"RAINDROPS, TEST TUBES AND GALAXIES"

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A History of Astronomy in Natal,

with references to the allied Sciences

of

Meteorology, Chemistry etc.,

From 1850 to 1982

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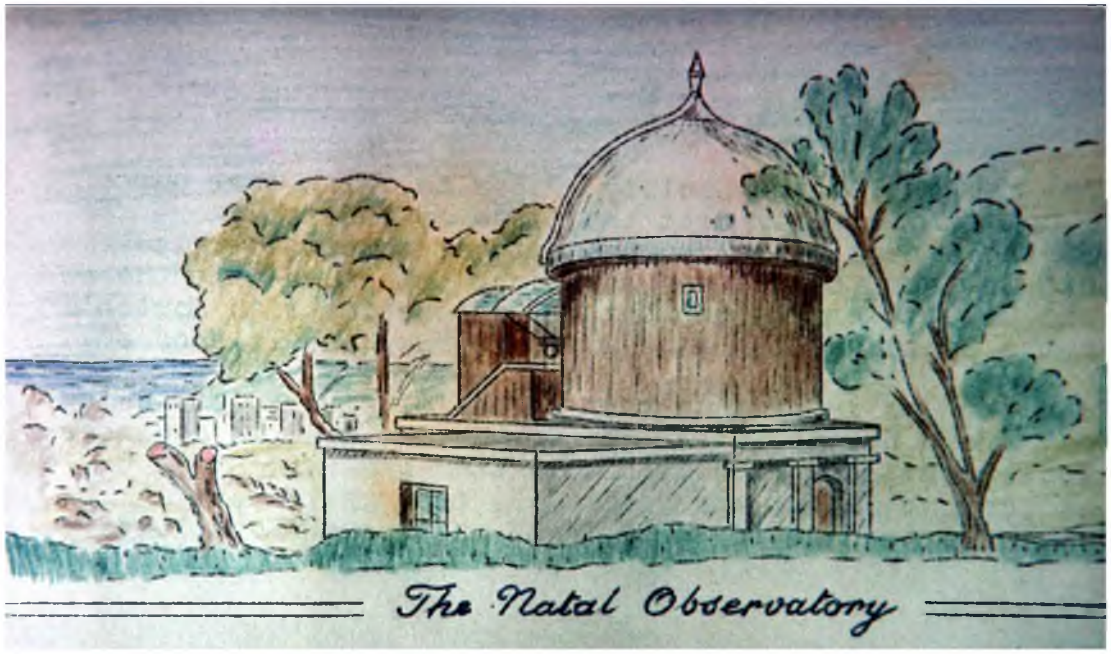
By M A Gray

then Secretary and P.R.O. of the Natal Centre

Astronomical Society of Southern Africa

Originally researched & written in Durban, Natal in 1980

(See Author's Notes)



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AUTHOR'S NOTES

This work began in August 1975 and was originally completed in 1980. The original was typed on a manual typewriter and, although a few photocopies were made, the work lay dormant for many years until it was felt that a "Re-type" onto modern computerised equipment was desirable. This has now been carried out and the following pages are the result, together with some editing and rewording of the original text.

Grateful thanks must go to Dr Ian Glass of the S.A.A.O. for carrying out considerable proof reading and corrections during 2010.

Owing to the lapse of some thirty years since the original was completed, many of the personages mentioned about in the latter stages of "BOOK ONE" have since died and events which have taken

place since 1980 have not been included other than reference to the Re-enactment of the 5th December 1882 Transit of Venus a century later, and the exhibition which was held in the Local History Museum to mark the end of the researches.

It must also be noted that extracts from various documents and newspapers (normally here in *italic script*) have been copied verbatim. No attempts have been made to change the wording, spellings or styles then used.

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This work is dedicated to
the memory of a man with whom
I would have wished to know, and
also with whom it would have been
a privilege to work :

EDMUND NEVILL NEVILL (NEISON)

F.R.A.S., F.R.C.S.,

Government Astronomer to the Colony

of Natal from 1882 to 1912

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INTRODUCTION

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The story behind the compilation of this work, started with a telephone call during August 1975, from Dr B Jones of the Department of Land Survey, University of Natal, Durban. He stated that, during a clear out of odds and ends in their laboratory, he had come across an interesting old "Transit Telescope" and asked if someone would care to have a look at it.

I went to see it and discovered that it appeared to have been one which was originally used in the old Durban Observatory almost a century earlier. After discussion, the instrument in its large wooden box, was then transferred to the Local History Museum in Durban and into the capable hands of the Curator, Mrs Daphne Strutt. She in turn, contacted me a short while later and asked if we (The Natal Centre of the Astronomical Society of S.A.) would be prepared to find out something more about the instrument. Her only records of the old Durban Observatory consisted of a yellowed sheet of paper on which had been typed out a short weather report from the then Government Astronomer.

On behalf of the Natal Centre, I agreed and the researches uncovered a whole mass of information, not only about the transit instrument itself, but also the events leading up to the erecting and equipping of the Observatory, the work carried out there by Natal's only Government Astronomer, Mr E N Nevill (who used the name "NEISON" for his work). This included the work as Government Assayer, Chemist,

compiler of the Natal Tide Tables, part-time Coroner, instigator of the Time Signal system (still in use today) and the "father of Meteorology" in Natal.

Personal travels took me back to the days of the "Byrne Settlers" near Richmond, Natal (1849) and still further researches revealed the story of the start of the "Amateur Astronomical Society" and most of the history of its successor, the Natal Centre. Historical Durban personalities - many of whose names have been lent to main thoroughfares in Durban and elsewhere - were involved and recorded for posterity.

The "chase" was fascinating, the information unearthed - highly interesting to come across, and the many meetings with people in libraries and archives, most rewarding.

Having reached the conclusion that to try to unearth yet more information would involve too much further time and detail, the time has now come (1980) to set out this History in what is hoped to be a readable and interesting manner. Hopefully, my efforts have been successful.

M A Gray

Durban, Natal, 1980

Revised in Cape Town

1997 & 1998

and finally updated in Cape Town

in 2012

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ACKNOWLEDGEMENTS

****

The Author wishes to acknowledge and place on record his sincere thanks and appreciation to the following persons and organisations who gave freely of their time, encouragement and assistance during the period that this work was being researched :

The late Mrs Daphne Strutt - Curator of the Local History Museum, Aliwal Street, Durban

Dr Patrick Moore - "Farthings", Selsey, England

The Staff of : The Observatory Library, S.A.A.O., Cape Town

The Don Africana Library, Durban

The Natal Archives, Pietermaritzburg

The Natal Society Library, Pietermaritzburg

The Municipal Records Department, Durban

The newspapers - "The Daily News", Field Street, Durban

- "The Natal Mercury", Devonshire Place, Durban

- "The Natal Witness", Longmarket Street, Pietermaritzburg

Miss Maud Nevill for permission to record extracts from her father's diaries

The Librarian, Natal College of Advanced Technical Education, Durban (The Natal Technikon)

The Staff of the Deeds Office, Pietermaritzburg

The Staff of the Surveyor General's Office, Pietermaritzburg

The Editors (past and present) of the "Monthly Notes" of the Astronomical Society of S.Africa

The Secretary of the Council for Scientific & Industrial Research (C.S.I.R.), Pretoria

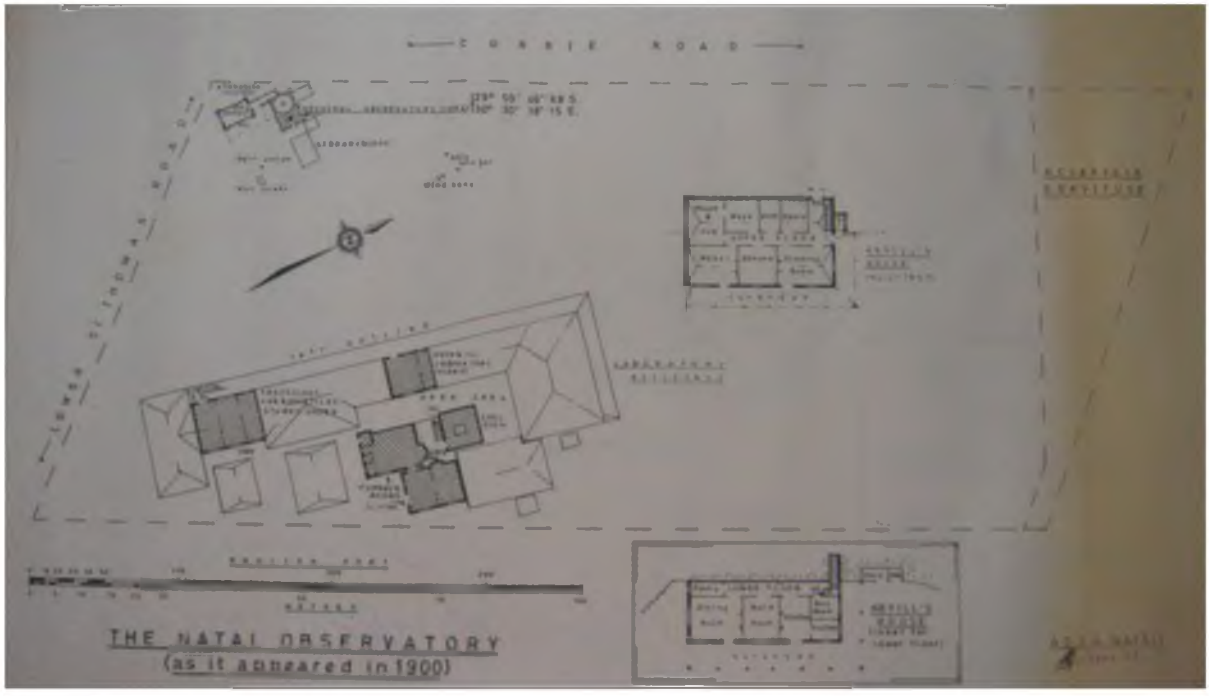
The late Mr Jan Hers, formerly of the National Physics Laboratory, Pretoria

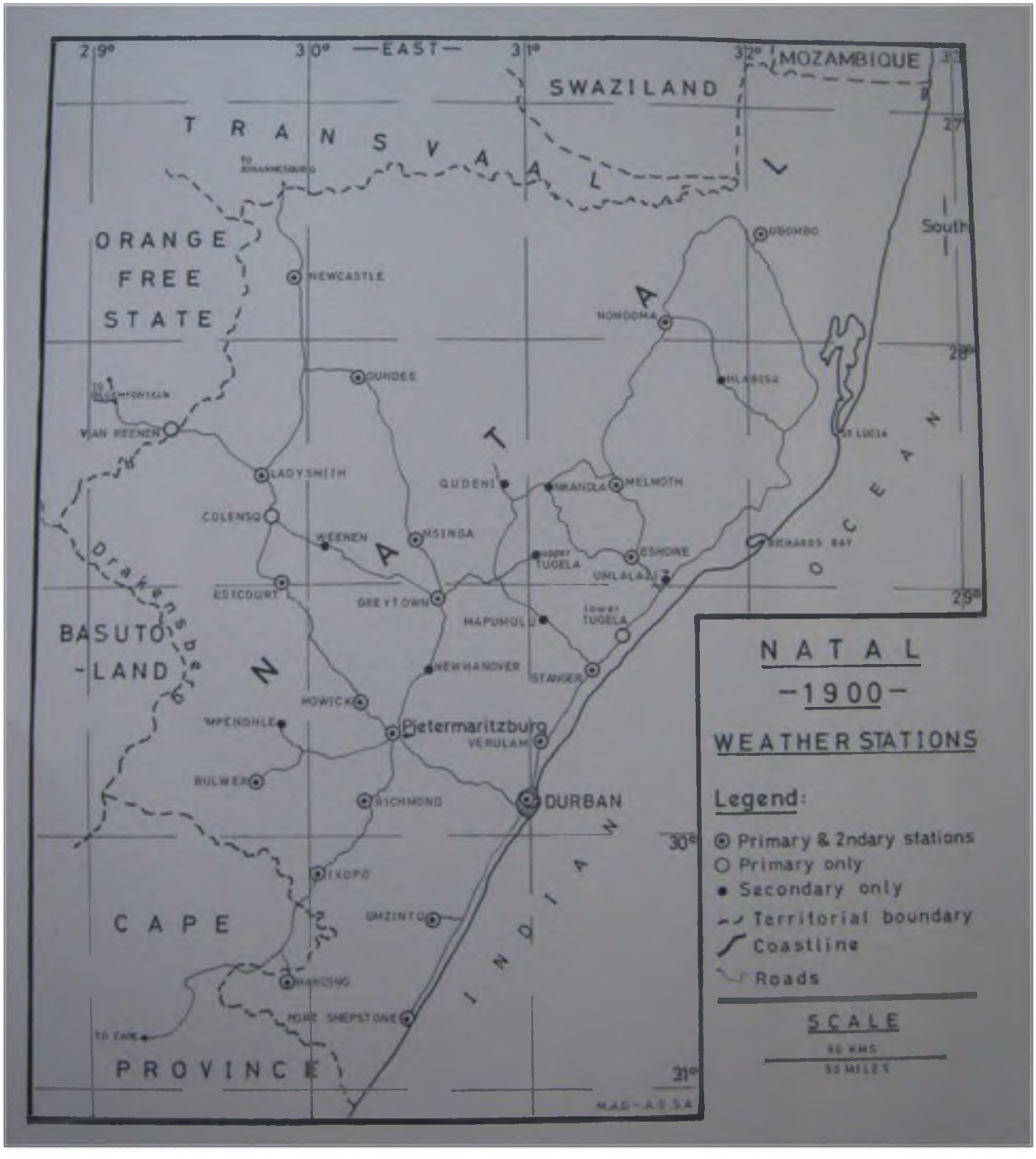
The Killie Campbell Africana Museum and Research Library, Durban

The author's then secretary, Mrs G Browne who had the unenviable task of typing the first book and Miss C Hamblin who typed the second book.

AND many other individuals who, by having taken the trouble to put pen to paper, caused their thoughts to be recorded for posterity, thus making this task a much easier and exciting one than would otherwise have been the case. Also to the many members of the "Natal Centre" who gave enormous encouragement to ensure that the task was completed in good time for the Centenary in 1982.

FINALLY, to my late wife Ann and family who put up with many interruptions in our private life whilst the research was being carried out.





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CONTENTS

BOOK ONE

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THE PERIOD FROM

1844 until 1912

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SETTING THE SCENE

Chapter One

I

OF the various subjects such Astronomy, Meteorology, Chemistry and similar sciences, the first one which appears to have been given official recognition in the days of the old Colony of Natal, was Astronomy.

But, before spending time on the details, it may be well to make some form of reference to the state of affairs which existed in the Colony during the period from 1844 until the main era of this work, namely 1882.

Natal was annexed to the British crown on May 31st 1844, as a separate district of the old Colony of the Cape of Good Hope. The first Lieutenant-Governor of Natal was Martin West, who was appointed as such on 12th December 1845, at which time, the early settlement of what was then called "D'Urban" had only been in existence for a few very turbulent decades.

During 1845, Dr William Stanger arrived and was appointed as Surveyor General. His first objective was to conduct a survey of the Colony, starting with D'Urban and Pietermaritzburg.

Two years later (in 1847) the first sugar cane was imported from Mauritius and planted in Natal as an experiment which, as is known, has become one of the most important crops in the region.

In 1849, the first of the "Byrne Settlers" arrived outside the small settlement of D'Urban and started their long journey into the hinterland near the present day town of Richmond. These settlers are the subject of the first part of this work with one of them being one of the earliest to start keeping records of a meteorological nature in the Colony. It was also in that year that on 1st August, Martin West died. He was replaced by Benjamin Pine (later "Sir Benjamin") as the second Lieutenant-Governor.

It took until 1854 before "D'Urban" achieved Municipal status when its name was changed to the present day Durban. George C Cato was its first mayor and the newspaper, the "*Natal Mercury*" was then two years old, having appeared on the streets for the first time on 25th November 1852. The oldest of the Natal newspapers, the *"Natal Witness"* had started publication in 1850. Both of them are still in business today.

The early Boer settlers who had trekked all the way from the Cape of Good Hope, started to leave Natal and move inland and in January 1854, Bishop John William Colenso arrived and controlled what was then the Church of England from his bishopric in Pietermaritzburg. He was intensely interested in the language, customs and education of the Zulu peoples and created a small school which he called ***"Ekukhanyeni"*** a few kilometres outside Pietermaritzburg.

This school first opened its doors on 1st February 1856 with a total of nineteen pupils. Colenso's interest caused the visit and eventual stay of the Colony's first great educationalist, Dr Robert James Mann.

A wide gauge railway line - the first in Natal - was laid between the Point and the centre of the new town in 1860. This was extended through to the then settlement of Umgeni - a distance of four miles (6 kms.) in 1867, after which the line was purchased by the Natal Government who, on 1st January 1876 started laying the present day narrower gauge line from the town and inland to Pietermaritzburg. This took four years to complete, despite many steep hills, valleys and rivers which had to be traversed. The town of Ladysmith was reached in 1885. Charlestown (at the boundary between Natal and was what became the Transvaal) was reached in 1891 and Johannesburg in 1895 - all of which has a direct bearing on the work carried out by the main character in this work, The Government Astronomer.

Other aspects of this period were the tragic Zulu war which started with an attack in January 1879 across the Tugela River against their King, Cetshwayo and his impis.

Six months later, on 1st June, the Prince Imperial of France was slain by the Zulus in an ambush. By then, the first Indians to be brought to Natal for work in the fast growing cane fields, had been in the Colony for some seventeen years. They now form a sizeable part of the population of the area.

Cetshwayo, the defeated Zulu King, was re-enthroned by Sir Theophilus Shepstone - known by the Zulus as "Somtseu" - on 1st September 1873 but the Zulu/Settlers troubles started up again and Cetshwayo was captured and deported to the Cape. He finally returned to Zululand where he died on 8th February 1884, two years after the inauguration of the Durban Observatory. He was succeeded as King of the Zulus by Dinizulu, one of whose advisors was one Mr William Grant, of whom we shall hear more later on.

Until the year 1878, the only "modern" communication with the hinterland, the telegraph, was from Durban to Pietermaritzburg. On 19th April of that year, the first telegraph line to the Cape of Good Hope was inaugurated. This covered a distance of well over 1600 kilometres, running from Durban through to Pietermaritzburg, Kokstad, Umtata, Kingwilliamstown and thence to Cape Town. This line augured well for the future Observatory and assisted the Astronomer greatly in the work that he was to carry out.

Such then was the state of affairs in the old Colony in those far off days. A Colony beset by local uprisings and wars, short of funds, peopled by men of vision and a peculiar sense of justice towards those who were not born of the same kin as themselves. Shortage of Government funds was the norm and into this somewhat turbulent but fast growing area, there arrived a man who was to bear the brunt of many of the problems of the shaky economics, political and day to day problems, changing opinions of his peers and even the ordinary citizen of the day. His name was Mr Edmund Nevill Nevill.[1]

II

It is almost impossible to state the day or even the year when Astronomy started in Natal, but it appears that the first person to make any headway was the afore-mentioned Dr Robert James Mann, M.D., F.R.C.S., F.R.A.S., who wrote numerous articles and papers, not to mention several books, during his stay in the Colony.

According to Mrs Mann, her husband was born in Norwich, England on 5th January 1817 and that *"during 1844, the science that took the greatest hold of him after he had settled in Buxton, and to the pursuit of which he became more and more addicted, was that of Astronomy. He made an iron reflector [*telescope*] which was afterwards replaced by a 2¾ inch refractor which was constructed for him by Andrew Ross - installing this instrument in a rough observatory at Buxton".*[2]

Dr Mann was one of several Natal Settler Agents in Britain and, at the behest of Bishop Colenso, he and his wife had set sail from Britain on 20th July 1857 in the vessel "*Hotspur*". The ship anchored in Table Bay on 15th September and the Manns visited Mr Thomas Maclear (later Sir Thomas), spending some time at the Royal Observatory where Maclear was then the Astronomer Royal at the Cape.

Dr Robert James Mann, M.D., F.R.C.S., F.R.A.S. whose small observatory in Upper Burger Street Pietermaritzburg set the first time signals for the Colony. He also was the headmaster of the little school at *Ekhukanyeni*. (By courtesy of the Local History Museum, Durban)

Trans-shipping from Cape Town, the Manns finally arrived at Durban on 5th October 1857 and travelled - probably by horse-drawn coach - the 80 odd kilometres to Pietermaritzburg where they took up residence at Bishopstowe, just outside the city.

As mentioned earlier, Bishop Colenso had started up his little mission school called "*Ekukhanyeni*" for the local Zulus. This was near Colenso's home, about 9 kilometres from the centre of the city. It was at this school that Dr Mann started his work of teaching but, as he found it almost impossible to master the Zulu language, it was not long before he and the Bishop parted company and Dr Mann moved into the city where he was to devote a lot of his time to upgrading the educational system of the Colony.

His home was near the present Imperial Hotel in upper Burger Street and was in full view of the garrison headquarters at Fort Napier, about one kilometre distant to the South. He had not been in the Colony for very long before he started a series of meteorological recordings, the earliest of which were in 1858. He published a small booklet entitled ***"The Climate of Maritzburg, Natal - an extract of Meteorological Observations made at Maritzburg in the year ending September 1864, and of the mean results of observations made during the previous six years".*** This booklet was full of facts and figures and served as a basis for

recorded meteorological information for several years.[3]

It is interesting at this point to note that upon Mann's arrival at the Cape, Maclear had advised him to *"take up Meteorology rather than Astronomy"*, and as shall be seen, his

contribution to either science fell into the latter field, although he did become a member of the overseas Meteorological Society in 1867 and was its President from 1873 until 1876. However, let us return to the rest of his work in the Colony.

Mann was made Director of Education in 1858 or 1859 and *"it is to Dr Mann that we owe the establishment of our educational system. He established our High Schools and reconstructed our Government Primary Schools. He also created the principle of Aided Schools*".[4] This latter is now extremely well established.

During 1865, Mann at last achieved his life-long ambition by constructing *"a solidly built and conveniently appointed Observatory - and in this, the Astronomical Clock*

which had hitherto been on the wall of his study, was at last deposited in its own specially designed recess."[5]

The "Natal Almanac and Register" of 1865[6]" records an item under the heading of Latitudes and Longitudes of Southern African Observatories, giving only two, these being : *"Royal, Cape of Good Hope"* and *"Private, Dr Mann's Residence, Natal : Latitude 29° 35' 30" South, Longitude : 30° 22' 30" East, height of Observatory above the Customs House, Port Natal* (Durban), *2095.674 feet* "

Although Dr. Mann's residence no longer exists, after he returned to Britain in 1866, the work of providing a 9 o'clock Time Signal to the Port was carried on by a Mr. Bird, who was a Natal Government Surveyor. He lived in this small house in [redacted] Street Pietermaritzburg and, with the aid of a handkerchief and a chronometer, signalled the fort from the upper window of the gable of this building. Photograph by Author - August 1976.

Apart from the 2¾ inch refractor, there was also an "alt-azimuth" instrument which had circles reading to 10 seconds of arc, together with a small Transit instrument. The Observatory had a revolving dome and was wired to the city Telegraph Office and Durban Bay for accurate time signals to be transmitted. Durban, at this stage of her history, had no means of obtaining accurate times, and thus had to rely upon Dr Mann's observations.

On referring to present day maps of the city of Pietermaritzburg, the Latitude and Longitude of Mann's Observatory would have placed it somewhere about 1 kilometre into the then surrounding countryside to the North of the city and it was no mean feat

for him with instruments of limited power and accuracy to have been less than 0.8' out in Latitude and 10 seconds in time too "fast"! Whatever small errors he might have made, the position of his observatory became far more accurate that had been the case before he started his observations.

Mann's method of communicating the time signals - before linking up by wire and telegraph - is of especial note as *"by means of boards and a pulley attached to a large tree in his garden, he signalled the time every morning to the gunners waiting at the* (nearby) *fort to fire the 9 o'clock gun"*.[7] This rather primitive method of signalling accurate time could of course, not be allowed to continue and it was soon replaced by wiring the Observatory to the local Telegraph Office. However crude his methods might have been, it must be remembered that Dr Mann created the FIRST ever reasonably accurate and regular system of Time Signals in Natal and that these were in fact, the forerunners of the system which is in use today, that is

"Greenwich Mean Time plus two hours" being appropriate to the 30° East longitude line which runs right through central Natal Of the Observatory or Mann's old home, sadly nothing now remains.

Dr and Mrs Mann returned to Britain in 1866 where he became a Government Settler Agent. Before he died in 1886 at *"8 a.m. on the 4th August after being paralysed and contracting bronchitis"*[8] he had rendered the Colony inestimable service in assisting a future leader of the Colony, Mr Harry Escombe with the purchase of the equipment necessary for the then future Durban Observatory.

Mann's work with Meteorological recordings continued until he left the Colony, but there was also some very good work being carried out elsewhere in Natal.

III

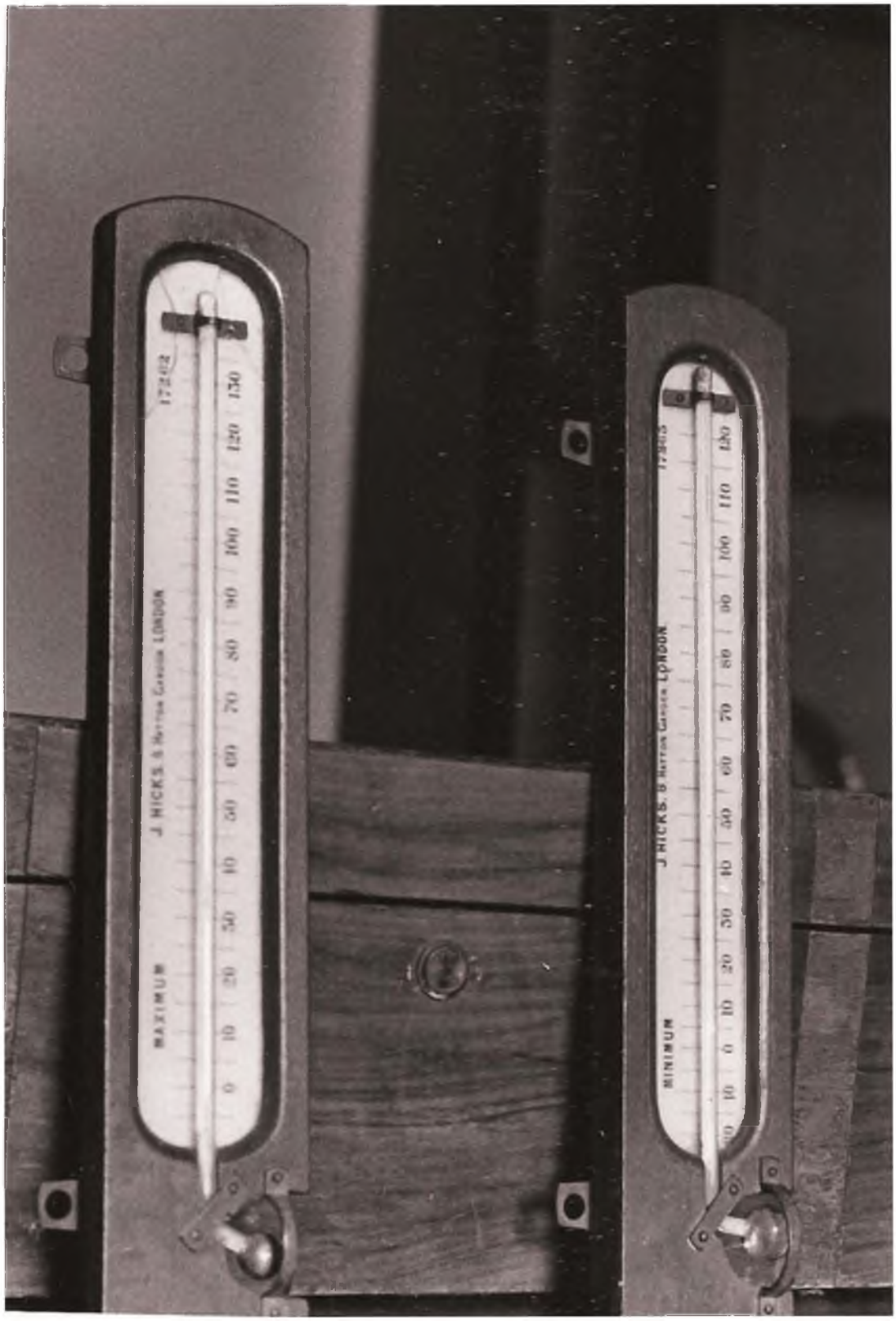
Some 65 or so kilometres to the South of Pietermaritzburg lies the beautiful Byrne Valley at a height of some 3500 feet (1,100 metres) above sea level. The valley has been the scene of settlers from late 1849 and the little area had been desperately trying to get onto its feet - without very much success. Into this part of the Colony there came the McLeod family from England. Most fortunately, Mrs McLeod was an avid letter writer and as a result of her correspondence with her sister "Louisa" in

Britain, further information about Meteorological observations have been recorded for posterity. A contribution to the Natal Almanac of 1878 shows that *"twelve months' meteorological observations from July 1876 to June 1877"* had been made by Mr George McLeod. A later note states that *"all at once, therefore, the Byrne Valley becomes the focal point of weather and rainfall readings for Natal, and Herbert's barometer is made to serve the public."* ("Herbert" was a relative in England who had sent the barometer out to Natal as a present). The readings were recorded as *"having been taken at Byrne, source of the Illovu [sic.] Latitude S29° 48', Longitude E30° 14', approximate height above sea level, 3 500 feet."*

This work continued until George McLeod missed the first four months of 1881 due to an illness which culminated in his death on 29th July of that year. The work however, was continued by his son "Herby" and the reports continued to be published until 1896 when they were supplanted by a "Meteorological Office" which we now know was the new Durban Observatory.

How did this all come about? From early archival records, we find that George McLeod arrived in the Colony in 1850. By 1870 he had made a name for himself as a *"dabbler in scientific curiosities"* - especially by building an *"electrical machine"* and (of course) by starting to send the weather reports to the Durban and Pietermaritzburg daily papers at 8 a.m. and 3 p.m.

The barometer with a thermometer arrived from England in 1875, to which he added the usual paraphernalia used by a serious recorder of weather data. Some of these instruments are still in existence and were re-discovered in the Macrorie House Museum in Pietermaritzburg.


MAXIMUM
J HICKS
MINIMUM
J HICKS
LONDON

McLeod's grave can be seen in the lovely little churchyard of the old settlement and the wooden cross which marked his grave is on the inner wall of the church porch.[9]

IV

Having lost Dr Mann to Britain and having noted the sterling work of George McLeod in the field of Meteorology, now at an end, did Astronomy then die out in the old Colony? In part it did but not entirely. For instance, a painting by Thomas Baines in 1873, entitled *"Durban from Mr Currie's Residence, Berea"* shows a fine refracting telescope in a thoroughly pastoral scene.[10]

This was only one of a number of instruments of this type possible for the use of Astronomy that apparently existed in the Colony during the years from 1870 to 1880. They would naturally also have been used for observing the arrival of vessels off the

coast and quite likely for studying the heavens and the many fascinating objects which can be seen only from southern latitudes.

In fact, judging by the numerous applications the Durban Observatory received with offers of assistance, there were quite a few observers at various locations including one as far afield as Harrismith in the Orange Free State. The work carried out by the Durban Observatory is the subject of much of the rest of this book.

*

REFERENCES AND SOURCES OF INFORMATION

- - - - - - - - - - o 0 o - - - - - - - - - -

1. 1"A History of Natal" by Brookes and Webb, Natal University Press, 1965, pp. 42/155

2. "A Sketch of the life and work of Dr. Mann" - by Mrs Mann, Private circulation in 1886. May's Library No 448, Don Africana Library, Durban.

3. "The Climate of Maritzburg, Natal" - Government issue, Natal Society Library, Pietermaritzburg.

4. The "Natal Mercury" - September 1886, on microfilm, Don Africana Library, Durban

5. Vide 2. supra.

6. Natal Society Library archives

7. "Pietermaritzburg Panorama" by A F Hattersley, Natal Government archives, Pietermaritzburg.

8. Vide 2. supra.

9. "Dear Louisa" - book published by Dr R E Gordon 1970. Pp. 206/207

10. "Durban from Mr Currie's Residence, Berea" (Painting by Thomas Baines), Local History Museum, Durban.

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THINGS START MOVING :

Chapter Two

I

During December 1874, there occurred one of those rare phenomena which take place in the heavens, the planet Venus transited or crossed the face of the sun as seen from our own planet Earth. Several teams of astronomers were sent to different sites all over the world but at virtually all of them, the observations failed, mainly due to adverse weather conditions. The precise timing of first and second contacts during such a transit would enable astronomers to calculate the Earth/Sun distance more accurately..

However, there was to be a second chance as, when an event of this nature takes place, it is usually repeated with a further transit some eight or so years later. This second transit of Venus was due in December 1882 and on this occasion the Astronomers were not going to be caught napping. News of the forthcoming event travelled around the world and in due course, it reached the ears of several important men in South Africa, one of whom was in Natal.

Mr Harry Escombe, who was at that time a member of the Natal Legislative Council immediately became interested in trying to do something about Natal's contribution to science. He was already thoroughly involved in the expansion of the railway system and was also trying to open up the harbour of Durban to allow deep sea vessels to enter at all states of the tide.

The Rt. Hon. Harry Escombe, P.C., Q.C., LID, Mlb, one time Premier of Natal, a close friend of Edmund Nevill and prime mover of the building and equipping of the Natal Observatory. He paid 600 pounds for the 8" Grubb refractor telescope. (Photo, courtesy of the Durban Local History Museum)

Fortunately, Mr Escombe remembered the work carried out in Pietermaritzburg by Dr Mann, and having Mann's London address and after some discussion with David Gill ("Sir David") who was by then the Astronomer Royal in the Cape, he wrote the following letter on 12th July 1880 :

My dear Dr Mann,

I rely on the interest you have always taken in Natal for such assistance as you may be able to render to me in the efforts I am making to promote the establishment of an Astronomical and Meteorological Observatory.

I propose to introduce the subject to the Legislative Council in October [1880] *by asking the Government to vote sums of money sufficient for the :*

(a) Erection of suitable buildings;

(b) Purchase of necessary instruments;

(c) Payment of suitable salaries to a Gentleman from England to take charge of the Establishment and to an assistant.

I have been prevented from broaching the matter in the last two sessions by the disturbed condition of all South Africa, but now that we have no burning questions either in politics or in our relation with the neighbouring tribes, the season seems favourable for an attack upon the public purse.

For the past three or four years, I have been in the habit of delivering lectures on astronomical subjects and of referring to the necessity of carrying out at an early date the project now in contemplation and every case those references have been well received.

I enclose a cutting from the "Natal Mercury" of the 10th instant from which you will see that I have the promise of support from "Canopus", whose name I do not know.

It may be urged against me that the neighbourhood of the Cape Observatory renders unnecessary a similar institution here and what I particularly seek to show is that there is more work to be done as regards the Southern Heavens than present stations are equal to, with some evidence on this head and having regard to the large interest which is taken in Natal, in the cause of education I shall be able to make a good fight even if I fail.

I do not know if the Astronomical Society will interest itself in the matter, but if the Council of that body will lend me its support, I should carry out my intention with greater confidence.

We shall not be able of course to be of much [use] as regards the transit of Venus in 1882 except as perhaps as regards the first contact with a clear Western heaven but the date of that conjunction will be a good one to work to and I see no reason why the Station should not be complete within the time.

I shall not be afraid to ask for a suitable site, £1 000 for buildings, £2 000 to £3 000 for instruments and £1 000 a year for the fixed Establishment but it is only prudent to expect some opposition, not only to the principle of the measure, but also to the detailed cost.

I take it that the nomination of a Gentleman fully qualified for the office would be entrusted to the Astronomical Society or a kindred institution.

The points on which I specially seek information are as follows :-

(a) What will be the cost in England free on board the ship of the instruments necessary for a thoroughly useful but unpretentious Meteorological and Astronomical Observatory?

(b) What sum would be a fair salary to a Gentleman properly qualified to take charge of this Observatory?

(c) What sum would be a fair salary for an Assistant?

(d) Assuming the ability of Natal to bear the expense, has science a fair claim upon the Colony for such services as a second Observatory in South East Africa would render?

(e) What, in your opinion having regard to the convenience now offered by the Railway, is a suitable locality for a site; Maritzburg, Durban or some point between these two towns?

As soon as the Council is over, I hope to pay a visit to England and thank you in person for your kind aid which I venture to anticipate.

I remain

My dear Dr Mann

Yours faithfully

H ESCOMBE [1]

This letter has been reprinted in full because it is the first and oldest of all the letters referring to the founding of the Observatory that appears to be in existence. The original was written in Mr Escombe's own hand on ruled foolscap paper in pencil and it was then re-written in copperplate by a scribe. Both documents (amongst many others) are now in the possession of the Local History Museum, Durban.

The post from Durban to England had to go by sea via the Cape and it was some time before a reply from Dr Mann was received. *Inter alia*, it reads :

5 Kingsdown Villas

Wandsworth Common, London

September 13th, 1880

My dear Sir,

It gave me much pleasure to receive your communication requesting information and advice as to the best course of proceeding for the establishment of a serviceable Astronomical and Meteorological Observatory in Natal ..... I have consulted with Mr Browning upon the character and costs of the instruments most desirable, as he is one of the best authorities in England on such matters.....

My own impression certainly is that the Meteorological observations are of the first importance upon public grounds, ... and that owing to the peculiar circumstances in Natal, these should be carried out simultaneously both in Durban and Pietermaritzburg. The scientific and practical value of the observations at each of these will be quite doubled by the comparisons which would thus be provided for .... the cost for each station for the best class of instruments would not exceed £50.0.0d.

..... I deem it well to point out that it is of very great consequence that these should be at once started upon following the same plan as those which I myself made at Maritzburg some time hence for eight years. My own series of observations are still carefully preserved and are most complete and valuable. .... When you begin to print the Meteorological observations, it would be well to print my entire series in full detail. I have my own manuscripts of these observations carefully preserved and there is a

duplicate copy of them in the record office of the Meteorological office of the Government in London.....

So far as the Astronomical Observatory is concerned, I think that there can be no doubt that the first step should be to establish a Time Signal Station for nautical purposes and on this account the Observatory should assuredly be at Durban. I should endorse that in the first instance the instrumental establishment of this observatory should be a clock of the very best quality - a three inch Transit instrument and an 18 inch altazimuth instrument. These could be supplied for £460 - it should carry a Time Ball of some kind ..... the Altazimuth instrument could be made to accomplish some wonderful work.

After the fundamental work of the Observatory had been satisfactorily established ... I should recommend the addition of a thoroughly good six inch equatorial with a driving clock and parallel thread micrometer ... These could be supplied for £550 ... The work could be planned with friendly consultation and in co-operation with the Royal Astronomer at the Cape.

The Plan of the Observatory should therefore from the first, comprise a Transit, Clock and Alt-azimuth room, the Alt-azimuth have a revolving dome but the room being so planned that the clock can be used with both instruments - and an Equatorial room with a revolving dome .....

I think you would require a salary of £500 for the Astronomer and of £200 for the Assistant who should also take the Meteorological Observations. £100 should suffice for the salary of the Meteorological Observer at Pietermaritzburg. I would recommend that any selection of the Astronomer should be placed in the hand of the Astronomer Royal at Greenwich ....

It will be unnecessary that I should add how exceedingly glad I shall be at any time, to see you here, and to go into the whole matter with you most exhaustively and carefully .....

I am, my Dear Sir

Very truly yours

Robert James Mann M D.,

F.R.C.S., F.R.A.S.

P.S.. I am unable on the instant to give any estimate of the cost of packing and shipping instruments but it would not be very large.

There follows a separate sheet of paper upon which Dr Mann listed out the various costs of certain instruments that would be required. They are printed in full if for no other reason than to give today's Astronomers a chance of comparing them with current prices!

NORTH ELEVATION

EAST ELEVATION

The proposed appearance of the Observatory when constructed. Dome for the 8" refractor with Transit room extension. (Courtesy L.H.M. & S.A.A.O)

INSTRUMENTS FOR METEOROLOGICAL OBSERVATORY :

Standard Barometer

Standard Thermometer

Maximum Thermometer

Solar Rack above Thermometers

Dew Point Thermometer

Minimum Thermometer

Copper Rain Gauge, Royal Observatory pattern

Robinson Anemometer - As made by Browning for Royal Observatory

Osslers Wind Vane & Pressure Plate . . . . . £ 50.0.0d

Duplicate set for second observatory . . . . . £ 50.0.0d

INSTRUMENTS FOR ASTRONOMICAL OBSERVATORY :

Siderial clock of best construction . . . . . £ 85.0.0d

3 - inch Transit instrument . . . . . £ 75.0.0d

18 - inch alt-azimuth reading to 1 second of arc with

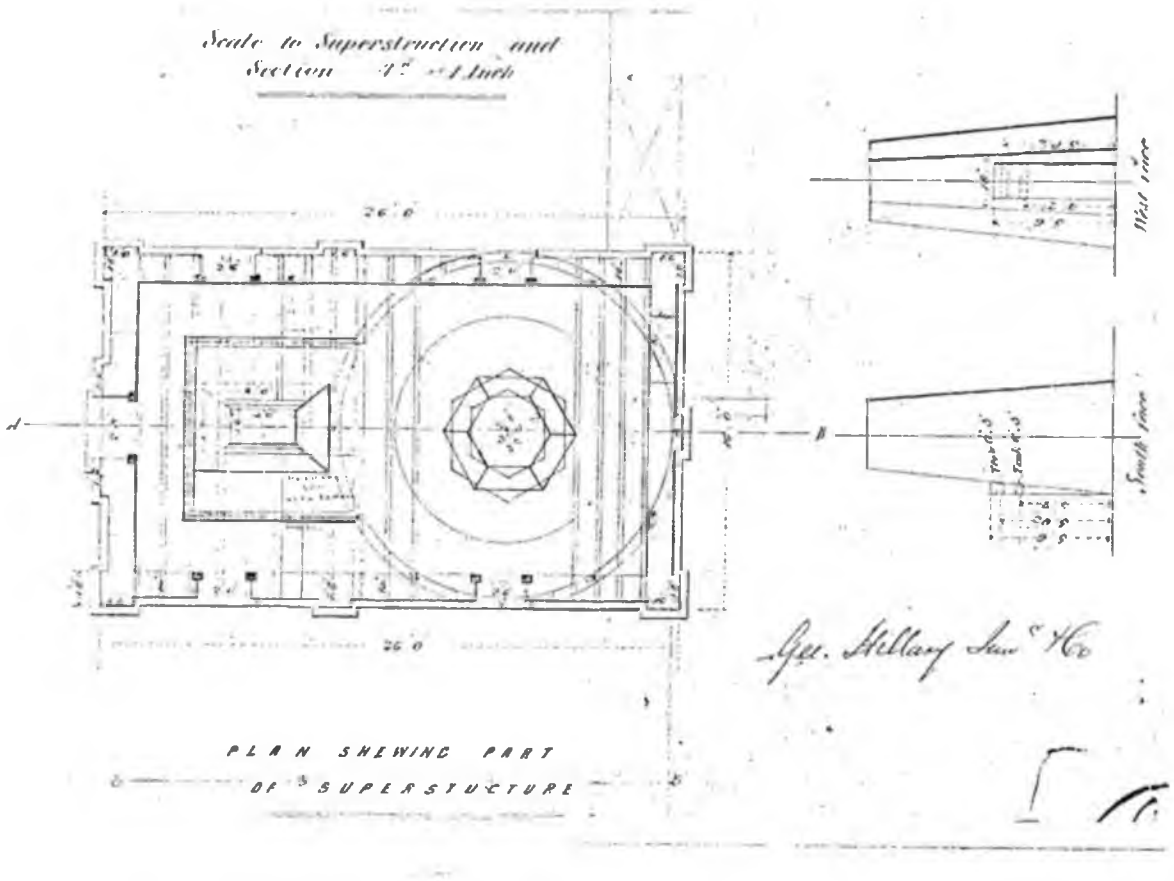
three eyepieces and 2 microscopes £300.0.0d

Six inch Equatorial (telescope) £500.0.0d

Driving clock and micrometer for ditto . . . . . £ 50.0.0d

Time Ball . . . . . unknown

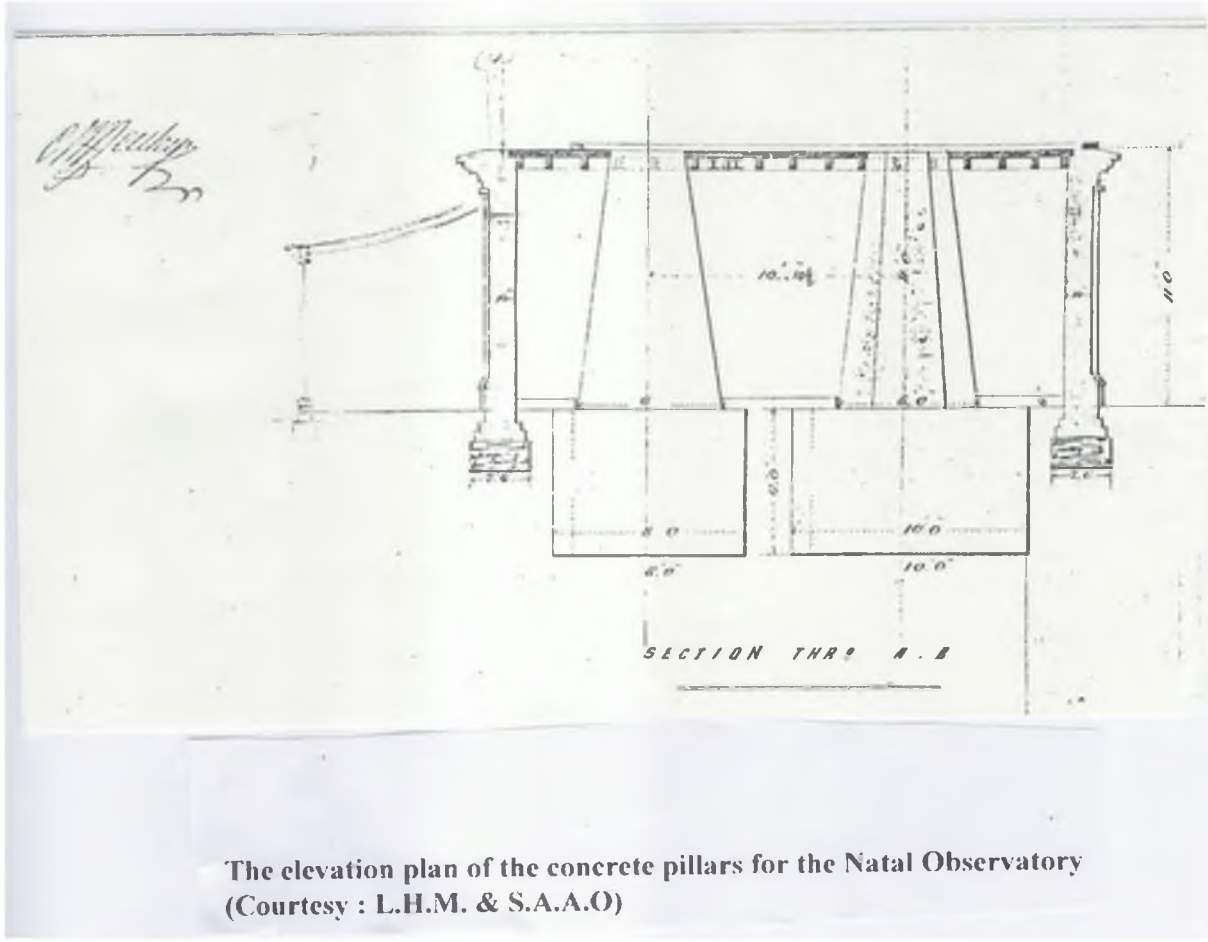
Packing and shipping not included in estimate.[2]



The Architect's plan of the proposed Natal Observatory (Courtesy of the Local History Museum, Durban & the S.A.A.O)

With these two letters, things began to move, slowly at first, but with gathering momentum as time passed. Plans were drawn up by Mr Howard Grubb (whose company eventually becale "Grubb Parsons") and a letter to Mr Escombe dated August 19th 1881, was written from a Mr H G Jordan of Durban asking permission to submit an estimate for the building ... *"in Portland cement concrete or to submit a design for such a building in concrete"*. The said Mr Jordan had by then already constructed the concrete pedestals "*upon which the instruments are fixed, which Dr Gill is now using in the Government enclosure in Durban*". He also stated that he had the honour while in England ... *"a few years ago to build a small Observatory at Lower Norwood, Surrey"*.

Hence, we learn that Dr David Gill was actually in Durban in August 1881 and that the pedestals for some of the instruments had already been cast. On 20th August, Gill (who had by then returned to the Cape) wrote to Escombe advising him that he had received an estimate from Howard Grubb. He recommended the acceptance of the proposed Observatory at £200 and enclosed a rough sketch which *"will enable any intelligent Architect to prepare the foundation and piers of the Observatory"*.[3] A few days later on 28th August, Escombe wrote to Mann in England advising him that *"the site is in the North-west corner of the Botanic Gardens. My fellow townsmen, Greenacre and Randles contribute the building. I, the Equatorial, the Government will introduce a salary for a Gentleman to take charge and for Transit Instrument, clock etc...."*[4]



The elevation plan of the concrete pillars for the Natal Observatory (Courtesy : L.H.M. & S.A.A.O)

A new figure now appears on the scene, namely the then Secretary of the Botanic Gardens, Mr William Keit. He wrote a letter to Escombe on 16th September 1881 as follows :

Dear Sir,

About the year 1851 [the] Government granted fifty acres of land to the Natal Agricultural and Horticultural Society.

In 1854, Messrs. W Evans and Kähts were elected trustees and the Title Deeds of land granted were placed in the hands of the Society.

[The] Trustees and Mr Sanderson, who was President during the last twenty years of his life, are dead and Mr Brickhill, Honorary Treasurer and Mr Jameson are, I believe, the only persons officially connected with the Society at present, but I do not know who is now in possession of the Documents of the Institution.

[The] Government has informed the Society lately that possibly during the next session of Council, the Grant in Aid of the Gardens may be withdrawn and I fear that, if the Society does not speedily reform, our Institution will collapse and Government will take repossession of the land.

Therefore until the fate of the Gardens has been decided, I am unable to point out anything that might stand in the way of having a few acres of land ruled off from the Gardens for an Observatory.[5]

History now shows that Mr Keit's fears did not materialise and the Gardens today are one of the main tourist attractions of the City of Durban. Dr Mann had moved to "Sloley Hall" in Norfolk - whether permanently or not is unknown - when he wrote again to Escombe in a letter dated 4th October 1881, asking to be kept informed as to the progress of the establishment of the Observatory.[6] David Gill cabled Escombe on the same day advising him that *"Grubb has sent very satisfactory contract for most complete equatorial eight inches for four hundred sixty five pounds half to be paid now and remainder on completion. Shall I send him order on your Brother or shall you do so? Plans and estimate of observatory to come by next mail"*[7] He followed this up with a confirmatory letter in which he added that the British Government had decided not to send a Transit of Venus expedition to Natal. Gill's view was that, *"although the meteorological conditions may not be favourable, in every other point of view, Durban is the most favourable position on the whole, in the Southern hemisphere for the observation of ingress"*[8] A further letter to Escombe dated 17th October, indicated that the Grubb contract was enclosed and that he had sent of the confirmation order for the equatorial to his [Escombe's] brother in London. *"The telescope will be all a telescope can be and I think it a remarkable bargain."*[9]

On the 7th November, Harry Escombe wrote to Gill advising him that he felt the Government Grant for the salary of an observer would be attended to on a "year to year" basis. The matter was to be brought before Government very shortly and the Observer could be placed on duty during 1882, either on January 1st, or July 1st., [10]

On 23rd November, the first offer of [local] outside assistance made its appearance in the form of a letter from Mr E E Markwick of the Ordnance Department, Fort Napier, Pietermaritzburg.

This letter reads as follows :

Dear Sir,

Being much interested in the progress of astronomy and hearing the Observatory which you have advocated with such praiseworthy zeal is now to be definitely established, I beg to offer my humble assistance in any way which may be useful, either in making observations, or reducing them.

As the Observatory is to be at Durban and I am stationed at P.M.Burg [sic.], my opportunities of the former would of course be comparatively scarce, but at the same time, I should be only too glad to assist in any line of work which my spare time would allow me to take up.

I have had a certain amount of practice in amateur observations, more especially observations of sun spots. My own telescope , a 2¾" refractor of beautiful definition is now in England but I have ordered it out now that I find that I am to be permanently stationed at P.M.Burg.

I quite recently arranged for a good reflector of 6 inch aperture to be sent out (from Calver in England) to a Gentleman in Pretoria of astronomical tastes. I have no doubt he will have excellent opportunities of observing in the wonderfully clear sky which usually prevails in the Transvaal.

Apologising for troubling you - and hoping soon to have the pleasure of making your acquaintance,

I am, etc ..... [11]

As will be seen later on, Mr Markwick's assistance was taken up for the actual Transit and in fact, his work proved to be of great value. Here then, is the first known Amateur Astronomer in Natal whose offer of assistance to the professional Astronomers was accepted.

II

David Gill sent a circular letter to all interested bodies in the country during November 1881 in which he advised details of the minor planets "Victoria" and "Sappho", which were to come into opposition during the summer and autumn of 1882 (January to April in the Southern hemisphere) asking for assistance in observing these and thus determining more closely the solar parallax.

Further on in his circular, he detailed several instruments which would be made use of for these observations, the third of which was, or would be *"an equatorial ... of eight inches aperture by Grubb of Dublin. The cost of this telescope with its observatory had been defrayed by the liberality of three gentlemen in Durban, Natal ....[The Durban] telescope will be employed by an assistant especially trained for the work."*[1]

Turning now to Municipal matters, the Minute Book of the Council of the City of Durban dated 16th December 1881 reveals that, under the heading of "re - Astronomical Observatory" the following entry appears : *"No 8847, Messrs. H Escombe, H Randles and B H Greenacre, dated December 16th 1881, praying the Council to grant a tenancy at will of a suitable site for an Astronomical Observatory within the Borough. Moved by Councillor Jameson, seconded by Councillor Aiken, and resolved that Memorialist be informed, the Council will be most happy to give the matter their favourable consideration if they will point out a site which, in their opinion, is suitable for the purpose named."* Thus, the wheels for obtaining the land had started to turn.

On 13th January 1882, Mr Harry Escombe was elected a Fellow of the Royal Astronomical Society. The Certificate sent to him was signed by J W L Glaisher and its receipt must have given Escombe a most pleasant surprise. His election was the direct result of much lobbying by Dr Mann in London.

Permission for the laying of the foundations of the Observatory was given by telegram from the Cape to Escombe on January 16th 1882, and the successful candidate for carrying out the work was a Mr C J H Jenkyn. This cable also mentions, for the first time, the name of Mr Pett who was then on the staff of the Cape Observatory. He was to be seconded to Durban to see to the construction and layout of the building and its contents. Escombe immediately got to work and wrote to Jenkyn that he was to proceed at once *"with the foundations for the equatorial, drawing on me under the head of 'Observatory' for the cost of the work and your own professional charges."*[2] At that stage, the instruction was to "Lay foundations and build walls, also lay concrete foundations for piers but do not cast piers themselves until you have my letter" - this referring to a special request by Gill at the Cape.

Mr Pett - who was soon to arrive in Durban, had some doubts about the wisdom of his move and wrote several letters enquiring about the terms of his employment. David Gill's own feelings were rather fatherly towards his assistant and suggested that Pett's salary should be in the region of £400 per annum. At that time Pett was then actually employed by the Admiralty and Gill felt that there might be considerable delay in engaging a successor for him at the Cape. Somewhat naturally, Pett want some sort of guarantee for his salary! This was given on 2nd February when Escombe wired Gill, at the same time ordering the Transit instrument and the clock. He stated that at least one year's salary was guaranteed.

However, it does not appear that Pett was totally satisfied, for he wrote his first known letter to Escombe from the Cape early in February, advising Escombe that :

> "*My appointment here [Cape Town] is worth, with allowances, about £250 with every prospect of promotion and a pension on retirement, and although anxious to meet you in every way, Dr Gill agrees with me that I would be very foolish to resign my permanent position for a temporary appointment which is only guaranteed for one year.....*
>
> "*If you have no hope of the observatory being made a permanent institution, and the observer's position secured by the Government or some public body, I regret to say that I shall not feel justified in resigning my appointment here.*
>
> "*This will probably not interfere with my work of mounting the instruments and making the proposed minor planet observations this year, but it will seriously affect the question as to the observation of the Transit of Venus*

with your instrument, since Dr Gill says that unless my resignation is handed in before the middle of April, he cannot accept it"[3]

One can hardly blame Pett for his reluctance to upset his own future and, as shall be seen, everything eventually worked out in his favour.

Just after that letter was received, Harry Escombe received the news from Dr Mann that he (Escombe) had been elected as a member of the F.R.A.S., and ended his letter of 10th February with the words "... *With assurance of very kind regards and my wish that you may have [many] prosperous and happy years of fellowship in this venerable and really distinguished Society"*[4]

No doubt that there were some mild celebrations that day!

To Robert Pett's letter of concern, Escombe replied that it was his hope that the Observatory would be permanent and that this hope is "*founded on the general approval of it which has been expressed upon its admitted utility and our own intention to use all endeavours to secure a yearly vote."*[5] Other matters were however to be attended to, and as a result of a request to the Telegraph Department in Pietermaritzburg, the General Sub-Manager, Mr Chadwick promised to "*take immediate steps for the providing of an estimate of the cost of construction of the lines of telegraph"*[6] - obviously from the local Post Office to the Observatory.

Further worries on the part of Robert Pett then resulted in the idea that the Government should place the Observatory on the same footing as other branches of the civil service, and should not have to rely on the annual motion of a private member. This would obviously make the institution slightly more stable and also lend it a feeling of permanency.

Royal Astronomical Society,

BURLINGTON HOUSE.

13th Jan 1882

Sir

I HAVE the pleasure to inform you, that you have this day been elected a Fellow of the Royal Astronomical Society. The Bye-Laws relative to new Fellows, with which it is expedient that you should be more immediately acquainted, will be found on the subsequent page. The prescribed form of obligation, therein alluded to, is enclosed; and I have to request that you will return it to me at your earliest convenience, after having subscribed it with your Christian name and Surname, together with the addition of your Rank, Profession, &c., and your *usual* place of Residence; in order that they may be properly inserted in the usual printed List. Enclosed, also, is a Card announcing the days on which the ordinary Meetings are held during the present season.

I have the honour to be,

Your most obedient Servant,

J W L Glaisher

Secretary.

Harry Escombe Esq.

Mr Harry Escombe's election as a Fellow of the Royal Society in January 1882 (Courtesy L.H.M. & S.A.A.O.)

More private assistance was forthcoming with a letter from a Mr John Ballot of Rolfontein, Wakkerstroom in the Transvaal who sent a letter dated 18th March (1882) to Escombe offering his assistance at the forthcoming Transit, although he pointed out that he had no previous experience in observing or reducing, he was as keen as he could possibly be to join and assist in whatever task he was given, however menial. Mr Ballot's offer was refused but he did what he could for the Transit whilst still in the Transvaal, some 700 kilometres distant.

In April, Dr David Gill made his decision. Robert Pett was to be temporarily transferred to Durban and would be available to observe the Victoria and Sappho conjunction but would have to return to the Cape for the Venus Transit. A letter from Gill letter (4th April 1882) advised also that if *"after two or three months in Durban, you [Escombe] cannot persuade Mr Pett to accept Directorship of the Observatory after the Transit of Venus, I think I can immediately put my hands on an efficient substitute..... P.S. Please accept my congratulations on your election to the F.R.A.S"*[7]

To this arrangement, Pett agreed and things seemed to be settled. Twenty days later, Gill wrote again to say that *"Mr Grubb hopes to send off your telescope this month. The dome is done but the lower part of the Observatory is not quite completed. He hopes to send it off this month or by the first week in May. He has been under extreme pressure to complete all his orders for the Transit and I have had to put very severe pressure on him and to threaten him with no future orders unless the Cape and Natal work is done and in time...."*[8]

These threats appear to have worked because a letter from the "S.A. Loan, Mortgage and Mercantile Agency Ltd.," in Britain, advised that the cases containing the telescope had been shipped to Natal on the ***"Taymouth Castle***" and ***"Conway Castle".***

The subject of the proposed "Time Ball" was the next item to be considered and Escombe received a long letter dated 27th May 1882, from a firm called Simpson and Son of Central West Street, Durban, setting out a long list of technical and non-technical information as to how such a ball might be operated. They had had the pleasure of installing such a system in Calcutta.

On 15th June (or thereabouts), Pett finally arrived in Durban - almost on the same day as the ***"Conway Castle"***. The freight for the shipping of the telescope parts had cost £15.8.6d. Mr Grubb followed this up with a letter from Dublin dated 5th July confirming that all had now been shipped to South Africa.[9] He was as good as his word as, on 15th July, five cases arrived on the ***"Duart Castle"*** containing the iron

dome but it was some time this could be erected. The main task was to cast the piers for the instruments and then to erect the dome. The piers were duly cast, the telescope was erected but then there was trouble!

Even though protected by three layers of new tarpaulins, heavy dew had penetrated these coverings. Natal's weather, being what it was (and sometimes still is) was acting in its usual unpredictable manner. Right in the middle of what is generally regarded as the "Dry Winter Season" the heavens opened up and during a critical 24 hour period, just over an inch (25.4 mm) of rain fell and soaked everything!

Pett had a general complaint which he passed on to Gill at the Cape. He informed Gill that the total freight for the shipment of the whole Observatory had come to £72, of which some £57 had been for the dome alone. He stated *"I have been engaged this week [July 23rd] dismounting the telescope, rigging stage and hoisting the stand on top, getting stone made and fixed on top of pier and on business with Jenkyn, the carpenter, Pardy and Escombe"*[10] He must have felt quite frustrated!

A new name now appears for the first and apparently the only time. The letter is quoted in full as the father of the person who wrote it lent his name to one of Durban's more residential streets, Currie Road, high on the Berea in Durban - in which the Observatory was being erected.

To Mr Escombe. Porril, July 28th, 1882

Dear Sir,

Nothing would please my ambitious self than to be of some service to the Astronomical Society at the Observatory now in course of completion on the Berea, in return for any information which I should be sure to gain from it. I regret not being able to subscribe to it, but should be pleased in fact, feel it an honour to be of any service.

I live within 200 yards of it and not much fear of changing my residence for years. Trusting you will bear me in mind in the event of any office work as Honorary Secretary being created.

I am, Dear Sir, Yours faithfully,

J Currie[11]

No records appear to have been made in Durban of the work done (if any) to observe the opposition of the two minor planets. It is possible, but unlikely that Pett had the equatorial telescope functioning in time. Maybe some records of this event exist in the Archives of the Cape of Good Hope or even in Britain.....

The next problem that the planners had to deal with was "Good Communications". A letter received from the Town Office (28th July) and signed by the Town Clerk advised that as the water pumping station at Currie's Fountain was being fitted with telegraph wires, the Council had in mind asking permission to use some of the poles connecting the fountain and Observatory for an extension to the Berea Police Station to facilitate speedy communication should a fire break out![12] These wires ran down to the Durban Post Office. Pett replied to the effect that he felt that the exercise might well prove fruitless as the telegraph wires were really for the purpose of the future Time Ball and could not be tampered with.

A vote of £350 was granted by the Council of Durban on 28th July towards the cost of the Observatory and Mr Escombe (under Minute No 9716 of 1st August) acknowledged receipt of this amount. The next entry in the Minute Book is somewhat amusing but has absolutely nothing to do with this work. However it will give the reader an idea of the ways of Durban in those far off days. A Mr Henderson requested permission ***"to blow a bugle upon the starting of the Umgeni bus. Resolved such permission be granted in terms of application during pleasure of Council and subject to such privilege not being abused".***[13] It must be remembered that all road transport in the 1880's was either by ox-wagon or horse-drawn vehicles.

III

What had the Legislative Council and the Natal Colonial Government been doing? During the extremely busy period from early 1882 until August of that year. To answer this question it

will be necessary to turn back the clock a little to pick up threads of the story.

As usual, Mr Harry Escombe was the prime mover of the various motions that were raised and discussed at the highest levels. It obviously made sense for an ambitious person to be a member of the Legislature, no doubt an early example of the old adage that "it is not *What* you know but rather *Who* you know"!

We go back to the proceedings of the Legislative Council for Tuesday 25th October 1881 where we find under the heading of ....."*VIII, Mr Escombe moved, pursuant to Notice, seconded by Mr Garland that, respectful address No 8 be presented to the Administrator of the Government, requesting His Excellency to cause to be placed on the Estimates for the year 1882, the sum of £500 for the purposes of an Astronomical and Meteorological Observatory and of an observation of the Transit of the planet Venus in 1882".*[1]

After discussion, the motion was put and agreed to. The discussion itself is worthy of reproduction in full as it grants a clue to the attitude of the representatives of the man in the street with respect to Astronomy well over a hundred years ago. Unfortunately, this attitude was to change drastically as the years went by and it is certain that, had Escombe known it then, he would have had second or third thoughts about spending £600 of his own money in purchasing the eight inch Grubb telescope. The discussion reads as follows :

"ASTRONOMICAL AND METEOROLOGICAL OBSERVATORY"

"*The honourable member [Mr Escombe] said this [the above request for £500] could only be regarded as a grant-in-aid, if it was fortunate enough to meet with the approval of the Council, because the Amount would have to be supplemented by private enterprise. The remaining sum, to make a total of £1 500 had been promised. This grant could scarcely, he admitted, be justified from a material point of view, but he pointed out its good effects from an educational point of view. It would encourage astronomical and meteorological observations. He had been for two years in communication with Dr Mann, and in a recent letter, that gentleman pointed out the importance of observations being recorded both at Durban and Maritzburg. Dr Mann still preserved the results of his eight years' records in this Colony.*

"*The Astronomer Royal at the Cape [Sir David Gill] when here recently, expressed himself in favour of some exchange of observations between Natal and the Cape for mutual information. In so far as the vote was concerned, he could not claim it on the grounds of direct gain to the Colony. He submitted that there was work to be done in*

the world, although no particular section might obtain a direct advantage, by neglecting to do it might tend to disadvantage to the whole. The work done might be useful in years and centuries to come. It might be suggested that such an observatory was not necessary, because there was one at the Cape, supported by the British Admiralty, but he should meet that objection by quoting a letter of the Cape Astronomer Royal, in which he expressed a hope that an Observatory would be established in Natal.

"*If an Observatory were established here, we should not be dependent on the Cape for our time, which was so important a matter to shipping. It would be within the knowledge of honourable Members that there was to be a Transit of Venus in December 1882, and it was a fact that Natal was one of the best sites in the world for the earlier observations. It these were properly done, they would have an important effect in the settlement of the distance of the earth from the Sun - a matter which had occupied the attention of science for centuries.....*

"***Mr Mellersh** : Who is to take these observations?*

"***Mr Escombe** : The intention is that the observations shall be taken by a telescope now ordered from England, by a skilled observer to be paid out of the vote in question.*

"***The Colonial Secretary** : said that he heartily supported the motion. The vote asked for was to supplement a generous gift of two gentlemen in Durban, to whom they ought to be grateful for assisting the Colony to take a rank in the science of astronomical observations ... He did not always agree with the observations of the Honourable mover. It was not long ago since the Honourable member made the observation that he, the Colonial Secretary, might have been sent to the Virgin Isles! Since that observation, he has been pestered with applications from young men to go with him as his aides.....*

"***Mr Garland** : said that he was informed that one hundred years would elapse before there was another such Transit of Venus, so that honourable Members need not fear they would have a similar application.*

"*Motion passed and address agreed to*"[2]

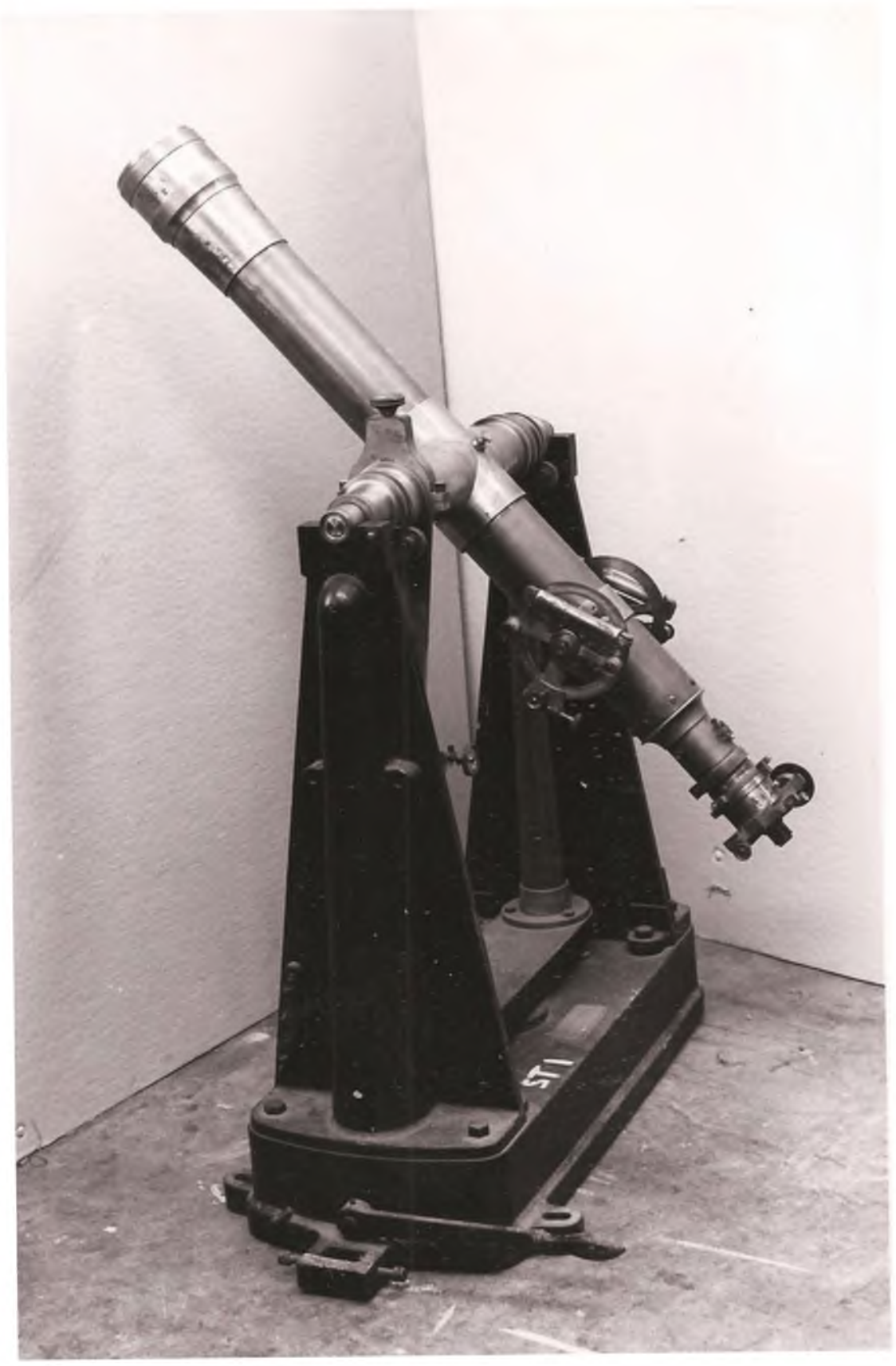
IV

By August or September 1882, about everything that could be done to get the Observatory started, had been carried out. The building was more or less completed, the large refractor was suitably installed and Robert Pett was attending to the last details to see that everything would be in order for the forthcoming Transit.

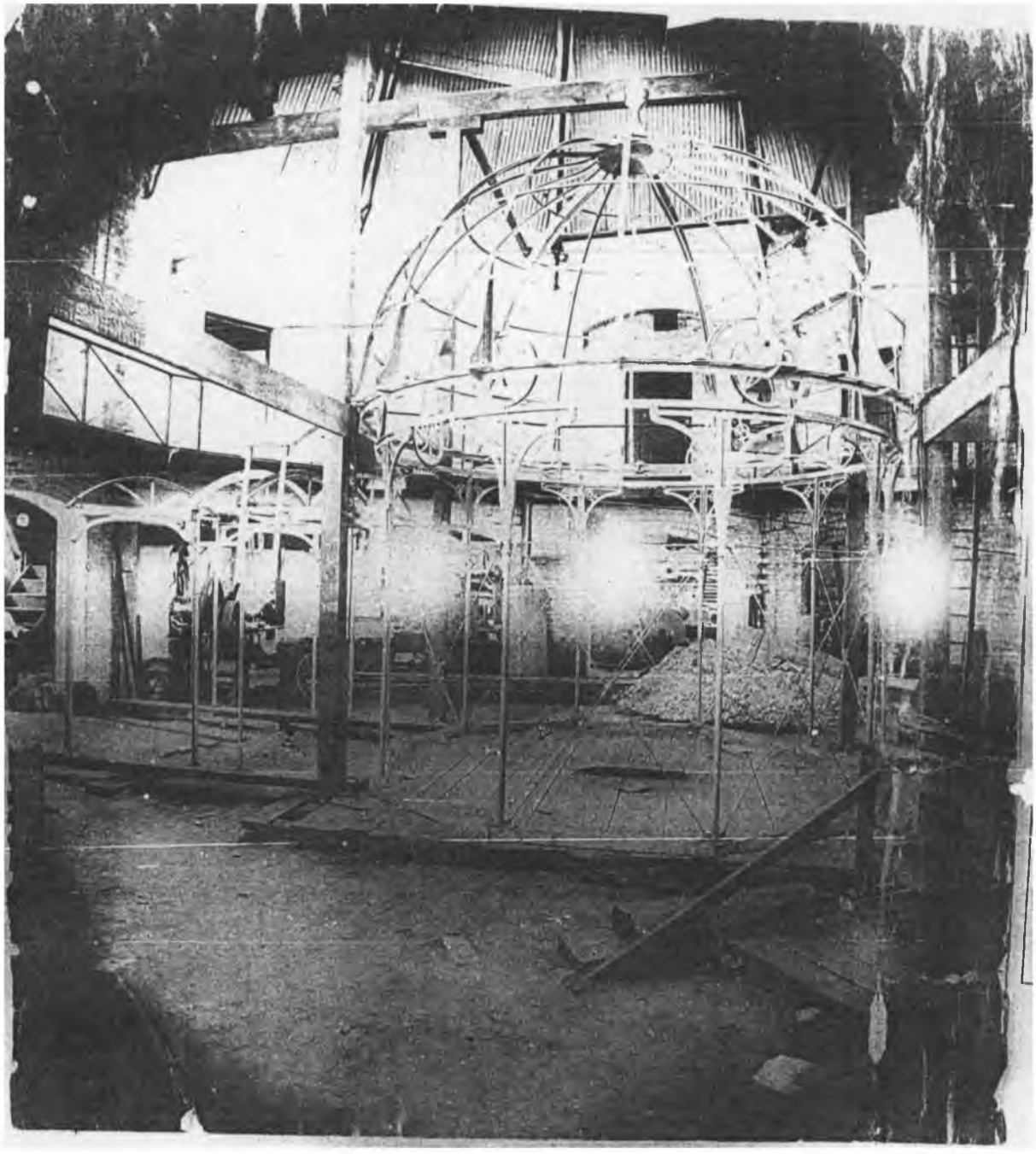
The clock and the transit telescope had been ordered - the latter from Troughton and Simms, and hopes were high for successful observations. The only (and major) problem that still remained was that of the Directorship of the Observatory. Pett decided that he should accept Gill's demand that he return to the Cape in time for the Transit, and this he did. He did not return to Natal but resumed his position as Gill's third assistant.

This now left Escombe in a most invidious position. A brand new observatory had been virtually completed. He was personally out of pocket to the tune of £600. His backers were also out of pocket - Mr Greenacre £150, Mr Randles also £150, the Durban Council £350, the company of Randles Bros. & Hudson by twenty guineas, Mr G S Smith by twenty guineas, ten guineas each from Mr F L Jonsson and Mr J Morrison and a sum of £70 from a Mr Pullen. This all came to £1 380 not counting the vote from the Legislative Assembly. Including the latter this all came to a grand total of £1 850 of personal and public moneys - a considerable amount for those times.

The Observatory was now just idle with nobody on hand to deal with the very event which had made its existence possible. A most worrying and unsatisfactory state of affairs....



The Troughton & Simms Transit telescope on its cast- iron stand. (Courtesy - Local History Museum, Durban)



The dome for the Natal Observatory under construction in the U.K. before shipment to South Africa. (Source: Gray)

No correspondence has been found for the period from July 1882 until December of that year but it is naturally presumed that Escombe transmitted his concerns to David Gill in the Cape. Gill had already mentioned in earlier correspondence that he had someone in mind in Britain who would very likely be able to come out to the Colony and take over. The trouble was that time was short - the Transit was only a very few months away and, in those days, letters took a long time to reach their destination. Had Pett stayed in Natal, his "replacement" would not have been required to take up his duties in Durban until 1883, so under the new circumstances, things had to move quickly.

The letter to Britain was sent and, almost on twenty-four hours notice, the new Astronomer for the Colony of Natal was on his way.

*

REFERENCES AND SOURCES OF INFORMATION

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Most of the following references are taken from a file of loose letters which had then just been transferred from the C.S.I.R. in Pretoria to the Local History Museum in Durban. They had at that stage not been catalogued.

Section **I** :

1. First file of loose letters, 12/7/1880 to 31/11/1881, Local History Museum, Durban

2. Ibid

3. Ibid

4. Ibid

5. Ibid

6. Ibid

7. Cable to Escombe from Gill, dd. 4/10/81, first file, Local History Museum, Durban

8. as "1" supra.

9. Ibid

10. Ibid

11. Ibid

Section **II** :

1. First file of loose letters, 12/7/1880 to 31/11/1881, Local History Museum, Durban

10. Vide 1 supra

3. Second file of loose letters, 31/1/1882 to 28/7/1882, Local History Museum, Durban

4. Vide 3 supra

5/11 Vide 3 supra

12. Council Minutes Nos 9716 & 9723 of 31/7/1882, City Archives, Durban

Section **III** :

1. Debates of the Legislative Assembly, 6/10/1881 to 14/12/1881, pp. 57 and 58, Don Africana Library, Durban

4. Vide 1 supra.

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ENTER NEVILL / NEISON

Chapter Three

I

On the morning of Monday, 27th November 1882, the following short announcement appeared on page three of the newspaper, the ***"Natal Mercury"*** :

THE C.S.S. "MELROSE"

This steamer which was expected to arrive here yesterday morning with the mails and passengers ex. "Warwick Castle" was not in sight from the Bluff signal station up to dusk last evening".

However, the following day (Tuesday 28th November), under the heading of *"Shipping Gazette"*

it was noted that : ***"Melrose, C.S.S. of London, 530 tons gross, from Cape ports. Cargo - General. Passengers from England : Mr B Saphris, Mr & Mrs Carbotz and family ..... Mr Neisson [sic.] ..... Report : Left Algoa Bay at 11 p.m. on 24th inst., called at East London on the 25th and left that Port the same day, arriving at the roads at 2 a.m. on the 27th, bringing with her a large number of passengers and the mails from the 'Warwick Castle'. D C Andrew, Agent"***[1]

A further report stated that the vessel crossed the bar at 5.55 a.m. and received pratique [health and immigration clearance etc.,]. Therefore if all went well, the *"Melrose"* came alongside one of the wharves at the Point and Mr Edmund Nevill, the Government Astronomer stepped ashore some time at about 7 o'clock. Nothing appears anywhere indicating what kind of reception he received, where he was taken to or who took the trouble to meet him. We are left to conjecture that at least Messrs. Escombe, Greenacre, Randles and possibly some others would have constituted some form of "welcoming Committee" and very shortly afterwards would have taken him up to the site of his brand new Observatory.

Who was this man and why was he chosen to take up this post? Clues exist from his then last surviving daughter Maud Nevill and also from the obituary which was read out at the 121st Annual General Meeting of the British Astronomical Association. Firstly, Miss Nevill advised that her father was NOT the first choice. This had fallen to someone else who, at the last moment, had backed out of the arrangements, causing a last minute second decision to be made. This ties in neatly with the obituary, in which it is stated that *".... Nevill received an urgent telegram from Gill [in the Cape] offering him the post of Government Astronomer. He accepted and sailed on almost 24 hours' notice on 27th October 1882, reached Durban on November 27th and, in accordance with instructions, furnished by the Colonial Secretary, he took possession of the Observatory on December 1st as Astronomer to the Natal Government".*[2]

This was cutting it fine, to say the least, as the Transit of Venus was only five days away! From Nevill's own report to the Colonial Secretary dated 20th June 1883, he confirmed that *:"on receipt of an urgent telegram from Mr Gill, I left England in the* ***'S S Warwick Castle'*** *and after a little delay caused by the quarantine Regulations, reached Durban on November 27th"....*[3]

Reading between the lines and knowing that all vessels from Britain to South Africa called at the Cape, Nevill would have probably had at least two days in Cape Town, during which time he would have made a point of going to see David Gill at the Royal Observatory. It appears from old records that the ***"Warwick Castle"*** arrived in Cape Town on or about 20th November. The "***Melrose"*** left Cape Town on the 22nd and left Port Elizabeth on 24th on its way to Durban. We naturally wonder what discussions took place in that short time in Cape Town between the two Astronomers! No doubt Gill was full of enthusiasm about the new Observatory and Nevill was probably somewhat apprehensive. He was unfortunately in for rather a shock when he finally arrived at the site in the upper Botanic Gardens.....

II

It is tempting at this stage, to continue with the events that immediately followed but we must answer the question of Nevill's background in order that his characteristics can be more fully appreciated as we follow the work that he carried out during the period from 1882 until he retired in 1912.

There has been some confusion as to the year that Edmund Nevill Nevill was born. The various obituaries that were written about him give his date of birth as 27th August 1849 but members of his family, including his sister Maud insist that he was born in 1847, two years earlier. For the sake of family "peace" it will be assumed that the family are or were correct and leave it as 1847, even if this may cause some confusion amongst some professional researchers who may have studied his works over the years.

He came into this world at Beverley in Yorkshire before the days when such births were registered at Somerset House in London. He was duly baptised in Yorkshire (place unknown) but no record of this baptism has been found by members of his family. It is understood (statement by Maud Nevill) that the Nevill family is closely related to the Earl of Abergavenny (Reference : Debretts and Burke's Peerage) and Miss Maud Nevill, when she was still alive, regarded herself as a 69th cousin! This also gives us a clue as to Edmund Nevill's use of the pseudonym "Neison" whilst he was the carrying out his studies as an Astronomer. Nevill can easily be changed to Nevill's son or shortened to "Neison". The name Nevill apparently goes back to the Norman era when one "De Neville" arrived on Britain's shores.....

Not much is known about his early life. He is reported to have been educated at Harrow and New College, Oxford, but again his family have not been able to trace his scholastic or University record. After his education, he went to Europe and joined the French forces in the Franco-Prussian war, serving on the General Staff. Then when the French and the British relations were becoming strained, he returned to England. He then became a Parliamentary reporter with the "***Standard***" newspaper as well as acting as a theatre critic. His hobby of astronomy earned him Fellowship of the Royal Astronomical Society in 1873. He was twenty-six years old at that time. In this field, he equipped himself with good telescopes, studying the Moon from Hampstead using a six inch refractor and a 9½ inch Browning reflector.

His other interests were Babylonian history, Chemistry [as a young man, one of eyes was injured after an explosion in his laboratory and this gave him trouble in later years] and the writing of several books, and his sporting activities included pistol shooting and tennis.

By the time that Nevill was on his way to Natal, he had carried out a tremendous amount of work on the corrections of observing the Moon - his favourite subject. He published the book *"The Moon and the Condition and Configuration of its Surface"* in 1876 under the name "Edmund Neison" and also wrote up the book *"Astronomy"* which was published in 1886, having carried out the work between 1880 and 1882. Very few copies of these two books still exist although one of the latter has appeared in the private Africana collection of a Mr G N Johnsson of Natal. One other book - still in manuscript form - was written by him, this being a novel entitled *"Maud"*. Could this have been named after his elder daughter? Who knows....

He wrote a paper entitled "The supposed new crater on the Moon" advocating caution. This was published in Popular Science Review, page 138, April 1879. It appears that this "caution" was at the time fully justified. He also was a founder member of the Selenographic Society and enjoyed a brief but energetic "career" in the 1870's and 1880's when he was Secretary of that body. The Society declined in fortunes after he resigned from Natal in 1883 but many of his written contributions can still be found in the volumes of its Journal.

He pressed for the establishment of an Institute to represent the profession of chemistry and on 26th April 1876, the then Chemical Society appointed a Committee which resulted in the founding of the "Institute of Chemistry". Nevill was an original member of its Council, serving from 1877 until 1880, after which he became Honorary Corresponding Secretary for the Institute of the Natal Colony, this lasting for some years.

His sketching prowess also deserves mention - proof of this being the large quantity of superb drawings of lunar craters and other features which have been preserved in the archives of the Library at the Observatory in Cape Town.[1]

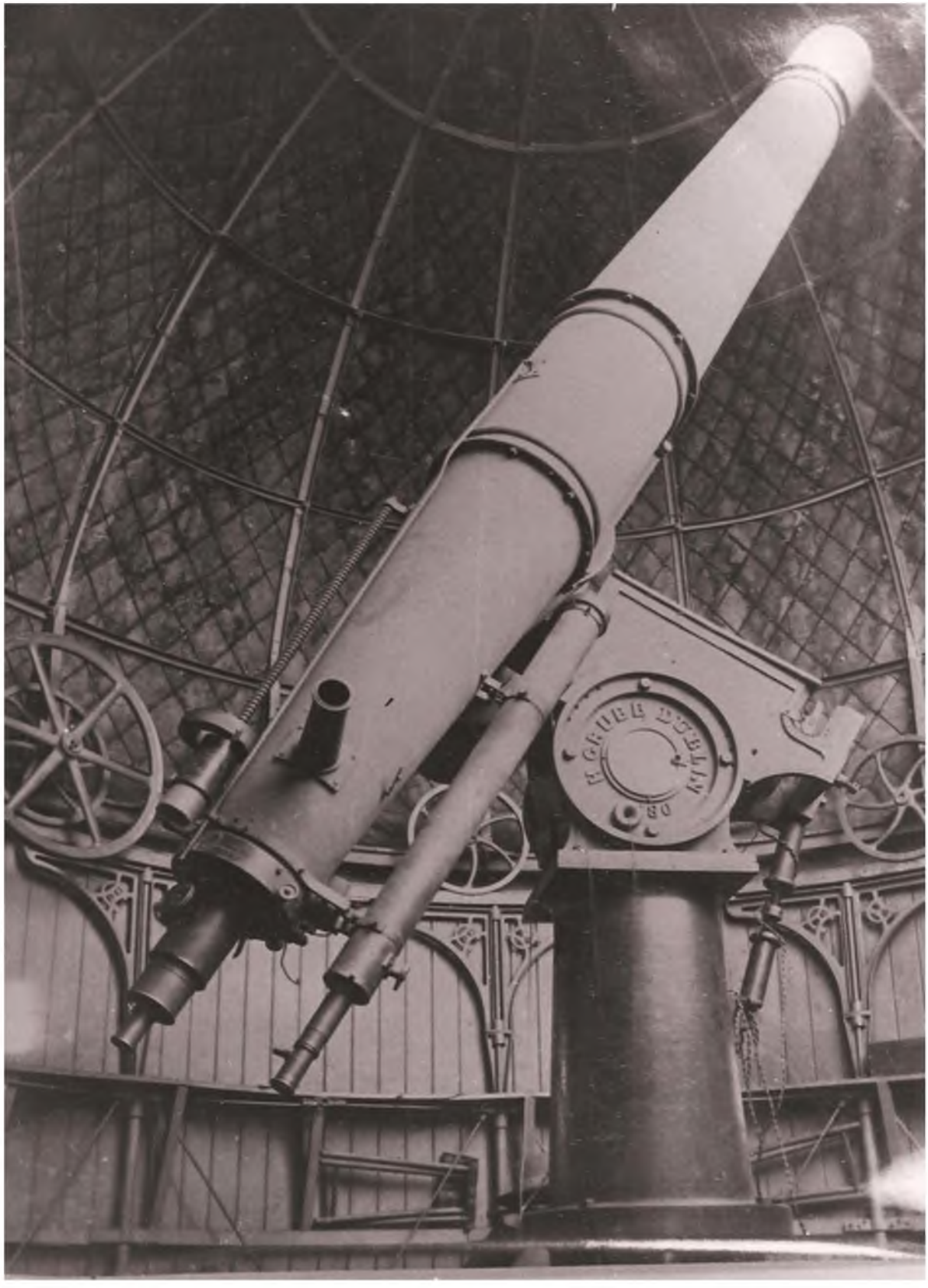
To complete the image of this somewhat remarkable man, mention must be made of his skill at the two sports he enjoyed, golf and tennis. Such was the man that arrived on the shores of Natal at the end of November 1882. The question now remains, "Why did he call himself 'Neison'?" The answer to this seems to be that in the mid 1800's, amateur astronomers (rich and poor alike) used their own names, but it was considered somewhat *infra dig.* to be actually employed as a Professional

Astronomer, unless one was of the status of a Herschel or a Gill! Hence those that were employed used a pseudonym instead..... At least, this was the reason given by Miss Maud when she came to South Africa in 1982!

Nevill's arrival apparently caused quite a stir in the area and it is indeed fortunate that he was not averse to putting pen to paper. By doing so, we gain a better insight into further aspects of his life and that of others in the Colony. Approximately five hundred of his letters, or others dictated by him, exist in books of copy letters, both in the care of the Local History Museum in Durban and from these, plus his many reports, that it has been possible to piece together much of the work done and the details involved in the running of the Observatory - at least from 1882 until the turn of the century.

III

As stated earlier, although Nevill arrived on 27th November, he only officially took up his appointment as Astronomer on 1st December. He found that things were far from ideal at the site. He immediately had to strip the Grubb refractor, reporting to the Government that *"the instrument was erected [last winter] prior to the arrival of the dome to shelter it, and was protected from the weather as best might be by means of tarpaulins. In spite of the care taken, it has suffered from this exposure - salt from the sea breezes, has deposited within crevices and screw threads and set up oxidisation, which has caused several portions to become rust-bound. On my arrival, I found the instrument working very stiffly and showing indication of having suffered from being thus exposed to so trying a climate as that of the Natal coast"*[1] In fact, those portions of the telescope which were not bare metal had been coated with so many coats of paint that most of the moving parts were stuck together. He therefore had very little time indeed to get everything properly organised for the Transit, but was fortunate in being able to count on the assistance of those gentlemen who had offered their help for the actual observation.



Photograph of the 8" Grubb refractor - probably taken in the late 1920s. (Courtesy - Local History Museum, Durban)

The local newspapers were quick to note that an "Important Personage" had arrived on the scene and immediately before the Transit, several articles about the forthcoming event were published. One Mr Alfred Belville wrote from Bellair (then a separate village from Durban) on 29th November offering guidance to the man in the street as to how to go about observing the event.[2] Further on in the same issue, official cognizance of the event was given as follows :

THE TRANSIT OF VENUS

AN OBSERVATION TO BE TAKEN HERE

It was thought that, owing to the Cape Astronomer, Mr Pillans, being unable to land here in time for the Transit of Venus, in consequence of the quarantine

regulations, no observations of the phenomenon would be held in Durban; but we are happy to be able to announce that by the arrangements made by Dr Gill for the permanent occupation of the office of Natal astronomer, this much hoped-for observation will be taken.

*Mr Neison, an Astronomer of considerable experience, arrived here from England in the "**Melrose**" ex **"Warwick Castle"** and has received the permanent appointment for the Durban observatory.*

He is in ample time to make an observation of the transit and will at once set to work to prepare for his operations. It was intended that Mr Pillans should assist him, but as that gentleman cannot be here, possibly some local assistance will be obtained. We are glad to find that, professional talent being apparently unavailable, some local gentlemen, well grounded theoretically, in astronomical science, had intended to observe the transit, and by careful examination and copious note-taking, perhaps their efforts might have been rewarded with some successful results. It is however with pleasure we find that a gentleman well versed with the necessary knowledge for the undertaking - which requires extreme accuracy - is to take charge of the operations; and the Colony will thus derive the advantages to be gained from its being an astronomical station on this important occasion, which it was feared it would lose."[3]

Despite his hectic schedule of work, Nevill still found time to write a letter to the local press and from what can be discovered, his first ever letter to a local daily newspaper was published on the actual day of the Transit - 6th December 1882. This gave the predicted time of first contact at 3h 54m 41s, first internal contact at 4h 14m 40s, last external contact at 10h 15m 57s, - all being "p.m." Durban Mean Time, noting the fact that the sun would have set after the first two events. He then went on to describe the correct method of timing and observing the event - in fact a letter of extraordinary length for a man who was desperately short of time![4]

What then, of the actual day of the Transit and the event itself? Nevill recalled those frantically busy hours by stating :

> "I was fortunate in obtaining the assistance of Mr Markwick, F.R.A.S., of the Ordnance Department, Maritzburg. Mr Philip Sandford of the Durban High School also kindly volunteered his assistance as time-recorder during the Transit.

> "The Observatory had to be cleaned and the revolving dome brought into thorough working order, for by some mistake, a thick coating of paint has been given to the machinery by which it was moved. The telescope itself was cleaned as well as the short time would allow, but worked stiffly from the accumulation of dirt and thickened oil in parts which could be cleaned in the short time available for that purpose.

> "The polarising solar eyepiece supplied by Messrs. Merz of Munich would not fit either the telescope or its accessories so that it became necessary to construct temporary adaptors. This was successfully accomplished."[5]

As the transit telescope - which had been ordered some time back by Mr Escombe - was still lying in Cape Town in quarantine (!), elaborate time checking systems had to be set up with direct contact to Cape Town via the telegraph office. These times had to be further transmitted to Pietermaritzburg to assist any observers in that city. Nevill continued his report by stating :

> "Arrangements were made for erecting three small telescopes on the open ground to the South side of the Observatory, as it was thought that observations with them might be of use for comparison with similar observations sure to be made in the United States. One of these instruments

was a 2¾ inch equatorial refractor brought down by Mr Markwick from Maritzburg; the second was an altazimuth refractor of 3" aperture lent by Mr B W Greenacre and the third was a 2¾ inch altazimuth refractor lent by Mr Pardy. Mr Greenacre's telescope was fitted with a screen and an image of the sun thrown by projection upon a card so that more than one could view the phenomenon at the same time.

"The day of the Transit was exceedingly fine, the sun being intensely hot, and as the afternoon wore on, a thin hazy glare came over the sky. The observation passed off very successfully, the times of contact being taken with the three instruments.

"My own observation was made with the large equatorial, with its aperture reduced to six inches in accordance with the instructions of the Transit of Venus Committee. A Merz polarising eyepiece, magnifying 160 times, being used. Mr Philip Sandford stood by the chronometer and counted the seconds aloud, marking off on a previously prepared form every ten seconds as he counted, so as to preclude the possibility of any mistake in the time.

"Owing to the intense heat of the sun, the walls of the Observatory had become so hot that the heated air streamed up from them in strong convection currents, rendering the image of the sun unsteadier than would otherwise have been the case."

There then followed a reading of the official record of the observations made and from these it appears that Mr Markwick used a diagonal solar eyepiece, his timings being recorded by a Mr A A de Pass who was using the Frodsham Chronometer No 1888. The magnification was about x60, compared with Mr Pardy who was using an ordinary eyepiece magnifying 45 times. A Mr W Hartley also made observations at Overport, using a 3¾ inch altazimuth instrument at 80 power, a Mr Kisch used a 3½ inch altazimuth at 60 power at the Point - his times being recorded with a chronometer used by Mr G C Cato.[6]

Other observations were made as follows : "Mr R Raleigh at Addington with a small telescope, Mr S Knox at Stanger with a 3¾ inch altazimuth, at Red Hill by Mr Newbury and finally at Rolfontein, Transvaal by Mr Ballot, but '*unfortunately no sufficient guarantee for the accuracy of the times exists in these cases....*'"[7]

This was the Astronomer's view of the affair. The newspapers of course, had a field day and numerous articles were written extolling the beauty of the event and the excellence of the weather. Extracts from one such article which filled two full columns of typeface stated for example :

It is seldom that we have such a remarkably pure atmosphere in December as we enjoyed two days back. We congratulate Mr Neison the local Astronomer, Dr Gill who watched us so closely in spirit, and the gentleman whose timely munificence secured for us the Astronomical station in our Botanic Gardens.

It was very cheering to see the great and general interest manifested throughout Durban in the Transit. To kafirs [sic.] who exclaimed "WOW" when they saw it through a bit of smoked glass, or the little boy who shouted "Hie father, run 'ome, grandma's got Venus in a little bit of paper", the Transit was but a peepshow. However the general intelligence displayed by the host of amateurs as to the scientific value of the phenomenon was indeed remarkable and a credit to the community.

Hours before Venus was due, the courteous tenant of the little dome-capped building had set and adjusted his large telescope. Inside the mysterious chamber all is still but for the ticking of the clockwork which turns the telescope at will. Only the sound of the telegraph instruments as time signals are flashed about, or a fraternal message comes speeding from the Cape Town Observatory, breaks in on the silence. The doors are closed until contact is over and several amateur observers outside make a last examination of their telescopes, whose bright brass barrels reflect back the rays of the now fierce sunlight."[8]

The actual time of the first external contact - corrected to Natal Mean Time was 3h 56m 03.4s (1 minute and 22 seconds late), the first internal contact was timed at 4h 15m 33.8s (53.8 seconds late), which for predictions made nearly one hundred years ago, were quite remarkable.

We might at this point be forgiven for pondering the reaction of the 20th century man-in-the-street to such things as a Transit of Venus. It is feared that there would be little if any reaction other than a slight flicker of interest before reaching for the telephone to make a golfing date, or switching on the television to check the score of some rugby game or other.

The Transit was over. It had all been worth while, the results had been tabulated successfully and things started to settle down in the little building which was to become Nevill's home and place of work for many more years than he had originally anticipated.

IV

As we would say today, with the "heat off", things got under way to try to get the Observatory onto a proper footing. Letters were written on December 9th asking for the grant of £500 that was promised to Mr Pett[1] - who had long since returned to the Cape -, on 11th December sending the full results of the Transit to Gill at Cape Town[2], several letters to the amateurs thanking them for their invaluable assistance, also on 11th and 15th December to a Captain Aldrick of ***"H.M.S. Fawn"*** complaining that no acknowledgement had been received after he (Nevill) had let off a roman candle to indicate a time signal![3] Thus, the matter of supplying the area and the port with the correct time had now become important.

On 21st December, Nevill wrote to the Colonial Secretary detailing the costs of building the Observatory, such as £90 10/- to Mr Jenkyns the builder, of accessory instruments of £41 10/- to Grubb of Dublin and some petty expenses of £5 for the actual observations of the Transit.[4]

He also asked for a full account of all moneys received and expended by Mr Pett on behalf of the Observatory so that he could get his own accounting system operative. Here, we see another side of the man - one which insisted on things being done correctly wherever finance was involved. His daughter (Maud) in a letter received in 1976 however stated that *"the only thing that Dad worried about was if there was a cheque left in his cheque book, NOT what was left in the bank!"* This must have been in Nevill's later years because he WAS meticulous at the start. Maybe with the onset of years in the thirty that were to follow, his care over money matters must have slackened. As shall be seen, pure frustration could easily have caused this.

For the first time since he arrived. Nevill must have taken a short but well earned break over the Christmas and New Year period as the next letters only commenced on 10th January 1883.

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REFERENCES AND SOURCES OF INFORMATION

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Section I :

1. The "Natal Mercury" - microfilm, 28th Nov. 1882, Don Africana Library, Durban

2. Monthly Notes R.A.S., Vol. 101, p.137 - 1941 - R.A.S. London

3. Report to the Colonial Secretary, 20th June 1883, Local History Museum, Durban

Section II :

1. Numerous references from correspondence with then surviving members of the family, especially Miss Maud Nevill of London, the Journal of the B.A.A., Vol. 75 Nos. 4 & 5 by Dr Patrick Moore, the Monthly Notes of the R.A.S. Vol. 101 *et seq.*, (1941) and the publication "The Starlit Sky 1972" by Dr Patrick Moore in 1972 and published by the South African Broadcasting Corporation.

Section III :

1. Report to the Legislative Council, 24th July 1883, page 3 - Local History Museum

2. Microfilm, of "Natal Mercury" - 29th November 1882, Don Africana Library, Durban

3. Vide 2 supra (Editorial column)

4. Vide 2 supra (Tuesday 5th December 1882 - letters to the Editor)

5. Vide1 supra, pp. 4 *et seq.*

6. Vide 1 supra

7. Vide 1 supra

8. "Natal Mercury" Microfilm, Friday 8th December 1882, Don Africana Library

Section IV :

1. Letter No 2, large letter book, Local History Museum, Durban

7. Letter No 3, large letter book, Local History Museum, Durban

3. Letter No 6, small letter book, Local History Museum, Durban

4. Letter No 8, large letter book, Local History Museum, Durban

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THE NATAL OBSERVATORY

Chapter Four

I

At this very early stage in what was to become a somewhat chequered career, let the description of the Observatory as it stood at the beginning of 1883 be recorded by referring to the Reports of the Government Astronomer in those years. Nevill stated :

> "*It is a substantially built rectangular red brick building with cement facings, and carries a light wooden structure, forming the equatorial and transit rooms, the former being surmounted by one of Grubb's iron screws. The Equatorial room is circular in shape and fourteen feet in diameter. The Transit room is rectangular and eight feet three inches long by seven feet nine inches broad.*

> "*The computing room below is twenty three feet long, thirteen feet wide and nine feet nine inches in height; much of this space being taken up by the massive concrete piers carrying the instruments....*

> "*The substantial walls of the Observatory become so hot during the day that it is difficult to secure proper observations until the building is completed by the erection of a verandah to shield the walls.*"[1]

The verandah called for was constructed in 1883 and this made life a little easier for the Astronomer. As the years followed, several small further additions were made to the building and these will be referred to in the following chapter.

From the very start, there was a remarkable lack of instrumentation on the site. The only instruments in existence in January 1883 were the Grubb Refractor "*being 8" aperture with a object glass of 'excellent quality', ten feet in focal length [f15] and being provided with a good parallel wire position micrometer of convenient form, also carries a 3" finder*". Clocks were begged or borrowed until the Observatory's own clocks finally arrived. The Transit Telescope was still in Cape Town and did not arrive until April - a delay which caused Nevill considerable frustration!

He had not settled in for very long before he found the acute necessity for an Assistant. On March 2nd 1883, he wrote to the Colonial Secretary referring to the sum of £84 that had been voted for a "clerk", requesting permission to employ one at a rate of £10. 10/- per month.[2]

Other concerns also appeared. One of these was a request from the Botanic Gardens that he take over the meteorological instruments. He replied that he had received no instructions on this account.[3] Another appears in his letter to the General Manager of the Natal Government Railways referring to the necessity for uniform time and stating that he was working out ways and means of supplying this to all parts of the Colony.[4] {At that stage, all villages and towns were operating on their own solar time - dependant on their longitude!}

This last letter was dated 17th February and, as he had written to the Colonial Secretary only a few days earlier, requesting a "railway pass to assist in the arranging of the time signals" he was certainly not letting any grass grow under his feet!

A further matter which he had to deal with was the complete stripping down of the Grubb equatorial refractor in order to get rid of the dirt and old oil which had caused so much trouble at the time of the Transit of Venus. In this, he was constantly in touch with Mr Pett at the Cape, on the best means of dealing with this problem.[5]

The Transit Telescope finally arrived early in April and was set up immediately. Nevill's comment was :- "it is a very good one of its kind".[6]

On 3rd April, the first rumblings of concern over the future of the Observatory were heard. Nevill wrote to Gill on that day, stating ....."*the financing of the Observatory, whilst it is properly enough left quite in my hands, is a very delicate operation, especially in these hard times out here ..... and consequently it takes up much of my time 'ere it is a very slow progress. An extra sum of £400 has to be raised to meet the claims of Messrs. Grubb and Simms. I shall do this but shall try and obtain it from an extra vote of the legislature rather than from private subscriptions.*"[7] The problem of funding was to be a constant nightmare for Nevill during the thirty years that he remained in Natal.

Mr Herbert Lloyd had, by that time, had approached Nevill to be appointed as assistant and on 12th April, the latter wrote to the Colonial Secretary, this time advising him that he wanted to appoint Mr Lloyd.. He was successful in his request.

Before the month of April was out, Nevill again had to deal with concerns over money matters. On 28th he wrote a letter to Gill. This one was marked "Confidential" :-

> "*Things have changed considerably since Mr Pett's departure and as far as I can gather from your letters and from Mr Escombe and others, the intention was to make the Observatory an independent institution ..... Times have become exceedingly bad, it is useless to hope for a single subscription from the public and there is a strong feeling now that the Observatory is an unnecessary institution, considerable opposition to the grant for next year is certain ..... the idea of a house or anything for the observer has been waived ..... I was informed that the Observatory was to be regarded as a special department of the Government - it having been taken over by them to date from 1st January this year. In consequence, I am now officially Astronomer to the Government of Natal, and the Observatory, its staff and belongings go into the Government's Service.*"[8]

The "hard times" referred to were the high cost of pushing the new railway line through Ladysmith and the constant battles with various Zulu tribes and other dissident bodies - all of which tended to render cause a 'mere' Observatory to be treated as a "luxury", so soon after the excitement and enthusiasm which attended the Transit of Venus only five months earlier!

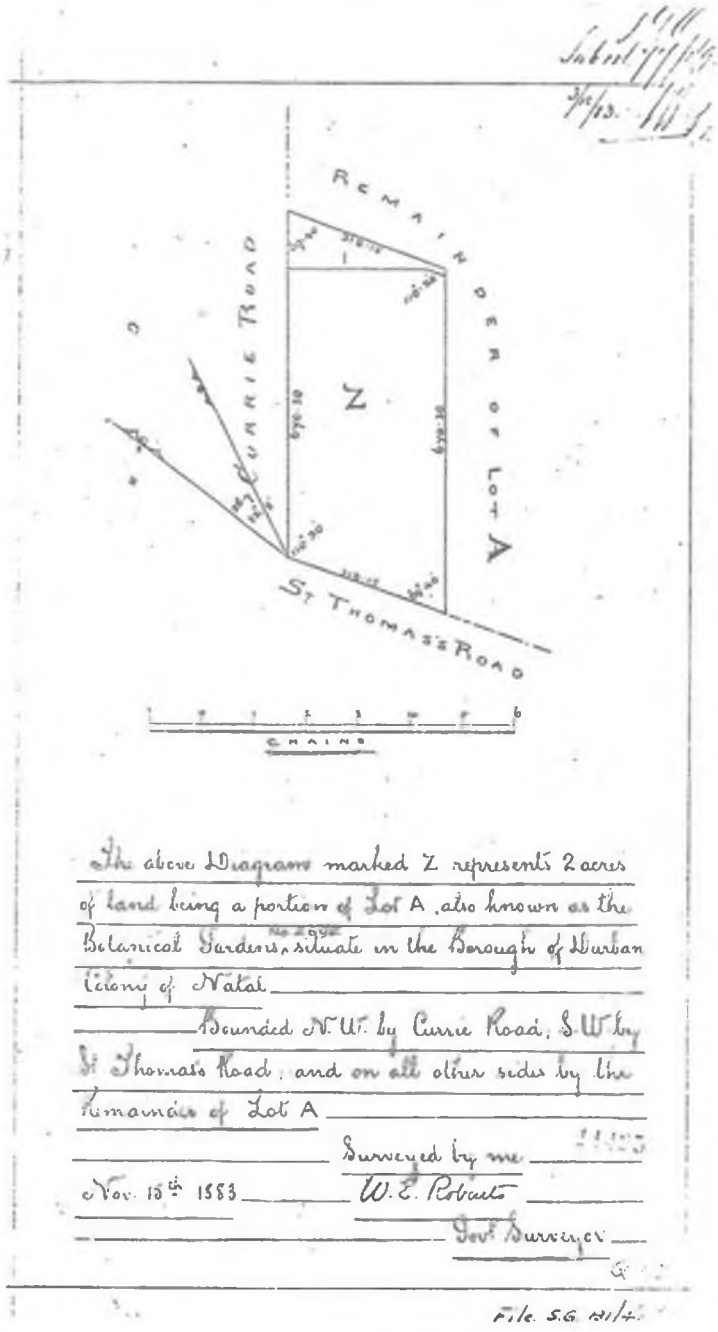
A new and rather interesting event was about to take place. It was not generally realised that although the building of the Observatory existed, and that it, its contents and the staff attending to it were now the "property" of the Natal Government, the

actual *land* on which these fixed and movable assets stood belonged to the Horticultural Society! This was rather a case of putting the cart before the horse. It was not long before this problem was corrected. The Honorary Secretary of the Natal Botanic Gardens, Mr James B Aiken entered into discussion with Nevill as to the amount of land that should be set aside for the Observatory. Aiken felt that one acre should be sufficient. Nevill asked for five . After some wrangling, the matter was settled at two and the land was accordingly surveyed.

On 3rd July 1883, a Government Gazette Notice was published to *"appropriate an agreed site for the Natal Observatory"*. Four months later, Mr W E Roberts, Government Surveyor, surveyed an area of two acres in the South-west corner of the Botanic Gardens and submitted his completed diagram for registration. This was done on 15th November 1883.[9] The full description of the property reads :-

> *The above diagram marked Z represents two acres of land being a portion of Lot A, also known as the Botanic Gardens No 2602, situate in the Borough of Durban, Colony of Natal, bounded N.W. by Currie Road, S.W. by St. Thomas's Road; and on all other sides by the remainder of Lot A.[10] (diagram referred to is copied below)*

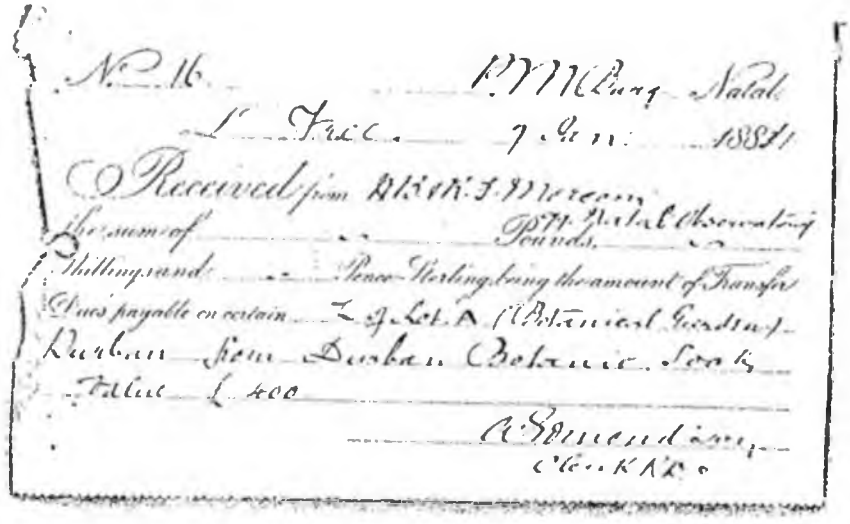
The Deed of Transfer of the land was drawn up at the end of December and was registered on 9th January 1884 - some fourteen months after the Transit and about eighteen months after the first foundations of the Observatory had been laid. There was a 'Power of Attorney to Transfer' in the name of James Burnett Aiken :- ....."in my capacity as Secretary of the Durban Botanic Society incorporated under Law 21, 1883 and acting herein by resolution of the said Society passed at the meeting of the Committee thereof held at Durban on 11th December 1883"[11]



November 15th 1883 - Copy of W E Roberts (Government Surveyor) site diagram - 2 acres of ground handed over by the Durban Botanic Gardens for the building of the Observatory.

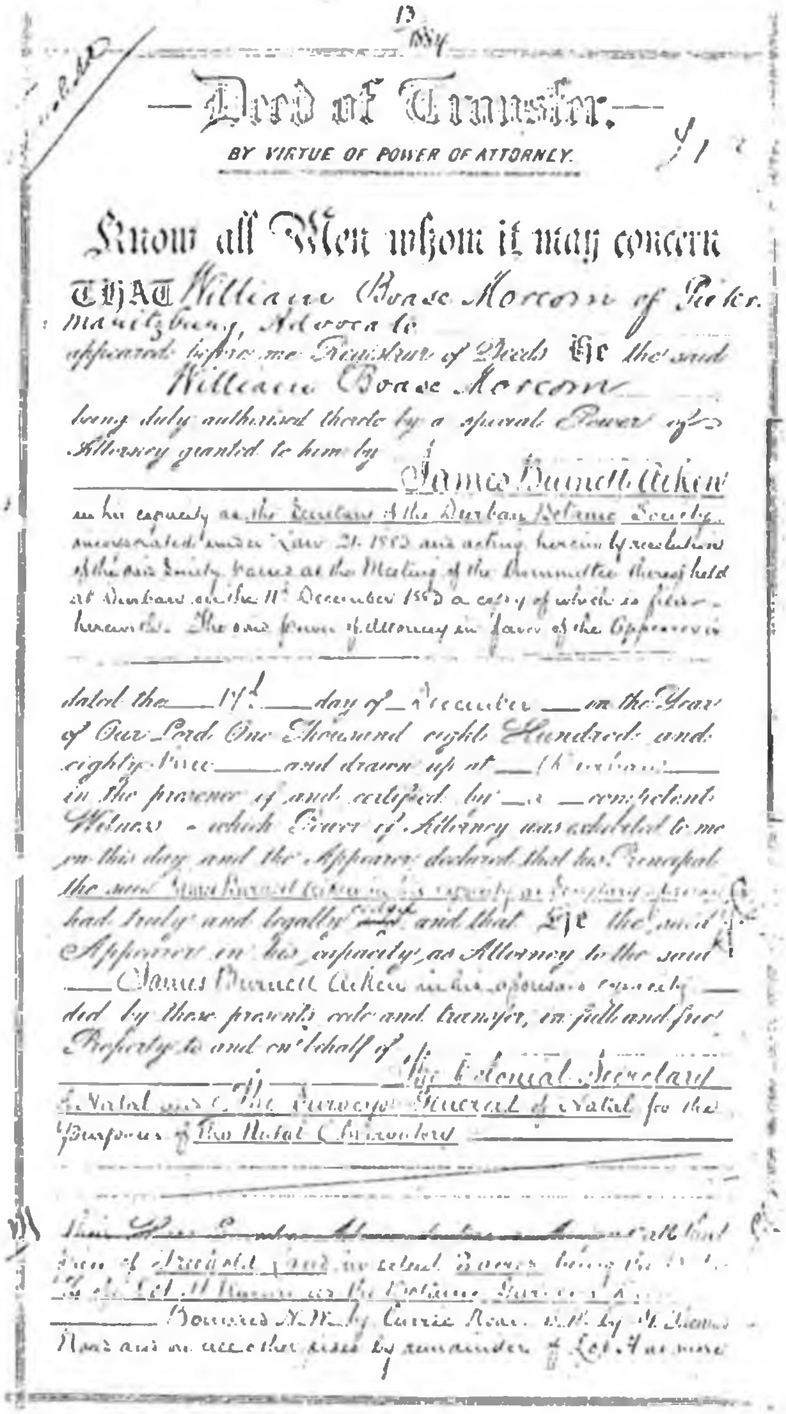
The resolution referred to, allowed the Botanic Society to divest itself of any interest in the two acres of land to be transferred to the use of the Observatory. Mr William Boase Morcom (later to become Chief Legal Adviser to the Government), Advocate of Pietermaritzburg, acted on behalf of the interested parties.

Going back just a little, the Colonial Secretary had written (13th December 1883) to Mr Aiken, stating *inter alia "…. that it is the wish of the Government that the land to be transferred for the purposes of the Natal Observatory shall be transferred to the Colonial Secretary and Surveyor General…."*[12] Following this there is an amusing piece of officialese in the form of a receipt dated 7th January 1884. It reads : *"Received from W B and R J Morcom q.q. Natal Observatory, the sum of nil pounds, nil shillings and nil pence sterling being the amount of transfer dues payable on certain Z Lot A (Botanic Gardens) Durban from Durban Botanic Society, value £400. Signed A Edmondson, Clerk."*[13] So, at least we now know that land on that choice part of Durban's Berea was in those days worth £200 an acre!



The receipt for "nil pounds, nil shillings &nil pence" dated January 17th, 1884

It is of interest to note here that, although a small portion of these two acres was transferred in September 1961 back to the City Council of Durban for use as a water reservoir, the rest of the original two acres still remains in the name of the (now) Province of Natal. The building of the Observatory and other buildings which were erected during the years to follow remained intact, during the period from 1912 when Nevill retired. The original design of the Observatory was never finally completed but it was finally demolished in 1957.



Deed of Transfer.

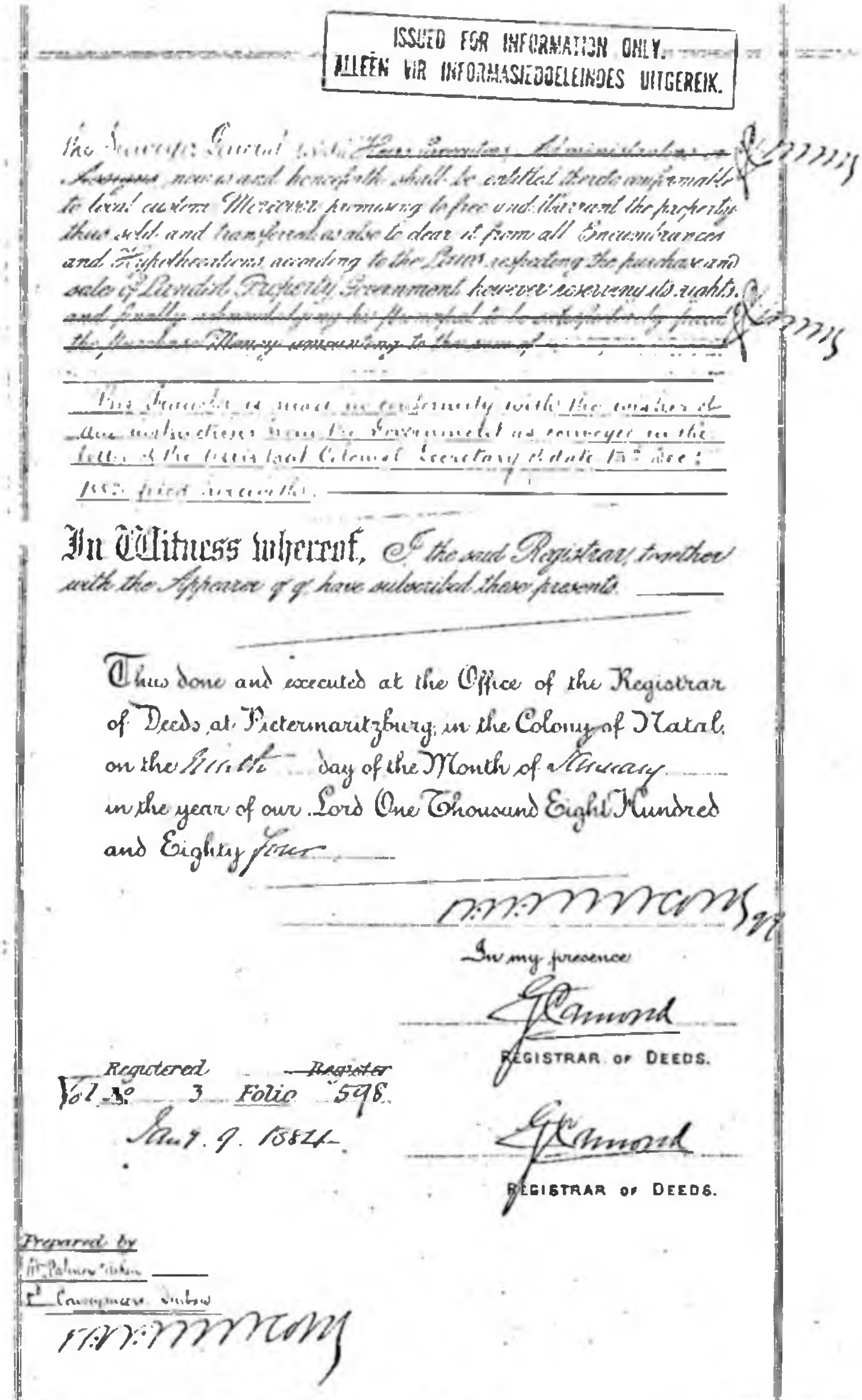
BY VIRTUE OF POWER OF ATTORNEY.

Know all Men whom it may concern

THAT William Boase Morcom of Pietermaritzburg, Advocate appeared before me Registrar of Deeds He the said William Boase Morcom being duly authorised thereto by a special Power of Attorney granted to him by James Burnett Aiken in his capacity as the Secretary of the Durban Botanic Society incorporated under Law 21 1883 and acting herein by resolution of the said Society passed at the Meeting of the Committee thereof held at Durban on the 11th December 1883 a copy of which is filed herewith. The said Power of Attorney in favor of the Appearer is dated the 17th day of December in the Year of Our Lord One Thousand eight Hundred and eighty three and drawn up at Durban in the presence of and certified by a competent Witness which Power of Attorney was exhibited to me on this day and the Appearer declared that his Principal the said James Burnett Aiken in his capacity as Secretary aforesaid had truly and legally sold and that He the said Appearer in his capacity as Attorney to the said James Burnett Aiken in his aforesaid capacity did by these presents cede and transfer, in full and free Property to and on behalf of The Colonial Secretary of Natal and The Surveyor General of Natal for the purposes of the Natal Observatory

[illegible] piece of Freehold Land measuring [illegible] Acres being [illegible] of Lot [illegible] known as the Botanic Gardens [illegible] Bounded N.W. by Currie Road, [illegible] by St Thomas Road and on all other sides by remainder of Lot [illegible]

January 9th 1884 - the front page of the Deed of Transfer by Jàmes B Aiken, Secretary of the Botanic Gardens to the Colonial Secretary for the "purposes of erecting an Observatory".



ISSUED FOR INFORMATION ONLY.
ALLEEN VIR INFORMASIEDOELEINDES UITGEREIK.

the Surveyor General ... Administrator ... now is and henceforth shall be entitled thereto conformable to local custom. Moreover promising to free and warrant the property thus sold and transferred as also to clear it from all Encumbrances and Hypothecations according to the Laws respecting the purchase and sale of Landed Property. Government however reserving its rights. ~~and finally acknowledging he/themselves to be satisfactorily paid the Purchase Money amounting to the sum of~~

This transfer is made in conformity with the ... authorities from the Government as conveyed in the letter of the ... Colonial Secretary of date 15th Dec: 188.. filed herewith.

In Witness whereof, I the said Registrar, together with the Appearer q.q. have subscribed these presents.

Thus done and executed at the Office of the Registrar of Deeds, at Pietermaritzburg, in the Colony of Natal, on the Ninth day of the Month of January in the year of our Lord One Thousand Eight Hundred and Eighty four.

In my presence

REGISTRAR OF DEEDS.

Registered ~~Register~~ Vol. No. 3 Folio 598.

Jan. 9. 1884.

REGISTRAR OF DEEDS.

Prepared by

The obverse page of the same document, signed on January 9th, 1884.

II

On the 3rd of May 1883, the official change from "Pietermaritzburg Mean Time" to Durban Mean Time took place and was duly gazetted. It will be recalled that the previous time system was introduced by Dr Mann in Pietermaritzburg in 1865, eighteen years earlier. In June 1883, the task of writing out the first official report of the Observatory was completed by Nevill. This document consisted of nineteen pages of closely written script and was duly sent off on 20th June to the Colonial Government, appearing later in printed form. A copy of this and all subsequent reports exists in the Don Africana Library and also in the Natal Society Library in Pietermaritzburg.

Much was said in the newspapers of the day about Mr Nevill being an amiable and kindly tenant of the Observatory. This was so, but if he was angered by any matter, then the other side of the man immediately became apparent. One example of this took place when one of his African servants was - as he put it - wrongly arrested for removing timber from the immediate precincts of the Observatory. His reaction was swift and quite devastating. He immediately sent off telegrams of protest to everyone that he could think of and wrote some fairly superb pieces of sarcastic prose. His descendants will not be offended if one of these is reproduced below :

To the Honorary Secretary August 2nd 1883

Botanic Gardens

Sir,

Yesterday morning during my absence, your Curator gave my native servant into custody for removing wood from the ground in the immediate vicinity of the Observatory, although this Curator was duly informed that it was done in pursuance of my orders. On applying to your Chairman, the charge of theft was at length withdrawn.

This action is in pursuance of the threat contained in [this] letter of May 26th that he would arrest any of my subordinates found on the land about the Observatory, a threat which I had understood to have met with the disapprobation of your Committee.

As I feel sure that this system of petty annoyance cannot meet with the approbation of your Committee I shall be glad if they will take steps to restrain their servant, and trust to secure a disavowal of any participation in this action.

At the same time I think your Committee will see that the same expression of regret is due to those who have been pout to such annoyance and inconvenience by this discourteous action.

If your Committee wish to raise any questions in any way with respect to the manner in which I am carrying out the duties entrusted to me by His Excellency the Governor I would submit that the only right course to take is to direct their action against myself in person, and not against my subordinates for carrying out my orders.

I have the honour to be, Sir,

Your obedient servant,

E Neison - Government Astronomer.[1]

Obviously not a man with whom to cross swords! Other letters of similar vein were written to the Colonial Secretary and David Gill. No doubt many a reader has suffered the same problems of being indirectly accused of some action by unknown persons but never face to face!

On 17th August, Nevill placed a requisition in front of the Natal Government for meteorological instruments. These were : Two good standard barometers, a maximum and minimum and an ordinary thermometer, two wet and dry bulb thermometers, three rain gauges and a 'Campbell' Sunshine recorder, mentioning that the total cost for all of these items would amount to £55. On the same subject, he received a long letter from the Meteorological Commissioners at the Royal

Observatory in the Cape, advising him that the Commissioners had decided to set up a system of simultaneous weather data at all ports on the South African coast. They asked if they could count on his assistance. And another part of the original story - the work started in the Byrne Valley in 1849 - came to an end when the last reports from there and from Pietermaritzburg ceased in the mid 1880s. The Natal Observatory took over the work as the original "Prime Station" for Natal.[2]

As a result of agitation by some of the local newspapers about the "lack of information" emanating from the Observatory, a small but significant new development took place. A Board of Visitors was formed. It held its first meeting at the Observatory on Monday 12th November 1883 at 4 p.m. Its members were Messrs. Escombe, Behrens, B W Greenacre and G Rutherford.[3] An interesting point is that such a Board was also appointed at the Royal Observatory in Cape Town some time earlier. The Natal Board met regularly each month for a number of years before it was disbanded.

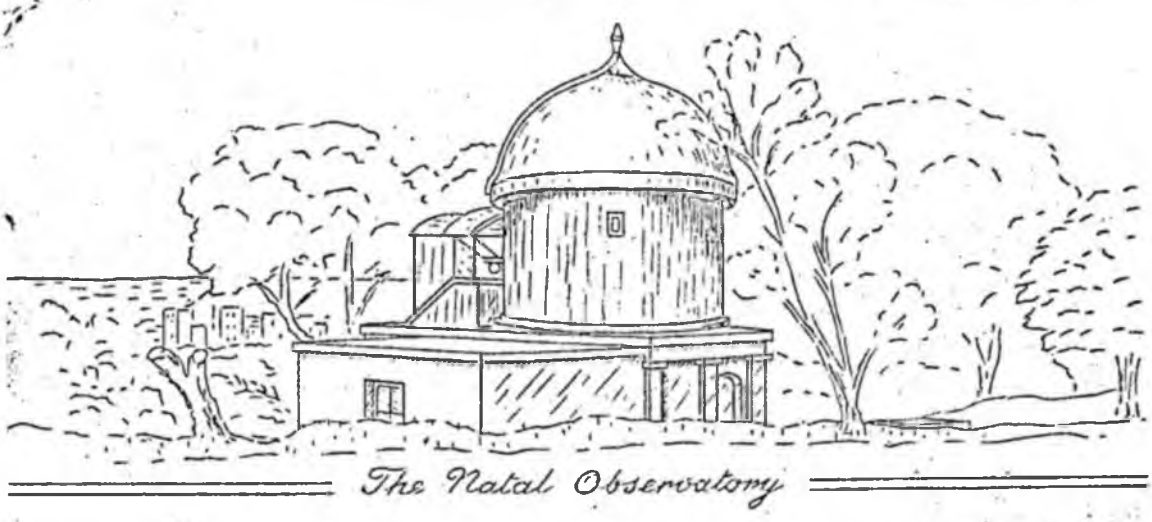
A word about Nevill's "accommodation" will not be amiss here. He had suffered the misfortune of sleeping on the premises during the first two summers in Natal (1882 - 1884) and he was certainly not looking forward to repeat performances. He wrote a long letter to the Colonial Secretary on 4th November 1884 advising him that :

> *"On my appointment to the Directorship of the Natal Observatory, I was informed that it was intended to provide the Astronomer with suitable residence attached to the Observatory, pending the erection of which an allowance for house rent had been made to Mr Pett.*
>
> *I quite understand the that unfavourable condition of the revenue of the Colony has hitherto prevented this intention from being carried out and in consequence have, at my own cost, rented a house near to the Observatory for the general purposes of a residence, though by the nature of my duties, I was compelled to work and sleep in a very small room in the basement of the Observatory.*
>
> *Experience during the last two summers has only too forcibly shown me that I cannot continue this for another summer without seriously suffering in health. It is absolutely essential therefore, that some better accommodation should be provided for the Astronomer before the end of the year.*

As far as I could gather from an interview with you, you do not see any prospect of the Government being able to do anything this year to provide such better accommodation. On the other hand I can foresee that another year's experience will almost certain[ly] end in my being compelled to resign my appointment through ill-health ..... I propose to erect a small bedroom and small ante-room and lavatory at a cost of not exceeding £200 ....."[4]

Had Nevill realised what the future was in store for him, he probably would have resigned on the spot. The "promised" house was not erected until nearly the turn of the century!

"M.N.A.S.S.A" Vol. V, No 1 published in January 1931 by Mr H E Krumm F.R.A.S. (Courtesy of the Astronomical Society of S.A.)



The Natal Observatory

MONTHLY NOTES

OF THE

ASTRONOMICAL SOCIETY OF SOUTH AFRICA

Volume V, No: 1.

EDITOR: H.E.Krumm, F.R.A.S. Leeuwendal Crescent, Cape Town.

1946 January 31.

III

If his scrap books are anything to go by, Nevill was reasonably at peace with the local Press. His knowledge of matters chemical came to the fore during the latter part of 1883 when he produced a learned discussion on the safety of the water that was being drawn from Currie's Fountain. He felt, quite naturally, that water drawn from a well that was only nineteen feet deep could easily become contaminated *"Should by any misfortunate outbreak of any dangerous character occur amongst the coolie [sic.] inhabitants on the flat or foot of the Berea, the water drawn from Currie's Fountain, if once contaminated would serve to spread it through the town, and convert a local outbreak into a general epidemic.... "*.[1] The article continued to state that as far as the various sources of water supply was concerned, ... *"Mr Neison ranks them in respect of quality in this order : Umlaas, Krantzkloof, Umbilo, Umhlatuzan, Umgeni [Rivers]. In doing this, he bears out the suggestions of common sense and unprofessional observation. The Umlaas runs through a deep rocky valley, with no towns, mills or other contaminating centres along its course. Krantzkloof is a precipitous and almost inaccessible ravine, unapproachable by cattle and never likely to be the abode of any manufacturing industry. The Umbilo also, for some miles above the proposed site of reservoir, flows through secluded gorges little frequented by man or beast. The Umhlatuzan is of considerable excellence though not so good as the other three, but it is more liable to pollution than any of them; whilst the Umgeni, though intrinsically good, pure water is, as we all know, exposed to contamination more or less along its course - all the impurities for instance, contributed by Maritzburg and Inanda native locations are poured into it by its tributaries."*[2]

Had the writer of that Editorial been able to see into the future, he would have suffered a severe shock! The proposed reservoir was constructed on the Umbilo River in what is now called "Paradise Valley" at the Eastern end of Pinetown. It has long been abandoned but parts of the original foundations and settling ponds were still visible in the 1980's. Pinetown has become a very large industrial complex and the water supply for the cities of Durban and Pietermaritzburg, together with most of the towns and villages between, now comes mainly from the Umgeni River - suitably purified.

The Umbilo River was not the ideal source for the water, but the estimated cost of erecting the dam was, in 1883, £25 000 whereas much higher figures for any of the other rivers would have been required. This was still a large sum of money for those days but the dam was nevertheless constructed and was estimated to be big enough to supply a town of up to twenty thousand inhabitants, such was the population of Durban at that time.

Where did Nevill fit in with the above? It appears that when the initial investigation was carried out, he accompanied the Borough Engineer on a tour of inspection of the various water sources and was authorised to conduct the chemical examination of the water from each. He was paid an honorarium of fifty guineas by the Council for his trouble.[3] A further newspaper cutting reveals that the sampling and testing of the various waters commenced on 30th July 1883, thus providing us with a firm date on which Nevill's work as Government Chemist can to be based.[4]

Looking South from St. Thomas Road. *circa* 1890. Possibly the earliest picture of the Observatory.
Credit: Local History Museum, Durban.

IV

To summarise, Nevill had only been in Natal for a very few months. He had overhauled the large Grubb refractor. The Transit instrument was in place and working, the clocks were still a worry but he had been lent a sidereal clock (No 1915 by Dent and Company) which had a very steady rating and was the property of the Rev Perry F.R.A.S. Another Dent sidereal clock (No 2322) had been purchased for the Observatory by Dr Gill in the Cape but had been found to be erratic in behaviour. A Poole chronometer (No 1407) was lent by Mr Pardy (a Durban watchmaker) and this was a good steady instrument and was being used to transmit the time signal throughout the Colony. One further chronometer (Frodsham No 1888) was also lent by Mr Pardy and which, when rediscovered many decades later, overhauled and

started up, kept a steady rate of plus 3 seconds daily. The Dent and Poole timepieces were eventually purchased at a cost of £70.

On going though notes on compiling this summary, it is recalled that Nevill's annual salary was initially £400 and this amount remained unchanged for a number of years. From the description of the Observatory and from photographs taken at the time, the dome over the Grubb eight inch refractor was hemispherical with a pointed portion at its apex, this being surmounted by some lead ornamentation. This would have allowed the refractor to observe objects only up to about 80° in altitude and this is rather surprising. Why would a firm of the outstanding calibre of Grubb in Dublin design a dome in this manner? It is of note that the refractor mounting was "assymetrical" and peak of the dome itself carried a large lead ornament.

*

REFERENCES AND SOURCES OF INFORMATION

- - - - - - - - o 0 o - - - - - - - -

Section I :

1. Report to the Legislative Council, 24th July 1993, Local History Museum, Durban

2. Large letter book, letter No 29, Local History Museum, Durban

3. Small letter book, Letter No 9 dated 3rd January 1883, Local History Museum, Durban

4. Vide, letter No 16, dated 17th February 1883

5. Vide, letter No 25, dated 3rd April 1883

6. Vide, letter No 26, dated 3rd April 1883

7. Vide, letter No 26, dated 3rd April 1883

8. Large letter book, letter No 39, Local History Museum, Durban

9. Copy of documents from Surveyor General's Offices, Church Street, Pietermaritzburg

10. Vide 9 supra.

11. Copy of Deed of Transfer, Deeds Office, Church Street, Pietermaritzburg

12. Vide 11 supra, (Letter attached to document.)

13. Vide 11 supra. Receipt attached to document.)

Section II :

1. Small letter book, pages 70 and 71, Local History Museum, Durban

13. Large letter book, letter number 99, " " " "

3. Small letter book, letter number 102, " " " "

4. Large letter book, letter number 174, " " " "

Section III :

1. Nevill's first scrap book - extract from "Natal Mercury" Editorial of 6th. Oct. 1883. Library of the South African Astronomical Observatory, Cape Town.

4. Vide 1 supra

3. Vide 1 supra - "Natal Mercury", August 12th 1884 article.

4. Vide 1 supra - "Natal Mercury, February 8th 1888 - article and 'letter to the Editor'.

Section IV :

No references.

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NORMAL AND ADDITIONAL DUTIES

Chapter Five

I

Posterity is fortunate that Nevill became a "Government Servant". As such, he was required to supply his employers with annual reports concerning day-to-day progress at the Observatory. These were duly printed for the knowledgeable and also the somewhat ignorant populace of the Colony to feast their eyes upon. In the reports - parts of which purely concern routine detail - there are some insights into the difficulties and frustrations which he and his tiny band of helpers had to face. During the following years, life at the Observatory was far from smooth - a situation which lasted until the date of his retirement in 1912.

The first thing that is noticed is that, far from remaining 'just' the Astronomer to the Government of Natal, Nevill was handed a number of other portfolios, all of which ate into his limited time and the even more limited amount of cash available for carrying out his duties. Let us now turn to these reports, letters and records and discover what happened between 1884 and 1885.

Following his original lengthy report in 1883, Nevill's next one dealt with the period from May 1883 until May 1884. The first major outside work (apart from testing the waters of the various rivers), was a request from the Natal Harbour Board to have Tidal Observations reduced by the Observatory. At this stage, work was under way to try to improve the entrance to Durban Harbour by erecting breakwaters. Apart from the effect that these would have on shipping, it was essential that tidal predictions be prepared for future years. As the Chairman of the Board was none other than Mr Harry Escombe - the major benefactor of the Observatory - Nevill could hardly refuse such a request! The reduction of the tidal readings became an ongoing task.

At that stage, the staff of the Observatory consisted of Nevill, his first assistant Mr Herbert Lloyd (who also happened to be the Secretary of the Berea Lawn Tennis Club) and, during November 1883, a Mr W J Grant who joined the staff as Astronomical Computer. Grant was one of the many children of Mr William Grant, a well known merchant in the town, living at "The Grove" on the Berea. The present day "Grant's Grove" off Musgrave Road was named after William Grant and more will be read about this family as the years move on. Nevill was earning £400 per annum and Lloyd and Grant were each being paid £144 per annum.

A four stranded wire fence had been erected to enclose the two external sides of the Observatory grounds and an "*Amatingulu fence*"(An indigenous hardwood) had been planted along the remaining two sides. Ditches had been dug around the upper side of the building to carry away storm water and ..."*the Observatory is now surrounded on three sides with a light Wooden Verandah, eight feet wide, which completely shelters the main building from the sun and prevents the heating of the massive walls, previously found to be so prejudicial to good definition..... A similar verandah has been put up above, so as to shield to a great extent, the walls of the Transit Room. It has proved of considerable service, especially in tending to steady the rate of the Astronomical Clock.*

On the South-east of the Observatory, there has been erected for the purposes of facilitating the meteorological work, a small Met. House, surmounted by a wide overhanging roof Within this has been placed the Standard Barometer, Thermometer and certain of the other Meteorological instruments, whilst its outer walls serve to support a complete set of Thermometers, these being sheltered by the overhanging roof

Beyond this Meteorological House, there have been erected trestle platforms, eight feet six [inches] high, for carrying the upper Rain Gauge and the Campbell Sunshine Recorder. Near them, a smaller trestle carries a second rain gauge, elevated only four feet from the ground."[1]

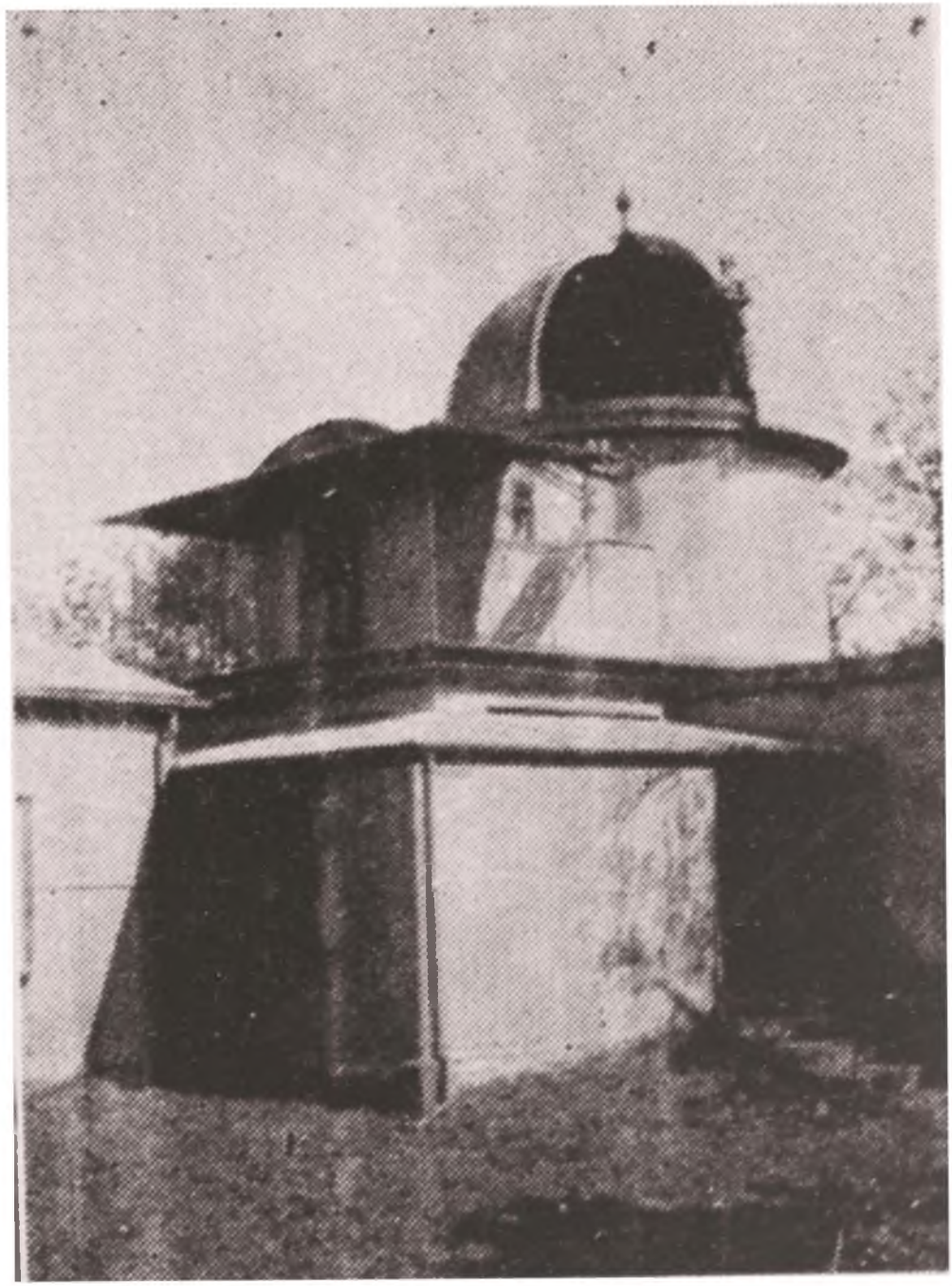
The Meteorological instruments referred to had been received in December 1883 and regular observations were commenced on 1st January 1884. The instruments on hand (All by Negretti and Zambra unless stated otherwise) at that stage and their positions are listed hereunder :

Standard Barometer (Fortin's Pattern) No 1371 (Calibrated in inches)

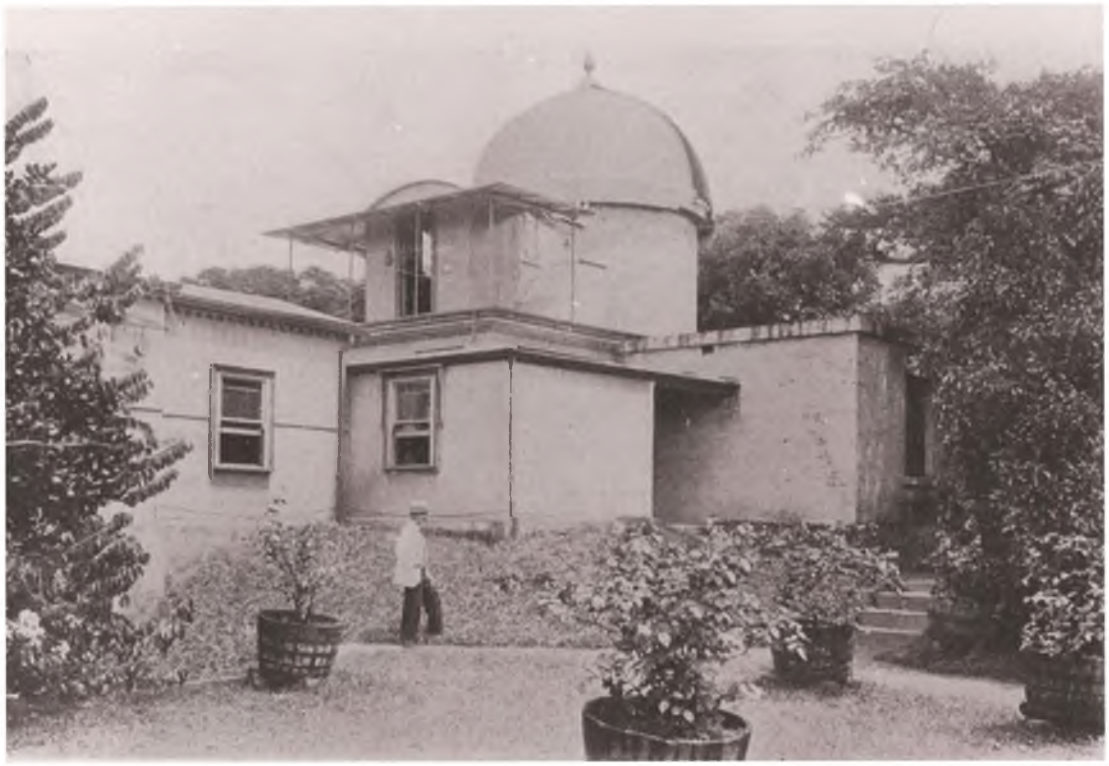
Standard Barometer (Fortin's Pattern) No 1410 (Calibrated in millimetres)
Both placed in the Met. House at an altitude of 261 ft. Above sea level.

Aneroid Barometer No 10865 (Calibrated in inches)

A very early picture of the Observatory (maybe 1900) with Edmund Nevill beneath the dome. (Courtesy Sir Patrick Moore, Miss Maud Nevill & the Ronan Picture Library)



Also in 1903, the Observatory with various extensions plus shade verandah around the Transit room. The figure is Edmund Nevill himself. (Courtesy of the Don Africana Library & taken from the 1903 Natal Illustrated Railway Guide)



Also in 1903, the Observatory with various extensions plus shade verandah around the Transit room. The figure is Edmund Nevill himself. (Courtesy of the Don Africana Library & taken from the 1903 Natal Illustrated Railway Guide)

Standard Thermometer No 49500, South outer wall

Standard Thermometer No 49498, South outer wall

Maximum Thermometer No 52371, South side of Met. House

Maximum Thermometer No 51520, North-west side of Sun Recorder

Minimum Thermometer No 52518, South side of Met. House

Minimum Thermometer No 52434, North-west side of Sun Recorder

Wet & Dry Bulb Thermometer No 42974/5, Met. House, South wall

Wet & Dry Bulb Thermometer No 42986/7, South wall of Observatory

Sunshine Recorder, Campbell Pattern, placed on open trestle work stand, thirty five feet South-west of the Observatory, at an elevation of nine feet above the ground and protected in showery weather by a glass cover.

> Three, eight inch diameter rain gauges, pattern No 1, being in a shallow brick pit with rim six inches above the ground. Each is placed to the South-west of the Observatory at a distance of from 25 feet to forty feet.[2]

According to the report, the Pobservatory equipment had there was a self-registering Anemometer on the staging of the Time-Ball at the Point. Nevill had also requisitioned for a self-registering barograph for the Observatory.

The Observatory equipment has not altered and all items were "in good shape although the weather during the past few months has rendered systematic observations very difficult." During January 1884, observations of the Comet "PONS" had been made as had a few observations of the inner satellites of the planet Saturn. The Transit instrument - now fitted with a suitable micrometer, had been in great demand and the following numbers of observations made were :

Stellar Transits ***1 273***

Transits of the Sun ***17***

Transits of the Moon's Limb ***61***

Transits of the Crater, 'Murchison A' 58

Zenith Stars observed for Latitude . . ***26***

As a result of the latter set of observations, Nevill had been able to reduce the error of the position of the Observatory down to a very fine art. He reported the position as follows :

Longitude 2h 2m 1s.183 East of Greenwich, Latitude 29° 50' 47".42 South.

A point to note is that when David Gill had visited Durban in 1881, he had erected a temporary Transit Instrument near the old Durban Post Office. The Longitude of the Durban Observatory rested on Gill's observations. From these, there was an apparent difference of about 0.57 seconds of arc. As this represents only about 16 metres, the discrepancy was not considered to be significant. The Longitude was eventually refined by Nevill down to within two or three centimetres.

Time signals had commenced at the beginning of the year (1884), these being at one o'clock (13h00) Observatory Mean Time and had covered those areas of Natal which were then connected to the telegraph system. The method of signalling was by a Morse Key, but added to this, Nevill reported that :

> "*....Besides the Time Gun which is regularly fired from Fort Napier at Maritzburg, a Time Gun has been established during the year on the Market Square, Durban. This gun fires with moderate regularity on every day except Saturday, the majority of failures seeming to be due to imperfect fuses.*
>
> *It should be added that the control of neither the Time Guns nor the Time Ball rests with the Observatory, whose duty in connection with them is solely confined to regularly sending the requisite current at 1 o'clock to the Durban Central Telegraph Office, where it is divided and transmitted to its proper destinations; and to noting whether the current has been properly received. It should be added that the eight o'clock gun from Fort Napier is not fired by an electric current from the Observatory."*[3]

He concluded his report by stating that he had received Meteorological data from various stations throughout the whole of South Africa as from 1st March 1884, these stations being situated at Clanwilliam, The Royal Observatory (Cape Town), Cape Point, Cape L'Agulleas [sic.], Mossel Bay, Cape St. Francis, Port Elizabeth, Port Alfred and East London.[4] This, then was the extent of official Meteorological Observations in 1884!

On more mundane matters, the day-to-day affairs of the Observatory carried on without a break. A Bank draft was sent to Troughton and Simms for £135 to pay for the Transit Telescope with a further £10-5-4d for the micrometer. £210 was paid to Grubb in Dublin in payment for the iron-work of the observatory dome and £75 to a Mr Stone in payment for the *"Dent No 1915 Siderial Clock"*.

A certain Mr E Innes (possibly a relative of the Union Astronomer of the 20th century?) stayed in Durban in April 1884 and on April 5th, the first Meteorological readings were wired to Cape Town. A number of letters were written to members of the public on such matters as the fitting of lightning conductors to one's house, how to clean the optics of a telescope and even how to build a small observatory! All

these were dealt with in an extremely patient and detailed manner and some even included beautifully executed drawings of the subject concerned.

It appears that Mr John Grant had been an unofficial member of the Staff because his appointment did officially commence until 1st January 1885. It is probable that Nevill had paid Grant's £10 per month out of his own purse - something which completely in keeping with his character.

On 20th January 1885 there was a slight altercation between the Astronomer and the Superintendent of the Durban Telegraph Office. This prompted Nevill to write :

> "....*This morning, although every endeavour was made, I failed to get a message through to you, the line being interrupted, though clear up to as far as Sunday. Later at ten, finding the line clear, I commenced sending down the message only to be interrupted by the improper message 'Don't bungle so!'. Will you be so good as to see for the future that no such improper messages are set up, or I shall be obliged to apply to the General Manager to demand that the proper courtesy be maintained. Herewith I enclose the message."*[5]

This naturally caused a flurry of apologies and acceptances of same. Because no further references can be found on this subject, the "improper messages" appear to have ceased forthwith!

Numerous observations of ***Barnard's Comet*** were made from August 12th until December 18th 1884, and a report of all these sightings was duly sent to interested observatories around the world in February 1885. During the same period, Nevill caused to be published in the Astronomical Journals, a highly technical article entitled ***"On the Long Inequalities of the Motions of the Moon due to the Disturbing action of the Planet Mars".*** Where he found the time to put together data of this sort is quite unknown.

Mr G Rutherford became Chairman of the Board of Visitors at the beginning of 1885, but as so often happens with Staff, a resignation had been handed in. It was from Mr Herbert Lloyd who had resigned on 20th November the previous year. After leaving the Observatory, he went on a tour almost around the world. A suitable article was published in the *"Natal Mercury"* - date unknown - marking Lloyd's departure :

By the steamship **"Dunkeld"** *which sailed on Friday last for the East Coast, there left Mr Lloyd of the Durban Observatory. Mr Lloyd has bidden farewell to the Colony and we are sure that he has taken with him the good wishes of a very large circle of friends for his future welfare.*

We have frequently been much indebted to Mr Lloyd for statistical information and, as Secretary to the Berea Lawn Tennis Club, he will be much missed. Mr Lloyd proceeds to Zanzibar and Aden, thence by steamer to India and Australia, proceeding home to England through America.

With Lloyd's departure, Mr Grant was promoted and his place was taken by Mr Henry Chard. The Observatory staff was once again up to full strength.

A new room had been constructed at a distance of twelve feet from, and South-west of the main building for the use of the duty Astronomer. It was some 20 feet long by 14 feet wide and was fitted with a lead covered flat roof, being connected to the Observatory by a small ante-room which opened into the computing room underneath the Dome.

During 1884-1885, adjustments were made to the positioning of the rain gauges. These were moved from 90 feet to 110 feet North-east of the Observatory and a wind vane had been provided - being some 14 feet above ground level. Once again, the weather had not been very favourable but numerous transits had been recorded : 1155 of Stars, 8 of the Sun, 57 of the Moon's limb, 50 of the Crater Murchison "A", 3 of the Moon's diameter and 202 Zenith stars. A small adjustment in the Latitude of the Observatory corrected it to 29° 50' 57".383 South - a difference of about 0.1 of a second of arc. Insufficient observations had been made to materially affect the given Longitude of the station.

Time signals had carried on with only two failures "through accidental causes", with specially arranged sets of signals being sent to Captain Morris R.E., head of the Geodetic Survey, Lieut.

Laffan R.E., for the use of the survey party at Pietermaritzburg and also to Newcastle for onward transmission to Mr J Ballot of the Rolfontein Observatory in the

Transvaal. It appears that Mr Ballot had set up a proper, albeit small, observatory since the days of the famous Venus transit.

Work on the reduction of the Tidal data could only commence once the required forms (on order from the Government in India and also from Prof. G Darwin F.R.S.) had been received.

Despite all these varied activities, criticism from the public sector once again raised its head. Articles about the Observatory started to appear and letters were written to the Editor complaining about the apparent uselessness of the Observatory. Just after the 1885 report had been published, this appeared in the *"Natal Mercury" :*

> *The very interesting reports of the Superintendent of the Natal Observatory suggests the question - What is the use of the Establishment? So far as we can see, it is altogether of little practical value, and this arises from the simple fact that the work of the Observatory is recorded in something like a field book. We never hear about the Establishment or get any information from it except once a year, when the Superintendent's Report is submitted to the Legislative Capital. Now there is much that might be made known to us every week - in fact every day .... What is the use of going to the expense of it, if it is to be locked up in the Observatory?"*[6]

Of course, there was a reaction. Five days later, on 30th July, the Colonial Secretary explained that *"The Government did not think that a separate Establishment [vote] should, in the present state of the finances, be continued for the Observatory. However, under the heading of 'Miscellaneous', they proposed to have a sum of £300 set apart for the Observatory."*[7] Now, remembering that Nevill's salary alone came to £400 per annum, this was somewhat unfair. The said £300 was made to stand over on several occasions and was passed only after much fierce lobbying on 20th August 1885 - and even then only because after Mr Kershaw had reminded the Council that of the original cost of £1900, £1400 had been raised entirely by public subscription!

Behind Mr Kershaw's support lay the activities of Messrs. Fisher and Atkinson who had both rushed up to Pietermaritzburg at the first signs of trouble. They pleaded with all concerned for support, pointing out that the actual annual running costs of the Observatory were : £400 for Nevill himself, £120 for a Clerk, £12 for "Natives" and a further £135 for computing costs, rations and the like, totalling £667. This meant that there would be a shortfall of £367 which had to be raised from somewhere.

There is no record of how this money was raised, but on reading through some of the last letters of Nevill before he retired, it appears that he went without his own salary for that year and on several other occasions to ensure the continuance of the Observatory as a functioning body.

As soon as the general public and the local press realised what was going on, there was one of those inexplicable *volte faces* and editorials came out in support of the Observatory. Copious articles appeared outlining the exceptional value of the institution in a world where science was coming to the fore. Humanity is indeed fickle.....

Before we leave this particular set of Reports and information, a matter took place at the end of 1884. The beautiful old homestead of Bishop Colenso at Bishopstowe, was completely destroyed by a serious grass fire. Everything was lost in the inferno. Future historians probably lost some fascinating reports concerning Dr Robert James Mann and many details about Colenso's life in Natal would have gone in that tragedy.

II

During 1885, Nevill went down with a serious illness which caused the work at the Observatory to be severely curtailed. No doubt the worry and strain caused by the financial difficulties had taken their toll. A letter which John Grant wrote to Henry Ballot on 26th August stated that "*....Mr Nieson however has been far too ill to be able to observe and is not likely to be able to resume his work for some weeks to come.....*"[1]

The Report for the year 1885 mentions that as a result of his illness - which had lasted from mid-July until nearly December - the astronomical work had been reduced to only 544 stellar transits, 4 solar transits, 22 lunar transits and 1236 zenith observations. The Tidal Record sheets had finally arrived and the vast backlog of information was being attended to. No doubt the extremely stringent cash supply was of great concern and the sheer volume of work to be done caused Nevill to look around for some outside assistance without this being much of a drain on his own pocket. We find that *"In the early part of the year, it was found possible to make arrangements by which the services of four ladies were obtained during each morning as Astronomical Computers; and owing to their zealous work during the year, the Observatory has been able to carry out a great mass of Difficult Calculation"*[2] This mass of "Calculation" totalled **Seven Thousand Reductions,**

Nine Thousand Measurements and Three Hundred and Sixty Schedules, thus producing - amongst other things, the Tidal Observations for the period from 1st March 1884 until 1st March 1885!

Who were the "ladies" mentioned in the Report? Fortunately, being a meticulous person, Nevill recorded their names and their emoluments :

Assistant No 1 A ..... Miss M F Grant £4: 6: 8d

Assistant No 2 A ..... Miss M F Grant £2: 17: 0d

Assistant No 3 A ..... Miss B Grant £3: 19: 0d

Assistant No 4 A ..... C M Chard £7: 17: 4d

Assistant No 5 A ..... A Chapman £4: 7: 4d

Note the names "Grant" in the above. These were three of Mr Grant's TEN daughters who were obviously in need of some "pin money". So, for an outlay of only some £23, the enormous total of calculations shown above, were carried out and Natal received its first official Tide Tables.

Illness or not, in the middle of all this work, Nevill published a really superb piece of scientific Astronomy under the name of Edmund Neison. This was a short treatise entitled : ***"Work at the Natal Observatory - a Review, and, on the Corrections Required by Hansen's 'Tables de la Lune'"*** [2] Copies of this treatise were sent to all major astronomical centres and were also published in the local Press.

III

Readers may well be wondering about the work done by Nevill under the heading of "Chemistry". At this stage, very little was recorded, although a few newspaper cuttings in his scrap books reveal that he did undertake the testing of samples of water from time to time. He made no comments about these in his letter books but on 6th August 1885 - during the period of his illness - he was able to write a long report

to the Natal Harbour Board concerning damaged cement on board a vessel called the ***"Brunette"***. His "Opinion" was summed up as follows :

> "*The effect of crude creosote vapour on Portland cement is to render it 'greasy', or to take water badly, and cause it to cake.*
>
> "*If the timber had been recently creosoted, as seems to have been the case, in my opinion, its transmission in the closed hold of a vessel might be reasonably expected to materially damage any cement packed with it, owing to the conjoint effect of the mixed vapours of creosote and water, which would be evolved from the timber under these circumstances.*
>
> "*The damage would be the same even [if the] ship [were] built of iron or wood.*
>
> *EDMUND NEISON F.C.S.*
>
> *Government Astronomer.*
>
> *Fellow of the Institute of Chemistry of Great Britain and Ireland."*[2]

Almost immediately after this, he received samples of water for analysis but these were submitted with insufficient data, causing him to write on 12th August that as soon as he received the information required, and .... *"as soon as I am well enough to leave my couch"*...[3], he would analyse them. This work was completed ten days later and his report dated 22nd August referred to the samples as being "absolutely foul"! This particular report was signed in the same manneras that above but for good measure, he added the following to his list of qualifications : "Late Lecturer in Chemistry at Charing Cross Hospital, London School of Medicine and Lecturer in Chemistry at Trinity College"[4] All these had been gained before he left England in 1882 at the age of 35 years.

A further list of names of Assistants was recorded in November 1885, these being : P Davis, F M Grant, C Chard, B Grant and A Chapman, whose salaries cost the Observatory about £30. On this occasion, only two members of the Grant family were involved.

Before the end of 1885, Nevill wrote a long letter to the Chairman of the Natal Harbour Board (Harry Escombe) advising him that work was proceeding apace with the reductions of the tidal data so far presented to him. He remarked that he proposed to *"utilise the data already obtained for constructing provisional Tide Tables and to compute from them the times of High Water and the rise of tide for every day during the forthcoming year, both for the use of the Port Office and for the sake of comparing the observed with the theoretical height. ...I propose to defer the consideration of the scientific results of the reduction of the Observations until the completion of the work, when I will lay them before the Board in the form of a complete Report.*[5]

To sum up this phase of Nevill's work, by the end of 1885 after nearly three full years at the Observatory, he had (under the pseudonym of "Neison") become : a) The Government Astronomer, b) The Meteorologist, c) Unofficial Chemist, d) Compiler of the Tide Tables, e) The Supplier of accurate Time Signals to the Colony and f) "Whipping Boy" of those who thought that his work was a waste of time and money! All this for a reduced salary, additional expenses which he paid for himself and probably earning only a few shillings here and there with extraneous work.

No further handwritten letters survive after this time but as Nevill had the good sense to keep copies of his annual reports and newspaper cuttings, these give us a clue as to some of the following years' work whilst still in Natal.

*

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ASTRONOMY SLOWS, CHEMISTRY STARTS

Chapter Six

I

Although this Chapter covers the years from 1886 until 1894, let us immediately digress and remind readers that on 27th August 1883, after several days and nights of ominous rumblings, the island of **Krakatoa** erupted and exploded, creating enormous tidal waves and widespread destruction.

It did not take very long after this event before the whole planet was surrounded by a fine high level suspended layer of volcanic dust. Magnificently coloured sunsets were the order of the day and Nevill made some interesting remarks about these in the publication "Knowledge" in the June 1884 edition. From Durban, he commented that :

> "*In England, you all seem busy over discussing the extraordinary sunsets. They began in Natal in February 1883, but on a less grand scale but gradually became more until June. Then for two months nothing was noticed. In the latter end of August, they became most vivid. On 21st and 22nd they were noticeable and not vivid. The next five days were stormy with much rain and lightning. On 28th and 29th the sunsets were most vivid. The 30th was rainy. August 31st and September 1, 2, 3 and 5 were fine and the vivid redness of the sky was most remarkable, fading away as it did into green and purple in the East.*

> "*Then came a week of much rain and the sunsets vanished, not to return for nearly four months, except in a very faint degree. In February and March of this year [1884] they again became very noticeable, but did not last so long. Now (April 22nd 1884) they have gone again. Now for a remarkable point. In the Transvaal they were first noticed in the beginning of September - the 2nd I think - and were most vivid until then end of January, though here, only some 250 miles off, nothing was seen.*

"*They disappeared, as far as I can gather, from the Transvaal in January .... I am inclined to believe the sunsets to have been purely meteorological. Those in February 1883 were sufficiently marked to induce me to try a water-colour sketch on February 8th. It was spoilt the next day by two visitors to the Observatory who upset a glass of water over it, smashing the glass and making general havoc.*

"***I got a specimen of the fine dust which fell on the ships in the Indian Ocean a few days after the eruption of Krakatoa.*** *It was absolutely free from metallic iron or mineral containing iron decomposed by hydrochloric acid - pumice stone, pure and simple I believe. I tested it expressly for iron in both these forms. It was a grayish-white dust".*

Furthermore, the tidal wave of the explosion was recorded in Algoa Bay (Port Elizabeth) when the ***"Hawarden Castle"***, under the command of Captain Webster was at anchor in 6¾ fathoms. Apparently at about 8.30 p.m. on 27th August with a moderate wind and almost calm sea, the ship suddenly swung round from facing South-east to North-east, bringing the wind and sea onto the beam [right angles to the length of the vessel]. The anchor cable friction brake would not hold and the Captain had to order the second forward anchor to be let go. The vessel then stayed facing North-east for about eight minutes, then suddenly swung to the South-east. Shortly afterwards, she swung back to North-east and spent the next three hours swinging from the one heading to the other. Eventually at 3.00 a.m. on the 28th, she finally settled down to face the wind and sea.[1]

Despite the distance of Krakatoa from the coast of the Eastern Cape and Natal, within hours of the eruption, the effects of the tidal wave were felt and recorded at Port Elizabeth. Surprisingly, there was no mention of a similar "swinging of vessels" at anchor off Port Natal. The brilliant sunsets during the period prior to the eruption were obviously NOT of volcanic origin but were more probably the result of grass and forest fires. Whatever the causes, the last traces of these unusual sunsets carried on until at least the end of 1885. Nevill made no mention as to whether the high level dust in the stratosphere affected his telescopic "seeing" or visibility.

The year 1886 was noticable for a number of reasons, all of which had an effect on the work being carried out at the Observatory. The first was the fact that the Natal Government Railways had by then forged ahead and the main line had reached the town of Ladysmith. This opened the doors to the setting up of a string of secondary and tertiary Meteorological stations along the way.

The second reason was that, after his long illness - which would have been exacerbated by conditions in his living quarters in the Observatory and/or the very trying Durban climate during the months of December to March - Nevill returned to England for the period from May until October. Unfortunately no record exists as to the names of the ships that he sailed on or their dates of sailing. However, one of the matters which he attended to whilst in England was to see to the publication of his superbly written book **"Astronomy - A Simple Introduction to a Noble Science".** Nevill had reduced the work to a final manuscript between 1880 and 1882, but the publishers Ward Lock & Co., of London did not publish it until 1886. In his preface which describes the contents, Nevill's final remarks were ..... *" it is hoped that by enlisting further recruits to our ranks, it [the book] may tend to the advance of Astronomy"*.[2] This researcher would very much like to add those sentiments with respect to the work you are now reading!

II

The Annual Report for the year 1886 was very much reduced in length as a result of Nevill's absence overseas. During his absence and sickness, the running of the Observatory had been left in the hands of his only official Assistant, Mr John Grant. Help for computing had continued unabated with the five ladies, Mesdames Grant, Grant, Grant, Chard and Chapman. Their working conditions cannot have been of the best as they were either in the open or in the extremely cramped space in the Observatory beneath the telescopes. A request was made for the construction of a light, cool room, similar to the Transit Room, that is, of wood and painted canvas. This was for the use of the Computers.

Nevill had taken parts of the Grubb eight-inch telescope with him to England to be improved. These had now been brought back and were in good order - notable amongst them were the filar micrometer, which had had its range extended and its dark field illumination improved. A collimator had been fabricated for the Transit but was awaiting installation. All the meteorological instruments were working satisfactorily.

One o'clock time signals had been sent out by telegraph without interruption but the Observatory was still in need of a good mean time clock. The third year of the Tidal Observations were being reduced prior to the construction of up-dated Tide Tables.

Concerning Meteorological Stations, for the first time a full list of those (1886) Stations which were sending in regular readings twice daily, was published. Those who are familiar with Natal will be surprised at their geographical range. They were : Stanger, Verulam, Durban, Richmond, Ixopo, Pietermaritzburg, Greytown, Estcourt, Ladysmith and Newcastle. Sixteen other centres outside Natal were also sending in regular reports. Some of the information given was purely statistical, but one item is of particular interest. Nevill reported that during the year, Durban had experienced fifty-seven rain storms and thirty-three thunderstorms. Its overall rainfall came to 31.79 inches - some *"ten inches less than the average over the last twelve years"*.

During 1887, Nevill was officially appointed to the post of "Government Chemist and Assayer". Thus the experience as a chemist he had gained in England was to bear further fruit and may have increased his income. The first and most important task was to design and construct the laboratories. These took until July 1888 to complete so that no report for 1887 concerning them exists. Unlike the Observatory, the original laboratories have survived the passage of time and the original brickwork of the buildings and the flues of the assaying ovens still existed in 1982 amongst the buildings of the Department of Health located forty metres below the site of the Observatory.

Astronomically, things had quietened down considerably. Mr Grant left the Observatory at the end of 1886, with no mention as to what had happened or where he had gone. A clue exists in the poignant remark in Nevill's report that ***"No funds*** *had been provided for in the vote for the past year* ***for the payment of salaries***". Natal (and especially Nevill) temporarily - it seems - lost a highly trained man. This was another year when Nevill himself did without his salary and had to pay out moneys from his own reserves. Was it then a coincidence that he had been appointed as chemist and assayer at the same time?

The computing assistants had had to be reduced to four in number, these being the Misses M & B Grant, Miss Chard and Miss Chapman ... *"who have carried on the greater part of the astronomical computations, meteorological recording and tidal reductions. It has been found impracticable to carry on more than ordinary routine work"*. The eight inch refractor was back in commission but the transit micrometer's cross wires had been broken by "some insect" (later found to have been a spider!) and the frame had been sent to England for repair.

December 1886 saw the Observatory receiving the requested self-recording barometer, this being *"Browning's Recording Compound Aneroid Barometer No 2711, which has worked well and yields trustworthy results especially in indicating the approach of heavy rains and thunderstorms. It is placed in the Observatory at a height of 260 feet above sea level."* The instrument was obviously an early type of barograph.

III

Nevill's patience concerning his cash and personal ;problems was rewarded when, on 1st February 1888, Mr John Grant was re-appointed Assistant Astronomer! A further member of the "fairer sex", Miss Platt joined the little band of computers. Masses of reductions had been accomplished and in the 1888 Report, under the heading of "**Work at the Observatory"**, the following entry will be of interest to the serious astronomer :

> "The principal work of the Observatory is the comparison of the Declinations deduced from observations made at the Observatories in the Northern and Southern hemispheres by a comparison by Talcote's method of Zenith Distances of northern stars and circumpolars both above and below the Pole. During the year, a number of observations have been made.
>
> "Considerable progress has been made in the observations of pairs of equi-zenith distance stars for the determination of the latitude of the Observatory, which forms the ***second fundamental point of the South African Geodetic Triangulation.***
>
> "During the year, the Greenwich Lunar observations for the ten years 1878 - 1887, have been reduced and compared with the theoretical basis of Hansen's Lunar Tables in the same manner as those for the sixteen years 1862 - 1877 are reduced, compared and discussed in the Memoir on the Corrections required by Hansen's "Tables de la Lune" - Memoirs 1885"[1]

A manuscript of about 4000 observations of the "Right Ascension of Zodiacal Stars" had been prepared and the third year of tidal data had been reduced satisfactorily. An undated newspaper cutting in the scrap book stated that "Dr David Gill was leaving for England in the Union Mailship ***'Trojan'*** today, the main reason for his visit being to inspect the new heliometer for the Cape Observatory". At this time, Gill was deeply involved with the new "science" of Astro-photography which he had pioneered almost by accident.

The Laboratory was now ready and it did not take Nevill long to get started on the mass of work awaiting attention. The first "Report of the Government Laboratory" was dated 1st February 1889. From July 1888 until February, Nevill had conducted six qualitative analyses, sixty-one assays in gold and silver, eleven scientific reports, five toxicological examinations and seventeen miscellaneous reports - eighty-three in all. The first part of his report (which was published under his correct name of "Nevill") states that : ..."*as the toxicological Examinations require special and expensive re-agents and apparatus, and are highly dangerous in this climate without special appliances, application for authority to provide these at the cost of the Colony had been made, and being duly granted, the proper steps are being taken to obtain what is necessary*"[2]

Part of Nevill's original laboratories. Photo: Andrew Gray.

The exterior of part of the original laboratories. Photo: Andrew Gray.

It is interesting to note that under "Appendix K" of the section dealing with Assays, one of the samples taken in Alexandra County yielded five ounces, 2 dwt. of gold. Of the other fifty-one gold assays, two yielded a "nil" amount but one from the "Umsinga Division" [an area in Zululand close to the present settlement of Mpofana] yielded no less than 8 oz. 18 dwt. - a very good lode indeed but apparently never followed up.[3] The assay yields probably refer to amounts "per ton of ore" but this is not stated.

Additional rooms were constructed in 1889 for the laboratory. These included a special laboratory for toxicological examinations together with cellars for storing the highly volatile reagents. Examinations were conducted on tallow for the Railway Department and on potable water for the Colonial Engineer's department. A total of one hundred and six examinations, assays and analyses were conducted during the year and the list of substances tested and checked reads like the contents of a general dealer's store : Gold, Silver, Coal, Bituminous Shales, Diamonds, Paints, Tallow, Saltpetre, Potable Waters, Dynamite, Iron Ores, Bismuth, Copper, Lead, Pyrites and others! The testing of potable waters is of especial interest as the various samples came from inland rivers for the purposes of the Commission ***"on the introduction of***

Salmon and Trout Ova into Natal"![4] Those good folks of Natal and elsewhere who spend many hours trout fishing in the lower reaches of the mighty Drakensberg

The rear doors of the two Assaying ovens - all that is left of the original furnaces. Photograph by Author

Close up of the of the rear doors of the old assaying ovens. Department of Health, Currie Road, Durban. 1976. Photograph by the Author

Mountains can possibly be quietly thankful for the work done on their behalf by a man who was, first and foremost, an Astronomer!

Before ending the 1889 Chemistry Report, Nevill stated that a sample of saltpetre found in the Colony was so rich as to be worth more than three times as much as the best Peruvian deposits; in fact, pure enough to fetch a high price on the London market without any refinement.[5] A total of twenty-five assays had been conducted and the highest figures for precious metals were 11dwt. for gold from several areas and 43 ounces, 17 dwt. for silver from a sample of galena from Umsinga [see above].

Amongst all the laboratory work, the Observatory itself was having a hard time. The Assistant Astronomer was, fortunately, still Mr J Grant and he managed to keep things moving along. The computing assistants were the Misses M & B Grant, Chard, Platt and now D Platt. They continued to calculate masses of reductions, and the Observatory had been given a thorough cleaning and painting.

The Mean Time Clock was now (1889) on order from England but the eight-inch Equatorial was beginning to suffer badly from the ravages of the notorious Natal summer. Parts were sent to England for repairs and improvements and the webs of the Transit Micrometer were becoming brittle, to the point of breaking with "monotonous regularity". Nevill's own health was again deteriorating - he was still

sleeping under the telescopes - and the mathematical work, which was his responsibility, was suffering.

The authorities changed the fiscal year (financial year end) at the end of 1889 and this made it necessary for the following Annual Reports to run for eighteen months, from 1st January 1890 until 1st July 1891. This particular report noted that Miss M Grant (Mabel) had now joined the permanent staff as "Meteorological Assistant". More will be heard of her later, but meanwhile the computing had been conducted by a whole galaxy of local ladies numbering SEVEN in all. These were the Misses B Grant, E Platt, A Robinson, D Platt, N Grant, M Hellet and V Manisty. Once more there were four members of the Grant family involved - John Grant and three of his sisters.

A new "Magnetic Circle" had been purchased by Nevill during a recent trip to England (no dates given) and this had been installed in a small wood and copper building in May 1891 on the North terrace of the Observatory.

Electricity was then still in its infancy but the Observatory had partly modernised itself by installing a series of "Swan Incandescent Lamps". The instruments had been fitted with electrical illumination - run off a series of Leclanche cells.

For the first time, Nevill had a word to say criticisng the Transit instrument which, until then, had given excellent service. He was finding that owing to the small size of its objective lens (three inches or 76 mm. diameter) he was unable to observe seventh magnitude stars. This indicates that he had already covered the whole visible sky down to sixth magnitude which, with all his other pursuits over eight or so years was quite an achievement. The sidereal clock was also by then requiring urgent attention but the Poole (No 1407) mean time Chronometer was still being used to send accurate time signals throughout the Colony.

As far as the tide tables and recordings were concerned, the alterations to the breakwaters at the mouth of Durban's harbour had resulted in a fall of about one inch in the level of the mean low tide. The breakwaters had been extended out to sea and Nevill attributed the lowering of the level to the fact that the alterations permitted a "quicker discharge of waters of the Bay." In fact, the harbour entrance was being dredged out under the supervision of Mr Harry Escombe. The tidal reductions for the fourth year showed similar results as for the previous three years.

Meteorological work was still going strong and by mid-1891 the number of Natal stations had increased to include the Lower Tugela, Umzinto, Port Shepstone and Harding, making a total of fourteen stations. Apart from the Durban prime station, *"none of the stations in Natal are provided with proper Meteorological instruments and it was desirable in the interests of the Colony that each of these stations should be provided with a suitable barometer, set of thermometers and a rain gauge..... Provision having been made for the expense of supplying a rain gauge and a set of thermometers for each of the Coastal Magistracies, before long the Observatory will be in receipt of improved Meteorological returns for most of the coast stations in Natal. .... The number of thunderstorms in Natal is decreasing slowly and the total rainfall for the year amounted to 32.9 inches which fell in 135 days in Durban."*[6]

What form did the daily reports take? Before the necessary instruments were installed at the various stations *e*ach station reported the "direction and force of the wind, and the state of the sky

at 9 a.m., and the approximate amount of rain which may have fallen. The time of maximum intensity of any thunderstorm which may have occurred since the previous morning's report".[7]

From notes which were made during the original research, it was found that Nevill had visited each of the fourteen stations more or less once per year, no mean feat considering that several of them could only be reached on horseback! His salary as Government Astronomer remained pegged at £400 (whenever the authorities decided that he should actually receive a salary for the year!) and apart from the salary of £144 which was paid to Mr J Grant, no mention is made of any payment to his computing ladies or his official Meteorological Assistant, Mabel Grant. It is more than likely that these personnel were paid out of his own pocket.....

IV

Laboratory work-loads increased dramatically and by the end of September 1891 over a period of eighteen months, Nevill had carried out 284 Assays and examinations. By far the most frequent of these were 142 analyses of dynamite! Fortunately for him, the number of toxicological examinations had been reduced to two - something which he must have appreciated as some of these could have proved

dangerous to his health. He reported that "very little work had been done in developing the rich veins of Copper and Bismuth Ore known to exist in the Colony, samples of which have more than once been analysed. Several samples of saltpetre of very good quality have been sent for analysis and report, but the deposits seem to be thin and far from extensive. It is probable that deposits affording greater facilities for working may yet be discovered. The samples of Plumbago [graphite] deposits .... should prove useful wherever steps are taken to utilise the great deposits of excellent iron ore in the immediate vicinity of the Colonial Coal Fields..... The samples of bituminous shale sent for examination have proved to be of far better quality than those of former years. Those from the source of the Umkomaas [River] might serve as the basis of a fair asphalte [sic.]. None are suitable for distillation with the view of obtaining Mineral Oil, as the products obtained are mainly heavy high boiling oils".[1] Further on in the Government Reports, the then Commissioner of Mines stated that Nevill had been busy on analysing various samples of the coal deposits in the Colony and when the results were to hand, ... *"the real value of our coal deposits [should be] placed before the world in their proper light"*[2] As is well known in the area, these coal deposits were found to be of excellent quality and quantity and are nowadays being exported from the new harbour at Richards Bay.

Returning to the subject of the popularity or otherwise of the Observatory, there is a large gap in Nevill's scrap book of newspaper cuttings. However, there was the usual sniping in the Press - particularly from one individual who wrote under the *nom de plume* of "Star Gazer". He commented upon the complete lack of information being given to the public about various things that could be seen in the night sky - .... *"Our Astronomer might as well be at the North Pole for all the aids to popular education which emanate from the Berea Observatory! Could he tell us for our encouragement whether our telescopes of moderate strength will avail to discover the comet passing before the group of the Pleiades on 4th and 5th September [1891] or must we go to Greenwich or Hong Kong to be within range? Seriously, is it not possible to so constitute the*

management of the Natal Observatory that some popular good may result from its existence? The astronomer has a very high reputation. Ask him to tell us something of what he knows."[3] Somewhat stung by this attack, Nevill immediately replied :

> "Your correspondent "Star Gazer" (why not have signed his name, for anonymous communications are unsatisfactory) asks a definite question on a definite scientific matter, and as scores of Natalians can testify, I am always willing to answer such queries.

> "With regards to ***Wolf's Comet*** passing before the Pleiades, there is not a telescope in the Colony which would show a glimpse of it, and if there were, there is no good reason to suppose that anything remarkable would be seen. Such telescopic comets frequently pass over bright stars, which simply obscures the dim light of the comet.
>
> "Paragraphs such as he quotes are not out of place in England and America where there are hundreds of powerful telescopes but as there are no such telescopes in the Colony, it is useless to direct attention to opportunities which cannot be utilised.
>
> "Education in science, be it popular or profound, is only to be obtained by the study of suitable scientific text books, and not by the perusal of newspaper paragraphs or essays. These may arouse sometimes interest, but never really instruct; and the multiplication of such paragraphs or essays is no real contribution to the advance of proper scientific education. That can only be achieved by the study of some good text book, of which many exist, and to quote a favourite maxim of my friend Sir Robert Ball (who, by the way, is *not* the Astronomer Royal) : 'To be a student of Astronomy is such, but it is useless to self, society or science to be a 'star gazer'"[4]

Those final remarks are worthy of being noted by serious students of astronomy. Individuals who refer to them as "Star Gazers" should be gently corrected! Of course, despite this reply, further scurrilous remarks were still published from time to time. One was from *"Astra"* who complained that : "it is no use trying to draw out the astronomer for he will not respond. He keeps himself most carefully shut up in his shell and treats the popular craving for knowledge with contempt. Yet there is no doubt some vitality about the astronomer, for I find the establishment is down in this year's Supply Bill for £862 and a ***new house*** was voted for his residence". It was to take some time before the proposed house was finally constructed..... Several other letters along similar lines were published but there were also several taking the opposite view in favour of Nevill, his team and the work that they were carrying out. Such is the price that has to be paid if one becomes a public figure!

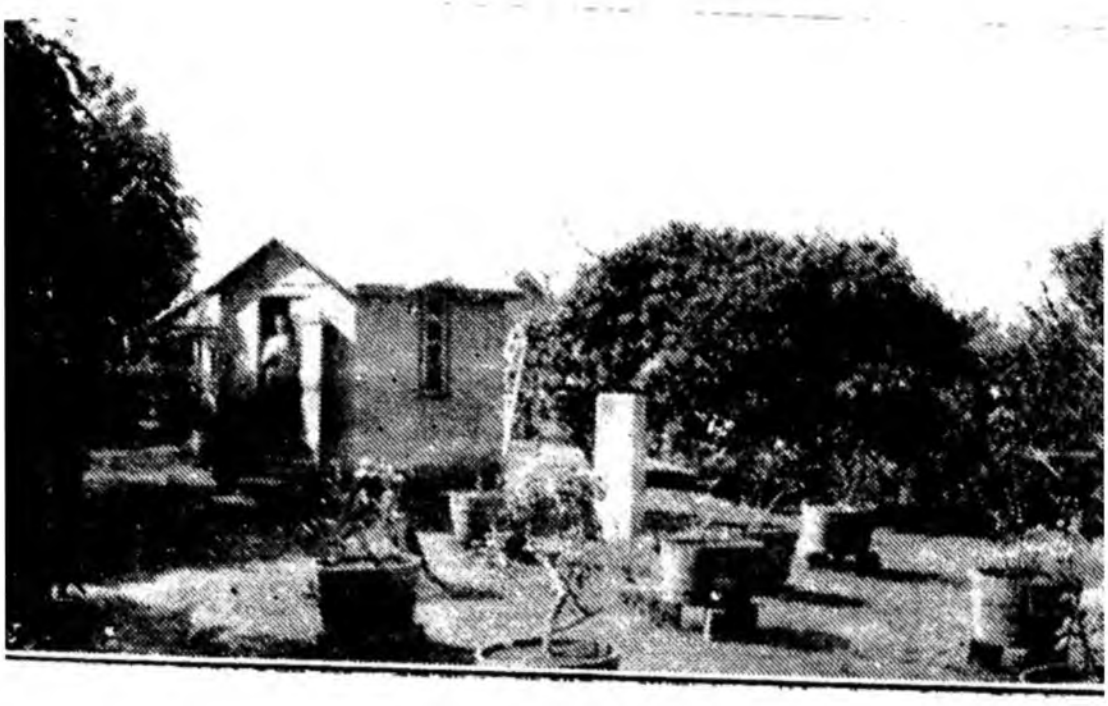
From 1891 to 1892, the lady computers had been reduced in number to three namely the Misses A Grant, M Hellet and V Manisty. Mabel Grant was still on the staff, but she had now been promoted to Astronomical Assistant, her place being taken by Miss B Grant as Meteorological Assistant. Around this time, Mr John Grant had left the Observatory but no record exists as to why he left or why he did so..

The Astronomical work was routine and the instruments were still in good working order. One event of importance to astronomers the world over, was the opposition of the planet Mars which ...*"offered a good opportunity for determining the distance of the Sun by observing the displacement through parallax, of the apparent position of the planet. The observations commenced in June 1892 and were brought to an end by persistent bad weather in the early part of September. Meridian observations of Mars with the Transit instrument were obtained on thirty-eight nights and sixty-two sets of morning and evening observations were obtained with the Equatorial. Considerable progress has been made with the reduction of these observations, but there is a good deal of subsidiary observation still to be made when the weather will permit.*

A great deal of work has now accumulated at the Observatory awaiting printing and publishing and the time seems to have arrived for considering the advisability of issuing a volume of Natal Observations".[5]

The 1893 Report reflects no change in the Staff or instruments but the computng section had by then been reduced to one person, Miss I Grant. This meant that the persons employed at the Observatory were only Nevill himself and three of Mr Grant's daughters. One wonders at what Mr & Mrs Grant thought about this - in fact, all was not exactly well in the Grant household as will be seen from remarks made in Nevill's diaries in Book No 2.

Nevill once again drew attention to the need for publishing the vast accumulation of information that had been reduced. As it turned out, all this work was never destined to reach the publishers. Further in the Report, Nevill stated that the new Mean Time Clock (Kullberg No 5366) had arrived safely. Miss I Grant had left and her place had been taken by Miss J Grant. By means of a total of 639 observations, the latitude of the Observatory had been determined more accurately determined as 29° 50' 46".68 South - a distance of only twelve feet from that shown in the early Trigonometrical Survey. The magnetic observatory had, by use of its special compass, determined that the Variation was 24° 59' 27" West with an annual reduction of 5' 47" per annum.



The Magnetic pavilion, rain and other weather gauges. From Illustrated Natal, Vol 1, No3, 1903). (Courtesy Local History Museum, Durban)

The Kullberg Mean Solar Time clock which gave time to the Post Office and Harbour. From Illustrated Natal, Vol 1, No 3, October 1903 (Courtesy of the Local History Museum, Durban)

The daily time signals were still sent out at one o'clock Durban Mean Time. This was equivalent to 10h 52m 58s.82 Greenwich Mean Time and 12h 25m 58s.82 Cape Colony Uniform Time. A full table of barometric averages and temperatures, wind,

moisture and cloud cover for the period from 1885 to 1893 was published in the Report. It is interesting to note that the rainfall in 1893/4 exceeded 71 inches - nearly double the annual average for the previous ten years. The number of Meteorological Stations remained unchanged although it was then envisaged that an additional one at Polela might be opened. The Report closes with the words .... *"although some delay was experienced towards the end of the period covered by the Report from changes in the Observatory staff, all the observations have been fully reduced and carefully tabulated as usual, up to date"*[6] What were the changes mentioned? The answer was simple - Nevill married to his Assistant Astronomer, Miss Mabel Grant! After many vicissitudes, the couple became man and wife at St. Cyprian's Church on Monday, 4th June 1894.

According to the October 1892 Laboratory Report, Nevill had conducted a total of 117 assays and examinations, one of these being a ..... *"sample of pyrites concentrates from Alexandra County, which yielded* ***552 ounces, 12 dwt. of gold to the ton of ore. The concentrates contained***

roughly 80% of pyrites, carrying about 700 ounces of gold to the ton".[7] That yield in today's terms would have created an immediate gold rush fever! The 1893 Laboratory Report reflects a marked reduction in examinations to only 47 but the toxicological investigations had risen to five. A further reduction in laboratory work to only 37 cases (with five toxicological examinations) took place up to June 1894 but in that particular report, Nevill went to great lengths in discussing the properties of "native" drugs - most of which were completely unknown to the science of those days. He pointed out that the use of certain barks and roots, whilst reasonably safe at one time of the year, could well become highly toxic during a different season owing to changes in the concentrations of sap. (Hence the reason for the "Toxicological Examinations").

He also started what is thought to be the first investigation of the properties of the soils found in different regions of the Colony - having made a large number of analyses from of samples from four different regions - from "Highveld" to the coast. He gave a comprehensive report on the need for the addition of fertilisers to improve crop yields, advocating a four year crop rotation in most areas. Work of this kind is now (1980) being carried out on a large scale at the South African Experimental Station at Mount Edgecombe. It is probable that Nevill's investigations laid the foundations for the analytical work that has continued since 1893 or 1894.

As usual, the Press was active during these two or three years and all the jibes and remarks were

skilfully parried by the "Tenant of the Observatory" with his "usual good grace".

The first, and main part of Nevill's life and work was now complete. As mentioned, his marriage to Mabel Grant would change his whole life style. She had stood by his side and assisted him in many ways since she had started as a lowly assistant computer several years earlier.

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MARRIAGE, CHILDREN & OTHER EVENTS

Chapter Seven

I

Having noted that Edmund Nevill married Mabel Grant, it may not be amiss to elaborate on the background of the Grant family. We find that Mr John H Grant, Mabel's grandfather was born in South Devonshire during the early part of the 19th century. He and his wife had several children, amongst whom was a son named William who was born in Devonshire on 22nd July 1836 and mostly educated at "Burt's School" in Plymouth. In September 1850 at the age of fourteen, he and his parents arrived in Natal from the West Indies. Thirteen years later on 8th January 1863, he married Sarah, the second daughter of the Rev. J Pilcher.[1]

During their long lives, Sarah and William Grant begat no fewer than eleven children - large families being the order of the day in the old Colonies. These children were : Agnes, Arabella, Beatrice, Edith, Frederick, John, Mabel, Marylin, Maud, Nessa and Robert. As we have seen, several of his family became involved with the running of the Observatory at one time or another.

All but two of the children eventually married. Of the two remaining, Robert - who is reported to have been the youngest and very artistic - died whilst still a youngster, and Arabella remained a spinster, taking on the task of looking after her ageing parents.

After an extremely full life, William Grant died in Johannesburg on 4th June 1907 where he had gone to ease a "troublesome chest complaint". During his life, William Grant had become a most respected merchant in Durban and had purchased a large house on twelve acres of prime land on Durban's Berea, just below Musgrave Road. The frontage of his property became known as "Grant's Grove" and although the family home was demolished in the late sixties or early seventies, traces of the gracious gardens and driveway were still visible in 1976.

Apart from his obvious business sense, William Grant became well known in public affairs. His obituary on 7th June 1907 speaks for itself when it states, *inter alia :*

> "*Few men in South Africa had had such a remarkable career as that of the late Mr Grant, and few could speak with so great knowledge and confidence upon native questions. In fact, Mr Grant had long been recognised as one of the best native authorities in the country, and his opinion always carried the utmost weight from the circumstance that almost as far back as the middle of last century, he began to take a lively interest in all that concerned the native and, in particular, the Zulus....*

> "*In the month of October 1881, Mr Grant was requested by Sir Hercules Robinson (later Lord Rosemead), the High Commissioner, to take charge of Cetewayo and party, then about to proceed to England with a view of facilitating the re-settlement of Zulu Land. He was unable to accept.... but when visiting England some time later*

(November 1881) he discussed the whole Zulu question with Earl Kimberley, the Colonial Secretary."[2]

The foregoing gives an idea of the stature of Grant's status. He even became senior adviser to the great Zulu Chief Dinizulu - apart from his membership of the Natal Legislature and later, the Transvaal Legislative Council.

Mabel Grant was born in Durban during 1865 and was thus 29 years of age when she and Edmund Nevill (then 47) were married. This disparity in ages caused quite a family upheaval and the descendants still living in Natal in the 1970's recall that Mabel was virtually thrown out of the family by a highly irate father. Age, it appears was not the only reason for this family split. The choice of husband was the other! No doubt William Grant was quite horrified at the thought of his seventh child leaving a well-founded and notable home and actually marrying a virtually "Penniless Astronomer" who was constantly being attacked by the local Press, by members of the public and by certain members of the Natal Legislature. Her living quarters changed from a beautiful home to the basement of the Observatory. It is no wonder that the family was appalled!

Despite the privations Mabel had to endure, she was made of stern stuff and managed to live to the ripe old age of ninety-three, dying in England in 1958.

Edmund and Mabel *circa* 1900. He hated having his photograph taken! (Courtesy of Sir Patrick Moore, Ronan Picture Library U.K. and the Local History Museum, Durban)

After working for Nevill at the Observatory for eight years, firstly as a computer, then as a meteorological assistant and finally as an astronomical assistant, Mabel and he were married by the Rev. Hubert Johnson MA on 4th June 1894 at St. Cyprian's Church, then in Smith Street, Durban. (Entry 354 of the Church archival records). These records show that the chief witnesses were Theresa Escombe (eldest daughter of Mr Harry Escombe), David Green and Frank F Churchill - no relation of Sir Winston Churchill but still to become a prominent figure in local politics. As befitting such an occasion, the *"Natal Mercury"* did the honours :

> "It would be noticed by our domestic announcements yesterday that the marriage of Mr Nevill, Government Astronomer and Miss Mabel Grant, the South African Tennis Champion, took place on Monday at St Cyprian's Church. The wedding was evidently a very quiet affair.
>
> "Both parties are well known and highly respected by a large circle of friends who will wish them every happiness. Mrs Nevill has been associated with her husband in his work at the Observatory for a long time past."[3]

According to Nevill's diaries, they had no honeymoon, but returned to the Observatory where they stayed and tried to create a home under the telescopes and dome - their residence for a few years to come.

To summarise the further history of the family, the Nevills had three children, these being Maud who was born in Britain on 27th April 1895 after a rushed journey there, their first son Ralph

Copy of the Marriage Certificate of Edmund Nevill to Mabel Grant, dated June 4th, 1894 in St. Cyprian's Church, Durban. (By Courtesy of the Church)

who was born under the eight inch Grubb refractor on 24th May 1898 and their second son Guy who was also born at the Observatory on 24th September 1902. Of the three children, Ralph died in 1961 leaving a son Richard who was born on 29th June 1943 and his widow Georgina. Richard has (1980) a daughter Sarah (born 9th December 1965) and a son Lance (born 28th January 1969). The other son Guy was

still living in 1980 and he married Miss Marjorie Hulett - the grand-daughter of the late Sir Liege Hulett, there being three children of that marriage, namely Christopher (born 30th November 1937), Anthony (born 31st July 1940) and Sally (born 6th February 1944). Anthony remained a bachelor as of 1980 whilst Christopher and Sally are both married and have progeny.

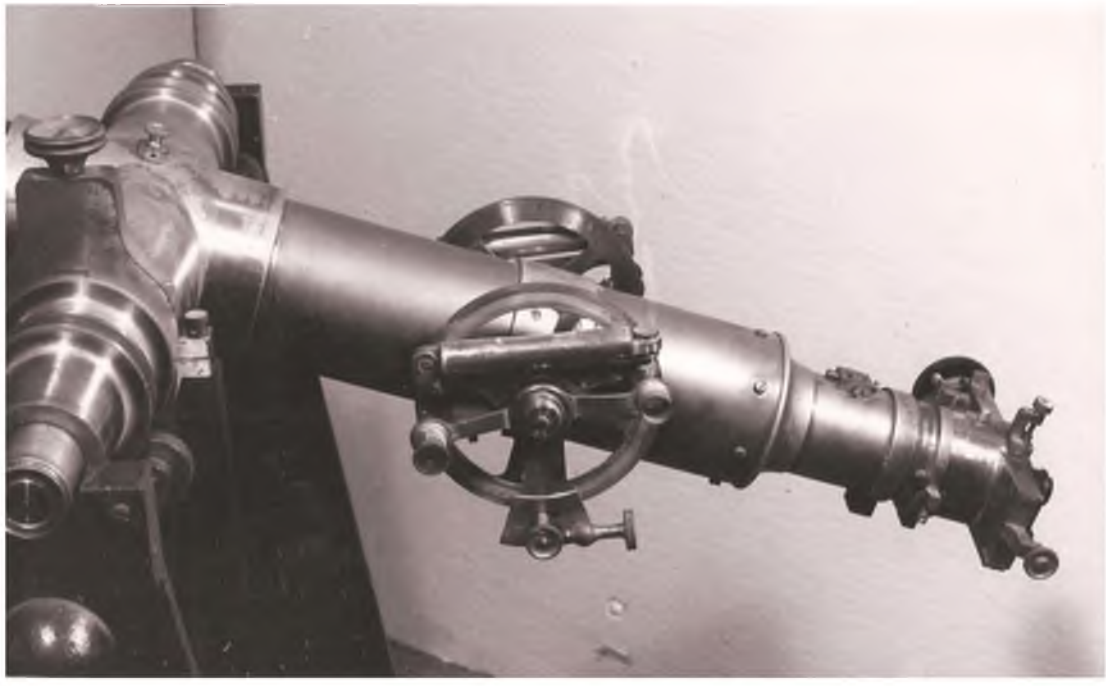
This leaves the eldest, Miss Maud. She remained a spinster and, whilst this research was being carried out, she supplied an absolute wealth of information about the whole family including a set of Nevill's diaries which proved invaluable and appear in summary form as "Book Two". Maud went to England when her parents left South Africa in 1912 and remained there, working as a nurse and then later as Matron in various London hospitals.

All in all, despite their numerous problems, Mabel and Edmund did a fine job of raising their family and the family name has been well and truly perpetuated in Natal. (See the Genealogical table at the end of this work).

II

Now, back to the work done by the Nevills at their home in the Observatory.

Nevill had conducted over a hundred observations of pairs of stars using Talcott's method of observing meridian transits azimuths to accurately determine latitude but unfortunately, owing to the wires of the micrometer being broken during his absence, observations for the rest of the year 1894 were impossible. On a more positive note is his report of the work done on the opposition of the planet Mars during the period October to November 1894 and ....."*although on numerous occasions, the weather rendering observations impossible, no Southern Observatory appears to have been more successful.*"[1]



Close-up picture of the setting circles on the Troughton & Simms Transit telescope used in the Observatory. (Courtesy - Local History Museum,)

Nevill again drew attention to the vast amount of important work which had accumulated at the Observatory and was awaiting publication. He stated that *"it is very desirable that these results of the work of the Observatory should be published as a volume of Natal Observations and Investigations; a contribution on the part of the Colony of Natal towards the advancement of science. It would be only right that the elaborate work done at the Observatory towards the completion of the theory of the Moon and the perfection of lunar tables should be included in this volume. The expense of printing would not be very large, though, as it would comprise such mathematical formulae, probably it would be found necessary to send it to one of the establishments in England, having special facilities for such work."*[2]

The Observatory staff - apart from the Nevills - now comprised a new Junior Assistant and Computer, Mr W H Pay and the Meteorological Observer and Computer, Mr Fred Hammond. Both of these had been trained at the Observatory and the reader will note that the rest of the

Grant family had ceased to be involved - no doubt at "father's insistence". No changes had been made to the instruments, these still being the Grubb eight-inch refractor, the Troughton and Simms Transit instrument, the Dent Sidereal Clock and the Kullberg Mean Time Clock - apart from a few chronometers, minor instruments and fittings. A new device had been ordered for automatically registering the actual dropping of the Time Ball at the Point, this being manufactured at Troughton and Simms but they were finding it difficult to complete the work. The main parts of this

apparatus had in fact arrived in June 1895 but the completed unit would require a specially designed and constructed building. The thought that lay behind the ordering of this equipment was the apparent reluctance of the Time Ball to drop when the pulse was transmitted from the Observatory. The altitude of the ball itself had been increased considerably and except on misty or very hot and humid days, it could be seen from the Observatory. During the previous twelve months it had apparently failed four times but, as was always the case, those four occasions brought forth a flurry of letters to the Editors of the local daily papers making life uncomfortable for the Astronomer and his staff. These failures occurred in spite of the fact that the pulse **always** left the Observatory on time.

Lest the reader dismisses the public reaction to occasional failures as being somewhat childish, may the point be posed that even in the twentieth century our children are normally berated if they get three questions out of ten wrong and we seldom praise them for getting the other seven right?

A momentous occasion took place on 1st September 1895. On that day ***..."the official time of the Colony was altered to that of the Thirtieth Meridian East of Greenwich, so that the time signal is now sent at One o'clock Natal Uniform Time, which corresponds to 11h 00m 0s00 Greenwich Mean Time and to 12h 30m 0s.00 Cape Uniform Time. The new Uniform Time of the Colony approximates closely to the mean times of Ixopo and Newcastle, the Thirtieth Meridian passing very nearly through these two places."***[3] In this reference we see the commencement of the time system that is used throughout the Republic of South Africa to this day and it was only a short while after this that the rest of the country was to adopt the Natal time system.

Meteorologically speaking, things were reasonably normal - no exceptional readings were received and the observing stations had increased and were divided into several categories. Firstly there were the original fourteen main stations in Natal with a secondary set of stations producing daily reports, these being at Howick, Colenso, Dundee, Bulwer, Umsinga ('Msinga) and Van Reenen. Eshowe and Melmoth were added, both being in Zululand. Subsidiary stations, numbering twenty-two in all were being set up and these included such places as Noodsberg, Fort Nottingham and Boston, each of which were supplied with a recording barometer at a cost of £7 per instrument. Again, a somewhat amusing touch is added to the Meteorological Report - that is, amusing if seen through the eyes of twentieth century man with all his comforts and facilities :

> "In the Appendix to this report will be found the details of the observations made at these subsidiary stations during the year 1894. They are less complete than could be desired, this arising from the fact that the

> duty of taking these observations has had to be entrusted to officers without training or experience in the use of these instruments. In consequence, they are always putting them out of adjustment, though this is by no means easily effected, and [they] are quite unable to re-adjust them although furnished with full directions, so that from time to time, the observations have to be suspended whilst the instruments are returned to the Observatory for re-adjustment.
>
> The only means of returning these instruments to their station is by post or by Native messenger, and experience has shown that, during the journey back, they are liable to be again thrown out of adjustment from the violent vibrations and "joltings" inseparable from such modes of transmission to their destination....."[4]

Readers may have to be reminded that the "mode of transmission" referred to was normally that of horseback - which most certainly renders the accuracy of an aneroid-type barograph highly suspect.

A very short report for the period July to December 1895 was published. In this, Nevill stated that the Staff of the Observatory and the instruments therein remained unchanged. The new room for the accommodation of the special apparatus for automatically regulating the transmission of Time Signals had been completed. The equipment had been erected and tested and was found to be working well but had not yet been connected up, pending the doubling of the wires to and from the Point. The Time Ball itself had been giving trouble and had failed to drop on several occasions - causing the usual hue and cry from the Press. The annoying habit of the Time Ball was to be rectified during 1896 when the whole apparatus was refurbished. From then onwards, only minimal problems took place.

Elsewhere in the country, political troubles began to appear. The Jameson Raid took place in December 1895 in the Transvaal and the quiet discontent of the Boer Volk started to make itself heard and felt. War clouds between Boer and Briton were gathering and, as the railway line from Durban had now reached the Natal border at Charlestown and had been linked up with the line from Johannesburg, troop movements could be made with far less trouble and delay than had hitherto been the case. These war preparations made the Colonial Government in Natal tighten its belt even further and the Observatory was not left out of the financial pruning.

During July 1896, Walter H Pay resigned as Junior Astronomical Assistant and was transferred to the post of Assistant at the Government Laboratory on 1st September,

having worked out six months' period of notice. From then onwards, all the work of the Astronomical section was to be carried out by Edmund Nevill and his willing wife, whose daughter Maud (who by then was eighteen months old and would have been quite a handful) and this would have placed quite a strain on both of them. Needing a junior Assistant Astronomer, Nevill went to great pains to explain just what was entailed in the appointing of such an officer :

> "*The duties attached to the post of Assistant at the Observatory require special training for their performance and the training necessary for even the simpler duties of the junior assistant cannot be acquired under a year's practise. It is essential therefore, to make it one of the conditions of appointment that the candidate should agree to serve for a period of at least three years if so required, otherwise a year or*
>
> *more's time may be wasted in training a person who resigns his post to take one a little better paid, just when his work begins to be of value.*
>
> "*The salary at present attaching to the post of Junior Assistant is at the rate of £84, £102 and £120 per annum and compares favourably with that paid in other Government Departments, but it does not suffice to bring forward suitable candidates for the vacancy, because the prospects of promotion are far less than in other Departments. The difficulty in filling the post is all the more serious, as it requires fully three years' assiduous training before one of the junior Assistants could acquire the experience and astronomical knowledge necessary to carry out the more difficult duties belonging to the posts of Senior Assistants at the Observatory.*
>
> "*Should my senior Assistant (*Mabel Nevill) *resign, the only method at present open to fill the vacancy, would be to obtain a trained Assistant from England or America at double the present salary attached to the post".*[5]

An addition to the instruments had been made during this period. This was a three inch Equatorial Refractor but no make or number was recorded. Once again Nevill drew attention to the great accumulation of work that required printing and publishing. He was becoming somewhat desperate and, in order to whip up some form of reaction to his pleas, he inserted in his 1896 Report no less than seven full

pages of close type, fully describing his findings on the theory of the "Motion of the Moon"[6] - something quite unheard of in an official departmental report! Unfortunately, this prodigious effort had no effect on the authorities.

III

In 1897, Mr Harry Escombe - who had been the chief instigator of the Observatory - was appointed as Prime Minister of the Colony of Natal. This was a just and fitting reward for all the work that he had done, especially in developing the harbour at Durban.

All had been purely routine at the Observatory and the Time Ball system was now working perfectly. The ball was dropping on time and, in addition, a time signal was being sent to the Port Captain's office every hour on the hour, by the ringing of one stroke on an automatic bell. *"In addition to the preceding time signals, one is sent at one o'clock direct to the Post Office for transmission to Maritzburg and other stations in the Colony".*[1]

On 24th May 1898, Mabel was delivered of a son Ralph at the Observatory which meant that for a period of at least two or three months, Nevill was the sole Astronomer at the Observatory. During 1896, he had constructed a new Transit Room some yards away from the original one next to the Equatorial and had intended to move the Transit instrument as soon as funds would have permitted. In 1898 he reported that ***"as no funds had become available from the Observatory Vote"*** - the "Vote" had been reduced anyway! - it was still impossible to carry out this small task. Once again, he was reduced to financing everything out of his now almost totally depleted private resources. His Staff List for 1898 brings the position up to date once more :

"*The Government Astronomer, Mr E Nevill, appointed November 1882; the Senior Assistant Astronomer Mrs [Mabel] Nevill, appointed September 1891; the Junior Astronomical Assistant Mr H C Mason appointed December 1897; the Meteorological Assistant Mr F A Hammond, appointed October 1894".*[2]

Obviously the pleas for a Junior Assistant did not go entirely unheeded. Mr H C Mason was to stay with the Observatory and carry out quite a lot of useful work during the few years that were left to it. For the first time since it had opened in 1882, Nevill set out the duties of the various staff members and we copy them here for the record :

"*The Government Astronomer acts as Director of the Observatory, maintains a general supervision over the whole of the work, undertakes all special observations as well as all observations made after midnight during the early hours of the morning, makes all magnetic observations, carried on all the general and astronomical correspondence, performs all the final reductions of the observations and their comparison with the tables, catalogues and ephemerides, adjusts all the instruments and appliances and constructs all the electrical and other instrumental fittings and appliances.*

"*The Senior Astronomical Assistant {his wife, with two babies!} in addition to assisting when required in all observations made between eleven o'clock at night and eight o'clock the next morning, looks after, makes out, checks and pays all accounts, keeping the necessary books and preparing and rendering all the returns required by the Government, calculates all the ephemerides, working lists and tabular places; constructs all auxiliary tables and charts; and generally takes over the duties of the Junior Astronomical and Meteorological Assistants when they are absent on duty, or leave from illness.*

"*The Junior Astronomical Assistant undertakes the routine clock star observations and their reduction, carries out the comparison of the clocks and chronometers; maintains the Standard Mean Time clock in accuracy and applying the necessary daily corrections; carries out the search for comets, minor planets etc., which are to be observed, and performs the duplicate check calculations required for verifying the results of the astronomical and meteorological observations, besides carrying out one of three daily series of readings of the meteorological observations.*

"*The Meteorological Assistant makes out two of the three daily series of meteorological observations, and reduces and tabulates the whole series of observations made at the Observatory and twenty subsidiary stations; carries out all correspondence relative to the meteorological work and receives, prepares and sends the various telegraphic messages daily coming to or leaving the Observatory".*[3]

One cannot help but think that Mabel Nevill had her hands more than full and she must have dreaded the day that either of the junior staff went on leave or fell ill.... As

far as her husband's work was concerned, it must not be forgotten that apart from his normal huge load, he was also the Government Chemist and Assayer. Truly this was a remarkable man and a remarkable team of husband and wife.

Nevill had observed "***Comet Coddington"*** and everything appeared to be running smoothly at the Observatory. He did however bring pressure to bear upon the authorities by reporting that as yet, his home had STILL not been constructed despite several requests, each more urgent than the previous. He mentioned that a sum of £1200 had been put onto the estimates for 1889, but as he had then had to visit England, by the time that he returned, the vote had lapsed. He further reported that all additions to the original building : the erection of the verandah, outer buildings and structures, the library and the like had been ***at the entire expense of the Astronomer.***

Possibly this information must have shaken the consciences of the authorities for at last the erection of his home was started *"and will be completed by the middle of 1899, so that after waiting for* ***sixteen years*** *there will be provided at last, the residence promised in 1882. As the vote sanctioned will only suffice to meet the cost of the shell of the new house, the expense of completing it by painting the walls, providing drains and outbuildings, and fitting of all fixtures such as fire grates, blinds, water supply etc., will presumably have to be met by the Astronomer himself "*[4]

In this assumption, Nevill was - once again - perfectly correct and although before his retirement in 1912 he requested the reimbursement of his personal outlays over the years, he received not one single farthing that can be traced.

IV

In 1899, the growing bubble of political discontent finally burst and the whole of the Colony was caught up with that dreadful misunderstanding between the two racial groups - the English and the Afrikaner. The second Boer War had started. Many deeds of valour on both sides have been recorded elsewhere and the result of this three year episode - one of the unhappiest in South Africa - was that every part of the country became impoverished.

The Observatory continued its weary round of duties with the staff and instruments unchanged. The original 1899 report had been destroyed by a fire at the printers and a subsidiary report had to be put together in haste, this only being submitted in April 1900. In it, Nevill requested that as the Durban Corporation mains electrical supply had by then reached the vicinity of the Observatory, it should be connected up, doing away with the need for oil lamps and the many Leclanche cells which had hitherto been used for illuminating the telescopes etc.

He had by then succeeded in moving the Transit Telescope to its new position - exactly 35 feet six inches due East of its original position but, owing to the second reduction in the vote for the Observatory, very little additional astronomical work could be carried out.

The greatest misfortune of all, and one which must have just about broken Nevill' heart, was the fact that the "New Lunar Tables" - comprising many years of his work - which had been calculated and which were about to be forwarded to England for printing and publication, had been to a great extent destroyed by the flooding of a portion of the Observatory during a heavy rain storm.

He reported that .... *"they will have to be re-written to render them legible, the ink having run."*[1]

Having repeatedly requested that this mass of invaluable data be sent off for printing and having been ignored time and time again, the result was a total loss. The documents were never in fact re-written and the originals (still illegible) are believed to be somewhere in Great Britain.

The erection of the house had been completed by May 1899 and the final touches, mentioned earlier, had cost Nevill about £130 - nearly a quarter of his own annual salary. Nevill then reported on a matter which had hitherto not been mentioned. This was to the Observatory Library which, again, had been formed at his own cost ! :

> "*During the year, a number of additions have been made to the Library, in a few cases by purchase, a greater number by presentation, and others having been supplied by the Astronomer. The Astronomical Library is becoming extensive and valuable, as many of the works are very difficult to obtain, even regardless of cost. During the year, a number of volumes of Greenwich, Edinburg [sic.], Pulkowa and Cape Observations were*

kindly presented by Admiral Maclear and form a valuable addition to the earlier records at the Observatory.

"*Thus the Observatory already possesses a complete set of the Radcliffe Observations from the year 1862 to the year 1890, given by the Astronomer, and these have now been supplemented by Admiral Maclear with the earlier volumes 1842 up to 1862. The Royal Astronomical Society have presented a number of the earlier volumes of the Monthly Notices and Memoirs of the Society, thus enabling reference to be made back as far as 1846.*

"*The greater portion of the Library is now placed in a brick and concrete roofed room* ***constructed by the Astronomer in 1898,*** *where it is fairly safe from being destroyed by fire. Previously, the books were scattered in all sorts of corners where space could be obtained, and mainly in wood and canvas structures.*

"*During a heavy rainstorm, a portion of the Observatory was flooded, the water pouring through an unexpected leak in the roof....*"[2]

The wooden Meteorological house, constructed with timber and canvas in 1883, had by now been almost destroyed by dry rot and white ants. One of the auxiliary rooms (also constructed by Nevill) was to be used for Astronomical Photography as soon as the requisite cameras and equipment had been obtained.

The final days of the nineteenth century were to prove most sad ones for Edmund Nevill. On 27th December, only two days after Christmas, his closest friend and ally, chief supporter and confidant - and indeed the man who made Nevill's stay in Natal possible, Mr Harry Escombe, died after a short illness.

Escombe's death was a great shock to the whole of Natal as he was a well loved and very highly respected member of the community. The funeral procession stretched from the West Street Cemetery almost to the City Hall in Durban.... Natal lost one of her finest sons and Nevill lost a very dear friend.

The name of Escombe - who had refused knighthood, but in his position as Prime Minister had been given the title "Right Honourable" - has been perpetuated by the Borough of Escombe outside Durban, a statue of him exists in the City Square outside the Durban City Hall and several roads were named after him. His works whilst in the Natal Legislature and Government appear in many volumes on the shelves of such bodies as the Don Africana Library, Durban and the Natal Society Library in Pietermaritzburg.

We will learn more about the man and his family when we turn to the Nevill Diaries in the next section of this work.

The Funeral Procession of the highly respected Late Rt.Hon. Harry Escombe - December 1899. The procession was from the Durban Centre to the graveyard.(Copied from Mrs Coral Escombe's private collection and reproduced by kind permission of the family.)

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LABORATORY Etc., WORK FROM 1895 - 1900

CHAPTER EIGHT

I

Having concentrated somewhat on matters concerning the Observatory during the last five years of the nineteenth century, what of the Laboratory work and other aspects of life at the small establishment high on Durban's Berea? Let us now have a look at the other Reports which Nevill worked so hard to produce,

The "Reports of the Government Chemist" for the periods July 1894 to June 1895 and July 1895 to December 1895 were both short and to the point. The first one states that a total of thirty analyses (no toxicological ones) had been conducted. There were no gold or silver assays and fifteen of the thirty were under headed "miscellaneous". A number of reports had, however been furnished for the information of the Government on various technical subjects. The second Report gives a clue as to Nevill's personal movements as he mentions that ..."*Practically the whole of the work has been confined to the two months, November and December [1895] as I only returned from England on October 14th.*"[1] Again the number of analyses totalled thirty but of these, seven were of gold and silver and two were toxicological. Nine analyses of "soils and manures" were carried out, from which he probably again assisted local farmers to improve their crops. The trip to England was undertaken to be there when his first-born, Maud, came into the world, she was about six months old when she and her parents arrived back in Durban.

Nevill's Observatory Report appeared late in 1894 and immediately there was a letter in the Press querying his tardiness.. This was from his old bugbear - *Astra* - who bemoaned the fact that the Time Ball was often late, that nothing ever came from the Observatory and that, in any case the Colony could well do without the extravagance of an Astronomer! The tone of the letter (which is quoted in part) would probably bring a lawsuit in today's world :

> *"I put this question plainly. Does the Astronomer mean us really to believe that it is beyond his power to give us the correct time? The importance of accurate time to a ship may be seen when I state that the error of four seconds will make a difference of one mile in Longitude. The Observatory cost the Colony about £900 last year and all we have for it is contained within the four corners of the report. There is a rumour of increased taxation in the forthcoming budget; would it not be as well to try what retrenchment would do in some departments - in this one for instance. I think we could easily find an intelligent, active person who could give us accurate time, and make the meteorological observations for about £300 a year and residence. I do not even object to the present vote, if we could only have the work done properly; but to pay the money and have no apparent return is exasperating."*[2]

The Editor of the newspaper concerned replied that it was an ill-conceived idea that Nevill "did nothing more than play tennis and ride up and down in the tram cars during the day, and loll under the big telescope gazing at the stars until bed time at night, thus being credited with occupying a remarkably soft billet".[3] He also mentioned that a suitable reply would be printed on the following day. Nevill's reply dealt at length with the various accusations and rather bitter criticisms. Once again, portions of his reply give further clues as to his strength of character :

"As you know, it is rarely that I take notice of anonymous letters in the newspapers, because I can see no reason why anyone criticising the Observatory and its doings should hesitate to sign his name. To do so can do him no harm - for astronomers are harmless enough nowadays; they have forgotten all their astrological lore, foregone all their witchcraft and lost all their teeth, in fact, now they rarely bark, seldom growl (except at Editors) and never, never, bite.

"But just this once, just for the fun of the thing, you must have some running comments on the letter in your paper for this afternoon, signed "*Astra*". You really must not tempt me too often in this way; I cannot afford the time, but right now I am neuralgic, captious and incapacitated from work, and I cannot resist the bait you have so cunningly held out, and 'copy is copy - hang the quality'". {Nevill then proceeds to tear *"Astra"* to gentle pieces.} He finishes with :

"But it is time I stopped. It is amusing to read the criticism of a man who, in unconscious ignorance, undertakes to criticise what he does not understand, but even making fun of it becomes wearisome after a time, and is apt to degenerate into ill-temper (I fear I might have not entirely escaped), You have caught me this time sir, but you will have to wait before you catch me again.....[4]

A somewhat chastened reply then came back from *"Astra"*, who was determined to have the last word. Nevill had the good sense just to let him get on with it.

The matter of the water supply for Durban was debated at length in the Press and an Editorial in 1895 advised that for the past six years (1888 - 1894) Nevill had been requested to make frequent examinations of the water supply from the Umbilo Reservoir (probably the one in Paradise Valley at Pinetown) and on each occasion, he had found the purity to be excellent. This type of work was being done quite voluntarily and he was offered thanks by the newspaper for his work.

Nevill also spent a lot of his time writing newspaper articles on such matters as the Transit of Mercury, Solar Eclipses, "white spots" on Mars and the like - all of which (despite "*Astra*"!) created stirrings of interest amongst the readers. His Report as Government Chemist brought forth much more favourable comment as it contained a wealth of information concerning the physical make-up of a whole range of rock and soil samples, breaking each one down to no less than fifteen parts such as : free moisture, silica, alumina etc. This type of report brought forth the Editorial comment on 7th January 1895 that "*In Mr Nevill, the Colony is fortunate in having a scientist of a high order, and therefore exceptionally well fitted to fill the offices of Government Astronomer and Chemist. Mr Nevill's reports always bear evidence of a thorough grasp of the subjects dealt with, and although they are necessarily of a technical character, he never fails to also make them readable, and at least in part understandable by the layman....*"[5]

Although mentioned in the previous chapter, a further word is necessary about the adoption of the 30th Meridian as the Standard Time Zone for the Colony. A leader article in one of the "dailies" - unfortunately no date or mast-head, but probably just prior to 1st September 1895 - reads in part as follows : "In 1892, when the Cape railway system was extended to Johannesburg, it was found necessary in order to prevent confusion, to give up local time and adopt a standard time. After a good deal of discussion and against the strongly expressed opinion of the Astronomer Royal [Sir David Gill], the meridian of one and one-half hour East of Greenwich was adopted, and has been in use ever since in all parts of South Africa, except Natal. Not being connected by rail with any of the other States, it really made no difference to

us, but now that our isolation in this respect is on the eve of termination, it was desirable that some decision should be come to, on the point. Two courses were open to us. Either to adopt the Cape Standard Time, or adopt the hour zone system. Very wisely the latter has been chosen, as the present standard of Cape Time is at best a temporary arrangement which must be altered if the Cape does not intend to be the only country in the world having a time standard of its own. Moreover by Natal adopting the zone system in preference to the Cape standard, the universal acceptance of the scientific standard of time reckoning throughout South Africa will be hastened.

"At the Railways conference at Bloemfontein and Cape Town in the early part of this year, the question of uniform time was discussed, but while it was acknowledged, and made the subject of a resolution at both places that uniform time should be adopted, a good deal of difference of opinion existed as to what meridian should be taken. At Bloemfontein it was proposed that the meridian of that town should be adopted, and at Cape Town the acceptance by Natal of the 22½ degree meridian was suggested and also the adoption of the 30 degree meridian, but nothing definite was settled, although it was pointed out that the natural meridian for South Africa was unquestionably the one now adopted by Natal....."[6]

Miss Maud Nevill informed me that it was largely through her father's efforts and insistence in Bloemfontein that the 30 degree meridian was chosen.....

II

The Report of the Government Chemist for 1896 mentions that little work could be undertaken owing to a change in the system adopted for carrying out examinations, analyses and assays. Until that time, these had been conducted at his own expense but he *had* made a small charge to cover his costs.

"*On 1st July 1896 the Department was placed on a new basis with a view to increasing its scope to include all classes of agricultural analyses..... Under the new arrangements, all fees are paid into the Treasury and a vote taken to meet the expenses of the Department.*

"*To meet the more extended work to be undertaken, it was necessary to increase the Laboratory accommodation by erecting a new laboratory. About three hundred pounds' worth of apparatus, reagents and chemical appliances,* ***which had been supplied by myself*** (Author's emphasis) *for carrying on the analytical work previously undertaken, were passed over by me to the Government.....*

"*The new buildings were not begun until the end of October, and even by the end of the year, little more than the foundations had been completed.*"[1]

It was fortunate that Nevill devoted much of his report in 1897 to detailing the improvements to the laboratory. The existing laboratory consisted of a "substantially constructed brick basement containing, 1) A Main Laboratory 31 feet long by 18 feet wide and 10 feet high, lit by four large windows, for use as a room for carrying on all ordinary mineralogical analyses and assays. 2) A furnace room 14 feet by 13½ feet by 10 feet high containing four furnaces for assay work, besides a furnace and still for digestions and preparation of distilled water. 3) A combustion room 10 feet by 10½ feet by 10 feet high for use for organic analysis. 4) A cool storage room of similar dimensions, except being only 8 feet high, for storing volatile chemicals, strong acid, and other reagents which must be protected from the heat in such a climate as that of Natal. Above the basement is a wooden structure [since demolished] consisting of :

> "*5) The principal laboratory, 33 feet long by 20 feet wide by 10 feet high at the walls and 12 feet high towards the centre, where the roof carries a central opening for ventilation 20 feet long by 6 feet high, rising 3 feet in extra height, with perforated zinc sides for ventilation, and six skylights in the roof for extra light. The room carried seven large windows and a glass door, so as to secure the ample light necessary for the work.*

> "*6) A balance room, 12½ feet long by 11½ feet wide by 10 feet high at the walls and 14 feet in the centre. It is lighted by three large windows, is built on a concrete floor for freedom from vibrations, and is equipped with three very delicate Balances for accurate weighing.*

> "*7) A room for Microscopic and Spectroscopic work, of similar dimensions to the preceding. This is also used as an Office and Library.*

"*Alongside the new buildings, and communicating with them by a passage is the Laboratory* [still in existence in 1980] *meant for toxicological work, 14 feet long by 12 feet wide and rising in height from 9 feet at the walls to 12 feet at the centre. It is fitted with large fume cupboards opening onto a special furnace, to decrease as far as can be the danger of carrying on these analyses. Beneath is a subterranean laboratory used for the analysis of explosives, and other work which must be done at a lower temperature.*

"*The building was commenced in December 1896 and completed in April 1897. The shelving, benches, tables and other accessories were not completed until June and the water supply not laid on until August. It was not therefore until September that the Laboratory was sufficiently completed to enable work to be properly carried out.*

"*The Laboratory is well equipped with all the necessary apparatus, reagents and other appliances required for chemical analysis and assay, the equipment having been derived from the following sources :*

"*1) The considerable quantity of apparatus, reagents and other appliances of the value of over £400, which have been provided by* ***myself****, for carrying on the analytical work, which I have carried out for the Government during the last ten years.*

"*2) The special apparatus and reagents to the value of about £100 required for carrying out the special toxicological work, the cost of which was defrayed some years ago from a special vote.*

"*3) A supply of additional apparatus and reagents for meeting the wants of the agricultural and technical analysis, which the new laboratory has been constructed to meet. These were indented in March and June 1896 and 1897, and received at the Laboratory in November 1896, and January and November 1897, and represent a value of about £350.*

"*There having already been provided by* ***myself****, a chemical library of over a hundred volumes of works of reference, it was only necessary, under the new conditions to supplement this by the purchase of fifty additional volumes in order to render it complete for all ordinary purposes. About thirty of these extra works have already been purchased, and the remainder*

will be obtained as soon as may be. Scientific works, like all professional works, are costly, and the 180 volumes forming the present laboratory Library represent a value of about £250.

"*Additional microscopic and proper spectroscopic apparatus have yet to be provided to enable work to be done.*

"*Additional facilities will also have to be provided for carrying out series of test cultures and pot experiments in connection with the scientific investigation of Agricultural problems such as the best method of dealing with the Mealie Blight and similar matters. These can be provided as the necessity arises.*

"*THE STAFF : The staff of the Laboratory consists of the Government Chemist [Nevill] and two junior assistant who are being taught and trained at the Laboratory. A third Junior Assistant will have to be appointed in July 1898. The two present assistants are : Mr W H Pay, appointed in September 1897 (seconded from the Observatory) and Mr A L Jones, appointed in 1897."*[2] {Emphasis by Author}

Under the heading of "Work Done" - which covered only seven months, owing to the construction work being carried out, Nevill advised that this work fell into seven categories. These were Agricultural, Mining, Excise (samples of spirits etc.), Arms, Customs, Toxicological and General. All of these comprised 82 samples of which thirteen fell under the heading of the testing of dynamite and four under the heading of "cases of suspected poisoning" - causing him to write a further long treatise on the subject of the use by Africans (Sangomas, or "witch doctors") of tree and plant roots, bark and other substances, most of which were (and in most cases, still are) relatively unknown to medical science. For all this work, the total income of the Laboratory amounted to £157 : 17/- . Because the new arrangements to relieve Nevill of bearing the costs of the Department had not come into effect, he was, once again, considerably out of pocket.[3]

The 1898 Report reflected that Walter H Pay was still on the staff of the Laboratory but that Mr A L Jones had resigned in June 1898, his place being taken by Mr J S Jamieson. The new Junior Assistant, appointed in September 1898 was a Mr C L Turner.

Concerning the dynamite tests, Nevill reported that the samples were of "Nobel's manufacture and all were found to be in satisfactory order and condition and of proper quality"[4]

He had carried out thirteen toxicological cases, of which eight were suspected poisoning, three were blood stains and two were marked as "Miscellaneous". Once again, he reiterated his views on the use of poisonous substances by the indigenous population. A forensic expert in today's world would find the reports and remarks fascinating and possibly illuminating.

Work escalated with the completion of the new laboratory facilities. In all, he conducted 294 cases of investigation, for which (under the 'new' arrangements), the fees earned amounted to £329 : 9 : 6d and, had they been charged at the going rate in the other Colonies in the country, would have realised about £800, making the Laboratory a paying concern. Compare the Government's attitude towards money for the Laboratory work to that of keeping the Observatory on a sound financial footing!

The final report of the century - that of 1899 - shows that the Staff position had remained unchanged. The fact that Mr Jamieson had received his training for four years at the Edinburgh University, made him well qualified to stand at Nevill's side and relieve him of some of the work load. Of the 186 cases under examination that year, there had been no less than 29 toxicological examinations. These again comprised nine cases of suspected food poisoning, three blood stains, three poisoned foods and eleven case involving poisonous roots or medicines.

As mentioned in the previous chapter, the Anglo-Boer War broke out during 1899 and this fact is reflected in Nevill's closing remarks in his Report which was only published on 12th April 1900. He stated that "*In September (1899) Mr W H Pay and Mr C Turner were called out to service at the front, both being members of the Volunteer Forces, and from the end of October till long after the end of the year were at Ladysmith. Consequently for the last six months, the whole of the work of the Laboratory has fallen on the Government Chemist and Mr Jamieson*".[5]

It appears that Mr Pay was attached to the old Natal Mounted Rifles and Mr Turner served with the Natal Naval Volunteers.

III

As appears to have been the norm, every time that the vote for expenditure came forward to the Natal Legislature - especially during the last two years of the old century - there were the usual howls of protest at the apparent waste of money as far as the Observatory was concerned. The newspapers of course, always printed the acrimonious remarks and statements that were being bandied about, and poor Nevill had to grin and bear it. It is almost incredible that the very same people immediately switched sides when it came to the Laboratory vote and spent only a few moments, in passing this vote *"summa cum laude"*. How fickle can people be?

Yet again, in order to try to save the day for his primary occupation, Nevill added to his work load by starting to produce monthly articles called ***"Astronomical Notes for the Month of....."***. These were eagerly snapped up by the populace. He did not stop there but also wrote reams of paper on various topics such as forthcoming eclipses, highest and lowest temperatures, extraordinary rainfalls, the effect of the "Mealie Blight" and so on, and this way somehow managed to keep his rather neglected Observatory from heading for the metaphorical rocks.[1] The salary offered to a new Junior Assistant Analyst was £7 per month for a six month probationary period. If he was put onto the permanent staff, this was raised to £102 per annum, rising to £120 after the first year - hardly enough to keep a young man of 20 to 25 years old happy.

In the newspaper cuttings in Nevill's Scrap Books, held at the S.A.A.O. Library in Cape Town, there is a simply delightful tangle of 'master minds' on the subject of the "Flat Earth Theory". In some parts of this planet, there are still certain persons who hold onto this theory, despite Moon landings, the space age and other manifestations. The cuttings list all kinds of fascinating ideas as to why the Earth can only be flat. They mention a series of public debates that had been taking place, and challenged Nevill and his wife to appear on a public platform so that the Natal Flat Earthists could annihilate them verbally! The outcome is unknown but it is highly unlikely that Nevill bothered to take the matter seriously. After all, he had his hands more than full with all his duties.

So, the century closed. Harry Escombe had gone. The Anglo-Boer War was on its way and fighting had broken out in up-country Natal and elsewhere. The staff of the Laboratory was reduced to only only including Nevill himself. The Observatory work was reduced considerably. Mabel was the mother of young children, living in frightful conditions until their move into the new house. Years of hard work had been destroyed by flooding and Nevill had, since 1882 - a period of eighteen years - set up the Observatory, the Time System, the Assaying and Toxicological laboratories, the

soil analyses, the meteorological stations and had written numerous annual reports, and to top it all, had produced the Natal Tide Table..... Quite remarkable when one considers that almost since his arrival, he had been forced to subsidise most of the improvements and salaries out of his own pocket. What had been a small fortune left to him in England was dissipated by unwise investors and in the end, he was almost destitute.

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THE FIRST YEARS OF THE 20TH CENTURY

CHAPTER NINE

I

The twentieth century was ushered in by the arrival in South Africa of the first motor car - a Benz - which was taken up to Johannesburg and thence to Pretoria for President Paul Kruger to see. It is reported that he (who was also a "Flat Earthist") was not exactly impressed with this smelly, noisy contraption. At that time, the only smog to exist was that generated by coal burning ships, tugs, railway locomotives, mines and factories. It took a few decades before the problem became serious enough to cause a major degradation in the atmospheric condition at the Observatories. The growth of light pollution was slow but inexorable...

The Anglo-Boer War was still being waged. By 1900, the Natal Government Railway system had spread from Durban up the North Coast towards Zululand, down the South Coast towards "Upper" Port Shepstone and from Pietermaritzburg towards Greytown. This meant that hitherto inaccessible regions were being opened up. Travel to these far off places had previously been by horseback, horse-drawn carriage or pony trap.

In 1900, the Observatory Staff was still only two - Edmund and Mabel Nevill. Mr H C Mason had resigned as Junior Assistant Astronomer in June of that year and the post had remained vacant. There were no changes in the Observatory instruments, but the place had been given a fresh coat of paint and the old meteorological house had been replaced by a new one. Little work had been done on the telescopes, although the Time Signals were still accurate.

The Meteorological Report for 1900 was fairly comprehensive giving a full table of averages since 1885 and a tabulation of the monthly records for 1900 which reflected a marked drop, not only in monthly rainfalls, but also in the yearly total. For historical purposes, the full list of "Primary, Secondary and Tertiary" Weather

Stations in the Colony at that time appears below, with those in Zululand marked with a "Z" :

THE MAIN STATIONS :

Lower Tugela Stanger Verulam

Durban Richmond Ixopo

Umzinto Howick Colenso

Dundee Harding Port Shepstone

Pietermaritzburg Greytown Estcourt

Ladysmith Newcastle Bulwer

'Msinga (Z) Van Reenen Eshowe (Z)

Nondweni (Z) Melmoth (Z) Nongoma (Z)

Ubombo (Z)

THE SECONDARY & TERTIARY STATIONS WERE :

Stanger Port Shepstone Impendhle

Verulam Umzinto New Hanover

Greytown Richmond Mapumula

Newcastle Pietermaritzburg Nongoma (Z)

'Msinga (Z) Howick 'Nkandla (Z)

Estcourt Ladysmith Qudeni (Z)

Bulwer Dundee Umlalazi (Z)

Ixopo Weenen Hlabisa (Z)

Harding Upper Tugela (Z) Melmoth (Z)

Eshowe (Z) Ubombo (Z) [1]

There were twenty-five in the first category and 29 in the second, with some duplication, probably as a result of having two stations at opposite sides of town or City. Pietermaritzburg was a prime example where the West side close to Town Hill received far higher rainfalls than the East side. Apart from all these, Nevill also reported that he was receiving "valuable returns from F F Churchill Esq., J.P. at 'Chalfont', Hillcrest, County Durban".[2] This was the same Frank Churchill who was a witness at his wedding some years previously.

By 1901, the South Coast railway line had reached North Shepstone, and it stopped for some decades until the Umzimkulu River was bridged over. The extension of the railway lines greatly assisted Nevill's helper, Mr F A Hammond, Meteorological Assistant, by enabling him to reach some of the farthest Met. Stations with much less difficulty.

The Reports of the Government Astronomer were becoming extremely brief - simply a run-down of the various duties which he carried out, similar to those mentioned in the previous chapter. This time, he reported that the Magnetic Variation had changed from 24° 59' 27" West in 1893 to 23° 27' West on 1st January 1902 with an annual reduction of 12'. The remainder of his Report concerning the weather of the year was similar to the previous year.

In 1902 there was a major change in that ..... *"On July 1st, Mrs Nevill tendered her resignation from the post of Senior Assistant [Astronomer] which she has held since September 1891, but agreed to hold the appointment until the arrival of her successor, Mr R Fermor Rendell, B.A., F.R.A.S., late of the Royal Observatory, Greenwich, who was appointed towards the end of the year, and is expected to take up the duties of the post in April 1903.... Steps have been taken to fill the vacancy (Junior Assistant Astronomer) by the appointment of a Junior from one of the English Observatories."*[2]

It is hardly surprising that Mabel wished to resign in July, for on 24th September 1902, her second son, Guy, was born. Not for him the little cramped room under the telescopes! His arrival was inside the new house constructed in the grounds. This was Mabel's last child but even then, owing to the late arrival of Mr Rendell, she

continued assisting her husband until the moment the boy was born and rejoined him within days afterwards. What a determined woman!

II

Queen Victoria died in 1901 and if any changes took place at the Observatory, they were mentioned. However, the newspapers gave wide coverage to the event. The Edwardian Era was ushered in and, in the Colony of Natal and elsewhere, the Anglo-Boer War came to its somewhat inconclusive end with the signing of the Treaty of Vereeniging in 1902 at Melville House in Pretoria. An uneasy peace ensued and the task of rebuilding the country started.

In this period, Durban was also undergoing some changes. The harbour mouth was being deepened by dredging and was widened. This in itself caused the work of years on the Tide Tables to be suspended pending the taking of a new set of readings. Nevill had a fair amount to say about this :

> "*Arrangements are being made to utilise the manuscript 'Tidal Tables' calculated by the Government Astronomer from the Tidal Records for the years 1884 to 1888 for the purpose of supplying the Port Office with information as to the theoretical rise and fall of the tide, and the times of high and low water which may be anticipated apart from those due to purely meteorological conditions.*

> "*Since the epoch when these tidal observations were made, great changes have taken place in the condition of the works at the entrance to the Bay, and these alterations must produce some changes in the range of tides within the entrance channel, and in consequence similar changes in the time of High and Low Water.*

> "*It is only to be anticipated therefore, that the Tidal Tables at the Observatory will require supplementing to take into account the effects of these large changes in the conditions within the entrance channel.*

"*The data for these can only be obtained by a comparison of the existing tables at the Observatory with a further reduction of the Tidal Observations made during the last two or three years.*

"*This is a work of much labour and calculation, and it might be as well to defer its systematic undertaking until the final condition of the works at the mouth of the Harbour have been settled.*"[1]

Before we turn to the work done by Nevill as Government Chemist, part of his Report on meteorological affairs is quoted for the reason that it would be interesting to know if modern Meteorological researchers would agree with his comments :

"*Apart from its local importance, the study of Meteorological conditions prevailing in Natal is rising to exceptional importance from the information it affords as to the conditions prevailing over the Eastern [Indian] Ocean which has so important an influence over the rainfall in India. Repeated applications have been made during the year [1902] for complete returns of Natal Meteorological Observations for the purpose of affording data for the study of the conditions regulating the rainfall of India.*

"*Meteorologists of high standing have shown that the results of the observed conditions of the weather in Natal throws much light on the conditions likely to prevail in India during the following season, especially in regard to rainfall.*

"*Australian Meteorologists have already established the connection between the prevailing conditions in South Africa and those in Australia, and it seems probable that a similar connection will be traced between the meteorology of South Africa (especially Natal) and India.*"[2]

III

A new sub-heading in the work of the Government Chemist appeared in the 1900 Report. This was in the field of "Colonial Secretary" - surely an odd heading - which

was to deal with "mainly examinations of water, foods etc., in connection with questions of public health."[1]

Messrs Turner and Pay were still busy working for the Chemist and Nevill was successful in engaging Mr F Stanger Higgs F.C.S. from May to October. Turner decided to resign his position in October and a Mr F G MacDonald was appointed on a temporary basis to fill his post. None of this was entirely satisfactory but it was the best that Nevill could do with the major series of battles going on up-country. Despite these difficulties, between them they conducted 339 tests of samples during the year.

An extra room with adequate overhead and southern lighting had to be erected for Microscopic and Spectroscopic work as it had been found that it was too difficult to carry out this work in the existing laboratory - not to mention the danger to the instruments from the fumes created.

One of the rooms at the laboratory was placed at the service of Mr Pardy F.C.S., of the Agricultural Department to enable him to make soil and other analyses. The entire expense for apparatus, fuel and chemicals was defrayed by the Government Laboratory.[2]

Mr MacDonald resigned in November 1901 and went to Johannesburg, otherwise during the year the staff remained unchanged. Three hundred and eighty samples were analysed, including several cases of arsenical poisoning, twenty-four examinations of food and tinned provisions, several examinations of beer, wines and spirits (with a number of these being conducted for the Army Service Corps). Pardy was still using his room for testing soil samples and this work continued beyond 1903.

The work-load remained high in 1902 with a total of **six hundred and twenty-two** examinations - almost double the previous total - and these brought in a cash flow of some £1 137. Had they been carried out elsewhere, the income realised would have been over £2 000. The main reason for the vast increase in work was the use of the Laboratories by the Department of Mines. They received reports on 156 samples of coal, 92 samples of gold reef, 24 samples of copper, lead, iron and other ores, 213 samples of minerals and 36 samples of rock, limestone etc., totalling 521 samples.[3] In addition, 101 tests of the more usual type were carried out. During May 1902, Mr A B Tonkin joined the laboratory staff as a Junior Assistant.

Reference has been made in previous chapters to the use of dangerous roots and barks by the indigenous population - a practise which continues to this day. Lest the reader thinks that the matter has been over-emphasised, the use of these "potions" caused many cases of murder to be opened and Nevill frequently had to take the witness stand to give his opinion on the matter. In spite of the fact that Nevill was primarily the Government Astronomer, as Government Chemist his opinion was highly regarded. One of these cases was reported on 9th June 1900 in the *"Natal Mercury"* and is worthy of being re-stated :

The Criminal Sessions of the Circuit Court were resumed yesterday morning. Mapuyana, a native [sic.], was charged before Mr Justice Mason and a jury, with culpable homicide by killing Nozitendo, alias *Eliza Umhlalo, a native woman at the Umvoti Mission Station about January 24th. Mr D Calder, Clerk of the Peace, prosecuted and Mr Renaud defended.*

Nompiniso, a native girl residing with the deceased, stated that on the evening before deceased's death, prisoner came to the kraal and compounded some medicine from the root of the nature of a sweet potato, and the gravy from a boiled fowl was poured on the medicine to which a good quantity of water was added. Prisoner directed that it be given as an enema, three horn's full. Deceased was not ill at the time. Witness administered the medicine on the following morning about breakfast time some distance from the hut. As soon as they arrived home again, the deceased vomited considerably and expired almost immediately. The root used by the prisoner was named ***"Mahadene"*** *[a Zulu name]. Witness did not know why deceased took the medicine.*

Dr. Jones, District Surgeon for the lower Tugela District, said that he had made a post-mortem examination of the body of the deceased woman, who was said to have died from some powerful narcotic.

The Clerk of the Peace, in answer to the Court, explained that the base of the poison on Mahadene was isaconine, and was similar to henbane, an irritant narcotic....

Mr Edmund Nevill, Government Chemist and Analyst, produced a vegetable infusion which had been submitted to him and which he had analysed. The infusion was contained in an open tin covered over with brown paper. The tin contained a large number of pieces of root. The infusion was yellowish in colour, cloudy in appearance, and had a peculiar pungent aromatic odour

and a stringently acid reaction. The root was fibrous in texture, yellow in colour, with dark bands on the surface and resembled in many respects the wild parsnip root.

The infusion was first examined for the presence of hydrocyanic acid, as that was the poison which had been found in the infusion of such roots, and gave rise to symptoms resembling those which had been described. No trace of such poison could be detected. The infusion was then examined for the presence of the volatile poisons of the conine group. The result was unmistakable; the powerful peculiar odour and the strong physiological effect of the vapour became strongly manifest, and further experiment had to be suspended for some days on account of the strongly poisonous effects of the vapour. [In fact, Nevill became seriously ill as a result!]

The actual isolation of the poisons of this group was a very difficult and a very slow process, owing to their extreme volatility, and the rapidity with which they decomposed either on warming or by treatment with chemicals, or even exposure to oxidisation by air. The results finally obtained showed the poison to be in that form of conine found in a number of plants, which might be called the 'neoconine'. Though its poisonous effects were almost identical, it possessed a somewhat different odour, a greater irritating effect on the skin and the eyes, and somewhat different chemical reactions.

The poison was present in a quantity as far as could be judged, sufficient to prove fatal to several persons. This was the ninth case of poisoning by this substance that he had brought before him for examination. In no case had the root been used in such a form that the actual plant could be identified, but he was certain that it was present in a number of distinct plants.

The root used in the present instance was not one of those used in the previous cases, but was of the same character as those of the wild hemlocks containing the conine known to science. He did not know the root as a native medicine; neither could any of his natives recognise it, despite its peculiar pungent odour. In each of the cases where this poison had been detected, it had been stated that the root was used as an ordinary native medicine, such as had often been used without any noxious effect, and in the majority of cases there had been no reason for suspecting wilful poisoning.

Hence it would appear either that there were poisonous roots as closely resembling the true native medicine that they were at times mistaken for

each other, or that, under certain circumstance, ***especially after a dry season****, the roots used by natives as medicine became strongly poisonous. This last is known to be the case with the plants of this family in Europe, the proportion of conine being very variable in different seasons in the different species of hemlock.*

Under these circumstances, no attempt was made to examine the intestines of the deceased woman, which had been brought to the laboratory, as it was hopeless to expect to detect the very minute traces of neo-conine, which alone could be present. Continuing, he said that if a portion of the infusion were injected in the form of an enema, vomiting would result, followed by paralysis of the blood vessels and ultimate death. It was one of the very few poisons which could produce death in less than an hour, being one of the quickest poisons known.....

The Jury, after a short deliberation, returned a verdict of 'Guilty of gross negligence in the administration of the drug' but they recommended mercy, because of the prisoner's ignorance of the fact that the drug was poisonous. ... The prisoner was sentenced to two month's imprisonment with hard labour. The Judge remarked that this indiscriminate use of drugs by natives might render them liable to be brought up [before the Courts] and probably severely dealt with."[4]

It is only now that science has started to discover some of the beneficial uses of the barks, herbs and roots that have been used by African "Sangomas" or "Witch Doctors" for centuries. The dangers of poisoning are still present but 'indigenous science' has made great strides forward and "Traditional Healers" are becoming a part of modern medicine.

IV

During Nevill's absence in England in 1901, in May of that year a local Pastor, the Rev. N Abraham F.R.M.S, delivered a highly interesting lecture with lantern slides on the subject of comets. This was held in the Wesleyan school room in Musgrave Road, Durban on the evening of 18th May. His main topic was the "***Victoria Comet"*** which had unexpectedly appeared in the local skies. The hall was packed to capacity and the lecture included a question and answer session. The media devoted about 35 cms. columns of print to this talk and one wonders what astronomical subject would invoke that sort of reporting today.

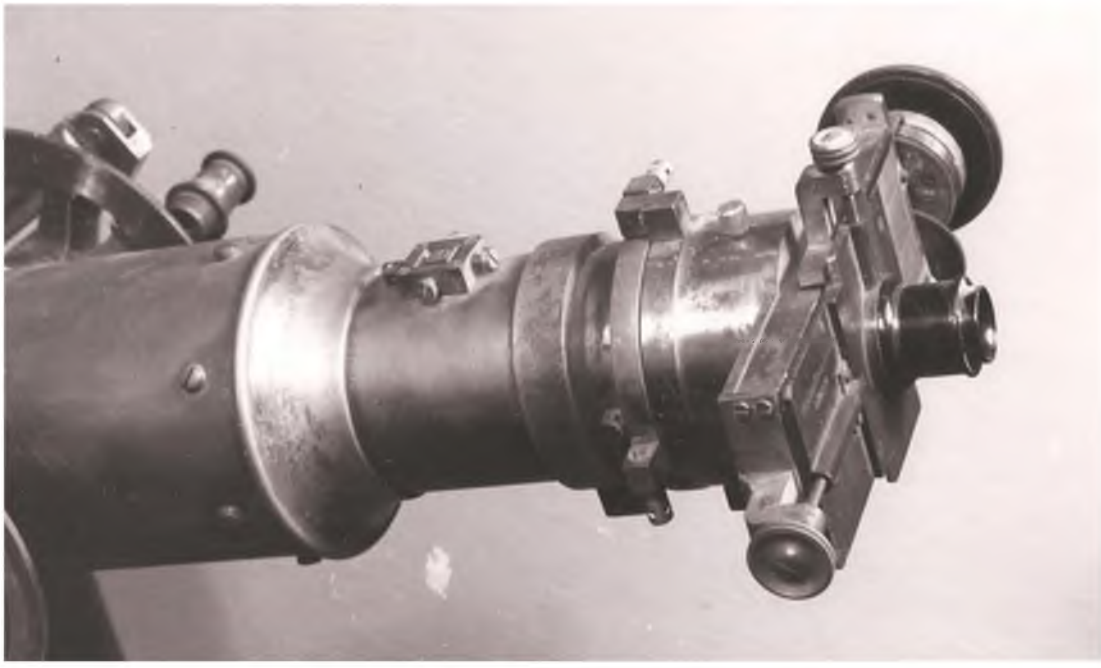
Twentieth century climatologists have been warning us about "global warming" and the so-called "greenhouse effect" since the Second World War. Was this something new? The answer is "No" because 'way back in 1901 on May 15th, a series of articles appeared in the "Express" and "Natal Advertiser" on a similar subject. The main headline of each newspaper was "**A THREATENED PERIL"** and the beginning of the text reads "We are momentarily threatened with a great glacial deluge. So says the eminent geologist Mr Leon Lewis, and he claims to be no alarmist [!!] The great Southern Ice-cap of the earth is threatening to break up; its stability is gravely menaced by the tremendous strain placed to which it is subject; at any moment it may break up; with the consequence of a wild rush towards the Northern hemisphere of fifty million cubic miles of ice, and many more million cubic miles of water."

The Editorial comment reminded readers that in 1900 there had been dire predictions of a terrible disaster which was to overtake the Earth when all the planets were in conjunction on one side of Earth's orbit in November and December of 1901. The surface of the earth was to be "riven by earthquakes, swept by cyclones and drowned by tidal waves". As is known, nothing of the sort took place and conjunctions such as these take place regularly with the usual outpourings of "death and disaster" by sensationalists! That global warming is in fact taking place is now almost proven but its effects will be occur slowly, not causing a sudden disaster.

The year 1903 was a welcome one for Nevill in that Mr Fermor Rendell arrived on the scene on 15th April. His appointment as Senior Assistant Astronomer ended what must have been a most

harrowing time for Nevill. Rendell's credentials were "B.A. London, F.R.A.S., over eleven years a member of the Staff at the Royal Observatory, Greenwich". This admirably fitted him for the job. He was also joined on 12th May 1903 by Mr A E Hodgson F.R.A.S., who had formerly been at the Solar Physics Laboratory in South Kensington. He took up the position as Junior Assistant Astronomer. At last, Mabel was now able to devote her time to her three children and to become more domesticated, but with a woman of her character and determination, it is doubtful if she allowed herself to relax for a moment.

During the year, a dark room had been fitted up at the Observatory and it was hoped that Astronomical Photography could start as soon as the required equipment was obtained. The eight inch equatorial had been put to use to observe the path and orbit of ***"Comet Berrelly"*** - with the aid of a cross-bar micrometer to determine its ephemeris. So, with the Astronomical Staff back up to strength, things could get under way again at the Observatory.



Close-up photograph of the eye-piece with micrometer unit attached. (Courtesy - Local History Museum, Durban)

The weather had been normal up to December 1903 but one great find had been published. This was the list of all the Meteorological results from the Durban Botanical Gardens which covered the period from 1873 until 1883, the ten years prior to the Observatory taking over this function. These results had only just been discovered that year and were printed and recorded for posterity in the Astronomer's Report for 1903.[1]

A new era had started in the printing and publishing world. Copies of photographs started to appear in books and the newspapers. These give the first and earliest known pictures of the Observatory as it appeared from 1895 onwards. The earliest of these printed photographs appeared in a fine small booklet entitled "The Natal Illustrated Railway Guide" which was published in 1903 in Durban.

V

During 1904, a slight change was made in the instrumentation of the Observatory by the addition of "A four inch refractor, obtained during the year from Watson and Sons. This has been equatorially mounted, a shelter to cover it has been erected. A small apparatus for Astronomical photography has been received and work

commenced with it. Some pictures of the Moon have been secured and some of these have been enlarged and mounted. The series will be extended and tabulated with a view to the determination of the real libration of the Moon.

"A Dip Circle [ordered some time before] which arrived at the end of 1903, has been mounted. This indicates that the magnetic dip for Durban is 62° 48' which at this stage is approximate."[1]

The inclusion of the Watson four-inch refractor as part of the Observatory equipment connects us to the present era. The instrument had been lost, but by studying letters which came into the researcher's possession, it was re-discovered in 1976 in the Department of Physics at the Natal University in Pietermaritzburg.

For many years, the Time Ball had been in operation at Durban's Point - hence the street name "Time Ball Street". In 1904, this was a change. ...."The Time Ball has been removed from the Point and erected in a more conspicuous position upon the Bluff". It is unfortunate that the original building housing the Time Ball at the Point (dating back to about 1882) has been demolished. Only the street name remains to remind us of the past.

The work-load at the Laboratory remained high in 1903 with a total of 577 analyses being

carried out. Further expansion to the buildings was requested. Poisoning cases had risen alarmingly and the Laboratory had to deal with forty of these during that year. The numbers of samples for analysis rose even further during 1904 when a total of 705 were conducted. Of these, 297 were samples of explosives and 34 were cases of suspected poisoning. For two years, the staff comprised Nevill, his two senior assistant analysts and one junior analyst - clearly a case where the department had grown rapidly.

Apart from official reports and articles in the Press (thankfully preserved by Nevill) no letters appear to have been preserved for the period since the very early days when hand-written letters were copied onto a flimsy paper copybook until after 1903. Perhaps the advent of the typewriter put paid to the need for keeping copies. Letters from 1904 up to and after the closing of the Observatory have however, been discovered and more of the personal affairs of the Astronomer-extraordinary and his staff will be recorded in some of the following chapters.

Fortunately for Nevill, Mr Rendell took some of the work of writing articles for the Press from Nevill's shoulders. Very soon after his arrival on the Staff, Rendell started reporting to the Press on matters of public interest. These included a solar eclipse on 21st September 1903, spots observed on the Sun in July of that year, and a very learned article on the possibility of a trans-Neptunian planet that was then thought to exist. The discovery of Pluto on 18th February 1930 by Clyde Tombaugh using the Lowell telescope in America was still some years ahead.

An extremely violent storm broke over Durban on 22nd December 1903, causing unprecedented floods in the City. In about twenty minutes, over two inches (50mm) of rain fell and the rain gauges at the Observatory recorded a fall of three inches in 45 minutes . Although Nevill stated that the storm was "nothing remarkable" it caused considerable damage. Torrents of water rushed down the streets from Mitchell Park. On encountering a sewer in Florida Road, the water shot into the air some five or six feet. ..."A lady fainted with the excitement"..... Greyville was under two feet of water and Harvey Greenacre's shop in West Street suffered extensive flooding and all in all, an 'exciting' time was had. It will be remembered that Greenacre was one of the Founders of the Observatory in 1882.

March 1904 saw another solar eclipse - only portion of which was visible in Natal - and a local citizen, Mr Gerald H Lepper M.B.A.A. appeared on the scene, writing numerous articles of astronomical interest in the local papers and also giving lectures on the subject to the general public.

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2. Vide 1 supra - page H48
3. Vide 1 supra - year 1902, pages 1 and 4

Section II :

1. Report of Government Astronomer 1904, page 4

2. Vide 1 supra - page 5

Section III :

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AMATEURS, STORMS AND THE CHURCH

CHAPTER TEN

I

Edmund Nevill was not opposed to Amateur Astronomers - remember the invaluable assistance given to him during the Transit of Venus in 1882 - but he was not exactly in favour of "outsiders" organised into one or other Association when they tended to intrude into his personal and professional domain. It is possible (and more than indeed probable) that he preferred to share his own branch of Science with those who were of his own professional standard. This is understandable if one imagines the feelings of a professional Architect when trying to deal with a person who tries to draw up his own house plans!

The reason for these comments become clear when we read that, in 1904, Fermor Rendell, in his correspondence to a body called the "S.A.A.A.S." - which had existed for a number of years - mentioned to Mr R T A Innes (later to become Dr Innes) and who had worked hard at the Royal Observatory in Cape Town before becoming Director of the Transvaal observatory, that he (Rendell) wanted to join this body. Nevill's reaction to this idea was quite negative. The SAAAS - the South African Association for the Advancement of Science - or the "S2A3" as it is more commonly known, was certainly not an amateur body, consisting of many persons who were professional or quasi-professional scientists.

Rendell's letter dated 20th May 1894 reads in part as follows that ....."he [Nevill] does not seem at all disposed to have anything to do with it. Of course, I could not do much in the matter apart from him, so I think I must wait a bit to see how things turn out. I am glad to gather from what you [Innes] say, that the Association is making such splendid progress - I hope to see something of the British Association next year."[1] From this letter, it appears that in 1904, a Mr Fletcher was the Honorary Secretary of the S2A3 in Durban and that he, in turn, thought that "Durban's turn was coming, soon after Kimberley." This could possibly refer to a forthcoming Annual

General Meeting. Rendell closed off his letter with the comment that he did not regret coming out to Natal and that Durban came quite up to his expectations.

A word here about Dr Robert Thorburn Ayton Innes (1861-1933). He was appointed Secretary of the Royal Observatory at Cape Town on 1st January 1896. His other occupation included those of Librarian and Accountant, all under Sir David Gill who had been appointed H.M. Astronomer on 19th January 1879, three years prior to the arrival of Nevill in Natal.

Innes undertook voluntary astronomical research and on 31st March 1903, he accepted the position of Director of the Transvaal Meteorological Department in Johannesburg. The Department became the Transvaal Observatory in 1906, and changed its name to the Union Observatory in 1912, finally being renamed the Republic Observatory in 1961.

He had a good spell of duty before he retired at the end of 1927, finally rejoining his Maker on 13th March 1933. The 26½" refractor - now seldom used - in Johannesburg, was later renamed the "Innes Telescope" in his memory. During his life-time, Innes was to play a vital part in the affairs of the Durban Observatory from 1904 onwards. Fortunately he and Rendell were on good terms with each other, hence the letters which have survived to this day.[2]

Despite Nevill's obvious lack of enthusiasm, Rendell had become a member of the S2A3 by 3rd October 1904. No mention is made of Nevill's reaction to this news. Rendell was not very happy with his position at the Observatory. He had heard that Mr H C Russell, Government Astronomer of New South Wales, was on the point of retiring. He wanted to know if Innes could put in a good word for him as "here was an opportunity of being first in command instead of being second." Being an Australian by birth, he felt that he stood a good chance if he applied for the post. As it turned out, he was not successful but remained in Durban for a while longer. This must have been somewhat unsettling for both him and Nevill....

The Astronomer's Report for 1904/1905 fell into the usual pattern of listing the major instruments, mentioning that the Magnetic Dip was now 62° 48', that the Variation was 23° 18'W and was decreasing by 11 minutes of arc annually, and that the work on the Tide Tables was being carried on without a break. No astronomical information was given and his Report as Meteorologist was just as unremarkable in content, as was his report as Government Chemist.

Nothing untoward happened in the early part of 1905 but later in the year, Natal was in for a tremendous storm. The new Standard Sidereal Clock (No 54 171) had arrived and had been erected on top of the base of the old Transit Pier - the Transit telescope having been moved some time previously to a separate building. The clock was working satisfactorily. Nevill's 1905 Report as Government Chemist stated that "The Laboratory is the best equipped in South Africa and is adapted for every description of chemical investigation and scientific research".[3]

The staff in this department consisted of himself, two Senior Assistant and one Junior Assistant Analyst. The number of investigations had once again risen to an all time high. A total of 911 analyses had been made - an increase of over 200 from the previous year and "*towards the end of 1905 it was decided, owing to the rapid increase of cases of drunkenness amongst natives [sic.] in the Borough of Durban and elsewhere, to revise the regulations governing the methylation of spirits. It was resolved, on the recommendation of the Excise Commission, to add pyridine to spirits as a denaturing agent, and as it is anticipated by the Commission that the extreme nauseousness of this compound will act as a deterrent in the consumption by Natives and others of methylated spirits.*"[4] Whether this was ever done, is unknown.....

The salary scales were published with the report - something quite unusual - showing that the salaries for all four members of the staff totalled £1 012 : 1s : 4d. An amount of £1 063 had been budgeted for. The slight saving was the result of two of his staff being absent on active service for a short while.

Under the heading of "Report of the Auditor General" on the Natal Observatory, a saddening note appears. ...."*The observation in my report for 1904/1905 in connection with the printing of the first volume of the publication of Natal Observatory, it now appears that the manuscripts had been sent home [to Britain] to be printed, but the order was subsequently countermanded, and it was the returned manuscript, not the printed volume which was received in the Colony.*"...[5]

This is the only reference that has been found concerning this manuscript and, like so many of the valiant efforts by Nevill, it came to naught. It is not known who countermanded the printing order. The manuscript has apparently been lost. It could have made fascinating reading to any professional Astronomer.

II

The 1905 Meteorological Report is completely overshadowed by the "Great Storm of May 31st." Much has been written elsewhere about this event which was one of the

worst in the history of Natal. It is doubtful if Nevill's views on the subject would have ever come light to had it not been for the various reports in the newspapers and in his official reports to the Colonial Government. Let us see what he had to say about the weather that year. He opens his report by mentioning that on Sunday, 8th January, a storm had "fused the electrical connections. The Standard Mean Time Clock was considerably damaged and had to be repaired. On March 1st., a cyclonic disturbance raged along the coast and, although it did not reach the Observatory, much damage was done near at hand in Durban."[1] The main storm was referred to as follows:

> "*The storm of the night of May 31st was one of the most remarkable that have occurred in Natal during the last thirty years. Coming up the coast, it struck inland at the angle of the Drakensberg [Mountains], and swept over the entire Colony with extraordinary severity. There have been previous occasions when the wind had been greater, and others when even more rain has fallen in a short space of time, but the continuation of so great a velocity of wind with so heavy a fall of rain has never been recorded previously in the Colony. The severe damage to the trees and vegetation was in great part due to the combination of these two causes, the foliage being rendered much heavier than usual by the heavy rainfall.*

> "*The storm began in a preliminary wave about 5.00 p.m., accompanied by a fall of about an inch of rain, but the true storm came up at 9.00 p.m., and raged furiously until past 5 a.m. in the form of successive waves of high wind velocity and driving rain, accompanied by violent thunderstorms. From 5.30 p.m. to 7.30 p.m., there fell nearly an inch and a half of rain, then came a lull, followed by the main storm, and from 10.00 p.m. until 5.00 a.m., there fell nearly six inches of rain in short heavy downfalls separated by lulls. By 9.00 a.m., over nine inches of rain had fallen and by 3.00 p.m., this had increased to nearly eleven inches.*

> "*In all its characteristics, the storm presented the features of those which prevail in the Atlantic and in the Western Pacific Ocean, without any of the features of the cyclonic storms which prevail in the Indian Ocean, there being neither the changes in direction of the wind [and] no other features which characterise these true cyclones."*[2]

Reference to the newspapers of the day shows that they devoted much space to the event. Reports of severe damage started pouring in from all parts of the Colony and some time later, the *"Daily News"* in Durban published an article on 2nd January 1906 under the heading "**Railway Cameos - No 2, The Great Storm".** This reads :

"'Disorganisation of Railway Traffic : Trains will run only if circumstances permit.'

"This startling notice was put up at the Durban Station on June 1st 1905 when Natal's Great Storm of the previous day had isolated the people at the port from the rest of the Province. In the Verulam District [North Coast area] an embankment some 50 metres high was washed away and the rails left in mid-air and the 2.10 up-train from Durban got no further than Northdene because of a landslide nearby.

"Further Northwards, the blizzard had smashed the windows of a passenger train near Ladysmith and near Byrnbella, a locomotive had to drive through deep drifts of snow - it came to a dead stop at Willowgrange [just outside Estcourt]. A Durban-bound engine hit a telegraph pole which had been bent across the line and had its steam dome ripped off. At many stations, railway staff stayed on duty for more than 36 hours trying to cope with breakdowns and effecting repairs to the vital telegraph system.

"But railwaymen eventually sorted everything out and the notice at the station was taken down!".[3]

Other headlines reflected "Business suspended in Greytown", "Durban still isolated", "Blizzard at Ixopo" and more of the same. Records show that with the severe flooding and exceptionally cold weather, hundreds of local Africans and almost as many Indians had perished during the storm and its immediate aftermath.

Further researches into this event revealed that trees had been uprooted, electricity standards had crashed down, shops were flooded and the ***"Kenilworth Castle"*** had collided with a "***D.O.A. Liner"*** [Dutch East Africa] causing damage to both vessels' low bulwarks. The Marine Hotel [demolished some years ago] suffered numerous broken windows, hail stones at least 8 centimetres in diameter were found, and in the Market Hall, some of the workers had to change their clothes when the lantern roof gave way and torrents of water entered the building. A fowl was struck by a fragment of ice and .... the concussion itself was followed by an agonised 'squawk' but "marvellous to relate, the rooster picked itself up, ruffled its feathers and regained its family, none the worse for its somewhat Arctic adventure".[4] Three of the large hydraulic cranes at the Point in Durban were derailed and generally, havoc reigned over the City.

The author decided to seek further information about this violent storm and , a Mr F C Ryecroft, the oldest resident of Howick was interviewed during July 1976. Mr Rycroft had been born in Bellair in 1888 and had gone to work for a farmer in the Dargle area of the Natal Midlands. Having worked a full year, he had been given a week's leave of absence to return to his home 140 miles away, and duly proceeded there on his horse. He was then seventeen years old. He vividly recalled being caught in the "worst storm" he had ever encountered. Bitterly cold, soaking wet and thoroughly disgruntled he had to ford various swollen streams and make wide detours to gain his objective for which he had only three days. Normally it took him one and a half days to get from the farm to his home. He finally arrived, was fed, warmed up and was promptly sent back to the farm! It took him several days to recover from his ordeal.

When interviewed, Mr Ryecroft was 88 years of age, on his second pacemaker and was pottering around in his rose garden. Three weeks later, on 5th August 1976 he died, after having caught a heavy cold. Howick lost its oldest and most knowledgeable citizen. His son, Professor Hedley Brian Ryecroft, (born in 1918) was appointed in 1954 as Director of the National Botanic Gardens of South Africa with headquarters at the world renowned Kirstenbosch National Botanic Garden. He was also appointed Pearson Professor of Botany at the University of Cape Town. He retired in 1983 and died in 1990. He is survived by several descendants. (1997)

Shortly before this "Great Storm", there was an eclipse of the Sun on 7th May and this was well reported on.

III

Amateur astronomy appeared again on 18th April 1905 when Gerald H Lepper M.B.A.A. [see previous chapter] published a long article on the planet Mars,. This filled a total of 70 centimetres of 5 cm. wide columns. Quite an effort for those days.

In June of that year, the usual arguments for and against the Observatory again took place in the Natal Legislative Assembly. On 9th June, this following exchange occurred :

*"On the vote for the Observatory : **Mr Rethman** moved the reduction by £424. He thought that an Assistant was quite unnecessary. The Colony was not in a position to stand those luxuries.*

*"The **Prime Minister** said that if the reduction were agreed to, it would simply mean the crippling of the whole institution, which did a vast amount of good.*

*"**Mr Rethman** asked what benefit star gazing was to the Colony. If the Astronomers were of any use, why did they not foretell the blizzard? The institution was only to support the fad of a few gentlemen who wanted to know one star from another.*

*"**Mr Rethman's** amendment was lost.*

"The following item of £1 533 for the Government Laboratory excited some criticism of Mr Rethman whose efforts to obtain its reduction failed.

*"**Mr Pepworth** was also dissatisfied with the vote, but on explanation from the Minister of Lands and Works, withdrew a motion to strike it out."*[1]

One may wonder if the doughty Mr Rethman was an avowed enemy of the hard working Astronomer. He never seemed to fail to have a protracted "go" at reducing Nevill's income and certainly always made sure that he could pass some derogatory remark about astronomy in general.

On the other hand, and for a change, the Editorial in the *"Natal Advertiser"* had some nice words to say about the Observatory, praising its efforts, even if the instruments used were, by then *"years out of date with the rest of the world"*. Nicely put but this still not stop the flow of letters to the Editor - both for and against the little building and its occupants - particularly about the

lack of prediction about the May blizzard. This prompted an interview with Nevill and unfortunately the printing is almost indecipherable. The gist was that it must be impressed upon the public that an Astronomer can NOT foretell such things as

blizzards with the instruments that were then available. Modern artificial satellites try to do it today but even they cannot forecast reliably!

In August 1905, the British Association held its inaugural meeting in Cape Town. Amongst the dignitaries present were Professor Darwin (no details given), Sir David Gill and many other of high station in the Astronomical and Scientific world. The affair was reported as a great success. Tthe two hundred overseas delegates had sailed to South Africa from Britain in the "***Saxon"*** - one of the earliest mail-ships. Although no mention of this is made in the notes and letters available, the very fact that the event is so well documented in Nevill's scrap books indicate that he had also wanted to go to Cape Town for the occasion.

Rendell had prepared a paper entitled "Meteorological Notes from the Natal Observatory" and Nevill also prepared a paper but its title is unknown. Rendell's disillusionment with the Colonial Government came soon after, for he wrote (September 22nd.) to Innes in Johannesburg that ..."leave of absence is hard to come by and I must confess that in Natal, we are not perfectly content. In their endeavours to cope with the *bad times*, the powers that be have descended to the breaking of contracts which seems to me a foolish and short-sighted policy. Doubtless, retrenchment is sometimes necessary, but when it takes this form, it reveals a lamentable lack of capable statesmanship. How it will all end, I do not know. I may tell you in confidence that faith has been deliberately broken with me.

"It is not convenient for me to resign or I would do so. As it is, I feel a bit sore at having been brought here under false pretenses, simply to find definite pledges broken after a few months. That I came at my own expense adds to the sting. I suppose that I must comfort myself with the hope that better times are coming and that this is not the prelude to worse experiences. Mr Nevill is very nice to me but there are things which he cannot control, but my confidence has been rudely shaken and in spite of the many charms of life in fair Natal, I now keep an eye open for a favourable opportunity of going elsewhere."[2]

Innes replied that the trouble that he (Rendell) mentioned seemed to be inevitable in dealing with the Colonial Government and ..."I fancy that I told you in London that this was why Pett of the Cape Observatory declined to leave the Imperial Service and go to the Durban Observatory. I am glad that you and Mr Nevill get on all right - remember, he has a terrible fight at all times with the Government."[3]

From this exchange of letters, it is obvious that Nevill's disheartening experiences at the hands of the Colonial Government were being watched and recognised by others of his professional standing outside Natal.

After the year 1905, the official Reports of the Government Chemist appears to have ceased, although the work being carried on in the Laboratories continued. The only documentary evidence remaining for that year (1906) is contained in the Auditor General's and the Accountant General's Report for the year ended 30th June 1906. Possibly all the troubles referred to above had something to do with this and one can hardly blame Nevill if, after all his years of hard work, he felt that if the Government wanted a Report, they could jolly well get on with it themselves!

So it is at this stage that, purely for a lack of documentation, the story of the work done by the Government Chemist during his last six years at the Observatory comes to a close. Most of the buildings still existed in 1980 and the work there had been continued, being taken over by Government employees either in 1912 or 1913. No doubt they too, had more than their share of problems with their masters.....

IV

In a 1906 publication called "Illustrated Natal", a pen picture of the Observatory and its work was presented. This repeats most of the descriptions given at length in previous chapters but is worth restating as a kind of summary :

> "The Durban Observatory stands on the slope of the Berea, above the Botanic Gardens at a height of 260 feet above the sea. It was founded in the year 1882 at the instance of the Right Hon. Harry Escombe in order to observe the Transit of Venus of that year to the advancement of science.

> "As the weather is usually fine in Natal when cloudy at the Cape, the Durban Observatory is well placed to supplement the work of the Royal Observatory at Cape Town by furnishing observations which cannot be obtained at the Cape during the rainy season.

"On the appointment of Mr Nevill as Astronomer, the Observatory was taken over by the Government of the Colony, but the original design was never completed, and the Observatory still lacks its full equipment of both buildings, instruments and observers. Originally consisting of only a single room carrying a domed superstructure and a small transit room, it has been enlarged from time to time partly at the cost of the Government, but mainly at the cost of the Astronomer, who has furnished a fine library and a number of auxiliary instruments. A considerable amount of important scientific work has been carried out at the Institution, which is now being prepared for the Press.

"Apart from the more purely scientific investigations which are carried out at the observatory, its work consists of maintaining the time over the Colony, controlling the different meteorological stations, and recording and discussing the observations taken and reducing and tabulation of the tidal records of the port. The equipment consists of a fine eight-inch equatorial telescope, the gift of the founder Mr Escombe, a small transit instrument and various accessory clocks etc.

"The Staff consists of ; The Government Astronomer - E Nevill, Chief Assistant - R F Rendell B.A., F.R.A.S., Meteorological Assistant - F A Hammond, Junior Assistant - A E Hodgson F.R.A.S."[1]

Further information of a similar nature but in more detail appears in the volume *"Twentieth Century Impressions of Natal"* - pages 54 to 61, published in 1906, a copy of which exists in the Don Africana Library in Durban. This particular article also includes a graph of the rainfall as measured at the Observatory for the period from 1873 until 1904 - the readings before 1882 having been taken at the Botanic Gardens.

The 1906 Report of the Observatory showed a marked decrease in information. In place of the normal twenty or so pages, there was just a single page! In three short paragraphs, Nevill dealt with : a) Magnetic Variation - 22° 54' West, decreasing by 12' annually, b) The Magnetic Dip - 63° 12', c) The Time Signals still being transmitted at 1.00 p.m. daily, and d) The Meteorology for the year - Rainfall above average, cloudiness less than average, greater average wind force and lower mean temperature average. After twenty-four years of hard work, with little to show for his efforts, could it be that Nevill was becoming tired?

For all that, the correspondence showed no signs of slackening. Firstly, Mr Lepper wanted to sell his personal 3½ inch refractor (Negretti & Zambra, Catalogue No. 30) as he was then about to depart for Great Britain. There was no local buyer for this instrument which had cost him £40 when landed in Natal some two and a half years earlier.[2]

Rendell wrote to Innes mentioning that there were quite a few discrepancies in the high water predictions - no doubt caused by the alterations to the mouth of Durban's harbour - and that he had thought up a new method of making them. He sent his tables off to Innes covering a full year in advance and hoped that they would be of some interest. He also mentioned that he thought more than once of returning to "The Old Country" but had not decided to act on this as yet.[3]

To this, Innes replied that the "S2A3" was to meet in Pietermaritzburg in 1907 and hoped that Rendell would be able to be present. A further letter from Innes changed this venue to Durban and also advised that Rendell's work had been published in the Monthly Notices of the Royal Astronomical Society for May 1906, which was quite an achievement.

Rendell's work as Senior Assistant to Nevill must not be underestimated. He asked Innes if he could supply information about the new University for the Transvaal (Witwatersrand, or "Wits." as it is frequently referred to), adding that he could offer his assistance as an examiner or Moderator, having done this work for the Cape University. His subjects as a graduate of London University were, Spherical Trigonometry, Astronomy. Optics, Light and Heat, Plane Trigonometry, Mensuration and Algebra. All this would have been quite useful and his presence at the "S2A3" meeting would have been of great benefit to him had not an extraordinary development suddenly taken place. On 3rd March 1907, Rendell wrote to Innes, stating :

> *"I wonder if you will be surprised to hear the news contained in this letter.*
>
> *"I have been invited to present myself for Holy Orders and have decided to accept the invitation.*
>
> *"My mother and I sail in the* ***"Saxon"*** *on 14th instant and I hope at no very distant date to be at work in the parish of Barrow-in-Furness, where my friend, the Rev. A J Crosse is Vicar. Lancashire has the name of being very*

black, but there will be 10 000 parishioners to think of and plenty of work to do. So I am delighted at the prospect.

"..... After March 14th. will find me if sent to : 5 Overcliff Road, Lewisham, England."[4]

So, Rendell, a hard working thoughtful assistant, finally made the big decision, left Natal and joined the Church. Nothing more was heard of him at the Observatory and the Staff was immediately reduced to two, namely Nevill and Hodgson. Until the Observatory was closed in 1912, the position remained unchanged. As shall be seen, Rendell's decision started the final decline of the Observatory.

Letter-writing now once again fell on the shoulders of Nevill and one letter which has been preserved reveals some interesting information. Its was to Nevill from Innes, dated 24th July 1907 and the letter stated that :

"As far as the old Meteorological observations of Pietermaritzburg are concerned, in the Met. Council Publications (No 83, published in 1890) there is a complete set of records of pressure, temperature, humidity, cloud, rainfall and wind at ***Fort Napier*** *from September 1868 to December 1886 and also that in the fifth number of the Board of Trade Met. Papers of 1861, there was a complete set of* ***Dr Mann's Journals taken at Ekukanyeni*** *and also from Pietermaritzburg from January 1858 until December 1869."*

Where these old records are today is unfortunately unknown.

Mr William Grant, father of Mabel Nevill, died in the Transvaal on 4th June 1907 and a long and fine tribute was published by the *"Rand Daily Mail"*. He was buried in the Braamfontein cemetery on 6th June and many members of the Grant family were present to pay their last

respects. Many of his life-time devotees, the Zulus were also present at the graveside. According to the tribute, it appears that Mabel was not among those present, possibly

a reminder of the family "split" which took place when she and Edmund Nevill had married.

It was around this time that Nevill was made President of the Astronomical Section of the "S2A3", a signal honour which must have pleased him and his family immensely. His Report in 1907 was almost as brief as the previous one and contains little other than normal routine matters.

*

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THE FINAL YEARS AND CLOSURE IN 1912

CHAPTER ELEVEN

I

There were no major astronomical or meteorological events taking place when the year 1908 opened. In one of his monthly "Astronomical Notes", Nevill referred to one of the very earliest astronomical observations ever made in South Africa. The record occurs in Jan Van Riebeeck's ***"Journal of the first Hollander Settlement at the Cape"*** and refers to the appearance of a comet :

> "December 17th, 1652 - this evening, about between 9.00 and 10.00 o'clock, saw in the E.S.E., southwards from the head of The Giant [Orion] about 80 degrees above the horizon, a strange star with a tail; the tail stretched northwards, right onto the knees of The Giant, and the point most southerly about 10 degrees therefrom.

> "December 18th 1652 - Saw the star with the tail again, in the same place as it was yesterday.

> "December 20th 1652 - Saw the star with the tail at present in the North-east, north of the girdle [belt] of the Giant, about 60 degrees above the horizon.

> "December 21st 1652 - Saw the star with the tail again, in the N.E., from us as yesterday evening.

> "December 24th 1652 - This evening, saw the star with the tail again, shot quite into the N.N.W. from us, about 50 degrees above the horizon, with the tail (which is somewhat fainter than it was before) pointing to the East South East. What it betokens, God knows."[1]

Unfortunately no mention is made as to what comet this was but one thing is certain. The apparition which had Van Riebeeck puzzled and slightly worried about his soul and the future of the early Dutch settlement at the Cape, was one which moved extremely fast in the skies.

One or two of the pre-1908 newspaper articles preserved in Nevill's Scrap Book are also worthy of mention. For example : October 19th 1905 "An enormous sunspot, about one-tenth of the Sun's diameter was reported from East London". Another example was that "Mr C T Jerkes" [Yerkes? Indistinct] who had purchased two large glass discs which were lying in the workshops of M Mantois of Paris and thus built the Yerkes telescope, died and a tribute to him was published on 31st January 1906."

Gerald Lepper wrote an extremely long article which was published in the *"Natal Mercury"* on 30th August 1905 entitled "Today's Solar Eclipse". The newspaper gave this article about 100 cms. of 5 cm. wide space for this. As an aside, about 76 column cms. of type were presented to a Durban newspaper to cover the solar eclipse of Saturday 23rd October 1976. The paper decided to print about four columns of this! Perhaps modern astronomers can be grateful for small mercies.....

The British Association visited Durban on Tuesday 22nd August 1905 and apart from a very full programme of visits hither and thither - amongst which was a garden party at Sir Benjamin Greenacre's Residence at "Caister House, Musgrave Road" at 3 p.m., they visited the Botanic Gardens at 11 o'clock the following morning. Durban's then Mayor, Mr Charlie Henwood had a Municipal Advertisement published about the latter visit - "All Tram-cars labelled 'The Junction, Marriott Road, Old Toll Gate, Galloway House, or Cato Road' pass the Botanic Gardens Road, where members will alight and be conveyed by rickshas to the Gardens, where they will be met by the Curator, Mr J Medley Wood ."[2] Sadly, tram-cars have long since departed the scene and older readers will remember that despite their being noisy and somewhat uncomfortable, they were great fun to ride in....

Although there is no mention of the Observatory, it is highly probable that several of the more astronomically minded of these gentlemen and ladies would have sneaked off quietly up the hill to have a look at it.

Between Gerald Lepper and Edmund Nevill, many other articles were published about numerous "recent discoveries" such as the fifth moon of Jupiter (in 1904 at Lick Observatory by Professor Perrine), the ninth moon of Saturn, the completion of a new star chart by photographic methods at the Lowell Observatory, a further two moons of Jupiter in 1904 and 1905 and a tenth moon of Saturn, with many others of similar type. Many columns of print appeared in the newspapers and it is hoped that the readers of those days enjoyed them.

On 3rd October 1906, Sir David Gill left South Africa after a serious illness, having taken a year's early retirement. His works at the Royal Observatory are legion and his twenty-eight years of service at the Cape have been well recorded by Prof. Brian Warner in his book "Astronomers at the Royal Observatory, Cape of Good Hope" (Balkema 1979) and by many others. His place was taken by Sydney Samuel Hough who held the post of Astronomer Royal at the Cape from 1907 until 1923. It was in 1907 on July 15th that the "S2A3" met in Durban. The first speaker on the Agenda was : 10.00 a.m. : The Presidential Address by Mr E Nevill, F.R.A.S, F.C.S., and at 10.30 a.m. : "Numerical Summation of the Reciprocals of Natural Numbers" by Mr R T A Innes, F.R.A.S., F.R.S.E. - a subject which must have caused some mind bending! Nevill's address was published in summary form on the following day and referred to the work done at the Observatory since he had arrived in Durban some twenty-five years earlier. Apparently, despite Nevill's earlier antipathy towards the "S2A3", Mr Innes had caused him to bury his earlier feelings!

Now to 1908. A report was made in January of that year on the start of the work on the then new 100 inch reflecting telescope to be constructed at Mount Wilson. This beautifully designed instrument is still in use today.

An undated issue of the *"Natal Mercury"* - probably mid-April 1908, mentions **"A distinction for Mr Nevill"** when he was elected a Fellow of the Royal Society. Only one other "F.R.S." existed in South Africa at the time, this being Professor S S Hough, the Astronomer Royal at the Cape. Let the report speak for itself :

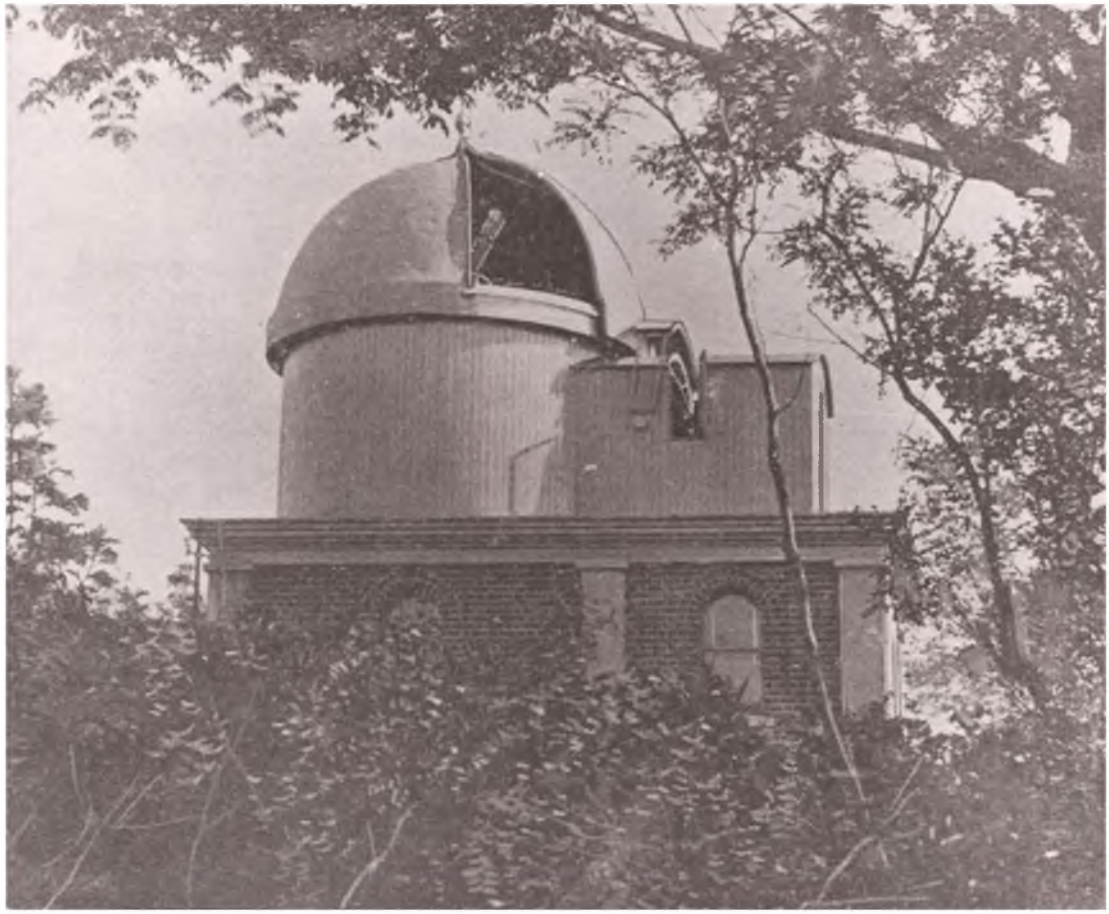
> "Mr Nevill has been Government Astronomer in Natal since 1883. He came out from England in the year previous to make observations of the Transit of Venus, originally intending to stay in South Africa not longer than six weeks. Circumstances so fell out however, that Mr Nevill decided to stay for another year and again for another year and eventually make Natal his permanent place of residence. Mr Nevill's scientific attainments have a wide recognition. He has distinguished himself in several branches of research, but is best known as a specialist in lunar phenomena. Mr Nevill is in fact,

one of the greatest living authorities on the theory of the moon and his book on the subject is a generally accepted standard work. He is also a chemist of wide repute and was one of the founders of the Chemical Society - of which he is a Fellow, and also of the Institute of Chemists.

"Small as is the establishment over which Mr Nevill presides, the Government Observatory in Currie Road takes a not unprominent place amongst the world's institutions of this character, the meteorological observations and statistics prepared there, being in wide request from other countries.

The Observatory - *circa* 1895. A small extention has been added to the right.
Courtesy: Local History Museum, Durban

"The Natal Observatory is at present working in conjunction with the Indian Government with reference to the movement of weather systems over the Indian Ocean, and probably similar duties will be undertaken in the near future for the Australian Government. An Observatory has lately been established at Delagoa Bay and the work carried on there will probably be of great advantage to the systems of meteorological intelligence which has not been organised in South Africa.



The Natal Observatory in 1893. Telescope dome and Transit slit both open.
From the Natal Railway Guide, 1893 and Courtesay of the Don African Museum, Durban.

"In addition to his position as Government Astronomer, Mr Nevill is also the Government Chemist and in that capacity performs duties with the aid of a number of highly qualified assistants which are of hardly less importance than the astronomical and meteorological work which has advanced Natal into a position of some scientific celebrity.

"Admission to the Royal Society Fellowship is regarded as being amongst the highest honours which a scientific career can bestow."[3]

II

Fifteen inches (380mm) of rain fell over Durban on 18th April 1908 causing havoc and general mayhem all around the City. Tram traffic was dislocated, the railway lines were washed away in several places and fortunately, the new road and pedestrian bridge across the Umgeni River had just been completed, saving Durban North from being cut off from the remainder of the City. This bridge [the Queen's Bridge] was only replaced in recent years and once again, the replacement was timely as, immediately after the new one had been opened (1970), the Umgeni River once more came down in flood and threatened to isolate the northern suburb. During the 1908 storm, some two hundred chairs belonging to the "Queen's Bridge Hotel" were washed out to sea and the nearby zoo (no longer in existence) saw scenes of wild chases and the capture of some animals including a kangaroo, all being eventually moved to safety. The river rose about twelve feet above its normal flood level.

In November 1908, Nevill, who was normally a stickler for scientific certainties, permitted himself to make a somewhat remarkable prediction which was based on the rainfall records which had been kept for so many years. He wrote a long article pointing out that, in his opinion, there was a rainfall cycle, just as there is a sunspot cycle. The records showed that with a somewhat mild winter coupled with certain motions of the moon, a cycle of about eighteen years took place. This theory was taken up by newspapers other than those published in Natal and in fact, the Meteorologist of the Transvaal (Dr Innes) confirmed Nevill's suspicions. Much space was printed in discussing the theory, Nevill predicted that Natal was in for an unusually wet summer, and the proof of his prediction lies in the records for the period November 1908 to March 1909. The rainfall over that period was about five inches higher than average but this was not enough to be thoroughly conclusive. Could there be such a pattern of eighteen year cycles? The trend appears to be there when one checks the rainfall records for the Botanic Garden in Pietermaritzburg.

Nevill's Astronomical Report for 1908 was completely unremarkable apart from a few paragraphs referring to the above predictions and, in 1909 - apart from noting a slight increase in rainfall, he reported that the eight-inch refractor had been "working constantly throughout the year". It was in excellent condition but, owing to cloudy conditions, ***"Moorehouse's Comet"*** had only once been seen. ***Halley's Comet*** was re-discovered on the 29th December.[1]

Despite there being no further Reports from the Government Chemist, from the "Blue Books" of the Colony, it is found that Nevill was still employed as such in 1910, his Assistants then being : Analysts - A B Tomkin, W Pay and J S Jamieson. Mr A T Sidall was employed as a clerk. Mr Pay apparently doubled as "Inspector of Explosives". From the point of view of the Observatory, the staff position was still very 'tight'. It consisted of Nevill himself assisted by Mr A G Hodgson. Hodgson realised his great ambition on 23rd March 1910 when he was promoted to Senior Assistant.

The last Report of the Astronomer that has been discovered is that for the year 1909 which was published on 1st November 1910. No further reports were printed from that date, even though the Observatory continued working for a short while longer.

The whole character of the Colony changed dramatically on November 4th 1910 when the Parliament of the new "Union of South Africa" sat for the first time in Cape Town. As an aside, on the same day a Mr F L Graham of Grahamstown was fined in Court for exceeding the official speed limit of **ten miles per hour**! Durban's speed limit was then far higher - a heady **twelve miles per hour!**

The year 1910 was also notable in that on 17th November at 2. 00 a.m. there was a total eclipse of the Moon. A few days later on 2nd December, the Duke and Duchess of Connaught visited Durban. The Duke laid the foundation stone of the new University of Natal in Pietermaritzburg. He was to lay the foundation stone of the new Technical College in Durban early the following year.

III

Referring to copies of typed letters to the Observatory which have been preserved, we find that in 1908 Nevill had the time to assist those in need of advice, however busy he might have been. For example, he wrote a number of letters giving advice on of making sundials. His correspondent was a Mr P Reid of the Telegraph Department in Pietermaritzburg. Reid also wrote to Innes in Johannesburg and received equally courteous replies. For all that, there is a remarkable lack of information for the period from 1908 until 1911. It appears that no local reports were prepared, doubtless due to the fact that the Colony had ceased as such and had become part of the Union with Pretoria as the new Legislative capital. It would be to there that all official reports would have had to go. A clue to events lies in a letter dated 18th January 1911 from Hodgson to Innes, the latter seemingly having become the "No 1 Astronomer" for the country. He wrote :

> "*It might interest you to know that a few days ago I was instructed over the telephone by Mr Bird, our [Natal's] Secretary for the Interior, to draw up a report on the work carried out at the Observatory. I told you some time ago [that] we had a similar request for a return showing our Meteorological work. Both returns were for the information of the Authorities in Pretoria.*

"It would seem to me from this that the Department is receiving some attention. It is about time, as the work is getting in arrear but they seem to be in no hurry to fill the vacancies. I am alone at the Observatory - Mr and Mrs Nevill have gone up-country for a few weeks' holiday.

"I very seldom see Pay now. He is very much engaged, Please give my best regards to Mrs Innes and the boys."[1]

As a direct result of this letter, Mr Innes wrote a confidential letter to the then Secretary for the Interior Mr E H L Gorges, part of which reads :

"I first met Mr Nevill (then "Neison") in 1877. The Natal Observatory was started on the initiative of the late Harry Escombe in the '80s and Nevill is so far the sole Astronomer - Mr Pett from the Cape Observatory was in charge until Nevill's appointment. He has, I believe, a lot of valuable work still in MS which he will no doubt take to England and publish there as he could never get the funds for printing from the Natal Government.

"If Mr Nevill is going to retire, I think that the scope of his institution might well be reduced and Mr Hodgson put in charge as Acting Superintendent, with a temporary assistant until the question of the future of the Meteorological Services of the Union is decided."[2]

Mr Innes then set out a short report of the activities of the Natal Observatory, after discussing some of them with Nevill. In short, Innes felt that owing to the poor climatic conditions in Natal [a problem which frequently drives today's amateur astronomers to distraction] it would not be worth while upgrading the instrumentation of the Observatory. There, the Time Service system then operating for the Port and the Province should be allowed to continue and the work on the Natal Tide Tables could be continued but in conjunction with the work then being carried out at other ports on the coast. The Meteorological work could be carried on and possibly be brought up to the condition of a "first order" station.

Concerning the staff at Durban, Innes felt that on Nevill's retirement, the post of Government Astronomer could well be discontinued and Hodgson could take over as Superintendent, living in Nevill's house, with the whole control of the Natal

institution passing into the hands of the Meteorological Department "as its future work will be chiefly Meteorology."

So it seems that in Innes' opinion, there was not much point in continuing the work which had been started in 1882, thirty years earlier. The die was thus struck and it only a matter of time before the whole matter came to an unfortunate end.

IV

The year 1912 passed with some obvious flurries of re-organisation. The Laboratory staff were becoming dissatisfied with the way things were turning out - one had been retrenched and others were threatening to find alternative employment, especially at the new University. Hodgson was himself left somewhat in the air about the whole thing. Nevill appears to have lost all interest which is hardly surprising and in fact started to make arrangements for his retirement.

After waiting for ten years, Nevill's house was finally constructed. As seen in August 1976. (Photograph by Author)

On 31st January 1912, Hodgson again wrote to Innes apologising for not having

written sooner as he had been suffering badly from a fever. He expected to be back on his feet within three weeks. This was not to be for on Sunday 11th February 1912 at 10 p.m., he died, leaving behind him a horrified Nevill. A Mr Hull wrote to Innes (who was of course by then the Director of the Observatory in Johannesburg) on the 13th February as follows :

> "*You will have heard of the death of Mr Hodgson, and I am only writing to you to express the feeling, shared by Mr Nevill and the Staff, of regret and misfortune at his untimely removal.*
>
> "*Mr Hodgson's illness began shortly after the New Year but did not seem very serious at first and he entirely refused to listen to his doctor's suggestion that he should go into hospital. I succeeded however, in getting him taken in by a lady who has had a thorough training as a nurse and who quite understood that the illness might develop into enteric fever, as it did.*
>
> "*I myself have been nursed at the house and I am certain that everything possible was done, both by the doctor who attended him most carefully and by the two nurses that had to help him through. He was certainly a very bad patient and obstinate about medicine, nourishment etc., but in spite of several haemorrhages, the intestinal trouble had been practically cured, when unfortunately, his heart gave way on Sunday the 11th, about 3.00 o'clock and he succumbed about 10.00 o'clock that evening.*
>
> "*All connected with him here, in the Laboratory, and in the town, will deeply regret Hodgson's loss; and when it is taken into account that the next few months would probably have seen him deservedly step into a higher position and receive some better reward for his services, his death becomes almost tragic.*
>
> "*His body was buried yesterday afternoon in the old cemetery on the top of the Berea Ridge, in the presence of a good many friends, and covered by numerous wreaths, including your own.*" [1]

Needless to say, with the death of the Senior Assistant Astronomer, and the imminent departure on retirement of Edmund Nevill, the fate of the Durban Observatory was sealed. Remembering that in the past, if an Assistant Astronomer was required, it took up to two years to train him before he could take over his duties full time, it

followed that to try to obtain a new Assistant at this late stage was almost impossible, let alone impracticable.

On receipt of the news of Hodgson's death, Innes was extremely upset but had to pass the information on to his superiors, who then started reorganising their plans for the future of the establishment. A Mr Shawe of the Department of the Interior, wrote to Innes stating that Nevill had indicated that he was proceeding on leave prior to retirement on 14th March 1912, and requested that he (Innes) proceed to Durban at the earliest opportunity to try to find ways and means of keeping things going. There was only a slight possibility that Mr Meldrum, Second Assistant, if Innes thought him sufficiently intelligent to carry on, could possibly fill the post after Nevill left.[2]

Innes replied that he would go at any time suitable but that in his opinion, **the Observatory should be abandoned!** Mr Meldrum was not suitable as a replacement and the only thing that bothered him was the system of Time Signals. On this particular point however, he had had discussions with the Controller of Telegraphs, whose opinion it was that the Time Signal System could just as easily be controlled from the Observatory in Johannesburg.[3]

V

Innes duly arrived in Durban on a Monday early in March, armed with a "free hand" to discuss

all matters pertaining to the future of the place with Nevill who, by this time, must have been totally dejected. Nevill had instituted claims for recompense on numerous items such as buildings, improvements to equipment, library books and the like which had either been purchased by him or financed out of his own pocket over the years. There was quite a lot of bickering on all these points.

Innes wanted to hand over the Laboratories to Mr Jamieson, the Senior Assistant Chemist, close the Observatory while removing some of the more "useful items" to take them back to Johannesburg. Nevill's reaction to these ideas can well be imagined! The letters indicate that Innes was not too sure about the validity of

Nevill's claims, but it is almost certain that Edmund Nevill would have put him right on many points. In fact, Innes' closing remarks in a letter dated 18th February to the Town Clerk, Durban, just before he travelled down to Durban stated : "I think you ought to give me a hint as to whether you are prepared to consider these claims at all or whether, to avoid vexatious correspondence, and let the man go away with a grievance, you would make him a compassionate allowance of say £500 in total settlement."[1]

Having had several discussions with Nevill, Innes then wrote again to the Durban Town Clerk from the Royal Hotel, suggesting *inter alia* that the institution be changed to "Government Laboratories and Meteorological Station" and that the Law No 21 of 1883 [transferring the land to the use of an Observatory] be amended to suit. He also suggested that, owing to the fact that the eight inch telescope had been purchased and the Observatory constructed mainly by public donations, it should be taken over by the City.[2]

On the same day (4th March 1912), Innes wrote to Shawe informing him that he and Nevill had come to an agreement concerning the latter's claims for compensation in an amount of £500 plus a further £100 still in dispute for work that Nevill had done to complete his house. The terms of the settlement were that **everything** would be left in Durban - books, instruments, furniture etc.

Nevill had already vacated his home and was living in a nearby hotel and was certainly not seeing eye to eye with Innes for closing down his life's work, the Observatory. Hardly surprising! Nevill was entitled to a pension of 39/60ths of his salary but if this was increased to 40/60ths, he would "forego the matter of pension for his residence-value"! Innes advised that Nevill "states that had Union not taken place he would almost certainly have remained in office for another four or five years. The whole business down here seems to have been gone through most haphazardly with the old Natal Government and I told him [that] I blamed him for not securing his rights before Union, but he asserts that he was always pegging away and Mr Bird, Secretary of the Interior for Natal, knows of his efforts."[3]

On the following day (5th March 1912), Innes wired that a final figure of £600 had been agreed upon and wrote a really long letter back to Pretoria setting out the various matters which had had to be dealt with. The Time Signal system was to remain unchanged until at least after Nevill had left and, unfortunately for his descendants, Nevill was accused of being "most un-business-like" and irregular in his dealings with the old Government - especially as regards his private purchases for the use of the Observatory and other activities of the Institution, but that "to a great extent, the Natal Government was aware of his 'irregularities' and did not trouble so long as Nevill found the money [!] He even tells that for two years, there was a break

in which there was no Observatory Vote and that he, during those two years, carried on the Observatory entirely at his own cost! In short, there has never been (so far as I can learn) any explicit declaration or instructions by the Natal Government as to their rights or liabilities or of what they expected from their Astronomer![4]

This was a shocking indictment. After so many years of back-breaking slog, weathering the most dreadful attacks from members of the old Government, doing without his salary, losing staff and having to fight to replace them and then, at the very end of his thirty years of work and his active career, to be told that he had not been acting in a business-like manner, must have just about finished the man.

Nevill departed on 14th March and four days later the Time System was transferred to the Johannesburg Observatory, ending a long and somewhat troublesome era in the annals of Natal. Innes had wasted no time.....

In the issue of the *"Natal Mercury"* of 8th March 1912, the following appears :

"The ***'Gloucester Castle'*** sails ex-Durban on Thursday March 14th without trans-shipment. Calling at St. Helena and Ascension Islands. Fare £31:10/- first class, £26:5/- second class and £12:12/- third class." The vessel's departure was however delayed for some reason and she actually sailed from Durban on the morning of Friday 15th March with the Nevill family on board. She called in at East London, Port Elizabeth and Cape Town *en route* for Great Britain.

So, after twenty-nine years and nine months, Edmund Nevill, F.R.A.S., F.R.C.S., F.R.S., etc., left the shores of Natal, never to return. He was then aged 65. His wife Mabel Nevill (born Grant) was 47. As to their children, Maud was a teenager of 17 years, Ralph was 14 and Guy was 10 years old.

The ship cleared the breakwater at Cape Town and left South African waters on 21st March heading North.

As an aside, the ***"Gloucester Castle"*** arrived in Southampton on 15th April 1912, the day after the latest in floating palaces, the brand new liner ***"Titanic"*** hit an iceberg and sank in the icy seas of the North Atlantic on her maiden voyage. Nevill's

daughter Maud recounted that this had made a lasting impression on the whole family.

So ends the story of Nevill's official work in Natal and also the end of the official life of the Observatory. What happened after Nevill left is the subject of the remainder of this work. The building, the equipment, the rise of the amateur societies, the parts played by the City of Durban, the Natal Technical College (now the Technikon), will be written about in Book Three. The second part of this work will refer to the Nevill Diaries. These give a different picture of Nevill as a man, a husband and as a father. It also casts light on several of Durban's then influential people, some of whom have been remembered in street names and other aspects of the City.

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