Instructions for the Expedition into Central Africa from the Cape of Good Hope, 23d June 1834.

THE "Instructions" drawn up for the guidance of Dr Smith, the chief of the exploratory expedition, at present in the interior of Africa, were sanctioned by Sir William Herschell, and other distinguished individuals at the Cape of Good Hope, interested in the success of the enterprise. The following pages from the "Instructions" will be read with advantage by those who may embark in similar journeys.

"At primary stations the Committee recommend the assiduous application of every instrumental means for the determination of the three elements of latitude, longitude, and elevation above the level of the sea, and especially at such stations as many series of lunar distances as possible should be procured, in addition to the usual sights for time (or observations of the altitudes of heavenly bodies near the prime vertical) which, together with meridian observations for the latitude, they would recommend to be practised daily as a matter of regular duty, at every station, as well primary as secondary. At primary stations also the barometer and thermometer should be observed at regular intervals, and the magnetic variation ascertained *by taking the sun's azimuth immediately before and after the observation for time* (*noting the exact moments, and thus obtaining data for interpolating to the time of observation*). At such stations likewise a careful investigation of the Index errors of Sextants should be made, the zero points or index corrections of the Sympiesometer should be determined by leisurely comparison with the mountain Barometer (giving time for the instruments to attain the same temperature), and the difference noted in the observation-books. The necessity of frequent comparisons of these instruments will be apparent, if it be considered that in the event of fracture of the barometer tube, no other means will exist by which the zero point of a new one can be determined. Occultations of stars by the moon, and, if possible, eclipses of the satellites of Jupiter, should be observed whenever an opportunity may occur. The former especially, affording the best known method of ascertaining the longitude by a single observation, should be constantly borne in mind, and the Almanac consulted several days in advance, so that no occultation of a large star certainly identifiable, should be allowed to escape through inadvertence.

"The Committee especially recommend that every observation made should be registered in a book devoted to that purpose, and preserved *in the exact terms of the readings off of the instruments and chronometers*, and kept rigorously separate in its statement from any calculation thereon grounded, and that the observed or presumed index or zero corrections, whether of Chronometer, Sextant, Barometer, or other instrument, should be stated separately in every case, and on no account incorporated with observed quantities; and, moreover, that the observations upon which such index errors have been concluded,

should also be preserved. Since, however, the guidance of the expedition will necessitate the calculation of many observations on the spot, the results of such calculations should be entered (as such) beside the observations from which they have been concluded.

"The Committee farther recommend, that the Chronometers with which the expedition has been provided by the liberality of his Majesty's Government, should on no account be corrected by moving the hands, however great their errors may become, not even in the extreme case of one or both of them having been allowed to run down. In case of such a misfortune (which should be most carefully guarded against by making it the daily duty of more than one person to remind their bearers to wind them at a stated hour) it will be most convenient in place of setting them, to defer winding them until the hours and minutes come round, at which they may respectively have stopped as near as may be ascertained from one to the other or from both, to other watches of the party; and such event, should it take place, should be conspicuously noted in the observation-book; and, as a further and useful precaution, it is recommended to keep some of the best going watches belonging to individuals of the expedition, to mean Greenwich time, by frequent comparison with one of the chronometers. In every case where time is observed, express mention should be made of the chronometer or other watch employed, designating it by the maker's name and number, so that no uncertainty may ever arise as to the proper application of the correction for error and rate.

"The rates of the chronometers should be examined at any station where the expedition may rest two or more consecutive nights, either by equal altitudes of a star, or more simply by noticing the disappearance of any large fixed star from the same point of view, behind the edge of a board fixed at some considerable distance in the horizon, and having its edge adjusted to a vertical position by a plumb-line; the interval between the two such disappearances being an exact sideral day, or 23 h. 56 m. 4 sec. mean time. Under the head of secondary observing stations may be classed those in which no lunar distances can be got, and when the sights for time and meridian altitude can only be superficially and imperfectly taken, or one without the other. With a view to the connection of these with the primary station, and to the sketching out a chart of the country passed through, at every primary station a series of angles should be taken with the sextant between remarkable and well-defined points in the horizon, dividing the horizon into convenient portions, and carrying the angles all round the circle, back to the point of departure; and in the selection of such points, two ends should be kept in view, first, the precise indentification of the point of observation, in case of its being desirable to find it again; and, secondly, the determination from it of geographical points. The first of these purposes will require angles to be taken between *near*, the second between *distant* objects. For the latter, of course, remarkable mountain peaks will, if possible, be chosen. Of such, when once observed, the appearances from the place of observation should be projected by the *Camera lucida*, and their changes of aspect and form as the expedition advances, should be well and carefully noticed, to avoid mistakes. The ap-

proximate distance of any remarkable object may be had by pacing or otherwise measuring more exactly, a base line of a few hundred paces, in a direction perpendicular to that in which it appears, erecting a staff at each end, and from each staff measuring the angle between the object and the other staff.

"In this manner the neighbourhood of any station may be mapped down so as to be available for many useful purposes. In all such cases the compass bearings of the most important object in the horizon should be taken, and in the absence of the sextant angles, azimuth compass readings of each point may be substituted, though of course with less precision.

"Indications of the progress of the expedition should be left at various points in its course, by making marks on rocks or stones, &c. and by burying documents in bottles. In regard to the latter, it will be necessary to deposit them one foot deep at some known distance, say 15 feet from a conspicuous surface of stone, on which there is painted a circle containing the distance and bearing by compass of the bottle, from its centre, and that the situation of such places of deposit should also be ascertained by exact compass bearings of several remarkable points in the horizon, both near and distant, as well as by angles between them, carefully determined with a sextant, and noted down in the journals of the expedition for their own reference or that of future travellers.

"In surveying the basin of a river, or in proceeding along the prevailing slope of a country, it is very desirable to determine as many points as possible on the same level, and form thus as it were a parallel of elevation to the level of the sea. A line of this kind traced at the altitude of, say 1000 feet, would determine, in a considerable degree, the physical condition of extensive spaces on the map on both sides of it. The stations of most interest will be found at the extremities of transverse arms of the ridge, or in the central and most retiring points of the intervening spaces. Let the general slope of the country on both sides of such stations, be noted as to its rate and direction; and in regard to the valleys which intersect the slope, let their width, direction, and general rate of declivity, and the section and velocity of their streams, be ascertained, and the probable course of the rivers, as far as it can be determined by the appearance of the country and the reports of the natives, giving them the aboriginal names when they can be discovered. The altitude and acclivity of remarkable peaks or ridges should also be investigated, along with the nature of their climate and of the clouds formed upon them. It will be requisite also to mark with care the nature of the winds and sky, as well as the temperature at stations in the neighbourhood, and to note the influence which changes of that description have upon the barometer, and observe also the temperature of deep pools or lakes and copious springs.

"The geological structure of the country is especially worthy of minute and extended observation, and will require that notes be kept of all such appearances as indicate or accompany changes of structure in the formation, or of components in the soil and surface, especially such fossil remains of plants or animals as may occur, and metallic ores, and that proper specimens accompany these notes, ticketed on the spot with precise localities.

"The botanical researches of the expedition will extend to the preservation of specimens of plants not found in the colony, and especially of transportable roots and the seeds of all such as may be found in a ripened state, noting localities and the varieties of aspect which vegetation puts on in different situations. In regard to other branches of natural history, as it is obvious that after a short experience of research under your direction, almost every one will be able to recognise and preserve what is rare or novel, no further instruction needs to be given, except the general expression of the desire of the Committee that all shall endeavour to secure for the Expedition whatever in any department they esteem valuable, it being expressly understood that every article collected by each individual belongs in property to the subscribers to the expedition collectively.

"In regard to the inhabitants themselves, it is a paramount interest to gain an exact portrait of their life, as respects their condition, arts, and policy, their language, their external appearance, population, origin, and relation to other tribes, or in general whatever tends to elucidate their disposition or resources as sharers or agents in commerce, or their preparation to receive Christianity.

"It will be proper to ascertain their religious traditions or practices if they have any, distinguishing what is indigenous from the glimmering apprehension of great religious truths which necessarily spreads in advance of the scenes of missionary labour.

"Examine also the state of their intellect generally, as exemplified in their social and political arrangements, and common traditions, songs, or amusements, and particularly in regard to their knowledge of nature, and their notions of its vast and varied proceedings, as thunder, rain, wind, &c.

"Inquiries respecting commerce and the prospect of its extension are to be viewed as of no small importance in this undertaking. Every means must be used to ascertain its present nature, channels, and extent, and to determine the existing demand for foreign commodities, and the return which may be expected for them. Proper inquiries may also lead to some satisfactory views of its future condition, as indicated by the wants of the native population, or the objects of most importance to improve their condition, and the corresponding resources for exchange which may arise from a more beneficial employment of their industry.

"Lastly, we may notice the propriety of making inquiries or gathering information with respect to similar enterprises, as whether the natives have traditions of movements of their own, or of the arrival of strangers among them. All that can be gathered respecting Dr Cowan's expedition will be acceptable in the highest degree. The elucidation also of an isolated effort to struggle through the difficulties of African travelling should also be kept in view; it was made by a missionary of the name of Martin, who has not been heard of since he crossed the Colonial boundary in December 1831. He is consequently supposed to have perished in the Gariep, or to have been destroyed on its banks, though, as it was his intention to avoid the establishments of Europeans or their lines of communications, there is a lingering possibility of his still surviving.

"The articles fitted for carrying on commerce with the natives have three distinct objects:—First, by keeping up a constant appearance of traffic, to present in their eyes an appreciable motive for this visit to their territory. Second, to conciliate favour, or to procure provisions for the purpose of husbanding the resources of the expedition. And third, for the purpose of procuring any profitable articles to carry on to the other districts for the ends above mentioned, or to sell in the colony at the termination of the enterprise. In regard to these the Committee has to remark, that attention to the two first mentioned objects is indispensable, from its necessary connection with the safety and efficiency of the expedition, and that the third is to be contingent on the acquisitions of the party in regard to its main object of collecting information as to the country, and securing what illustrates its natural history and resources, and on the state of its means of transport. The Committee therefore recommend that this third object be attended to only in case that it be necessary to send waggons back for supplies, or in case that in the homeward progress of the party, there be room for such articles without incommoding it in its other operations.

(Signed "Thomas Wade, Chairman, J. Herschell, A. Oliphant, James Adamson, D. D., T. M'Lear, A. J. Cloete, C. F. von Ludwig, F. S. Watermeyer, John Centilivres Chase, Hon. Secretary."

June 23. 1834.

CAPE EXPEDITION TO EXPLORE AFRICA *

"*Report of the Committee of Management of the Cape of Good Hope Association for Exploring Central Africa.*

"The Committee has much pleasure in announcing to the subscribers the receipt of despatches from Dr A. Smith, dated the 23d September 1834, at Caledon River.

"From these documents it appears that the journey from Graaff Reinet to the frontier of the colony, was attended with much hinderance and trouble, owing to the severe drought which has long been experienced in that part of the country, and it is understood has extended very far beyond the colonial boundary.

"Upon the arrival of the exploratory party at Philipolis, a missionary station belonging to the London Society, and the assumed capital of the Griqua Chief Adam Kok, situated about twenty-five miles to the north of the Nu-Gariep or Black (Orange) River, Dr Smith, from the information he there obtained, decided upon taking an easterly route, as the only one at that period practicable, the drought preventing a safe access with ox waggons to the Bechuana town of Latakoo, on the Kuruman River, which it had been proposed to make the starting point of the expedition.

"Had, however, this difficulty not intervened, Dr Smith considers that it

* We are indebted to the Director-General Sir James MacGrigor for the above document in regard to Dr Smith's expedition.

is highly probable he should have decided to adopt his present intended route, inasmuch as it is extremely desirable that the district between the two principal branches of the Orange River should be investigated, not only from its contiguity to the colony, but from the promise it holds out of very considerable and interesting additions to our scientific knowledge.

" The party, therefore, thirty in number, were to cross the Caledon River on the day subsequent to the date of the despatches, for the purpose of tracing up, in the first place, the country situated between the Caledon and Stockenstrom Rivers to their respective sources, thence to explore the origin of the Mapoota River, which it is believed takes its rise eastwardly of the same highlands, and falls into De La Goa Bay ; and having completed that survey, to stretch across the country westward to the Ky-Gariep or Yellow (Orange) River, following it down to its confluence with the Hart or Malalareen, somewhere about Lat. 28° 10′, Long. 24° 35′, and where they would arrive and communicate with the colony *via* Philipolis, in the month of December. At this point it was intended to ascertain from the Rev. Mr Moffatt, the intelligent missionary at Lattakoo, the state of the country northward, and the prospect of the expedition ; to bring together the stores laid up in reserve at Philipolis, and there finally to arrange the route of the party for its northerly destination, which it was expected would then be open in consequence of the periodical fall of rains, which would render the country traversable by oxen.

" In the prosecution of the preparatory excursion eastward, Dr Smith anticipated much interest and gratification. By native testimony he was assured that the wide Caledon issued at once a perfect river, from an enormous spring, on the side of a high mountain, where it was nearly as large as at the place where he was then encamped ; the probability of which singular circumstance may be credited from the fact, that the river at New Lattakoo, the Kuruman, gushes in the like manner from its rocky fount, a noble stream, and is at no part of its subsequent course of greater size. His route lay at first to Massus, King of the Basuta tribe of Bechuanas ; thence to the once formidable but now subdued Mantatees ; and after that to the kraal of a large but little known tribe, where twenty-five chiefs were reported to reside. He was in the immediate vicinity of the Agate Hills, which supply the Orange River with those well known and beautiful gems, and he had reason to believe that he would be able to investigate the porphyritic formations at its sources, of which so many and splendid specimens strew the course of that stream. There was also considerable prospect of a large supply of ivory obtainable in this route, as a return for the trading part of this expedition.

" The following memoranda of the acquirements of the expedition are attached to the despatch :—

" About 350 specimens of birds, quadrupeds, &c. have been preserved.

" Fifty drawings have been completed.

" The history of three Bechuana tribes, viz. Batlapee, Barralong, and Baclarou have been minutely investigated.

" A map of the route from Philipolis to the Caledon River has been constructed.

"The latitude and longitude of eleven stations have been ascertained (as per enclosure).

"The geological characters of the country between Graaff-Reinet and this station have been minutely investigated, and numerous specimens of rocks have been collected. The heights of many of the mountains and hills, both within and beyond the colony, amongst others the Compass Berg, have been taken."

(FROM A CORRESPONDENT.)*

"*27th December.*

"From letters addressed to Mr Chase, extracts of which he handed to us, we were enabled in last Saturday's paper to give an account of the unprovoked attack made by the Zulo chieftain Matsellikatz on a small Colonial party headed by that indefatigable and undaunted traveller, Mr A. G. Bain, of Graaf Reinet, between the rivers Seechecoolie and Meeritsaanie, in about Lat. 25° 30′ and Long. 26° 30′, who were out for the purpose of collecting wild animals for an American menagerie. We now insert, from the same source, extracts of a letter from Dr Smith, which give some account of the progress of the central expedition.

"Lat. 28° 30′, Long. 28° 30′.—*Nov.* 6. 1834.

"All goes on well, and every day supplies much of interest. The Bamtu and Backlogue are the two most powerful and interesting tribes which we have met with; all the individuals of both these hordes reside on the tops of mountains, part fortified by nature, and part by art, and are so secure in their retreats, that they have set at defiance both the forces of Dingaan and Masalacatzie. The latter, it is understood, has left the country towards Latakoo, and has taken up his position on the higher branches of the Vaal River, where he is plundering and murdering in every direction, and from various occurrences which have lately come to our notice, it would not be justifiable for us to approach him. We, therefore, intend to leave him to work his utter ruin, which, in all probability, is close at hand. He has, from fear of John Bloem and the Corannas, fled back to the country of Dingaan, who will now, having him within a moderate distance, eventually overthrow him.

"A party of Bastards were on a hunting expedition, about three weeks ago, along the banks of the Vaal River, and whilst occupied in cutting up some sea-cows which they had killed, were attacked by one of his commandoes without any provocation, and lost all their waggons, and two or three of their people. They shot a number of Caffres, and the chief of them informs me that had not part of his fled, they would have been able to have beaten them off. This act has excited the indignation of all the well-disposed people in this direction, and they are actively engaged in assembling a force to revenge it; if they manage matters well, they will certainly destroy him—if not, he will be more troublesome than ever.

"To-morrow morning we proceed with the view of advancing a little farther to the eastward, in order to get some idea of the character of the country to-

* From a Cape of Good Hope newspaper, sent to us by Sir James MacGrigor.

wards the sources of the Vaal River, and to examine the high mountain range which extends to N.E., distant about twenty miles from us, after which I intend turning back, and travelling along the high ground, which extends nearly east and west, between the Caledon and Vaal Rivers, towards Philippolis, where I expect we will arrive about the end of December. The Caledon River extends much farther to the eastward than would be inferred from any of our maps, and rises out of the same mountains with the Black River, or the Stockenstrom River of the maps. We are at present within a short distance of its sources, but despair of being able to visit them, as the mountains are so high and rugged. A few days, however, will decide the point.

"N.B.—Some time ago I happened to get hold of some Graham's Town papers, and was astonished to see such a statement about the Compass Berg. The figures are all wrong, and the remark about the want of a detached thermometer is incorrect."

Castle Toward, west coast of Scotland, Daily Meteorological Register, from 1*st October to* 31*st December* 1834.

Date.	9 o'clock A. M.			6 o'clock P. M.			Observations.
	Bar.	Ther.	Wind.	Bar.	Ther.	Wind.	Rain fallen in October, 5 Inches 5 Hundreds.
Oct. 1	30.21	55	S.	30.12	54½	S.	Most beautiful day.
2	30.2	56	SE.	30.2	57	S.	Beautiful day, blowy P. M.
3	30.21	54	NW.	30.20	53	S.	Most beautiful day.
4	30.11	57½	S.	30.5	58	S.	Blowy and cloudy, rain in the evening.
5	30.20	55	NW.	30.25	51	NW.	Cloudy A. M., beautiful P. M.
6	30.22	52	E.	30.11	55	SW.	Stormy and showery.
7	30.2	56¼	SW.	29.90	58¼	WSW.	Cloudy morning, very wet rough day.
8	29.84	58	SW.	29.80	56	SW.	Very wet and rough.
9	29.79	54½	SW.	29.75	48½	NW.	Gloomy, showery A. M., fine till 5 P. M., showery even.
10	29.95	50	SW.	30.7	48	NW.	Stormy, showers of rain and hail.
11	30.10	50	S.	30.12	52	S.	Beautiful day, gloomy afternoon.
12	30.	53½	S.	29.90	55	SW.	Stormy, with heavy showers.
13	29.89	58½	SW.	29.70	57	S.	Gloomy A. M., very wet P. M.
14	29.76	49	N.	29.76	48½	SW.	Showery.
15	29.62	49½	S.	29.75	45½	N.	Very wet A. M., fine P. M.
16	29.22	54	SW.	28.92	51	W.	Very stormy, with heavy showers.
17	29.33	45	NW.	29.43	44½	NW.	Stormy and wet.
18	29.59	43	NW.	29.90	45	NW.	Showery A. M., windy P. M.
19	29.80	46	S.	29.51	53	S.	Frosty morning, blowy showery day.
20	29.50	53	W.	29.62	48	E.	Very stormy and showery.
21	30.27	41½	N.	30.11	46	NW.	Rough and showery A. M., very blowy P. M.
22	29.78	50	WNW.	29.73	47½	NW.	Beautiful day, frost A. M.
23	29.58	47	N.	30.11	46	N.	Beautiful day, frost A. M.
24	30.15	37	N.	30.20	38	N.	Beautiful A. M., cloudy, few drops of rain P. M.
25	30.33	41	N.	30.40	41	N.	Beautiful day, cloudy blowy evening.
26	30.50	48½	N.	30.52	48	NW.	Most beautiful day.
27	30.54	53	NW.	30.54	52	NW.	Cloudy, rain in the evening.
28	30.60	47	NW.	30.67	46½	S.	Most beautiful day.
29	30.69	47½	NW.	30.59	48½	SW.	Cloudy rain in the evening.
30	30.22	50½	SW.	30.10	52½	W.	Very blowy and wet.
31	29.92	52	SW.	29.90	47½	W.	Very stormy and wet.