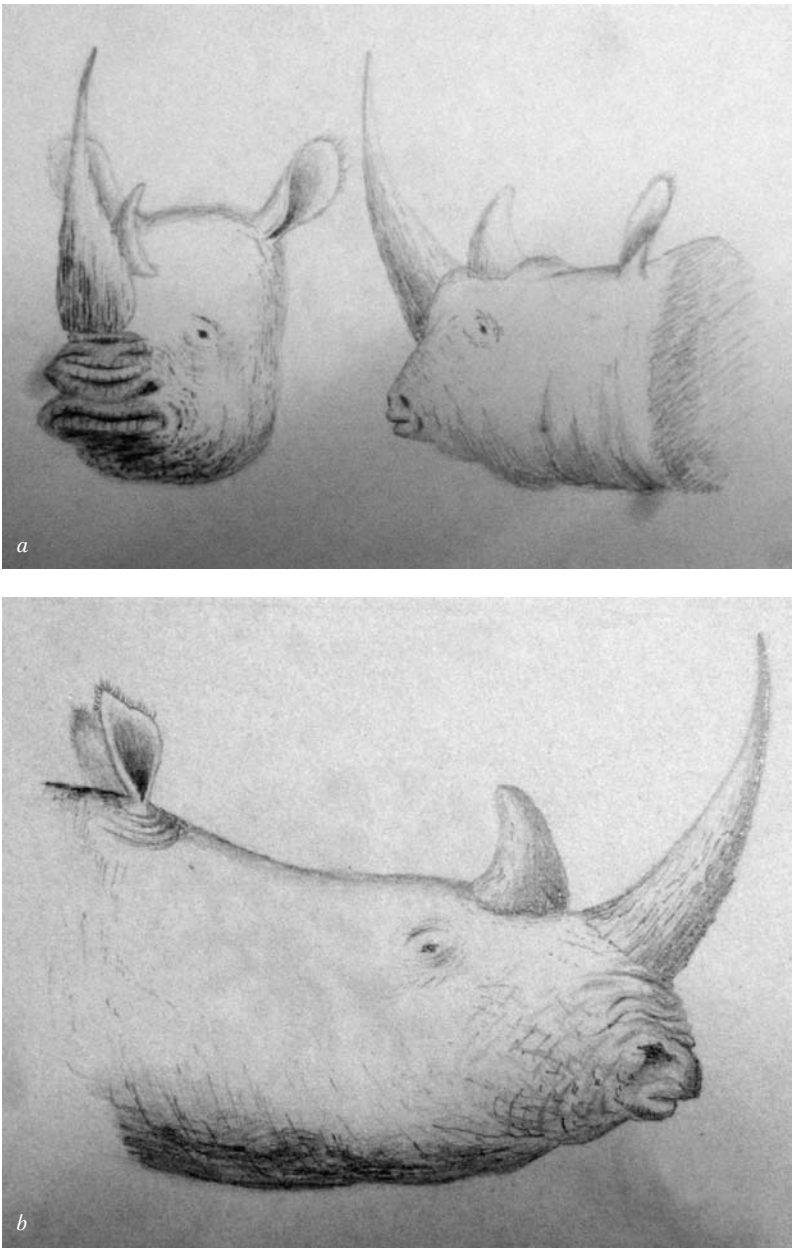

FIGURE 17.10 *Drawings of the white rhino* Ceratotherium simum (*Burchell, 1817*). The white rhino, Burchell's rhino, or the square-lip rhino, *Ceratotherium simum* (Burchell, 1817) was Burchell's greatest discovery. First noticed during his journey towards Chue Lake, it was described, measured, drawn and published by Burchell in 1817. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

Sparrman had dissected and recorded technically superior anatomical details of the black rhino's viscera. His methods, however, were somehow unorthodox:

> … we cut through the ribs with an axe, and what with hacking and tearing together, we at last made shift to empty the cavity of the abdomen. I made drawings and descriptions of these parts, and took the dimensions of them with as much haste as possible; after which we took out the diaphragm, and a naked Hottentot crept into the carcass, in order to pluck out the lungs and heart (Sparrman 1786: II, 102).

After this rather unusual dissection, Sparrman described the rhino's stomach, kidneys, heart, liver and lungs. He also measured the rhino's brain cavity: "six inches long and four high, and of an oval shape" and by using dried peas he obtained its capacity: it was found to hold barely one quart; a human skull, measured at the same time, required not much less than three pints to fill it (Sparrman 1786: II, 106).

The rhinoceros fascinated many travellers on account of its fabled "bullet-impenetrable" skin. The notion of the rhino skin's toughness was probably started by Gervaise, continued by Buffon (Sparrman 1786: II, 108), and was commented on by many who encountered and shot the animal, including Burchell. Even forty years after Burchell, Andersson felt duty-bound to dispel the same myth (Andersson 1856: 400). Others, like Thunberg, focused on the uses of rhino horns in the Cape – to cure convulsions and spasms in children – and the horn's ability to detect poison in a drink, by making the liquid ferment and foam over the rim (Thunberg 1986: 246).

His very first giraffe was spotted by Burchell on 3 October 1812, but four months earlier, on 16 June, he was excited to see the tracks of the animal: "the tallest of all the quadrupeds in the world; of one which, from the time of the Romans until the middle of the last century, was so little known to the nations of Europe, as to have been at length considered by most people as a fabulous creature; one not existing on the globe … And the hope of being the first of the party to see it, kept all my men on the look-out the whole day" (vol. II: 176). His long wish to procure a giraffe, made him offer a special reward to anyone who would secure one for him, as he wrote in his journal on 7 August 1812: "And to whoever shall bring down a Camelopardalis, anything of my bartering goods he may choose [it will be given to him]." In the end he was successful in obtaining a female on 13 October 1812 and two months later, on 26 December, a male, both of which he donated to the British Museum. The male, 17 feet and 6 inches tall, was one of the largest ever encountered – so much so that the Museum did

not believe its size until it received the specimen. Both skins were stuffed, and for a long time stood on the upper landing of the great staircase of Montagu House, as depicted in a drawing by George Sharf of 1845 (Pickering 1997: 316).

Burchell also described a new species of antelope, *Antilope taurina*, the brindled gnu, also called the blue hartebeest. The animal was shot by Speelman on 21 June 1812 and Burchell later obtained four more skins of this species, presenting one to the British Museum (vol. II: 198). Juli, one of his Hottentots, shot the sassabi, *Antilope lunata*, now known as *Damaliscus lunatus,* on 9 July 1812, its skin being the only specimen Burchell acquired throughout his four years of travels (vol. II: 238).

The largest predator of Southern Africa, the lion, inevitably attracted Burchell's attention. He frequently commented on the presence of lions around his camps and in August 1812 wrote about an unusually coloured one, apparently encountered by Kees: "head and shoulders are coal black, throat white, & hinder part of body grey & end of tail black. It is a rarer sort than the other." He also stated: "it is well known that if many fire at a lion, he will pass by those who stand near him & spring only on him who wounded him." Burchell was not alone in offering this "information" on the lion, as Sparrman, too, had recorded exactly the same belief (Sparrman 1786: II, 41). Thunberg and Sparrman asserted that the lion "prefers to eat a Hottentot to Christian, as Hottentot is always smeared with fat so he stinks, but his flesh is not so rich as he does not eat salt and spices" (Thunberg 1986: II, 69; Sparrman 1786: II, 41); Thunberg even advised that one should not run from a lion but "look it stern into the eyes" (Thunberg 1986: II, 70).

A number of manuals advising travellers on collecting in the field laid out the steps to be followed for the preservation of the animal's skin. It should be skinned by cutting a line from the vent to the throat and the flesh, eyes, tongue and brain carefully removed. Burchell followed this advice in most cases, but in at least two instances he experimented by making the cut across, not along, the body. No doubt with the intention of avoiding unnecessary scars for the future mounting of the skins, he performed the cut between the hind limbs in at least two skins: of *Cephalophus monticola,* the blue duiker, and *Georychus capensis,* the Cape mole-rat, that are extant in the OUMNH (Pickering 1997: 326).The skull – as in birds and reptiles – was to be left behind, as well as the feet and claws; after cleaning any remaining blood or dirt on the fur hairs, the inside of the skin was rubbed with special preparations. The principal ingredients of the recommended mixtures were substances that were presumed to have insecticidal properties: alum, sulphur, tanner's bark, tobacco, camphor and arsenic (Donovan 1794: 2, 3).

FIGURE 17.11 Aethomys namaquensis (*Smith, 1834*), *Namaqua rock rat.* Burchell named this specimen (OUM 18855) *Mus longicaudatus*. A small paper wrap containing part of the tail has a text in Burchell's hand: "longicaudatus. Tip of the tail of Mus". For this specimen Burchell used lichen and moss and other plant material to stuff the skin. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

Burchell never mentions using arsenic, but he certainly carried with him a great deal of tobacco, although it seems to have been intended exclusively as currency or presents when dealing with Hottentots and Bushmen. Here, once again he showed his ability to improvise and to use his extensive knowledge of plants. As mentioned earlier, he experimented with resinous plant seed-heads as protection against insect pests in the birds' skins, but for some of the small mammals he used a mixture of lichen and moss to provide a suitable padding and perhaps to act as an absorbent, as attested by the skin of *Aethomys namaquensis,* the Namaqua rock-rat, extant in the OUMNH (Fig. 17.11).

Burchell decided not to use spirit in skin preservation although that was the most highly recommended method: "in this manner it will retain the size and proportions infinitely better, than what the utmost skill of man can imitate, by any attempt to stuff the skins only"(Donovan 1794: 4). However, Donovan further instructs: "For convenience, the Animal may be transported from *Indies*, or any distant part of the world, and the intended attitude may be given after it has arrived, only be careful to pack it up in a close box with a quantity of tobacco and camphire" (Donovan 1794: 4). Burchell seemed to follow this

advice, and specimens were packed into boxes and carefully papered up to stop insects having access to them, although all too often this proved in vain.

There was only one possibility of drying specimens in the field – to lay them down and let the sun to do the work. Burchell was well aware of the danger of shrinkage associated with this mode of preservation and took careful measurements in advance, as for example with the skin of the sassabi, *Damaliscus lunatus.* Still, John Edward Gray complained of Burchell's specimens that "the smaller ones instead of being rolled up and packed were lying about the wagon while the larger ones, as the giraffe, were stretched out on the outside of the cover of the waggon … The consequence was that the skin of the legs had very much shrunk and the hair on many parts of the body were destroyed so as to quite unfit it for stuffing" (Gunther 1980: fol. 27).

Although certainly not an anatomist himself, Burchell showed an interest in describing his osteological specimens and proved his ability at comparing the various characters of his specimens. On his return to England he visited Brookes's Museum of Comparative Anatomy in London in order to examine the skeletons of quadrupeds, acknowledging Brookes's help in his investigations (vol. II: 163). The case of an African wild dog was especially interesting. Burchell at first assigned the animal to the Hyaenidae family, calling it *Hyaena venatica*, but having compared the molar teeth of two species of hyeana – the striped (*Hyaena hyaena*) and the spotted (*Crocuta crocuta*) – with that of a dog, he realized that the hyaenas have fewer cheek teeth than members of the Canidae family and his *H. venatica* resembled a dog in this characteristic. He also compared lumbar vertebrae and ribs, discovering that although all these animals have fifteen ribs, those of the hyaenas were of "extraordinary breadth", while those of dogs and *H. venatica* were thin and narrow. His conclusion: "The present animal, therefore, with respect to its teeth, ribs and lumbar vertebrae, would be arranged in the genus *Canis.*" However, being as scrupulous as ever in his observations, he noticed that the number of toes aligned *H. venatica* more closely with the hyaena, rather than the dog (vol. II: 163). There is an interesting post-script to this story. The Revd Hesse, Burchell's good friend from Cape Town, made a present of a live "*H. venatica*" (or what is now known to be African wild dog, *Lycaon pictus*), which Burchell took home with him. He drew a picture of the animal and noted that "its ferocious nature deterred everybody from an attempt at taming it; but it became at length so much softened in manners, as to play with a common domestic dog, also chained up in the yard, without manifesting any desire of hurting its companion; but the man who fed it, dared never to venture his hand upon it." The wild dog lived for thirteen months and there are entries in Burchell's home accounts showing the bills for its food (vol. II: 163).

Burchell was not without a sense of humour – or rather, of irony – when he wrote about the dogs accompanying him during the African journey, including one called by him Wantrouw. He introduced this dog as "a comparative anatomist to the expedition" explaining that Wantrouw had "prepared and cleaned a large collection of bones of rare quadrupeds, which would have been to any museum a valuable present" (vol. I: 266).

During the expedition, Burchell's party shot 289 quadrupeds, of which 120 skins of eighty species, plus a large number of osteological specimens were preserved (vol. I: 5). Some of them can be seen in Burchell's painting of his wagon (see Fig. 19.3): a hippopotamus tusk, an elephant's molar, a sable horn and the skull of a baboon. Forty-three of the "largest and finest" he donated to the British Museum in 1817, after, in April of that year, "resisting a flattering invitation from a foreign museum, of the first respectability … who were desirous of purchasing them" (vol. I: 267). These were the very first skin specimens of Southern African animals in the Museum (Gunther 1980: fol. 27). A few years later, disappointed that they were not mounted for display in the main halls, and discovering that some of them had perished as result of neglect (as he saw it), he complained bitterly in his *Travels*, blaming the staff for the situation. Matters did not improve when Gray, most probably in retaliation, named one of the zebra species brought by Burchell "*Asinus Burchelli*" – Burchell's ass.

The mammalian specimens were the only elements of the collection that Burchell wanted to sell when back in England: "I have remaining by me a collection of 7 skins of large quadrupeds, mostly antelopes, valued by Leadbeater at £80 and if you would mention this circumstance to any person who would be likely to become a purchaser you would much oblige me" (Pickering 1997: 312).

After his death Burchell's remaining mammal collections were donated by his sister to the University of Oxford, and the remnants can now be found in the OUMNH: seventy specimens, with twenty-two skins, and the remainder osteological specimens: skulls, horns, hooves and teeth. Of the skins, fifteen have a skull connected with them and seven are with foot bones only.

Insect Collection

Burchell had not ignored insects and although little mention is made of them in his surviving journal or his *Travels*, the collection, when donated to Oxford, comprised of 2,315 specimens belonging to 815 species (Smith 1986). In September 1811 he noted that "few insects were at this season to be seen" but "two species of *Pimelia* were found; one of which is probably the *P. inflata* of Olivier" (vol. I: 237). He was particularly fond of *Mantis lucubrans* that "often settled on my book … and remained still, as if considering some affair of

importance, with an appearance of intelligence which had a wonderful effect in withholding my hand from doing it harm. Although hundreds have flown within my power, I never took more than five" (vol. I: 290). On 14 September 1811 he found: "a species of the *Gryllus* tribe amongst the stones, and so exactly like them in color and even in shape, that it could never have been discovered, had it not been observed just at a moment when in motion" (vol. I: 2170). He numbered the specimen 752, and now known as *Methone andersonii,* it still survives in the OUMNH (Poulton 1907: 15).

In January 1812 he wrote to Revd Hesse that he had collected about 400 insects (vol. I: 354) and in November 1812 he spent over a month at the sources of Kuruman River near Litakun, where he collected insects of "many orders" (Poulton 1907: 37). The localities of some specimens can be found only with the aid of Burchell's map, since all the journals he created after 3 September 1812 are missing. It is from this map that we learn that he collected butterflies on the Maadji Mountain on 22 October 1812, and a male and female of *Teracolus subfasciatus,* now *Colotis subfasciatus,* were collected at the Chue Spring on the same day. These two specimens were used by Swainson in 1822 to describe a new species and to erect the genus *Teracolus*. Burchell made a mistake (as others had done) when he identified termitaria as anthills. He compounded his mistake by drawing a section of the termitarium, as an anthill, with an ant on top of it (Fig. 17.12), "as if it [the ant] had been the builder instead of intruder" (Poulton 1907: 21).

A further use of the standard herbarium method was applied by Burchell to his entomological collection. When collecting caterpillars he preserved them as he did the snake skins, by cutting them open, attaching to a strong paper and then drying and flattening the skins so that they resembled herbarium specimens (Fig. 17.13). He recalled first using this method in 1812 when a Hottentot presented him with a large caterpillar with unusually beautiful colours and fine markings. This technique was as successful with the caterpillar skins as it was with the snake skins, but in the end he decided that as the time required to preserve them could be more usefully spent on more pressing matters and "the possession of insects in the caterpillar state only, would have been of little use to science, and merely amusing curiosities, I collected very few objects of that kind" (vol. I: 327).

The insect collection, together with the birds, reptiles and mammals, was also presented to Oxford University by Burchell's sister in 1865.

One of the volumes taken by Burchell on his African trek was *Species Insectorum* by Fabricius, no doubt to help with the insect taxonomy and identification. Three species of insects were later named after him: an army ant,

FIGURE 17.12 *Drawing of a fragment of a termite mound with an ant.* "The ant-hills structure was irregularly cellular, and not unlike a volcanic honeycomb-stone; or rather consisted of perforations, or passages, opening into each other, without any apparently methodical plan. I brought away a piece of the hillock, and some of its laborious little architects" (*Travels*: I, 310). Burchell mistakenly identified the ant as a termite. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

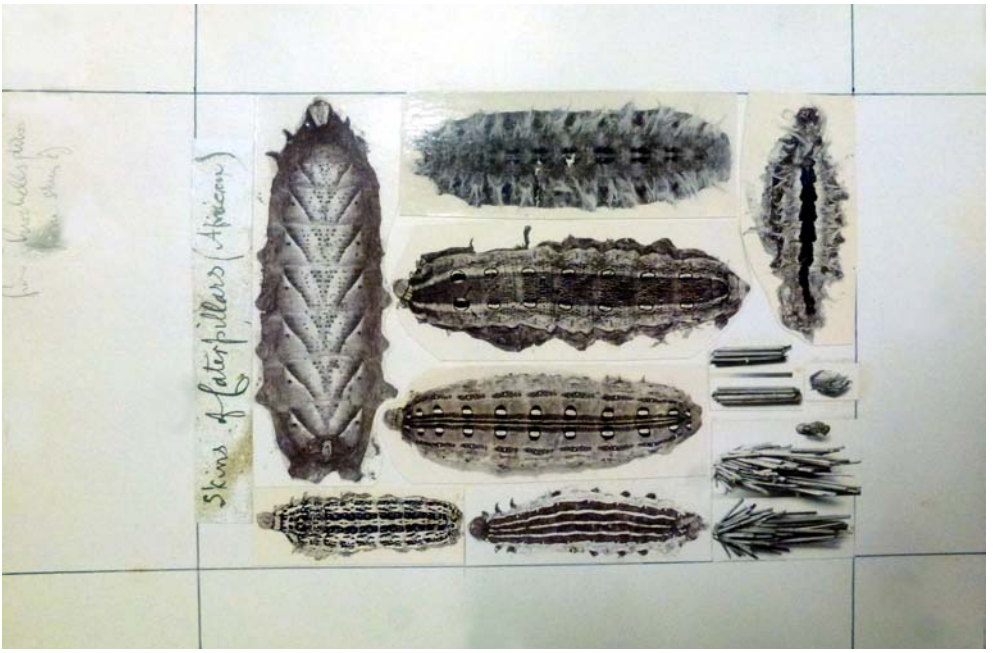

FIGURE 17.13 *Caterpillar skins.* Burchell preserved them using the same method as for plants and snake-skins. Photograph most probably taken for Professor Poulton around 1907. COURTESY OF THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY.

Eciton burchellii, and two species of butterflies: Burchell's yellow *Colotis subfasciatus* and Burchell's brown *Pseudonympha hippie.*

Three butterflies are included in the painting of his wagon, seen attached to the tilt, on the right side of the painting: the largest is of the family Nymphalidae, probably citrus swallowtail (*Papilio demodocus*), and the two smaller specimens from the family Pieridae.

Other Work of a Field Naturalist.

In addition to compiling natural history observations, Burchell was interested in painting, drawing, languages, anthropology, ethnography, astronomy, geography and cartography. He made many sketches and paintings during his journey, observing that "at all times a sketch is a most faithful and comprehensive memorandum, and describes most things much more fully than the pen can ever do" (vol. I: 285). To protect his artwork from the climate, he experimented again and introduced a new method of preservation, coating them with a fine dust of asbestos collected at Prieska.

Burchell's famous map was created on his return home. It was truly large-scale: "7½ feet by 8½ feet", but reduced to 27½ by 32½ inches for inclusion in the *Travels.* Interestingly, Burchell also mapped one area that he did not himself visit, instead making use of the writings and maps of other explorers: Thunberg, Sparrman, Lichtenstein and Paterson (Buchanan 2015: 191) . The cartography element was "the most troublesome part of my labour"(Buchanan 2015: 191). He noted the longitude and latitude of places, explained various signs and abbreviations, gave, whenever possible, the Hottentot and Dutch names and even the history of individual settlements. He was the first explorer to put the Asbestos Mountains on the map. He was quite passionate about keeping original place-names instead of adopting newer ones: he insisted, for example, on using the name Gariep instead of Orange.

He stated:

> It must, in the first place, be stated that *my own track* is laid down *entirely* and *solely* from my own observations, made during the journey. These observations consist of daily distances travelled; the courses from station to station; the bearings and trigonometrical intersections of distant and remarkable mountains; according to the concurrent information of the native inhabitants; very frequent astronomical observations for the latitude; and many sets of lunar distances for the longitude. These, whenever my time permitted, were laid down during the journey, from day to day, on a large scale; and various details added from ocular observations (Buchanan 2015: 190).

Return to England

Burchell arrived in Cape Town in April 1815 and packed all the zoological, botanical and mineralogical specimens, that he had collected on the last leg of his journey, into forty-eight packages and cases (McKay 1941: 72). Altogether during his four years in Southern Africa he had assembled over 63,000 natural history specimens (vol. I: 5). He sailed on 25 August and after a brief stop at St Helena, arrived in England on 11 November 1815.

On his return Burchell concentrated on writing up his experiences in his *Travels in the Interior of Southern Africa*, published in two volumes in 1822 and 1824 respectively. Although he planned to describe the natural history specimens in another volume, quite separately from the *Travels* (vol. I: 19), this ambition was never fulfilled. His painting *Inside of my African Waggon* was exhibited at the Royal Academy in 1820.

Ten years after his return from Southern Africa he set off again, this time on a five-year exploration of Brazil, returning to Fulham in 1829. He also travelled widely in Europe at the invitation of fellow botanists: Olaf Hesse, son of the Revd Hesse of Cape Town, Archduke Johann and Professor Endlicher. One of his old friends, Dr Lichtenstein, now professor of natural sciences at Berlin University, even asked him to come to work in Prussia and to bring his entire botanical collection with him. When in Fulham he was visited by Lord Carnarvon, the Hon. William Herbert, Prince Leopold of Saxe-Coburg, and Lord and Lady Caledon whom he knew from the Cape. He also enjoyed the company of John Henslow, professor of botany at Cambridge, Major-General Thomas Hardwicke, who had spent some four years in India where he collected many zoological specimens, and his closest friend Swainson (Buchanan 2015: 208).

Work on the plant specimens and their documentation occupied him for many years. On 30 January 1856 he noted:

> All the Labels from No. 3604 to 8735 have not yet been copied into the *Catalogus Geographicus* the original descriptions and notes made at time of collecting are to be found on the original labels which are pasted into one large folio volume (McKay 1941: 68).

On 11 June 1860, forty-nine years after the start of his African travels, he recorded:

> I finished the rubbing out of the pencil writing which I had anywhere in all my African and Brazilian Catalogues replaced in China ink of *this* tint (McKay 1941: 68)

Only three years after writing these words Burchell ended his life. After his death, his sister Anna Burchell presented his plant collection and his botanical manuscripts to the Linnean Society, from where they were later transferred to the Botanic Gardens at Kew and the rest of natural history specimens she offered to Oxford University. Burchell is widely remembered as an outstanding practitioner in the field:

> His work as a Naturalist has never been equalled. His careful preparation, execution and completion of his objective, detailed annotation and brilliant appreciation of nature set science a goal seldom achieved (*Dictionary of South African Biography*, quoted in Stewart and Warner 2012: 9).

Swainson wrote:

> He must be regarded as one of the most learned and accomplished travellers of any age or country, whether with regard to extent of his acquirements in every branch of physical science or the range of countries he explored. Science must ever regret that one whose powers of mind were so varied and so universally acknowledged throughout Europe, was so signally neglected in his own government – the most thankless and ungrateful one, to unpatronised talent under Heaven. A Government which bestows honours upon writers of novels, and pensions for licentious ballads, cannot be expected to regard modest worth or unobtrusive talent (Buchanan 2015: 207).

Bibliography

Manuscript Sources

Burchell, William J. Manuscript journal, 24 May 1812 to 2 September 1812, Library, Oxford University Museum of Natural History

Printed Sources

Andersson, C.J. 1856. *Lake Ngami, or explorations and discoveries during four years' wanderings in the wilds of South Western Africa*. London, Hurst & Blackett

Anon. 1790. *Proceedings of the Association for Promoting the Discovery of the Interior Parts of Africa* [*electronic resource*]. London, printed by C. Macrae

Barrow, J. 1806. *Travels into the Interior of Southern Africa: In which are described the character and condition of the Dutch colonists of the Cape of Good Hope, and of the several tribes of natives beyond its limits: the natural history of such subjects as occurred in the animal, mineral and vegetable kingdoms; and the geography of the southern extremity of Africa. Comprehending also a topographical and statistical sketch of Cape Colony; with an inquiry into its importance as a naval and military station, as a commercial emporium; and as a territorial possession*, 2nd edn. London, Cadell & Davies

Branch, W.R. 1999. Reptile systematic studies in Southern Africa: a brief history and overview. *Transactions of the Royal Society of South Africa* 54(1): 137-156

Buchanan, S. 2015. *Burchell's Travels: The life, art and journeys of William John Burchell, 1781-1863*. Cape Town: Penguin Books

Burchell, W.J. 1817. Note sur une nouvelle éspèce de Rhinoceros. *Bulletin des Sciences, par la Société Philomatique de Paris* [1817]: 96-97

Burchell, W.J. 1822. *Travels in the Interior of Southern Africa,* vol. I, *with an entirely new map, and numerous engravings*. London, Longman, Hurst, Rees, Orme & Brown. Reprinted from the original edition of 1822-1824 with some additional material and with an introduction by I. Schapera, 1953. London, Batchworth Press

Burchell, W.J. 1824. *Travels in the Interior of Southern Africa*, vol. II, with numerous engravings. London, Longman, Hurst, Rees, Orme & Brown. Reprinted from the original edition of 1822-1824 with some additional material and with an introduction by I. Schapera, 1953. London, Batchworth Press

Burchell, W.J. 1824-1825. Description of Malaconotus atro-coccineus. *Zoological Journal* 1: 461-462

Burchell, W.J. 1953. *Travels in the Interior of Southern Africa*, ed. Schapera, I. London, Batchworth Press

Cave, A.J.E, and Rookmaaker, L.C. 1977. Robert Jacob Gordon's original account of the African Black rhinoceros. *Journal of the Zoological Society of London* 182(2): 137-156

Cleverly, L. 1989. *W.J. Burchell: Special agent or naturalist?* Edenvale, privately printed

Davies, K.C. 1980. Burchell's serpents. *Journal of the Society for the Bibliography of Natural History* 9(4): 455-475

Davies, K.C. and Hull, J. 1983. Burchell's South African bird collection (1810-1815) *Archives of Natural History* 11(2): 317-342

Donovan, E. 1794. *Instructions for Collecting and Preserving various Subjects of Natural History. Together with a treatise on the management of insects*. London, printed for the author

Farber, P.L. 1985. Aspiring naturalists and their frustrations: the case of William Swainson (1789-1855). *Archives of Natural History*, special publication 3: 51-59

Gronovius, J.F. 1742. A method of preparing specimens of fish, by drying their skins, as practised by John Frid. Gronovius, M.D. at Leyden. *Philosophical Transactions of the Royal Society* 42: 57-58

Gunther, A.E. 1980. The miscellaneous autobiographical manuscripts of John Edward Gray (1800-1875). *Bulletin of the British Museum* (*Natural History*) Hist. Ser. 6:199-244

Huigen, S. 2009. *Knowledge and Colonialism: Eighteenth-century travellers in South Africa*. Leiden and Boston, Brill

Lettsom, J.C. 1774. *The Naturalist's and Traveller's Companion: Containing instructions for collecting & preserving objects of natural history, and for promoting inquiries after human knowledge in general*, 2nd edn. London, printed for E. & C. Dilly

Lichtenstein, H. 1812. *Travels in Southern Africa, in the years 1803, 1804, 1805, and 1806*, trans. and ed. Plumptre, A. London, printed for Henry Colburn, etc. Reprint of the translation from the original German, Cape Town, The Van Riebeck Society, 1928

MacGregor, A. 2007. *Curiosity and Enlightenment : Collectors and collections from the sixteenth to the nineteenth century*. New Haven and London, Yale University Press

McKay, H.M. 1935a. A scientist's wagon. *South African Journal of Science* 32: 680-683

McKay, H.M. 1935b. William John Burchell, scientist. *South African Journal of Science* 32: 689-695

McKay, H.M. 1941. William John Burchell, botanist. *Journal of South African Botany* 7: 1-186

Pickering, J. 1997. William J. Burchell's South African mammal collection, 1810-1815. *Archives of Natural History* 24(3): 311-326

Poulton, E.B. 1907. *William John Burchell : The materials of a lecture delivered before the British Association in the Town Hall, Cape Town*. London, printed by Spottiswoode & Co.

Rookmaaker, L.C. 1998. Rhinoceros illustrations, 1: W.J. Burchell. *Rhino Watch* 8. *SA Game & Hunt* 4(5): 40-41

Smith, A.Z. 1986. *A History of the Hope Entomological Collections in the University Museum Oxford: With lists of archives and collections*, Publications of the University of Oxford, University Museum 2. Oxford, Clarendon Press

Sotheby's and J. Davy & Sons 1865. *Catalogue of the Valuable Botanical Library and Library of general Literature ... of the late W.J. Burchell ... which will be sold by auction by Messrs. Foster at the Gallery, 54 Pall Mall, on Tuesday, 5th of December, 1865*. London, printed by J. Davy & Sons

Sparrman, A. 1786. *A Voyage to the Cape of Good Hope, towards the Antarctic Polar Circle, and round the world: but chiefly into the country of the Hottentots and Caffres, from the year 1772, to 1776*, 2nd edn. London, G.G. J. & J. Robinson

Stearns, R.P. 1952. James Petiver, promoter of natural science. *Proceedings of the American Antiquarian Society* 42: 243-365

Stewart, R. and Warner, B. 2012. William John Burchell: the multi-skilled polymath. *South African Journal of Science* 108(11/12): 1-9

Thunberg, C.P. 1986. *Travels at the Cape of Good Hope 1772-1775. Based on the English edition, London 1793-1795 ...* Van Riebeeck Society, *Works*, 2nd ser. 17, ed. Forbes, V.S. Cape Town, Van Riebeeck Society

Vaillant, F. le 1790. *Travels into the Interior Parts of Africa by the way of the Cape of Good Hope in the years 1780, 81, 82, 83, 84 and 85*, vol. 1 . London, printed for G.G. & J. Robinson

Williams, C. 1859. *Narratives and Adventures of Travellers in Africa*. London, Ward & Lock