

ALTITUDES of Places in Abyssinia—*continued*.

	1. Trigo- nometrical Survey.	2. Quarter- Master- General's Department.	3. Dr. Cook.	4. Mr. Markham.	5. Mr. Rohlf's.	Other Authorities.
	Feet.	Feet.	Feet.	Feet.	Feet.	
Debra Musa Pass	9,183	..	..	..	8,407	
Aiba Valley	8,580	..	..	..	7,864	
Debar Pass	10,524	10,200	11,189	..	9,728	
Bulago Camp	9,161	..	..	..	..	
Doba	..	..	..	..	7,324	
Makan (Haya)	7,800	7,300	8,168	..	7,101	
Aroma	7,497*	..	..	..	..	
Pass above Makan	8,254	..	..	..	..	
Ashara Pass	9,125	8,920	..	..	8,547	
Ashangi Lake	7,892	8,121	8,343	..	7,264	
Aine Mai	..	8,300	..	..	..	
Hill N. E. of Ashangi	8,737*	..	..	..	..	
" S. W. "	9,815*	..	..	..	..	
Mussagita Camp	..	8,300	..	..	8,026	
Tsolog	10,890*	..	..	..	..	
Womberat Pass	9,130	9,900	..	..	8,943	
Mountain west of it	10,310*	..	..	..	..	
Lat	..	9,005	..	..	8,478	9,784 Lef.
Daffat Pass	..	9,825	..	..	..	9,502 Lef.
Mountain east of it	10,370*	..	..	..	..	
Marawah (Assangalla)	..	7,400	..	..	5,899	
Abio	..	..	..	..	6,952	
Dildi (Tselare)	..	7,378	..	..	7,005	
Terragenna Amba	..	..	..	..	8,073	
Wandach Pass	10,912	10,500	..	..	10,600	11,463 Lef.
Emano Amba Pass	..	..	..	..	10,660	
Abuna Yosef?	13,500*	..	..	..	..	
Muja Camp	9,472	..	..	..	..	
Takazze River	..	7,795	..	..	..	
Santara Camp	10,500*	10,500	..	..	..	
Gahso	10,200*	10,200	..	..	..	
Abdikum	..	..	..	..	9,250	
Jedda River	5,956	5,800	..	..	..	
Talanta, Tukrena	9,082	9,100	..	..	..	
" Baba	..	9,200	..	..	..	
Bashilo River	5,371	5,300	..	..	..	
Gombagie	7,392	7,186	..	..	..	
Affijo Camp	..	7,646	..	..	..	
Isiangie	8,647	7,630	..	..	..	
Selassie	9,161	9,076	..	..	..	
Falah	8,823	..	..	..	..	
Magdala	9,190	9,100	..	..	..	

1. The Officers of the Trigonometrical Survey determined their altitudes by observing the boiling point, and in some instances, by trigonometrical measurements. The heights obtained by the latter method are marked by an asterisk.

2. The heights given in the Reports of the Quartermaster-General's Department have been obtained by aneroid observations.

3. Dr. Cook determined his altitudes by careful aneroid observations.

4. The heights contained in Column 4 are computed from Mr. Markham's boiling-point observations. Mr. Markham also obtained the following heights by aneroid:—

Senafè	7,780 feet.	Agula	7,398 feet.
Gunaguna	6,336 "	Buya (Antalo)	7,747 "
Adigrat	7,680 "		

He observed the boiling point and aneroid at many additional places, but not having noted the temperature of the air, these observations are not available for fixing the heights.

5. Mr. Rohlf's heights are based on boiling point observations.

The last column contains the heights obtained by former observers. d'Abadie obtained his results by careful trigonometrical measurements, and the other observers by barometrical observations. The agreement between the results obtained by Dr. Cook, d'Abadie, Feret, Galinier, and Rüppel appears very satisfactory.

CHAPTER XXXVI.

TRIGONOMETRICAL SURVEY.

Arrange-
ments for
despatch of
survey
party.

THE arrangements for the despatch of a Survey Party to accompany the Expedition were left to the Government of India.

The Surveyor-General of India, under instructions from the Government of India, reported for the information of the Government of Bombay, that, in conformity with the wishes of Sir Robert Napier, a Survey Party had been organized and equipped in concert with Lieutenant-Colonel Walker, Superintendent of the Great Trigonometrical Survey, to accompany the Expedition.

Instru-
mental
equipment.

The instrumental equipment of the party was provided for at Mussoorie, and every arrangement made to ensure efficiency as well as to prevent delay or failure.

It was deemed advisable to employ native sappers and miners, as most fitted for the work, and the Bombay Government allowed some picked natives from the Bombay Sappers and Miners to be placed at the disposal of Lieutenant Carter for survey duty, as men from Bengal would, it was feared, be unsuited for service beyond sea, and their transit to the port of embarkation would likewise have been attended with serious delay.

Establish-
ments.

About twenty-five tindals and callassies were obtained for the Survey Party at Poona, and freight was provided for the following strength:—three military officers, with horses and native servants; twenty native sappers; twenty-five tindals and callassies; stores, instruments, camp equipage, &c.

The Trigonometrical Survey Party in Abyssinia were placed under the Quartermaster-General's Department, and their proceedings have been constantly alluded to in the preceding pages, in the reports submitted to the Quartermaster-General, Horse Guards, by Captain Holland, Assistant Quartermaster-General.*

The following report by Lieutenant Carter will show the working of the Survey:—†

Report of
Lieutenant
Carter.

“The Survey Party sent from India to accompany the Abyssinian Expedition, with

Officer in Charge.

Lieut. T. T. CARTER, R.E., Surveyor G. T. Survey of India.

Assistants.

Lieut. A. E. DUMMLER, R.E., Assistant Surveyor, G. T. Survey.

Lieut. T. H. HOLDICH, R.E., Assistant Surveyor, Topographical Survey.

“the view of making a geographical survey
“of the country through which the troops
“marched, was comprised of the officers
“named in the margin, and a party of
“native carriers recruited partly from the
“Himalayas and partly from the neighbour-
“hood of Poonah, Bombay.
“The party was supplied with a large
“equipment of first class instruments,

* See pages 3, 19, 72, 86, 107.

† A map of the line of march of the Force, issued originally in five sheets, accompaniment to this report, will be found among the maps issued in a separate cover.

“including Theodolites, Transit Instrument, Chronometers, &c., as well as with smaller Instruments.
 “instruments for reconnoitering; and all arrangements were made before leaving India,
 “in anticipation of our stay in the country being a protracted one, to enable us to collect
 “a large amount of geographical information, and to devote time to the work. But the
 “circumstances of the expedition prevented our going any considerable distance off the
 “line of march, and therefore our work has been restricted to a survey of the route
 “taken by the force, embracing, as far as Antalo, a breadth of country averaging 25 miles,
 “and beyond, of a less breadth, the country being more disturbed. It is, however, to
 “be hoped that the results of the survey operations will be considered valuable by
 “geographers, as verifying the observations of former travellers, and laying down an
 “important geographical feature, viz., the watershed of Upper Abyssinia. The plan of
 “operations suggested by Colonel Walker, R.E., Superintendent Great Trigonometrical
 “Survey of India, was to measure a base line near the coast, and carry on a regular
 “series of triangles along the line of country through which the troops passed; to
 “observe too, and fix by intersection a sufficient number of prominent peaks by means
 “of which to sketch in the topographical details of the country by the use of the Plane
 “table, the method of surveying adopted in the topographical surveys of India, per-
 “mitting the details of configuration of the country, the positions of towns and villages,
 “the courses of rivers, &c., to be noted more rapidly than by any other process.

“We landed at Annesley Bay on the 8th of January, 1868; it was the 15th before Arrival.
 “carriage was obtainable, when we marched to Kumayli and commenced operations by
 “measuring a base line of about three miles in length; observations were taken from
 “four stations, and a sufficient number of peaks fixed to enable the plane tabling of the
 “country between Annesley Bay and Senafè to be taken up by Lieutenant Holdich.

“It soon became apparent that to carry on a continuous triangulation, to plane Commence-
 “table the country, and at the same time to keep pace with the force, was impossible. ment of
 “To have done so would have entailed our encamping at considerable distances from, and operations.
 “remaining away for days from, the permanent posts established along the line of march,
 “and would have necessitated our carrying more supplies than we had carriage for
 “(as nothing was obtainable from the inhabitants).

“The inhabitants were independent and suspicious, even to the head men attached
 “to us by the political officer, and they had the same opinion of a Surveyor as all other
 “uncivilized people in whose country I have worked, viz., as a person to be watched with
 “suspicion, and up to no good. In this light our friends the Shohos looked on us; they
 “were not good walkers, and decidedly objected to the amount of physical exertion
 “entailed by their accompanying us on our work. With us it was our object to reach
 “the highest peaks from which a good view of the surrounding country could be obtained,
 “with them to prevent our doing so. One day I was informed that the Sultan (I con-
 “jecture that this must have been some Egyptian official) had been in those parts, but
 “that he never showed any desire to go up these steep hills, and look about him with a
 “telescope as we did, and I inferred that they considered it objectionable our doing so.
 “I mention these circumstances as we were entirely dependent on these men for
 “guidance and information, especially in ascertaining the whereabouts of water, which
 “in these hills is exceedingly scarce, and only to be found where the natives have
 “scooped away in the beds of the ravines, thus obtaining a scanty supply for them-
 “selves and cattle; of these puddles they were naturally very jealous. These remarks
 “refer to the country between Senafè and the coast, and I mention them to show the
 “difficulty there would have been in carrying on a continuous triangulation in this part,
 “and the time it would probably have taken.

" Lieutenant Holdich has the credit of plane tabling this difficult piece of country, " under these unfavourable circumstances, and his report on the same is herewith attached " (Appendix A). Time and circumstances not permitting a continuous series of triangles " being carried on, and at the same time being unwilling to give up the method of survey- " ing by means of the plane table, the only plan that occurred to me was to measure base " lines at different points along the line of march, and from each of them to commence a " fresh set of triangles, and intersect and fix prominent peaks by which the plane table " might be worked. The geographical positions of the ends of these base lines were " determined by their being connected together by a traverse line, and thus referred to " the initial station at Mulkatto, Annesley Bay. Observations were taken at one end of " each base for latitude, and thus a check obtained on the position the traverse gave. " The bearing of each base line was determined by observations to ascertain the sun's " azimuth, and the angle between sun and referring mark. Lieutenant Dummmler con- " nected the north end of the Kumayli base line with the west end of the Senafè base " (measured on a plain a little south of Senafè Camp); that there was no great dis- " crepancy in the traverse may be seen from the position it assigns to Senafè Camp. " By Traverse, latitude $14^{\circ} 42' 35''$, longitude $39^{\circ} 26' 7''$; by Observation, latitude " $14^{\circ} 42' 33''$, longitude $39^{\circ} 26' 1''$.

" The latitude by observation is the result obtained by circum-meridian altitudes of " a pair of stars, one north and one south of the zenith; the longitude, the mean result " given by three chronometers rated at Bombay, and their error on Greenwich known.

Senafè base.

" The Senafè base was about three miles in length. Observations were taken from " six stations in its vicinity, and 24 points fixed; by means of these points the whole " of the country between latitude 15° and latitude 14° , as shown in Sheet No. 2, was " sketched (a most interesting portion of the highlands of Upper Abyssinia, being the " watershed), fixing the heads of the Agoritah, Hadàs, and Kumayli nullahs or ravines " which carry off the drainage to the Red Sea at Annesley Bay to the north; the " Maini, Baltu, Gaberta, &c., that drain into the Mareb to the west; the Mai Muna and " other streams that drain towards the Red Sea to the east; and the point where the " drainage begins to run southward, as shown by the Haussen and other smaller water- " courses south of Adigrat, which drain into the Takazze, and assist in causing the " sudden flooding of the Nile, mentioned by the traveller Sir Samuel Baker. I believe " that during the dry season the majority of these watercourses are dry, except where " the water of the previous rains has remained in some of the deeper pools, but that " immediately on the rain falling, about the beginning of June, they become considerable " sized streams.

" The following prominent mountains fixed by other travellers come into Sheet " No. 2:—

" I have drawn out a list of comparisons between our results and those of " M. d'Abbadie, whose positions of the same have, I believe, been determined by triangu- " lation. M. d'Abbadie's geographical researches in this part of Abyssinia seem to have " been very great, and I have no doubt but that this comparison of results of a few " common points will be of interest to those who may read this Report.

Comparison
of latitude
and longi-
tude of
prominent
mountains
as taken by
d'Abbadie
and Trigo-
nometrical
Survey.

" Mount Guddam (Gedem)	..	Latitude, $15^{\circ} 24' 14''$	Longitude, $39^{\circ} 33' 23''$
" Ditto. By d'Abbadie	..	" $15^{\circ} 24' 42''$	" $39^{\circ} 34' 37''$
" Mount Tuhuli	..	" $14^{\circ} 46' 29''$	" $39^{\circ} 6' 16''$
" Ditto. By d'Abbadie	..	" $14^{\circ} 46' 21''$	" $39^{\circ} 7' 22''$

" Mount Kisat	..	Latitude, 14 40 12	Longitude, 39 20 10
" Ditto. By d'Abbadie ..	..	" 14 40 7	" 39 21 15
" Mount Zéban Sifra (Gonda Gonda) ..	..	" 14 26 55	" 39 37 7
" Ditto. By d'Abbadie ..	..	" 14 26 35	" 39 38 35
" Mount Sargen (Dan Salla) ..	..	" 14 26 25	" 39 31 44
" Ditto. By d'Abbadie ..	..	" 14 26 1	" 39 33 2
" Mount Semiata	..	" 14 11 7	" 38 59 15
" Ditto. By d'Abbadie ..	..	" 14 11 0	" 39 0 58
" Mount Alé'qua	..	" 14 14 23	" 39 25 53
" Ditto. By d'Abbadie ..	..	" 14 13 48	" 39 27 6
" Mount Seora	..	" 14 44 22	" 39 31 18
" Ditto. By d'Abbadie ..	..	" 14 42 14	" 39 35 36

" This comparison shows that there can be no great error in the geographical positions assigned to these hills; they all agree closely in latitude, and show a constant difference of $1\frac{1}{4}$ minutes in longitude; with the exception of Seora. There are several other peaks and positions common, but I have only noted these as being the most prominent. In this Sheet No. 2 the positions of no less than 124 villages are fixed, the most important being that of Adigrat; the position of our camp, some 30" north of the village, was fixed by plane tabling to be in latitude $14^{\circ} 16' 53''$, longitude $39^{\circ} 29' 23''$; the village by D'Abbadie was determined to be in latitude $14^{\circ} 16' 0''$, longitude $39^{\circ} 29' 30''$; by Ferret and Galinier, in latitude $14^{\circ} 15' 57''$, longitude $39^{\circ} 29' 0''$. Our latitude by astronomical observations was $14^{\circ} 16' 62''$. On the map, in addition to the names of the villages, will be found the names of those portions of the ground on which they stand, but I was unable to ascertain whether these divisions were for any fiscal purposes. The word "midr" used to denote them meaning earth, soil. I may here mention that the word "Adi," prefixed to several of the villages, denotes village in the Tigré language. With reference to the geological structure of the portion of country shown on Sheet No. 2, the valleys were metamorphic rocks, the out-cropping hills being sandstone, containing a great deal of iron ore. The country for the most part was very bare of trees, except in the neighbourhood of Halai, where there are some large forests of very fine juniper trees. The plateau of Kohaito was also well wooded, and well stocked with game. The natives seem to devote their attention more to the cattle, and keep their land chiefly for pasturage; the crops met with were few, but wheat and barley seemed to thrive where sown.

" The villages in these parts were mostly deserted, the inhabitants being attracted to the different British camps, a sure market for labour—the people gladly bringing their cattle to be used as beasts of burden.

" The donkeys of the country, which are very fine, were also greatly used for the carriage of grain, &c., to the front.

" Sheet No. 3 contains that portion of the country, traversed by the force, that lies between latitudes 14° and 13° . The character of the country is more undulating. It is bare, and the soil is sandy, but produces large quantities of wheat and barley, judging from the amount of grain brought in for sale at the different camps.

" The towns or villages of importance are Antalo and Chelikot. The position of the latter had been determined by previous travellers:—

" In latitude—	Ferret and Galinier made it	$13^{\circ} 21' 51''$ N.
"	Lefebvre	" $13^{\circ} 21' 0''$.
"	Ourselves, by plane-table	.. $13^{\circ} 21' 50''$.

Position of
Chelikot.

- Latitude of Antalo. " At Antalo, the third base line was measured, and connected by traverse with the Senafé base. The latitude of Camp Buyah, by traverse, from Adigrat, was $13^{\circ} 14' 9''$; the astronomical observation gave latitude $13^{\circ} 14' 13''$.
- " The Antalo base was measured by Lieut. Dummler. Observations were only taken from its ends—fixing the high range of hills bearing the names Fingallat, Mejjem, and Garajam, which appears to be the southern boundary of Tigré. Lieut. Dummler was not permitted to visit any of these hills, it not being considered safe that he should do so, and he was therefore unable to extend the triangulation.
- Antalo to Ashangi. " From Antalo to Lake Ashangi, the route of the army lay through a more mountainous and difficult country, held by robber chiefs, who were not to be trusted. No officers were allowed to go off the line of march, and consequently the survey of this portion of the country is much curtailed. Lieuts. Dummler and Holdich, who completed the survey of this portion of the route, found it necessary, on more than one occasion, to take precautions to prevent their carriers being molested, which they effectually did with the small native guard attached to them (10 men), the only casualty being the loss of all their baggage mules, which were stolen one night.
- " Having left Lieuts. Dummler and Holdich to complete the work up to Lake Ashangi, I proceeded to re-commence from that point. It was the 26th of March by the time I had measured the fourth or Ashangi base, and had fixed a sufficient number of points to allow of my plane-tabling.
- " By the 31st, I had traversed along the line of march, as far as Camp Marawah, and had completed the sketching of the country between Ashangi and that point. From Antalo the country had become very rough and mountainous, the route ascending and descending ranges of about 10,000 feet in height, intersected by narrow valleys, such as the Atsala, Aiba, &c., as far as Lake Ashangi, and then passing over the Womberat and Duffat passes to Marawah. Notwithstanding these natural obstacles, the march of the advancing column had been steady and continuous; and on reaching Marawah, I learnt that, in a few days' time, the Commander-in-Chief would be before Magdāla, and that time would not permit me to do more than carry on a theodolite traverse, leaving the hill-sketching to be done on the return march.
- Talanta Plateau. " The traverse was completed up to the Talanta plateau by the 12th of April; on the 13th, Magdāla was captured, and till the 18th I was employed in making a plan of the position on a large scale, and in connecting my last traverse station on the Talanta plateau with Magdāla and the neighbouring heights. The portion of the country between Camp Marawah and the Bashilo river was only traversed by myself. The topographical detail, as shown on the maps between these two points, is taken from the Quartermaster-General's route survey, as I regret to say that my health had suffered considerably from constant exposure and over-work, and I was consequently unable to do any further work for a time.
- Lasta. " The return march of the force from Magdāla to the coast was hastened as much as possible, as the rainy season was expected to commence in the latter end of May, and no further opportunity occurred of extending the work. South of Lake Ashangi, up to the Takazze, the route of the army lay through Lasta, a rich country, producing wheat, barley, millet (*Halcus Sorghum*), or the Jarwar of India, dwarf beans, peas, and different kinds of pulses, grown in India, as well as chena (*Palicum Italicum*), commonly called gram in India.
- The Takazze. " From the Takazze, the ascent is made to the Wadela plateau, an extensive pasture ground, extending in a south-westerly direction for about 40 miles. Sheep and oxen seemed to thrive very well on this high land, its elevation being more than 10,000 feet

“above the level of the sea. The most northerly part of the plateau is near Bethor. The descent to the Djedda river and the ascent to the Talanta plateau, as well as the subsequent descent to the Bashilo, are extremely precipitous; but fortunately a good broad road had already been made from the edge of the Wadela plateau to Magdāla by King Theodore, for the transit of his heavy guns.

“The instrument used for determining the initial longitude at Malkatto was a Troughton and Simms portable transit instrument, with a two-foot telescope. The method of determination was that of Lunar transits Instruments described.

“The longitude of Senafè was determined by connecting it with the initial longitude by traverse; it was also determined by the method of transportation of chronometers, and the two results agree very fairly; but it is to be remembered that during the transit of the chronometers from Bombay to Senafè, they had been stationary for the greater time on board ship. Beyond Senafè I failed to obtain any satisfactory results. The greatest care was taken in moving them; but the fact of their being moved daily, combined, I believe, with change of temperature (the chronometers having been received from the Calcutta Observatory, where they had probably been lying some time), altered their rates.

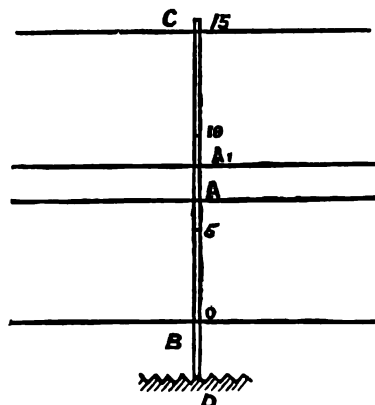
“Their rates, moreover, with one exception, were all large, viz., $+ 27.8''$, $- 5.3''$, $- 8.2'' + 1.0''$.

“The first could not be expected to give any results, and the next two have two large rates.

“For determination of longitude by this method, it is essential that the chronometers should have a small rate, as, being small, it is more likely to be constant; further, the number of chronometers should be considerable; and thirdly, the observer should be able to halt occasionally at one place for at least a week, to re-rate his chronometers, which the rapid nature of our march did not permit of our doing. Ours were ships' chronometers. I think that perhaps small pocket chronometers, carried on the person, might have given better results.

“In route-surveying of a rapid nature, embracing a large tract of country on either side of the line of march, I think the method of plane-tabling, on points fixed trigonometrically, the best that can be adopted. It has, among other advantages, these,—that the plan is made on the ground, and no field-book is required. It is only effectual where the Surveyor can leave the route to visit commanding positions. The one great qualification that a plane-tabler in a mountainous country should possess, is that of being a good walker, as it is most essential that he should ascend the loftiest elevations from which to obtain a good view of the surrounding country. He must, of course, be a good draughtsman as well.

“The Traverse was made with a theodolite, having a micrometer fitted to the eye-piece, enabling the observer to measure the number of revolutions of the screw-head that a known height subtends,—the angular value of one revolution of the screw-head having been previously determined.



“ CD is a staff marked 0, 5, 10, 15 feet. The micrometer has one fixed wire, A, and two moveable wires, B and C, attached to the screw-heads.

“ In observing, the fixed wire is made to cross the staff at any point, A; and if a 15-foot subtense is being measured, the moveable wires B and C are made to coincide with the marks on the staff at 0 and 15; and number of revolutions 15 feet subtends = rev. AO + rev. AB. In all cases, to prevent mistakes, a second reading was taken, the fixed wire being made to cross the staff, say at A'; then 15 feet subtends rev. A'C + rev. A'B; = rev. AC + rev. AB, if the observation has been made correctly.

“ The computation is made very simply by means of a table showing the distance in miles from the instrument to the staff corresponding to the number of revolutions that 15 feet subtend; the 10 and 5 feet marks are necessary for short distances, and the same table is used, by multiplying the revolutions by $\frac{2}{3}$ for a 10 feet staff, and multiplying by 3 if a 5 feet staff is observed to.

“ At Kumayli, where the base line was measured on ground cut up with numerous and wide ravines, this instrument was used; its accuracy was tested on several occasions, where the ground permitted it, by running a couple of perambulators over the same ground, the comparative results agreeing to the third place of decimals of miles.

“ This instrument has been introduced by Colonel Walker, R.E., Superintendent, Great Trigonometrical Survey of India, for mountain route surveying, or traversing over raviney and marshy ground; in the former case it is particularly useful in enabling the surveyor to avoid all the small bends at which the instrument would have to be put up where measurement has to be made with chain or perambulators.

“ In all cases the angle of elevation or depression to the staff were taken, and our distances have been reduced to the horizontal plane.

“ The whole of our traverse from Annesley Bay to Magdāla has been computed out by General Boileau's tables of latitude and departure; the latitude and longitude of points along the route at distances of about a mile apart worked out, and these plotted on the graticuled sheets.

“ I think this is a better method of plotting a long route, for a small scale map, than plotting the traverse on a large scale, and reducing it by squares or any other method.

“ The whole of our observations have been reduced by myself, assisted by Lieutenant, Dummmler and Holdich, at the office of the Director, Topographical Department, War Office, where we have received every assistance, for which I beg to thank the Director Colonel Sir Henry James, R.E., F.R.S., Lieutenant-Colonel Cooke, C.B., R.E., the Superintending Officer, and Captain Bailey, R.N., by whom the projections were made.

“ The hill drawing on the fair maps was done by Lieutenant Holdich, R.E., and they were prepared on the scale of two miles to the inch, with the view to reduction to the scale of four miles to the inch, which was done at the office of the Ordnance Survey, Southampton, Colonel Sir Henry James, R.E., Director.

“ I would beg to record my thanks to Major Darrah, of the Royal Engineers, who kindly assisted Lieutenant Holdich in taking the observations on which our initial longitude at Mulkatto, Annesley Bay, depends, which were taken after Lieutenant Dummler and myself had left for England.

“ Corporal Rhodes, of the Royal Engineers, a very intelligent non-commissioned officer, assisted me in the traverse between Lake Ashangi and Magdāla, and made himself generally useful while attached to the survey party. I am sorry to say that the health of my assistants as well as my own suffered considerably from the exertions we had to make in surveying so much of the country as is shown in the accompanying maps. We felt our time was limited, and it was only by continuous application to the work that we have been able to complete the survey of as much of the country as we have done ; I only regret that circumstances did not permit of our doing more.

“ In addition to Lieutenant Holdich's report on the country between Senafè and Annesley Bay, I have appended hereto the following :—

“ 1. A list of points fixed by triangulation, with their latitudes, longitudes, and heights (Appendix B).

“ 2. Observations for latitude, showing resulting latitudes (Appendix C).

“ 3. Observations for longitude, showing resulting longitudes (Appendix D).

“ 4. Observations to determine sun's bearing at different base lines, with resulting bearing (Appendix E).

“ 5. A list of time observations, showing chronometer errors deduced (Appendix F).

“ 6. A list of places and positions determined by traverse (Appendix G).

“ 7. A list showing boiling point observations, with resulting heights (Appendix H).

“ In conclusion, I have to return my thanks to my assistants Lieutenants Dummler and Holdich, of the Royal Engineers, for their cordial co-operation in carrying out the work on which we have been engaged.”

APPENDIX A.

THE following is a General Report by Lieutenant Holdich on the country bordering the route from Zula to Senafé :—

General description.	THE low country between the shores of Annesley Bay and the foot of the ranges of hills which terminate the Abyssinian plateau on the east and north, is a dry, sandy track of partially cultivated ground, which is unwatered during the dry season, when it is subject to the influence of perpetual sand-drifts, and the withering effects of a sun only temporarily clouded by the sand thus raised by the monsoon. At this time of the year it is apparently deserted by the Shoho agriculturists, although traces of their labours are visible everywhere; and it seems probable that during the rains large crops are raised in various parts of the district, particularly in the country south-west of the Gaddam Hills. In the presence of the British force, the cultivation of the ground hereabouts was entirely suspended; and information on this subject was very scantily obtained from the inhabitants. Rain is expected over this country during the months of February, March, and part of April; but these rains appear to be local, and extend from the coast line to a line of about 5,000 feet elevation in the hills, above which they cease. The rainy season commences in the high lands, or plateau, about the beginning of June; and it is during this month that the first torrents generally come down the ravines, and fill the Hadās and Kumayli rivers, and the beds of the smaller streams in their neighbourhood. Under their influence the country gradually becomes covered with luxuriant grass and rank jungle. The Shoho agriculturists come out from the ravines and rocks of the lower hills to pasture their cattle, and take possession of the scattered villages, of which the only remnants during the dry season are a few badly built stick huts. There is no indication of much trade amongst these people, and they seem to ignore the art of fishing, although they live on the shores of a sea abounding with fish.
Cultivation, &c.	
Rainy seasons.	
Water supply.	Water probably exists below the surface of the beds of most of the nullahs, and the appliances of the British forces brought it to the surface almost whenever it was needed; but native wells are uncommon, and, except at Futteh, where there are hot springs, the advantage of a permanent supply seems to be unknown. The fact that the natural disadvantages of climate and position are many, and the advantages few, may be inferred from the heap of ruins which now stand for Adulis.
People of the country.	There are five tribes of Shohos (who are all Mahomedans), who at present seem bound, by the ties of peace and common interest, into something like a permanent alliance. These are the Asakari, Asalesan, Ben-Farakatu, Ben-Elelish; and Fakat-harak tribes. The boundaries of their respective provinces are very indefinite: indeed two of them, the Asakari and Asalesan, occupy a hill region a little north of Senafé in common. At present these tribes appear to be banded together in order to hold their own against the Tigré people of the plateau, who are Christians, and consequently their bitter foes. For this frontier service they receive the protection of the Egyptian Government.
Geological features.	Geologically, the whole of this country is volcanic. At Eiromali, a small hill on the extension of the southern spur of the Gedom Hills, there are very distinct traces of recent eruption. The water below the surface of the ground is invariably warm, as at Kumayli and Futteh; and there is a report of a volcano existing in constant activity somewhere in a position south of Futteh, about three days' march towards the salt plains. The hills between the Kumayli and Hadās, and on either side the water, are almost invariably of a trap formation; and their peculiar, horizontal, laminated structure gives them a remarkably rugged and sharp outline, which is, I believe, seen only in the country of Abyssinia. In the beds of the nullahs are large blocks of schist, and of what appears to be granite. Sandstone is here and there found above the trap in the neighbourhood of Sanafé, and in the ridge east of the Makarra stream.
Villages.	Villages in all this district are few and far between. The people live in the plains only part

of the year; and when they retreat to the hills for water and pasture, they seem to dispense with all artificial habitations, and betake themselves to holes in the cliffs, and caves in the dry beds of the ravines, from whence they only emerge when washed out by the rains. Such houses as there are, are built of sticks and grass in a circular fashion, and stand about 8 feet high, and 10 or 12 feet wide. Sometimes there is an attempt at a roof; more generally the boughs of which they are composed are bent inwards and tied together at the top. The places where water may be found during the whole year are kept as carefully secret as possible; but there is no doubt that in the lower hills, in the beds of the ravines as they leave the hills, there are plenty of them. In the dry weather the people of the surrounding district collect and camp in the neighbourhood of these water supplies; and they are visited too by herds of wild animals which exist in the hills, and which come down at night to drink.

Elephants frequent the hills east of the Kumayli route in considerable numbers; their tracks are constant, but they are always on the move during the dry season, and between midnight and daybreak travel many miles through the jungle to and from their watering places. Like all other gregarious animals, in the rains they probably leave the hills for pasture in the plains. Lions make themselves occasionally heard amongst the hyenas at night, but their tracks are rare. They are not common in Tigré, or this part of the country. Five varieties of antelope are common here, including the Koodoo, a magnificent dun-coloured animal, standing 14 or 15 hands high; and the Ben-Israel, a small antelope about as big as a large hare, which drops to the smallest-sized shot. Hares are not so common, and are much smaller than the hill variety. Two species of guinea fowl and the common spur fowl are found everywhere. The most prominent and noisy of all the monkey species, viz., the dog-faced baboons, wander in countless numbers over all this region, and everywhere make themselves as conspicuous as possible.

Wild animals,
game, &c.

There are three routes to the Abyssinian plateau from the coast of Annesley Bay. The route of the Hadās river, which was reconnoitred previous to the campaign, is the most westerly. It is undoubtedly the longest, but it is the most generally adopted, as it affords a good supply of water all the year round. No road has been made in this ravine for the greater part of the distance. The ascent to Takonda was partly rendered traversable for military purposes, but is probably now in its original impassable condition again. The route *via* Kumayli was the one adopted for the ascent and descent of the British forces. This route follows the bed of a nullah for the whole distance. Water was plentiful at Kumayli, Sooroo, and Rahaguddy. Wells were made at a place called Maian, in the neighbourhood of Undel. This route has probably also resumed its primitive condition of difficulty by the action of the last rains. A third route exists which would be practicable when the two former were flooded, which is at all seasons open to native traffic, but which probably presents more natural difficulties to road-making than either. Its one advantage is its probable passability when the Kumayli and Hadās ravines are full of water. This route extends across the plains from Malkatto to the hot springs at Futteh; thence to a point where water is always procurable at Imtahagu, over the easternmost ridges into the Makarra stream. This part of the route is comparatively easy. Beyond this it follows up the bed of the Makarra, which is here broad and open, and presents no appearance of the effects of a torrent during the rains, to the eastern foot of the Maruglu range, which is in occupation of the Fakat-harak, and Bethasaba tribes. The Maruglu pass is steep and difficult, but from the Maruglu range it is said to be possible to reach Sanafé without descending into the Kumayli pass. The easier route, however, is by a small stream called the Garadaf, into a narrow, open plain in the pass, about a mile and a half above Undul wells; and thence by Rahaguddy to the plateau at Sanafé, or by the village of Undul to Takonda.

Routes to the
Plateau.

Synopsis of
points fixed
by triangulation.

APPENDIX B.

SYNOPSIS of Points fixed by Triangulation.

No.	Fixed Station. A.	Deduced Station. B.	Log. Distance in feet. A to B.	At A, Azimuth of B.	Latitude of B.	Longitude of B.	Height above Sea, of B.	Remarks.
1	North end Kumayli Base	South end Kumayli Base	4.1878026	322 8 25	15 13 28	39 35 44	100	Latitude and longitude of north end of Kumayli Base, referred to Initial point at Malkatto; Height from spirit-level observations. Azimuths reckoned from S. round by W. S. = 0°, W. = 90°, N. = 180°, E. = 270°.
2	"	Alumta, H. S.	4.6098712	354 34 26	15 11 27	39 37 20	74	
3	"	Kumayli, H. S.	4.3231449	65 7 22	15 6 46	39 36 23	2,803	
4	"	Imaru, H. S.	4.7342412	10 21 59	15 12 0	39 32 29	1,499	
5	"	Urug, H. S.	4.9760855	85 5 25	15 4 39	39 34 4	..	
6	"	Guddam, H. S.	4.8232601	168 4 11	15 12 7	39 19 40	7,940	
7	"	" No. 2, H. S.	4.7709404	175 27 19	15 24 14	39 33 23	..	
8	"	Peak, S.W. of Annesley Bay	5.0165180	309 36 28	15 23 11	39 34 56	..	
9	"	Hawa, H. S.	4.6295437	213 37 7	15 31 20	39 49 20	..	
10	Alumta	Abalu, H. S.	4.7635977	95 51 22	15 12 38	39 40 24	..	
11	"	Futteh, H. S.	4.4774868	325 58 0	15 7 44	39 26 34	7,610	Position of West end of Sanafé Base, determined by traverse connection with Kumayli Base, checked by astronomical observations; height by boiling thermometers.
12	South end Kumayli Base	Girgru, H. S.	4.7884497	52 44 8	15 7 20	39 40 12	..	
13	"	Farum, H. S.	4.9080865	48 49 47	15 5 58	39 29 55	..	
14	"	Guddam, No. 1, H. S.	4.8922905	164 14 13	15 2 41	39 27 1	8,085	
15	"	"	..	..	15 23 52	39 33 43	2,750	
16	West end Sanafé Base	"	..	..	14 41 2	39 25 6	7,580	
17	"	East end Sanafé Base	4.1643826	293 11 54	14 40 5	39 27 23	7,663	
18	"	Shimazana, H. S.	4.5511855	317 6 29	14 36 43	39 29 13	8,635	
19	"	Marara, H. S.	4.3379771	355 58 10	14 37 26	39 25 22	8,208	
20	"	Seora, H. S.	4.6193949	241 1 4	14 44 22	39 31 18	9,550	
21	"	Ad. Hazu, H. S.	4.9388360	273 42 38	14 40 6	39 39 45	8,976	
22	"	Ouda, H. S.	4.7630267	282 31 24	14 38 57	39 34 43	..	
23	East end	Kisat, H. S.	4.6284043	90 59 33	14 40 12	39 20 10	8,680	
24	Shimazana, H. S.	Akub Terika, H. S.	4.6762577	155 29 47	14 43 51	39 25 52	..	
25	"	Zeban Zifra, H. S.	4.8774270	321 50 41	14 26 55	39 37 7	10,314	
26	"	Sargen, H. S.	4.8066434	346 36 24	14 26 25	39 31 44	9,204	
27	"	Abalu, H. S.	5.1729645	15 36 25	14 13 0	39 22 26	..	
28	"	Focada, H. S.	4.9091890	26 22 16	14 24 42	39 23 6	8,979	
29	"	Maimarat	4.8594414	40 27 41	14 27 37	39 21 15	..	
30	"	Gundet, No. 1	5.3565017	85 36 15	14 33 47	38 50 46	6,145	

APPENDIX B—continued.

Synopsis of Points fixed by Triangulation—continued.

No.	Fixed Station. A.	Deduced Station. B.	Log. Distance in feet. A to B.	At A, Azimuth of B.	Latitude of B.	Longitude of B.	Height above Sea, of B.	Remarks.
31	Shimazana, H. S.	Gundet, No. 2, H. S.	5.3744644	89 38 49	14 36 25	38 49 1	..	Latitude and longi- tude of East end of Antalo Base de- termined by tra- verse connecting it with Sanafé Base. Position verified by astronomical obser- vations; height by boiling thermo- meter.
32	" "	Adbalu, H. S.	5.1024111	56 20 22	14 25 6	39 11 12	..	
33	Akub Terika, H. S.	Halai, No. 1, H. S.	4.9456398	154 53 42	14 57 4	39 19 31	..	
34	" "	Sa-asa, H. S.	5.0524637	157 33 48	15 1 6	39 18 33	8,710	
35	" "	Tahuli, H. S.	5.0662772	97 53 14	14 46 29	39 6 16	6,285	
36	Marara, H. S.	Aléqua, No. 1, H. S.	5.1445817	358 43 47	14 14 23	39 25 53	10,392	
37	" "	" No. 2, H. S.	5.1174611	1 43 47	14 15 47	39 24 42	10,191	
38	Seora, H. S.	Tsaro, H. S.	4.9035113	156 39 25	14 56 31	39 25 54	9,048	
39	" "	Bakhna, H. S.	5.1338589	165 27 47	15 5 38	39 20 4	..	
40	East end Antalo Base	" "	..	..	13 15 19	39 35 48	6,778	
41	" "	West end Antalo Base	4.1556673	112 51 12	13 16 14	39 33 35	6,500	Position of West end Ashangi Base, fixed by traverse. These points are on the ridge on west- ern side of Lake Ashangi. Denoted on maps by H. S. only.
42	West end "	Garajam, H. S.	4.8259888	316 4 54	13 8 15	39 41 25	8,652	
43	" "	Alaji, H. S.	5.0216917	345 29 38	12 59 25	39 38 1	10,798	
44	" "	Fingalat, H. S.	4.7363868	34 4 29	13 8 46	39 28 26	8,010	
45	" "	Mejjem, H. S.	4.7343595	4 53 18	13 7 18	39 32 48	9,190	
46	Akub Terika, H. S.	Aroma Vil., H. S.	4.6534482	120 40 23	14 47 39	39 19 18	7,497	
47	West end Ashangi Base	" "	..	..	12 37 6	39 39 3	..	
48	" "	East end Ashangi Base	4.1969522	235 8 3	12 38 35	39 41 13	7,912	
49	" "	Ashangi, H. S.	4.0880410	263 53 29	12 37 19	39 41 6	8,737	
50	Ashangi, H. S.	" No. 1	..	..	12 35 19	39 36 22	..	These points are on the ridge on east- ern side of Lake, called Makaré. De- noted on maps by H. S. only.
51	" "	" 2	4.4859126	66 42 33	12 37 22	39 37 37	..	
52	" "	" 3	4.3158056	90 54 32	12 39 13	39 37 25	..	
53	West end Ashangi Base	Makaré, No. 1	4.3556943	307 39 17	12 34 49	39 42 4	..	
54	" "	" 2	4.3789047	314 59 30	12 34 18	39 41 54	..	
55	Ashangi, H. S.	" 3	4.3417042	353 30 13	12 33 43	39 41 31	..	
56	" "	" 4	4.4556112	356 55 27	12 32 36	39 41 21	..	
57	West end Ashangi Base	" 5	4.4103097	331 46 52	12 33 21	39 41 6	..	
58	" "	" 6	4.3296276	341 0 0	12 33 46	39 40 13	..	
59	Ashangi, H. S.	" 7	4.3873094	27 27 23	12 33 44	39 39 12	..	

APPENDIX B—continued.
Synopsis of Points fixed by Triangulation—continued.

No.	Fixed Station. A.	Deduced Station. B.	Log. Distance in feet. A to B.	At A, Azimuth of B.	Latitude of B.	Longitude of B.	Height above Sea, of B.	Remarks.
60	West end Ashangi Base	Point No. 1..	4.4387030	12 57 17	12 32 41	39 38 1	..	} Points on ridge south of Lake
61	" " " "	" " 2..	4.2931097	21 4 34	12 34 2	39 37 50	9,815	
62	Ashangi, H. S. "	Tsolog, H. S.	4.7014951	49 1 3	12 31 52	39 34 42	10,890	
63	East end Ashangi Base	Point a	4.7791377	23 52 4	12 29 30	39 37 7	10,310	No name.
64	Ashangi, H. S. "	" f	4.7568849	9 45 57	12 28 1	39 39 28	..	Do.
65	" " "	" g	4.8491335	18 16 28	12 26 14	39 37 22	10,370	On the Duffat Range.
66	Talanta, H. S. "	" "	..	..	11 28 2	39 17 11	..	} This point fixed by traverse.
67	" " "	Selassie, H. S.	4.6686829	306 53 35	11 23 25	39 23 26	9,160	
68	" " "	Falah, H. S.	4.6554593	313 9 21	11 22 56	39 22 43	8,820	
69	Falah, H. S.	Point A	3.8386931	251 15 18	11 23 19	39 23 49	..	} These points on range east of Menjara Ra- vine.
70	" " "	" B	3.9596770	269 13 18	11 22 57	39 24 15	..	
71	" " "	" C (Gombagé Spar)	4.4079128	120 46 42	11 25 35	39 19 45	7,890	
72	Selassie, H. S.	Commander-in-Chief's Camp	4.1431700	83 34 49	11 23 10	39 21 7	..	} King's House.
73	Falah, H. S.	Tree on Arogi Plateau	4.1403370	118 46 18	11 24 2	39 20 41	..	
74	B., H. S.	S 2 ..	4.2836164	190 19 5	11 26 5	39 24 49	..	
75	" " "	S 1 ..	4.3119752	240 16 40	11 24 38	39 27 14	..	} This point on ridge east of Arogi Ra- vine.
76	Falah, H. S.	Low point on Selassie	3.8049029	243 43 25	11 23 24	39 23 41	..	
77	" " "	Magdala	3.9914880	273 16 18	11 22 50	39 24 22	9,190	
78	Selassie, H. S.	H. S. (across Kalkulla R.)	4.3166470	349 13 59	11 20 3	39 24 5	..	} This point on ridge east of Arogi Ra- vine.
79	Falah, H. S.	Selassie, H. S., No. 1	3.7056345	209 58 15	11 23 40	39 23 9	..	
80	" " "	" " 2	3.4258043	243 30 53	11 23 8	39 23 7	..	
81	Selassie, H. S.	Point d	4.2221106	139 54 19	11 25 32	39 21 38	..	

APPENDIX C.

CIRCUM-MERIDIAN Observations for Latitude.

Deduction No. 1.—Malkatto.

Circum-
meridian
observations
for latitude.

No. of Chronometer.	Object Observed.	Face.	Altitude.	Time of Observation.	Barometer.	Thermometer.	Clock Error.	Date.	Resulting Latitude.
3381, Sidereal.	α^2 Centauri.	L. R. R. L.	14 30 23 14 30 25 14 30 10 14 30 1	H. M. S. 17 22 18 17 26 53 17 29 7 17 32 13	30	75 F.	Fast, 2h. 54m. 52s.	June 5, 1868.	15° 15' 32.4".

Deduction No. 2.—East End, Kumayli Base.

278, Mean Time.	Sun's Lower Limb.	R. L. L. R. R. L. L. R. R. L.	54 53 8 55 3 20 55 8 24.5 55 10 15.0 55 10 58.0 55 10 38.0 55 7 19.0 55 3 27.0 54 54 4.5 54 49 24.5	2 30 54 2 36 27 2 41 15 2 46 42 2 49 16 2 52 58 2 58 11 3 0 40 3 6 46 3 9 37	29.5	70 F.	Fast, 2h. 36m. 39.6s.	January 24, 1868.	15° 13' 22.3".
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Deduction No. 3.—Senafé Camp.

3353, Mean Time.	ϵ Canis Majoris.	L. R. R. L.	46 30 27.3 47 31 47.3 47 30 27.3 49 6 22.3	6 12 48 6 17 16 6 19 25 6 22 59	22.2	55 F.	Slow, 3h. 16m. 45s.	January 12, 1868.	14° 42' 39.9".
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Deduction No. 4.—Senafé Camp.

3353, Mean Time.	ϵ Ursa Majoris.	L. R. R. L.	56 8 47.5 56 1 12.5 55 58 7.5 55 51 15.0	8 10 56 8 19 6 8 21 34 8 27 6.5	22.2	55 F.	Slow, 3h. 16m. 45s.	January 12, 1868.	14° 42' 26.6".
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Deduction No. 5.—West End, Senafé Base.

3353, Mean Time.	Sun's Upper Limb.	L. L. R. R. L.	60 21 47.5 60 15 27.5 60 12 15.0 60 7 32.5 59 40 47.5	9 5 56 9 11 26 9 13 40 9 16 5 9 25 27	22.0	55.0	Slow, 3h. 16m. 16.6s.	February 8, 1868.	14° 40' 58.0".
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Deduction No. 6.—Antalo.

No. of Chronometer.	Object Observed.	Face.	Altitude.	Time of Observation.	Barometer.	Thermometer.	Clock Error.	Date.	Resulting Latitude.
			° ' "	H. M. S.					
3353, Mean Time.	β Geminorum.	L.	74 43 5.0	4 22 50	23.5	75.0	Slow, 3h. 18m. 49s.	March 18, 1868.	13° 14' 12.8".
		R.	74 52 45.0	4 27 23					
		R.	74 54 57.5	4 33 42					
		L.	74 49 35.0	4 37 26					
		R.	74 33 51.0	4 46 16					
		R.	74 21 46.0	4 49 52.5					
		L.	74 8 11.0	4 52 37.0					

Latitudes deduced from Altitude of a Polaris.

No. of Chronometer.	Date.	Place.	Altitude.	Sidereal Time of Observation.	Barometer.	Thermometer	Latitude.
			° ' "	H. M. S.	Inch.	° Fahr.	° ' "
Sidereal.							
3353	June 5	Malkatto	14 1 5	14 33 39.7	30	80	15 15 58.5
278	Jan. 24	N.E. Kumayli Base	15 54 38	5 20 12.0	29.5	70	15 13 1.0
3353	Feb. 11	W.E. Senafé Base	15 7 46	6 2 44	22.2	55	14 41 5.0
Watch	Mar. 1	Halai	15 10 22	6 47 32.5	22.5	55	14 59 45.0
Watch	Mar. 12	Adigrat	14 32 9.5	6 36 5.2	22.5	60	14 17 2.0
3353	Mar. 18	Antalo	12 41 34.3	8 51 41.3	23.5	75	13 14 27.0

The latitude of Antalo was also determined by Lieut. Holdich, R.E.—from three observations to stars on meridian—to be 13° 14' 4.5".

The latitude of Ashangi was determined by Lieut. Holdich, R.E.—from four observations to stars on meridian—to be 12° 36' 41.8".

SYNOPSIS of Observations for Longitude at Malkatto, taken with 2' Transit Instrument, by Troughton & Simons. Chronometer Sidereal, No. 3381, Parkinson & Frodsham. Approximate Latitude, 15° 13' 0" N. Approximate Longitude, 39° 40' 0" E. Approximate Clock Error, Fast 2 h. 55 m. 0 s., 1868.

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TRIGONOMETRICAL SURVEY.

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Date and Limb.	Illd. Pivot.	Azimuth Error.	Level Error.	Transits Observed for Azimuth and Clock Error.						Mean Clock Error.	Moon's Observed Transit.	Moon's R. A. at Passage.	Longitude.
June 1st, 1868 ... D/	E.	+2' 48.82"	-2.4"	h. m. s. Polaris S.P. 15 57 48.12	h. m. s. β Ursæ Minoris. 17 46 25.2	h. m. s. α Virginis. 16 12 48.66	h. m. s. λ^2 Virginis. 16 19 41.26	h. m. s. κ Virginis. 17 0 26.24	h. m. s. λ Virginis. 17 6 32.48	h. m. s. α^2 Centauri. 17 24 53.6	h. m. s. 16 49 6.18	h. m. s. 13 54 33.08	h. m. s. 2 38 50.41
June 2nd, 1868 ... D/	W.	-42.7"	-5.0"	Polaris S.P. 16 6 14.4	η Ursæ Majoris. 16 37 2.1	κ Virginis. 17 0 36.14	λ Virginis. 17 6 42.94	α^1 Centauri. 17 25 27.06	ξ Libræ. 18 15 34.18	γ Libræ. 18 22 54.2	17 41 54.24	14 47 11.27	2 38 45.97
June 3rd, 1868 ... D/	E.	+8.1"	-2.3"	β Ursæ Minoris. 17 46 2.3	β Libræ. 18 4 44.7	ξ Libræ. 18 15 39.56	ξ Ursæ Minoris. 18 43 49.06	ν Scorpis 18 59 10.14	ψ Ophiuchi. 19 11 13.58	α Trianguli Australia. 19 29 33.34	18 35 4.68	15 40 16.34	2 38 52.47
June 4th, 1868 ... D/	W.	+3.6"	-1.6"	ξ Ursæ Minoris. 18 43 50.9	β Scorpis 18 52 41.28	ν Scorpis 18 59 14.9	ψ Ophiuchi 19 11 18.30	κ Ophiuchi 19 46 21.0	θ Ophiuchi. 20 8 49.3	...	2 54 51.8	16 33 52.34	2 38 58.66
June 5th, 1868 ... H	E.	-15.1"	-6.3"	μ Sagittarii 21 0 52.68	θ Ophiuchi 20 8 54.8	21 Sagittarii 21 12 29.3	α Lyræ 21 27 28.86	...	...	...	2 54 51.97	17 29 57.24	2 39 15.73

These Observations were taken by Captain Darrah, R. E., and Lieut. Holdich, R. E. ... { Mean 2 38 56.65
= Long. E. 39° 44' 9.75

Longitude
of Zula
Camp.

Longitude
of Senafé.APPENDIX D—continued.
LONGITUDE of Camp Senafé by Chronometers.

	Objects Observed.				Means in Time.	Means in Space.	General Mean.	Remarks.
	Castor, Feb. 6.	α Ceti, Feb. 6.	α Leonis, Feb. 8.	α Ceti, Feb. 8.				
Chronometer 3853.	Chronometer error on Dec. 27, 1867 ..	0 34 53.2	0 34 53.2	0 34 53.2				
	Increase for interval due to -5.3 s. rate	-0 3 37.3	0 3 37.3	0 3 47.9				
	Chronometer error at time of observation	0 38 30.5	0 38 30.5	0 38 41.1				
	Chronometer time of observation ..	5 12 2.6	6 18 28.3	5 26 34.6				
	Greenwich mean time of observation ..	5 50 33.1	6 56 58.8	6 5 15.7				
	Local mean time of observation ..	8 28 23.7	9 34 49.7	8 43 8.6				
Chronometer 2566.	Differential longitude East ..	2 37 50.6	2 37 50.9	2 37 52.9	2 37 52.9	39 28 14		
	Chronometer error on Dec. 27, 1867 ..	+5 54 28.7	5 54 28.7	5 54 28.7				
	Increase for interval due to +1 s. rate	+0 0 41.0	+0 0 41.0	+0 0 48.0				
	Chronometer error at time of observation	5 55 9.7	5 55 9.7	5 55 11.7				
	Chronometer time of observation ..	11 45 33.6	12 51 59.3	12 0 16.6				
	Greenwich mean time of observation ..	5 50 23.9	6 56 49.6	6 5 4.9				
Chronometer 1582.	Local mean time of observation ..	8 28 23.7	9 34 49.7	8 43 8.6				
	Differential longitude East ..	2 37 59.8	2 38 0.1	2 38 3.7	2 37 62.9	39 30 44		
	Chronometer error on Dec. 27, 1867 ..	-2 35 40.	2 35 40.	2 35 40.				
	Increase for interval due to -8.2 s. rate	0 5 36.2	0 5 36.2	0 5 36.2				
	Chronometer error at time of observation	2 41 16.2	2 41 16.2	2 41 32.6				
	Chronometer time of observation ..	3 9 29.6	4 15 55.3	3 24 2.6				
Chronometer 3853.	Greenwich mean time of observation ..	5 50 45.8	6 57 11.5	6 5 35.2				
	Local mean time of observation ..	8 28 23.7	9 34 49.7	8 43 8.6				
	Differential longitude East ..	2 37 37.9	2 37 38.2	2 37 38.4	2 37 36.8	39 24 12	39 27 43.3	

APPENDIX D—continued.

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APPENDIX E.

OBSERVATIONS to Determine Bearings of Base Lines.

Date.	No. of Chronometer.	A. End of Base Line observed from.	Time of Observation.	Bearing of Sun's Centre.	Angle between Sun's centre and opposite end of Base B.	At A, Bearing of Base Line.	Remarks and Compass Variation.
January 24 ..	278 {	North End of the Kuyi Base..	H. M. S. } 11 56 10.6	° ' " } 127 47 43	S. } 14 20 42	142 8 25	Variation, W. 4 55
February 8 ..	3353 {	West End of the Senafé Base..	4 33 21.3	111 45 57	S. } 1 25 57	113 11 54	" " 5 17
March 25. ..	3353 {	West End of the Ashangi Base ..	3 47 45.5	91 26 44	N. } 36 18 41	55 8 3	" " 5 36
May 13 ..	.. {	West End of the Antalo Base ..	Altitude of Sun. } 60° 50' 55"	255 46 52	N. } 37 4 20	292 51 12	

For the Bearing of Base at Magdala, the compass reading was taken, and an allowance made for a variation of 5° W.

APPENDIX F.

OBSERVATIONS for Time.

No. of Deduction.	No. of Chronometer.	Name of Place.	Date.	Barometer.	Thermometer.	Object Observed.	Altitude.	Chronometer Time of Observation.	Approximate Error of Chronometer.	Approximate Longitude.	Approximate Latitude.	Deducted Error of Chronometer.	Remarks.
1	278	Kumayli Base, N. End	1868. Jan. 24	29.5	70.0	Sun's centre	27° 54' 56.9"	h. m. s. 11 19 3	h. m. s. + 2 33 86	39 38 0	15 13 20	h. m. s. + 2 36 39.7	
2	278	"	" 24	29.5	70.0	"	30 55 38.8	11 33 59	+ 2 33 86	39 38 0	15 13 20	+ 2 36 39.4	
3	1582	"	" 24	29.5	70.0	"	27 41 53.8	3 24 16.5	- 5 18 21	39 38 0	15 13 20	- 5 17 3.1	
4	1582	"	" 24	29.5	70.0	"	29 6 28.8	3 31 12.3	- 5 18 21	39 38 0	15 13 20	- 5 17 2.8	
5	3353	Kumayli Camp	" 30	29.0	70.0	α Canis Majoris.	39 3 7.1	4 15 5.3	- 3 16 1	39 32 0	15 12 15	- 3 16 28.8	
6	3353	"	" 30	29.0	70.0	β Ceti	24 48 4.4	4 30 2.3	- 3 16 1	39 32 0	15 12 15	- 3 16 25.1	
7	3353	"	" 30	29.0	70.0	α² Geminorum	51 7 4.1	4 58 28.9	- 3 16 1	39 32 0	15 12 15	- 3 16 28.4	
8	3353	"	" 30	29.0	70.0	α Ceti	43 34 19.3	6 4 29.4	- 3 16 1	39 32 0	15 12 15	- 3 16 30.5	
9	3353	Sanafé Camp	Feb. 6	22.2	55.0	α² Geminorum	58 52 32.5	5 12 2.6	- 3 16 38	39 30 0	14 41 40	- 3 16 21.1	
10	3353	"	" 6	22.2	55.0	α Leonis	37 4 23.8	6 1 57.6	- 3 16 38	39 30 0	14 41 40	- 3 16 22.6	
11	3353	"	" 6	22.2	55.0	α Ceti	33 42 53.6	6 18 28.3	- 3 16 38	39 30 0	14 41 40	- 3 16 21.4	
12	3353	"	" 7	22.2	55.0	α Leonis	33 39 27.0	5 43 47.9	- 3 16 44	39 30 0	14 41 40	- 3 16 27.7	
13	3353	Sanafé Base, W. End.	" 8	22.0	65.0	Sun's centre	31 57 30.7	5 36 39.9	- 3 16 49	39 26 20	14 40 50	- 3 16 16.6	
14	3353	Sanafé Camp	" 8	22.2	55.0	α Leonis	30 23 49.3	5 26 34.6	- 3 16 49	39 30 0	14 41 40	- 3 16 34.0	
15	3353	"	" 8	22.2	55.0	α Ceti	38 34 38.1	5 50 8.1	- 3 16 49	39 30 0	14 41 40	- 3 16 38.2	
16	3353	Sanafé Base, W. End.	" 11	22.0	55.0	α Leonis	37 52 39.5	5 44 51.8	- 3 17 5	39 26 20	14 40 50	- 3 16 37.1	
17	3353	Sanafé Camp	" 12	22.0	55.0	α Leonis	32 42 7.4	5 19 52.0	- 3 17 10	39 30 0	14 41 40	- 3 16 46.0	
18	3353	"	" 12	22.0	55.0	α Ceti	33 34 4.9	5 55 6.0	- 3 17 10	39 30 0	14 41 40	- 3 16 44.5	
19	3353	"	" 13	22.2	55.0	α Leonis	34 57 59.0	5 25 17.1	- 3 17 16	39 30 0	14 41 40	- 3 16 48.3	
20	3353	"	" 14	22.2	55.0	α Leonis	33 37 7.3	5 15 39.1	- 3 17 21	39 30 0	14 41 40	- 3 16 55.3	
21	3353	"	" 14	22.2	55.0	α Ceti	22 3 12.3	6 34 38.3	- 3 17 21	39 30 0	14 41 40	- 3 16 59.2	
22	Watch	Halay	March 1	...	...	α Ceti	35 15 7.5	7 58 27.0	...	39 21 0	14 59 20	+ 0 4 1.4	
23	Watch	"	" 1	...	...	α Leonis	41 29 21.3	8 16 11.8	...	39 21 0	14 59 20	+ 0 4 30.0	
24	Watch	Adigrat	" 12	22.5	60.0	α Leonis	36 21 27.5	6 59 37.0	...	39 31 30	14 16 30	+ 0 1 41.9	
25	Watch	"	" 12	22.5	60.0	α Ceti	36 34 9.5	7 7 17.5	...	39 31 30	14 16 30	+ 0 1 32.3	
26	3353	Antalo Camp	" 18	23.5	75.0	α Leonis	63 21 37.5	5 7 0.9	- 3 20 16	39 31 0	13 19 0	- 3 18 43.6	
27	3353	"	" 18	23.5	75.0	α Tauri	32 46 17.0	5 20 23.1	- 3 20 16	39 31 0	13 19 0	- 3 18 55.1	
28	3353	"	" 25	23.5	75.0	Sun's centre	21 24 23.8	4 12 57.3	- 3 20 53	39 37 30	12 32 0	- 3 18 56.4	
29	3353	Ashangi Base, W. End	" 25	22.5	75.0	"	22 58 11.3	4 19 32.5	- 3 20 53	39 37 30	12 32 0	- 3 18 46.6	
30	3353	Talanta Plateau	April 19	21.2	75.0	"	32 50 10.3	4 47 4.3	- 3 23 5	39 7 30	11 32 0	- 3 20 31.7	
31	3353	"	" 19	21.2	75.0	"	35 5 56.9	4 56 17.6	- 3 23 5	39 7 30	11 32 0	- 3 20 29.1	

Observations for time.

APPENDIX G.

POSITIONS fixed by Traverse.

Positions
fixed by
traverse.

Names.	Latitude, N.	Longitude, S.	Heights.	Remarks.
Initial Point of traverse at Annesley Bay	*15° 15' 46"	39° 44' 10"	..	
N. end Kumayli Base..	15 13 28	39 35 44	100	
Kumayli Camp ..	15 11 55	39 33 42	1,060	Mouth of Kumayli Ravine.
Lower Sürü ..	15 5 35	39 31 44	1,440	
Upper Sürü ..	15 3 59	39 30 54	2,600	
Maiän, or Undel Wells ..	14 55 40	39 31 46	3,950	
Rahagedi Camp ..	14 45 29	39 29 33	6,370	
Senafé Ghat (foot of) ..	14 44 10	39 26 59	..	
Senafé Ghat (top of) ..	14 43 31	39 26 56	..	
Senafé Camp ..	14 41 47	39 25 41	7,690	
W. end Senafé Base ..	14 41 2	39 25 7	7,580	
Gūna Gūna ..	14 32 32	39 25 0	6,860	Camp.
Focada ..	14 24 20	39 23 40	7,890	Ditto } By Plane-table
Adi-grat ..	14 16 53	39 29 23	7,740	Ditto } fixing.
Mai-Wahèz ..	14 8 13	39 35 29	7,940	Ditto.
Lanchanet Village ..	14 0 37	39 35 36	..	
Adabāga ..	13 56 18	39 37 58	7,750	Camp.
Dongolo ..	13 48 40	39 39 7	..	Ditto.
Agūla ..	13 41 24	39 38 25	6,360	Ditto.
Mai Makdem ..	13 34 38	39 38 28	..	Ditto.
Dolo ..	13 29 30	39 37 58	6,830	Ditto.
Ei Kullet ..	13 21 48	39 37 4	..	Ditto.
Būyah Camp ..	13 14 9	39 34 44	6,500	Nr. Antalo.
E. end Antālo Base ..	13 15 19	39 35 48	..	
Mai-Masgah ..	13 8 2	39 35 46	6,610	Camp.
Mashik ..	13 1 43	39 37 28	7,620	Ditto.
Alāji Pass ..	12 58 49	39 38 53	9,880	
Atsala ..	12 55 52	39 39 4	7,980	Camp.
Aiba Pass ..	12 54 54	39 38 33	..	
Débarh Pass ..	12 52 33	39 38 41	10,520	
Būlāgo ..	12 50 10	39 38 53	9,160	Camp.
Makan ..	12 45 14	39 39 47	7,800	Ditto.
W. end Ashangi Base ..	12 37 6	39 39 3	..	
Ashangi Lake ..	12 33 49	39 39 0	7,900	Southernmost point.
Mussagita ..	12 32 34	39 38 54	..	Camp.
Adi Woka Vill ..	12 31 7	39 38 33	..	
Womberat Ghat ..	12 30 1	39 37 50	..	Top of.
Lāt ..	12 28 7	39 35 18	..	Camp.
Duffat Pass ..	12 26 8	39 33 7	..	
Murāwah ..	12 21 57	39 32 14	..	Camp.
Dildi ..	12 11 51	39 29 47	..	Ditto.
Wundatch Pass ..	12 6 39	39 29 10	10,910	Ditto.
Mūja ..	12 3 19	39 27 41	9,470	Ditto.
Takazzé River ..	11 57 43	39 27 44	..	Ditto.
N. end of Wadela Plateau ..	11 56 24	39 28 34	..	
Santāra Camp ..	11 55 12	39 28 15	10,500	
Gahso Camp ..	11 50 19	39 21 42	10,200	
Sindi Camp ..	11 38 12	39 12 58	..	
Béthor Camp ..	11 33 56	39 10 19	..	
S. end of Wadela Plateau ..	11 32 36	39 10 31	..	
Jedda River ..	11 32 24	39 13 19	5,960	
Talanta Plateau ..	11 29 31	39 13 37	9,030	Top of Ghat. [plateau.
Talanta Camp ..	11 28 15	39 17 18	..	Southernmost ridge of
Bashilo River ..	11 26 27	39 19 26	5,370	Camp.
Magdāla ..	11 22 26	39 25 47	9,190	

* By Astronomical Observations.

APPENDIX H.

BOILING-POINT Observations and Resulting Heights.

Names of Places.	Boiling Thermometer.	Thermometer in Air.	Corresponding Heights above Sea.	Boiling point obser- vations and resultant heights.
Maiän, or Undel Wells	206·20	72·0	3,947	
Rahaguddy	201·85	50·0	6,374	
Senafé Camp	199·50	52·0	7,726	
W. end Senafé Base	199·75	48·5	7,579	
E. end Senafé Base	199·50	66·0	7,796	
Marāra H.S.	198·57	79·0	8,210	
Shimazana H.S.	198·00	61·0	8,630	
Akub-Terika H.S.	197·50	79·5	9,047	
Mashal H.S.	198·67	76·5	8,340	
Mount Seora	196·83	69·0	9,369	
Guna-Guna	200·93	40·5	6,860	Camp.
Into-Koko	198·80	59·5	8,170	Plateau.
Mount Hazawut	198·60	76·0	8,380	
Source of Hadās	200·38	55·0	7,240	
Sa-asa Heights	198·00	73·0	8,712	
Halai Village	198·40	61·5	8,412	
Dara-ā Village	198·05	74·5	8,680	
Focada Camp	199·17	46·0	7,890	
Adi-grat Camp	199·60	51·0	7,740	
Mai-Wahez Camp	199·03	40·0	7,940	
Ada-baga Camp	199·55	63·5	7,753	
Agula Camp	202·00	69·5	6,355	
Dola Camp	201·17	68·0	6,832	
Buyah Camp	201·63	50·0	6,497	Nr. Antalo.
Mai-Masgah	201·67	87·0	6,610	
Maschik Camp	199·77	63·0	7,624	
Atsala Camp	199·22	70·5	7,982	
Aiba Pass	196·95	49·5	9,183	
Alāji Pass	195·93	62·5	9,875	
Aiba Valley	198·05	54·0	8,580	
Débarh Pass	194·80	60·0	10,524	
Bulāgo Camp	197·13	62·0	9,161	
Makan Camp	199·50	67·0	7,800	
Pass above Makan	198·75	70·0	8,254	
Pass above Ashangi	197·27	70·0	9,125	
Ashangi Heights	197·92	69·0	8,737	
Lake Ashangi	199·40	74·0	7,892	
Wundatch Pass	194·07	54·0	10,912	
Mūja Camp	196·57	59·0	9,472	
Jedda River	202·73	77·0	5,956	
Talanta Plateau	197·33	60·0	9,032	
Bashilo River	203·83	91·5	5,371	
Islamgi Plateau	198·1	72·0	8,647	
Selassie (highest point)	197·23	69·0	9,161	
Fālah	197·88	81·0	8,823	
Gombāgé Spur	200·40	94·0	7,392	(End of.)

NOTE.—The mean of three (3) boiling thermometers is used. These heights are all referred to Alumta H.S., where the thermometer read 208·2 (boiling point)—thermometer in air being 73°. The height of Alumta, determined by triangulation, is 2,802·5 feet—mean of two independent observations giving 2,797 and 2,808 feet respectively. Alumta is connected with north end of Kumayli Base, the height of which point is taken to be 100 feet above the sea-level, from levelling operations for the railway.

CHAPTER XXXVII.

ARMY WORKS CORPS AND BENGAL COOLY CORPS.

Proposal by
Capt. Walsh
regarding
an Army
Works
corps.

WHEN the expedition to Abyssinia was determined upon, Sir Robert Napier desired to have an Army Works corps and a Cooly corps placed at his disposal. Captain T. Prendergast B. Walsh, of the Bombay Staff Corps, submitted an excellent proposal for the organization of an Army Works Corps, which was approved of by Sir R. Napier, submitted to the Bombay Government, and acted upon with some slight modifications. The Cooly corps was organized at Allahabad.

ARMY WORKS CORPS.

Captain Walsh's proposal for an Army Works Corps was based upon the fact, that in Abyssinia the military service of every fighting man would probably be, constantly required in his own branch, so that it would be impossible always to give fatigue and working parties, when required, without lessening the effective strength, or wearing out our soldiers; that while large armies can easily spare a portion of their combatant force for sapping and mining purposes, the construction of siege works, making roads and bridges, digging trenches, pitching tents, cutting wood, drawing water, loading and unloading stores, and carrying the sick or wounded, &c., &c., for which the labour of able-bodied men is required in the field, a small force cannot spare working parties in the same numbers; it takes as many working men to clear a road for a few guns and waggons for a small force, as it does for a large one, which is more largely supplied with wheeled carriage; and looking at large and small armies together, there is a disproportion between the number of men required for Military Civil duties, and those wanted for actual combatant operations where the divisions are small. "The ability to advance is an essential condition of offensive combinations," and Captain Walsh represented that the formation of a corps such as he proposed, would enable the General Commanding to overcome those natural impediments which the force might expect to meet with on the rugged heights, or in the deep ravines of Abyssinia, and which might otherwise for a time retard the onward progress of the columns.

The following is Captain Walsh's report on the subject, on submitting his proposal for consideration:—

"Tumultuous crowds of Dooly-wallahs and Coolies will be sure to cause much inconvenience. Alexander's conquests were mainly attributed to the precision with which his transport service was worked, and he always endeavoured to enforce a certain degree of

“ order and discipline amongst those who had to assist in the carriage of his stores, and
 “ whose special duty it was to clear the road of all obstacles. I am of opinion that if a
 “ certain kind of military discipline is maintained amongst the class of men who must be
 “ employed to enable the force to rapidly, and with facility, traverse the country, the best
 “ results must follow.

“ If my plan of massing Dooly-wallahs and Coolies in battalion, and marching them
 “ in military order is approved of, the country people will be protected from pillage, and
 “ ready and effective aid will always be at hand when a road becomes impracticable for wheels
 “ or mules. I might point to the great assistance which the Generals in the Crimea
 “ received from the workmen and labourers sent to assist in making roads, who, although
 “ under the control of Messrs. Peto and Co., the well-known contractors, were not allowed
 “ to wander about at their own pleasure, but subjected to a judicious amount of control.

“ I propose enlistment in order to prevent complications arising hereafter, which will
 “ be possible if men are drafted off to a foreign country on a mere contract. Martial law
 “ no doubt would give a General great powers over camp followers, but at the present day
 “ it is not advisable to have recourse to its provisions in the case of civilians. A well-
 “ known writer has put it that the Act of Enlistment begets a ‘military enthusiasm in the
 “ individual’ enlisted, while others view it as most important, because it secures for a
 “ General the entire services of the men who accompany his force.

“ The scheme which I have drawn out may in many minor points be altered; for
 “ instance, it might be considered well to supply a certain portion of the men composing
 “ the force with muskets. However, I propose swords and pistols as the best weapons. In
 “ the Sardinian Army, in some companies, the men, say 20, are provided with one kind of
 “ weapon, and the rest with another. This plan, if considered expedient, might be
 “ adopted, but of course, as the corps is intended for manual labour, and not for com-
 “ batant purposes, the question of arming it like a regiment of the Line does not arise,
 “ while, nevertheless, the men must have arms to protect them from a surprise. When
 “ employed upon dangerous duty, a guard of Infantry could be supplied to protect them
 “ while at work.

“ The Austrian Engineer soldier carries his tools strapped to his knapsack at the side;
 “ this prevents the handle of the spade or pickaxe from getting between his legs. These
 “ men carry a weight of 45 lbs., including their kit. Small tools and nails are divided
 “ amongst the men, so that there is always at hand some appliance of a useful kind. When
 “ troops proceed on any sudden march where carriage cannot be obtained, this Corps would
 “ be most useful in carrying small shelter tents, which it will be recollected proved so
 “ valuable to the French Army in the Crimea. The same description of temporary tents
 “ are occasionally used at the camps of Aldershot and the Curragh, and are known as the
 “ ‘Tente d’Abri.’ The French tent is described as composed of pieces of linen, 5 feet
 “ square, with button-holes along the edges. It has two sticks, which are some four feet
 “ long, and are stuck into the ground at the distance of 5 feet apart, a cord at the top
 “ unites both. Two pieces of cloth are laced together, and are then thrown over the cross
 “ rope: the cloth is then strained out into the form of a rowti, and the bottom edges
 “ pegged to the ground. Two ropes attached to each pole, and pulling in reverse direction
 “ supports the tent, and prevents the wind from injuring it. Each French Cavalry soldier
 “ is provided with a piece of cloth, and when three men unite a capital tent is extempo-
 “ rized. If more join, the tent can be made of any size. A few Dooly-wallahs would carry
 “ a sufficient number of such tents, so as to encamp hundreds of men. As the cloth would
 “ have to be double or treble for a tropical climate, it would of course be of greater weight
 “ than the French shelter-tent, which the troops carry themselves; and this being so,

“Coolies must be employed to carry these tents, if adopted. When the outside of the bottom edges of these tents are banked up with earth, and the inside hollowed out, they resist weather beautifully. All this comfort for the troops can be secured by attaching portions of the proposed Army Works Corps to each regiment proceeding upon any special mission.

“Again, the services of this proposed Corps would be most valuable for conveying the camp kettles, as well as light camp equipage, where carriage cannot be spared.

“Hurdles and small rafters can be carried by men, and, with the addition of mud, straw or grass, huts can be made in a very short space of time. It is impossible, in a confined space, to show the great value of a corps of this description, and which for convoy duty would be also invaluable. Their use, too, in foraging and conveying supplies, I feel sure, would be duly appreciated. Placing them under military discipline would, as I said before, prevent disorder and plunder. When troops have to perform these duties, it wearies them for the duties of the following day, and when ‘forced foraging’ has to be done, it is even more distressing upon men and horses. Much depends on the rapidity of these expeditions, and were a special service organized for packing and carrying the supplies seized, the troopers and Infantry sent as a guard would be more free to act than if hampered with the transport of the hay and grain secured. Again, this corps would be of great value in embarking and disembarking stores. The lifting of heavy weights by men not used to such labour is most injurious. The Dooly-wallahs whom I propose to enlist are inured to labour, and accustomed to bear great weights. I regard this as a most important feature.

“I have not proposed any particular age or standard being laid down prior to enlistment. I think that the opinion of a committee of two combatants and one Medical Officer will be sufficient to justify enrolment. The term of service is short, and if the applicant for enlistment is strong and in robust health, it would be well to dispense with the severe test as applied to recruits.

“I fear that I have been almost prolix, and apparently lengthy in these remarks, but I have been run as to time in preparing this paper, and consequently have not been able to properly correct or prune it. It was committed to the printer’s hands 12 hours after the idea had first suggested itself to my mind. I believe that the proposal is a practical one, and as I have only the good of the service in view, I have ventured to put my ideas on paper. There is no time for correction. The 1st Brigade has sailed for Abyssinia, and other troops are rapidly following.

“Pontoons, so useful for forming temporary bridges, are usually conveyed upon carriages, but can be also carried on camels. Those invented by Colonel Blanchard only weigh 150 lbs each, and are 12 feet long; they could, therefore, be easily carried by four men with poles.

“Mules, no doubt, would be employed to carry the necessary planks, pontoon saddles, baulks, chasses, &c., where pontoon carriages could not be procured or used; but in cases of emergency, where neither are procurable, the employment of the men of the Brigade, which I have proposed, would prevent the movements of the column being retarded, and pontoon stores might thus be carried many miles. The ropes, bends, and knots used in pontooning are not massive cables, and could therefore be easily carried by men on emergent occasions. They would also prove of service, as drags, ropes, &c. In this campaign, on account of the nature of the country, ingenuity, ready contrivance, and rudely-made military stores must take the place of the more scientific and regularly constructed war gear and material, which would be easily procurable in Europe. I do not for a moment pit man labour against that of horse, camel, or mule; yet I would urge the necessity of using trained and disciplined human labour in preference to that of numerous

“and uncontrolled hosts of coolies, who must be employed to supplement the Transport Service. A most important ingredient in our anticipation for success is that there should be an organized system for the management and direction of the coolies and labourers which we shall have to employ. They may be attached to corps and departments, and subject to the rules and regulations of such; but I feel convinced that if they have a composition of their own, and be made into a separate service, greater efficiency will be secured, more work will be got through, and a larger amount of harmony and discipline will be gained, than if they are worked in gangs, upon the plan of a railway contractor.

“By the mail which arrived on the 10th instant, we are informed that the Topographical Department reports, which the War Office has recently produced, all establish the fact, that, in reaching the highlands of Abyssinia, animal carriage will be retarded, on account of the inaccessibility of the country. Indeed, from what I have heard, I believe that the Home Government have already been informed that the transport of stores in certain places must be carried out by coolies. I do not wish to quote M. du Bisson as an authority, but still he asserts, and it may be with truth, that there are provinces in Abyssinia where often man alone serves as a beast of burden, helping himself with his feet and hands. It has been also stated in the columns of the English ‘Times’ newspaper, that the difficulty of transit cannot be imagined, and this is founded upon the reports of Abyssinian travellers. I think that the reports which are current at home may be taken as an excuse, for, and as a justification of the small expense which I propose to incur in organizing this corps, which I believe would assist in overcoming these difficulties if they prove real. Mr. H. Dufton, who travelled in Abyssinia in 1863, pointed out that the ruggedness of the route in some places is so great, that camels cannot be used, and that only a single file can advance at a time. I am not endeavouring to endorse these discouraging accounts; indeed, I am inclined to believe that a tide of exaggeration in England has set in, and that no such gigantic difficulties will be met with. But the existence of uncertainty on the point justifies, I would respectfully urge, any expenditure incurred to meet the worst anticipations, even if such have been formed on only a prudential line of precautionary policy. By the same mail, a Mr. Perceval, a merchant, who was in Abyssinia in so lately as 1860, has suggested what “a hundred wood cutters with a box of matches, or a few practical quarrymen,” might do against the Army when in the woods through which our soldiers must pass, if they adopt any one of the three routes to Abyssinia which the force must traverse in order to rescue the prisoners. But might not the same kind of agency circumvent the construction of the cul de sac, to which he refers? I have named Dooly-wallahs as the class of men whom I propose to enlist, simply on account of their endurance under weight; but I am also inclined to think, that if one corps were formed from the wood-cutters of our forests, the men would prove invaluable. The Dang Jungles, between Goozerat and Khandeish alone would supply many wood-cutters, others might be procured through the exertions of conservators of the various forest establishments in this Presidency. The rate of pay usually earned by the woodmen is so small, that the sum I have fixed would attract many to the standard of the proposed brigade.”

Major-General Tremenheere, C.B., Commanding Engineer at Bombay, raised the Army Works Corps.* Its organization and working in Abyssinia will be understood from the subjoined report, framed at the conclusion of operations by Lieutenant R. H. F. Renick, R.A., Officiating Commandant of the Corps:—

* Under the authority of Bombay Government Resolution, Military Department, No. 4,738, dated 30th Nov., 1867.

Report on
the Army
Works
Corps.

" If the numerous services the Army Works Corps rendered, not only in connection with the Railway Department, the line of whose action was limited, not extending beyond Kumayli Plain, but with the movements of the Army at large, be taken into account, it will be seen how far the corps has been successful, and to what extent it has answered the expectations entertained of its utility and efficiency.

" This body of men, who were in November 1867 recruited on the spur of the moment and shipped to the scene of active operations, at first without any recognized commander, began its landing in December 1867, and accomplished it by the 11th February, when the full complement of men, 1,072 in number, with their late Commandant (subsequently appointed) and staff, were all landed ready for work.

How
employed.

" The call for these men was great; they were immediately on landing placed at the disposal of the various Engineer Officers who required them. They were all at first employed on the landing of the stores, the railway engines, plant, &c.; subsequently on clearing the surveyed line of railway to Kumayli, and on making the railway. Fifty of the Chinamen of the Corps, under Lieutenant Phillpott, R.N., were the only men retained to keep the railway supplied with plant for the transports up to the completion of the line, or rather to the close of the campaign. They worked very well, and they were the admiration of every one for the great physical force and endurance they displayed on the hard work they were employed upon under a trying sun, to which they were unaccustomed.

" In the latter days of January the men (the above Chinamen excepted) were, in compliance with directions, more distinctly detached under Engineer Officers in various gangs, and worked as follows:—At Zula, under Captain Wood, R.E., and afterwards under Lieutenant Lee, R.E., along with the Sappers and Miners, in completing the piers and maintaining them in repairs, and in erecting the various sheds, buildings, &c. In this latter duty the carpenters only assisted.

" At the Pioneer Wells, the men worked under Lieutenant Graham, A.F.E., and Lieutenant Baird, R.E., on the maintenance of the line either way when the railway got beyond that station, and in making the various sidings and loop lines for the working of the trains. They also assisted in putting up the various sheds and contrivances for the workshops, and they had besides to keep up the supply of water to the engines, which was an arduous and trying duty, by regular reliefs, and they did so remarkably well under the untiring superintendence of Inspector Davenport, who was always present when required. There is not one instance on record as to the supply having failed. I beg to bring Inspector Davenport's services to favourable notice. This work told severely on the men, and many have been unfitted from the Pioneer Wells, who have never received any compensation for the extra time they had worked.

" At the railway camp, which always changed as the line advanced, the men worked under Captain Darrah, R.E., and the officers under his directions, in clearing the line, making cuttings, throwing up embankments, laying the rail, building bridges, and viaducts, clearing the wells, and keeping up the supply of water to the camp, &c. The 'Huddas Bridge,' which was constructed by Lieutenant Williams, R.E., and the numerous other viaducts and small bridges between Zula and Kumayli, were entirely undertaken and completed by the men of the Army Works Corps under the direction of that officer, and, when he left for the front, under the superintendence of a Mr. McGregor, of the Railway Department, and that of a few European carpenters belonging to some of the regiments of the line.

" The important duty of keeping up the supply of water at the railway camp devolved on a native muccadam of the name of Golab Khan, a discharged havildar of the

“Bombay Sappers and Miners. This man, whose conduct also I beg to bring to notice, has, by his continued exertions and careful supervision, never allowed the water supply to fail. At one time, when detachments of the 2nd Grenadiers, 18th Regiment, Bombay Native Infantry, 45th Regiment, of Sappers and Miners, of the men of the Army Works Corps, and Shoho labourers, were all encamped together, the well, which hardly yielded the required number of gallons, which was 3,500 a day, was worked until the wants of the camp were satisfied.

“At Kumayli, a gang of men worked under Lieutenant Merewether, R.E., in looking after the pumps, sinking wells, &c., and was sent back to the railway camp under Captain Darrah, R.E., in April last, when the earthworks for the railway from Kumayli and Zula met. These men worked under Captain Hill, R.E., and Lieutenant Smith, R.E., before they were made over to Lieutenant Merewether.

“Beyond Kumayli, there were originally 200 men detached under Lieutenant Rule, R.M., doing duty with the Army Works Corps, for work on the ghats. Most of these men were bildars or miners. They did excellent service in blasting all along the road, in sinking wells, and keeping the road clear, and in repairing all damage from time to time done by the giving way of the embankments, and by the rough handling of the carts, &c., and in the latter days by the floods. These men were distributed as follows, on the road being opened to Senafè:—

“Seventy-five at Suru, to keep the pass clear, and look after the telegraph.

“Twenty-five at Undul Wells, to look after the pumps, road, and telegraph. Both the men at Suru and Undul Wells worked under Lieutenant Mainwaring, A.F.E., in sinking extra wells and making clearances for tents and Commissariat sheds, &c., in order to attend to the wants of the returning force.

“Twenty at Rahagedi; and

“Thirty at the Zigzag, for the same purpose as above.

“The men at the latter place were always at work, for the road not only required to be mended on account of the damage done by carts and stray animals, but also to be cleared of animals, who used to break down and die throughout this steep ascent of the ghat.

“I have the pleasure to mention here the name of Gopal Sing Maistry, who performed this duty satisfactorily, and kept the road in admirable order.

“Forty of the men worked between Senafè and Adigrat with Lieutenant Clarke, R.E., who had the pumps and water arrangements entirely under his charge after the departure of Lieutenant Lemessurier, R.E., on other duty. Some of these men went with him as far as Antalo.

“The remainder of the men along with those enlisted at Senafè, and the carpenters sent up from Zula in April last, were employed on all the works that were being carried on by Captain Hills, R.E.; in the latter days particularly, on the hutting works at Senafè. They were often sent out to Focada, Gana Guna, Adigrat, &c., to do some blasting and mend the road.

“Besides these men, there were 35 others employed under Lieutenants St. John, Haywood, &c., on the construction of the telegraph.

“In the latter days of their stay at Zula, the men of the corps made themselves very useful in re-shipping the railway engines and plant, the various stores and treasure, and in working on the cemetery. The masons and carpenters of the corps, along with those of the Field Park, largely contributed by their labours in erecting the various tombs over the dead of the Abyssinian Force.

“Thus, in reviewing the foregoing facts, it will be seen that the line of action

“ of the Army Works Corps extended from Zula to Adigrat, over a distance of 110
 “ miles, and that the men had a hand in carrying out all the various works of general
 “ utility.

“ They may be summed up as follows :—

- “ I. Assisting in landing and shipping of stores of all kinds.
- “ II. In the construction, working, and maintenance of the piers, of the various
 “ sheds, &c., and of the railway from Zula to Kumayli.
- “ III. In keeping open the road through the Senafè Pass, more particularly at the
 “ last, when it was damaged by floods.
- “ IV. Assisting in laying the telegraph, and furnishing labour for water supply
 “ arrangements.

“ I hardly feel that I am called upon to record an opinion as to the merits of the
 “ men in the various capacities they were employed in, and as to how they acquitted them-
 “ selves in the above works. I presume this has been done by officers under whom they
 “ were more immediately employed.

“ I have ventured in the above paragraphs merely to mention the various works
 “ that the men of the corps either undertook and completed, or had a share in the execu-
 “ tion of, also under whom they worked: but I hope that his lordship from his own
 “ personal observations will be enabled to do justice to the merits of the men of the corps
 “ by recording such an opinion of them that their unremitting labour, the works they have
 “ done, and their implicit submission to orders to command. It is due to the men irre-
 “ spective of anything the officers under whom they immediately served may have said in
 “ their behalf, that such a record should be made, were it even for the mere sake of
 “ form.

Conduct of
 men.

“ As far as my own experience and connection with the corps go, I can with
 “ confidence assert that the men were the most sober, willing, and obedient lot I have ever
 “ had anything to say to. The intelligence and the conduct of the Chinese from the very
 “ beginning, and all throughout the campaign, call for the greatest praise. The men
 “ grumbled very little, and they did so only under the most trying circumstances. They
 “ were always willing and ready to turn out, except on one or two occasions, when they
 “ showed a slight reluctance when disturbed in the midst of their cooking, and at midday
 “ after a morning's hard work. This irregularity was put to rights after due representation
 “ of the matter. There is no record of rows or riots having taken place, except once, when
 “ the Chinese struck work on the Sunday; but the case was peremptorily dealt with, and
 “ the cause of the evil removed. On the whole, the behaviour of the men, taking into
 “ account the strange and antipathetical classes that were huddled together, and the short
 “ training to discipline they had, and the almost entire absence of drunkenness, is to be
 “ considered highly satisfactory and commendable.

“ It will be almost impossible to arrive at an average of what number of men
 “ were employed on a certain work during a certain time, considering the changeable
 “ nature of the requirements and the great fluctuations of the numbers of sick; but it is
 “ a matter of comparative ease to calculate the daily average of men employed at each
 “ station on the various works that were being carried on. Of course at times the men
 “ employed were considerably in excess of the average numbers stated below; but those
 “ given may be considered as nearly representing the average from the beginning of the
 “ campaign to the end, a period extending over six and a half months. Thus, all through
 “ that period it may be said that at—

" Zula daily worked a body of	320 men.
Pioneer Wells, ditto	75 "
At Railway Camp, ditto	310 "
Above Kumayli, ditto	170 "
And on the Telegraph, ditto	35 "

" There were altogether three officers, five inspectors, and 1,224 men sent from Bombay, from the first formation of the Corps up to the 31st May, 149 of whom were sent after February, to replace men returned as unfit. The men unfitted for further service in Abyssinia were as follows :—

" In January	15
" February	100
" March	52
" April	73
" May	94
" June	6
	—
	340
	—

Total strength.

Number invalided.

" or more than one-fourth of the total numbers sent out.

" There was one serjeant supervisor invalided in April, and two officers and one inspector in June.

" The two writers of the Corps were unfitted in the early part of January.

Deaths.

" There were 10 deaths recorded, two of which were on the way out, seven in Abyssinia, and one on the way back; but of the seven in Abyssinia, two men were drowned in the flood of Suru, and one man supposed to have been killed on the hurried march back.

" There are 32 men put down as missing, of whom no trace could be obtained, although repeated enquiries were made, and a careful search in the hospital records, to ascertain what had become of them.

" If one is to judge of the climate of Abyssinia and the effect it had on the men by the number of them returned to India as unfits, and by those always in hospital, the conclusion to be arrived at of its salubrity is anything but satisfactory. The climate told severely on the men of the Corps. It could not be expected to be otherwise, the men were employed on very hard work, and the food they lived upon anything but of a sustaining nature. There are instances where men, after having worked over their twelve hours a day, had to go without any food almost, for they could not satisfactorily boil the dhol and rice they received, owing to the hardness of the waters used. Flour was not served out for many days, as there was a great call for it from the front. The Chinese, who received European rations, stood the country much better than the natives of India. The Mahrattas and the Gentoos were the second best; then came Mussulmans, and after them the other castes.

Effects of the climate on the men.

" Those the climate most disagreed with were the Purdasee Brahmins, the Parsees, and Portuguese. If ever there be a call for men on a similar expedition, these castes ought never to be entertained; not only are they physically unsuited for hard work, but they are most indolent, unwilling, and scheming. Nearly every Parsee or Portuguese of the Corps deserted, if he could not get a staff appointment, either as a cook, or servant to some European.

Medical
arrange-
ments.

"The medical arrangements were the best that could be made, although they left a good margin for improvement. At Zula, they were treated at the General Hospital. The men at the Pioneer Wells were sent to Zula for treatment. The men at the Railway Camp were treated by Dresser 'Gungajee Rowjee,' who was most zealous and attentive to his duties. He was most valuable in one way, that he never showed any partiality, nor gave the least encouragement towards scheming or malingering. The men along the passes had to come in to Zula. The men at Senafè and to the southward of Senafè were treated at the Native Hospital at Senafè. The admissions into hospital at Zula and the Railway Camp were numerous. In March there were over 60 men, and in April and May over 80 daily attended to. Striking the average for the men from Zula to Kumayli, the admissions were as many as 10 per cent., and sometimes the percentage was greater. The hospital at the Railway Camp was visited by Dr. Nolan, of the 2nd Grenadiers, during the time that regiment was in camp, but it was only in May an Assistant-Surgeon was sent to look after the Railway Camp.

Rations.

"The men of the Corps were rationed on two different scales; the Chinese received European rations, and the Natives were rationed on the scale for camp followers, a difference which they felt all through the campaign, and which told on them severely in the long run.

"At the close of the campaign, the men were given two ounces of meat, some pickles, and lime juice, but the meat being invariably beef, they preferred, most of them being Hindoos, to do without it. Doctors Nicolson and Nolan, who had the advantage of being some time with the men, were both of opinion that the large numbers unfitted and the heavy sick lists were entirely owing to the want of proper food. Most of the complaints the men suffered from were traced to this source. They were further of opinion that, if the campaign had lasted a few months longer many men who were suffering from dysentery, cutaneous diseases, and from little scratches that had developed themselves into suppurating ulcers, would have had to be sent back to India.

Health of
the men.

"One would have supposed that the natives of India, coming from a country comparatively speaking, hotter than that of the Chinese, who are from a more northern and congenial climate, were more likely to stand the campaign and keep their health in the hot plains of Zula. However, the reverse seems to have been the case. The native in Zula was out of his element; he had not the water that is essential to his very existence, while the Chinaman was well taken care of, he had his rations of fresh meat and vegetable and his tea. If the Chinese kept their health better, it is to be ascribed entirely to the better food they got, as I do not see any other cause to trace this superiority to. I am convinced if the men had received fighting men's rations and spirits they would have done equally as well as the Chinese, and not one-third of the number would have been unfitted. The grant of better rations would have fully repaid Government for the beneficial results it would have produced. While Government has actually been put to very great expense by not putting the men on a better scale of rations, it would have been put to still greater expense had the war lasted and the natives been maintained on the same scale. Out of 176 Chinamen, 13 were unfitted, or .073 of the number sent out. Out of 1,048 Natives, 327 were unfitted, or .312 of the whole. There were never more than 10 Chinese in hospital, while in May there were over 80 Natives sick; thus, for every Chinaman there were five Natives sent back.

"The organization of the Corps, as sent out to Abyssinia, with the pay, was constituted as follows:—

	Rs. per mensem.	Organiza- tion of the corps.
" 1 Commandant, with a Staff salary of	500	
2 Subaltern Officers, each ditto	300	
1 Serjeant Supervisor, with a salary of	200	
1 English Writer on	80	
1 Mahratta Writer on	60	
1 Store Carcoon	30	
4 European Inspectors on	120	

" And of eight gangs of useful workmen, consisting of,—

" 1 Maistry on	50
1 Carcoon on	30
1 Muccadum of Beldars (if a Native) on	18
Ditto (if a Chinaman) on	35
25 Beldars (if Natives) on	15
Ditto (if Chinamen) on	25
1 Muccadum of Miners (if Native) on	18
Ditto (if a Chinaman) on	35
25 Miners (if Natives) on	15
Ditto (if Chinamen) on	25
3 Muccadums of Coolies on	12
75 Coolies on	10
1 Blacksmith on	40
1 Bellows boy on	10

" The men of the Corps consisted chiefly of Chinese, Mussulmans, Mahrattas recruited from the Poonah, Darwar, and Sattara, Collectorates, Gentoos from Sholapore, Parsees and Portuguese of Bombay. The latter were very few. A mixture of certain castes of Brahmins of Hindoostan were also enlisted. Many men came from Nagpore, Kundwah, and from the Hyderabad districts.

" Each man obtained from Government the following free clothing :—

One cloth great coat;
One cloth short coat;
One pair of cloth trousers;
Two loose banians;
Two pairs of woollen socks;
Two pairs of boots; and
One kumlee, or country blanket.

Clothing.

" Each gang was intended to work separately, but the requirements were of such a variable nature that not once the men of a single gang were employed on a single work. I cannot help recording, as far as my experience goes, that the system of gangs did not answer at all. It was the cause of the greatest confusion in the accounts, and consequently it necessitated an amount of work, which could have been easily avoided had the men never been classed in gangs at all. Neither were the men of any one gang employed on a single work. There was a mixture of all gangs wherever a party was required to work, and at first always a difficulty to get the maistries and muccadums to exercise proper supervision over men who did not belong to their gangs, and not to show partiality to their own lot. Also I am inclined to think, that if the Army Works Corps had been directly under the orders of the Commanding Engineer, instead of under those

“ of a distinct Commandant, ‘things’ would have gone on more smoothly, greater interest
 “ would have been taken in the men, for every Engineer Officer would have been made
 “ responsible for those under him, proper reports and returns would have been sent in, and,
 “ above all, the men would not have been overworked, as they often were. As it was, the
 “ men were scattered over too great a distance to enable the limited number of officers
 “ with the Corps to look thoroughly after them. By these remarks, I must not be under-
 “ stood to say that the men were the less efficient, on the contrary, they were made
 “ almost too efficient, and were worked in many instances more than was conducive to
 “ their well being.

“ The Civil Inspectors, who had been the subject of correspondence in Bombay,
 “ performed their duties satisfactorily. Serjeant Supervisor Vanovy, of the Department
 “ of Public Works, was totally unfit for service in Abyssinia. He did little duty, being
 “ most of the time on the sick list, until he was invalided. He died on his way back to
 “ Bombay. He was suffering from a very acute attack of liver in India previous to em-
 “ barking, and it would have been better had he not been sent out. Mr. Jephson, who
 “ was promoted in his place, has been of great service both to Captain Blakeney and
 “ myself, he has, at all times, shown himself steady, zealous, and untiring to the calls of
 “ duty. Captain Christie mentioned him in his report on the Sooroo defile, and recom-
 “ mended those employed for pecuniary reward.

Tools.

“ The tools, &c., supplied to the Corps were by far too numerous. There were
 “ enough in charge of the Corps to supply a small army almost. They were the cause of
 “ some annoyance and trouble. The Engineers’ park was near at hand to supply all wants.
 “ They cost 12,933 rupees, and not one-eighth of those sent out have been used. They
 “ were all returned to the park.

Pay of the
men and
cost of tools,
&c.

“ The pay of the corps from the beginning of the campaign to the date of
 “ discharge of the men, exclusive of the pay of the officers, and the various other charges
 “ made in Bombay, amounts to 108,349 rupees 7 annas and 10 pies.

“ The men were paid up to the date of embarkation at Zula, and discharged with a
 “ month’s gratuity. An abstract of the abstracts of the corps as submitted for audit,
 “ with an explanatory balance statement is attached to this report for further reference.

“ I have not been able to get all the items of expenditure to arrive at a correct
 “ estimate of the total cost of the corps; but from the data I had to work upon it may
 “ be assumed the total cost of the corps was 251,082 rupees, or 204 rupees per man.

R.	A.	P.	
“ 13,454	14	0	on account of tools, stationery, &c.
108,849	7	10	“ “ pay, gratuity, &c.
40,186	0	0	“ “ clothing.
36,620	0	0	“ “ passage.
9,697	0	0	“ “ rations (for Chinese).
10,244	0	0	“ “ rations (for Natives).
1,431	0	0	“ “ enlisting men.
1,100	0	0	“ “ extra boots and railway passes.
15,000	0	0	“ “ of staff pay, donation batta, passage money, &c., for Officers.
15,000	0	0	“ “ the making of the tents supplied to the Corps (which must have fully cost that amount).

“ Out of the total cost, five-sixths were incurred entirely on account of the railway,

“and one-sixth on account of other works, for the whole of the men of the corps, excepting the 200 detached for the ghâts, and the 35 for the telegraph, either worked on the railway or on works which directly conduced to its advancement, such as the supply of the plant, the work on the piers, and the keeping up of the water supply.

“The following officers served with the Army Works Corps :—

“Captain (now Brevet-Major) Blakeney, Bombay Staff Corps ; Lieutenant Rennick, Royal Artillery ; and Lieutenant J. Davis, Public Works Department, unattached list. Officers of the corps.
“Captain Blakeney and Lieutenant Davis proceeded from Zula on medical certificate to England. Lieutenant Rennick, who was placed in command, had all the work of shipping and bringing the men back to India, paying them on their being discharged, and settling their accounts. Lieutenant Phillpott, R.N., and Lieutenant Rule, Royal Marines, did duty with the corps ; both these officers, who did excellent service, have been favourably mentioned by the Commanding Engineer.”

BENGAL COOLY CORPS.

Sir R. Napier, when the arrangements for the organization of the Force were first entered into, applied for a Cooly corps of 3,000 men.* A corps of the strength or exact description applied for was not obtainable, but orders were issued for the collection of a body of two thousand kahars, or bearers, at Allahabad, from the vicinity of that place, Dinapore, and Benares. The whole were placed under the charge of an officer, Lieutenant W. G. Smith, and the following instructions were issued regarding the terms of service, pay, clothing, equipment, &c., of the men :—

“1. *Terms of Service.*—The terms of service are to be very carefully explained to the men. They will be required to serve while the Expedition lasts, and to carry fair loads. Terms of instruction for raising Bengal Cooly corps.
“2. *Bamboos and Rope.*—They should be furnished at Calcutta with stout bamboo poles in the proportion of one to two men, with 10 per cent. spare ; also with a sufficient quantity of good stout rope for fastening loads, &c.

“3. *Scale of Pay.*—While absent from the Presidency, they will receive eight rupees a month with free rations, on the same scale as public establishments, viz. :— Pay.

“Wheat, rice or flour	..	..	..	..	1 seer.
“Dhall	..	..	..	..	2 chittacks.
“Ghee	..	..	..	..	1 chittack.
“Salt	..	..	..	..	One-third of a chitack.

“4. The mates, one per 25 kahars, will receive 10 rupees a month and rations. The sirdars, one per 100 kahars, will receive 15 rupees a month and rations. Their pay, till date of embarkation, has already been fixed at the usual rates of pay for bearers on command.

“5. *Scale of Clothing.*—Each man on embarkation will receive a blanket, and on arrival at Massowah† a suit of warm clothing, consisting of a cap, a coat and pair of trousers, blanket for cloak, two flannel banians, two pairs woollen socks, one pair shoes or boots. Clothing.

“6. *Advances.*—Only small advances, if any, should be made to them, and then only on security of the chowdries.

* See Chapter IV, page 55, and Chapter VI, pages 157, 173.

† This was on the same scale as for the Cooly Corps employed in the China Expedition.

Remit-
tances.

" 7. *Family Remittances*.—Those men who desire it will be furnished with family remittance certificates, on which will be noted the amount to be paid, and the parties* to whom the money is to be paid, &c.

" 8. This amount will then be paid regularly, month by month, by the various Executive Officers of the districts where the men have been entertained. On the occurrence of any casualty amongst the men, it should be reported at once to the Commissariat Officer of the district, who will discontinue the payment of the family remittance from date of decease.

" 9. To guard against over-payments from men becoming casualties, payments to families will be made one month in arrears; for instance, on 1st January for November, allowing December for time for notice.

" 10. The amounts paid will be charged off at once on acquittance rolls as a charge against the Imperial Government, Abyssinian Expedition. Lieutenant Smith will charge only the balance of their pay, after deducting the sums noted to be paid in this country. For instance, if a kahar from Lucknow wishes four rupees monthly to be paid to his family, the Executive Commissariat Officer, Lucknow, will charge four rupees in his account, and Lieutenant Smith will charge four rupees in his account. Lieutenant Smith will bear in mind that all such payments will continue to be made by the Executive Commissariat Officers of districts until they receive intimation from him of the death or desertion of any of the kahars in question.

" 11. Previous to starting, Lieutenant Smith will transmit to the Executive Commissariat Officers concerned a general roll, embodying the details of each certificate of which the amount will be payable by the Executive Commissariat Officer.

" 12. A form of family remittance certificate is sent herewith.

" 13. One such certificate is to be prepared for each individual, to be delivered at the person in whose favour it is granted, or sent to the person by the granter, or sent to the paying officer for delivery to the person.

" 14. The amount of the family certificate may be to the extent of two-thirds of the net monthly receipts of the granter.

Discipline
and treat-
ment.

" 15. *Discipline and Treatment*.—The men, while kept under strict discipline, must be treated with every consideration; every precaution must be taken to see that they receive their regular supply of rations; that they are attended to promptly when they require medical treatment; that their loads are not excessive; and that they are not beaten or ill treated by any one. Application will be made for a Native Doctor to be attached to the corps.

" 16. *Constitution*.—The men to be formed in regular companies of 100 each, with one sirdar and four mates, care being taken to keep the men of one district in the same company as much as possible. In detailing men for separate employ, care should be taken to send them by complete companies and half companies. Each company of 100 men will have its distinguishing number, and the number of the company to which each man belongs should be marked on his coat or jacket.

" 17. *Establishments*.—Lieutenant Smith will be allowed—

" One Warrant and one Non-commissioned Officer.
One Gomashta.
One Assistant.

Establish-
ment.

" No peon seems necessary, as the kahars will act as orderlies.

* The amount of the certificate was to be made payable to two holders, the second being paid in the event of the decease of the first.

“ 18. Lieutenant Smith will be allowed transport for his baggage animals; scale not yet fixed.

“ 19. Sanction has been asked for a staff salary of 300 rupees for Lieutenant Smith, and for transport at public expense for a charger for him; also for an increase of 50 per cent. on their pay to the warrant and non-commissioned officers, and for free rations to them. The usual office allowance in the field, 257 rupees, may also be drawn by Lieutenant Smith.

The following report by the officer who raised the Bengal Cooly or Kahar Corps and was in charge of it throughout the operations explains further details:—

“ Under instructions received by the Commissary-General, Bengal Army, from the Government of India, the enlistment of men to form a Cooly or Kahar Corps for service in Abyssinia was commenced in the beginning of October 1867, and stopped on the 14th December following. The enlistment took place at the stations of Allahabad, Lucknow, Cawnpore, Fyzabad, Benares and Dinapore, by the Commissariat Officers at these stations, and the men when passed by Medical Officers as fit for the service required, were collected at Allahabad, where the corps was organized, and from where it was dispatched *via* Calcutta to Abyssinia. Report by Lieut. Smith on the working of the corps in Abyssinia.

“ It being considered desirable that all the men of the Corps should, if possible, be able to assist in moving the sick with the force in Abyssinia, when required, men of the bearer (kahar) caste accustomed to carry dhoolies, were at first only entertained, but afterwards, when it was found difficult to collect sufficient kahars, a few coolies were enlisted. All the men, however, engaged to make themselves generally useful in whatever manner after their arrival in Abyssinia, their services would be most needed, such as in carrying the sick, cutting grass for horses, making roads, carrying loads to and from the shipping, &c., &c.

“ The kahars were enlisted on the agreement that, whilst absent from India, their rates of pay would be:— Pay.

“ For Sirdars, at Rupees 15 per month each.

„ Mates	„	12	„
„ Kahars	„	10	„

“ and that they would also receive free rations and a suit of warm clothing, and two blankets per man.

“ The strength of the corps on its embarking for Abyssinia in December, 1867, and January, 1868, was as follows, viz.:—

“ 3 European Commissioned Officers.	. Strength on embarkation.
3 European Non-Commissioned Officers.	
3 Native Gomastahs.	
2 Office Writers.	
2,041 Men of all classes (Sirdar, Mates and Kahars).	

“ A Native Doctor with Hospital Establishment was sent in each ship in which kahars embarked, but on arrival at Zula, the Native Doctors and establishments were transferred to other duties. Medical Establishment.

“ According to the orders of Government, the strength of the corps should have consisted of 20 companies of 100 men each, with one Sirdar and four Mates attached to each company, or in all of 2,100 men, but the corps had to embark before the full number of men could be collected.

Transports.	<p>“ The Kahar Corps embarked for Abyssinia at Calcutta in the sailing transports ‘ India,’ ‘ Queen of India,’ and ‘ Ophir,’ and steam transports ‘ Oriental,’ Himalaya,’ and ‘ Punjab,’ between the 20th December 1867, and 8th January, 1868, and landed at Zula in the latter part of January and beginning of February, 1868. I regret to have to</p>
Sickness in transport India.	<p>report that on the voyage, fever of a bad kind broke out amongst the men on board of the ship ‘ India,’ and a large number of men died before the vessel reached Zula, and most of the others arrived in a very sickly state at Zula, where they had to be kept detached in a separate camp, where many died.</p>
Deaths.	<p>“ Out of 417 men that embarked in this ship, 131 died on board, or after landing— 251 had to be invalided and sent back to India from Zula, and 35 only remained fit for</p>
Effective strength.	<p>duty. From this cause the effective strength of the Kahar Corps after landing was only about 1,650 men.</p>
Duties performed.	<p>“ Immediately after the disembarkation of the Kahar Corps at Zula, two of the Commissioned Officers, and all the non-commissioned officers, were removed from the corps, and appointed to other duties in the Land Transport Train and Commissariat Departments, and by the orders of his Excellency the Commander-in-Chief, more than a thousand of the men were attached to various Departments and hospitals, and sent with the force up to the highlands, the rest of the men (excepting those who came in the ship ‘ India’) were employed in working for the Commissariat Department at Zula, at the railway sidings, Kumayli, &c., &c., where a very large amount of the Commissariat was performed by these kahars work.</p> <p>“ A large proportion of the kahars, who went with the troops into the highlands, served with the several Field and Regimental Hospitals, as dhooly bearers and dhandy bearers, some were employed by the Meteorological and Survey Departments, 133 by the Land Transport Train, and the remainder by the Commissariat Department at its various depôts of stores, &c. I am unable to give a detail of the men attached to each hospital and department, as the numbers employed were continually being altered, owing to various causes, such as establishments being suddenly increased or reduced, men falling sick and being left behind in hospital, death, &c., &c.</p> <p>“ I regret I have no reports from the officers under whom the kahars served in the highlands, to show how the men worked, but from conversations I have had with some of those officers, I am led to believe that the kahars worked willingly and did much useful service, but that many of them were unable to bear up long under the hard work they had to perform in such a trying climate, and in consequence large numbers were usually under treatment in the different hospitals.</p> <p>“ Of the men detained at Zula, many were employed daily on the bunders in landing stores and conveying them to the Commissariat yards, others in loading and unloading railway trucks, working in the Commissariat yards, &c., &c. All these kahars being under my orders worked, I can say, most willingly without complaint, and well. Many of these men also, owing to the trying nature of the climate, hard work, and food of a different kind to what they had been accustomed to in India, were constantly on the sick list, several died and many were invalided.</p>
Conduct.	<p>“ During the time the kahars were absent from India they carried out to the best of their ability the terms on which they had been engaged, and made themselves generally useful in every way they could be employed; they raised no caste objections on board ship or in Abyssinia, and, as I have already stated, did much good service.</p>
Re-embarkation.	<p>“ The Kahar corps being amongst the last to leave Zula at the end of the Expedition, embarked in June 1868, in the steam transport ‘ Bengal’ and ships ‘ Ophir,’</p>

'Callerhoea,' and 'St. Albans,' and returned to Calcutta, where, on arrival, the men were "paid up, discharged, and sent to their homes.

"In conclusion, I may state that the strength of the corps on its return to Calcutta was only 1,261 men, during its absence from India 235 men having died and 545 having been invalided and sent back sick to their homes *vid* Bombay."

Number of
men re-
embarked.

The following statement, dated the 15th March, 1868, shows the distribution of the Bengal Kahar Corps in Africa, and how the men were employed:—

Distribution
in Africa.

To whom transferred for Employment.	Sirdars.	Mates.	Kahars.	Sirdars.	Mates.	Kahars.
Total strength embarked for Abyssinia	..	..	..	19	79	1,943
Hospital, 2nd Grenadiers, N. I.	..	..	8			
Commissariat Department, 1st Division	..	1	25			
Hospital, Royal Naval Brigade	..	..	6			
3rd Field Hospital, British troops	1	2	64			
Meteorological Department	..	1	9			
3rd Department Hospital	1	..	36			
Staff Hospital, 2nd Division	..	1	30			
Hospital, 18th N. I.	..	..	6			
Staff Hospital Zula	..	..	6			
Transport Train Department	1	5	127			
Commissariat Department, Senafé	3	12	300			
1st Field Hospital, British troops	1	2	60			
2nd	..	2	48			
2nd .. Native troops	1	3	80			
Artillery (2). Mountain Train Battery	..	1	32			
" B (2)	..	..	5			
General Hospital, Kumayli	..	..	6			
Trigonometrical Survey Department	..	1	20			
Executive Commissariat Officer, Rahagedi	..	1	25			
" " Upper Zuru	1	1	25			
" " Undul Wells	..	1	25			
Hospital, 45th Regiment	..	..	18			
3rd Dragoon Guards	..	..	2			
Total transfers	9	34	963			
In hospital, Zula	1	3	86			
On temporary command	..	1	19			
In fever camp	2	10	181			
Invalided to India from fever camp	2	1	96			
" Unfits " invalided to India	..	4	49			
Died up to the 14th March, 1868	..	5	146			
Deserted	..	..	1			
Present fit for duty at Zula	5	21	402			
				19	79	1,943

CHAPTER XXXVIII.

DESPATCHES OF SIR ROBERT NAPIER.

No. 1.

Sir Robert Napier to the Secretary of State for India.

Right Honourable Sir,

Magdāla 14th April.

I have the honour, in continuation of my despatch dated the 5th instant, to report, for your information, that it was necessary to halt on Talanta until the 9th instant, to concentrate the force and gain information regarding the state of affairs to my front, and generally around me. The Chiefs of Talanta and Daont both visited me during that time, and, principally through the personal exertions of Captain Speedy amongst the villages of Daont, and the endeavours of M. Münzinger, considerable quantities of grain were brought into our camp.

The rival
Queens of
the Gallas.

Mission to
Queen
Masteeat.

On the 7th I received a letter from Imam Ahmed, son of Masteeat, one of the rival Queens of the Wollo Gallas. The influence of the Imam extends over thousands of predatory Mahommedan Horse, whose country lies around Magdāla. He is the virtual Chief of the subjects of Masteeat, though the latter's own authority is also great. Masteeat is the rival of Werkait, another Queen of the Gallas, whose nominal ascendancy is at present established, through the assistance of Menelek, King of Shoa, though the majority of the Galla people support Masteeat. Information had reached me that Masteeat had very recently made friendly advances to Theodore, thinking this, no doubt, a good opportunity of enlisting his influence on her side against Werkait. Theodore is said to have accepted the presents she had sent him. Notwithstanding this alleged intrigue, the letter addressed to me by the Imam, her son, gave expression to feelings of utmost detestation on the part of his family towards King Theodore. As it was very possible that Theodore might flee from Magdāla, it seemed to me of importance to secure the co-operation of a tribe possessed of so much power as the Gallas, in preventing his escape. It was chiefly with this object that I had procured the appointment to the Expedition of Meer Akbar Alee, of Hyderabad, in the Dekkan, whose services have been already referred to, and who, as a Saiad who has visited Mecca, was well adapted to attach the followers of Masteeat to our cause. He was despatched accordingly to Imam Ahmed, bearing a reply to the Imam's letter, together with a horse and other gifts. Copy of the translation of the letter appended (Appendix A.) News of his interview with Imam Ahmed and Masteeat has not yet been received, but the impression produced upon the Gallas, by his arrival amongst them, has apparently been all that could be wished. There seems every reason to believe that Theodore's return to Magdāla, after his attempted flight, under circumstances which will be detailed further

on, was owing to the way in which the hills around the fortress were occupied by the Gallas.

On the 9th I advanced towards the banks of the Bashilo, and encamped near the edge of the Talanta Plateau, from which could be seen, in the midst of a vast panorama of mountains and valleys, two of the spurs, namely, Selassie and Fahla, of the mountain, of which Magdāla forms the third spur. Magdāla itself was, from this position, concealed by Fahla and Selassie, and was distant about 12 miles from where we were. Heavy rain fell during the afternoon, and the night was very cold.

The Bashilo,
9th April.

On the following morning, the 1st and 2nd Brigades proceeded to cross the Bashilo. The river lies at the bottom of a deep valley, among the mountains. The descent is in some places very steep, and represents a fall of about 3,900 feet, very irregularly distributed in $4\frac{1}{2}$ miles. The bed of the river itself is broad and rocky, and a considerable and now muddy stream flows in it at present, reaching nearly to our horses' girths. The ascent on the opposite side was very difficult. Theodore had lately conveyed his guns across the valley, and had constructed a road, which facilitated our passage. But the ascent was so severe, that perhaps this day's march was even more trying than any of the former ones to our troops.

No reply had been received from the King to my letter of the 3rd, copy of which accompanied my last despatch. Neither had any means of conjecturing how he meant to receive us. Several copies of my letter had been sent to him, but we had not learned if he had received any of them, though it has since been ascertained that a copy was placed in his hands on the day we were crossing the Bashilo, and had caused an outburst of anger at a servant of Queen Victoria having presumed to address him.

Letter to
King
Theodore:

Before crossing the Bashilo, I had caused to be prepared a second letter, of which a copy is attached (Appendix B.), intending that it should be forwarded, if occasion offered. As it proved, however, no opportunity of sending it occurred.

At four o'clock on the 10th instant, the head of the column, after traversing upwards of 10 miles of mountain and valley, had reached the plateau of Affjo. This plateau looks down upon the Arogie plain, on the other side of which rises the mountain height of Fahla. This mountain has an elevation of about 1,000 feet above the spot which we had reached, and on its ridge the King had placed seven guns. It was not until shortly before these opened fire upon us that we were aware of their being in position there. Owing to the very great height from which the guns were fired, the first round shot fell near where the column had halted, and our position, though distant over 3,000 yards, was within the extreme range of all the heavier guns. Shortly after the King's artillery had commenced to play upon us, large bodies of Abyssinians were seen descending the steep face of the mountain to attack us. The details of the engagement which ensued will appear from the official report, forwarded in a separate form. Our assailants showed so much bravery, that it was believed at the time that Theodore was leading them in person. But this was not the case. The King himself remained on the height, directing the fire of his troops. Our shells, and rockets, and Snider rifles taught the enemy a lesson which will long be remembered in this country. Their loss is computed at 700 killed (and 1,200 wounded), including many Chiefs of note.

Advance to
Affjo,
10th April.

Engage-
ment at
Arogie.

It was nearly dark before the assailants were completely driven off, and the fire of their artillery silenced. A suitable position having been taken in the immediate vicinity, the 1st Brigade bivouacked for the night on the ground, and the wounded were attended to. Our own loss amounted to only 20 wounded. The night passed without any alarm, the enemy, as afterwards appeared, having become paralysed by the blow which had been inflicted on them.

Arrival of
Lieutenant
Prideaux
and Mr.
Flad in
camp, and
negociations
with King
Theodore,
11th April.

The next morning, Lieutenant Prideaux and Mr. Flad appeared in my camp, on the part of King Theodore, from whom they delivered verbally the message, that, till yesterday, he had thought himself the greatest man in the world, but had now found out that there were others stronger than he, and that he desired to be reconciled to our Government.

In conversation with Mr. Flad several facts regarding current events were noted. The numbers of the enemy in the engagement of the day previous was estimated at between 6,000 and 7,000. About 3,000 of these were musketeers, armed chiefly with matchlocks, and there were upwards of 1,000 soldiers in addition who carried percussion muskets. There was no regular Cavalry, but the Chiefs of the army were all mounted on horses or mules. The Europeans assert that the guns were not served by them, but by Abyssinians. Theodore's favourite cannon, which he had named after himself, burst on the first discharge. The fire of the rocket battery had produced a powerful effect on the King's mind, and his impatience, after the battle was over, to avert the danger of a second attack by effecting a reconciliation with us was great. He had displayed to the last the characteristic cruelty which prevents us from in any way regretting his fate. There is no room for doubt that about 200 Abyssinian prisoners in confinement for very trivial offences were put to cruel deaths by his order the day before the battle. He had commenced the massacre with his own hands. The remains of the victims are still to be seen at the foot of the rock from which they were hurled.

Lieutenant Prideaux and Mr. Flad, in conveying to me the King's message, came accompanied by the Dejach Alamee, son-in-law of Theodore. I avoided entering into unnecessary conversation with his messengers, and sent my answer in writing, as shown in copy of my letter which is appended, marked C.

In the course of the same day Lieutenant Prideaux and Mr. Flad returned to my camp, with an unfavourable report of the way in which my reply had been received by the King, who, on understanding its purport, had become enraged, and ordered his former messengers to carry back to me a document which he had caused hastily to be written by his scribe, and which, on opening, I found to contain, enclosed with it in the same cover, my own letter of that morning, which the King had thus returned to me, he having conceived himself insulted, I am told, by my having presumed to address him at all. The Dejach Alamee did not on this occasion accompany Lieutenant Prideaux. Translation of the paper sent me by the King will be forwarded hereafter. It was not in the form of a letter, because he believed it beneath his dignity to hold such correspondence with me. Neither was it sealed.

It was very trying, in the aspect presented at this particular juncture by our relation with the King, to persevere in the course which I had adopted as the right one, since the lives of so many of our countrymen seemed to be endangered by that course. Nevertheless, I felt that I had no alternative, and therefore requested Lieutenant Prideaux and Mr. Flad to return to the King, and say to him that I could receive no further communications from him until my demand of that morning had been complied with.

But happily the King's own mind had undergone a kind of reaction almost as soon as he had despatched Lieutenant Prideaux with the paper referred to. He had recoiled from the possible consequences of his act, and after an attempt to commit suicide with a pistol, which was prevented by his attendants, had sent off Mr. Mayer, one of the European prisoners, to announce to me that all the captives whom we sought were on their way to my camp. Lieutenant Prideaux, while returning to the King, met Mr. Mayer coming down the mountain with this most unexpected intelligence, and he

and Mr. Flad, turning back with Mr. Mayer, again appeared at my tent, bearing the joyful news, but not charged with any message from the King touching his own submission to Her Majesty. Soon after dark, Mr. Rassam himself arrived in camp, a free man; and with him came Consul Cameron, Dr. Blanc, Rev. Mr. Stern, Mr. and Mrs. Rosenthal, Mr. Kerans, and Pietro. These had all been liberated. They were escorted on the part of the King by Mr. Mayer, Mr. Waldemaier, Mr. Saalmüller, and Mr. Moritz; artizans, and by the Dejach Alamee and Aito Samuel. It was not understood whether the German artizans above-named were expected by the King to return to him or had been liberated also; but I judged it better that they should return to Magdāla the next morning, until regularly discharged by Theodore.

Although matters had thus assumed a most hopeful aspect, yet there remained ground for anxiety. Mrs. Flad, whose Christian fortitude during all her trials had gained for her universal esteem, was still in the King's hands, and so were many other Europeans for whom we were bound to take thought. It was believed that they too had been liberated, and had been prevented only by illness or other causes, not resting with the King, from proceeding to our camp. Still the uncertain and dangerous temper of Theodore was too well known to permit of our thinking the life of any one safe while within his reach.

Early next morning I received, by the hands of the King's scribe and Mr. Bender, one of his German servants, an Amharic letter, which, on being translated to me verbally by Mr. Rassam and Aito Samuel (the latter rendering it from the original into Arabic, and the former, interpreting the Arabic again into English) was found to be an apology for the rude missive of the previous day. The King endeavoured to explain away the tone he had adopted in the latter, by informing me that that had been written after he had made up his mind to take away his life. He related how his attempt to carry out his design had failed, and that now he desired friendship, and was prepared to send down to us, at once, every European, along with an offering of a few cows, as it was the Easter feast. My reply was conveyed verbally because of my wish to avoid further correspondence with the King, whom I once more referred to my written communication of the day before. Mr. Rassam and others, however, acquired the impression that the cattle mentioned in the letter, had been accepted by me, as they certainly would have been, had the offering accompanied or signified His Majesty's acquiescence in my proposal of the previous day.

The Dejach Alamee, who had spent the night in my camp, carried back to Theodore my verbal answer to his second letter, and with the Dejach went Aito Samuel, Mr. Flad, and the four Germans who had escorted down Mr. Rassam's party the evening before. I did not think it necessary that Lieutenant Prideaux should return to Magdāla on this occasion, because he was a member of Mr. Rassam's party, and therefore had been duly dismissed by the King.

Mr. Flad has reported as follows what took place when he and his companions reached the King's presence with my message, on the morning alluded to. The Dejach Alamee delivered my compliments to the King, my acknowledgment of the arrival in my camp of Mr. Rassam's party, and my reiterated demand that the remainder of the Europeans should be sent to me. Theodore at once replied, "Well, I give every one of them permission to leave Magdāla."

The King then asked whether, at the time when Mr. Flad and his companions had left my camp, his scribe and Mr. Bender had arrived there with his letter, Aito Samuel replied, "Yes; your letter was presented to the Commander-in-Chief, and translated." The King inquired what answer had been given about the offered cattle. Samuel replied

A Letter
from King
Theodore,
12th April,
offering a
present of
cattle.

Verbal
reply of
Sir Robert
Napier.

Mr. Flad's
account of
the King's
reception of
Sir Robert
Napier's
proposi-
tions.

Arrival of
oxen and
sheep at the
British
camp, 12th
April.

that I had signified my willingness to accept them. His Majesty then ordered 1,000 oxen and 500 sheep to be taken to my camp. When it was reported to me that the animals had arrived at one of the outlying piquets, I gave orders that they should not be admitted within my piquets until His Majesty's full acceptance of my conditions of the previous day should enable me to receive them, or assume towards him any friendly bearing whatever.

The re-
mainder of
Europeans
arrive in
camp,
M. Bardel
excepted.

In the course of that day (the day before yesterday) every European in the King's hands arrived safely in my camp, with the exception of M. Bardel, who, though liberated by the King, had been prevented, I believe, by severe illness, from leaving Magdāla, and who had not even sent me a message to explain his delay.

But no sign was made by the King of acceding to the still more important demand that had been made of him, and submitting himself to Her Majesty the Queen. The considerations which, with the lives of so many of our countrymen in his hands, had impelled me to impose this condition upon him, had lost none of their force now. It was essential for the vindication of our national honour, which he has so grossly insulted, that he should be removed for ever from his place. Moreover, we could not have reached Magdāla in this season unless we had been aided by the country. Kassai's supplies of flour had rendered us for the time independent of the failure of Zula to supply us. The grain of Enderta and Agame had enabled our transport animals to live and advance, but this aid was given in the full belief that we would rid the people of Theodore; and had we failed to do so, we should probably have had to fight our way out of the country. No doubt can from the first have existed in Theodore's mind as to the purport of my demand, because the letter conveying it was translated to him by his own servants, and his remarks at the time showed that he understood every word of it. His failure to submit himself, therefore, left no other course open to us than to proceed towards him as an enemy.

A prize of
50,000
dollars set
upon the
King's
capture.

Early yesterday morning intelligence, which seemed reliable, was brought to me that His Majesty, with about 50 followers, had fled from Magdāla during the night. This was confirmed by the appearance of several Chiefs, with an offer to surrender into our hands the two strong outposts of Fahla and Selassie.

I at once sent word to the Gallas, offering a reward of 50,000 dollars for Theodore's capture, should he really have escaped; and as soon as measures had been taken for the protection of the Chiefs and people among the King's adherents who might choose to surrender, I proceeded to occupy Fahla and Selassie, with the same force and in the same order that I had designed for the assault.

While the column was ascending the mountain, contradictory statements regarding Theodore were brought to me. Hardly had one messenger confirmed the report of his flight, than another would come with the information that he had returned to Magdāla, and was busily engaged in massacring the Abyssinian prisoners confined there, to be followed by a third, stating that he had committed suicide. Fahla and Selassie were occupied by our troops, without any resistance being offered. The people everywhere laid down their arms and approached us with all confidence. It is impossible to form a correct estimate of numbers; they covered the whole face of the hill, and the paths leading from it were thronged for many hours during their migration. It is believed that the numbers could not have been less than from 25,000 to 30,000, of whom about a third were armed men.

The two hills formed a very strong position, and, if they had been defended with ordinary determination, would have caused very serious loss of life in their capture.

Both of them communicated with Magdāla itself; but what was the state of matters in that stronghold remained as much a problem as ever.

A desultory fire from small guns had been maintained from the walls for some time after Theodore's followers had retired within the fortress. It was said that Theodore himself, with a few of his soldiers, had galloped out of the gate on the first approach of our troops, and challenged a party of Cavalry to combat; but it was not possible to say certainly if it was he, though it now seems probable it was. He did not, however, approach near enough to give an opportunity of intercepting his retreat to the fortress. With the help of our telescopes, a good view of the interior of Magdāla was obtained. Whatever number of defenders the fort contained were studiously concealed. It was plain, however, that the place was not abandoned, as the gate which had been open on our first approach was perceived to be closed. A few figures were seen in different parts of the fort, and one officer thought he recognized Theodore himself.

About noon I directed a sharp cannonade to be opened upon the gates of the fortress, without, however, calling forth any demonstration in reply. In the absence of such, and in consideration of the numbers of women and children in Magdāla, it was not thought necessary to advance our guns near enough to produce anything like a general destructive effect upon the place.

About 4 P.M., the 33rd Foot was ordered to advance to storm the fortress. Led by Major Cooper, and keeping up a continuous fire upon the defences, this fine regiment soon surmounted the steep precipitous cliff which lay between them and the outer gate, notwithstanding the heavy fire of the garrison from behind their defences. Here their progress was arrested, and it was found the gate had been blocked up from within, by means of large rocks piled in the gateway. A company of Royal Engineers, under the command of Major Pritchard, had accompanied the advance party. But it was easier to enter the citadel by clambering, with the help of scaling ladders, over the fortifications on either side, which consisted of a masonry wall and very formidable thorn defence surmounting a scarpd rock, than it would have been to blow open the gate. When the place had been entered, another gate at the end of a long tortuous passage between two lines of rock had to be carried. Altogether this fortress is one of the strongest, even when its own proper defences had been reached, that I have ever seen. Its position, with reference to its outworks of Fahla and Selassie, adds so much to its strength, that it might be made quite impregnable. If Theodore had been properly supported by his soldiers, we could not have escaped very severe loss in entering it. As it was, however, his army had been so completely demoralized by the severity of the loss inflicted on them two days before that the troops remaining faithful to Theodore were very few, and when they found that their unscientific defences gave them no opportunity to inflict loss on the assailants without exposing themselves, which our rapid fire rendered fatal to them, on the death of the King all the survivors abandoned resistance, and made their escape by the Kaffirber Gate. The kind treatment bestowed upon their wounded had also produced a strong impression on their minds. It has since been ascertained that Theodore left Magdāla that morning, intending to seek safety in some distant province. But only a few Chiefs followed him out of the gate, and with the fear of his mortal enemies the Gallas before his eyes, he could not venture to leave Magdāla with so small an escort. He, therefore, returned to his stronghold, determined to die there rather than perish among the Gallas.

Every armed man who met our column after the fortress had been entered fell under the fire of the Sniders; and the bodies of several Chiefs of distinction, who had

Magdāla
cannonaded.

Capture of
Magdāla.

Attempted
escape of
Theodore.

King
Theodore's
body found.

remained faithful to their master to the last, lay close behind the outer and inner gates. Theodore himself was found lying dead some way up the narrow path which leads from the gate to the palace. A bullet had passed through his head. The Medical Report, of which a copy is herewith submitted (Appendix D.), will show that he is believed to have died at the last moment by his own hand.

His burial.

Copy is submitted (Appendix E.) of a letter addressed to the widow of the Emperor. At her request, the remains of her husband have been interred under the orders of the officer commanding in Magdala. No definite arrangements have yet been made for the disposal of her son, who is a boy of about eight years of age. Copy of translation of a letter which I have written to Dejach Gwangoo, brother-in-law of Theodore, is also forwarded (Appendix F). Replies have not yet been received to those two letters.

The property of the late King is being collected in the regular manner. His crown and royal seal have been taken possession of in Her Majesty's name, and will be forwarded to England by a suitable opportunity. Measures are being taken for the protection of the inhabitants of Magdala. Theodore's guns have been destroyed by blasting, and the fortress itself will be dismantled.

The liberated prisoners, of whom a list is attached (marked G.), leave for the coast immediately; and I hope to commence my return march toward Zula on the 18th instant.

Every endeavour will now be used to convey the Expeditionary Army with the least possible delay out of this country.

APPENDIX A.

Copy of translation of a Letter from Sir R. Napier to Imam Ahmed, Chief of the Wollo Gallas (original in Arabic).—We salute you. We have received your two letters, and accept your friendly expressions with much pleasure. We have come thus far with the Army, by command of Her Majesty the Queen of England, to punish Theodorus for his ill-treatment of British and other European subjects. We are close to Magdala, and will shortly attack that place. It is necessary that no means of escape should be left to Theodorus. We therefore write to ask you to collect your people, and close every place in your direction by which he might otherwise try to get away from the Amba. Should he try to fly through your country, we will most handsomely reward any one who will bring him to us. But if you close the passes on your side, he cannot fly.

To ensure successful co-operation, and to improve friendly communication, we would wish that some influential person, having your confidence, should be with us in our camp, to remain with us, and we would ask you to send such a person quickly.

We, on our part, have sent you a Mussulman friend, who has travelled in holy places, and is a person of estimation both among ourselves and among his own people. He will communicate to you our wishes on all points, and we hope he will be received well and honourably.

APPENDIX B.

Copy of Letter from Sir R. Napier to King Theodore, dated 10th April, 1868 (written before going down into Bashilo Valley, but not sent).—In order to avert unnecessary bloodshed, we recommend your Majesty to send into our camp forthwith an Abyssinian in your confidence, to whom we may communicate the views of Her Majesty the Queen of England.

APPENDIX C.

Copy of Letter from Sir R. Napier to Theodore, dated British Camp, Affajo, 11th April, 1868, sent in reply to the verbal message brought by Lieutenant Prideaux, Mr. Flad, and the Dajazmaj Alamee, the son-in-law of the King.—Your Majesty has fought like a brave man, and has been overcome by the superior power of the British Army.

It is my desire that no more blood may be shed. If therefore, your Majesty will submit to the Queen of England, and bring all the Europeans now in your Majesty's hands, and deliver them safely this day in the British camp, I guarantee honourable treatment for yourself and all the members of your Majesty's family.

APPENDIX D.

Surgeon Lumsdaine to Captain Tweedie, April 15th.—I have the honour to inform you that, by desire of His Excellency, the Commander-in-Chief, I went yesterday to Magdāla, to examine the body of the late Emperor Theodore.

The examination was conducted in the presence of two priests, who were watchers, of Samuel the Agent, and of Dr. Blanc, and was identified by all.

There was a gunshot wound at the back of the head; the inside of the mouth was blackened and scorched; the palate blown away, and a probe, passed in at the mouth, came out at the wound on the back of the head.

From examination of these two wounds, the internal and external, I am of opinion that death was self-inflicted.

APPENDIX E.

Copy of translation of Letter from Sir R. Napier to Ythegé Tooroo Wark, 14th April, 1868.—His Majesty the late Theodore, King of Abyssinia, having fallen in arms against the British Government, it remains for us only to request that you will inform us of your wishes regarding the disposal of his body, whether you would like it to be buried by us with all due honour, or made over to you for interment as you may direct.

We would like to know your wishes also regarding the son of his late Majesty. It is to be feared that, in the present state of Abyssinia, the youth's life will be in danger at the hands of many persons who will aspire to the empire of Abyssinia. We are willing to take the child under our protection, and send him to England or Bombay to be educated, and we would suggest this arrangement to you as the best that could be made. Your own wishes regarding his disposal shall, however, be followed by us.

APPENDIX F.

Copy of translation of Letter from Sir R. Napier to Dejach Gwangoo, brother-in-law of Theodore, 14th April, 1868.—His Majesty the late Theodore, King of Abyssinia, having fallen in arms against the British Government, we ask you to inform us of your views regarding the disposal of all the members of his late Majesty's family, in order that your wishes may receive our consideration.

APPENDIX G.

For a list of the captives liberated, see Chapter XXI, page 81.

No. 2.

Sir R. Napier to the Secretary of State for India (received 19th June, 1868).

Commander-in-Chief's Office, Political Department,

Camp Dildi, 30th April, 1868.

Right Honourable Sir,

March from
Magdāla to
Dildi.

I HAVE the honour to report for your information, in continuation of my despatch, dated the 14th instant, that the Head-Quarters and Rear Guard of the Expeditionary Force recrossed the Bashilo *en route* toward the coast on the 18th instant.

2. A short halt was necessary on the Talanta Plain, in order to make arrangements for the march of the whole Force in suitable divisions to Zula.

3. On the 24th instant, the rear of the Army crossed the valley of the Jedda; the River Takazze has since been passed, and we are halting to-day to rest, after a very toilsome march yesterday.

Events at
Magdāla.

4. I will now revert to the events which took place at Magdāla and in its neighbourhood subsequent to the date of my last Despatch. Anxious as I felt to abstain from further interference in Abyssinian affairs after the object of the Expedition had been attained, yet it was necessary for the sake of our national credit that due consideration should be shown for the large numbers whose interests and safety had centered in Theodore's existence, and who remained disarmed and unprotected, and exposed to merciless plunder and slaughter at the hands of the wild tribes which circumstances had, for the moment, converted into our allies.

Magdāla
offered
to the
Wagshum.

5. The disposal of the Fortress of Magdāla first demanded attention. This strong position is situated geographically in the country of the Wollo Gallas, from whom it was finally wrested by Theodore about ten years ago. In his hands it has imposed an effectual check upon the encroachments of the Gallas on Christian Abyssinia. I desired, in the interests of Christianity, to place the stronghold in the possession of Wagshum Gobaze, the *de facto* ruler and principal Chief of this portion of Abyssinia. But when I had sent for his lieutenant, the Dejach Mashashah, the latter excused himself, in his master's name, from accepting the charge, alleging as his reason that it would require so large a garrison to hold it that it would be a source of weakness rather than of strength.

6. Wagshum Gobaze himself, notwithstanding his repeated invitations to us, through Brigadier-General Merewether, C.B., to come quickly to his aid, had removed himself and his army to a distant quarter before our arrival, in pursuit of objects of his own, and it was impossible for me to await a reply to the letter which I addressed to him on the subject of Magdāla.

The fortress
destroyed.

7. I therefore destroyed the gates of the fort, burned everything on the mountain that was combustible, and abandoned it.

8. Several claimants for its possession had, in the meantime, addressed me regarding it. One of these was the Chief of Daont, a small territory lying adjacent to Magdāla. Werkait, one of the two rival Queens of the Gallas, had also put forth her claims, as likewise had Masteeat, the other and more powerful of the Galla Queens.

9. At the time when the disposal of Magdāla was thus exciting so many hopes and desires, the widowed Queen of Theodore and her son were brought down in safety from the mountain, and placed within the protection of my camp; the removal of the disarmed garrison and released native prisoners was at the same time in progress.

The Galla
Queen
Werkait.

10. Shortly after the arrival of Werkait's letter soliciting that the fortress might be delivered to her, the lady presented herself at my picquets. Although it was evening, she was immediately admitted to an interview, and allowed to represent her claims.

She was greatly affected in revisiting a locality which had been associated with so many misfortunes to her family and people. She remarked to me, "We fought with Theodore "as long as we could, and when his power was too strong for us to resist any longer, my "son submitted to him, on receiving a promise of good treatment, notwithstanding "which he was inhumanly cut to pieces, and thrown over the precipice of Magdāla; and "now I have come to see the grave of my enemy Theodore, and the place where my "son fell."

11. At this time, the offer of the fortress had been made to Gobaze's lieutenant, and his answer had not yet been received. Magdāla was still the scene of military operations while our troops were engaged in destroying Theodore's cannon, and the exodus of its former inhabitants continued in full progress. Therefore it was not thought expedient that Werkait's wish to ascend the mountain should be indulged at such a time. Almost before her story was concluded, intimation was received that her rival Masteeat was also in the neighbourhood, and on her way to offer her congratulations and submit her claim.

12. At first I hoped to be able to make peace between these two rival Queens; but, when this was hinted at to Werkait, she said, "When two persons are striving together "for a crown, how can peace be made between them? If Masteeat were to make peace "with me to-day, before you, she would betray me to-morrow."

13. The news of Masteeat's approach caused great uneasiness amongst Werkait's escort and adherents; and, after a second interview with me, during which she exhibited symptoms of much distress, she took a hasty departure, apprehensive lest she should be intercepted by her more powerful and more fortunate rival; more fortunate because her son is alive, and the centre of the hopes of a large body of the people, while to poor Werkait there remains only the memory of her son, so treacherously slain by Theodore. Suitable presents were made to her, as she took her leave; and, shortly after her departure, Masteeat arrived with her son Imam Ahmed, and expressed no small gratitude and rejoicing at Theodore's fall. She had responded very effectually to our request to close all avenues by which the late King could have escaped, and thus she came to us in the character of an established ally. To her request for the possession of Magdāla I was able to answer that Gobaze's lieutenant having declined to receive it, I would abandon the place, after dismantling it, and burning all of it that could be so destroyed, as a mark of the anger of the British at the ill-treatment of our countrymen, as well as of our abhorrence of the cruelties which Theodore had committed there. To this the Queen replied that indeed nothing but fire could purify it. On my asking her if she could make peace with Werkait, she answered that she would gladly do so, but that it was impossible, because if Werkait were to swear friendship on the Koran itself to-day, she would violate her oath to-morrow.

14. Next to the question regarding the disposal of Magdāla arose the necessity of sending away the vast number of Abyssinians who had laid down their arms, together with the other inhabitants of Magdāla and Islamgi, including very many women. Many of these appeared to possess mules and property of their own. They were escorted through the Arogi Pass, across the Bashilo and the Jedda, and as far as Bet-Hor, by patrols of our troops. From Bet-Hor they began to diverge to their own several districts, and by the time our column had crossed the Takazze they had all disappeared.

15. Certain others of the inhabitants of Magdāla remained longer under British protection. Such were the family of Theodore, the political prisoners whom we had released, and a few chiefs and employés who were more especially connected with Mr. Rassam and his party.

The rival
Queen
Masteeat.

Departure
of the
former
inhabitants
of Magdāla.

Queen
Masteeat
occupies
Magdāla.

16. Advantage was taken of our friendly relations with Masteeat to obtain from her safe conducts and the promise of protection for as many of the people of Magdāla as had occasion to pass through Galla territory on their journey home. A son of Saheela Selassie, named Dargeeh, who had long been confined in Magdāla, was made over to her care, along with a few other natives of Shoa similarly circumstanced, in order to be escorted to Menelek's capital. Masteeat had also undertaken, at my request, to receive charge of certain Abyssinians who had been wounded in the engagement of Arogie, and who were still undergoing treatment in our field hospital. But when Major-General Sir C. Staveley and myself proceeded, on the morning of the 18th, to superintend the march of the last remaining brigade from the neighbourhood of Magdāla, it appeared that no arrangements had been made for the transport of these men. Masteeat herself had accompanied us a short distance on our way. When our wounded enemies were seen being transported by our own people, her followers were shamed into exerting themselves to provide attendants for them, and finding that five of their number were more or less connected with themselves, they took charge of these and removed them to their camp. The remainder were carried along with our column by spare muleteers from the Transport Train, as our regular hospital establishment had not the means of conveying them. We then took leave of Masteeat, who proceeded without delay to establish herself and her followers in the dismantled fortress of Magdāla.

17. A list of the principal political prisoners liberated by us on our occupation of Magdāla is appended, marked A. An opportunity was taken of receiving all of them who desired an interview with me, and advice suitable to their several circumstances was then tendered to them. Booroo Gooshoo, the Prince of Gojam was the first who was introduced. He bore in his enfeebled frame the marks of 14 years spent in captivity. It is probable that Gojam, which has generally formed a separate principality, will now become subject to this Chief. The Prince of Enderta, who is the maternal uncle of the present ruler of Tigré, was next presented to me. He left the following day for the court of his relative Dajasmaj Kassa. Wagshum Tiferri, who is said by some to be in reality the hereditary Prince of Wag, was then introduced, and afterwards other Chiefs of lesser note.

18. The widow of Theodore and her numerous attendants still remain, as it were, the guests of our camp, and will probably travel with us as far as the nearest point in our route to the lady's native district of Semen. Her severe illness during the past ten days has prevented my seeing her; but I trust she is now recovering under the care of the medical officer attached to my Staff, who has been detailed by me to provide for her comfort.

19. Translation is appended (marked B) of a proclamation which I have thought it right to issue to the Chiefs and people of this portion of Abyssinia at the present time.

20. Translation is appended also of a letter received a few days ago from Menelek King of Shoa, and of my reply (Appendix C); together with translations of my letters to Dejasmaj Wagshum Gobaze, and Dejasmaj Kassai respectively, announcing recent events (Appendices D and E).

A.

For a List, showing the principal Chiefs found confined in Magdāla, and released on the 13th April, 1868, see Chapter XXI, page 81.
