

EAST AFR. PROT.
25080

25080
REC'D
MAY 20 20

A. G.
DRAWING 406

1920

23rd APRIL
Last previous Paper.

37172/19

SURVEY DEPT REPORT

Trans annual report for year 1919-20

M: R. Stanley

Enclosure sent to geographical section

W.O. for information etc

P. H. M.

14. 11. 20

W. G. S. H. G. 14 25

Subsequent Paper.

30614
22

AFRICA PROTECTORATE
406

(GOVERNMENT HOUSE,
NAIROBI),
BRITISH EAST AFRICA.
REC
REL 20 MAY 208 April, 1920.

My Lord,

I have the honour to transmit herewith
the Annual Report of the Survey Department
for the year ending March 31st 1920.

I have the honour to be,

Your Lordship's

humble, obedient servant,



ACTING GOVERNOR.

RIGHT HONOURABLE

VISCOUNT MILNER, P.C., G.C.B., G.C.M.G., &c. &c.,

SECRETARY OF STATE FOR THE COLONIES,

DOWNING STREET,

LONDON, S.W.

AFRICA PROTECTORATE
406

C (GOVERNMENT HOUSE,
NAIROBI,
25030
REC'D
REC'D 20 MAY 20

BRITISH EAST AFRICA.

April, 1920.

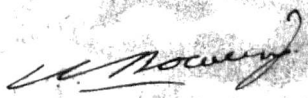
My Lord,

I have the honour to transmit herewith
the Annual Report of the Survey Department for
the year ending March 31st 1920.

I have the honour to be,

Your Lordship's

humble, obedient servant,



ACTING GOVERNOR.

RIGHT HONOURABLE

VISCOUNT MILNER, P.C., G.C.B., G.C.M.G., &c. &c.,

SECRETARY OF STATE FOR THE COLONIES,

DOWNING STREET,

LONDON, S.W.

DEPARTMENT OF LANDS.LAND SURVEY BRANCH.Organisation.

During the year under review the Trigonometrical and Topographical Branch was separated from the so called Cadastral Branch of the Survey Department.

The Trigonometrical and Topographical survey became a separate department under the Directorship of Major Kempthorne, formerly Deputy Director of the Trigonometrical and Topographical Branch.

The Cadastral Branch was attached to a remodelled department called the Land Department and will henceforth be known as the Land Survey Branch of the Department of Lands.

Mr. A. E. Townsend, Deputy Director of the Cadastral Branch, was appointed Acting Director of the Land Survey Department with Mr. Galbraith as Deputy Director.

The remainder of the staff retained their old designations and carried out the same duties as before amalgamation. Provision was, however, made for the District Surveyors to add to their duties those of Assessment Surveyors for the purpose of valuation of lands held under lease or licence from the Crown and for any other purpose for which valuation may from time to time be necessary.

I do not propose to comment on the work of the Trigonometrical and Topographical branch up to the time of separation from the Cadastral branch.

3 1A

Land Survey Branch Staff Health.

The health of the staff during the period under review has been very indifferent due to fevers and other forms of ill health contracted whilst on the coast and on military service. Many days were lost in the highlands through sickness as a direct result of the above cause and also through long service without home leave.

Field Staff - the Highlands.

All the available staff including a certain number of computers was employed in subdividing unalienated farms into 'A' and 'B' classes for Ex-Soldier Settlers under the Soldier Settlement Scheme of 1919.

The 'A' class farms were about 160 acres and the 'B' class varied from 1000 acres to 5000 acres each.

The number of farms available at the time of allotment were A 290, B 1080. These however were paper subdivisions only, the necessary field work and demarcation still remained to be done. There was also a large area of land, densely covered with bracken and other growths and heavily timbered along the banks of the rivers. This land was South of Kericho and was allotted to a Disabled Soldiers Settlers Syndicate and various other syndicates. But for these extra areas it is probable that the whole of the Soldier Settlement areas as shown on the Catalogue would have been completed by the end of the financial year. An area was also set aside for Syndicates on the Kipkarren River. The survey of this area also shall assist to retard the original settlement surveys as detailed in the Catalogue.

Land Titles Survey - Coastal Districts.

This work proceeded steadily as in previous years; unfortunately the district, in which survey and demarcation is taking place, is very unhealthy and has once more taken its toll. Mr. E. W. Nelson, Staff Surveyor, died suddenly of blackwater, two other surveyors contracted blackwater in the area but recovered. One of them was invalided and the other went on leave as soon as it was possible to provide accommodation.

The illness of the staff seriously retarded the work. Fever is not confined to the European staff, All the Asiatics have contracted malaria in more or less severe form. The natives have also suffered very severely. It is no exaggeration to say that there is not now a sound surveyor in the Department.

Township Surveys.

A small number of plots to satisfy local demands were laid out in Nairobi, Nakuru, Kisumu and Rumuruti. A considerable amount of Township work could have been completed if the various authorities concerned with the design of such townships could have reached a definite conclusion in regard to the designs placed before them.

During the past year considerable sums of money have been expended on contour surveys and designs of townships, in connection with the townships of Ruiru, Limuru, Kaiate, Gilgil etc., the final layout and surveys of which have been held in abeyance owing to obstacles being brought forward by certain members of the Town planning Boards.

It is a great pity that some firmity cannot be arrived at speedily as the long delay causes considerable

Withdrawn

330A

loss of revenue and without doubt has prevented the townships in question becoming thriving business centres.

Office	Salary	Name	Date of Appointment	Remarks
Director of Land Survey.	300 by 25 to 600	A. H. Townsend.	27 th . Oct. 1919	Penn. Leasable. Surveyor July 12 th . 1905.
	400 by 20 to 500	T. H. Calbraith, Jr., M. O.	9 th . Oct. 1919	Penn. Leasable. Surveyor July 18 th . 1906.
District Surveyors	550 by 50 to 550	G. Woodruff.	1 st . July. 1910	Surveyor, Sept. 12 th . 1900.
		A. S. Baker.	14 th . Apr. 1919	Forest Demonstrator. Aug. 28 th . 1907.
		G. O. Gilbert.	1 st . Oct. 1919	Surveyor. Sept. 18 th . 1919.
		F. S. O'Malley	7 th . Oct. 1919	Surveyor. Jan. 22 nd . 1919
	400 by 20 to 550	G. I. Oggle.	"	Jr. Surveyor. July 17, 1913
		F. B. Ballenden	"	" " Aug. 12 th . '12
		F. W. E. Flint.	"	Senior Staff Surveyor. 16 th January, 1915.
		(Vacant)	"	"
				"
				"
Senior Staff Surveyors.	425 by 15 to 505	A. Reeler	1 st . Apr. 1914	Watchman. Dec. 17 th . 1906
	425 by 15 to 475	V. McDonald	1 st . Apr. 1914	Junior Staff Surveyor. Sept. 14 th . 1911.
Junior Staff Surveyors.		L. G. Wright.	1 st . Apr. 1918	Computer. Aug. 21 st . 1913
		(Vacant)	"	"
		J. Marzengo	1 st . Apr. 1907	"
		S. H. Hasey	1 st . Feb. 1913	Asst. Surveyor. Aug. 12 th . 1912.
	410 by 10 to 460	G. E. Taylor	16 th . Jan. 1914	" " Sept. 1 st . 1910
		I. Lewison	1 st . Apr. 1914	Clerk, C. E. Feb. 1 st . 1911
		G. Taylor	1 st . Apr. 1914	Draughtsman. Jan 9 th . 1912
		H. W. Hayes	July, 1914	Asst. Surveyor. Oct 1, 1913
		V. H. Low	23 rd . June, 1915	Clerk, Land Office. 1/3/07
		A. G. Stevens	21 st . July, 1915	Draughtsman. June 18 th . 1913
Junior Staff Surveyors.	370 by 10 to 420	G. A. V. Hall	1 st . Dec. 1915	" " Sept. 18 th . 1915
		A. W. Morris	29 th . Sept. 1919	Jr. Staff Surveyor. 4/4/14
		S. S. Willis	1 st . Apr. 1919	Asst. Surveyor. 5/8/14
		W. H. Gilles	1 st . June, 1919	"
		W. S. O. Szeskewy.	20 th . Aug. 1919	Jr. Staff Surveyor. 20/8/19
		W. E. K. Bending.	1 st . Oct. 1919	Draughtsman. Feb. 23 rd . '14
		S. S. Morris	1 st . Sept. 1914	"
		V. S. Taylor	1 st . Oct. 1914	"
		H. V. Eisenstein	17 th . May, 1915	Draughtsman. 13 th . Aug. '13
		J. C. Langan	19 th . June, 1916	Leak. Leak. Feb. 3 rd . 1915
Assistant Junior Staff Surveyors	220	H. C. Willis	15 th . Sept. 1918	Draughtsman
	220	P. Barry	3 rd . Sept. 1919	Asst. Surveyor. 8/9/19
		I. Davidson	1 st . Apr. 1919	Tracer. 1-4-13.

Office	Age at first appointment	Salary	Name	Remarks
Chief Computer.	160 by 20 to 400	400	<u>Accounting Office.</u> J. H. Williams.	100. Aug. 1910 Pensionable.
		350	A. B. Atkinson	9th. Nov. 1911
		350	J. G. S. McKay	31st. Dec. 1913
		350	F. J. Gordon.	1st. Apr. 1913
		350	H. M. Thornhill.	1st. Apr. 1914
		350	H. Hepo.	20th. May, 1914
		350	J. F. Weber.	5th. Aug. 1914
		310	W. Woods.	1st. Apr. 1916
		270	J. F. O. Parrell	1st. Oct. 1918
		290	E. R. Le Neveor	14th. Feb. 1919
		250	W. Hepo.	2nd. Sept. 1919
		100	L. G. Donovan	23rd. Jan. 1920
Chief Draughtsman	250 by 20 to 350	350	<u>Accounting Office.</u> G. J. B. Furling	15th. Aug. 1906 Pensionable.
		175	J. Derrery	20th. May, 1914
		175	F. J. E. Wood	20th. Aug. 1915
		(")	(")	...
		(")	(")	...
		(")	(")	...
		(")	(")	...
		(")	(")	...
		(")	(")	...
		(")	(")	...
		(")	(")	...
		(")	(")	...
Draughtsman	160 by 15 every 5 yrs. to 205	100	<u>Public Map Office.</u> F. O. Lebrison	1st. Sept. 1913
		175		...

List of Qualified Surveyors who have obtained
Licence to survey in the East Africa
Protectorate.

Name	Date of licence	Remarks.
<u>Left the Country.</u>		
J. A. Coryell.	18/5/1905	
A. S. Frew.	9/4/1906	
A. J. R. Frew.	"	
H. M. Shaw.	27/3/1912	
F. G. H. Mehler.	23/4/1912	
A. H. F. Duncan	19/9/12	
M. E. Smuts.	31/12/12	
W. A. Leonard	27/3/13	
R. Pizzighelli.	27/3/13	
H. E. Beckman	29/4/13	
W. H. Sainsbury	1/8/13	
F. K. Webber	6/10/13	
C. H. Wainsley	14/1/19	
A. G. MacLennan	2/5/19	
<u>Available.</u>		
P. A. Van Broda	28/3/04	
J. E. Gailley.	"	
A. A. Orslop	30/4/06	
W. H. Nightingale	1/5/11	
J. C. Coverdale	15/12/11	
V. E. Kolbe	17/8/12	
W. G. Stanley	15/12/12	
J. H. McEwen	7/11/17	
F. H. Jordan	31/8/07	
H. H. Webber	4/10/07	
T. J. Murray	10/11/11	Not practicing

Name	Date of licence	Remarks
W. Gemmell	28/4/13	
M. Spence	19/8/13	
G. C. Oakes.	19/8/15	
W. E. Corrie	14/1/19	
M. A. Villiers Stuart.	7/4/19	
H. R. Payzant	31/5/19	
H. K. Grogan	2/9/19	
<u>In Govt. Service.</u>		
T. H. Galbraith	30/4/06	
W. St. C. Brockway	22/4/13	
P. W. E. Flint	5/9/13	
G. T. Cogle	5/3/17	
L. C. Wright	24/4/17	
G. Woodruff	13/2/18	
W. H. Low	13/2/18	
H. Heps.	9/5/18	
W. H. Hayes	23/7/19	
A. E. Adamson	2/8/19	
<u>Deceased.</u>		
F. W. Lind.	5/6/10	
D. O. Roberts	1904	
B. H. A. O'Hearn	24/7/06	

Cost of Survey Department for the year
ending March 31st. 1920.

Personal Emoluments	Estimates		Expenditure	
	£	£	£	£
Staff on duty and leave.			18260	
" " military service and seconded.			3979	
		23629		22248
<u>Other charges.</u>				
Local transport and labour.	7500		6875	
Printing etc.	500		541	
Equipment.	680		641	
Instruments.	1253		120	
Materials (Expendable)	852		550	
Books.	10		10	
Local purchases and contingencies.	285		196	
Travelling allowance.	712		591	
Office expenses	20		22	
Passages.	5190		1795	
		14982		13157
Grand Total		<u>38611</u>		<u>35385</u>
Deduct :				3979
Nett cost of Department.				<u>31406</u>
Comparative Annual accounts for year ending March. 31st.				
1919		36887		21480
1918		39485		19780
1917		40305		27956
1916		38165		28905
1915		44033		32650
1914		32396		33158
1913		30800		29755

Detail of Revenue.

Survey fees.	£ 465
Sale of maps.	484
Sale of War office maps.	74
Miscellaneous receipts.	<u>637</u>
	<u>£ 1660.</u>

N.B. This is compiled with value of rupee as 1/4
as standard was fixed at 2/- in January, 1920.

Comparative Annual Statement of Cost of Survey.

Year ending March 31st.	Triangulation. Shillings per sq. miles.	Topography Shillings per sq. mile.	Cadastral Survey & Fence per acre.
1912	19.4	11.0	5.96
1913	6.6	8.0	4.51
1914	7.2	10.4	6.06
1915	5.9	-	5.15
1916	-	-	12.18
1917	-	-	11.60
1918	-	-	79.75
1919	-	-	201.60
1920	-	-	15.60

Comparative Annual Statement of TRIANGULATION.

Year ending March 31st.	No.	Major Triangles		Minor Triangles		Area in square miles.
		Average triangular error. Seconds.	Area in sq. miles	No.	Average triangular error. Seconds.	
1908	50	1.77	7,320	163	2.51	3,610
1909	27	1.11	5,624	8	1.66	600
1910	34	1.45	738	20	2.68	1,117
1911	38	1.59	4,821	75	3.02	4,239
1912	18	1.06	2,629	23	3.10	3,615
1913	55	2.72	8,209	26	3.72	1,323
1914	63	2.16	7,823	39	2.79	2,360
1915	7	2.30	778	1	1.48	55
1916	..	..	..	..	..	..
1917	..	..	..	..	..	..
1918	..	..	..	..	..	..
1919	..	..	..	..	..	..
1920	..	..	..	..	..	..

Comparative Annual Statement of Topography.

Year ending March 31st.	Scale 1/62500 square miles.	Scale 1/125,000 sq. mis.	Scale 1/250,000 sq. mis.	Remarks.
1907	2,393	Lambert, good reconnaissance only.
1908	447	...	...	Uasin Gishu, good reconnaissance only.
1909	631	...	...	do do
1909	242	...	...	do do
1910	450	...	...	do do
1910	...	3,342	...	Mairubi.
1911	688	...	...	Kalindi.
1911	...	2,987	...	Kinungop, Marges and Takumua.
1911	8,575	N.W. of Nyeri. Published on 1/125000 scale.
1912	...	2,060	...	Makurak, S.W. of Nyeri and Fort Hall.
1912	Rumurati and Naivasha; and 4,400 sq. miles.
1912	reconnaissance N. of Kenya.
1912	Coast. Trans Hazia and 500 sq. miles reconnaissance in Maragret.
1913	5,390	Coast S. of Mombasa, Elgon and Uasin Gishu.
1913	...	1,188	...	O.L. Deinya Sabuk.
1913	10,500	Machakos, Baringo (northern 1/2 sheet) Uasin Gishu (1/2 sheet) Mumias (1/2 sheet) and 1,000 sq. miles reconnaissance S.E. of Kibwezi.
1914	...	950	...	North Kenya.
1914	...	790	...	Coast Sarvey Tana River.
1914	8,000	Kawirondo, Kisii and Kenya.
1915	1,500	Lambua and Setik.
1916	M.A.
1917	M.A.
1918	M.A.
1919	M.A.
1920	M.A.

Scales	Description.		
1/250,000	North A 36 M	L. Albert	Uganda.
"	" M	Hoima.	"
"	" O	Masindi Port.	"
"	" P	Balulu (Provisional)	"
"	Part of N A 36 s)		
		) Fort Portal	"
	& N A 35 x)		
"	North A 36 T	Mabendi.	"
"	" U	Entebbe	"
"	" V	Ripon Falls.	"
"	South A 35 F.	Lake Edward	"
"	" A 36 A	Mbarara (not yet available).	"
"	" B	Napaka.	"
1/1,000,000	Lake Victoria.		
1/250,000	North A 36 Q	Elgon (Provisional)	T.A.P.
"	" R	Sekerr	"
"	" W	Mumias	"
"	" X	Usain Gishu.	"
"	" A 37 S	Baringo	"
"	" T	Meru (Provisional)	"
"	South A 36 E	Karungu	"
"	" A 36 F	Kericho	"
"	" A 37 A	Nakuru-Nyora	"
"	" B	Kenya	"
"	" C	Mumoni	"
"	" H	Mashakes	"
"	" I	Kitui	"

Scales.	Description.
1/250,000	South A 37 N Makindu (Provisional) E.A.P.
"	" O Yatta Plateau (Provisional) "
"	" U Vei " "
"	" V & W Mackinnon Road, Malindi. "
"	" B 37 D Mombasa "
"	Reconnaissance Lumbwa Sotik. "
"	Magadi District. "
"	South A 37 A I Nakuru. "
"	" A II Nyeri. "
"	" A IV Njandara. "
"	" B III Fort Hall. "
"	" G II Nairobi. "
"	" V II Mangesa "
"	" V IV Takaungu "
1/62,500	Nairobi. "
"	Malindi. "
1/1,000,000	Narsabet. "
"	Mombasa-Nairobi. "
1/500,000	Turkana. "
1/2,000,000	British East Africa (not yet available) "
1/3,000,000	General plan E.A.P. "
1/1,500,000	" " " " " "
1/250,000	Magadi District. (local) "
"	Country West of Lake Magadi (local) "
"	Simba " "
"	Vei " "
1/4,000,000	Index map "
"	E.A.P. and Uganda. "

Scale	Description	
1/300,000	A 1	Lake Kivu Tanganyika Territory.
"	A 2	Karagive "
"	A 3	Victoria Nyanza "
"	A 4	Ikoma "
"	B 1	Usigi "
"	B 2	Usundi "
"	B 3	Mwanga "
"	B 4	Nyassi "
"	B 5	Kilimanjaro "
"	C 1	Ujiji "
"	C 2	Rutehagi Post "
"	C 3	Tabora. "
"	C 4	Turu "
"	C 5	Masai Steppes. "
"	C 6	Tanga "
"	D 1-2	Karema "
"	D 3	Kalula "
"	D 4	Kilimatindi "
"	D 5	Mpapua "
"	D 6	Dar-es-salaam "
"	E 2	Bismarckburg "
"	E 3	Lake Rukwa "
"	E 4	Iringa "
"	E 5	Kissaki "
"	E 6	Mchore "
"	F 2	Kalambe Mouth. "
"	F 3	New Langenburg "
"	F 4	Gawiro "
"	F 5	Mahongi "
"	F 6	Kilwa "
"	G 4	Songea "
"	G 5	Middle Rowana "

Scale	Description.
1/300,000	G 6 Masasi Tanganyika Territory
"	G 7 Mikindani "
1/100,000	Kerogwe. "
"	Tanga "
"	Wilhelms tal "
"	Moa "
1/25,000	Dar-es-salaam "
1/7,500	Tanga. "
1/1,000,000	Dar-es-salaam. "
"	Lindi "
"	Tabora "
1/2,000,000	General plan. "
1/4,000,000	Index map. Tanganyika Territory.

Table VII.

Land survey Branch 343

Details of Cadastral Surveys during 1919-20.

Description.	No.	Area.
Agricultural and Grazing Farms.	10	13,320.0
Agricultural & Grazing farms, reserved & subdivided for Soldier Settlement by Government.	415	450,000.0
Agricultural and grazing farms, reserved and subdivided for Soldier Settlement by Licensed Surveyors.	12	5,105.0
Reserves.	5	1,170.0
Re-surveys and revised surveys.	20	4,975.0
Township plots (Government locations)	306	201
Forest surveys.	-	-
Contour surveys.	1	851
Subdivisions of Township plots (Government location).	24	11
<u>Coast Land Surveys.</u>		
Mombasa Island.	168	56
Mombasa Mainland North.	920	9,045
" " South.	197	1,143
Subaland.	-	-
Tanaland.	165	4,797
Reserves.	5	627
Demarcations.	750	7,948
	3,030	502,449
<u>Private Surveys by licensed Surveyors 1919-20.</u>		
Township plots.	340	1,890
" " sub-divisions.	115	94
Farm surveys	214	155,518
Concession	1	70
Revised surveys.	4	55,537
Mombasa Island.	22	5
	696	211,117

Description	No.	Acreage.
<u>Miscellaneous Surveys 1919-20.</u>		
Triangulation.) Included in detail-		
Standard Traverse.) ed surveys.		
Plane table surveys.	-	-
Inspection, check and sundry surveys.	9	-
Road Surveys.	5	-
	14	-

Table VIII.

345

Deed plans made and issued for year
ending March, 1920.

	Number	Approx. value.
<u>Description.</u>		£
To Land Office. Deed plans.	974	240
" " " Temporary Occupation Licences. D.P.	192	28
To Recorder of Titles.	942	314
to Public.	276	61
Licensed Surveyors' plans sent for examination and signature.	1325	
Prints of above sent to Land Office.	534	107
<u>Miscellaneous maps & Cadastral Sheets.</u>		
To Government Departments.	15686	637
" Public.	8830	334
<u>War Office MAPS.</u>		
To Government Departments.	663	64
" Public.	723	74
1920 total	30145	1859
1919 "	6620	934
1918 "	6384	839
1917 "	3192	1000
1916 "	7209	1176
1915 "	9654	1584
1914 "	6243	1326
1913 "	5850	1628

Entered on
roll duty
from
to

Rank	Name	Entered on roll duty	from	to	Remarks
	A. E. ...		6/2/20	1/3/20	
	F. B. ...		1/4/19	6/2/19	
	W. ...		2/3/20	1/3/20	
	A. G. ...		17/4/19	20/4/19	
	C. O. ...		1/4/19	25/9/19	
	F. B. ...		1/4/19	4/4/19	
	F. B. ...		30/3/20	31/3/20	
	Vacant				
	A. ...		13/5/19	5/12/19	
	Vacant		20/11/19	31/3/20	
	J. ...	1/4/19 to 8/11/19			
	S. H. ...	1/4/19 to 31/3/20			
	E. W. ...		27/1/20	31/3/20	
	C. E. ...		29/3/20	31/3/20	
	I. ...		11/12/19	31/3/20	
	G. ...		29/3/20	31/3/20	
	M. W. ...		1/4/19	26/5/19	
	W. ...		29/9/19	17/11/19	
	A. G. ...				
	A. W. ...		20/10/19	10/10/19	
	C. A. ...		20/4/19	15/12/19	
	W. ...				
	S. S. ...	1/4/19 to 20/4/19			
	W. H. ...				
	W. W. ...				
	W. C. ...				
	V. ...		19/6/19	26/3/20	
	H. V. ...		29/9/19	14/3/20	
	J. ...				
	H. ...				
	P. ...				
	T. ...				
	J. ...		29/1/20	14/3/20	
	A. ...				
	J. ...		1/1/19		
	J. ...				

Died of blackwater fever
on 24/9/19

Re-appointed after War
Service in Europe

Appointed 20/8/19

Joined Sept. 20/1919,
Appointed 1/4/20

Office	Name	Period on military service	Period on leave		Remarks
			From	To	
Director of Surveys, Deputy Director, District Surveyor.	A. E. Townsend		6/2/20	31/3/20	
	T. H. Galloway, M.C.		1/4/19	26/5/19	
	G. Woodruff,		29/3/20	31/3/20	
Secretary Staff Surveyor	A. G. Becker				
	G. O. Gilbert		17/4/19	20/8/19	
	F. S. O'Malley				
	G. I. Gogle		1/4/19	25/9/19	
	F. B. Mallemson		1/4/19	4/4/19	
	P. W. E. Flint		30/3/20	31/3/20	
	Vacant				
	A. Essler.				
	W. MacDonald	1/4/19 to 8/12/19	15/5/19	5/12/19	Died of influenza fever on 24/4/19
	L. O. Wright,		20/11/19	31/9/20	
Senior Staff Surveyor	Vacant				
	J. Marsonge.				
	S. H. Ramey				
	E. W. Nelson				
	G. E. Taylor.		27/1/20	31/3/20	
	I. Lewison		29/3/20	31/3/20	
	G. Taylor		11/12/19	31/3/20	
	M. W. Hayes		29/3/20	31/3/20	
	W. S. Low		1/4/19	26/5/19	
	A. G. Stevens		29/9/19	17/11/19	Re-appointed after War Service in Europe
	A. W. Harris.				
	G. A. V. Hall		20/8/19	10/10/19	Appointed 20/8/19
	V. McClellan.		20/4/19	14/12/19	
	S. S. Willis	1/4/19 to 20/4/19			
	V. H. Giles				
	V. V. B. Kitching.				
	V. O. Tappan				
	V. Thornhill		19/6/19	26/3/20	
E. V. Thacker		25/9/19	31/3/20		
J. Robinson	1/4/19 to 9/7/19	Oct. 1919	31/3/20		
R. O. Walsh					
P. S. Sear					
I. Davidson					
E. S. Williams					
A. E. Atkinson		29/3/20	31/3/20	Joined Dept. 8/9/19.	
F. O. F. MEYER		6/11/19		Appointed 1/4/19	
F. J. Jackson		11/12/19			

Land Survey Branch.Promotions, New Appointments, Resignations,
& Deaths.Promotions.

A. E. Townsend to Director of Land Surveys.	October, 1919.
T. H. Galbraith to Deputy Director of Land Surveys.	" "
F. S. O'Molory to District Surveyor.	" "
G. I. Cogle " " "	" "
F. B. Ballenden " " "	" "
P. W. E. Flint " " "	" "
S. S. Willis to Junior Staff Surveyor.	1st. April, 1919
W. H. Giles " " "	1st. June, 1919.
B. Kitching " " "	1st. October, 1919.
T. Davidson to Asst. Junr. Staff Surveyor.	1st. April, 1919.

New Appointments.

W. Brockway. Re-appointed Junr. Staff Surveyor	11th. October, 1919
A. V. Morris. " " "	17th. November, 1919.
P. Savy to Asst. Junior Staff Surveyor.	6th. September, 1919
W. Hope to Computer.	15th. October, 1919.
L. G. Deyaroux to Draughtsman. 1st. Cl.	23rd. January, 1920

Resignations.

Major L. N. King, Director of Surveys. Recalled by War Office. Serving in Europe.	
W. Gemmill.	19/3/19
G. G. Mars. Clerk.	13/4/19
F. W. Shields. Asst. Junr. Staff Surveyor. Transferred to Chief Native Commissioner's Office.	2/4/19.
G. B. Campbell. Asst. Junior Staff Surveyor.	3/4/19.

Deaths.

E. V. Nelson. Contracted Blackwater fever in the Vanga District & died on	24/9/19.
---	----------

Labour-Percentage Statement 1919-20.European Staff.Directory.

Possible man days.	2802	100%
Office.	1604	58.1%
Leave	92	4.6%
Military service	506	15.3%

Field Staff.

Possible man days.	9385	100%
Office	459	4.9%
Field.	6571	70.0%
Leave	1741	18.6%
Military Service'	614	6.5%

Computing.

Possible man days.	3300	100%
Office.	1450	43.1%
Field	975	29.9%
Leave	594	17.8%
Military service.	222	6.8%
Vacancies.	127	3.8%

Drawing.

Possible man days.	2448	100%
Office	608	24.8%
Leave	510	20.7%
Vacancies	1530	62.5%

Asiatic Staff.

Directory.

Possible man days.	1147	100%
Office.	878	76.0%
Leave	269	23.4%

Field Staff.

Possible man days.	2142	100%
Field.	2142	100%

Drawing.

Possible man days.	3508	100%
Office.	3133	89.3%
Leave	375	10.7%

Arrears shown in Report are made up as follows:-

Arrears for 1917/18.1149 areas.April '18 - March '19.

data from Record Books Nos. 2 & 3.

Received. 1027 Coast areas.

288 Other "

1315 Total.

Checks 428 Coast areas.

274 Other "

702 Total.

Arrears for 1918/19.

Coast 599 areas.
Other 14 "
Total 613 areas.

April '19 - March '20.

data from Record Book No. 3 & from Mr. Robinson.

Received 1511 Coast areas.

427 Soldier Settlement.

1037 Other.

2975 Total.

Checked 600 Coast areas.

401 Other

1001 Total.

Arrears for 1919/20.

Coast 911 areas
Soldier Settlement 427 areas.
Other 636 areas.
Total 1974 "

THIS SHOWING Total arrears 3756 areas.

1919 - 1920.

352

Introduction and General

1. The Cadastral Survey Department, now known as the Land Survey Department, was separated from the Trig. & Topo. Survey Department, as from 1st. April 1919, and placed under the Land Office.

2. Major H.N. Kempthorne, D.S.O. was appointed Director of Trig. & Topo. Survey vice Major L.N. King dated 16th. April 1919.

3. The normal technical Staff allowed in the Annual Estimates, which had been reduced to the lowest limits owing to the necessity of post-war economy was:-

- Director.
- Assistant Director.
- 3. Surveyors.
- 1. Draughtsman Clerk.

Owing to casualties, leave, and one Surveyor being still seconded for Military Service, the actual available staff was:-

- The Director.
- One Surveyor.
- One Draughtsman Clerk.

4. The Trig. & Topo. Survey moved Offices during the year to a War Building at the Ordnance Siding.

5. It is regretted that one Surveyor (L/Cpl. Bird, C.) died of enteric fever in May.

This M.C.O. had just returned to the Department after 5 years active service.

He had a most creditable record and is a great loss to the Department.

Trigonometrical Work.

6. Major and Minor Triangulation has been carried out the following areas:-

(a) VOI - TAVETA.

This Series was run by Major H.N. Kempthorne, D.S.O. and Mr. H.C. Jones, M.C. The primary object was a demand for Land Survey Control points near Taveta. The Series also gives Main Control the Voi-Tanga Railway as far as Taveta connects up with the original Anglo-German Boundary Commission work of common sides and triangles, which enabled a complete recomputation of the Anglo-German Boundary Commission to be carried out on the R.A. Pro Base Value and to coordinate it to the Protectorate Main Triangulation.

35
Observing was carried out mainly with 8" Theodolite; some triangles were badly conditioned owing to lack of water and inaccessibility of stations and observing conditions were bad under the shadow of Mount Kilimanjaro. The mean triangular error was 2".10 and a useful check was obtained on the Taveta Check Base, which was measured several years ago by the Anglo German Boundary Commission; the series closed on this base within an error of 1:150,000. The area covered by triangulation was approximately 970 sq.miles.

(b) TEITA SERIES.

This Series was run by Mr. H. O. Jones, B.C., the primary object being to provide a control for a large scale Geological Map of the Teita Hills, and 8" Theodolite was used.

The triangular error in Major Triangles was 1".65. All work was inside an original quadrilateral of the Athi - Mombasa Series. The error in the closure of the chain run through the quadrilateral was under 1:25,000, and all triangulation adjusted thereto by a change in scale and azimuth throughout.

The area covered by triangulation was approximately 800 sq.miles.

Topographical Work.

7. The Kericho Sheet was 1/3rd. completed when War broke out and the remaining portion cannot at present be touched owing to lack of Staff. For this same reason the urgent work of revising the Nairobi Sheet remains undone.

Only one Surveyor being available it was thought best that he should devote himself to the large scale topographical work for mineral research purposes in the Teita Hills, which area was triangulated during the year.

The work is on approx. 1" to 1 mile; 100 sq. miles of topography has been completed which represents half the full survey.

In addition to the ordinary Topo. work, 75 samples of rocks and earth were collected covering the whole area surveyed; these have been classified by the laboratory, and a geological map of the area will now be made.

The primary object of this map of the Teita Hills is to provide a map of the most promising mineral area for the use of the Mineral Survey Department, which it is hoped to form during 1920 - 1921.

Office Work.

Compilation.

- (a) Accomplishment of the sheets of the Northern Frontier District has been kept up during the year, and revisions of compilations carried out with the assistance of Political and King's African Rifles Officers, to whom I am much indebted.

354

Some sheets have been revised three times and the stage when these will be worth reproduction by lithography will be reached shortly and will enable a new edition of the 1:1000,000 to be produced, which is badly needed.

I have received the greatest assistance in this work from the Intelligence Branch of the King's African Rifles, who have encouraged their Officers to do new work in districts practically unknown before.

The present sheets are an immense advance over previous publications, but even these are only compilations and no really accurate map can be expected until we can carry out some more rigorous control work in the Northern Frontier District than exists at present.

(b) A compilation of the area covered by Mount Kenya and its peaks above the forest and on the snow line has been undertaken and is nearly completed.

This completes a portion left blank in the new Kenya Sheet which is ready for publication at home.

Our own Surveyors could not reach the area above the forest line; advantage was therefore taken of Dr. Arthur's recent ascent of the mountain during February 1920, to provide him with instruments and maps, and to suggest a programme. Dr. Arthur carried this out; the programme consisted of noting the bearings of all prominent objects in his photographs and at the same time resecting the position of his camera stations from known points below the mountain. I am much indebted to both Dr. Arthur and Mr. Melhuish for records of boiling point and aneroid readings for altitude, the loan of their photographs and sketches, and their general assistance in the construction of the map, which includes every glacier of importance on the mountain.

2. SUMMARY.

The Triangulation run during the year from Voi to Taveta, gave a fourth point of junction with the original single German boundary Commission work.

The boundary Commission work has puzzled us for many years, in that unexplained discrepancies were apparent wherever we joined on to it.

The new junction enabled a complete investigation to be made of the causes of unexplained errors, and the whole series from the coast to Victoria Nyanza has now been recomputed on the S.A.P. Base length value and coordinates with the Protectorate Main Control. The previously unexplained discrepancies appear to be accounted for by the following:-

- (a) The necessity for connecting with the German Usambara Triangulation, which now shows a great error in both Latitude and Longitude.
- (b) The fact that an observed latitude, on which the S.A.P.C. work near Kilimanjaro was based, was some six seconds wrong owing to local attraction near the mountain.

(c) The fact that the Germans and our own Officers of the Boundary Commission carried out the same triangulation independently, and that where discrepancies arose it was necessary to mean results and impossible to decide on the relative value of either. Investigation tends to show that the work of our own Officers suffered accordingly at the hands of the German work.

Map Publications.

(a) The Turkana Sheet on a scale of 1:500,000. Index No. S.A. 36 U.A. 37
U.A. 37 U.A. 37

has by the courtesy of the Director of Military Intelligence, War Office, been photographed and Litho Prints received. This map was largely based on the work and triangulation of the area west of Rudolf, carried out by Lieuts. Jennell and Willis of the King's African Rifles during the Turkana operations in 1918.

(b) The Kenya Sheet scale 1:250,000. Index No. S.A. 37
U.A. 37

has, it is understood, been printed by the War Office and may be expected shortly.

(c) The newly compiled sheets of the Northern Frontier District on a scale of 1:500,000. are each traced as revised, and blue prints issued to those concerned.

Survey Offices.

The moving of the Department to new Offices has entailed the work of the laying down of a new base line and re-erecting and re-adjusting of the transit instrument.

This work has occupied a considerable amount of time.

Base Measuring Apparatus.

During the War the six Invar 24 metre wires of the S.A.A. Survey were sent to the Survey of Egypt for report on standardisation, where comparisons were carried out with the wires of the Survey of Egypt at HELWAN.

Our Survey is much indebted to their courtesy in the extreme care taken in the work and to Mr. T.H. Bennett for his report.

The results of the re-standardisation is of general scientific interest in the circumstances that the behaviour of Invar wires, due to age, is uncertain, and are worthy of record in this report.

Results are as follows:-

No. of wire.	Description & use.	Change in 2920 days
262.	Office Standard.	plus 0.15
263.	Field Standard.	plus 0.12.
264.	Field Use.	plus 0.11.
265.	Office Standard.	plus 0.07.
266.	Field Use & General.	plus 0.04.
267.	Field Standard.	plus 0.06.

It appears probable that wire No. 267 has in the course of use in the field been subjected to some shock, but it is interesting to observe that growths of the other 3 wires are in the mean, nearly twice that amount to be expected from the "Calcul des Changements permanents au passage de l'acier au nickel INVAR" issued by the Levree Bureau.

Nearly the same result was found in 3 wires belonging to the Survey of Egypt which with a period of 3,300 days had a growth in the mean of 0.17 m.m. as against a calculated growth value of 0.07 m.m.

Cost of Department.

The approximate expenditure during the year amounted to £2880 against a previous average of £7300. (both converted at Rs.18/- to the £)

I am of opinion that considering the extremely small staff available the output of work as detailed above is well up to the standard in both quantity and accuracy.

W. A. P. T. S. A. K.

DIRECTOR - TRIG. & TOPO. SURVEY DEPARTMENT.
P. A. P. T. S. A. K.