

## William Burchell's medical challenges: A 19th-century natural philosopher in the field

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Two hundred years ago, the naturalist William John Burchell departed from Cape Town on extensive travels in South Africa 'solely for the purpose of acquiring knowledge'. An intelligent observer who was exceptionally skilled at recording his observations in words and pictures, he is remembered for numerous contributions to the country as scientist, artist and ethnographer. The medical perspective on his travels has yet to receive attention. He identified and recorded illnesses of the indigenous peoples with whom he came into contact. He also described the medical care he administered to his companions and to himself; in doing so, he

revealed a profound care for his 'fellow creatures'. His vivid and sometimes poignant descriptions remind us of some of the health risks endured by early travellers in the country. One of the most riveting is his successful care of an assistant whose left hand was severely mutilated when a firearm exploded in his hands. Burchell was probably the first person to include the *materia medica* of the Khoi in an essentially European approach to the non-surgical management of such a serious condition.

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In June 1811, the 29-year-old William John Burchell started an extensive journey in South Africa 'solely for the purpose of acquiring knowledge'.<sup>1</sup> Over the next 4 years, he travelled 7 000 km, mainly by ox-wagon. His journey took him as far north-east as the asbestos mountains a little north of the Chue Spring (Heuningvlei or Tsoe), in what is now Northern Province. He returned to Cape Town via Graaff-Reinet, the mouth of the Great Fish River, Uitenhage, the Langkloof, Plettenberg Bay and then a route that, in the main, was a short distance north of today's N2 highway.

Burchell had learned from his father and staff at Kew about the propagation of plants; a successful nursery was the source of income that paid for his travels. Burchell was educated and trained in natural history (today, the natural sciences). As a teenager, he was trained in landscape painting and in draughtsmanship; this was his preferred medium of communication, despite his exceptional skill in languages. Burchell had not received any formal training in medicine, but nevertheless dealt with significant medical challenges during his travels. He was probably the first person successfully to integrate indigenous and Western approaches to the management of a patient with a serious medical condition.

### Burchell's legacy

Burchell is credited with having been the most prolific collector of botanical and zoological specimens, and one of the most scientific of the collectors of that era. In South Africa, he collected 50 000 specimens of plants, seeds and bulbs, and 10 000 specimens of insects, animal skins, skeletons and fish. He painstakingly categorised, described and often drew his specimens; his notes included the exact location, morphological features and habitat of the plants and animals.<sup>2</sup> His botanical collections and catalogue are now at the Royal Gardens in Kew, and his animal collections and catalogues at the Oxford University Museum of Natural History. He was elected a Fellow of the prestigious Linnaean Society when he was only 22 years



Fig. 1. Flower of *Burchellia bubalina*.

old. Oxford University awarded him the degree Doctor of Civil Laws in 1834.

While botanists know Burchell for his pioneering work, few non-botanists know about the genus named after him, the only species of which is *Burchellia bubalina*, the beautiful indigenous wild pomegranate that produces buffalo wood (Fig. 1).

Somewhat paradoxically, his name is commonly associated by South Africans with animals, most often Burchell's coucal and Burchell's zebra. Less well known are the other animals named after him, e.g. 3 birds (Burchell's starling, coarser and grouse) and a lizard (Burchell's sand lizard), and the fact that he was the first to give a scientific description of some South African animals, such as the white rhinoceros.

Burchell was a naturalist and a polymath with numerous practical skills; he knew a lot about a lot and could do a lot. He was of a breed of scientist of whom few survive in this time of specialisation and reductionism.<sup>3</sup> He designed, maintained and repaired a modification to the Cape ox-wagon that carried him and much of his equipment on his travels (Fig. 2). He was a competent navigator, geographer and cartographer; his Map of the Extratropical Parts of Southern Africa was a milestone in the cartography of the country. Because of his knowledge of geology and keen observation, he discovered asbestos near Prieska. Burchell was an accomplished ethnographer and developed good relationships with the local inhabitants, indigenous and colonial. He was a linguist who had mastered 6 modern and

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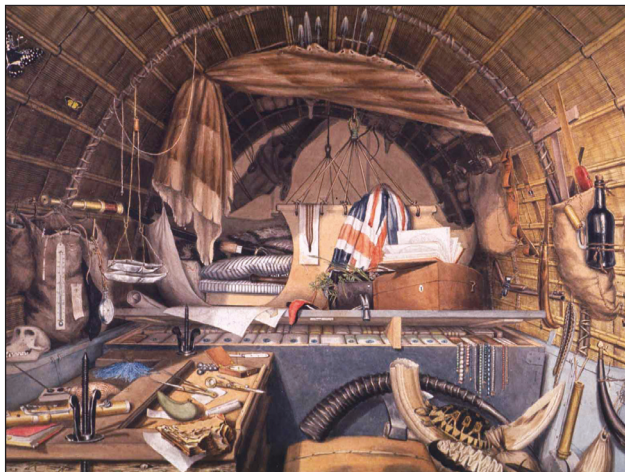


Fig. 2. 'Interior of My African Waggon' (Burchell, 1822).

ancient languages, including some that were spoken in South Africa. His command of written English and the accuracy of his descriptions are widely admired. His book<sup>1</sup> is a much sought-after treasure. George Theal, the historian, described Burchell's book as 'one of the most trustworthy and valuable books ever issued upon South Africa' in his *Catalogue of Books and Pamphlets of South Africa*. An accomplished artist and draughtsman, Burchell drew South Africa's landscapes, animals, plants, and the people he met and aspects of their culture, including their artefacts. He was a talented amateur musician who played the flute for personal gratification and to entertain his companions.

## Burchell and medicine

Helen McKay did extensive research on Burchell. Seventy-one years ago, an article by her about some of Burchell's medical observations and encounters was published in this journal.<sup>4</sup>

Preceding Burchell were famous medically qualified natural historians Carl Thunberg, Anders Sparrman and Hinrich Lichtenstein, who travelled extensively in South Africa. They recorded their observations of diseases prevalent among indigenous peoples, but none recorded in any detail their practice of medicine in the country. Burchell also identified health issues and diseases among the indigenous peoples with whom he came into contact. Some of the diseases remain common, e.g. ophthalmia (conjunctivitis) and jaundice. Others were devastating conditions seen by few of today's medical practitioners, e.g. anthrax, leprosy and smallpox. Burchell's medical experiences are differentiated by his management and vivid description of some serious medical challenges with which he dealt.

As naturalist, Burchell had some knowledge of anatomy and herbal medicines. His painting of the interior of his wagon shows that he took with him numerous books (he had 50). Although not trained in medicine, some of his books were on the subject, but he did not identify them. Perhaps some titles were supplied by his friend Mr Mackrill, a surgeon, who had a garden with indigenous plants and whom Burchell visited. He had a small chest of medicines that were probably supplied by his apothecary friend and amateur naturalist, Peter Polemann (Pohlmann) who, with Diedrich Pallas, ran a chemist and druggist business at 26 Strand Street in Cape Town.

## Gunshot wounds

In the 19th century, European and colonial travellers used to shoot for the pot. Naturalists also killed to collect specimens. Burchell donated the skins of 120 quadrupeds to the British Museum.

Shooting accidents were a significant risk. Burchell describes in detail how he attended to two accidental gunshot wounds – one to himself and one to an assistant.

The first gunshot wound, relatively minor but potentially serious, occurred in the Roggeveld, about 20 km south-south-west of today's Fraserburg. Burchell had adjusted the hair trigger of a flintlock firearm after Speelman, one of his assistants, had 'put it out of order' and, assuming the gun was unloaded, cocked it and pulled the trigger. Although there was no priming in the pan, the gun fired. 'By a providential guidance' the ball passed between the two men, but 'the flash from the pan scorched my eye, and rendered me blind for the remainder of the day'. The 'pain and inflammation were at length alleviated by continued bathing with warm water ... the next day my sight was uninjured, a discovery which ... rejoiced me as much as any event on my journey'. Burchell continued on his way 'as soon as the painful operation of picking the grains out of my face had been submitted to'.

The more dramatic wound occurred at Klaarwater (Griquatown today). Burchell was aroused early one morning by the sound of a gunshot followed by a commotion. Beside his wagon, he saw Gert who shouted 'Help! Help, sir. The gun is burst and my hand's in pieces'. His left hand was supported by the right '... a shocking sight ... literally blown to pieces. The fore-finger and thumb were remaining, although torn apart; but the other fingers, with part of the palm, and the other two metacarpal bones were quite separated, and adhered, or rather hung, only by a small piece of the flesh.'

Would Gert survive without an amputation? Neither Burchell nor the missionaries at Klaarwater had surgical instruments or skills. Burchell 'immediately cleansed the wound of gunpowder and particles of dirt'. He then bathed it with Friar's Balsam<sup>\*</sup> and closed what remained of the hand with bandages '... as it did not bleed, I conceived the balsam useful in the absence of blood, to form, as it were, an artificial skin'. After a few hours, the hand began to bleed. Having allowed it to do so long enough 'to prevent inflammation, I washed it frequently with a solution of alum<sup>\*\*</sup> in plain water ... and gradually stopped the flow of blood'. 'Twenty drops of laudanum<sup>†</sup> were given him in the course of the evening, by the assistance of which he enjoyed his usual sleep.† I passed a night of distressing wakefulness'. Burchell was distressed by 'the only incident ... I have to reflect on, with the painful feeling of my travels in Africa having caused harm, or personal injury, to any of my fellow creatures'.

The 'Hottentots expressed so much faith in *Boekoe-azyn*' (Buchu vinegar) that 'I allowed it to be used to cleanse the wound. I ... had long believed the leaves of the *Diosmas* to contain virtues which would ... obtain for them a place in the *materia medica* of Europe ... as they have long done in that of the Hottentots and Boors'. He put the *Diosma* leaves in a bottle of cold vinegar in which they were left to steep ... 'the longer infused, the more efficacious ... becoming ... almost a mucilage'. Since his stock of vinegar had run low, Burchell

\*Friar's Balsam is Compound Tincture of Benzoin. It is a tincture of the balsamic resin from trees of the genus *Styrax* from East Asia, combined, with Storax, the resinous exudate of the Sweetgum (*Liquidambar orientalis*) and, in South Africa, with Cape Aloe, the bitter exudate of leaves of *Aloe ferox*.

\*\*Alum is a group of hydrated aluminium salts. In medicine, alum powder was used to reduce bleeding and as an astringent. It has been used to shrink haemorrhoids and to stop them bleeding.

†Laudanum is a tincture of opium, the dried juice from cuts made in the unripe capsule of the opium poppy, *Papaver somniferum*. It has narcotic, soporific, analgesic and astringent effects, and contains approximately 1% morphine, as well as codeine, papaverine and other alkaloids.



Fig. 3. Longleaf buchu *Diosma serratifolia*\* (Burchell, 1824).

made the next batch of buchu infusion in brandy, 'which faster disappeared than could be accounted for by the wants of my patient'. For 10 days, he washed the hand with the buchu solution twice daily and occasionally thereafter. As soon as the hand began to heal, 'I employed a wash made of a decoction of the leaves of *Wilde-alsem* (*Artemisia afra*; *Wilde-als*; Wild Wormwood)'.<sup>4</sup>

There is some modern scientific rationale for Burchell's use of these indigenous herbal medicines. Antimicrobial and anti-inflammatory activities have been reported for buchu and antimicrobial and analgesic activities reported for Wild Wormwood.<sup>5</sup> Burchell's is probably the first reported case of successful integration of indigenous herbal medicines with medicines used in Europe into the management of such a serious condition.

There was no need for opiates after the fourth night, when the dose had been lessened to 10 drops. Gert had 'very little fever; and the wound in a few days began to assume a healing appearance'. For 12 days, Gert was confined to the hut, but 'he was never deprived of the consolation of his tobacco-pipe. ... The fungus flesh that began to form was reduced by frequently powdering it with burnt alum. A healing plaster was made by melting together a wax candle with a quantity of sheep's tallow,' sufficient to give it the proper softness.'

'After 6 weeks I considered the cure complete.' A deep wound near the wrist could have closed much sooner 'had I not judged it prudent to keep it open'. The thumb and finger were re-united and the wounds covered with new skin. Slowly, he recovered the use of the remaining digits. Burchell concluded that fortunately 'I possessed neither the skill nor instruments of a surgeon ... and this was reason for rejoicing ... the patient had a useful half hand and not a useless stump!'

### A poignant encounter with leprosy

Shortly after his facial injury and about 10 km south-south-east of Fraserburg, Burchell had a moving encounter with that 'dreadful and incurable malady, leprosy'. A *trekboer* asked Burchell to visit his wagons where his daughter lay very ill. The girl and her mother had

'hopes of some cheering opinion ... of her case. ... But how was I shocked the moment I beheld her, when obliged to intimate to her father that her disorder was incurable. ... I saw, too plainly to be mistaken, all the symptoms of the loathsome leprosy. ... She was said once to have possessed some share of beauty; but now every feature was disgusting; such is the usual effect of this dreadful disease.' Burchell suspected that measles played a role in disturbing her immune response; he reported that, soon after inoculation against leprosy a few years earlier, the girl had suffered measles, which seemed to aggravate the inoculation site. 'I wished that chance had not thrown me in their way to open their eyes to her hopeless situation, since we could offer neither remedy nor mitigation. ... Finding I could be of no service, I left this unhappy family with the most heartfelt commiseration for them, not less than for the ill-fated sufferer.'

### Hypothermia and influenza in the Sneeuwberge

In search of assistants who would accompany him further north from Klaarwater, Burchell travelled between Klaarwater and Graaff-Reinet through Bushmanland and the Sneeuwberge.

No other European explorer or colonial had travelled successfully through Bushmanland. The route was considered dangerous. However, Burchell developed very good relationships with the San and travelled the route safely. The San even entrusted one of their children to his care while he continued to Graaff-Reinet. The weather in the Sneeuwberge, however, was a more formidable challenge that nearly resulted in their death from hypothermia.

The party endured wind, rain and piercingly cold weather in the mountains. We do not know how cold it was as, on this quick round trip, Burchell did not take his thermometer, which was left in his wagon at Klaarwater. While trying to descend the mountains, his Khoi guides informed him that their colleagues could not continue. It was clear to Burchell 'that every one of my men was now suffering from the severity of the weather'. Furthermore, the San boy in their company was *in extremis*. He was almost naked, since he was dressed for the weather he encountered near home. Burchell found him 'affected to an ... alarming degree ... and his face had assumed that peculiar yellowness which ... is the visible symptom of either approaching dissolution or the decay of energy in the vital functions.' Burchell had committed to returning through Bushmanland to deliver the boy safely to his family; 'The most distressing reflections crowded on my mind.'

Burchell halted at what was recorded in his journal and on his map as Cold Station. He immediately set about trying to remedy the situation and revive his companions. Those who could still move struggled in the rain 'in kindling a fire'. They prevailed and a strong fire warmed them all.

Burchell assessed that the boy most urgently needed attention, and the more elderly companions were next. Burchell placed the boy close to the fire and wrapped him in one of his own blankets. For an hour, the boy remained speechless and moribund. Desperate 'to restore the activity of the vital functions, which the cold seemed to have nearly stopped', Burchell made as strong a mixture of volatile alkali\* as he dared; he confessed that volatile alkali was in danger of becoming his panacea for all serious conditions. He administered some of the mixture to both the boy and the old men, who also were suffering greatly. After a while, the boy started to move his legs and recover his speech. Two hours later, Burchell 'rejoiced to find him sufficiently

\*Burchell identified the buchu plant as *Agathosma serratifolia*, previously *Diosma serratifolia*. It might well have been *Agathosma crenulata*, which is also a long-leaf buchu, but the preferred medicinal species.

\*\*Sheep's tallow is a rendered form of sheep fat that is solid at room temperature and can be stored for extended periods without refrigeration, in an airtight container.

\*Volatile alkali was Burchell's *liquor ammoniae*, probably a solution of ammonium carbonate or ammonia in water. Both release ammonia, which irritates the upper airways so as to stimulate breathing.



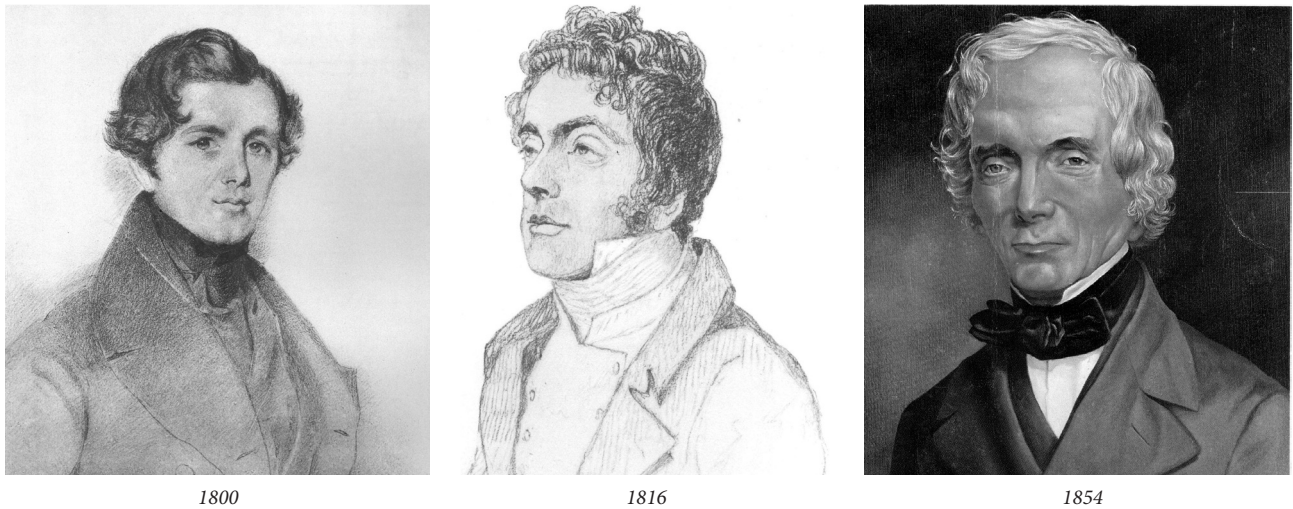


Fig. 4. Three successive portraits of Burchell.

restored to be able to eat' and 'desired him to eat a large quantity of food; a request which is never unseasonable to a Bushman'. They all revived to a degree, but 'the party sat over the fire very melancholy and dejected'. After they had eaten quickly, the clouds enveloped them again. They endured a night of drenching rain. Since Burchell was not travelling in his wagon, he passed the night under his umbrella. In the morning, despite the fire having been extinguished by the rain, they had all recovered enough to travel again.

Another medical challenge was in store for Burchell and his party. At the foot of the Sneeuwberge, Burchell 'began to perceive symptoms of a violent fever; having felt a chill and shivering, even in the sunshine and the cold I had taken having already produced a hoarseness.' At the base of the Ouberg Pass, his party found a vacant, ramshackle, leaking hut. Burchell took 'some antimonial powder' and then, unable to stay on his feet any longer, wrapped himself in blankets, which still were uncomfortably wet from the previous night's rain. 'The fever and hoarseness worsened and a violent headache in the evening prevented all sleep.' His self-medication failed to induce the perspiration he sought. Nevertheless, within three days, he felt much better. By this time, local residents in Graaff-Reinet had learned of the presence of Burchell's party which, incredibly, had entered the Colony from the north! They escorted him to the town in a horse-drawn cart and delivered him to the home and care of Rev. Kircherer, a local missionary, and his wife. Despite the ministrations of Mrs Kircherer, Burchell soon relapsed. He suffered a productive cough for a while but, within about 10 days, he felt fit enough 'to take a ramble along the river'.

He learned that he had 'suffered a species of influenza that had pervaded the whole Colony and the epidemic was now on the decline'. Soon the rest of his party were suffering from influenza. 'It was now my turn ... especially my duty to take care of them.' Within 2 weeks, Burchell and all of his team had recovered, except one elderly man who took a few days longer.

### Burchell's health after departing from South Africa

We know very little about Burchell's health during the remaining two-thirds of his journey or after his departure from South Africa.

#### Ptosis

On comparing the portraits of Burchell in 1800 and 1816, it is clear that he had acquired bilateral symmetrical ptosis (Fig. 4). There is no record to suggest that he suffered from any systemic illness or neuromuscular

disorder that could explain this. It is unlikely that the ptosis was a spurious artistic interpretation. The 1816 portrait, drawn in the year after his return to England, is by Mary Dawson Turner, after an etching by John Sell Cotman, a well-established marine and landscape painter and illustrator, of whom Turner had been a student. It is very likely that both artists would have known Burchell; their interest in common with Burchell was botany and Kew Gardens. It is also clear from a portrait in 1854 that the ptosis was temporary. The cause remains a mystery.

### Burchell's death

In later life, Burchell became quite isolated and, apparently, a sad figure; it seems that he suffered from depression. In 1863, at the age of 82, he committed suicide rather clumsily. After unsuccessfully attempting to end his life by shooting, he hanged himself in a small outhouse in the garden. The jury investigating his death recorded a verdict of 'suicide during a temporary fit of insanity' and added that it was not their duty 'to investigate the causes which resolved in this great man taking this step'. Initially, Burchell was refused a Christian burial but, after the intervention of his sister, was buried near his home in Fulham, in the family tomb at All Saints Church, Hammersmith.

Burchell's suicide was a sad and poignant ending to a remarkable man. He made his mark in many different ways, including his sound management of serious medical conditions and the high level of care and concern he displayed towards his 'fellow creatures', in health and in sickness.

**Note:** Unless referenced otherwise, all quotations are from Burchell's book.<sup>1</sup>

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