

## *William Stanger*

### *and the early years of cartography in Natal, 1845-1854*

A lack of accurate topographic maps haunts the history of Natal and is particularly noticeable at times of military activity: during the Anglo-Zulu and both Anglo-Boer wars. This recurrent problem constitutes a paradox in view of the fact that the post of Surveyor-General was the first official professional appointment in the colonial administration of 1845. An explanation of the paradox involves not only a variety of cartographic factors but also a complexity of problems existing during the first decade of the colony's existence.

The first incumbent of the Surveyor-General's post was William Stanger, born on 27 September 1811 at Wisbech in Cambridgeshire. A member of the 1840 expedition to the Niger River area, he moved to the Cape of Good Hope, where he acted as a naturalist, geologist and surveyor, surveying the road to Grahamstown from Cape Town in 1843. Stanger was the second choice for the Natal job, it having been turned down by C. D. Bell, who became Surveyor-General of the Cape three years later. The early appointment of a Surveyor-General to Natal reflected the importance attached to the question of the land in general, and its division in particular, in a hitherto undeveloped territory.

Stanger's letter of appointment, signed by John Montagu, Colonial Secretary at the Cape, and dated 17 February 1845, laid down 35 points outlining his duties, including those related to surveying. In general terms Stanger was required to carry out the ". . . measurement and appropriation of lands . . .". He was ordered to appoint four qualified surveyors "if the services of that number can be secured. . ." to be employed on surveys of Durban, Congella, Pietermaritzburg and Weenen. The other main surveying duty was "to ascertain by a Trigonometrical Survey, the real extent of the Territory" and to map in particular the main topographic features and any features which would "facilitate a cadastral survey." The method of achieving this was specified and Stanger was requested to ". . . ride over the Country to make yourself generally acquainted with it, and to select the most central or otherwise eligible point for a measurement of a base line from which the surveyors . . . should start upon the Survey." Even at this early stage the drawback of general trigonometrical survey, in an undeveloped colony, that of delay, was perceived. Stanger was instructed to avoid retarding the occupation of farms by laying down a limited network of triangulation points and surveying the farms of a locality, starting with the most densely populated areas. Given the circumstances, an inherent conflict was built into Stanger's terms of reference, with the need to accommodate both a long term definitive topographic survey of Natal and a rapid and piecemeal cadastral survey. The trigonometrical survey was to be

carried out at a scale of 1 : 63 360 (1 inch to 1 mile) with standardized symbolization so that localized surveys could be incorporated into the broader. A sliding scale of survey charges was laid down at 12/- per erf up to four erven, and 9/- per erf thereafter, with a total fee of £14/12/10d. for 6 000 acres. Surveyors were to be held personally responsible for errors which had to be rectified in their own time and at their expense.

During Stanger's tenure not only were surveys carried out at the four towns mentioned in his letter of appointment, by 1846, but those at Lady-smith (completed 1847) and Colenso (completed 1855) had also been started. A greater number of problems was, however, to be found with the trigonometrical survey. Stanger had a justifiably low opinion of the cartographers who had preceded him. In a letter dated 2 April 1846 to the Secretary to Government, Stanger described existing maps as "very erroneous". He pointed out that Arrowsmith's map placed the Drakensberg some 70 miles too far East and portrayed rivers inaccurately, and that such errors had been perpetuated by the copying of other cartographers. Wyld's was the only map, for example, showing Pietermaritzburg, but detracted from its accuracy by the attribution to the town of an inaccurate line of longitude. But Holden's later map of 1855 persisted in showing the Drakensberg to be a mere 4 000 to 5 000 feet high. Stanger travelled widely through Natal, wrote a geographical description of the colony and made some fundamental discoveries. He verified the sources of a number of rivers, recognized that the Drakensberg incorporated a dog-leg shape and did not follow a simple straight line, and proved that Natal was larger in area than had been thought—at least 13 500 square miles depending on the trend of the Drakensberg escarpment in Northern Natal, rather than the hitherto accepted 10 000. Stanger had thus partially complied with a request from Donald Moodie, Secretary to Government, dated 27 February 1846, to form a general idea of the extent of Natal, in particular the Northern limits of the colony, the trend of the Drakensberg and the height of its passes, and the sources of the Buffalo and Umzimkulu Rivers. Moodie had in fact stressed the acceptability of a "best estimate".

Apart from his written report on Natal, and in particular his comments on territorial limits and agricultural potential, Stanger left tangible evidence of his work in the form of two maps. The first was published in 1848 and entitled *Sketch of Natal shewing its proposed divisions, projected towns, villages etc.* Natal's boundaries were fixed mainly by river survey but relief detail is sparse, the Drakensberg shows little elaboration, and relief elsewhere is highly simplified. Even Stanger perpetuated the positioning of the Drakensberg too far to the East and rectified this too severely in his second map *The District of Natal*, published in 1850, which shows the mountains 18 miles too far West. Yet again the topographic base of this map is over simplified, but the map is more precise than any contemporary publication and, in showing albeit simplified farm boundaries, can claim to be the first topo-cadastral map of Natal. The farms shown are those granted in 1843 and 1848 in the form of registered and Land Commission farms, while Crown Lands and African locations are also shown. Contemporary maps of the Eastern Province and Border show far greater relief detail, although this can, of course, be related to comparative states of development. Stanger himself was the first to point out the limitations of his work and he adds in

a footnote to his 1848 map that in parts it is little more than a sketch and the surveyed areas, as well as being limited, contain an element of estimation. Such an admission highlights Stanger's professional status at a time when amateur cartographers were publishing a wide variety of cartographic nonsense as accurate surveys. However, it can in no sense be claimed that in the first nine years of the Surveyor-General's department's existence Stanger was able to carry out his terms of reference regarding a trigonometrical survey of Natal.

Explanations of this inability are to be found in Stanger's correspondence, primarily with the Secretary to Government. The difficulties he encountered can be grouped under the broad headings of the physical; financial; official policy and staffing; cartographic; and the burden of other responsibilities. The physical difficulties involved in the topographic mapping of Natal in the mid-nineteenth century were immense and were indeed not fully solved until the advent of aerial photography ninety years later. Stanger had to contend with vast distances, a lack of roads combined with horse-back travel and, when surveying, progressing at the pace of oxen. The supply of unreliable and sub-standard ox teams for his wagon was not the least of his worries. The terrain and vegetation were such that much of Natal could be surveyed only by theodolite and the climatic extremes of summer and winter resulted in floods and drought with their concomitant problems. Nearly forty years later the report on the Geodetic Survey<sup>1</sup> listed the hazards of mist, heavy rains and grass fires as retarding progress and these problems would have affected Stanger's work in no small measure.

Stanger was under constant pressure to hasten the progress of rural surveys. For example, a letter dated 20 January 1846<sup>2</sup> asks for a reason for the delay over farm surveys in response to prompting from London. Not only were the physical difficulties great but local administrative problems frustrated progress. These included conflicting claims to land arising from the transfer of the administration from the Boers to the British. The Volksraad had granted land without survey or registration and the new British administration was slow to deal with claims, leading to a three-way clash between Pietermaritzburg, London and the settlers themselves.<sup>3</sup> Stanger clearly did not remain neutral in this context — a certain A. J. Spies, writing in April 1848,<sup>4</sup> accuses the Surveyor-General of robbing the Boers of land. Above all was the problem of finance. Landowners were held responsible for survey fees incurred, and deeds and survey plans were withheld until the necessary sums were paid. Many farmers, however, could not afford the money at this early stage of Natal's development and the colonial government in Cape Town refused to advance the necessary finance. Considering that small farm survey fees could amount to twice the value of the land, it is perhaps surprising that any surveying was carried out. Clark gives the example of land valued at 1/- per acre costing 2/3d. to survey.<sup>5</sup> The parsimony of the colonial government was of crucial importance. In a personal letter to F. Becker, Clerk to the Resident Magistrate at Ladysmith, on 17 May 1852, John Bird, the acting Surveyor-General, explained the drawbacks of the system of finance. Each department was required to budget by the month but approval of forward budgeting was frequently delayed and would often result in the unavailability of money for a particular month, as in fact happened in May 1852, with neither the Treasury nor the Surveyor-

General able to release money. The financial stringency of the times is best illustrated by the attitude of the administration to the purchase of cartographic instruments. For example, on 14 April 1848 Stanger was still awaiting approval of the costs of instruments from the Secretary of State.<sup>6</sup> This followed his request on 17 February for £125 worth of instruments — a theodolite, chain, barometer, level, perambulator, chronometer, transit instruments and measures. Eventually Stanger's request for a chronometer and transit instruments was rejected because they were not available in Cape Town. Stanger maintained that these were necessary for calculating azimuths of larger triangles and laying down of base lines respectively, and proceeded to provide them at his own expense. By August Stanger was hampered by a lack of a good theodolite in his laying down of base lines. Like many cartographers before him, he had problems in calculating longitude using bearings and distances, the root cause of the misplacement of the Drakensberg on early maps of Natal. Ironically the subject of instruments was raised again in 1851<sup>7</sup> when Bird, acting Surveyor-General, requested a sextant, Stanger having prudently taken his own on leave to England.

Stanger also had staff problems, although these can only have been exacerbated by the Surveyor-General's irascible nature. Initially there was a shortage of qualified surveyors and although numbers later came forward there was a constant problem of dishonest practitioners. In September 1846, for example, Stanger warned his surveyors against conducting private work detrimental to their public function. On 22 August 1850 the authorities decided that errors in farm surveys conducted by Cloete should be rectified at public expense. By this time Cloete had left the public service. In 1852, acting Surveyor-General Bird complained to surveyors<sup>8</sup> that farmers in the Klip River area could not find the locations of the beacons delimiting their land because they had been inadequately described. A comparison of new plans and descriptions of the original beacons suggested that farms' best land had sometimes been excised. In a directive which implies that he doubted the efficiency of his employees, Bird demanded a list of beacons on each farm and a guarantee that these had been pointed out on the spot to each farmer, together with explanations for subsequent alterations. There was, in addition, constant negligence in communicating the receipt of survey fees to the Surveyor-General's office, by surveyors in the field.

The cartographic consequences of these factors were severe. The Surveyor-General's correspondence is full of their effects on both specific farm and general topographic survey. The financial problems meant that a general survey was an impossibility, and in April 1846 Stanger estimated the probable cost of a general triangulation at £4 000 spread over five years. It would, however, have been possible to build up such a survey from specific farm surveys, that is to say, work in a deductive way, had these surveys been contiguous. That they were not, resulted in a patchwork of surveys characterized by overlap and omission. In the Byrne valley area the authorities expected the plotting of lots as small as  $\frac{1}{4}$  acre in extent at a scale of 1 : 31 680 to 1 : 47 520, a technically difficult operation.<sup>10</sup> At the other end of the scale the surveying of 6 000 acre first class farms in isolation was less detrimental to a general survey, but Stanger apologized to Moodie<sup>11</sup> for unavoidable errors, explaining that it was impossible to pinpoint farms and farmhouses without sufficient points of reference. Indeed, although some

farms were actually surveyed, those based on the 1848 inspections owed their boundaries to estimated distances and no reliance could be placed on them or the extent of the intervening land. Both Stanger and Bird refused to accept full responsibility for the accuracy of isolated plans unrelated to a more general survey which Stanger described as essential.<sup>12</sup> Stanger admitted to having surveyed in 1847<sup>13</sup> unoccupied land between scheduled farms in lieu of a definitive trigonometrical survey but no further mention was made of this and financial constraints and the pressure of other work presumably caused its abandonment. In future Crown Land was to be surveyed only when there was a demand for land, as for example, with the large influx of immigrants. With an eye to the future Stanger instructed his draughtsman to prepare farm plans on the same scale as his projected trigonometrical survey so that the former could be fitted more easily into a definitive survey at a later date. Government policy led to an *ad hoc* survey system meeting the needs of the moment without taking into account the future development needs of the colony. As Stanger justifiably pointed out, the postponement of a general survey for financial reasons was in reality a false economy and the authorities were storing up future problems, particularly in relation to unoccupied land. In one of his most persuasive letters<sup>14</sup> Stanger argued that a trigonometrical survey would be a valuable long-term investment and not always an additional cost, for example, in the delimitation of the African locations. Two years later the Drakensberg location had not been delimited and it was impossible to say where the boundary between farms and the location lay.<sup>15</sup>

It is important to realize, however, that the job of Surveyor-General in mid-nineteenth century Natal was a broad one and Stanger had responsibilities other than drawing up farm plans and a trigonometrical survey. He was an agent of settlement as well as a recorder and was required to anticipate settlement as well as formalizing that which had already taken place. From time to time Stanger was required to undertake special tasks such as conducting a topographic and hydrographic survey of St. Lucia,<sup>16</sup> later cancelled, and a survey of a suspected coalfield at Compensation. The laying down of erven of future towns was considered a primary responsibility and by mid-1849 Stanger was involved in the Land Commission, the Magisterial Districts Commission, the employment of Africans on road building, the collection of African taxes and improvements to the Durban-Pietermaritzburg road. The surveying of town sites, for example, involved resurvey work after earlier efforts had been found to be faulty. Houses were discovered to be occupying what should have been Commercial Road, Pietermaritzburg, and property had to be evened up allowing for a road 83 feet wide, which led to disputes with landowners. Similar problems arose in Durban.

William Stanger died on 14 March 1854 of pneumonia in Durban and was buried in the West Street cemetery. At the time he was acting Secretary to Government and it was not until 1856 that he was succeeded as Surveyor-General by Peter Cormac Sutherland, who was to occupy the post until 1887. Stanger himself had been absent from the colony on leave in England from March 1851 to April 1853, and from 1851 onwards exercised progressively decreasing influence on mapping in Natal. He cannot be said to have carried out fully the terms of his original directive, nor did he fulfil what he personally considered to be Natal's mapping priorities. His maps, although

a distinct improvement on their forerunners, were not unfailingly accurate. In this connexion it has to be remembered that no map, especially in the mid-nineteenth century, is an entity in itself — all draw upon previous maps in a cumulative process. Additional physical, administrative, financial, human and technical problems with which he had to contend have been outlined above. Stanger stands apart from his contemporaries as a cartographer for two reasons. Firstly, he was able to recognize the limitations of his own work, and indeed to comment freely on these. Secondly, and perhaps more importantly, he recognized the vital nature of a general topographic survey for Natal in terms of its future economic development, a need which the authorities proved unwilling, or unable, to provide.

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## REFERENCES

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- <sup>3</sup> WRIGHT, John B. *Bushman raiders of the Drakensberg, 1840-1870*. pp. 48-9.
- <sup>4</sup> A. J. Spies to W. Stanger, 1 April 1848.
- <sup>5</sup> CLARK, J. *Natal Settler-Agent*, pp. 26-7.
- <sup>6</sup> D. Moodie to W. Stanger, 14 April 1848.
- <sup>7</sup> J. Bird to D. Moodie, 11 September 1851.
- <sup>8</sup> J. Bird to G. Greaves, G. Moodie and C. Bell, 4 August 1852.
- <sup>9</sup> W. Stanger to D. Moodie, 2 April 1846.
- <sup>10</sup> CLARK, J. *op. cit.* p. 20.
- <sup>11</sup> W. Stanger to D. Moodie, 10 December 1847.
- <sup>12</sup> W. Stanger to D. Moodie, 7 September, 10 December 1847; 19 January, 10 September 1850.
- <sup>13</sup> W. Stanger to D. Moodie, 7 September 1847.
- <sup>14</sup> W. Stanger to D. Moodie, 10 September 1850.
- <sup>15</sup> J. Bird to D. Moodie, 13 August 1852.
- <sup>16</sup> D. Moodie to W. Stanger, 17 April 1849.

## SOURCES

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