

[SECRET.]

# SEISTAN.

REVENUE REPORT AND NOTES

OF THE

PERSO-AFGHAN ARBITRATION COMMISSION,

1902-1905.

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VOLUME II.

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V.--APPENDICES AND GLOSSARY.



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VOLUME II.

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Appendices.

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PART V.

APPENDICES.

APPENDIX I.

CONTENTS.

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Statement showing the area *in square miles* of the different tracts into which Afghan and Persian Seistan may be divided from an irrigation point of view.

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*N.B.*—These areas were obtained by planimeter from the map on the scale of four miles to the inch made by the Mission in July 1905.

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## APPENDIX I.

## AFGHAN AND PERSIAN SEISTAN.

*Statement showing the areas in square miles of the different tracts into which Afghan and Persian Seistan may be divided from an irrigation point of view.*

The area of Afghan Seistan includes the trough of the Helmand up to Lat above Rudbar, i.e., it includes the Sanjamit tract, but it does not include the delta of the Khash Rud.

Serial number.	Name of country.	IRIGATED AREA IN SQUARE MILES.								Valued and cultivated area.	Culturable but not watered.	Culturable but covered by dense sand-hills.	High uncommandable plains.	High but commandable plains.	Grand Total in square miles.
		Haman.	Gand-i-Zireh.	Inundated area on the western shore at Sar-i-Sheh.	Naizar.	Bunnaistan.	Total.								
1	Afghan Seistan	259'68	972'32	"	220'48	56'16	1,508'64	287'52	773'12	287'06	801'76	4,159'20			
2	Persian Seistan	243'56	"	84'80	473'44	432'64	1,231'44	784'40	511'04	7'68	58'72	2,846'88			
	Total	503'24	972'32	84'80	693'92	488'80	2,742'08	1,081'92	1,284'16	295'04	860'48	7,006'08			

*N.B.*—The culturable area in the delta of the Khash Rud below Gikan and Alesi, judging from the ruins and ancient canals shown in the Survey of India's map is 186'00 square miles. We have no information of the area in its Delta watered by the river, but it may be estimated as a strip 3 miles wide along the river from Gikan to the Naizar a distance of 32 miles or 96 square miles. All the Naizar and Haman of the Khash Rud has been of course included in that of the Helmand.

100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332
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## APPENDIX 2.

## CONTENTS.

## THE SEISTAN BOUNDARY AWARD.

Letters from the British Commissioner to the Persian and Afghan Commissioners forwarding maps and documents.—The final arbitral statement on the Seistan Boundary by the British Commissioner.

## APPENDIX 2,

## THE SEISTÁN BOUNDARY AWARD.

*Copy of a letter from Colonel A. H. McMahon, C.S.I., C.I.E., British Commissioner, Seistán Arbitration Commission, to the Persian and Afghan Commissioners, dated the 1st February 1905.*

*After compliments.*—The boundary line between the territories of your Governments in Seistán has now been demarcated with boundary pillars, and I herewith send you the following maps and documents relating to that boundary line for the information of your respective Governments:—

- (1) The final arbitral statement regarding demarcation of the boundaries of Seistán. This is written on parchment.
- (2) A list containing the necessary details of latitude, longitude, construction, site, etc., of all the boundary pillars from Koh-i-Malik Siah to Siah Koh. This list is in three sheets and is a ferro-type reproduction.
- (3) A map on the scale of 1 inch = 4 miles, illustrating the whole boundary from Koh-i-Malik Siah to Siah Koh, Bandan. It is in two sheets and is drawn on tracing cloth.
- (4) A map on the scale of 1 inch = 1 mile in one sheet, illustrating only that portion of the boundary which lies between the point of separation of the Nad Ali channel and the Rud-i-Parian from the Helmand and Tappa-i-Tilai.

The above maps and documents all bear my signature and thoroughly explain the boundary line as now demarcated and will, I hope, prevent any doubts arising regarding it in the future.

I take this opportunity of conveying to you my thanks for the assistance given in the work of demarcation, and to express my sincere hope that the work now completed will prevent further disputes and strengthen the friendship between both parties. Usual ending.

*Final arbitral statement on the Seistán Boundary by Colonel A. H. McMahon, C.S.I., C.I.E., British Commissioner, Seistán Arbitration Commission, dated 1st February 1905.*

1. The boundary line between Persia and Afghanistan in Seistán was defined in my arbitral award of November 1903 as follows:—

“The boundary line in Seistán between Afghanistan on the east and Persia on the west should run as follows, *i.e.*, from the Malik Siah Koh in a straight line

to the Band-i-Kohak and thence along the bed of the Helmand river to the point of separation\* of its two branches, the Rud-i-Parian and Nad Ali channel. From there it should follow the bed of the Nad Ali channel into the Sikhsar and along the bed of Sikhsar to a point near Deh Yar Muhammad where the Sikhsar has been diverted towards the west in the water channel shown on the map which joins the Shela-i-Shamshiri near to Deh Hassan Kharot. The boundary line should follow the left bank of this water channel to the Shela-i-Shamshiri, leaving Deh Hassan Kharot on the east. It should then run in a straight line separating the hamlets of Deh Ali Mardan on the west from Deh Ali Jangi on east to Tappa-i-Tilai: thence in a straight line to the most western of the mounds of Tappa-i-Shaharaki; thence in a straight line to the most western mound of Tappa-i-Kurki; thence in a straight line to Shalghami; and thence in a straight line to Siah Koh, Bandan.”

2. The above award having been accepted by both Governments, I have now demarcated the boundary line by boundary pillars in strict accordance with that award. The following remarks will clearly explain the boundary line and the manner in which that line has been demarcated by pillars.

3. The starting point of the boundary line is marked by a boundary pillar on the summit of Malik Siah Koh which was constructed by the Afghan-Baluchistan Boundary Commission in 1896, and is known as Boundary Pillar No. 186 of that Commission.

4. The latitude and longitude of this and all other Seistan boundary pillars, the position of each with regard to prominent places visible from them, and all necessary particulars of their size and construction are fully stated in the list of boundary pillars attached to this statement.

The position of each boundary pillar is also clearly shown in two maps attached to this.

5. From the top of Malik Siah Koh to the Band-i-Kuhak (also called Band-i-Seistan) the straight line of boundary has been marked by 51 pillars. As these are all in exactly one straight line, a further description of each is unnecessary; and it suffices to say that No. 12 is on the south bank of the Shela, No. 36 on the north bank of the Sana Rud, and No. 51 on the left bank of the Helmand river where the Rud-i-Seistan leaves that river at the Band-i-Kuhak. Between pillars Nos. 8 and 9 and between Nos. 12 and 13 are 3 and 8 miles respectively of heavy sand through which it was not possible to demarcate the line with pillars.

Besides these 51 pillars there are 16 smaller marks also exactly on the straight line. The positions and particulars of these are stated in the attached list of pillars. They bear the following numbers in that list—13A, 14A, 15A, 16A, 17A, 18A, 18B, 18C, 21A, 23A, 23B, 25A, 25B, 26A, 32A, 43A, but in order to prevent confusion with boundary pillars they have been shown in the map attached to this only as small black dots without numbers.

6. From the Band-i-Kuhak demarcation with pillars was unnecessary along the course of the Helmand river as far as the point of separation of the Rud-i-Parian and Nad Ali branches of that river. To mark this point pillar No. 52 has been built at a distance of 94 feet from the left, *i.e.*, Persian bank of the Nad Ali channel, and pillar No. 53, has been built at a distance of 65 feet from the right or Afghan bank of the same channel. The boundary line thence follows the Nad Ali channel. The old ruin of Burj-i-As marks the right bank of that channel near Nad Ali and pillar No. 54 marks the right bank at the point where the Shela-i-Charakh leaves that channel. From pillar No. 54 the Nad Ali channel is known as the Sikhsar. Pillar No. 55 marks the left bank of the Sikhsar at the point where the Deh Dost Muhammad canal takes off from it, while pillar No. 56 also marks the left bank at the point where the Sikhsar again turns northwards. Pillar No. 57 has been built on a prominent mound called Tappa-i-Sikhsar which is situated at a distance of 240 feet from the right or Afghan bank of the Sikhsar.

Further north, pillar No. 58 which has been built at a distance of 109 feet from the right bank, and pillar No. 59, which is situated 20 feet from the left bank of the Sikhsar stream, mark the point where the boundary line leaves the Sikhsar as defined in my award. Pillar No. 58 is built alongside the site of Deh Yar Muhammad. That village mentioned in my award has lately been deserted and no longer exists.

7. Further demarcation of the course of the Helmand river and the Nad Ali and the Sikhsar streams is at present impossible owing to the nature of the banks which are liable to be inundated. Moreover, further demarcation appears unnecessary at the present time, as the course of the water in those streams clearly marks the boundary. Hereafter should any of those streams dry up by reason of a change in the course of the Helmand, and cease to be water channels, their course can easily be ascertained and demarcated, if necessary, with the aid of the pillars and places above described.

8. From pillar No. 59 the course of the boundary line is demarcated by pillars Nos. 60 and 61 built on the left bank of the water channel which joins the Shela-i-Shamshiri near Deh Hassan Kharot. Pillar No. 62 has been built to mark this point on the south bank of the Shela-i-Shamshiri close to Deh Hassan Kharot. From here the straight line to Tappa-i-Tilai has been marked by pillars Nos. 63, 64 and 65, the last named being built on the top of Tappa-i-Tilai. It

is necessary to note here that the villages of Deh Ali Mardan and Deh Ali Jangi mentioned in my award as being on either side of this line have been deserted since my award was delivered and neither of them now exists.

9. To illustrate the boundary line from the point of the separation of the Rud-i-Parian and Nad Ali channels to Tappa-i-Tilai in greater detail than is possible in a map of 4 miles to 1 inch, a map of 1 mile to 1 inch of that portion of the boundary line is attached to this statement.

10. Pillar No. 66 has been built on the top of the most western of the Sharaki Tappas and the straight line onwards to Tappa-i-Kurki is marked by pillars Nos. 67 and 68, the latter being situated on the top of the most western of the Kurki Tappas. On the straight line between pillar No. 68 and Shalghami, which is marked by pillar No. 70, pillar No. 69 has been built. The land on which pillars Nos. 67 and 69 have been built is generally under water; but as it happened to be dry at the time of demarcation, massive masonry pillars have been built at those points which it is hoped will last a long time.

11. From pillar No. 70 at Shalghami the straight line of boundary to Siah Koh has been marked by 19 pillars, Nos. 71 to 90. Of these pillars some are built in Naizar lands subject to inundation, and every care has been taken to build them strong and massive enough to last a long time. The line from pillar No. 70 to pillar No. 76 passes 600 feet south of the most southern edge of a prominent Tappa called Tappa-i-Kharan, 3,223 feet south of the centre of top of southern face of Tappa-i-Shaghalak, and 1,485 feet south of the highest point of Tappa-i-Musjidak. Between pillars Nos. 76 and 77 the line crosses the open water of the Hamun and demarcation was impossible. Pillar No. 77 is on the west shore of the Hamun, and the line thence ascends the barren and waterless glacis and slopes of the Siah Koh. Pillar No. 90 is on the summit of Siah Koh, which is also known locally as the Nar-i-Ahu.

12. Two maps accompany this statement. One in two sheets is on a scale of 1 inch = 4 miles and illustrates the whole boundary from Malik Siah Koh to Siah Koh. The other is on a scale of 1 inch = 1 mile, and illustrates the boundary between the point of separation of the Rud-i-Parian and the Nad Ali channels of the Helmand and Tappa-i-Tilai only.

It should be noticed that the number of names of villages has been restricted as much as possible in these maps. This is due to the fact that most of the villages in Seistan frequently change not only their names but also their positions. Endeavour has been made to show only such villages as are likely to be permanent.

These maps should be considered as superseding those issued with my award of November 1903.

13. Attached to this statement is a list,\* already referred to, of all the boundary pillars, giving all necessary particulars of the position, size, construction, etc.

14. All measurements, such as inches, feet, yards, and miles in this statement and the accompanying list of boundary pillars, are English inches, feet, yards, and miles.

\* Not reprinted.

APPENDIX 3.

CONTENTS.

THE ARBITRAL AWARD ON THE SEISTAN WATER QUESTION.

Preliminary remarks—The award—Covering letter from the British Commissioner to the Afghan Commissioner—Covering letter from the British Commissioner to the Persian Commissioner.

## APPENDIX 3.

ARBITRAL AWARD ON THE SEISTÁN WATER QUESTION, DATED AT CAMP KUHAK ON THE 10TH APRIL 1905, BY COLONEL A. H. McMAHON, C.S.I., C.I.E., BRITISH COMMISSIONER, SEISTÁN ARBITRATION COMMISSION.

*Preliminary remarks.*

*Paragraph 1.*—General Sir Frederick Goldsmid, as Arbitrator between Persia and Afghanistan, was called upon to settle the question of rights to land and water of Persia and Afghanistan in Seistán. He delivered an arbitral award on both points in 1872, which was confirmed by Her Majesty's Secretary of State for Foreign Affairs and accepted by the Persian and Afghan Governments in 1873.

2. At the time of the above award the Helmand river had one main distributary channel in Seistán, *i.e.*, the Rúd-i-Seistán, at the mouth of which, in order to divert sufficient water into this Rúd, was a tamarisk *band* known as the Band-i-Kohak or Band-i-Seistan. The Helmand river from thence onwards flowed in one channel past Nad Ali and along what is now known as the Sikhsar into the Naizár and Hámún. In 1896 a large flood caused the river to burst out for itself a new main channel, which left the old one near Shahgul and is now known as the Rúd-i-Paríán.

3. Various disputes regarding water between Persian and Afghan Seistán, which were caused by changes in the course of canals and in the course of the main river, have arisen since 1872. My enquiries show that these have, until recently, always been mutually and amicably settled by the responsible officials concerned on both sides, *i.e.*, the Governors of Seistán and Chakhánsúr. These officials, who thoroughly understood each other's water requirements, have always shown great tact and skill in settling water disputes to the mutual satisfaction of both countries.

4. Unfortunately of recent years, whatever may have been the cause, and whether this was due to the changes in the course of the main stream, or to more strained relations, the amicable settlement of water difficulties has been found to be no longer possible. A series of small, and in themselves unimportant, water questions arose between 1900 and 1902, which, by reason of estranged relations, caused mutual misunderstanding and increased ill-feeling, until matters were brought to a crisis by further disputes arising from abnormal deficiency of water in the Helmand in 1902. This led to the present reference to the arbitration of the British Government.

5. The condition under which the present arbitration has been agreed to by the Governments of Persia and Afghanistan is that the award should be in accordance with the terms of Sir Frederick Goldsmid's award.

6. In framing my award I am, therefore, restricted by the above condition.

7. Sir Frederick Goldsmid's award on the water question was as follows:—  
"It is to be clearly understood that no works are to be carried out on either side calculated to interfere with the requisite supply of irrigation on both banks of the Helmand." Her Majesty's Secretary of State for Foreign Affairs, in his capacity as the final confirming authority of that award, further laid down in 1873, after consulting General Goldsmid, that the above clause should not be understood to apply either to existing canals, or to old or disused canals that it may be desired to put in proper repair, nor would it interfere with the excavation of new canals, provided that the requisite supply on both banks is not diminished.

8. The above award is so definite that it is unnecessary to make any attempt to define it further, except on one particular point. This award provides that Persia has a right to a requisite supply of water for irrigation. In order to prevent future misunderstandings, it only remains to define what amount of water fairly represents a requisite supply for Persian requirements.

*El. nashin  
1894*

*See 153  
41  
1128.*

9. From the careful and exhaustive measurements, observations, and enquiries made by this Mission in Seistán, the following facts have been clearly established :—

- (a) Seistán suffers more from excess than deficiency of water. Far more loss is caused by damage done to land and crops year after year, by floods, than is caused by want of water for irrigation.
- (b) In only very few exceptional abnormal years of low river has any question of sufficiency of water arisen in Seistán, and then Afghán Seistán has suffered equally with Persian Seistán. Moreover, questions as to the sufficiency of water only prove serious when the spring crop cultivation is concerned, when the river is at its lowest, *i.e.*, between the autumn and spring equinoxes, yet it has been ascertained that in only 3 out of the past 35 years has there been any serious deficiency of water in Seistán during that season. It is necessary, therefore, first to consider water requirements during the season of spring crops. Any settlement based on the requirements of that season will meet the case of the remainder of the year also.
- (c) After carefully calculating the normal volume of the Helmand river during the period between the autumn equinox and the spring equinox, it has been clearly ascertained that one-third of the water which now reaches Seistán at Bandar-i-Kamál Khán would amply suffice for the proper irrigation of existing cultivation in Persian Seistán, and also allow of a large future extension of that cultivation. This would leave a requisite supply for all Afghán requirements.

10. I therefore give the following award :—

AWARD.

*Clause I.*—No irrigation works are to be carried out on either side calculated to interfere with the requisite supply of water for irrigation on both banks of the river, but both sides have the right, within their own territories, to maintain existing canals, to open out old or disused canals, and to make new canals, from the Helmand river, provided that the supply of water requisite for irrigation on both sides is not diminished.

*Clause II.*—The amount of water requisite for irrigation of Persian lands irrigable from and below the Band-i-Kohak is one-third of the whole volume of the Helmand river which enters Seistán.

Seistán, to which Sir Frederick Goldsmid's award applies, comprises all lands on both banks of the Helmand from Bandar-i-Kamál Khán downwards.

*Clause III.*—Persia is, therefore, entitled to one-third of the whole Helmand river calculated at the point where water is first taken off from it to irrigate lands on either bank situated at or below Bandar-i-Kamál Khán.

*Clause IV.*—Any irrigation works constructed by Afghánistán to divert water into Seistán lands, as above defined, must allow of at least one-third of the volume of the whole river being available for Persian use at Band-i-Kohak.

*Clause V.*—To enable both sides to satisfy themselves that this award is being complied with, and at the same time to avoid the necessity of fresh references to the British Government and the expense of special Missions, a British officer of irrigation experience shall be permanently attached to the British Consulate in Seistan. He will be empowered to give an opinion, when required by either party, on any case of doubt or dispute over water questions that may arise. He will, when necessary, take steps to bring the real facts of any case to the notice of the Government concerned. He will be able also to call the attention of either party to any important indications of threatening danger to their water-supply arising from natural causes or their own irrigation works. To enable this officer properly to fulfil the functions of his office, free access shall be given to him by either side to the Helmand river and its branches and the heads of canals leading therefrom.

*Clause VI.*—The maintenance of the Band-i-Kohak is of great importance to the welfare of Persian Seistán. It is possible that the deepening of the river bed at and below the site of the present band may necessitate moving the band a short distance further up the river. Afghánistán should allow Persia to move this band, if necessary, and grant Persia the right to excavate the short canal required for such new band through Afghán territory to the Rud-i-Seistán.

Similarly, should it become necessary for Afghánistán to move the present Shahgul band across the Rud-i-Parian somewhat lower down the stream, Persia should (as has been done before) allow Afghánistán right of way for a canal through Persian territory from that band to the Nad Ali channel.

*Clause VII.*—It will be noted that the rights to the Helmand river, which her geographical position naturally gives to Afghánistán as owner of the upper Helmand, have been restricted to the extent stated above in favour of Persia in accordance with Sir Frederick Goldsmid's award. It follows, therefore, that Persia has no right to alienate to any other Power the water-rights thus acquired without the consent of Afghánistán.

*Clause VIII.*—I cannot close this award without a word of warning to both countries concerned. The past history of the Helmand river in Seistán shows that it has always been subject to sudden and important changes in its course which have from time to time diverted the whole river into a new channel and rendered useless all the then existing canal systems. Such changes are liable to occur in the future, and great care should, therefore, be exercised in the opening out of new canals, or the enlargement of old canals leading from the Helmand. Unless this is done with proper precaution, it may cause the river to divert itself entirely at such points and cause great loss to both countries. This danger applies equally to Afghánistán and Persia.

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*Covering letter from the British Commissioner, Seistán Arbitration Commission, to the Afghan Commissioner, dated 16th April 1905.*

*After compliments.*—I hereby hand over to you, for delivery to His Highness the Amir, my arbitral award on the subject of water. It is written on parchment, and bears my signature.

This question is considered of such importance, and such conflicting opinions regarding it are entertained by both sides, that it is hardly likely that any arbitral award, whatever it may be, will be entirely pleasing to both parties concerned.

I have endeavoured to safeguard the requirements of Persia without injury to the rights of Afghanistan.

The terms of the award are clearly expressed, and I do not think that they require further explanation by me.

The clause relating to the possible necessity for some day moving the Band-i-Seistán a short distance further up the river applies equally to the possible necessity of moving the Afghán band now near Shahgul, a short (distance) into Persian territory. The Helmand has long shown signs of taking a new course to the west of the present Rud-i-Parian towards Khadang. When it does so, the only means of filling the Nad Ali channel may be by means of a short canal through Persian territory.

I sincerely hope that my award will remove future dangers of disputes and ill-feeling regarding water between the people of Afghanistan and Persia in Seistán. Water questions, however small, are apt to give rise to excitement and ill-feeling, and, as you know from your long experience of these matters, the only way of settling them satisfactorily is to do so in the mutual and amicable spirit which has characterised the settlement of past disputes for many years, and, until quite recently, between yourself and the Persian Governor of Seistán. I have every hope that the same good spirit will continue to be shown on both sides in future in Seistán.

The presence in Seistán of an impartial officer of experience in water questions, as provided in my award, is very desirable in order to prevent small questions being made, through mischievous misrepresentations and exaggeration into

questions of fictitious importance. As an instance of this, I need only remind you of how the Persian Government were informed last year that the Ju-i-Sultani was taking off all the water of the Helmand, whereas I was able to inform the Persian Government, as you know, that the said canal was only taking the ordinary and proper amount of water.

I trust that this award will prove acceptable to His Highness the Amir.

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*Covering letter from the British Commissioner, Seistán Arbitration Commission, to the Persian Commissioner, dated the 10th April 1905.*

*After compliments,*—I herewith hand over to you, for delivery to His Majesty the Shah of Persia, my arbitral award on the subject of water. It is written on parchment, and bears my signature. This question is considered of such importance, and such conflicting opinions regarding it are entertained by both sides, that it is hardly likely that any arbitral award, whatever it may be, will be entirely pleasing to both the parties concerned.

I have endeavoured to safeguard the requirements of Persia, and to ensure the future provision of a requisite supply of water.

The terms of my award are clearly expressed, and I do not think that they require further explanation by me.

I sincerely hope that this award will remove the danger of future disputes and ill-feeling regarding water between the people of Persia and Afghanistan in Seistán.

I trust that it will prove acceptable to your illustrious Government.

## APPENDIX 4.

## CONTENTS.

Genealogical tree of the Kayání dynasty from the times of Lais, the coppersmith,  
with an historical account by Khán Bahádur Mír Sham Shah, Political  
Attaché to the Mission.

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*Note.*—The material is more suitable to the archaeological work, but up to the time of going to press nothing definite has been decided about that work; these notes are therefore printed here. They contain the result of valuable enquiries made in Seistan by Khan Bahadur Mir Sham Shah, who has made the genealogy of important frontier families a lifelong study.



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APPENDIX  
CONTENTS

THE CHAPTER IN PAGE 21

AN ACCOUNT OF THE MARRIAGE OF THE KING

The King's marriage to the Queen is the subject of the first chapter of the book. The account is given in a simple and straightforward manner, and is of great interest to the reader. The marriage took place on the 1st of January, 1800, and was a most happy one. The King and Queen were both very young at the time, and their union was a most fortunate one. The King was a most kind and generous man, and the Queen was a most devoted and affectionate woman. Their marriage was a most happy one, and they lived together in the most harmonious manner until the King's death in 1820. The Queen survived him for many years, and died in 1837. Their marriage was a most successful one, and their children were all of them very good and virtuous people.

## APPENDIX 5.

## CONTENTS.

*Vide* CHAPTER IX, PAGE 51.

## AN ACCOUNT OF THE MAHALS OF PERSIAN SEISTÁN.

The Shib-i-Ab brought under cultivation—The *mahal* in the time of the Sarbandi supremacy—Some notes about the direction of the main stream—The *mahal* in the time of Mir Alam Khan, Hashmat-ul-Mulk—The shares into which he divided the labour on the *band*—The villages from which the labour on the *band* came in 1904.

## APPENDIX 5.

*An account of the mahal of Persian Seistán gathered by Lala Thakur Dass, Supervisor, Amir Singh, Zilladar, from those among the villagers who have some knowledge on this subject.*

It would appear from the traditions of such men as the Arbab Saif-ud-Din, Mulla Qabla Ghulam of the family, who were the Mulla of the Sur Gumbad or Gumbad-i-Mulla Shahi at Kala-i-Fath, Karbalai Muhammad, Bandbaf, whose family have built the *band* for some generations, that the delta now in the possession of the Persians was re-populated about the time of Malik Lutf Ali Khan, who resisted Nadir Shah's invasion and was the defending hero at the celebrated resistance of the Kuh-i-Khwaja.

The Kala-i-Fath tract had to be abandoned for some reason; the Arbab says it was destroyed by floods, and Kunderak was built as the seat of Government. The main stream then followed the Rud-i-Dali which passed the following points. South of Kuhak Fort—between Kaud and Burj-i-Sar-i-Band—west of Kakha and north of Bahramabad-i-Kayani—east of Baghak village—between Nasirabad Saiyad and Nasirabad-i-Kuragaz.

The tract to the south and south-west of this river was Naizar. The cultivation upon which Kunderak was established was in the tract to the north and east which was irrigated by a big canal, probably a canalised *shela*, i.e., arm of the river; this canal is the Rud-i-Hasanki or Rud-i-Asiniki (by Baluchis).

The tract now watered by the Nad-i-Ali channel was a sand covered waste situated with many ruins, very like what the Sar-o-tar tract is now.

The river encroached to the north and Kunderak had to be abandoned; the Kayanis built Hamzabad or Kachian in its place in A. H. 1223 (A. D. 1808) and ruled all Seistán, Persian and Afghan from there.

As the river encroached towards the north and east, the lands on the south around Sihkuha were set free and ceased to be Naizar; the Sarbandis settled at Sihkuha and from here gradually extended their power over the reclaimed land. The Sharakis settled at Dashtak and the Nahrui at Burj-i-'Alamdar\* now known as Kala-i-Nau and the Sanjaranis at Jahanabad. For a time the course of the Rud-i-Dali divided the Province into two natural divisions which were called Pusht-i-Ab and Shib-i-Ab; the Pusht-i-Ab tract being that which was irrigated by the Rud-i-Hasanki and peopled by the Farsiwans; whilst the Shib-i-Ab tract comprised the inundated lands which were being reclaimed as the waters receded by the Baluchi immigrants.

The power of the Kayanis gradually declined before that of the Sarbandis, who possessed themselves of some villages to the north of the Rud-i-Dali; the main stream had, however, by this time worked itself still further to the east and discharged itself into the Puzak Hamun by flowing somewhere in the direction of the present Nad-i-Ali channel.

In the time of the Sarbandi supremacy there are said to have been the following five *mahals*:—

The mahal in the time of the Sarbandi supremacy.

## Principal villages.

Mahal-i-Kayani { Bahramabad.  
Kachian with Deh Rahdar.  
Jalalabad.

Bahramabad eventually became a village of the Sarbandis and some say was always included in their *mahal*.

\* So named from 'Alam Khan, Nahrui, the head of the tribe at the time. This is the place mentioned in Dr. Bellew's book, *Indus to the Tigris*. Kala-i-Kuhna, another Nahrui village to the west of Kala-i-Nau, is said to have been so named as the village was established near an old mound or fort.

Mahal-i-Nahrui	{	Kala-i-Nau or Burj-i-Alamdar.
		Kala-i-Kuhna.
		Deh Sukhta.
		'Aliabad.
		Kaftargi.
		Kala-i-Baz.
		Kimak.
		Khwaja Ahmad.
		Sharifabad.
Deh Kalik Dad.		

Sharifabad was built at the site of Deh Nazar Khan; Sardar Ibrahim Khan, Sanjarani, gave this village and Khwaja Ahmad to Sharif Khan, Nahrui, when he married Sharif Khan's sister, Bibi Begum.

Mahal-i-Shahraki	{	Dashtak.
		Jazinak.
		Burj-i-Sar-i-Band.
		Wasilan.
		Gauri.
		Kamak.
		Sazla.
		Malik Haidari.
		Deh Ali Jafir.
		Deh Bazzi.
		Ziarat Gah.
Kala-i-Kang.		
Pulgi.		
Luf.		

*Mahal-i-Sanjarani	{	Jahanabad.
		Tilfak ( <i>i.e.</i> , Tiflak).
		Khadang.
		Zahidan.
		Deh Masti Khan.
		Shahristan-i-Kuhna.
		Shahristan-i-Nau.
Kaud.		

Khwaja Ahmad and Deh Nazar Khan were given to Sardar Sharif Khan by Sardar Ibrahim Khan as already stated.

Mahal-i-Sarbandi.—The remaining villages of Seistan.

This tract comprised many villages in the original Pusht-i-Ab tract which had come into possession of the Mir family such as Iskil Kasimabad, Bunjar and others as well as the Sarbandi villages of Sihkuha, Warmal, Tuti, Chilling, Daudi, Afzalabad, and others.

Since the original strongholds of the Sarbandis, Sharakis and Nahrui were in the Shib-i-Ab, their *mahal* was considered to be in the Shib-i-Ab division of the country, even though they acquired villages across the boundary formed by the line of the ancient Rud-i-Dali.

There were of course many changes in the direction of the main stream before it left this side of the delta; at one period a *band* was built each year at Burj-i-Sar-i-Band to force water down the Rud-i-Hasanki, now a tamarisk weir is put in the head of the Rud-i-Hasanki to prevent it drawing the Rud-i-Seistan down its channel. Such changes are small year by year and pass unnoticed except to the most

\* Jahanabad was cut off from the Rud-i-Seistan in the flood of 1885 and became Miankaengi. Shahristan-i-Nau and Kuhna are now in Mahal-i-Nahrui having been given by Sardar Ibrahim Khan to Sardar Sharif Khan. The remaining five villages are now in Pusht-i-Ab.

observant; but when we differentiate between wide limits of years the changes are large and lead to big results. In making inquiries about such changes one soon realises that each observer attaches importance to those positions of the river which came most under his observation; and it is very difficult to decide whether two men are speaking of the same, or widely different phases of the river. The people themselves are observant and accurate, but events in the physical, like those in the political history of the country, shade off so gradually that the labour of unravelling them is immense; and is only useful as a training to understand the full import of the big changes, which, though brought about by gradual, one might say continuous movements, often develop with great suddenness and with far-reaching effect.

In the time of the Sarbandis the population of the country was small and the work of *band* making was much greater than it is now, as the main stream was narrower, steeper and deeper than it has since become. Ali Khan, second son of Mir Khan, Sarbandi, therefore ordered that each Sardar should bring every able-bodied male to the work as soon as the order for the annual repairs was issued.

The supremacy of the Sarbandis came to an end when Mir Alam Khan of the Mahal in the time of Mir Alam Khan, Kain arrived as Persian Governor of Hashmut-ul-Mulk, Seistan. Some say that he accepted the following Mahal\* in Seistan.

Pusht-i-Ab, the tract irrigated by the Rud-i-Hasanki, which comprised the Kayani Mahal except Bahramabad and the villages of Bunjar, Iskil, Kasimabad and others that had once belonged to the Kayanis. The Sanjarani villages were included in this Mahal.

The Shahraki, as already given.

The Nahrui, as already given.

The Sarbandi, the villages already given less those in the Pusht-i-Ab.

Others say that Mir Alam Khan anxious to thoroughly break the power of the Sarbandis would not recognise this Mahal and that there was no Mahal, called the Sarbandi Mahal, in his time, but the Sarbandi villages were called Shib-i-Ab; they are certainly so called at this time.† It is also said that his enmity extended to all the Baluch Mahal and they were all classed as Shib-i-Ab, and thus he reverted to the Kayani distribution of Pusht-i-Ab and Shib-i-Ab as divided by the old Rud-i-Dali; but the Mahal-i-Nahrui and Mahal-i-Sharaki are still used for administrative purposes.

By the time Mir Alam Khan of Kain took up the Governorship in Seistan the shares into which Mir Alam Khan divided labour was more plentiful, and it is said that he first divided out the work on the *band* and other public works among the Mahal on fixed shares, giving  $\frac{2}{3}$  to the Mahal-i-Pusht-i-Ab and  $\frac{1}{3}$  to the Mahal-i-Shib-i-Ab.

The Shib-i-Ab (by a private arrangement of their own perhaps) subdivided their work; the Sarbandis taking  $\frac{3}{4}$  and the Shahrakis and Nahrui  $\frac{1}{4}$ . The latter again subdivided their share, the Shahrakis taking  $\frac{3}{4}$  and the Nahrui  $\frac{1}{4}$ . So that the work was divided out as follows:—

				Per cent.
Pusht-i-Ab	...	...	$\frac{2}{3}$ ... $\frac{40}{100}$	40
Sarbandi	...	...	$\frac{2}{3} \times \frac{3}{4} = \frac{3}{4}$ or $\frac{75}{100}$	36
Shahraki	...	...	$\frac{1}{4} \times \frac{3}{4} = \frac{3}{16}$	14.4
Nahrui	...	...	$\frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$	9.6
				100

\* The Miankangl Mahal was formed gradually by changes in the main stream of the river which about 1880 began to throw out *shala* to the west, leaving dry tracts of land near the Afghan border. Early in the eighties Ali Khan, Saruni, recovered the lands around Karku Shah and Deh Dost Muhammad from the Naisar.

† Later on those western distributaries of the river cut off villages from the area irrigated by the Rud-i-Seistan, till the present position of the main stream, known as the Rud-i-Parian, was reached in 1896. The river still shows a disposition to travel to the west and probably in a few years another parcel of land will be added to the Miankangl.

† See the official list of villages in appendix 41.

This division of labour is said to have been observed so long as the Shahraki and Nahruī Chiefs held their villages, but when these Chiefs disappeared the labour was organised on the number of *ghami* ploughs that cultivated, though on some small works, such as protection embankments and works in the City, when only small gangs are needed, the labour is still called out on this old system.

The accompanying list gives the villages that supplied the labour to the Band-i-Seistan this year (1904) with the number of men levied and the number of *ghami* ploughs in the village:—

Serial No. of village in Statement "A."	Name of village.	Number of <i>ghami</i> from each village.	Number of men from each village.	Number of <i>ghami</i> ploughs in the village from Statement "A."
<i>Mahal-i-Nahruī.</i>				
6	Chah-i-Nima ... ..	...	16	7
10	Kala-i-Kubna ... ..	...	40	30
11	Khalakdad ... ..	...	9	10
12	'Aliabad ... ..	...	3	20
13	Sukhta ... ..	...	1	15
14	Bagi ... ..	...	1	9
15	Shamsabad ... ..	...		
Total number of men from Mahal-i-Nahruī		...	5	120
<i>Mahal-i-Shahrakī.</i>				
16	Wasilan ... ..	...	4	20
17	Pulgi ... ..	...	30	6
18	Pulgi Asghar ... ..	...	30	10
19	Jazinak ... ..	...	...	31*
	Miran ... ..	...		
	As-i-Ghazi ... ..	...		
	Deh Haji Beg ... ..	...		
20	Luf ... ..	...	4	12
Carried over		...	8	79

\* See also Deh Kul No. 69 under Mahal-i-Shah-i-Ab.

Serial No. of the village in Statement "A."	Name of village.	Number of <i>patar</i> from each village.	Number of men from each village.	Number of <i>ghami</i> ploughs in the village from Statement "A."
	Brought forward	8	200	79
<i>Mahal-i-Shahraki—contd.</i>				
21	Dashtak	...	60	12
28	Khamak	...	30	16
	Ziarat Gah	...		
	Deh Asghar	...		
	Total number of men from Mahal-i-Shahraki	8	290	107
<i>Mahal-i-Shib-i-Ab.</i>				
33	Husainabad Pilpili ( <i>Filfilli</i> )	...	10	20
34	Sihkuha	...	60	27
39	Deh Miran Haji	...		
37	Warmal	...		
35	Pusht-i-Dasht	...	70	33
36	Ali Beg	...		
40	Muhammadabad	...	30	22
41 & 42	Kausha Mir Jafar Khan	...	30	17
46	Taki	...	11	12
47	Tuti	...	40	20
57	Khari	...		
49	Akhund	...	50	18
51	Ismail	...		
48	Deh Duwana	...		
44	Deh Allai	...	50	20
52	Daulatabad	...		
53	'Ali Salar	...		
54	Deh Naigard	...	4	20
32	Char Khani	...		
	Carried over	20	351	189

Serial No. of the village in Statement "A."	Name of village.	Number of <i>pakar</i> from each village.	Number of men from each village.	Number of <i>ghami</i> ploughs in the village from Statement "A."	
	Brought forward	...	20	351	189
	<i>Mahal-i-Shib-i-Ab—contd.</i>				
56	Tilar	...	...	10	5
58	Khadri	...	...	...	...
63	Gurg	...	...	12	4
67	Muhammad Safar	...	4	24	10
69	Kul*	...	...	8	22
71	Nasirabad	...	...	15	6
72	Afzalabad	...	...	8	9
80	Akbar Abbas	...	2	15	15
82	Muradi	...	...	10	4
87	Abbas Khan	...	...	...	...
	Deh Sufi	...	1	10	7
90	'Ali Akbar	...	1	20	12
95	Muhammad Azam	...	...	4	3
96	Husaina Baba	...	...	...	...
97	Sher Dil	...	...	30	17
	Total number of men from Mahal-i-Shib-i-Ab	...	28	517	303
	GRAND TOTAL	...	41	927	490

\* Jazinak No. 19 in Mahal-i-Shahraki also belongs to Kadkhuda Taj Muhammad Kul. Total number of ploughs belonging to the Kadkhuda is 53 and total number of men sent is 88.

#### *Mahal-i-Pusht-i-Ab.*

The 'Hashar' of the Mahal-i-Pusht-i-Ab had worked on the silt clearance of the Rud-i-Hasanki for about one month only 108 men came to Band-i-Kuhak and worked there for 5 days; they were then taken to dig the Chah-i-Nima canal for the Deputy Governor. Here they worked for 10 days, so also did all the other labourers that had worked on the *band*.

It is interesting to note that the cultivators of all the *tahwil* or *beghami* ploughs also worked on the silt clearance of the Rud-i-Hasanki.

## APPENDIX 6.

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VIDE CHAPTER X, PAGE 55.

*Statement showing the usual time of sowing and harvesting of the various spring and autumn crops with the corresponding phases of the river.*

*Autumn*—Spring crops—Autumn crops—The river—Its reliable autumn flow.

*Winter*—Spring crops—Delta of the Khash Rud—Rain and snowfall—*Khudvau* crops—Rain water collected off the *dasht*—The river—Winter floods—The breaching of the *band*—Winter floods of the three years 1903-04-05.

*Spring season*—Autumn crop sowing—Spring crop harvest—Opium—River—Floods.

*Summer season*—Autumn crop—Sowing—Harvest.

The wind of 120 days.

Spring crops—Harvest of the last crop—Early waterings of next crop.

River—Minimum river in 1903 and 1904—Times of *band* making.

## APPENDIX 6.

VIDE CHAPTER X, PAGE 55.

Statement showing the usual times of sowing and harvesting of the various spring and autumn crops with the corresponding phases of the river.

## AUTUMN.

*Autumn Equinox (21st September) to Winter Solstice (21st December).*

The sowing of early wheat begins on the 21st September and the sowings made up to the 21st December are considered early; after that date they are called late sown. Early sowings of barley and *adas* begin about the middle of December. Opium is sown in November and December. Sowings cannot be made without water; the land has been thoroughly desiccated by the strong hot dry winds of summer. There is never rain at this season to assist the sowings.

The waterings to mature autumn crops end about the middle of September on the arrival of the shorter cooler days. The crops are harvested in October and threshed out by the end of November. Carrots and turnips are dug up from the end of November to the end of January.

During this period the river\* is steadily rising from its minimum by the effect of the decrease in evaporation loss<sup>es</sup> owing to the shorter and cooler days and longer and colder nights.

The most valuable characteristic of the Helmand is the reliability of the autumn flow. In Appendix 24 the history of each year since 1877 is given, and it will be seen that the flow has never been known to fail at the sowing time of wheat.

## WINTER.

From the Winter Solstice (21st December) to the Spring Equinox (21st March), *Nauruz* or New Year's day, a great Persian festival.

This is the season for making the late sowings of wheat and sowings of barley and *adas*. The sowings of wheat usually end early in February, but at times they are extended to *Nauruz* even on the Helmand delta; the Khash seldom comes down in flood till the middle or end of March, so that in the delta of the Khash the sowings of wheat as well as those of barley are usually made each year at that time. In normal years the sowings of barley extend up to the middle of March or even to *Nauruz*. In 1903-04 the bulk of the sowings in the Miankangi were made in February and March, because the previous autumn crop had been a heavy one and the people had no leisure or inclination to work at spring crop (*Rabi*) sowings till late in the season. Not only does the Helmand river receive its freshets and floods at this season, so that the canals flow full and there is ample water for irrigation if needed, but rain, and in most years snow, also falls, which provides moisture to mature the crops. The ten inches of snow on the 13th January 1904 caused the demand for irrigation to cease till the beginning of March. Again in 1905 on the Rūd-i-Seistān canals large volumes of water were run to waste in January and February and crops were destroyed near Muhammadabad and Chilling.

It may be noticed that no ploughings and sowings are done on rainfall in Seistān. The rainfall is never sufficient for this purpose. Some self-sown (*khudrau*) barley was matured on rainfall alone in an exceptional year like 1902-03.

\* In 1902 the river was dry for 3 months below the Rudbar canal head, and the water did not again reach the Band-i-Seistān till about the 22nd September; to do this it had to burst the *band* across the river below the Rudbar canal head, another *band* across the river below the Khoga canal head. A considerable volume must have come down, as it reached the City nearly 30 miles from the *band* measured along the water channels by the 24th morning.

In 1903 the river reached its minimum on the 14th September (1,609 cusecs) and in 1904 on the 19th August remaining at its minimum (903 cusecs) till the 29th August; by the 21st September the volume was 1,228 cusecs against 1,840 cusecs on the same date in 1903.

In 1905 the river reached its minimum of 300 cusecs at the end of August.

In some places favourably situated for the purpose the cultivators conduct water to their fields from ravines that are fed from rain that falls on the high lying bare plateaux, called locally *dash*. The areas of crops thus raised on rainfall are very *small* indeed.

In 1904 the sowings of wheat and barley were made early, and at the end of November there was a good shower that did much good to early sown wheat. The light showers and cold weather of January and February 1905 did the crops much good.

During this period the freshets come down the river due to the winter rains,

River.

These are the only rains\* that normally reach the valley of the rivers that drain into the lake of Seistán.

In years of good flood the Band-i-Seistán is breached, so that it ceases to have any effect on the distribution of the supply to the Rüd-i-Seistán.

Major Benn says that rain fell on the 29th October 1902; the first shower since 21st March 1901 and between the 1st and 15th December the Band-i-Seistán was completely demolished. When the Mission arrived at the *band* in February 1903, the afflux was only two or three inches.

In the year 1904 the *band* was gapped in January and ceased to have any effect on the supply level after the 10th March. Between the 1st and 10th March the volume rises suddenly due to the combined effect of the February rains and the snow melted by the warmer days.

In the year 1905 good rain fell in Seistán at the end of November, and at the same time general rain fell over the Helmand valley and extended into India, but in December and January there were no good falls of rain. At the end of January there was great cold and the river during January and February was unusually low and the *band* remained intact, except for a small breach that occurred during a small fresh in February. The *band* was breached by a sudden flood of 15,216 cusecs on the 20th March 1905. The volume of the river soon fell and did not rise again till the end of April. The maximum volume, only 16,853 cusecs, occurred from the 4th to 7th of May. The damage done to the *band* this year could only have been slight.

#### SPRING SEASON.

##### *From Spring Equinox (21st March) to Summer Solstice (21st June).*

This is the season for sowing the summer crops of melons, millet and maize and cotton and *másh* which should all be sown before the end of May, though late sowings of water melons and maize can be made in July. Millet is sown before the end of April.

Autumn crops.

China (*arzan*) and tobacco are sown early in March.

Spring crops.

The final waterings to spring crops are given by the end of March or middle of April.

About the first of May the harvest of barley begins and about the 15th May that of wheat; both wheat and barley are harvested by the middle of June. In abnormally cold or cool years like 1902-03 and 1904-05 the harvests were three weeks and a fortnight late respectively. It is a defect in the Helmand river that the floods come in April and May before the corn is harvested.

The poppy is in flower in April and the juice is extracted during May. Some cultivators of Lutak were making incisions on poppy heads in the cultivated fields I last saw, when I left Seistán on the 16th May 1905.

\* Only one flood is remembered to have occurred in July and that happened about the year 1859 and it is known as the *Sul-i-Sel-i-oh Sarkh* or the year of the flood of red water. Occasional thunderstorms come into the Helmand valley during the period of the south-west monsoon, but they are extremely rare and with the exception of the year 1859 only cause a very slight discoloration of the otherwise crystal clear water of the river.

During April and May the river is in full flood. The flood is at its height about the end of April and begins to subside about the end of the first or second week in May. The volume of the river falls steadily after the floods have passed away and continues to dwindle till the minimum river is reached.

River.

In 1903 the maximum flood was on the 1st May (70,000 cusecs) and by the 21st June the river had fallen to 13,650 cusecs. The people say that the river becomes fordable at the gathering in of the harvest, and in 1903 the harvest was about three weeks late. The river did not become fordable till the first week of July.

In 1904 the maximum flood was on the 13th April (27,000 cusecs); by the 21st June the river had fallen to 5,834 cusecs.

SUMMER SEASON.

*From the Summer Solstice (21st June) to the Autumn Equinox (21st September.)*

Autumn crops.

Late sowings of maize and melons and sowings of *másh*, til, carrots and turnips are made.

The autumn crops have to be matured. Water melons ripen at the end of June or early in July. Grapes become plentiful about the end of July.

The *Bad-o-sad-o-bist ruz* or the one hundred and twenty days' wind blows during this season. The wind usually begins about the 20th May, two months after *Naurus*, and blows to the end of August. During this time it blows almost continuously, in years of exceptionally strong wind like that of 1904, the breaks only lasting a few hours till the end of August when the breaks get longer and the wind blows on a few days only in September. In 1903 the wind did not set in properly till the middle of July and had blown itself out about the middle of September.

During this period the thrashing of wheat and barley is vigorously carried on. In most villages the produce is divided out by the middle or end of September. Though occasionally where officials are obstructive this may not be done till later.

Spring crops.

At the end of August or early in September the land is flooded, so that ploughing and sowing may begin at the Equinox.

During this period the river falls steadily to its minimum about the end of August. The strong dry hot winds that blow must cause an enormous loss of water by evaporation.

River.

In 1903 there was ample water everywhere to mature the large areas of melons and millet that had been sown on the lands flooded by the high river in May; even on the Rúd-i-Seistán there was ample water, although nothing remained of the *band*.

On the Nad-i-'Ali channel there was so much water that the Parian *band* was not made in 1903-04 at all; the first time it had been omitted since it was first made in 1896.

In 1904 there was not sufficient water on the tail canals of the Rúd-i-Seistán in the Shib-i-Ab, and on the Sikhsar and Ibrahimabad canals of the Nad-i-'Ali channel. The Persians and Afghans began the *band* at Shahgul and the Parian in July, but the Rúd-i-Seistán *band* was not made till September as usual. This *band* is not made till the canal clearances are done; in a year like 1904 one would have expected that all this work would have been done earlier and water got to mature autumn crops, but the Rúd-i-Seistán people lay themselves out to cultivate wheat and barley, and attach but little importance to the crops of the autumn harvest.

Some interesting information about the Seasons in Persia is given by Khán Bahádúr Maulá Bakhsh in Appendix 40; the Note was received after this work was set up in type.

## APPENDIX 7.

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*Administration of canals in Persian Seistán.*

The mirab and his duties—Remuneration of the mirab—The duties of the mirab on the *band*—Distribution of the supply when the river is low—Silt clearances of village canals—The bridging of roads—The Miankangi canals—Silt clearance and *band* making—Some big works on the Rüd-i-Seistán—Making a new canal for Deh Dargi.

## APPENDIX 7.

*Administration of canals in Persian Seistan.*

The Hashmat-ul-Mulk, it is said, appoints two or three of his most influential and favourite leading men to supervise the arrangements for working these canals.

*The mirab and his duties.*

The charges are : (i) for making the *band*, (ii) for the supervision of the canals of the Rud-i-Hasanki which irrigates the Pusht-i-Ab, (iii) for the supervision of the canals from the Rud-i-Seistan below the Rud-i-Hasanki head, at Shahristan-i-Kuhna, which irrigate the Shib-i-Ab.

Sardar Purdil Khan has been mirab for both the Shib-i-Ab and the *band* for some years.

Mir Sher Ali Khan, a cousin of Mir Muhammad, Kalantar of Iskil, was mirab of the Pusht-i-Ab in 1904. It is said that the Kalantar had been the mirab, but he offended the Hashmat-ul-Mulk and lost the appointment, which is one of honour and distinction. It is said that the *shirini* or *pishkash* to be paid on appointment is 15 *tuman*, and this must be renewed each year.

The duties of the mirab are responsible; he sees that the canal system is drawing a proper supply, and if not, represents matters to the Governor; that the canals of the system are properly repaired by the *kadkhudas* before the time of sowing; that each canal receives its proper share of water.

The mirab cannot be said to be directly remunerated; he is always a person in high favour at the time with the Hashmat-ul-Mulk and enjoys the advantage thereof in many perquisites peculiar to the land he lives in; the office of mirab is only one of these. The present mirabs have quite a high reputation and very few complaints are heard against their administrations.

*Remuneration of the mirab.*

When the season of low river (about August) arrives, Sardar Purdil Khan, as mirab of the Band-i-Seistan, takes the Bandbaf (Appendix 8) with him and inspects the Rud-i-Seistan and issues orders to the various *kadkhudas* for the silt clearances and special repairs that must be done before the *band* is made to increase the supply.

*The duties of the mirab on the band.*

The site of the *band* is then inspected and the work to be done considered. The mirab then makes his report to the Hashmat-ul-Mulk proposing the number of men that should be called out. The operations of the *band* building have already been described in Chapter XIV.

The watchmen on the *band* report all untoward accidents to Sardar Purdil Khan and he issues the orders for the necessary repairs, or in case of excess supply down the *Rud* for a gap to be made in the *band* to relieve the supply.

The duties of *band* making and canal repairs are very efficiently performed, but the work of distributing the supply, as may be expected, and as has been said on

page 102 of Chapter XIV, is not efficiently done. This duty has not often to be exercised, and when it does the temptations to let weak villages go to the wall are greater in Seistan than in India.

The season of low river covers the maturing time of melons; the crop that appeals to every Seistani's heart and the sowing time of wheat. These follow each other and the tight time, when it comes, extends from the end of July to the end of November as a general limit. In years of deficient river at this season the mirab inspects the canal heads and reduces the size of those that are getting more water than their due share. If the mirab is bent on doing justice by all he considers the number of ploughs on the canal and allots the water by what we should call guessing, but with the Seistani noblemen, as well as cultivator, it is a sense he inherits, so that he distributes water with the same ease and accuracy as a British farmer distributed beer in the good old days of the home brewed ale.

In extreme cases the mirab may order a rotational closure of the canals, but no one I met had seen this done in recent times.

If any village disobeys the orders of the mirab, the kadhuda and cultivators are fined and the money paid to the Hashmat-ul-Mulk.

At times of high supply such villages as are injuriously affected close their canals at the heads; no permission is required to do this. Some are too lazy to do it, and the State lands are ruined in consequence. A good mirab should certainly insist on this being done.

Villagers can be trusted to silt clear their own canals, but in case the kadhuda is slack, the cultivators may appeal to the mirab to see that proper arrangements are made. The canals are silt cleared before the labour goes to the *band* repairs, and in case of any change in the cultivators of the plough, it is done by the men who have reaped the harvest and not by those who are about to sow. Canal repairs like *band* repairs are of course only done by the *ghami* cultivators. The only exception is the Rud-i-Hasanki silt clearance this year on which all the *beghami* cultivators also worked.

Any road that the Hashmat-ul-Mulk considers important must be bridged where it crosses the canals, and the mirab sees that the kadhudas do not neglect these bridges. Influential people see that the road from their village to the City is properly bridged. It is surprising how quickly these bridges are re-made when carried away and just as surprising how others are neglected.

Canals in the Miánkangi are managed in the same way as those on the Rud-i-Seistán.

The Miankangi canals.

There are three main systems—first, the Deh Dost Muhammad canal that takes out below Burji-i-As, where the old Helmand bifurcates into several channels. This canal irrigates the lands of which Dost Muhammad, Saruni, is kadhuda; his father, Ali Khan, was the first to reclaim lands in the *warshufti* of the Miánkangi, and the son is the leading man on the irrigation system.

Second, the Deh Siadak and Jahanabad canal system; also known as the Lakhshak. This canal has had several vicissitudes since the Parian channel formed. It was at one time fed by a channel from above the Parian *band* at Shahgul. It can also be fed from the tail of the Nad-i-'Ali channel at the same place as the Deh Dost Muhammad canal. But at this place the canal has a great draw and the Persians and Afghans have agreed to feed it from a point above Burji-i-As. Even at this point its head must be controlled by tamarisk to moderate the supply it draws. The Afghans and the Persians up to 1898 used to arrange these details amicably between themselves, but of late years the control of the Lakhshak has been a subject of friction.

The water of the Nad-i-'Ali channel at low river has for years been divided half and half between the Afghans and Persians, and careful observations made shew that it was so divided all the time the Mission was in Seistan. The Lakhshak system of canals is under Khan Jan Khan, Sanjarani, who has a long term contract for the collection of the Government revenue in the tract irrigated thereby.

The third series of canals take out from the Parian near Deh Haji and irrigate Deh Khamak, Shaikh Waisi, Pulgi, Takht-i-Shah, etc.

The general administration of these canals was carried out by Malik Gulzar Khan, Kayani; and since his death in June 1903 no one seems to have general charge of them. But Sultan Mir Husain Arab has great influence in this district and probably he, or one of his nominees, supervises the system.

Some 6 or 8 years ago the silt\* was cleared from the bed of the Rud-i-Seistan from the head to Burji-i-Sar-i-Band. The Rud-i-Hasanki is also cleared once

Silt clearance and *band*-making.

\* This year a large supply of very clear water went down the Rud from February to April and the channel has secured out, and is now deeper than usual in its upper reaches.

in 3 or 4 years; it was cleared in 1904, the *beghami* cultivators being turned out as well as the *ghami* ones; this is very unusual.

Works of silt clearance in the Shib-i-Ab are distributed by the Bandbaf among the villages called out, and in the Pusht-i-Ab by some one deputed for this purpose by the mirab. A reach is chosen for the day's work and all the villages work at that reach being given a length proportional to the number of ploughs in the village. No measurements are made, but each village must finish its task that day and be ready to go on to the task appointed for the next day. This insures that each village has a like share of deep silt and shallow silt. Work on embankments is given out in the same way. No baskets are ever used; nor is the use of the bullock scoop known; the men are arranged in lifts and all earth is thrown by the *tisha* from lift to lift. As a result silt lies high on the spoil bank; and borrow pits for embankments are made at the toe of the embankments themselves, whilst the slopes of the banks are about 1 in 1 or less. All this is done to save distance in the throw. The earth in Seistan is of such a remarkable good mixture of clay and sand that a bank seldom or never slides down into a borrow pit; doubtless the Seistani noticed this property and saved labour accordingly. Banks that are meant to withstand water or wind action are pitched by burying tamarisk in them in layers just as is done in the Punjab on the inundation canals of Multan.

It is said that in silt clearances the bed width is tested by a rod or stick and that the length of the stick is reduced as the silt clearances progress towards the tail. This stick is wielded by a *pishkar* or assistant appointed by the mirab, in the Shib-i-Ab; as already said, this is the Bandbaf. The bed slope is sometimes tested by allowing a small flow of water down the bed. But they usually trust their instinct or observation for this. The mirab usually inspects the work before water is admitted.

Sardar Purdil Khan has had some difficult engineering problems to negotiate on the Rud-i-Seistan. In 1898 he turned the *Rud* from its old channel near Aliabad into a new channel in the lands of Kimak and Dashtak by which he secured an assured supply to the villages of the Shib-i-Ab, though he put much good land in Kimak and Dashtak under water, but this was not a serious matter, as the cultivators could remove to the lands brought under the better supply.

In 1903 the Rud-i-Seistan developed a tendency to breach its right bank near Khamak, the water passing in large volumes by Kunderak to the escape at Atzalabad. Two or three attempts to prevent this were only partially successful; so in 1904 Sardar Purdil Khan cut a diversion for the *Rud* as well as building embankments. The work stood the test of the floods of 1905. But these were light and there are signs that the Rud-i-Seistan has now a command of level over this low ground, and if not carefully watched, will develop a channel down it to the detriment of the villages of the Shib-i-Ab. This may lead to a *band* being required at this place to prevent the water going down the escape and forcing it into the canals of the Shib-i-Ab. There is only a small quantity of tamarisk near the site, so the *band* will be difficult to make.

In 1904 a new canal was made for Deh Dargi at the tail of Rud-i-Hasanki, because it did not get a fair share of the water from the canal that supplied Deh Dargi, Deh Arbab, Deh Shaitan and Deh Kala-i-Nau. The *kadkhuda* applied to the Hashmat-ul-Mulk, giving at the same time a *shirini* of 300 *krân*; thereupon the Governor ordered the mirab to turn out the *hashar* of the Pusht-i-Ab Mahal to dig the canal. The *kadkhuda* also spent 120 *krân* on entertaining the *kadkhudas* who came with the labour to tea and *sherbat* in the Persian fashion. But had he not been in favour and his *shirini* been accepted, he would have had to pay the labour and had considerable difficulty in persuading it to come to his work. The mirab with the assistance of the *pakar* chose the line, small marks of earth being placed to shew where the canal was to go. They studied the dimensions of neighbouring canals that irrigated land for the same number of ploughs and thus arrived at the size of the canal that they required.

## APPENDIX 8.

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*The Bandbaf.*

The descent of the Bandbáf—The *band* at the tail of the Trakú channel—Some details of the Bandbáf family—Remuneration of the Bandbáf.—From the ploughs—From Sardár Purdil Khán—From the Hashmat-ul-Mulk.

Some useful details of previous *band*—Major Euan Smith's account of the *band*—Tamarisk material for making the *band*—Method of gauging the equal division of the water—Placing the bundles of tamarisk in deep water—Detail of labour employed on the *band*.

## APPENDIX 8.

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*The Bandbáf.*

The Bandbáf Muhammad, a man of about 50 years of age, says that he has heard his father say that Jafar\* his great grandfather learnt the art of *band*-making from a Khalifa-i-Rumi or Turkish expert. Muhammad's *taifa* is called *Audí*, i.e., *Ab deh* or the distributor of water. The family were employed on the *band* that used to be made at the end of the Traku channel when the Reis family† ruled at Hauzdar and Kala-i-Reis (Macchi). He says that the regulator was made of brick and the openings were adjusted to the sizes of the canals; a very small masonry regulator has been found near Gird Kalat by Mr. Tate, but there are no minor openings in it such as the Bandbáf describes.

When the Hauzdar tract went out of cultivation Jafar, the head of the family, came to Sihkúhá with Mir Kuchak Khán, Sarbandi.‡

Mullá Akbar, son of Jafar, the contemporary of Mir Khán, Sarbandi, was carried away by the current and drowned when building a *band* near the present village of Shahrak. Since then the Sarbandi Chief has always been a friend and patron of the Bandbáf. Sardar Muhammad Raza Khán gave Ghulam Ali cultivation at Deh Tuti, which was in the Naizár where *tut* (bulrush) grew; now of course no *tut* grows within 15 or 20 miles of Deh Tuti. Akbar is now too old to work on the *band*, so that Muhammad, who has no children, trains his nephews. Muhammad began to work on the *band* in the time of Kadkhuda Abbas Rahan, a celebrated man who was brought to Seistán by Muzaffar-ud-Daula (about 1866).

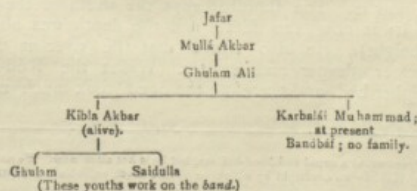
The papers which the family had from the Reis and the Sarbandis were taken by Mir Alam Khán, Hashmat-ul-Mulk, saying that he would give them papers that would establish their claim to the post of Bandbáf for ever: so it has come about that, like many other families in Seistán, they have now no papers.

The family is paid 2½ *man* Seistáni of grain from each plough in all the villages that take water from the Rúd-i-Seistán; this would amount to some 5,000

Seistáni *man* of grain, or the whole produce of a very strong plough of cultivation, but the difficulty of collecting the grain robs it of much of its value. The Bandbáf has no difficulty in collecting the grain from the Sarbandi villages in the Shib-i-Ab Mahal, as these are under the influence of the Sarbandi Chief. To some villages he sends a man to accompany the Sar Mashrif and to collect his dues, and in others he sells a contract to some one in the village; a good deal of the grain is thus paid away in collecting it.

The Governor also allows him 300 Seistáni *man* of barley from his own grain. At one time the family were allowed a free plough of cultivation, but this has been withdrawn and this allowance given instead, thus effecting a saving of some 6 to 7 *kharwar* of grain to the Governor. The Amir, Alam Khan, the father of the present Governor, gave the Bandbáf a *khilat* each year when the work was done; this is now seldom given; both these reductions in emoluments tend to show that the work is not so difficult and anxious as it was, and bears out what Muhammad says, as will be explained further on in the note.

\* Genealogical tree of the Bandbáf family, who now live at Deh Tuti.



† From what the Bandbáf and one of the Reis family, which still survives, say this was about A. D. 1770.  
‡ In the time of Sardár Ali Khán, Sarbandi, 5 Seistáni *man* per plough was given and the Government share of the produce of one plough

Sardár Purdil Khán each year shows his appreciation of Muhammad's work by giving him a substantial present when the *band* is closed in ; moreover, to add to the authority of the Bandbáf, he is distinguished from the workers on the *band* by having his meals with the Sarbandi Chief, and eating from the same dish so long as they live together at the huts at Kúhak. Apparently on the completion of the Band Sardár Purdil Khán visits the Hashmat-ul-Mulk, and presents him with *shirini* worth some 50 or 100 *tuman* for being allowed the distinction and honour of making the *band*. The Hashmat in return congratulates him on his success and gives him a *khilat*. The Bandbáf says that this ceremony is always performed. The Bandbáf thinks the post of Sardár in charge of the work is a source of profit, by the cash recovered from those who do not attend ; but this is not the general impression among the people of the country.

The Bandbáf has much interesting information to give of the former sites of the *band*. When the main stream went down the Nad-i-'Ali channel Mir Khán, Sarbandi, moved the site of the *band* from Sháhrak to Sarrak, a site below the present Kúhak fort, where the Bandbáf's father found a hard sound bed in the river. The trace of the old channel from this site to Sháhrak can still be followed by those who remember it ; to whom this site is also known as Band-i-Muhammad Raza Khán, as he for years renewed the *band* at Sarrak. His son, Sardar Ali Khán, moved the *band* to the Kúhak fort, the channel from the older site having silted up, so that at flood time the water overflowed the banks of the channel and did damage in the lands of the newly established villages. The Bandbáf says, in order to find the best site for the *band*, 11 canals were made and the canal which drew best was chosen as the cut by which to lead the water.

This\* canal was dug by the Kadkhuda Ghulam Raza, Kakhá.† The Kakhás are by tradition the *band*-builders from the most ancient times, and it is believed among the people that one of the family has always been present as a leader on all *band* built on the lower Helmand for the irrigation of Seistán.

The tamarisk foundations (*bun-i-band*)‡ of this *band* were washed away in the Sái-i-barf and the new *band* was made at a short distance upstream of the old. The following autumn Láj Muhammad Khán escaped from Teheran and passing through Seistán burnt the *band*. The Amir Alam Khán came in pursuit from Káin and found the inundations out, so that he had to cross the Sar-i-Shela at the Rah-i-Gardan Reg near Gumbad-i-Liddi. The year was cold and the floods were unusual, and although the Amir collected all his men and employed his soldiers to carry tamarisk from the thickets near Shahrístan-i-Kuhna, yet he was not able to complete the *band* and many villages were not able to irrigate their crops. The next year no success was obtained with the work till the Hashmat-ul-Mulk released Kadkhuda Ghulam Raza Khán, Kakhá, whom he had imprisoned at Káin for taking too active an interest in the fortunes of the Sarbandis. The Kadkhuda rose to the occasion and backed up by the Governor turned out every able-bodied man in Seistán, and cleared the silt from the upper reaches of the Rúd-i-Seistán to lower its bed. He also made a piece of new channel as a leading cut at the place where the head of the Rud-i-Seistán is now ; the site of the *band* being for the first time placed where it now is. The Bandbáf says the width of the leading cut was 60 feet about ; it is now 120 feet ; and the depth was about 6 feet (one *qad* or man's height). He also states that the river at Kuhak in those days was narrower, deeper and swifter. Whilst the Rúd-i-Seistán had a narrower and higher bed and therefore the *band* took much more labour and

\* He was man of renown as a canal and *band*-builder, but he is not alive now. We unfortunately did not make the acquaintance of any Kakhá—an oversight by which we missed much valuable information on this subject.

† This event took place 30 years before Sái-i-barf (1877).

‡ The *Bun-i-band* have only been swept away on three occasions in Muhammad's time ; in Sái-i-barf 1877, Sái-i-Nuh (1883) and in or about 1896 ; on each occasion they had great difficulty to build the *band* in the following autumn. Mr. Merck was told that the *band* was not repaired in 1885 after the flood.

a longer time\* to build it. He thinks that the width was but a third of what it is now.† The depth was so deep that steps were made in the vertical bank (*karod*) to get to the water. Moreover, when the trenches were dug to enable the tamarisk to be dovetailed into the bank, the earth had to be thrown out in three lifts. This dovetailing of the tamarisk into the banks, is called † *tirg*; it is a work of cardinal importance and is carefully supervised by the *Bandbáf* himself. It is done to make the *band* hold the bank and to prevent it being outflanked. At the present time the "dovetail" is laid in the sand of the river's bed and a retired embankment is made across the sands to the natural ground which is now not much above the level of the *band* crest.

Judging from what the *Bandbáf*, *Dadi*, formerly *Kadkhuda-i-Kalán* in *Afghán Seistán*, and *Mazar*, *Bandbán*, say, the level of the river at *Kúhak* is now some 7 feet higher than it was in the later sixties or early seventies.

It will be useful to study the account given of the *band* by Major Euan Smith, who visited the work with General Goldsmid, Captains Beresford Lovett and Smith and Quarter Master Sergeant Bower on the 18th February 1872. The account is carefully written and fixes some useful details, so that it is reprinted here for ready reference.

Description of the *band* written in 1872 by the members of Goldsmid Mission.  
 Vide page 281 of Volume I, Eastern Persia.

"The great *band* across the *Helmand*, near *Kúhak*, has existed for more than fifty years, but it is only within the last six or seven years that it has been so constructed by the *Amir* of *Káin*, as to completely turn the course of the river, and transvert its waters into those districts of *Seistán* which own Persian rule. Practically speaking, except when its waters are at flood, the natural course of the river ends at this *band* from which point it is made to follow the artificial channel of the canal. In former years the *band* used regularly to be swept away by the river every year, and a new *band* constructed. The *Amir*, however, on his arrival in *Seistán*, gave his attention to this point, and has expended so much care on its construction that the present 'Band' has now held for six § years, and will probably prove permanent. The banks of the river at this point are very low, the stream itself being about 172 yards broad with deep water. The dimensions of the *band* are as follows: entire length, 720 feet; length across original bed of river, 520 feet; breadth at broadest part, 110 feet; depth, 18 feet on river side. It is formed of fascines of tamarisk branches closely interwoven together with stakes ¶ driven into them at intervals: the branches used for this purpose are green and fresh, but of no great size; while the interlacing of them is very close. The *Amir* initiated the practice of filling up the interstices between the branches with loose earth and stones ¶ brought from a distance, and the natives ascribe the stability of the present *band* to this process; one which had never before been tried in *Seistán*, the ancient *band* affording a free passage for a considerable quantity of water. The present *band* was constructed by 2,000 men in three months, all classes in *Seistán* giving their aid to a work on which their own prosperity was so much dependent. The great part of the labour was in bringing from a distance the enormous quantity of tamarisk required; but it is said that when once the branches were collected, the actual construction was performed in a short time by one man, a native of *Banjar*, \*\* the sole possessor of this art, and who refuses to impart his knowledge to any one but his own son. The *band* still requires a small yearly repair when the spring floods are over, and its face towards the river is annually increased by a yard or more, but these repairs are now easily accomplished by fifty or sixty men. When the river is in flood its waters escape over the summit of the *band* and flow in the original channel north up to the *Hámán* near *Chakhánsúr*, where they are lost; and a passage, some sixty feet wide, is also cut in the *band* itself by which much of the violence of the pressure is mitigated. The canal is, at the point it receives the waters of the *Helmand*, 150 feet wide, flowing with considerable current; but half its contents are drawn off by supplementary canals by the time it reaches *Kimak*. On the left bank of the

§ This is only because these were years of very small flood; the Goldsmid Mission did not seem to realize that the drought was only a passing phase.

¶ Stakes are not used now.

T. R. J. W.

¶ This is not done now. There is no stone now near *Kúhak* and the gravel is small and difficult to get. Shingle is obtainable at the site of the *Band-i-Sultani* and is used there for the same purpose.

T. R. J. W.

\* Sixty to seventy and even 90 days are mentioned as the time required in the sixties and early seventies. It is said that *Ali Khan*, *Sarbandi*, once collected 10,000 men and did the work in 20 days. This was before the Persians under *Mir 'Alam Khan* of *Káin* came to *Seistán*.

† It is over 500 yards now.

‡ The *Bandbáf* says that in 3 days the dovetail trenches were carried 100 feet into the bank and the *band* was 125' wide and the height was 11 feet above water surface on the down stream sides.

These "Tirg" are considered an essential part of the *Ban-i-Band*.

river at some 400 yards distant, there is a small canal\* cut above the *band* which was commenced by Taj Muhammad, and intended to convey water to Sihkuha. The work was however abandoned, and this canal now joins the great canal some quarter of a mile below the *band*. On the right bank and about a mile above the *band* a broad canal is cut which supplies† Nad-i-Ali with water. At the time of our visit, a considerable quantity of water was flowing through the upper part of the *band* and the original bed of the river on the northern side also contained a fair quantity. When the floods come down at the flowering of the tamarisk in the spring, the river overflows both its banks, and rushes with great velocity over the *band* into its natural bed: and when the waters subside the natives say that great fish come to the foot of the *band*, and attempt to leap over it into the deeper water beyond, but being of course unable to do so, are staked in the tamarisk branches, and great numbers are caught in this way. In the dry season the *band* is found to harbour great quantities of snakes who breed inside it. They say that several men‡ are always bitten when they commence to remove the branches for the annual repairs."

\* Still exists, but no one now knows its origin.

† Not now used. Nad-i-'Ali is irrigated from the Sultanai canal.

T. R. J. W.

‡ The fish are now caught in nets held down stream of the *band*.

§ We heard of the loss of only one life.

T. R. J. W.

There seems to be no difficulty in obtaining tamarisk each year for the *band*.

Tamarisk materials for making the *band*.

It is collected from both banks; in 1903 the bulk of the tamarisk was got within one-and-a-half or two miles of the work, but in 1904 the thick large tamarisk required for the base of the *band* was obtained from a distance of 3 miles below the *band* near Deh Lakri. Tamarisk is a quick growing material provided the floods flow over the land. This they have not done near Kúhak for two years, and this, I think, is the reason that the tamarisk growth is now very thin within 3 miles of the *band*; a year or two of high floods will rectify this.

Mazar, *bandbân* (watchman), has a written order from the Governor, dated 1307 A. H. (about 1880), to guard the *band* and the tamarisk thickets near Sháhrístán-i-Kuhna and to imprison any one who cuts or burns the tamarisk. There is no such care taken of the tamarisk now. This also leads to the conclusion that the work was greater and more tamarisk was used formerly than now.

The *Bandbáf* says that the *band* is so made as to take at least (*sic*) one-half of the supply down the Rúd-i-Seistán.

The method of gauging the equal division of the water.

It is his duty to decide when this object has been attained; he gauges the volume by walking across each channel when the *band* is complete and comparing the depths and force of the two currents. If he thinks the volume in the Rúd-i-Seistán, is less than half he still further staunches the *band*.

The chief work of the *Bandbáf* comes when the wall of tamarisk extended from either bank reaches deep water; each bundle of tamarisk is then placed by himself. The bundles are of specially selected long and strong tamarisk. The *Bandbáf* carries out the work, so that the end of the *band* which he is advancing is notched or indented; he throws each bundle, so that it is gripped in a notch, and at the same time he forces the thick end down to the bed of the river. In this way each bundle is held fast and cannot be carried away by the current.

The *Bandbáf* says that the object of providing the weak place for the *band* to breach as far away from the head of the Rúd-i-Seistán as possible is to avoid the silting up of the head channel of the *Rud*, which would happen if the main stream was drawn near the head by a break in the left side of the *band*. He says that in 1904 a narrow deep channel had developed on the left side which he carefully closed with tamarisk and he hopes it won't reopen.

The plans of the *band* shew that a large pool is formed in the river where the Rúd-i-Seistán takes out and silt is caught there that would otherwise have closed the head channel of the *Rud*; this is quite in accordance with sound practice in India.

#### Detail of labour employed on the *band*.

Detail descriptions of the labour employed on the construction of the *Band-i-Seistán* in 1903 and in 1904 and on the *Band-i-Parián* in 1904 are given in the following three Appendices, which also give the value of the labour per *ghamsi* plough and per irrigated acre.

APPENDIX 9.  
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Notes on the operations at the Band-i-Seistán in August and September 1903.

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11th  
12th  
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2nd

## APPENDIX 9.

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Notes on the operations at the Band-i-Seistan in August and September 1903 taken by Lala Thakur Dass, Supervisor, and Babu Ghulam Kadir, Sub-overseer.

Date.	Total number of men.	Men employed on miscellaneous work.	Men bringing bundles of tamarisk.	Number of bundles.	Total number of bundles.	REMARKS.
11th August 1903	60	60	...	...	...	The first thing done was to repair the old huts. All the coolies were employed on this work and by the evening of 12th August completed the work of repairs. 18 huts were repaired.
12th " "	150	150	...	...	...	
13th " "	150	100	50	4	200	One man out of every ten was left to cook food. About 90 men were employed to remove "snags" from the bed and the head of the Rud-i-Seistan.
14th " "	250	...	250	4	1,000	The work of collecting tamarisk for the band was started in earnest, but in the evening all the men left the work, as no one had arrived to guide or look after them.
15th " "	...	...	...	...	...	No work was done on the 15th and 16th, all men having gone back to their homes.
16th " "	...	...	...	...	...	
17th " "	50	...	...	...	...	Sardar Purdil Khan, Sarbandi, arrived at Kuhak on the evening of the 17th with about 50 men.
18th " "	110	10	100	5	500	The men brought tamarisk and made lines of brushwood in the dry bed of the river on the Kuhak side, to catch the wind blown sand, which would be a help in making the earthen band in continuation of the tamarisk band.
19th " "	200	20	180	5	900	The band-making was started in earnest.
20th " "	500	...	450	8	3,600	The band was started 60 feet wide at bottom. Every day in the evening, all the bundles of tamarisk collected by the men were put in place in the water, but every party had to keep their bundles separate that they might be counted.
21st " "	700	...	630	8	5,040	
22nd " "	1,400	...	1,260	8	10,080	
23rd " "	1,600	...	1,440	8	11,520	Bundles of tamarisk were collected and thrown in every evening.
24th " "	1,700	...	1,530	8	12,240	Ditto ditto.
25th " "	1,700	...	1,530	8	12,240	Ditto ditto.
26th " "	1,700	...	1,530	8	12,240	The labour added to the width of the band and made it 100 feet wide at the bottom.
27th " "	2,000	...	1,800	4	7,200	After midday all the men were employed to throw up an earth band in continuation of the band of tamarisk; work done $450' \times \frac{8+12}{2} \times 4' = 21,600$ cubic feet of earth.
28th " "	2,000	...	1,800	4	7,200	10* They added to the width of the band and made it 100' wide at the bottom.
29th " "	2,000	...	1,800	7	12,600	8* Pushed on the band as usual. The deep water was reached, and the progress was slow. They also made small cuts from the main river into the Rud-i-Seistan through the sand bars.
30th " "	2,000	...	1,800	15	27,000	18* The band was pushed on vigorously.
31st " "	2,000	...	1,800	15	27,000	18* Ditto While crossing the river a man was drowned. The deepest part of the river having been reached, the labour began to make the right side part of the band, and started collecting tamarisk from the right bank of the river.
1st September 1903	2,000	...	1,800	15	27,000	Began to build the band from the right bank.
2nd " "	2,000	...	1,800	15	27,000	The band-making was pushed on vigorously. Though the distance from which tamarisk had to be brought had increased, the number of bundles required of each man was not lessened, as the current was strong and all had to work hard.

\* Length of band constructed.

Date.	Total number of men.	Men employed on miscellaneous work.	Men bringing bundles of tamarisk.	Number of bundles.	Total number of bundles.	REMARKS.
3rd September 1903	2,000	...	1,800	15	27,000	
4th " "	2,000	...	1,800	15	27,000	One man while cutting tamarisk on the right bank was attacked by a Baluch and wounded. The Baluch took away his <i>Phaarah</i> .
5th " "	2,600	...	1,800	15	27,000	The gap left in the centre was about 45 feet this day. The volume of the river was 2,084 cusecs.
6th " "	2,000	...	1,800	15	27,000	The tamarisk bundles were collected on 5th, 6th and 7th, and on the 7th the labour combined to throw them in to close the gap, but failed to do so. Many bundles were carried away by the current.
7th " "	2,000	...	...	...	...	
8th " "	2,500	...	2,250	15	33,750	As the <i>band</i> presented greater difficulties than were expected, Sardar Purdil Khan called 500 more cultivators to the work.
9th " "	2,500	...	...	...	...	Tried to close the gap but could not.
10th " "	2,500	...	2,250	15	33,750	Collected tamarisk bushes on 10th, 11th and 12th. The order was that the longest and thickest possible tamarisk should be brought. Huge heaps were collected on either side of the gap.
11th " "	2,500	...	2,250	15	33,750	
12th " "	2,500	...	2,250	15	33,750	
13th " "	2,500	...	...	...	...	The gap was closed and the tamarisk <i>band</i> was completed so far as the laying of tamarisk was concerned. The volume of the river was 1,713 cusecs.
14th " "	2,000	...	...	...	...	Bundles 1 foot diameter of long grass were brought and put upstream of the <i>band</i> to stop leakage. Some cultivators worked on the earthen extension <i>band</i> which was completed up to the tamarisk jungle on the high left bank in which the cultivators had lived.
15th " "	1,500	...	...	...	...	A layer of silt was put on the top of the left half of the <i>band</i> to give additional weight to compress the tamarisk and prevent leakage on the left bank, the right half was not so covered. All men left Kuhak on the evening of 15th September 1903.
Total	...	340	37,750	...	4,47,560	$\frac{4,47,560 \times 5}{40} = 55,945$ Indian maunds, weight of green tamarisk used on the Band-i-Seistan.

Ind. mds.

The number of maunds of tamarisk per worker was  $\frac{55,945}{37,750}$  \*nearly  $1\frac{1}{2}$  maunds Indian.

Value of the work done on the Band-i-Seistan.

Nothing was paid to the labour employed on the *band*, but this work may be valued as under :-

## Repairs of huts—

340 men at 1 *kran* a day

Kran.

340

Making the *band*—37,750 men at 1 *kran* a day

37,750

38,090

or in rupees at 367 *kran* a rupee, Rs. 10,297.

To this must be added the value of the supervision which had to be paid for would have cost some 10 per cent. on the work. The total value of the *band* may therefore be estimated at 42,000 *kran*. The area cultivated may be taken at about 110,000 acres, so that the cost of the *band* is only about  $\frac{1}{3}$  of a *kran* an acre in labour.

There are about 1,450 *ghami* ploughs on the Rud-i-Seistan worked by 8,700 cultivators; but the *salar* does not usually come on to work, so that there are 7,250 men available for this work. On this occasion the work lasted about one month, and if the men turned out in pairs for a week each, each plough was represented.

\* These small bundles are called *Nimcha*, each of which weighs about 5 seers Indian. Three to four of these *Nimcha* make one *Kuldk* or bundle which weighs about half a maund Indian.

APPENDIX 10.

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Notes on the renewal of the Band-i-Seistan in the month of September 1904.

## APPENDIX 10.

VIDE PAGE 100, CHAPTER XIV.

Notes on the renewal of the Band-i-Seistan in the month of September 1904, collected by Babu Ghulam Kadir, Sub-overseer.

Date.	Total number of men employed.	Men employed on miscellaneous work.	Men bringing bundles of tamarisk.	Number of bundles brought per man.	Total number of bundles collected each day.	Daily progress.
30th August 1904	150	150	...	...	...	Sardár Purdil Khán arrived at the <i>band</i> with 150 men at 10 A.M. The men at once began to repair the roofs of the huts. The walls did not require any repairs. That day no work was done on the <i>band</i> .
31st " "	500	120	380	4	1,520	By the night of 30th 400 men had collected. Out of these 20 men were left on cooking food for others; and 380 men brought tamarisk. During the day about 100 men came from other villages; and as they arrived they were put on clearing the head of the Rud-i-Seistán, <i>i.e.</i> , removing rubbish and leveling off the heaps of silt to help the flow of water into the Rud-i-Seistán.
1st September 1904	1,035	52	983	4	3,932	On the 1st September all the men were put on bringing tamarisk. The volume in the river was 989 cusecs.
2nd " "	1,035	52	983	4	3,932	.....
3rd " "	1,035	52	983	4	3,932	The bundles collected by the men during the day were put on the <i>band</i> in the evening.
4th " "	1,035	52	983	4	3,942	The bundles collected by the men during the day were put on the <i>band</i> in the evening. As the tamarisk for the first 4 days was taken from the jungle near Kuhak Fort, a larger number of bundles was collected by each man; but the size of the tamarisk being small, the quantity and the weight of tamarisk collected per man per day was almost the same as that brought from the right bank of the river, where the tamarisk is long and thick.
5th " "	1,035	52	983	4	3,932	.....
6th " "	937	547	390	4	1,560	On the 6th 500 men were put to make the earthen <i>band</i> on the left flank of the tamarisk <i>band</i> . The quantity of work done was $1,000 \times 12 \times 4 = 48,000$ cubic feet. They also made a small cut through the silt at the head of the Rud-i-Seistán to add to the flow in it. This cut was $150 \times 6'0 \times 2'5$ which gives 2,250 cubic feet of earth work. Total earth work done by 500 men on the 6th was 50,250 cubic feet.
7th " "	937	47	890	4	3,560	.....
8th " "	937	47	890	4	3,560	} After the 4th all men had to bring tamarisk from the right bank of the river. The Afghans never raise any objection; each have free access to the opposite bank when <i>band</i> -making. } The tamarisk was got from a distance of 3,000 feet where the material was long and well suited for the purpose.
9th " "	937	47	890	4	3,560	
10th " "	937	47	890	4	3,560	As usual the tamarisk collected during the day was put on the <i>band</i> every evening.
11th " "	937	47	890	4	3,560	The <i>band</i> was completed or closed in by this evening.
12th " "	937	47	890	4	3,560	The widening and strengthening of the <i>band</i> was done on this day as well as on the next two days. The earthen <i>band</i> too, which was made on the 6th instant, was pitched with tamarisk on both faces and at top during these days.
13th " "	937	47	890	4	3,560	
14th " "	937	47	890	4	3,560	On the evening of the 14th September the <i>band</i> was completed in every respect, and all the <i>hushar</i> or men collected were sent away. Only 2 Baluchis were left to guard the <i>band</i> . The volume in the river was 1,220 cusecs.
Total	14,258	1,453	12,805	...	51,220	

Notes.—The bundles given here are large bundles called *Kulák*. The small bundles are called *Nimcha*. Three to four *Nimcha* make one *Kulák* which weigh about 18 Indian seers. A *Nimcha* weighs about 5 Indian seers.

## ABSTRACT.

- (1) Number of Indian maunds of green tamarisk  $51,220 \times \frac{1}{15}$ , or 33,049 Indian maunds on the *band*.  
Ditto ditto per worker  $\frac{33,049}{12,805}$ , or 1'8 Indian maunds.

- (2) Nothing was paid to the labour, including supervision. But the work may be valued as under:—

Repairs of huts	...	...	150 men at 1 kran a day	...	Kran.
Making the <i>band</i>	...	...	14,108 ditto	...	150
					14,108
Total	...	...	14,258	...	14,258
Supervision at 10 per cent.	...	...	...	...	1,425
					15,683
					or 4,273 Rs. at 3'67 kran per rupee.

The number of *ghami* ploughs in the area of Seistán irrigated by the Rud-i-Seistán is about 1,450. The cost of the *band*, therefore, may be taken at Rs. 3 per *ghami* plough. But the area cultivated is equivalent to 1,500 ploughs, including Tahwil and Kalgiri, so the cost averages about Rs. 2'4 on a plough.

The area irrigated may be taken at about 110,000 acres, so the cost is less than half an anna an acre; or less than a fifth of a *kran*. In addition to the construction of this *band* the *ghami* cultivators have to silt clear their village canal which will amount to from 5 to 7 times the amount of work that is done on the *band*.

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Notes on the construction of the Band-i-Parian in the month of August 1904  
to feed the old channel of the Helmand River.

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TABLE I.

Station	Date	Time	Direction	Distance	Remarks
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
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## APPENDIX II.

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Notes on the construction of the Band-i-Parian to feed the old channel of the Helmand River in the month of August 1904.

(Notes collected by Lala Thakur Das, Supervisor, and Babu Ghulam Kadir, Sub-overseer.)

Date.	Total number of men employed.	Men employed on miscellaneous works.	Men bringing bundles of tamarisk.	Number of bundles brought per man per day.	Total number of bundles of tamarisk collected per day.	Daily progress.
12th August 1904	240	240	...	...	...	These men were of Deh Dost Muhammad. They arrived on the 12th August and made trenches to put <i>tirg</i> of the tamarisk to form the wings or dovetail of the <i>band</i> . They also built a few <i>zhabbar</i> for the Kadkhudas. Sixty men from Sindak arrived on the 13th. They made <i>tirg</i> or profiles of tamarisk on the right bank of the river at the end of the <i>band</i> to catch the wind driven sand. All the tamarisk collected by day was put on the <i>band</i> in the evening.
13th " " ...	300	80	220	16	3,520	
14th " " ...	300	80	220	16	3,520	About 60 men dug trenches to put <i>tirg</i> or foundations on the right bank and the rest collected tamarisk.
15th " " ...	300	90	210	16	3,520	About 120 men cleared silt for half a day from the head or mouth of the old Helmand immediately above the site of Band-i-Parian and the rest brought tamarisk.
16th " " ...	300	30	270	16	4,320	Tamarisk was collected this day and put on the <i>band</i> .
17th " " ...	200	20	180	18	3,240	<i>Hakar</i> from Deh Dost Muhammad was reduced, as they had come in large numbers first and made good progress in advance on the <i>band</i> .
18th " " ...	200	20	180	18	3,240	
19th " " ...	200	20	180	18	3,240	
20th " " ...	200	20	180	18	3,240	
21st " " ...	200	20	180	18	3,240	
22nd " " ...	200	20	180	18	3,240	
23rd " " ...	200	20	180	18	3,240	
24th " " ...	200	20	180	18	3,240	
25th " " ...	200	20	180	18	3,240	
26th " " ...	200	20	180	18	3,240	
27th " " ...	200	20	180	18	3,240	
28th " " ...	200	20	180	18	3,240	The tamarisk collected every day was put on the <i>band</i> the same evening.
29th " " ...	200	20	180	18	3,240	
30th " " ...	200	20	180	18	3,240	As the tamarisk grows thick close to the <i>band</i> , the distance travelled by the men bringing the tamarisk was very small, and they collected it in large quantities.
31st " " ...	200	20	180	18	3,240	
1st September 1904	200	20	180	18	3,240	They brought about 50 <i>Nimcha</i> , or, say, 18 <i>Kulak</i> , each <i>Kulak</i> weighing about 15 Indian seers.
2nd " " "	200	20	180	18	3,240	
3rd September 1904	200	20	180	18	3,240	The <i>band</i> was closed on the 3rd September 1904; and the labour left. But 70 men from Deh Dost Muhammad and Siadak were left to finish the <i>band</i> properly. They added tamarisk when it was needed and closed holes in the <i>band</i> . On the evening of the 19th all the men left the <i>band</i> .
4th to 19th September 1904.	1,120	1,120				
	6,160	2,000	4,160	...	*73,200	

\* A *Kulak* weighed 15 Indian seers, etc.

## General Remarks on the construction.

*Object.*—This *band* was made to force a sufficient supply of water into the Nad-i-Ali channel in order to feed the Deh Dost Muhammad and Siadak Canals to mature the autumn crop of 1904 and to sow the spring crop of 1904-05. The volume in the Rud-i-Parian at the time was 600 cusecs.

*Collection of labour and supervision.*—The labour came from the villages belonging to Kadkhuda Dost Muhammad and Sardar Khan Jan Khan under Lashkaran, Azad and Muhammad, the village Kadkhudas. The Deh Dost Muhammad Canal in the Miankangi takes water from the old Helmand or Nad-i-Ali channel below Burj-i-Aa. But the Siadak or Lakhshak Canal formerly took out from the Rud-i-Parian about half a mile below the head of the Nad-i-Ali channel. The flood of 1903 destroyed this canal and Khan Jan Khan then took water from the Nad-i-Ali channel near Burj-i-Aa. To get water into the Nad-i-Ali channel from the main stream (the Parian River), Dost Muhammad and Khan Jan Khan built the Band-i-Parian this year; the labour to work on this *band* was divided equally between Deh Dost Muhammad and Deh Siadak. The *patar* from the villages supervised the labour, and as they had learnt the work from the Bandbaf on the Band-i-Seistan, it was not necessary to call the Bandbaf to this work. Moreover, the Band-i-Parian is not considered a very important *band* like the Band-i-Seistan. Kadkhuda Dost Muhammad inspected the *band* on the 5th September; and Sardar Shamsud-Din Khan of Milak used to come and give instructions about the *band*-making; he had worked on the Band-i-Seistan for some years and had some knowledge of *band*-building. As a matter of fact, the *band* was badly made and gave a lot of trouble throughout the season.

*Construction.*—This *band* was made at this site for the first time. Therefore it was necessary to dovetail the foundations into both banks. This work consisted of 80 feet long trenches (5 in number) dug on the width of the *band* about 2½ feet deep (the depth taken below the water surface on the date) and 50 feet wide. These were filled with thick and stout bundles of tamarisk rammed into the trenches with force. The *band* was started on both banks; and the method of working was the same as that on the Band-i-Seistan.

The discharge of the Parian River at this time was low; first they cleared silt from the head reach of the old Helmand, and then started making the *band*.

The *ting* or profiles on the right bank at the end of the *band* were made to serve two purposes. First, they did not allow the sand to drift into the head or mouth of the old Helmand or Nad-i-Ali channel; and, in the second place, the profiles caught sand and made the right flank of the *band* strong. The people working on the *band* gave these two reasons for making the profiles.

## Abstract.

1. Weight of green tamarisk in Indian maunds  $73,200 \times \frac{1}{4} = 27,450$ .
2. Nothing was paid to the labour. But the work can be valued as under :—

	Kran.
Silt clearance in the head reach of the old Helmand 60 men at one <i>kran</i> each ...	60
Making the <i>band</i> , 6,100 men at one <i>kran</i> each ...	6,100
	—
Total ...	6,160
Add 10 per cent. for supervision ... ..	616
	—
Total cost in <i>krans</i> ...	6,776
Or Rupees ...	1,846

The number of *ghami* ploughs irrigated from the Nad-i-Ali channel is 173, so that the value of the labour of each *ghami* plough is 39 *krans*. About 9,554 acres of spring crops are irrigated from these canals, so the value of the labour is about  $\frac{1}{3}$  of a *kran* an acre of spring crop irrigated. This work costs the individual cultivator more labour than the Band-i-Seistan does the cultivator of the Shib-i- and Pusht-i-Ab.

APPENDIX 12.

CONTENTS.

*VIDE* CHAPTER XII, PAGE 83.

*The distribution of the expenses and profits of a plough cultivating autumn crops.*

*Melons—Cotton—Mdsh, Mdk, Millet and Til.*

APPENDIX 12.

The distribution of the expenses and profits of a plough cultivating Autumn Crops.

Melons.—The distribution of the expenses and profits of a plough in the important wheat and barley crop have been given in Chapter XII, page 83. It may be useful to give here rough and brief notes on the distribution of the profits and expenses of the autumn crops.

About 1/3rd of a Seistáni man of melon seed are used to an acre of land. It may be remarked that melon seeds are eaten and barter for about their weight of grain. The produce of an acre is about 3,200 melons; the outturn of the plough may therefore be taken at 12,800 melons on the Rúd-i-Seistán and 20,640 on the Miánkangí, because from Statement N the former will cultivate about 4 acres and the latter about 6.4 acres.

The revenue on melons is assessed in cash by the sarmushrif. In the summer of 1903 each plough throughout the Miánkangí was assessed at 35 kran for revenue on water melons, and in 1903 at 30 kran.

On the Rúd-i-Seistán the cash assessment for melons per plough varied in these two seasons from 20 to 40 kran. The amount is fixed after inspection of the cultivation and may be taken to be 30 kran per plough on the average. In ordinary years melons are said to sell from 30 to 40 for a kran; but during the stay of the Mission in Seistan the price varied from 8 to 10 for a kran. An assessment of 30 kran would at these rates represent from 900 to 1,200 melons only.

But the Government share of melons is said to be 1/4 of the produce, for, if a plough declines to pay the cash assessment, they must deliver 1/4 of the melons at the City of Seistán. The cash assessment is pitched lower than this; doubtless because there is no real market for melons in the height of the season, as every one connected with the land either grows or obtains melons sufficient for his consumption.

The stipulation that if the cash assessed is not paid, the melons must be delivered at the City is a device to ensure the payment of the cash, as the carriage of the Government share of the melons would be beyond the powers of the cultivators of the plough. It is probable that the value of melons as an asset to pay Government revenue is not more than 100 for a kran. If a bazgar cannot pay his quota of the cash assessment his bádár takes his share of the Government share of the melons and pays the cash himself.

It will be better therefore to consider the Government demand as 1/4 of the melons produced.

The following allowances are paid from the melons at harvest:—

	Melons.
Kadhkuda ... ..	60
Blacksmith ... ..	20
Carpenter ... ..	20
Barber ... ..	20
Mulla ... ..	20
Mushrif ... ..	30
Pakar ... ..	40
Sabzwan the same share as a cultivator of the plough, say	650
Total	860

The hire of the ploughing bullocks is paid for with an 1/8th share of the melons after the Government share and the expenses of cultivation have been recovered from the crop. This will be 1/8 (12,800—860—3,200), or 1,092 melons, making a

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N

total expenditure of 2,952 melons. On the Rúd-i-Seistán, where the cultivation done in the autumn crop by the plough is insignificant, allowances are only paid from the melon crop; no allowances are, as a rule, paid from any of the other autumn crops to the artizans, mulla, kadkhuda, etc.

In the Miánkangí, where the other autumn crops amount to a significant area, allowances are made to some extent from all crops.

The account of the melon cultivation for the Rúd-i-Seistán will then be—

				Melons.
Total outturn	...	...	...	12,800
				Melons.
Paid as expenses of cultivation	...	...	...	2,952
Government share	...	...	...	3,200
				6,152
				<hr/>
Balance to be divided	...	...	...	6,648
				<hr/>

In the Miánkangí about twice this number of melons would be obtained by the plough.

Half of these melons go to the bádár and half are divided among the six cultivators.

Further expenses on melons are the collection of the melons to a heap for storage near the centre of the field (*dakhila*). Labourers are paid from 10 to 15 melons a day for this work.

The carriage of the melons from the field to the home of the owner is paid for at one-tenth of the melons carried.

Melons ripen at the end of June and as soon as the cash assessment has been agreed on, they are plucked as they ripen, so that it is only the balance left over in September that has to be collected and stored for consumption during the autumn and winter months.

*Cotton*.—For the early sown cotton 2 and 2½ Seistáni *man* of seed is used and for late sown cotton 4 Seistáni *man* to 7½ *man* are used. The seed is supplied by the bádár and 2 *man* of cotton seed may be taken as equivalent to one *man* of picked cotton.

Cotton seed at the time of sowing is worth about 1 *man* 10 *sir* to 1 *man* 20 *sir* per *kran*; at the harvest picked cotton is worth from 20 to 25 *sir* a *kran*. One *man* of picked cotton gives 8 *sir* of fibre and 32 *sir* of seed and husk, which are used for food for cattle.

The outturn of cotton is from 33 to 66 Seistáni *man* an acre, say, 40 Seistáni *man* on the average, so that the outturn of the plough on the Rúd-i-Seistán, which does about one acre of cotton on the average, would be 40 *man* Seistáni of cotton, and in the Miánkangí, where a plough does about 6 acres of cotton, 240 Seistáni *man*.

Few or no allowances are usually paid from cotton on the Rúd-i-Seistán. In the Miánkangí the blacksmith, carpenter, barber, *pakar* and mullá would each receive ½ *man* Seistáni; the kadkhuda 2 *man* or 4½ *man* Seistáni per plough in all.

The hire of the ploughing bullocks is paid for by ⅒ of the balance of produce after the Government share and the expenses of the cultivation have been paid.

No allowance (*damani*) is now given to the cultivators of the plough for picking the cotton.

The picking is usually done on one day so as to control speculation; the labourers employed are paid ⅒ of the quantity of cotton picked. It is difficult to estimate what quantity of cotton would be picked by the families of the cultivators of the plough and what by hired labour. The probability is that little or

no outside labour would be employed in the Rúd-i-Seistán, whereas on the much larger areas to be picked in the Miánkangí nearly all the cotton would be picked by such labour. The payment is made from the cotton picked and not from the divisible produce. The Government share of the divisible produce of cotton is  $\frac{1}{3}$  the same as for wheat and barley.

*On the Rúd-i-Seistán.*

		Seistani man.
The total divisible produce may be taken as	...	40
The Government share is	... ..	13 $\frac{1}{2}$ man
The allowances made are	... ..	Nil
The cost of hire of plough bullocks $\frac{1}{10}$ (44—13 $\frac{1}{2}$ )	... ..	3
Total	... ..	16 $\frac{1}{2}$
Balance	... ..	23 $\frac{1}{2}$

This is divided half to the bádár and half to the six cultivators of the plough.

*In the Miánkangí.*

		Seistani man.
The total divisible produce may be taken at	...	240
The Government share is	... ..	80
The allowances paid are	... ..	4 $\frac{1}{2}$
The hire of plough bullocks $\frac{1}{10}$ (240—84 $\frac{1}{2}$ )	... ..	15 $\frac{1}{2}$
Total	... ..	100
Balance to be divided between bádár and cultivators	... ..	140

*Másh, mák, millet and til.*—Másh, mák, millet and til can be taken together. About one *man* Seistáni (6 seers Indian) of seed is sown to the acre of *másh*, millet and about half a *man* Seistáni of til.

The outturn of millet is often 100 fold; the average outturn may be taken at 80 *man* Seistáni and of *másh* at 47 *man* Seistáni, the outturn of til being 27 *man* Seistáni an acre; the outturn of the plough would be—

	<i>On Rúd-i-Seistán.</i>	<i>In Miánkangí.</i>
* These are the areas a plough usually cultivates; they are not taken from Statement N, but from a note book, as Statement N had not been prepared when this account was made.	* Area in Seistani Seistani acres. man. man.	Area in Seistani Seistan acres. man. man.
<i>Másh</i>	0'23 × 47 = 10'8	1'14 × 47 = 54
Millet	1'1 × 80 = 88	4'15 × 80 = 332
Til	'06 × 27 = 1'6	'095 × 27 = 2

On the Rúd-i-Seistán no allowances are paid from these crops, as the area is insignificant. But in the Miánkangí the following allowances are paid. The blacksmith, carpenter, barber and *mullá* a *man* Seistáni of millet and 5 *sír* of *mák* each, to the *kadhuda* 5 *man* of millet; in all 9 *man* of millet and 20 *sír* of *mák*, or of *másh*, whichever is available.

The cost of ploughing is  $\frac{1}{10}$  of the net produce after paying all charges and Government revenue.

The hire of bullocks for the small quantity of *másh*, millet and til to be threshed on the Rúd-i-Seistán would be paid for by the day and may be estimated at six bullocks for two days at one *man* Seistáni a head a day, say, 12 *man* Seistáni of grain.

In the Miánkangí the work is often done in contract, the same as the thrashing of wheat and barley: and as often in daily labour at from 10 *sír* to 20 *sír* Seistáni a bullock a day. It may be estimated at 2 $\frac{1}{2}$  per cent. of the grain.

The Government revenue on each of these crops is  $\frac{1}{3}$ .

The account for millet would then be as follows:—

*On Rûd-i-Seistân.*

					Seistani man.
Total divisible produce	...	...	...	...	88
Government share	...	...	...	39	...
Allowances...	...	...	...	nil	...
Cost of threshing, say	...	...	...	10	...
Cost of ploughing $\frac{1}{10}$ (88—39)	...	...	...	5	44
Balance to be divided	...	...	...	...	44

*In Midkangî.*

					Seistani man.
Total divisible produce	...	...	...	...	33 <sup>2</sup>
Government share	...	...	...	111	...
Allowances ...	...	...	...	9	...
Threshing $2\frac{1}{2}$ per cent. on 332 Seistani man	...	...	...	8	—
Cost of ploughing $\frac{1}{10}$ (332—128)	...	...	...	20	148
Balance to be divided	...	...	...	...	184

The earnings of a plough in the autumn crop would therefore be distributed as follows:—

*On Rûd-i-Seistân.*

Description.	Melons.	Cotton. Seistani man.	Mash. Seistani man.	Millet. Seistani man.
Government share	3,200	13 $\frac{1}{2}$	3 $\frac{1}{2}$	29
Expenses	2,952	3 $\frac{1}{2}$	1 $\frac{1}{2}$	15
Cultivators...	3,324	11 $\frac{1}{2}$	3	22
Badar	3,324	11 $\frac{1}{2}$	3	22
Total	12,800	40	11	88

*In Midkangî.*

Description.	Melons.	Cotton. Seistani man.	Mash. Seistani man.	Millet. Seistani man.
Government share	5,160	80	18	111
Expenses...	2,610	20	8	37
Cultivators...	6,435	70	14	82
Badar	6,435	70	14	82
Total	20,640	240	54	332

APPENDIX 13.

CONTENTS.

METEOROLOGICAL NOTE.

The seasons—The summer—The wind—The extent of country over which the  
wind is felt—Season of cloud and rain—Blizzards—Rainfall—Wind records.

*Meteorological Abstract.*

Barometer, thermometer and wind records from April 1903 to May 1905.

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### APPENDIX XIII.—Meteorological.

Note by Colonel A. H. McMahon, C.S.I., C.I.E.

The climate of Seistan is one of great variety and sudden changes, which take place with curious regularity year after year.

There are practically only two seasons in the year, for spring and autumn can hardly be said to exist. The transition from winter to summer, and from summer to winter, is very rapid, sometimes only a matter of a few hours.

Summer sets in at any date between the end of March and the end of April, and winter begins with equal suddenness at any time between the beginning and the end of November.

May and the first half of June are very hot, trying months. The temperature rises to a maximum of  $117^{\circ}$  in the shade, and owing to a total absence of wind at this period, swarms of mosquitoes and flying insects of all kinds come out and make life very unpleasant.

At the end of May or middle of June,\* the celebrated Bad-i-sad-o-bist roz (120 days wind) sets in and blows with but little cessation till the middle or end of September. It blows unceasingly for 4 or 5 days at a time, usually attaining its maximum daily velocity between midnight and 5 A.M., and again between 8 A.M. and 5 P.M. It moderates a little in the early morning and evening. After 4 or 5 days it drops a little for a day or two, only to recommence with renewed violence.

It blows with appalling violence, reaching the maximum velocity, as recorded by the Mission anemometers, of 72 miles per hour. It blows always from one direction, *vis.*, a little west of north, *i.e.*, between  $316\frac{1}{2}^{\circ}$  and  $333\frac{1}{2}^{\circ}$ . Whatever discomforts it may cause in the form of dust laden air, noise and so on, it is nevertheless the saving of Seistan. It not only blows away the insects and mitigates the heat, but clears the country of typhus, small-pox and other diseases so rife in the country in May and June. Without this wind the summer in Seistan would be almost unbearable, and the country would be a very unhealthy one.

It stops abruptly about the middle or end of September, when the temperature again begins to rise somewhat.

The Bad-i-sad-o-bist roz is not felt in the mountainous country west and north-west of Seistan. It is said to be even more violent in Lash Juwain than in Seistan. It is less violent in Herat, and apparently decreases quickly in violence south of Seistan, as it is but little felt on the Nushki-Robat trade route.

The Seistan summer is an absolutely cloudless one. The last clouds are seen about the middle of May, and no more are seen until September†.

As noted above, winter sets in with great suddenness. In 1903, it changed from summer to winter in a few hours on the night of November 1st. In 1904, it did not set in till the middle of November.

Cloudy weather begins about Christmas time and showers of light rain occasionally occur during the winter. Both in 1903 and in 1904, a snow fall occurred in January of four to six inches, which lay on the ground for a few days.

Blizzards are of frequent occurrence, from 1st January onwards to the end of March. In a blizzard on 29th March 1903, the temperature fell far below freezing, and on 29th March 1905 to  $8^{\circ}$  Fahrenheit. The cold in winter is often very severe, reaching, in 1903, a minimum of  $12^{\circ}$  on the 27th December; in 1904 of  $14^{\circ}$  on 14th January; and in 1905 of  $4^{\circ}$  on 23rd January.‡

† In 1904 we saw a few clouds on September 16th, but in 1903 none were seen till November 1st.

‡ The chief characteristic of the Seistan climate is the wind. I have already referred to the Bad-i-sad-o-bist roz, but with the exception of a calm period in May and the beginning of June, and again from the end of September to December, winds are very prevalent. They always blow from the same quarter and

with great violence, blowing unceasingly for 3 to 5 days at a stretch. A strong blow is always to be expected a week or ten days after Naoroz, known as the bad-i-Naoroz. In 1905, this surpassed all previous records by reaching a velocity of 120 miles an hour on the 28th March. For over 16 hours it blew at an average velocity of over 88 miles an hour.

Only in unsettled weather, and only for a short time then, does the wind leave the north, and blow from the south, south-west or south-east. This is always a sign of bad weather, and in Seistan is a very unpleasant wind at any time of the year. It never blows hard from the south.

The rainfall of Seistan is very slight, and in ordinary years can hardly exceed 3 to 4 inches. A complete record of careful meteorological observations taken in Seistan in 1903, 1904, 1905 is herewith attached.

The wind records present phenomena of some interest, and with them should be studied the barometer readings which, it will be seen, give evidence of an unusually small amount of variation. The barometer in Seistan gives little or no indication of coming wind, nor does the wind, notwithstanding its duration and violence, seem materially to affect the barometer.

A. H. McMAHON.

Temperature in degrees Fahrenheit

1000

900

800

700

600

500

400

300

200

100

0

1000

900

800

700

600

500

400

300

200

100

0

### METEOROLOGICAL ABSTRACT.

*Wind Diagram plotted by hand  
from the Original Meteorological  
observations Book kept by the  
Mission.*

Hour	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12					
Barometer	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0				
Thermometer	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50		
Wind																																									
Moisture																																									
Direction																																									
Force																																									
Clouds																																									
Remarks																																									

METEOROLOGICAL OBSERVATIONS BOOK



April 1905.

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note—
1	...	38.5	...	Duststorm calm	Min. of morning; other observation of the afternoon.
2	50.0	84.0	...	Clear	Moderate wind.
3	55.5	44.5	...	"	Light "
4	58.5	41.0	...	"	Calm.
5	58.7	47.0	...	Light cloud	Strong wind.
6	63.4	52.0	...	" "	" "
7	65.4	62.0	...	Scattered cloud	" "
8	58.0	57.0	...	Clear	" "
9	63.0	49.0	...	Light cloud	Calm.
10	66.5	52.0	Drops of rain.	Cloudy	" Few drops of rain.*
11	51.0	52.0	Heavy rain	"	Strong wind.
12	57.5	46.0	Good "	"	" "
13	61.0	49.0	...	Clear	Calm.
14	61.5	51.0	Drizzle	Light cloud	" $\frac{1}{2}$ " of rain.*
15	67.5	56.0	...	Cloudy	"
16	80.5	56.0	...	"	"
17	67.5	66.0	...	Light cloud	" Few drops.*
18	65.0	58.0	...	"	Light wind.
19	63.8	60.0	Drizzle	Cloudy	Calm.
20	65.0	56.5	Little rain	Light cloud	"
21	60.5	61.5	...	Cloudy	" $\frac{1}{3}$ " of rain.*
22	66.5	56.0	...	"	" $\frac{1}{10}$ " "
23	64.0	61.0	Showers	"	"
24	66.5	58.0	Heavy	"	Light wind.
25	61.5	59.0	Showers	"	Strong wind. $\frac{1}{3}$ " of rain.*
26	62.5	53.0	Heavy	"	Calm. $\frac{1}{4}$ " "
27	62.5	56.0	"	"	"
28	61.5	56.0	Showers	Light clouds	"
29	64.5	59.0	...	"	"
30	68.5	61.0	...	Clear	"

\* This information obtained from records of His Britannic Majesty's Consulate in Seistan (in the city), 25 miles from Mission camp



May 1903.

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
1	69.5	65.0	...	Cloudy, calm	Note— Min. temperature of morning: other observation of afternoon.
2	72.0	71.0	Few drops	"	Light wind. Few drops of rain.*
3	65.0	66.0	...	Clear	" "
4	71.0	64.0	...	"	" "
5	70.0	63.5	...	"	Calm.
6	74.0	67.0	...	"	"
7	72.5	66.0	...	"	"
8	76.5	67.0	...	Light cloud	Light wind.
9	78.0	74.0	...	"	Calm.
10	73.5	69.0	Few drops	Scattered clouds	Strong wind. Few drops of rain.*
11	71.0	62.5	...	Clear	" "
12	72.0	64.0	...	"	Moderate wind.
13	75.0	67.0	...	"	Strong wind.
14	72.0	65.0	...	Cloudy	Very strong wind.
15	65.5	53.0	Good rain	"	Moderate wind. $\frac{3}{16}$ " of rain.*
16	73.5	46.0	Shower at night.	Clear	Calm. Few drops of rain.*
17	74.0	62.0	...	"	Strong wind.
18	78.0	63.0	...	"	Calm.
19	79.0	64.0	...	Light cloud	"
20	72.0	73.0	...	Cloudy	Strong wind.
21	79.0	...	Light rain	"	Moderate wind. Few drops of rain.*
22	...	71.0	...	Clear	Very strong wind.
23	78.5	68.0	...	"	" "
24	80.0	68.0	...	"	Light wind.
25	84.0	71.0	...	"	Strong wind.
26	83.0	68.5	...	"	" "
27	88.0	69.0	...	"	Calm.
28	89.0	69.0	...	"	Light wind.
29	90.0	71.0	...	"	" "
30	92.0	72.0	...	"	" "
31	92.5	71.0	...	"	" "

\* This information obtained from records of His Britannic Majesty's Consulate in city (about 25 miles) from Mission Camp.

Meteorological Abstract for the month of June 1903.

Velocity of Wind.		Barometer readings.																								Velocity of Wind.					
Average per hour.	Totals for 24 hours.	28 12	27 97	28 03	28 02	27 95	27 82	27 95	28 00	27 97	27 90	27 87	27 88	27 83	27 74	27 78	27 85	27 85	27 85	27 82	27 76	27 66	27 65	27 73	27 90	27 80	27 82	27 83	27 91	27 86	
Miles 100	Miles 2400	107 0	106 0	110 3	109 5	108 0	107 0	105 0	109 5	108 3	113 0	117 0	114 0	111 5	109 5	106 0	107 0	106 2	105 0	109 0	114 0	107 0	110 0	104 0	102 4	105 0	109 0	107 5	107 3	106 5	108 2
90	2160																														
80	1920																														
70	1680																														
60	1440																														
50	1200																														
40	960																														
30	720																														
20	480																														
10	240																														
Calm.																															
Month and date.		3	5	6	9	12	15	18	21	24	27	30	(31st)	Month and date.																	

Max: Thermometer readings.

Wind.

Calm.

Month and date.

2100 Miles. 100 Miles.  
2460 " 90 "  
1920 " 80 "  
1680 " 70 "  
1440 " 60 "  
1200 " 50 "  
960 " 40 "  
720 " 30 "  
480 " 20 "  
240 " 10 "

June 1903.

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note—
1	91°0	75°0	...	Sky clear ...	Min. of previous night; other observations taken in afternoon.
2	92°0	67°0	...	" " ...	Light wind.
3	95°0	70°0	...	Evening light cloud ...	" "
4	92°0	73°0	...	Clear ...	" "
5	95°0	71°0	...	" " ...	Calm.
6	94°5	71°0	...	" " ...	"
7	93°0	73°0	...	Light cloud... ..	"
8	94°5	69°0	...	Clear ...	Light wind.
9	77°0	74°0	...	" " ...	Calm.
10	76°0	76°0	...	" " ...	Hot light wind.
11	79°0	74°0	...	" " ...	" " "
12	78°0	75°0	...	" " ...	" " "
13	80°0	73°0	...	" " ...	Light wind.
14	79°5	74°0	...	" " ...	Strong wind.
15	80°0	80°0	...	Morning cloudy	" " "
16	80°5	79°0	...	Scattered cloud	" " "
17	83°0	78°5	...	Clear ...	" " "
18	80°0	73°0	...	" " ...	" " "
19	68°2	74°0	...	" " ...	" " "
20	72°5	72°8	...	" " ...	Calm.
21	81°5	71°5	...	Cloudy ...	"
22	78°5	75°0	...	Clear ...	"
23	81°8	76°0	...	" " ...	Windy.
24	80°0	74°0	...	" " ...	"
25	87°5	74°5	...	" " ...	Strong wind.
26	82°0	78°5	...	" " ...	" "
27	70°0	75°5	...	" " ...	Light wind.
28	87°5	79°0	...	" " ...	Strong "
29	75°0	75°0	...	" " ...	Light "
30	73°5	73°0	...	" " ...	Calm.

*Meteorological Abstract for the month of July 1903.*

Velocity of Wind.		Barometer readings.												Velocity of Wind.					
Average per hour.	Totals for 24 hours.	Max : Thermometer readings.												Totals for 24 hours.	Average per hour.				
Miles 100	Miles 2400	27.8a	109.0	27.8a	109.5	27.75	109.5	27.75	109.5	27.75	109.5	27.75	109.5	27.75	109.5	27.8b	109.5	2400 Miles.	100 Miles.
" 90	" 2160	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	2160 "	90 "	"
" 80	" 1920	27.75	107.5	27.75	107.5	27.75	107.5	27.75	107.5	27.75	107.5	27.75	107.5	27.75	107.5	27.75	1920 "	80 "	"
" 70	" 1680	27.75	104.0	27.75	104.0	27.75	104.0	27.75	104.0	27.75	104.0	27.75	104.0	27.75	104.0	27.75	1680 "	70 "	"
" 60	" 1440	27.8a	111.2	27.8a	111.2	27.8a	111.2	27.8a	111.2	27.8a	111.2	27.8a	111.2	27.8a	111.2	27.8a	1440 "	60 "	"
" 50	" 1200	27.75	109.5	27.75	109.5	27.75	109.5	27.75	109.5	27.75	109.5	27.75	109.5	27.75	109.5	27.75	1200 "	50 "	"
" 40	" 960	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	960 "	40 "	"
" 30	" 720	27.75	107.5	27.75	107.5	27.75	107.5	27.75	107.5	27.75	107.5	27.75	107.5	27.75	107.5	27.75	720 "	30 "	"
" 20	" 480	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	101.8	27.85	480 "	20 "	"
" 10	" 240	27.8a	109.0	27.8a	109.0	27.8a	109.0	27.8a	109.0	27.8a	109.0	27.8a	109.0	27.8a	109.0	27.8a	240 "	10 "	"
Calm.																		Calm.	
Month and date.		Month and date.												Month and date.					
3		15												27					
6		18												30					
9		21												(31st)					
12																			
15																			
18																			
21																			
24																			
27																			
30																			

July 1903.

29 30

31 (1903)  
30  
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24  
21  
18  
15  
12  
9  
6  
3

Date.	THERMOMETER.			Sky.	REMARKS.
	Wet.	Min.	Rain.		
1	79°0	73°0	...	Clear ...	Note— Min. of morning; other observations of afternoon.
2	84°2	73°0	...	" ...	Calm. Light wind.
3	81°0	74°0	...	Light cloud	Strong wind.
4	78°0	76°0	...	Clear ...	"
5	77°0	74°0	...	" ...	"
6	85°0	72°3	...	Cloudy ...	Windy.
7	87°0	69°0	...	Clear ...	Calm
8	87°5	69°0	...	" ...	"
9	82°0	74°5	...	" ...	Strong wind.
10	79°0	67°0	...	" ...	"
11	71°5	76°0	...	" ...	Light wind.
12	70°5	74°0	...	Scattered cloud	Strong wind.
13	77°5	73°0	...	Clear ...	"
14	75°0	73°0	...	" ...	Light wind.
15	82°5	76°0	...	" ...	Windy.
16	85°0	77°0	...	Light cloud	"
17	75°0	80°0	...	Clear ...	"
18	83°0	72°0	...	" ...	Strong wind.
19	71°0	78°5	...	" ...	" "
20	72°0	78°5	...	" ...	" "
21	74°0	62°5	...	" ...	" "
22	72°0	73°5	...	" ...	" "
23	67°5	71°0	...	" ...	Calm.
24	73°0	71°5	...	" ...	"
25	71°5	76°0	...	Light cloud	Windy.
26	73°0	86°0	...	Clear ...	Strong wind.
27	76°0	80°0	...	" ...	" "
28	78°0	80°0	...	" ...	Light wind.
29	78°0	80°0	...	" ...	Strong wind.
30	80°0	81°0	...	" ...	Light "
31	78°0	82°0	...	" "	Calm.

WINDS OF VARIOUS DIRECTIONS

*Meteorological Abstract for the month of August 1903.*

Velocity of Wind.		Barometer readings.												Velocity of Wind.		Month and date.					
Average per hour.	Totals for 24 hours.	10.8	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	Totals for 24 hours.	Average per hour.	Month and date.	Month and date.
Miles 100	Miles 2400	10.8	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	100 Miles.	100 Miles.		
" 90	2160																	" 90 "	90 "		
" 80	1920																	" 80 "	80 "		
" 70	1680																	" 70 "	70 "		
" 60	1440																	" 60 "	60 "		
" 50	1200																	" 50 "	50 "		
" 40	960																	" 40 "	40 "		
" 30	720																	" 30 "	30 "		
" 20	480																	" 20 "	20 "		
" 10	240																	" 10 "	10 "		
Calm.																		Calm.			
		Max : Thermometer readings.																			
		10.8	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7			3	5
																				6	6
																				9	9
																				12	12
																				15	15
																				18	18
																				21	21
																				24	24
																				27	27
																				30	30
																				(31st)	(31st)

11  
August 1903.

Date.	THERMOMETER.				REMARKS.
	Wet.	Min.	Rain.	Sky.	
					Note—
1	72°0	75°0	...	Clear, calm ...	Min. of morning; other observations of afternoon.
2	70°5	77°0	...	" " ...	Light wind.
3	73°0	78°0	...	" " ...	Strong "
4	74°5	79°5	...	" " ...	" "
5	75°5	76°5	...	" " ...	Windy.
6	76°0	78°0	...	" " ...	Light wind.
7	77°5	75°0	...	" " ...	Strong wind.
8	81°5	78°0	...	" " ...	" "
9	79°5	77°0	...	Light cloud	Light wind.
10	74°5	76°5	...	" " ...	Calm.
11	78°5	81°5	...	Clear ...	Windy.
12	67°5	77°0	...	" " ...	Strong wind.
13	64°0	71°0	...	" " ...	" "
14	85°0	93°0	...	" " ...	Windy.
15	64°0	75°0	...	" " ...	" "
16	65°5	74°5	...	" " ...	" "
17	67°0	70°0	...	" " ...	Calm.
18	71°0	72°0	...	" " ...	" "
19	73°0	73°0	...	" " ...	" "
20	72°5	74°0	...	" " ...	" "
21	73°0	80°0	...	" " ...	Strong wind.
22	71°5	78°0	...	Light cloud	Windy.
23	70°5	82°0	...	Clear ...	" "
24	72°0	80°0	...	" " ...	Strong wind.
25	64°5	74°0	...	" " ...	" "
26	63°0	73°5	...	" " ...	" "
27	66°0	70°0	...	" " ...	Calm.
28	68°5	68°0	...	" " ...	" "
29	73°5	65°0	...	" " ...	" "
30	71°5	76°0	...	" " ...	" "
31	72°0	72°0	...	" " ...	" "

C341FD



September 1903.

(41) (40)

N. B.—Min : and Wet bulb, readings with other information should be entered on the back of this form.

Date.	Thermometer.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
1	75.5	69.0	...	Clear, calm	Note— Min. of morning : other observations of afternoon.
2	76.0	66.0	...	" "	Windy.
3	73.0	77.0	...	" "	Calm.
4	73.0	70.0	...	" "	"
5	68.5	75.0	...	" "	Strong wind.
6	63.0	65.0	...	" "	" "
7	63.0	66.0	...	" "	Light.
8	65.0	66.0	...	" "	"
9	64.5	57.0	...	" "	"
10	57.0	63.0	...	" "	Strong wind.
11	59.5	60.0	...	" "	" "
12	64.0	58.0	...	" "	Calm.
13	60.0	58.5	...	" "	"
14	58.5	66.0	...	" "	"
15	60.5	65.0	...	" "	Light cloud.
16	60.0	64.0	...	" "	" "
17	62.0	58.0	...	" "	Calm.
18	64.0	57.0	...	" "	"
19	66.0	58.0	...	" "	"
20	66.5	60.0	...	" "	"
21	64.5	71.0	...	" "	Light wind.
22	63.0	66.0	...	" "	" "
23	65.0	65.0	...	" "	Calm.
24	66.0	60.0	...	" "	"
25	67.0	63.0	...	" "	"
26	68.0	64.0	...	" "	Windy.
27	67.0	63.0	...	" "	Strong wind.
28	63.0	65.0	...	" "	Calm.
29	68.0	63.0	...	" "	"
30	63.0	60.0	...	" "	Strong wind.

Meteorological Abstract for the month of October 1903.

Velocity of Wind.		Barometer Readings.												Velocity of Wind.		Month and date.											
Average per hour.	Totals for 24 hours.	Max : Thermometer readings.												Totals for 24 hours.	Average per hour.												
Miles 100	Miles 2400	28.10	28.10	28.10	28.14	28.18	28.14	28.14	28.18	28.13	28.13	28.13	28.23	28.23	28.23	28.18	28.04	28.15	28.15	28.16	28.24	28.27	28.27	2400	100	28.10	30 (31st)
" 90	" 2160	88.5	87.0	88.0	86.0	89.0	85.5	85.5	86.5	83.5	83.0	89.1	92.0	94.0	90.5	91.5	91.5	90.5	80.0	85.0	85.0	88.0	88.0	2100	90	88.0	
" 80	" 1920	87.0	86.0	86.0	85.0	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	1920	80	85.5	
" 70	" 1680	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	1680	70	85.5	
" 60	" 1440	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	1440	60	85.5	
" 50	" 1200	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	1200	50	85.5	
" 40	" 960	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	960	40	85.5	
" 30	" 720	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	720	30	85.5	
" 20	" 480	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	480	20	85.5	
" 10	" 240	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	240	10	85.5	
Calm,		3	6	9	12	15	18	21	24	27	30	31st	Wind.										(Calm,	Month and date.			

N. B.—Min : and Wet bulb, readings with other information should be entered on the back of this form.

October 1903.

Date.	Thermometer.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
1	62°0	61°0	...	Clear-high wind	Note— Min. of morning; other observations of afternoon.
2	61°0	60°5	...	" "	Strong wind.
3	62°0	54°0	...	" "	" "
4	64°5	60°0	...	" "	Light "
5	65°5	54°0	...	" "	Calm.
6	65°0	52°0	...	Scattered cloud	"
7	61°5	61°0	...	Clear	Windy.
8	63°5	54°0	...	"	Calm.
9	66°0	55°0	...	"	"
10	61°5	65°0	...	"	Strong wind.
11	61°5	61°0	...	"	Windy.
12	64°0	62°0	...	"	Calm.
13	64°0	48°0	...	"	"
14	68°0	50°0	...	"	"
15	66°5	50°0	...	"	"
16	66°0	54°0	...	"	"
17	61°0	61°0	...	"	Light wind.
18	59°0	58°0	...	"	" "
19	65°0	58°5	...	"	Calm.
20	64°0	53°0	...	"	"
21	63°0	53°0	...	"	"
22	60°5	54°0	...	"	Strong wind.
23	63°0	54°0	...	"	" "
24	63°0	50°0	...	"	" "
25	64°0	47°0	...	"	" "
26	61°0	47°0	...	"	Windy.
27	53°0	52°0	...	"	"
28	61°0	45°0	...	"	Calm.
29	58°5	47°0	...	Light-cloud	"
30	60°0	48°0	...	Clear	"
31	60°0	52°0	...	Cloudy	"

C341FD

*Meteorological Abstract for the month of November 1903.*

Velocity of Wind.		Barometer Readings.												Velocity of Wind.																		
Average per hour.	Totals for 24 hours.	28 18	28 16	28 25	28 26	28 33	28 30	28 34	28 38	28 46	28 43	28 40	28 35	28 35	28 34	28 26	28 23	March														
Miles 100	Miles 2400	Max: Thermometer readings.												2400 Miles.	100 Miles.																	
" 10	" 240	86.5	76.0	64.5	65.0	72.0	72.0	69.0	64.0	67.5	68.0	72.0	75.0	74.0	74.0	69.0	72.0	2400 Miles.	90 "													
" 20	" 480	86.5	76.0	64.5	65.0	72.0	72.0	69.0	64.0	67.5	68.0	72.0	75.0	74.0	74.0	69.0	72.0	" 90 "	80 "													
" 30	" 720	86.5	76.0	64.5	65.0	72.0	72.0	69.0	64.0	67.5	68.0	72.0	75.0	74.0	74.0	69.0	72.0	" 80 "	70 "													
" 40	" 960	86.5	76.0	64.5	65.0	72.0	72.0	69.0	64.0	67.5	68.0	72.0	75.0	74.0	74.0	69.0	72.0	" 70 "	60 "													
" 50	" 1200	86.5	76.0	64.5	65.0	72.0	72.0	69.0	64.0	67.5	68.0	72.0	75.0	74.0	74.0	69.0	72.0	" 60 "	50 "													
" 60	" 1440	86.5	76.0	64.5	65.0	72.0	72.0	69.0	64.0	67.5	68.0	72.0	75.0	74.0	74.0	69.0	72.0	" 50 "	40 "													
" 70	" 1680	86.5	76.0	64.5	65.0	72.0	72.0	69.0	64.0	67.5	68.0	72.0	75.0	74.0	74.0	69.0	72.0	" 40 "	30 "													
" 80	" 1920	86.5	76.0	64.5	65.0	72.0	72.0	69.0	64.0	67.5	68.0	72.0	75.0	74.0	74.0	69.0	72.0	" 30 "	20 "													
" 90	" 2160	86.5	76.0	64.5	65.0	72.0	72.0	69.0	64.0	67.5	68.0	72.0	75.0	74.0	74.0	69.0	72.0	" 20 "	10 "													
" 100	" 2400	86.5	76.0	64.5	65.0	72.0	72.0	69.0	64.0	67.5	68.0	72.0	75.0	74.0	74.0	69.0	72.0	" 10 "	"													
Calm.		Wind.												Calm.																		
Month and date		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	(31st)	Month and date.	

*N. B.—Min. and Wet bulb readings with other information should be entered on the back of this form.*

November 1903.

Date.	Thermometer.		Rain.	Sky.	REMARKS.
	West.	Min.			
					Note—
1	60°0	48°0	...	Clear, Calm	... Min. of morning; other observation of afternoon.
2	53°0	53°0	Few drops	Cloudy ...	... Light wind. Few drops of rain*.
3	50°0	45°0	light	" ...	... Windy.
4	48°0	38°0	...	" ...	... Calm.
5	49°0	40°0	...	Clear ...	... "
6	48°0	40°0	...	" ...	... Light wind.
7	54°5	38°0	...	" ...	... Calm.
8	53°0	36°0	...	" ...	... "
9	55°5	40°0	...	" ...	... "
10	55°0	40°0	...	Scattered ...	... "
11	55°5	40°0	...	" ...	... "
12	57°0	40°0	...	Clear ...	... "
13	57°5	40°0	...	" ...	... "
14	58°0	42°0	...	" ...	... "
15	56°0	44°0	...	Light Cloud	... "
16	57°0	40°5	...	Clear ...	... "
17	56°5	45°0	...	Light Cloud	... "
18	57°0	45°0	...	Clear ...	... "
19	52°0	43°0	...	Scattered ...	... Windy.
20	43°0	41°0	...	Cloudy ...	... "
21	49°0	41°5	...	" ...	... Calm.
22	47°0	44°0	...	" ...	... Light wind.
23	48°0	43°0	Few drops	" ...	... Calm. Few drops of rain.
24	50°0	36°0	...	Clear ...	... "
25	51°0	38°0	...	" ...	... "
26	50°0	35°0	...	" ...	... "
27	48°0	33°0	...	" ...	... "
28	46°0	34°0	...	Light Cloud	... "
29	48°0	34°0	...	Clear ...	... "
30	...	32°0	...	Marching ...	... "

N. B.—Min. and Wet bulb readings with other information should be entered on the back of this form.

\* This information obtained from records of His Britannic Majesty's Consulate in the City (Seistan) 25 miles from the Mission Camp.

*Meteorological Abstract for the month of December 1903.*

Velocity of Wind.		Barometer readings.												Velocity of Wind.		
Average per hour.	Total for 24 hours.	28 10	28 15	28 20	28 25	28 30	28 35	28 40	28 45	28 50	28 55	28 59	28 59	28 59	Totals for 24 hours.	Average per hour.
Miles 100	Miles 2400	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	2400 Miles,	100 Miles.
" 90	" 2160	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	2160 "	90 "
" 80	" 1920	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	1920 "	80 "
" 70	" 1680	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	1680 "	70 "
" 60	" 1440	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	1440 "	60 "
" 50	" 1200	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	1200 "	50 "
" 40	" 960	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	960 "	40 "
" 30	" 720	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	720 "	30 "
" 20	" 480	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	480 "	20 "
" 10	" 240	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	240 "	10 "
Calm.		Wind.												Calm.		
Month and date.		Month and date.												Month and date.		
		3	6	9	12	15	18	21	24	27	30	31st				

December 1903.

Date.	Thermometer.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note—
1	47°	27°	...	Clear, calm ...	Min. of morning : other observations of afternoon.
2	48°	30°	...	" ...	Calm.
3	...	38°	...	Marching in afternoon ...	...
4	51°	29°	...	Clear ...	Calm.
5	47.5	30°	...	Light cloud ...	"
6	46°	35°	...	Cloudy ...	Light wind.
7	45.5	41°	...	Clear ...	Windy.
8	41.5	29°	...	" ...	Calm.
9	45°	21°	...	" ...	"
10	45.5	21°	...	" ...	"
11	48°	20.5	...	" ...	"
12	48°	25°	...	" ...	"
13	48.5	25°	...	Light clouds	"
14	...	29°	...	"	Marching in day time and afternoon.
15	41°	33°	...	Cloudy ...	Calm.
16	44°	28°	...	Clear ...	"
17	47°	25°	...	" ...	"
18	48°	25°	...	Scattered clouds	"
19	41.5	34°	Light	Cloudy ...	Few drops of rain.*
20	54°	33°	...	Scattered clouds	$\frac{1}{8}$ " of rain.*
21	51°	27°	...	" ...	"
22	50°	29°	...	" ...	"
23	46°	38°	...	" ...	Light wind.
24	38°	35°	...	Clear ...	Strong wind.
25	33°	30°	...	" ...	"
26	37°	24°	...	" ...	Light wind.
27	37°	12.5	...	Light cloud ...	Calm.
28	40°	17°	...	Clear ...	"
29	38°	17°	...	Cloudy ...	"
30	48°	25°	...	" ...	"
31	48°	25°	...	" ...	"

\* This information obtained from records of His Britannic Majesty's Consulate in the city (Seistan) 25 miles from the Mission Camp.

Meteorological Abstract for the month of January 1904.

Velocity of Wind.		Barometer Readings.												Velocity of Wind.										
Average per hour.	Totals for 24 hours.	Max : Thermometer readings.												Totals for 24 hours.	Average per hour.									
Miles 100	Miles 2,400	28-15	28-13	28-25	28-35	28-45	28-50	28-47	28-50	28-45	28-35	28-30	28-40	28-30	28-3	28-35	28-55	28-50	28-44	28-42	28-40	28-20	2400 Miles.	100 Miles.
" 90	" 2,160	73	73	36	35	46	45	49	47	50	49	50	53	55	47	55	59	60	65	65	71	73	2160 "	90 "
" 80	" 1,920	70	70	35	35	45	45	49	47	50	49	50	53	55	47	55	59	60	65	65	71	73	1920 "	80 "
" 70	" 1,680	67	67	35	35	45	45	49	47	50	49	50	53	55	47	55	59	60	65	65	71	73	1680 "	70 "
" 60	" 1,440	65	65	35	35	45	45	49	47	50	49	50	53	55	47	55	59	60	65	65	71	73	1440 "	60 "
" 50	" 1,200	60	60	35	35	45	45	49	47	50	49	50	53	55	47	55	59	60	65	65	71	73	1200 "	50 "
" 40	" 960	60	60	35	35	45	45	49	47	50	49	50	53	55	47	55	59	60	65	65	71	73	960 "	40 "
" 30	" 720	60	60	35	35	45	45	49	47	50	49	50	53	55	47	55	59	60	65	65	71	73	720 "	30 "
" 20	" 480	60	60	35	35	45	45	49	47	50	49	50	53	55	47	55	59	60	65	65	71	73	480 "	20 "
" 10	" 240	60	60	35	35	45	45	49	47	50	49	50	53	55	47	55	59	60	65	65	71	73	240 "	10 "
Calm.																								Calm.
Month and date		3	6	9	12	15	18	21	24	27	30	(31st)												Month and date.

January 1904.

Date.	Thermometer.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note—
1	49°0	37°0	...	Scattered, calm	Min. of morning; other observations of afternoon.
2	53°0	36°0	...	Clear	Calm. Few drops of rain.*
3	47°0	37°0	...	"	"
4	47°0	23°0	...	"	"
5	49°5	26°0	...	Light clouds	"
6	50°0	32°0	...	"	"
7	50°5	32°0	...	Cloudy	"
8	50°0	42°0	...	"	"
9	...	34°0	...	"	Marching, calm. Few drops of rain.*
10	44°0	22°0	...	Light clouds	Light wind.
11	42°0	34°0	...	Cloudy	"
12	34°5	39°0	...	"	Strong Wind. Few drops of rain.*
13	33°0	24°0	Snow fall good.	"	Calm. Snow (about) 6".*
14	35°5	14°0	...	"	"
15	38°5	20°0	...	"	Light rain.*
16	37°5	24°0	...	Light Clouds	Light wind.
17	37°5	27°0	...	Clear	" "
18	37°0	28°0	...	"	Windy.
19	39°5	27°0	...	Light cloud	Calm.
20	40°5	30°0	...	Cloudy	"
21	38°0	33°0	Little snow.	"	"
22	41°0	27°5	Slight rain	"	Few drops of rain.*
23	45°0	31°0	"	Scattered	"
24	45°5	40°0	Good rain	Cloudy	Few drops of rain.*
25	48°0	42°0	Little rain	Scattered	" " " "
26	48°0	32°5	Nil	Light cloud...	"
27	51°0	41°0	Few drops	Cloudy	"
28	51°0	35°0	Nil	Clear	"
29	50°5	34°0	...	"	"
30	50°5	37°0	...	Scattered	"
31	53°0	37°0	...	Cloudy	"

\* This information obtained from records of His Britannic Majesty's consulate in the city (Seistan) 30 miles from Mission Camp.



February 1904.

Date.	Thermometer.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
1	53°5	39°0	...	Clear, calm ... ..	NOTE— Min. of morning—other observations of afternoon.
2	53°5	44°0	...	" " ... ..	Calm.
3	48°0	35°0	...	" " ... ..	"
4	48°5	29°0	...	" " ... ..	Light wind.
5	51°0	35°0	...	" " ... ..	Calm.
6	49°0	36°0	Few drops	Cloud ... ..	Strong wind. Few drops of rain.*
7	43°0	39°0	...	Light cloud ... ..	" "
8	45°0	33°0	...	Clear ... ..	Light "
9	49°0	27°0	...	" ... ..	" "
10	50°0	29°0	...	Cloudy ... ..	Calm.
11	54°0	32°0	...	Clear ... ..	"
12	50°0	36°0	...	" ... ..	"
13	52°0	32°0	...	" ... ..	"
14	50°0	34°0	...	Scattered ... ..	"
15	52°0	43°0	...	Clear ... ..	"
16	57°0	33°0	...	" ... ..	"
17	52°0	36°0	...	Cloudy ... ..	" $\frac{1}{2}$ " of rain.*
18	55°0	53°0	Few drops	" ... ..	Light wind. Few drops of rain.*
19	56°0	39°0	...	Clear ... ..	Calm.
20	...	41°0	...	" ... ..	Marching, calm.
21	47°0	40°0	...	" ... ..	Light wind.
22	52°5	32°0	...	" ... ..	Strong "
23	54°0	46°0	...	Light cloud .. ..	Calm.
24	56°5	45°5	...	Clear ... ..	"
25	56°0	41°0	..	" ... ..	"
26	56°5	51°0	Few drops	Light cloud ... ..	" Few drops of rain.*
27	57°0	44°0	...	Scattered ... ..	"
28	55°0	46°0	Few drops	Cloudy ... ..	" Few drops of rain.*
29	55°0	50°0	...	Scattered ... ..	Light wind.

\* This information obtained from record of His Britannic Majesty's Consulate in city (Seistan) about 37 miles from Mission Camp.

Meteorological Abstract for the month of March 1904.

Velocity of Wind.		Barometer Readings.												Velocity of Wind.																			
Average per hour.	Totals for 24 hours.	Mar. 17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total for 24 hours.	Average per hour.															
Miles 100	Miles 2.4	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	59.0	2,400 Miles.	100 Miles.															
" 90	" 2,160	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	58.0	2,160 "	90 "															
" 80	" 1,920	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0	1,920 "	80 "															
" 70	" 1,680	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	1,680 "	70 "															
" 60	" 1,440	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	1,440 "	60 "															
" 50	" 1,200	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	1,200 "	50 "															
" 40	" 960	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	53.0	960 "	40 "															
" 30	" 720	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0	720 "	30 "															
" 20	" 480	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	480 "	20 "															
" 10	" 240	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	240 "	10 "															
	Calm.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Calm.	...															
Month and date.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	(31st).

Max: Thermometer readings.

Wind.

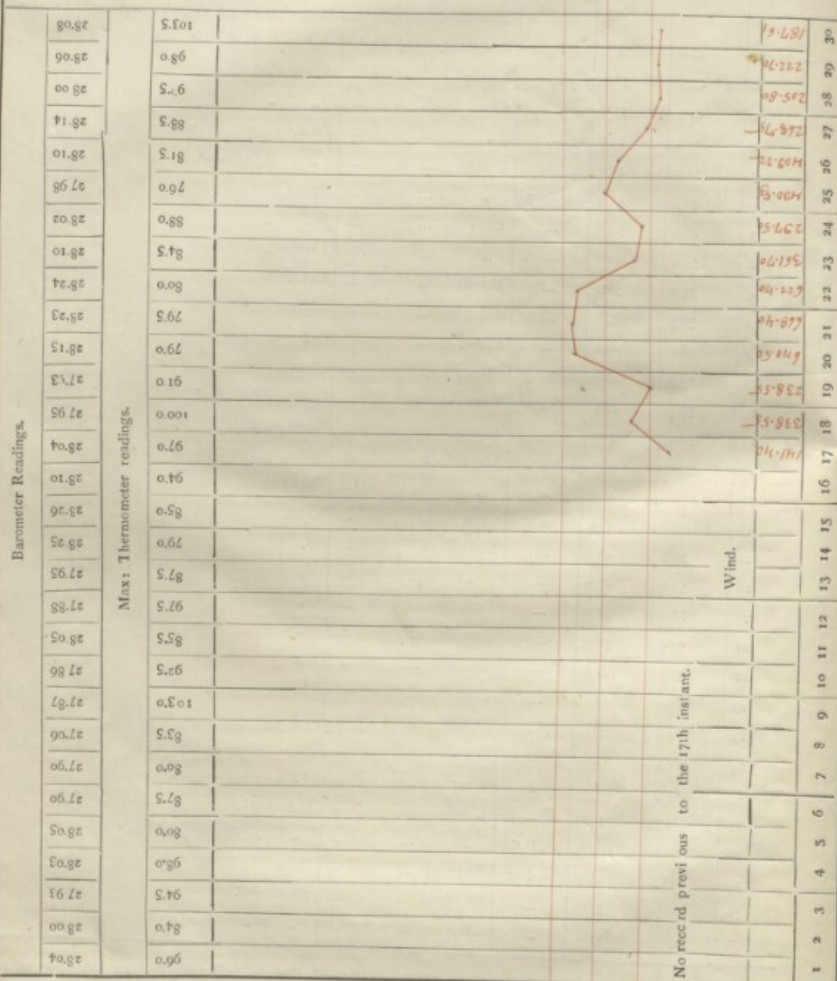
March 1904.

Date.	Thermometer.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note — Min. of morning; other observations of afternoon.
1	45°	39°	A little	light cloud, strong wind	Few drops of rain*.
2	43°	38°	...	Cloudy ...	Strong wind.
3	45°	37°	...	Clear ...	" "
4	49°	34°	...	" ...	Calm.
5	51°	42°	...	Cloudy ...	" $\frac{1}{4}$ " of rain.*
6	42°	42°	Few drops	" ...	Strong wind.
7	46°	38°	...	Clear ...	" "
8	50°	42°	...	" ...	Light "
9	53°	36°	...	Cloudy ...	Calm.
10	56°	43°	...	" ...	Light wind.
11	58°	49°	...	Clear ...	" "
12	52°	48°	Few drops	Cloudy ...	Calm.
13	58°	44°	"	Scattered cloud	" $\frac{1}{2}$ " of rain.*
14	59°	48°	...	Cloudy ...	Light wind.
15	54°	49°	Little rain with hail	Light cloud	Calm. Few drops of rain *
16	...	44°	...	" ...	Marching.
17	59°	45°	...	Clear ...	Calm.
18	57°	45°	...	Light cloud	"
19	56°	47°	...	" ...	"
20	63°	54°	...	Calm ...	"
21	61°	51°	...	Scattered ...	"
22	59°	51°	...	Cloudy ...	"
23	62°	50°	...	Clear ...	"
24	63°	53°	...	Cloudy ...	"
25	62°	60°	...	Scattered ...	"
26	62°	8°	...	Clear ...	"
27	64°	57°	...	Cloudy ...	Light wind.
28	62°	57°	Little rain	" ...	" " Few drops of rain.*
29	61°	49°	Few drops	Scattered ...	Calm.
30	69°	51°	...	Cloudy ...	Slight wind.
31	56°	57°	...	Clear ...	" "

\* This information obtained from records of His Britannic Majesty's Consulate in the city (Seistan) about 25 miles from Mission Camp.

Meteorological Abstract for the month of April 1904.

Velocity of Wind.		Barometer Readings.		Velocity of Wind.	
Average per hour.	Totals for 24 hours.	Max: Thermometer readings.		Totals for 24 hours.	Average per hour.
Miles 100	Miles 2400	96	96	96	2,400 Miles. 100 Miles.
" 90	" 2,160	97	97	97	2,400 " 90 "
" 80	" 1,920	98	98	98	1,920 " 80 "
" 70	" 1,680	99	99	99	1,680 " 70 "
" 60	" 1,440	100	100	100	1,440 " 60 "
" 50	" 1,200	101	101	101	1,200 " 50 "
" 40	" 960	102	102	102	960 " 40 "
" 30	" 720	103	103	103	720 " 30 "
" 20	" 480	104	104	104	480 " 20 "
" 10	" 240	105	105	105	240 " 10 "
Calm.		Wind.		Calm.	
Month and date.		No record previous to the 17th instant.		Month and date.	



April  
Month and date.

(G14)

April 1904.

48 49

Date.	Thermometer.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
1	59.0	54.0	...	Light cloud, calm	Note— Min. of morning : other observations of afternoon.
2	63.5	64.0	Drops of rain.	Cloudy ...	Light wind.
3	65.0	59.0	...	Scattered cloud	Calm. Few drops of rain.*
4	65.0	64.0	...	Clear ...	Light wind and hot wind.
5	56.5	55.5	...	" ...	Strong wind and dust storm.
6	57.0	51.0	...	Light cloud	Calm.
7	59.0	57.0	...	Scattered ...	Strong wind.
8	60.5	51.0	...	Clear ...	Calm.
9	61.5	51.0	...	Light cloud	"
10	60.0	62.5	...	Clear ...	Wind moderate.
11	57.0	57.0	...	" ...	Strong wind.
12	61.0	51.0	...	" ...	Calm.
13	54.5	60.5	...	Hazy ...	Strong wind.
14	52.5	54.0	...	Clear ...	" "
15	53.5	50.0	...	" ...	Light wind.
16	57.5	52.0	...	" ...	Calm.
17	59.5	52.0	...	" ...	
18	65.0	60.0	...	" ...	
19	63.0	64.0	...	" ...	
20	51.0	55.0	...	" ...	
21	53.5	52.5	...	" ...	
22	53.0	52.5	...	" ...	
23	56.0	53.0	...	" ...	
24	61.0	50.0	...	Light cloud	
25	60.0	62.0	...	" "	1/4" of rain.*
26	58.0	53.0	...	Clear ...	
27	62.0	56.5	...	" ...	
28	65.0	56.0	...	" ...	
29	64.0	66.0	...	" ...	
30	66.0	62.0	...	" ...	

\* This information obtained from records of His Britannic Majesty's Consulate in city (Seistan) 25 miles from Mission Camp.

Meteorological Abstract for the month of May 1904.

Velocity of Wind.		Barometer Readings.		Max : Thermometer readings.		Wind.	
Average per hour.	Totals for 24 hours.						
Miles 100	Miles 2400	105.0	105.0	105.0	105.0	105.0	105.0
" 90	" 2160	104.5	104.5	104.5	104.5	104.5	104.5
" 80	" 1920	104.0	104.0	104.0	104.0	104.0	104.0
" 70	" 1680	103.5	103.5	103.5	103.5	103.5	103.5
" 60	" 1440	103.0	103.0	103.0	103.0	103.0	103.0
" 50	" 1200	102.5	102.5	102.5	102.5	102.5	102.5
" 40	" 960	102.0	102.0	102.0	102.0	102.0	102.0
" 30	" 720	101.5	101.5	101.5	101.5	101.5	101.5
" 20	" 480	101.0	101.0	101.0	101.0	101.0	101.0
" 10	" 240	100.5	100.5	100.5	100.5	100.5	100.5
Calm.		100.0	100.0	100.0	100.0	100.0	100.0
Month and date.		100.0	100.0	100.0	100.0	100.0	100.0

Hour	Barometer	Thermometer	Wind
1	100.69	100.69	100.69
2	100.72	100.72	100.72
3	100.76	100.76	100.76
4	100.74	100.74	100.74
5	100.73	100.73	100.73
6	100.70	100.70	100.70
7	100.70	100.70	100.70
8	100.70	100.70	100.70
9	100.70	100.70	100.70
10	100.70	100.70	100.70
11	100.70	100.70	100.70
12	100.70	100.70	100.70
13	100.70	100.70	100.70
14	100.70	100.70	100.70
15	100.70	100.70	100.70
16	100.70	100.70	100.70
17	100.70	100.70	100.70
18	100.70	100.70	100.70
19	100.70	100.70	100.70
20	100.70	100.70	100.70
21	100.70	100.70	100.70
22	100.70	100.70	100.70
23	100.70	100.70	100.70
24	100.70	100.70	100.70
25	100.70	100.70	100.70
26	100.70	100.70	100.70
27	100.70	100.70	100.70
28	100.70	100.70	100.70
29	100.70	100.70	100.70
30	100.70	100.70	100.70

N.B.—Mm. : and Wet bulb readings with other information should be entered on the back of this form.

May  
 Month and date.  
 1904  
 To be filled for 24 hours.

May 1904.

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note—
1	68°0	66°0	...	Light cloud ...	Min temperature of night previous: other observations same afternoon.
2	69°5	67°0	...	Clear ...	
3	71°0	72°0	...	" ...	
4	68°0	71°0	...	" ...	
5	68°0	65°0	...	" ...	
6	67°0	69°0	...	Light cloud ...	
7	67°0	71°0	...	Clear ...	
8	70°5	70°0	...	" ...	
9	89°0	72°0	...	" ...	
10	70°5	69°0	...	Scattered cloud	
11	68°5	71°0	...	Cloud along horizon	
12	68°5	66°0	...	Clear ...	
13	65°5	68°0	...	" ...	
14	67°0	67°0	...	" ...	
15	68°0	61°0	...	" ...	
16	67°0	60°0	...	" ...	
17	74°5	55°0	...	" ...	
18	78°0	62°0	...	" ...	
19	80°0	70°5	...	" ...	
20	78°0	73°0	Drops	Cloudy ...	
21	73°5	75°0	...	Clear ...	
22	68°0	58°0	...	" ...	
23	65°0	63°0	...	" ...	
24	61°0	65°0	...	" ...	
25	61°0	68°0	...	" ...	
26	65°5	63°0	...	" ...	
27	65°0	70°0	...	" ...	
28	63°0	69°0	...	" ...	
29	63°5	73°0	...	" ...	
30	67°5	74°0	...	" ...	
31	79°0	70°0	...	" ...	

N.B.—Min. and Wet bulb readings with other information should be entered on the back of this form.

(4) (16)

Meteorological Abstract for the month of June 1904.

Velocity of Wind.		Velocity of Wind.	
Average per hour.	Totals for 24 hours.	Totals for 24 hours.	Average per hour.
Miles 100	Miles 2,400	2,400 Miles.	100 Miles.
" 90	2,160	" "	90 "
" 80	1,920	" "	80 "
" 70	1,680	" "	70 "
" 60	1,440	" "	60 "
" 50	1,200	" "	50 "
" 40	960	" "	40 "
" 30	720	" "	30 "
" 20	480	" "	20 "
" 10	240	" "	10 "
Calm.		Calm.	
Totals for 24 hours.		Totals for 24 hours.	
Month and date.		Month and date.	
June		June	

Barometer Readings.		Max: Thermometer readings.	
Barometer	Thermometer	Barometer	Thermometer
27.84	102.3	27.84	102.3
27.88	100.0	27.85	94.5
27.86	100.0	27.87	100.5
27.80	99.5	27.88	97.5
27.79	110.0	27.89	103.2
27.83	114.0	27.90	106.0
27.86	109.5	27.91	106.8
27.84	100.0	27.92	106.5
27.79	101.5	27.93	107.5
27.75	106.0	27.94	107.5
27.75	106.0	27.95	107.5
27.75	106.0	27.96	106.5
27.71	106.5	27.97	106.5
27.66	107.0	27.98	106.5
27.66	108.0	27.99	106.5
27.70	108.0	28.00	106.5
27.70	106.5		
27.80	106.5		
27.75	109.5		
27.75	109.5		
27.82	97.5		
27.77	100.5		
27.83	94.5		
27.83	103.2		
27.89	106.5		
27.79	106.5		
27.74	106.8		
27.70	106.0		
27.70	107.5		
27.75	106.8		
27.75	106.8		
27.75	110.8		
27.75	108.8		
27.88	102.2		
27.82	105.5		

Wind.	Wind.
147.10	147.10
333.65	333.65
787.00	787.00
278.50	278.50
1430.85	1430.85
1785.55	1785.55
815.00	815.00
791.80	791.80
925.30	925.30
724.55	724.55
665.40	665.40
554.20	554.20
1480.40	1480.40
1464.80	1464.80
651.10	651.10
117.20	117.20
565.20	565.20
935.00	935.00
707.40	707.40
126.40	126.40
871.70	871.70
767.30	767.30
671.20	671.20
644.60	644.60
632.40	632.40
704.60	704.60
816.20	816.20
909.40	909.40
842.30	842.30
855.60	855.60

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

50 60

June 1904.

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note --
1	63°0	71°0	...	Clear.	Min. temperature of night previous : other observations same afternoon.
2	63°0	70°5	...	"	
3	66°0	66°0	...	"	
4	69°0	71°0	...	"	
5	70°0	76°0	...	"	
6	67°0	70°0	...	"	
7	74°0	66°0	...	"	
8	62°0	71°0	...	"	
9	62°5	73°0	...	"	
10	69°0	75°0	...	"	
11	64°0	75°0	...	"	
12	64°0	76°0	...	"	
13	68°0	72°0	...	"	
14	65°5	75°5	...	"	
15	66°0	74°0	...	"	
16	75°0	71°0	...	"	
17	67°0	77°0	...	"	
18	67°0	74°0	...	"	
19	66°5	70°0	...	"	
20	61°0	49°0	...	"	
21	63°0	73°0	...	"	
22	66°0	75°0	...	"	
23	66°0	76°0	...	"	
24	63°5	77°0	...	"	
25	65°2	74°0	...	"	
26	68°0	78°0	...	"	
27	68°2	78°5	...	"	
28	68°0	81°0	...	"	
29	67°0	76°0	...	"	
30	66°5	76°0	...	"	

C341FD

Meteorological Abstract for the month of July 1904.

Velocity of Wind.		Barometer Readings.		Velocity of Wind.	
Average per hour.	Totals for 24 hours.	Max: Thermometer readings.		Average per hour.	Totals for 24 hours.
Miles	Miles 2400			Miles	100 Miles.
"	" 2160			"	" 90
"	" 1920			"	" 80
"	" 1680			"	" 70
"	" 1440			"	" 60
"	" 1200			"	" 50
"	" 960			"	" 40
"	" 720			"	" 30
"	" 480			"	" 20
"	" 240			"	" 10
				"	" Calm.
Month and date.				Month and date.	

Day	Barometer	Thermometer	Wind
1	106.0	76.9	6.0
2	106.0	79.8	7.9
3	102.5	87.8	8.7
4	103.0	83.8	8.3
5	101.8	83.4	8.3
6	100.3	84.4	8.4
7	104.5	78.8	7.8
8	108.5	84.8	8.4
9	106.7	74.8	7.4
10	108.7	74.2	7.4
11	109.0	63.4	6.3
12	111.0	47.8	4.7
13	112.3	65.8	6.5
14	112.0	63.4	6.3
15	116.5	52.8	5.2
16	113.0	45.4	4.5
17	99.5	48.8	4.8
18	97.0	45.8	4.5
19	98.2	42.8	4.2
20	104.8	45.8	4.5
21	109.5	47.8	4.7
22	111.5	44.8	4.4
23	111.5	44.8	4.4
24	109.8	47.8	4.7
25	111.5	43.8	4.3
26	111.1	48.8	4.8
27	105.8	45.8	4.5
28	103.8	42.8	4.2
29	107.5	41.8	4.1
30	112.5	42.8	4.2
31	108.5	41.8	4.1

July  
Totals for 24 hours. (31st)

July 1904.

(51) (52)

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note—
1	66.5	74.0	...	Clear.	Min. temperature of night previous; other observations same afternoon.
2	67.0	77.5	...	"	
3	63.0	77.0	...	"	
4	65.5	75.0	...	"	
5	64.0	73.0	...	"	
6	64.0	74.0	...	"	
7	68.5	75.5	...	"	
8	64.2	71.0	...	"	
9	65.5	77.0	...	"	
10	68.0	77.5	...	"	
11	65.0	78.	...	"	
12	69.0	76.0	...	"	
13	77.5	81.0	...	"	
14	67.0	81.0	...	"	
15	68.0	81.0	...	"	
16	67.5	83.0	...	"	
17	...	74.0	...	"	
18	...	73.0	...	"	
19	...	74.0	...	"	
20	...	66.0	...	Light cloud.	
21	...	65.0	...	Clear.	
22	...	76.5	...	"	
23	...	83.5	...	"	
24	...	84.0	...	Light scattered.	
25	...	79.0	...	Hazy; no clouds.	
26	...	81.0	...	"	
27	...	83.0	...	"	
28	...	80.0	...	"	
29	...	77.0	...	"	
30	...	75.5	...	Clear.	
31	...	78.5	...	"	



August 1904.

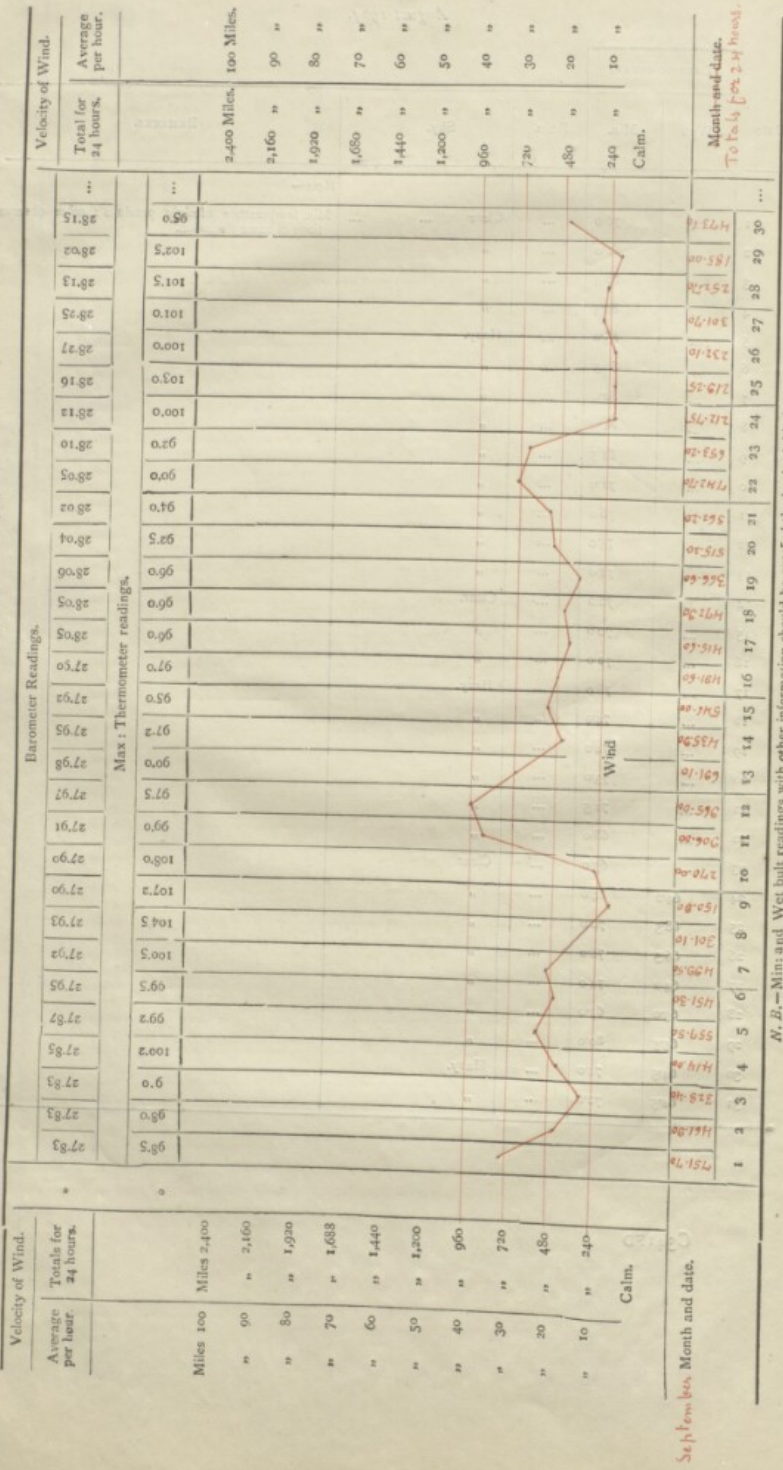
(52) (31)

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
1	...	76°0	...	Clear ...	Note— Min. temperature of night previous: other observations of same afternoon.
2	...	82°0	...	"	
3	...	82°3	...	"	
4	...	80°5	...	"	
5	...	85°0	...	Hazy.	
6	...	80°5	...	"	
7	...	82°0	...	"	
8	...	81°0	...	"	
9	...	81°5	...	"	
10	...	71°0	...	"	
11	...	76°0	...	"	
12	...	75°0	...	"	
13	...	74°0	...	"	
14	...	72°0	...	Clear.	
15	...	70°0	...	"	
16	...	72°0	...	"	
17	...	76°0	...	Hazy.	
18	...	74°0	...	"	
19	...	74°0	...	"	
20	...	73°0	...	"	
21	...	72°5	...	"	
22	...	68°0	...	"	
23	...	63°0	...	Clear.	
24	64°2	64°0	...	"	
25	68°5	70°0	...	"	
26	66°5	78°0	...	"	
27	64°2	74°0	...	"	
28	63°0	67°0	...	"	
29	65°5	80°0	...	"	
30	64°5	74°0	...	Hazy.	
31	64°5	72°0	...	"	

C341FD

INFORMATION SHOULD BE ENTERED ON THE BACK OF THIS FORM.

Meteorological Abstract for the month of September 1904.



September, Month and date.

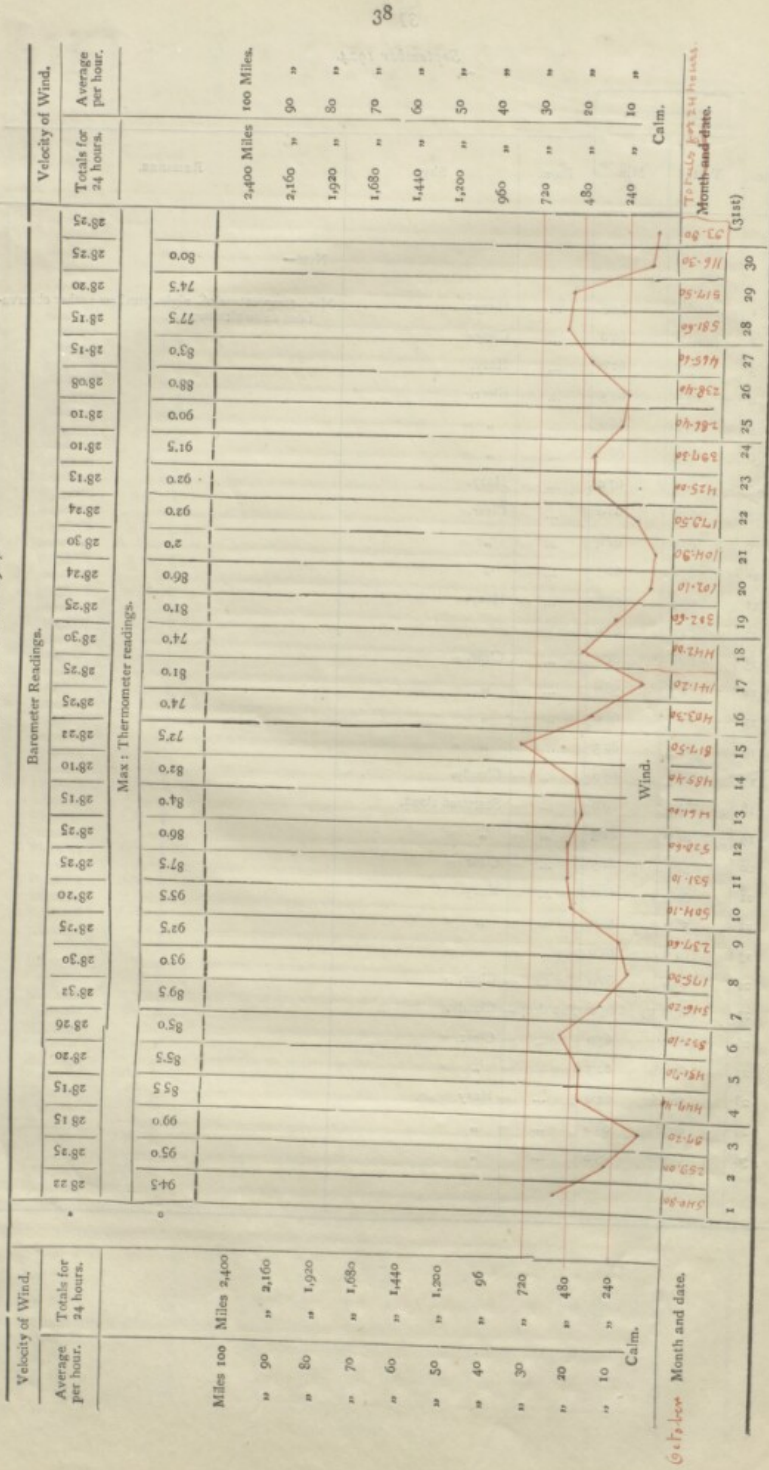
Month and date.  
Totals for 24 hours.

W. B.—Mins and Wet built readings with other information should be entered the back of this form.

September 1904.

Date.	Thermometer.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note—
1	66°0	74°5	...	Hazy.	Min. temperature of night previous: other observations same afternoon.
2	64°0	69°0	...	Clear.	
3	63°8	62°0	...	Hazy.	
4	64°5	64°5	...	Clear.	
5	63°0	66°0	...	"	
6	64°5	66°0	...	"	
7	64°0	67°0	...	Hazy.	
8	67°0	66°0	...	Clear.	
9	69°0	61°0	...	"	
10	65°0	61°5	...	"	
11	65°5	75°0	...	Hazy.	
12	62°0	68°0	...	"	
13	60°0	61°0	...	Clear.	
14	59°5	58°0	...	"	
15	61°0	61°0	...	"	
16	64°5	62°5	...	"	
17	63°0	69°0	...	Cloudy.	
18	63°0	69°0	...	Scattered cloud.	
19	64°5	62°5	...	"	
20	51°0	61°5	...	Clear.	
21	59°0	61°0	...	Hazy.	
22	59°0	59°0	...	"	
23	60°5	61°0	...	"	
24	66°0	60°0	...	Clear.	
25	64°0	65°0	Few drops.	Cloudy.	
26	69°2	64°0	...	Clear.	
27	69°5	62°5	...	"	
28	70°0	64°0	...	Hazy.	
29	69°8	60°0	...	"	
30	65°5	65°0	...	"	

Meteorological Abstract for the month of October 1904



N. E. - Min: and Wet built readings with other information should be entered on the back of this form.

October 1904.

54 56

Date.	THERMOMETER.			Sky.	REMARKS.
	Wet.	Min.	Rain		
					Note—
1	62.5	58.5	...	Scattered cloud	Min. temperature of night previous: other observation of same afternoon.
2	66.0	59.5	...	Clear.	
3	66.5	61.0	...	Cloudy.	
4	62.5	62.5	Few drops	"	* Few drops of rain.
5	65.5	55.0	...	Clear.	
6	64.0	56.0	...	Cloudy.	
7	63.5	59.0	...	Scattered.	
8	67.0	53.0	...	Clear.	
9	60.0	54.0	...	"	
10	58.5	54.0	...	"	
11	58.0	60.0	...	Light cloud.	
12	57.5	66.0	...	Cloudy.	
13	57.0	54.0	...	Clear.	
14	56.0	54.0	...	"	
15	52.0	52.0	...	"	
16	52.0	41.0	...	Light cloud.	
17	57.0	39.0	...	Light cloud scattered.	
18	52.0	45.0	...	" "	
19	58.0	40.0	...	" "	
20	57.0	42.0	...	Clear.	
21	58.5	45.0	...	"	
22	59.0	48.0	...	"	
23	60.5	55.0	...	"	
24	61.0	55.0	...	"	
25	59.5	54.0	...	Light cloud.	
26	60.0	54.0	...	Scattered cloud.	
27	55.5	55.0	...	Clear.	
28	53.5	53.0	...	"	
29	51.5	50.5	...	"	
30	52.5	39.0	...	"	
31	58.0	42.0	...	Scattered cloud.	

\* This information obtained from records of His Britannic Majesty's Consulate in the city (Seistan), 25 miles from Mission Camp.

Wet. — Min. and Wet bulb readings with other information should be entered on the back of this form.

Meteorological Abstract for the month of November 1904.

Velocity of Wind.		Barometer readings.		Velocity of Wind.	
Average per hour.	Totals for 24 hours.	Max: Thermometer readings.		Total for 24 hours.	Average per hour.
Miles 100	Miles 2400	90.5	90.5	90.5	2400 Miles.
" 90	" 2160	89.5	89.5	89.5	90 "
" 80	" 2080	88.5	88.5	88.5	80 "
" 70	" 1980	87.5	87.5	87.5	70 "
" 60	" 1800	86.5	86.5	86.5	60 "
" 50	" 1200	85.5	85.5	85.5	50 "
" 40	" 960	84.5	84.5	84.5	40 "
" 30	" 720	83.5	83.5	83.5	30 "
" 20	" 480	82.5	82.5	82.5	20 "
" 10	" 240	81.5	81.5	81.5	10 "
Calm.		81.0	81.0	81.0	Calm.
Month and date.		80.5	80.5	80.5	Month and date.

Barometer readings.	Max: Thermometer readings.	Wind.	Month and date.
30.8	70.5		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 (Tue)
30.7	72.0		
30.6	73.5		
30.5	75.0		
30.4	76.5		
30.3	78.0		
30.2	79.5		
30.1	81.0		
30.0	82.5		
29.9	84.0		
29.8	85.5		
29.7	87.0		
29.6	88.5		
29.5	90.0		
29.4	91.5		
29.3	93.0		
29.2	94.5		
29.1	96.0		
29.0	97.5		
28.9	99.0		
28.8	100.5		
28.7	102.0		
28.6	103.5		
28.5	105.0		
28.4	106.5		
28.3	108.0		
28.2	109.5		
28.1	111.0		
28.0	112.5		
27.9	114.0		
27.8	115.5		
27.7	117.0		
27.6	118.5		
27.5	120.0		
27.4	121.5		
27.3	123.0		
27.2	124.5		
27.1	126.0		
27.0	127.5		
26.9	129.0		
26.8	130.5		
26.7	132.0		
26.6	133.5		
26.5	135.0		
26.4	136.5		
26.3	138.0		
26.2	139.5		
26.1	141.0		
26.0	142.5		
25.9	144.0		
25.8	145.5		
25.7	147.0		
25.6	148.5		
25.5	150.0		
25.4	151.5		
25.3	153.0		
25.2	154.5		
25.1	156.0		
25.0	157.5		
24.9	159.0		
24.8	160.5		
24.7	162.0		
24.6	163.5		
24.5	165.0		
24.4	166.5		
24.3	168.0		
24.2	169.5		
24.1	171.0		
24.0	172.5		
23.9	174.0		
23.8	175.5		
23.7	177.0		
23.6	178.5		
23.5	180.0		
23.4	181.5		
23.3	183.0		
23.2	184.5		
23.1	186.0		
23.0	187.5		
22.9	189.0		
22.8	190.5		
22.7	192.0		
22.6	193.5		
22.5	195.0		
22.4	196.5		
22.3	198.0		
22.2	199.5		
22.1	201.0		
22.0	202.5		
21.9	204.0		
21.8	205.5		
21.7	207.0		
21.6	208.5		
21.5	210.0		
21.4	211.5		
21.3	213.0		
21.2	214.5		
21.1	216.0		
21.0	217.5		
20.9	219.0		
20.8	220.5		
20.7	222.0		
20.6	223.5		
20.5	225.0		
20.4	226.5		
20.3	228.0		
20.2	229.5		
20.1	231.0		
20.0	232.5		
19.9	234.0		
19.8	235.5		
19.7	237.0		
19.6	238.5		
19.5	240.0		
19.4	241.5		
19.3	243.0		
19.2	244.5		
19.1	246.0		
19.0	247.5		
18.9	249.0		
18.8	250.5		
18.7	252.0		
18.6	253.5		
18.5	255.0		
18.4	256.5		
18.3	258.0		
18.2	259.5		
18.1	261.0		
18.0	262.5		
17.9	264.0		
17.8	265.5		
17.7	267.0		
17.6	268.5		
17.5	270.0		
17.4	271.5		
17.3	273.0		
17.2	274.5		
17.1	276.0		
17.0	277.5		
16.9	279.0		
16.8	280.5		
16.7	282.0		
16.6	283.5		
16.5	285.0		
16.4	286.5		
16.3	288.0		
16.2	289.5		
16.1	291.0		
16.0	292.5		
15.9	294.0		
15.8	295.5		
15.7	297.0		
15.6	298.5		
15.5	300.0		
15.4	301.5		
15.3	303.0		
15.2	304.5		
15.1	306.0		
15.0	307.5		
14.9	309.0		
14.8	310.5		
14.7	312.0		
14.6	313.5		
14.5	315.0		
14.4	316.5		
14.3	318.0		
14.2	319.5		
14.1	321.0		
14.0	322.5		
13.9	324.0		
13.8	325.5		
13.7	327.0		
13.6	328.5		
13.5	330.0		
13.4	331.5		
13.3	333.0		
13.2	334.5		
13.1	336.0		
13.0	337.5		
12.9	339.0		
12.8	340.5		
12.7	342.0		
12.6	343.5		
12.5	345.0		
12.4	346.5		
12.3	348.0		
12.2	349.5		
12.1	351.0		
12.0	352.5		
11.9	354.0		
11.8	355.5		
11.7	357.0		
11.6	358.5		
11.5	360.0		
11.4	361.5		
11.3	363.0		
11.2	364.5		
11.1	366.0		
11.0	367.5		
10.9	369.0		
10.8	370.5		
10.7	372.0		
10.6	373.5		
10.5	375.0		
10.4	376.5		
10.3	378.0		
10.2	379.5		
10.1	381.0		
10.0	382.5		
9.9	384.0		
9.8	385.5		
9.7	387.0		
9.6	388.5		
9.5	390.0		
9.4	391.5		
9.3	393.0		
9.2	394.5		
9.1	396.0		
9.0	397.5		
8.9	399.0		
8.8	400.5		
8.7	402.0		
8.6	403.5		
8.5	405.0		
8.4	406.5		
8.3	408.0		
8.2	409.5		
8.1	411.0		
8.0	412.5		
7.9	414.0		
7.8	415.5		
7.7	417.0		
7.6	418.5		
7.5	420.0		
7.4	421.5		
7.3	423.0		
7.2	424.5		
7.1	426.0		
7.0	427.5		
6.9	429.0		
6.8	430.5		
6.7	432.0		
6.6	433.5		
6.5	435.0		
6.4	436.5		
6.3	438.0		
6.2	439.5		
6.1	441.0		
6.0	442.5		
5.9	444.0		
5.8	445.5		
5.7	447.0		
5.6	448.5		
5.5	450.0		
5.4	451.5		
5.3	453.0		
5.2	454.5		
5.1	456.0		
5.0	457.5		
4.9	459.0		
4.8	460.5		
4.7	462.0		
4.6	463.5		
4.5	465.0		
4.4	466.5		
4.3	468.0		
4.2	469.5		
4.1	471.0		
4.0	472.5		
3.9	474.0		
3.8	475.5		
3.7	477.0		
3.6	478.5		
3.5	480.0		
3.4	481.5		
3.3	483.0		
3.2	484.5		
3.1	486.0		
3.0	487.5		
2.9	489.0		
2.8	490.5		
2.7	492.0		
2.6	493.5		
2.5	495.0		
2.4	496.5		
2.3	498.0		
2.2	499.5		
2.1	501.0		
2.0	502.5		
1.9	504.0		
1.8	505.5		
1.7	507.0		
1.6	508.5		
1.5	510.0		
1.4	511.5		
1.3	513.0		
1.2	514.5		
1.1	516.0		
1			

November 1904.

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
1	61.5	50.0	...	Scattered cloud	Note— Min. temperature of night previous: other observation of same afternoon.
2	63.0	50.0	...	Clear.	
3	64.5	50.5	...	"	
4	64.5	52.0	...	Light cloud.	
5	67.5	48.0	...	Clear.	
6	65.5	52.5	...	Light cloud.	
7	61.0	50.0	...	Clear.	
8	60.0	52.0	...	Light cloud.	
9	58.0	53.0	...	Cloudy.	
10	60.5	52.0	...	Scattered cloud.	
11	61.0	49.5	...	" "	
12	60.0	50.0	...	Cloudy.	
13	61.0	47.0	...	Light clouds.	
14	54.0	60.5	...	Clear.	
15	59.0	46.0	...	Scattered cloud.	
16	59.0	49.0	...	Cloudy	Few drops of rain.*
17	60.5	50.0	...	Clear.	
18	58.0	44.0	...	"	
19	60.5	45.3	...	Scattered cloud.	
20	60.0	43.5	...	Cloudy.	
21	60.0	46.0	Drops of rain.	"	Few drops of rain.*
22	58.0	43.0	...	Scattered cloud.	
23	58.0	45.5	...	" "	
24	62.0	40.0	...	" "	
25	52.5	52.0	...	" "	Few drops of rain.*
26	53.0	48.0	shower	" "	$\frac{1}{8}$ " of rain.*
27	55.0	48.0	...	" "	
28	56.5	33.0	...	Hazy.	
29	52.0	35.0	...	Light cloud.	
30	54.5	34.0	...	Cloudy.	

\* This information obtained from records of His Britannic Majesty's Consulate in the city (Seistan), 25 miles from the Mission Camp.



December 1904.

Date.	THERMOMETER.			Sky.	REMARKS.
	Wet.	Min.	Rain.		
					Note—
1	57°0	43°0	...	Light, cloud	Min. temperature of night previous; other observation of same afternoon.
2	63°0	52°0	Drop of rain.	Cloudy ...	Calm. Few drops of rain.*
3	61°5	46°0	...	" ...	"
4	64°5	48°0	...	Scattered cloud	"
5	60°0	48°0	...	Cloudy, hazy	"
6	54°5	47°0	...	" "	Light wind.
7	58°0	41°5	...	" "	Calm.
8	57°0	45°0	...	Light cloud	"
9	47°0	44°0	...	Scattered cloud	Strong wind.
10	52°0	39°5	...	Clear ...	Calm.
11	51°5	39°0	...	Scattered cloud	"
12	45°5	40°0	...	Clear ...	Strong wind.
13	48°0	35°0	...	Scattered cloud	" "
14	45°0	39°0	...	Clear ...	Calm.
15	44°5	24°0	...	" ...	"
16	48°0	31°0	...	" ...	"
17	45°5	20°0	...	" ...	"
18	49°0	23°0	...	" ...	"
19	46°0	27°0	...	" ...	"
20	55°0	35°0	...	" ...	"
21	44°0	23°0	...	" ...	"
22	46°0	37°0	...	Light cloud	"
23	47°0	33°0	...	Clear ...	"
24	48°0	33°0	...	Cloudy ...	"
25	50°0	35°0	...	Light cloud	Light wind. Few drops of rain.*
26	53°5	39°0	...	Clear ...	Calm.
27	48°0	32°0	...	Scattered cloud	"
28	46°0	26°0	...	Cloudy ...	"
29	47°5	33°0	...	Scattered cloud	"
30	47°0	26°0	...	Clear ...	"
31	47°0	40°0	...	Cloudy ...	"

\* This information obtained from records of His Britannic Majesty's Consulate in the city (Seistan) about 35 miles from the Mission Camp

Meteorological Abstract for the month of January 1905

Velocity of Wind.		Barometer Readings.												Velocity of Wind.					
Average per hour.	Totals for 24 hours.	Max : Thermometer readings.												Totals for 24 hours.	Average per hour.				
Miles 100	Miles 2,400	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	2,400 Miles.	100 Miles.
" 90	" 2,160	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	2,160 "	90 "
" 80	" 1,920	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	1,920 "	80 "
" 70	" 1,680	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	1,680 "	70 "
" 60	" 1,440	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	1,440 "	60 "
" 50	" 1,200	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	1,200 "	50 "
" 40	" 960	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	960 "	40 "
" 30	" 720	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	720 "	30 "
" 20	" 480	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	480 "	20 "
" 10	" 240	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	240 "	10 "
	Calm.	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	Calm.	
														Month and date.					
														3	30				
														6	27				
														9	24				
														12	21				
														15	18				
														18	15				
														21	12				
														24	9				
														27	6				
														30	3				
														Month and date.					
														(31st)					

A n e m o m e t e r

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January 1905.

Date.	THERMOMETER.			Sky.	REMARKS.
	Wet.	Min.	Rain.		
1	54°	43°	Good rain	Scattered cloud, calm ...	Note— Min. temperature of night previous: other observation of same afternoon. Few drops of rain.*
2	51°	45°		" " ...	Light wind. $\frac{1}{2}$ " of rain.*
3	49°	43°	...	" " ...	" "
4	50°	33°	...	Clear ...	Calm.
5	51°	34°	...	" ...	"
6	50°	32°	...	Scattered cloud ...	"
7	50°	35°	...	Cloudy ...	"
8	53°	35°	...	Light cloud ...	"
9	49°	36°	...	Scattered cloud ...	"
10	55°	33°	...	Clear ...	"
11	52°	41°	...	Scattered clouds ...	"
12	54°	39°	...	Cloudy ...	"
13	52°	48°	...	Clear ...	"
14	44°	36°	...	Cloudy ...	Light wind.
15	48°	34°	...	" ...	Calm.
16	51°	40°	...	Clear ...	"
17	50°	40°	...	" ...	"
18	51°	33°	...	Scattered cloud ...	"
19	51°	39°	...	Cloudy ...	"
20	33°	35°	Little rain	" ...	Strong wind.
21	35°	18°	...	Clear ...	" " Few drops of rain.*
22	26°	9°	...	" ...	" "
23	30°	4°	...	Cloudy ...	Light wind.
24	48°	27°	...	Clear ...	Calm.
25	41°	32°	...	Cloudy ...	"
26	Marching	...	Little rain	" ...	"
27	34°	25°	...	Light cloud ...	Blizzard with snow at night. About 3" of snow.
28	...	10°	...	Marching ...	Light wind.
29	41°	8°	...	Clear ...	" "
30	35°	12°	...	" ...	" "
31	46°	14°	...	" ...	" "

\* This information obtained from records of His Britannic Majesty's Consulate in city (Seistan) about 30 and 20 miles from the Mission Camp.



February 1905.

Date.	THERMOMETER.			Sky.	REMARKS.
	Wet.	Min.	Rain.		
					Note—
1	50°0	20°0	...	Clear ... ..	Min. temperature of night previous : office observations of 8 A. M. afternoon.
2	50°0	22°0	...	Scattered cloudy.	
3	47°0	39°0	...	Cloud.	
4	44°5	26°0	...	Clear.	
5	42°0	26°0	...	Cloudy.	
6	45°0	26°0	...	Clear.	
7	64°5	18°0	...	"	
8	40°0	34°0	...	"	
9	42°0	30°0	...	Cloudy.	
10	43°0	35°0	...	" ... ..	Few drops of rain *
11	48°0	42°0	Drops of rain.	" ... ..	$\frac{1}{10}$ " of rain.*
12	51°0	36°0	...	Scattered cloud.	
13	50°0	38°0	...	Cloudy.	
14	50°5	33°0	...	"	
15	48°0	36°0	...	Clear.	
16	47°0	34°0	...	"	
17	47°0	32°0	...	"	
18	52°0	31°0	...	Cloudy.	
19	51°0	33°0	...	Scattered cloud.	
20	57°5	42°0	...	Cloudy.	
21	54°0	45°0	Rain shower.	" ... ..	$\frac{1}{10}$ " of rain.*
22	45°5	42°0	...	"	
23	39°0	29°0	...	"	
24	40°0	29°0	..	"	
25	41°0	34°0	...	"	
26	40°0	30°0	...	Light cloud.	
27	46°0	30°0	...	Clear.	
28	52°0	27°0	...		

\* This information obtained from records of His Britannic Majesty's Consulate in the city (Seistan), 25 miles from Mission Camp.

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*Meteorological Abstract for the month of March 1905.*

Velocity of Wind.		Barometer Readings.																								Velocity of Wind.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Average per hour.	Totals for 24 hours.	Max. Thermometer readings.																								Total for 24 hours.	Average per hour.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Miles 100	Miles 2400	28 17	28 18	28 19	28 20	28 21	28 22	28 23	28 24	28 25	28 26	28 27	28 28	28 29	28 30	28 31	28 32	28 33	28 34	28 35	28 36	28 37	28 38	28 39	28 40	28 41	28 42	28 43	28 44	28 45	28 46	28 47	28 48	28 49	28 50	28 51	28 52	28 53	28 54	28 55	28 56	28 57	28 58	28 59	29 00																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
" 90	" 2160	66.5	71.0	75.0	78.0	81.0	84.0	87.0	90.0	93.0	96.0	99.0	102.0	105.0	108.0	111.0	114.0	117.0	120.0	123.0	126.0	129.0	132.0	135.0	138.0	141.0	144.0	147.0	150.0	153.0	156.0	159.0	162.0	165.0	168.0	171.0	174.0	177.0	180.0	183.0	186.0	189.0	192.0	195.0	198.0	201.0	204.0	207.0	210.0	213.0	216.0	219.0	222.0	225.0	228.0	231.0	234.0	237.0	240.0	243.0	246.0	249.0	252.0	255.0	258.0	261.0	264.0	267.0	270.0	273.0	276.0	279.0	282.0	285.0	288.0	291.0	294.0	297.0	300.0	303.0	306.0	309.0	312.0	315.0	318.0	321.0	324.0	327.0	330.0	333.0	336.0	339.0	342.0	345.0	348.0	351.0	354.0	357.0	360.0	363.0	366.0	369.0	372.0	375.0	378.0	381.0	384.0	387.0	390.0	393.0	396.0	399.0	402.0	405.0	408.0	411.0	414.0	417.0	420.0	423.0	426.0	429.0	432.0	435.0	438.0	441.0	444.0	447.0	450.0	453.0	456.0	459.0	462.0	465.0	468.0	471.0	474.0	477.0	480.0	483.0	486.0	489.0	492.0	495.0	498.0	501.0	504.0	507.0	510.0	513.0	516.0	519.0	522.0	525.0	528.0	531.0	534.0	537.0	540.0	543.0	546.0	549.0	552.0	555.0	558.0	561.0	564.0	567.0	570.0	573.0	576.0	579.0	582.0	585.0	588.0	591.0	594.0	597.0	600.0	603.0	606.0	609.0	612.0	615.0	618.0	621.0	624.0	627.0	630.0	633.0	636.0	639.0	642.0	645.0	648.0	651.0	654.0	657.0	660.0	663.0	666.0	669.0	672.0	675.0	678.0	681.0	684.0	687.0	690.0	693.0	696.0	699.0	702.0	705.0	708.0	711.0	714.0	717.0	720.0	723.0	726.0	729.0	732.0	735.0	738.0	741.0	744.0	747.0	750.0	753.0	756.0	759.0	762.0	765.0	768.0	771.0	774.0	777.0	780.0	783.0	786.0	789.0	792.0	795.0	798.0	801.0	804.0	807.0	810.0	813.0	816.0	819.0	822.0	825.0	828.0	831.0	834.0	837.0	840.0	843.0	846.0	849.0	852.0	855.0	858.0	861.0	864.0	867.0	870.0	873.0	876.0	879.0	882.0	885.0	888.0	891.0	894.0	897.0	900.0	903.0	906.0	909.0	912.0	915.0	918.0	921.0	924.0	927.0	930.0	933.0	936.0	939.0	942.0	945.0	948.0	951.0	954.0	957.0	960.0	963.0	966.0	969.0	972.0	975.0	978.0	981.0	984.0	987.0	990.0	993.0	996.0	999.0	1002.0	1005.0	1008.0	1011.0	1014.0	1017.0	1020.0	1023.0	1026.0	1029.0	1032.0	1035.0	1038.0	1041.0	1044.0	1047.0	1050.0	1053.0	1056.0	1059.0	1062.0	1065.0	1068.0	1071.0	1074.0	1077.0	1080.0	1083.0	1086.0	1089.0	1092.0	1095.0	1098.0	1101.0	1104.0	1107.0	1110.0	1113.0	1116.0	1119.0	1122.0	1125.0	1128.0	1131.0	1134.0	1137.0	1140.0	1143.0	1146.0	1149.0	1152.0	1155.0	1158.0	1161.0	1164.0	1167.0	1170.0	1173.0	1176.0	1179.0	1182.0	1185.0	1188.0	1191.0	1194.0	1197.0	1200.0	1203.0	1206.0	1209.0	1212.0	1215.0	1218.0	1221.0	1224.0	1227.0	1230.0	1233.0	1236.0	1239.0	1242.0	1245.0	1248.0	1251.0	1254.0	1257.0	1260.0	1263.0	1266.0	1269.0	1272.0	1275.0	1278.0	1281.0	1284.0	1287.0	1290.0	1293.0	1296.0	1299.0	1302.0	1305.0	1308.0	1311.0	1314.0	1317.0	1320.0	1323.0	1326.0	1329.0	1332.0	1335.0	1338.0	1341.0	1344.0	1347.0	1350.0	1353.0	1356.0	1359.0	1362.0	1365.0	1368.0	1371.0	1374.0	1377.0	1380.0	1383.0	1386.0	1389.0	1392.0	1395.0	1398.0	1401.0	1404.0	1407.0	1410.0	1413.0	1416.0	1419.0	1422.0	1425.0	1428.0	1431.0	1434.0	1437.0	1440.0	1443.0	1446.0	1449.0	1452.0	1455.0	1458.0	1461.0	1464.0	1467.0	1470.0	1473.0	1476.0	1479.0	1482.0	1485.0	1488.0	1491.0	1494.0	1497.0	1500.0	1503.0	1506.0	1509.0	1512.0	1515.0	1518.0	1521.0	1524.0	1527.0	1530.0	1533.0	1536.0	1539.0	1542.0	1545.0	1548.0	1551.0	1554.0	1557.0	1560.0	1563.0	1566.0	1569.0	1572.0	1575.0	1578.0	1581.0	1584.0	1587.0	1590.0	1593.0	1596.0	1599.0	1602.0	1605.0	1608.0	1611.0	1614.0	1617.0	1620.0	1623.0	1626.0	1629.0	1632.0	1635.0	1638.0	1641.0	1644.0	1647.0	1650.0	1653.0	1656.0	1659.0	1662.0	1665.0	1668.0	1671.0	1674.0	1677.0	1680.0	1683.0	1686.0	1689.0	1692.0	1695.0	1698.0	1701.0	1704.0	1707.0	1710.0	1713.0	1716.0	1719.0	1722.0	1725.0	1728.0	1731.0	1734.0	1737.0	1740.0	1743.0	1746.0	1749.0	1752.0	1755.0	1758.0	1761.0	1764.0	1767.0	1770.0	1773.0	1776.0	1779.0	1782.0	1785.0	1788.0	1791.0	1794.0	1797.0	1800.0	1803.0	1806.0	1809.0	1812.0	1815.0	1818.0	1821.0	1824.0	1827.0	1830.0	1833.0	1836.0	1839.0	1842.0	1845.0	1848.0	1851.0	1854.0	1857.0	1860.0	1863.0	1866.0	1869.0	1872.0	1875.0	1878.0	1881.0	1884.0	1887.0	1890.0	1893.0	1896.0	1899.0	1902.0	1905.0	1908.0	1911.0	1914.0	1917.0	1920.0	1923.0	1926.0	1929.0	1932.0	1935.0	1938.0	1941.0	1944.0	1947.0	1950.0	1953.0	1956.0	1959.0	1962.0	1965.0	1968.0	1971.0	1974.0	1977.0	1980.0	1983.0	1986.0	1989.0	1992.0	1995.0	1998.0	2001.0	2004.0	2007.0	2010.0	2013.0	2016.0	2019.0	2022.0	2025.0	2028.0	2031.0	2034.0	2037.0	2040.0	2043.0	2046.0	2049.0	2052.0	2055.0	2058.0	2061.0	2064.0	2067.0	2070.0	2073.0	2076.0	2079.0	2082.0	2085.0	2088.0	2091.0	2094.0	2097.0	2100.0	2103.0	2106.0	2109.0	2112.0	2115.0	2118.0	2121.0	2124.0	2127.0	2130.0	2133.0	2136.0	2139.0	2142.0	2145.0	2148.0	2151.0	2154.0	2157.0	2160.0	2163.0	2166.0	2169.0	2172.0	2175.0	2178.0	2181.0	2184.0	2187.0	2190.0	2193.0	2196.0	2199.0	2202.0	2205.0	2208.0	2211.0	2214.0	2217.0	2220.0	2223.0	2226.0	2229.0	2232.0	2235.0	2238.0	2241.0	2244.0	2247.0	2250.0	2253.0	2256.0	2259.0	2262.0	2265.0	2268.0	2271.0	2274.0	2277.0	2280.0	2283.0	2286.0	2289.0	2292.0	2295.0	2298.0	2301.0	2304.0	2307.0	2310.0	2313.0	2316.0	2319.0	2322.0	2325.0	2328.0	2331.0	2334.0	2337.0	2340.0	2343.0	2346.0	2349.0	2352.0	2355.0	2358.0	2361.0	2364.0	2367.0	2370.0	2373.0	2376.0	2379.0	2382.0	2385.0	2388.0	2391.0	2394.0	2397.0	2400.0	2403.0	2406.0	2409.0	2412.0	2415.0	2418.0	2421.0	2424.0	2427.0	2430.0	2433.0	2436.0	2439.0	2442.0	2445.0	2448.0	2451.0	2454.0	2457.0	2460.0	2463.0	2466.0	2469.0	2472.0	2475.0	2478.0	2481.0	2484.0	2487.0	2490.0	2493.0	2496.0	2499.0	2502.0	2505.0	2508.0	2511.0	2514.0	2517.0	2520.0	2523.0	2526.0	2529.0	2532.0	2535.0	2538.0	2541.0	2544.0	2547.0	2550.0	2553.0	2556.0	2559.0	2562.0	2565.0	2568.0	2571.0	2574.0	2577.0	2580.0	2583.0	2586.0	2589.0	2592.0	2595.0	2598.0	2601.0	2604.0	2607.0	2610.0	2613.0	2616.0	2619.0	2622.0	2625.0	2628.0	2631.0	2634.0	2637.0	2640.0	2643.0	2646.0	2649.0	2652.0	2655.0	2658.0	2661.0	2664.0	2667.0	2670.0	2673.0	2676.0	2679.0	2682.0	2685.0	2688.0	2691.0	2694.0	2697.0	2700.0	2703.0	2706.0	2709.0	2712.0	2715.0	2718.0	2721.0	2724.0	2727.0	2730.0	2733.0	2736.0	2739.0	2742.0	2745.0	2748.0	2751.0	2754.0	2757.0	2760.0	2763.0	2766.0	2769.0	2772.0	2775.0	2778.0	2781.0	2784.0	2787.0	2790.0	2793.0	2796.0	2799.0	2802.0	2805.0	2808.0	2811.0	2814.0	2817.0	2820.0	2823.0	2826.0	2829.0	2832.0	2835.0	2838.0	2841.0	2844.0	2847.0	2850.0	2853.0	2856.0	2859.0	2862.0	2865.0	2868.0	2871.0	2874.0	2877.0	2880.0	2883.0	2886.0	2889.0	2892.0	2895.0	2898.0	2901.0	2904.0	2907.0	2910.0	2913.0	2916.0	2919.0	2922.0	2925.0	2928.0	2931.0	2934.0	2937.0	2940.0	2943.0	2946.0	2949.0	2952.0	2955.0	2958.0	2961.0	2964.0	2967.0	2970.0	2973.0	2976.0	2979.0	2982.0	2985.0	2988.0	2991.0	2994.0	2997.0	3000.0	3003.0	3006.0	3009.0	3012.0	3015.0	3018.0	3021.0	3024.0	3027.0	3030.0	3033.0	3036.0	3039.0	3042.0	3045.0	3048.0	3051.0	3054.0	3057.0	3060.0	3063.0	3066.0	3069.0	3072.0	3075.0	3078.0	3081.0	3084.0	3087.0	3090.0	3093.0	3096.0	3099.0	3102.0	3105.0	3108.0	3111.0	3114.0	3117.0	3120.0	3123.0	3126.0	3129.0	3132.0	3135.0	3138.0	3141.0	3144.0	3147.0	3150.0	3153.0	3156.0	3159.0	3162.0	3165.0	3168.0	3171.0	3174.0	3177.0	3180.0	3183.0	3186.0	3189.0	3192.0	3195.0	3198.0	3201.0	3204.0	3207.0	3210.0	3213.0	3216.0	3219.0	3222.0	3225.0	3228.0	3231.0	3234.0	3237.0	3240.0	3243.0	3246.0	3249.0	3252.0	3255.0	3258.0	3261.0	3264.0	3267.0	3270.0	3273.0	3276.0	3279.0	3282.0	3285.0	3288.0	3291.0	3294.0	3297.0	3300.0	3303.0	3306.0	3309.0	3312.0	3315.0	3318.0	3321.0	3324.0	3327.0	3330.0	3333.0	3336.0	3339.0

March 1905.

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note—
1	46°0	24°0	...	Clear ...	Min. temperature of night previous : other observation of same afternoon.
2	45°0	25°0	...	Cloudy.	
3	54°0	31°0	...	Clear.	
4	66°0	37°0	...	Cloudy ...	Few drops of rain.*
5	53°5	50°0	Shower	" ...	Ditto.
6	57°6	46°0	Heavy shower.	" ...	$\frac{1}{2}$ " of rain.*
7	67°0	47°0	...	"	
8	66°0	44°0	...	"	
9	60°0	52°0	...	" ...	Few drops of rain.*
10	58°0	51°0	Shower	" ...	Ditto.
11	48°0	49°0	...	"	
12	51°0	48°0	Light shower.	" ...	Ditto.
13	69°0	46°0	...	"	
14	81°0	46°0	...	"	
15	49°5	38°0	...	"	
16	52°0	40°0	Drop rain	Scattered cloud ...	Ditto.
17	52°0	40°0	...	Clear.	
18	56°0	44°0	...	Cloudy.	
19	51°5	46°0	Light shower.	" ...	Ditto.
20	51°5	41°0	...	"	
21	59°0	41°0	...	Clear.	
22	60°5	49°0	...	Scattered clouds ...	Ditto.
23	60°0	53°0	...	Light cloud.	
24	60°5	57°0	...	Cloudy ...	Ditto.
25	54°0	53°0	Good rain, little hail.	Light cloud's ...	$\frac{1}{10}$ " of rain.*
26	43°0	39°0	...	Scattered clouds ...	$\frac{1}{24}$ " "
27	36°0	33°0	...	Clear.	
28	42°0	20°0	...	Light cloud.	
29	...	8°0	...	Hazy.	
30	...	28°0	...	"	
31	55°0	45°0	...	Cloudy.	

\* This information obtained from records of His Britannic Majesty's Consulate in the city (Seistan), 25 miles from the Mission Camp.

Meteorological Abstract for the month of April 1905.

Velocity of Wind.		Barometer Readings.		Velocity of Wind.	
Average per hour.	Totals for 24 hours.	Max : Thermometer readings.	...	Totals for 24 hours.	Average per hour.
Miles 100	Miles 8400	...	...	2400 Miles.	100 Miles.
" 90	" 2160	...	...	2160 "	90 "
" 80	" 1920	...	...	1920 "	80 "
" 70	" 1680	...	...	1680 "	70 "
" 60	" 1440	...	...	1440 "	60 "
" 50	" 1200	...	...	1200 "	50 "
" 40	" 960	...	...	960 "	40 "
" 30	" 720	...	...	720 "	30 "
" 20	" 480	...	...	480 "	20 "
" 10	" 240	...	...	240 "	10 "
Calm.		...	...	Calm.	

Month and date.	Barometer Readings.	Wind.
1 April 317.80	...	...
2 " 318.14	...	...
3 " 80.00	...	...
4 " 195.44	...	...
5 " 313.10	...	...
6 " 183.00	...	...
7 " 179.60	...	...
8 " 191.60	...	...
9 " 114.10	...	...
10 " 352.10	...	...
11 " 312.40	...	...
12 " 423.20	...	...
13 " 398.25	...	...
14 " 83.46	...	...
15 " 154.74	...	...
16 " 12.60	...	...
17 " 247.94	...	...
18 " 442.90	...	...
19 " 565.50	...	...
20 " 575.50	...	...
21 " 324.60	...	...
22 " 85.10	...	...
23 " 174.20	...	...
24 " 207.60	...	...
25 " 262.10	...	...
26 " 231.40	...	...
27 " 108.50	...	...
28 " 358.10	...	...
29 " 105.50	...	...
30 " 275.60	...	...
(31st)	...	...

April 1905.

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note—
1	49°	45°	...	Clear	Min. temperature of night previous; other observation of same afternoon.
2	57°	48°	...	"	
3	68°	51°	...	"	
4	60°	50°	...	Scattered cloud.	
5	60°	51°	...	Cloudy.	
6	59°	49°	...	Clear.	
7	62°	49°	...	"	
8	60°	50°	...	"	
9	66°	53°	...	Scattered cloud.	
10	60°	58°	...	" "	
11	61°	55°	...	Clear.	
12	53°	49°	...	Hazy, no cloud.	
13	58°	54°	...	" cloudy.	
14	65°	54°	...	Scattered cloud.	
15	67°	58°	...	Hazy, cloudy.	
16	69°	59°	...	Clear.	
17	71°	60°	...	"	
18	67.5	68°	...	Scattered cloud.	
19	66°	65°	...	Cloudy.	
20	55°	54°	...	Clear.	
21	61°	51°	...	"	
22	61°	52°	...	Scattered cloud.	
23	62°	61°	...	Light cloud.	
24	68°	65°	...	Light scattered cloud.	
25	66°	65°	...	Light cloud.	
26	68°	62°	...	" "	
27	68°	64°	...	" "	
28	69°	73°	...	" "	
29	67°	75°	...	" "	
30	70°	67°	...	" "	

C341DF



May 1905.

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note—
1	73°	65°	...	Cloudy ...	Min. temperature of night previous : other observation of same afternoon.
2	67°	70°	...	Scattered cloud.	
3	66°	62°	...	Clear.	
4	70°	70°	...	Hazy, no cloud.	
5	68°	69°	...	Light cloud.	
6	73°	67°	...	"	
7	71°	68°	...	Clear.	
8	67°	72°	...	"	
9	69°	67°	...	Scattered cloud.	
10	72°	65°	...	Clear.	
11	73°	70°	...	Hazy, no cloud.	
12	69°	65°	...	" "	
13	65°	63°	...	Cloudy, haze.	
14	65°	59°	...	Scattered cloud.	
15	Marching	58°	...	Clear ...	Strong wind.
16	59°	52°	...	" ...	"
17	57°	59°	...	Cloudy ...	Calm.
18	62.5	Marching	...	Scattered cloud	"
19	66°	65°	...	Clear ...	"
20	61.5	57°	...	" ...	"
21	66°	71°	...	" ...	Strong wind.
22	64°	67°	...	" ...	Calm.
23	65°	64°	Few drops	Scattered ...	Dust storm in afternoon.
24	65.5	59°	...	Clear ...	Calm.
25	67°	61°	...	" ...	"
26	74°	58°	...	" ...	"
27	67°	Marching	...	" ...	"
28	70	"	...	" ...	"
29	73.5	65°	...	" ...	"
30	75°	72°	...	" ...	Light easterly wind towards evening blowing fresh from east.
31	79°	75°	...	"	

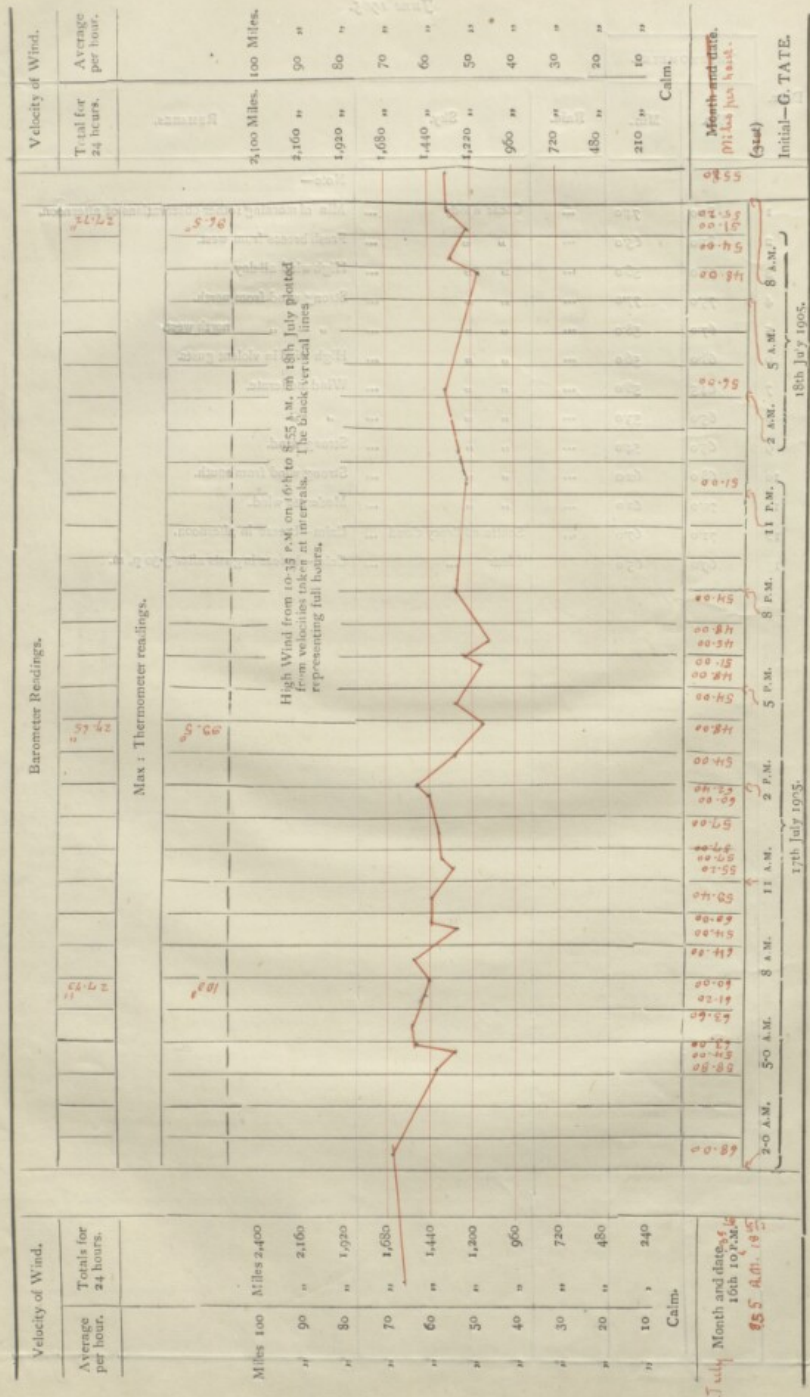
G. TATE.



June 1905.

Date.	THERMOMETER.		Rain.	Sky.	REMARKS.
	Wet.	Min.			
					Note—
1	82°	74°	...	Clear windy	Min. of morning : other observations of afternoon.
2	81°	65°	...	" "	Fresh breeze from west.
3	79°	56°	...	" "	High wind all day.
4	75°	77°	...	" "	Strong wind from north.
5	67°	58°	...	" "	" " north west.
6	68°	50°	...	" "	High wind in violent gusts.
7	64.5	56°	...	" "	Wind moderate.
8	65°	53°	...	" "	" "
9	65°	54°	...	" "	Strong wind.
10	68°	62°	...	" "	Strong wind from south.
11	70°	62°	...	" "	Moderate wind.
12	71°	67°	...	Scattered fleecy cloud	Calm—breeze in afternoon.
13	69°	65°	...	Clear	Calm—breeze in gusts after 3-30 p. m.

*Type of curve during paroxysm of the Bad-i-Sad.-O.-Bist Ros.*



Initial—G. TATE.

18th July 1905.

17th July 1905.

Month and date, 1905  
855 A.M. 1905

Month and date, 1905  
855 A.M. 1905

## APPENDIX 14.

## CONTENTS.

THE EXTENSION OF THE CHAH-I-NIMA CANAL MADE IN 1904; AND THE METHOD OF MAKING A *karis*.

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The *karis* on the north bank of the Sabári Hamun.

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## APPENDIX 14.

*The extension of the Chah-i-Nima Canal made in 1904; and an account of the method of making a kariz.*

(Notes collected by Lala Thakur Dass, Supervisor.)

Just ten years ago, *i.e.*, in 1895, the Chah-i-Nima Canal was first made by

The History of the Canal.

Ali Akbar Khan, son of Sher Khan, Nahru, under orders of Sartip Mir Masum

Khan, son of Amir Ali Akbar Khan, Hashmat-ul-Mulk.

Ali Akbar, Nahru, made his canal from the Rūd-i-Seistān and brought it along the boundary of the villages of Kaftargi and Burj-i-Sarband, then north of

\* Gurguri, an onomatopoeic word from the sound of water falling down a rapid; the Rūd-i-Seistān breached into the Chah-i-Nima depression; the breach could not be closed till the depression filled; this is said to have taken about three months.

Kaftargi village, and ended it at Dahana-i-Gurguri,\* the old channel which ran from the Rūd-i-Seistān into the Chah-i-Nima.

At this place he made a water-mill for himself and divided the supply into two branches. Since then and up till 1904 the Chah-i-Nima Canal irrigated from four to six ploughs of spring crops, but never less than four (say 220 acres). In 1901 Amir, Ali Akbar Khan, was displeased with Ali Akbar, Nahru, and tried to make him a prisoner. But the Sartip, Mir Masum Khan, secured his escape from Seistān, and made over charge of the Chah-i-Nima Canal to Safar, Nahru, who was the nazir and tahwildar of the Sartip.

The village of Chah-i-Nima from the very first belonged to the Sartip, and he changed the kadhudas at his pleasure. In 1903 he gave this village to Ghulam Ali Khan, who is said to belong to the Taifa-i-Ahangar (blacksmith) of Bunjar. Sardar Sharif Khan, Nahru, was the cousin of Ghulam Ali Khan; and as the Sartip is the son of Sardar Sharif Khan's daughter, Ghulam Ali Khan is a relation of the Sartip's.

At the end of August 1904, before the boundary pillars were built towards

The collection of labour.

the Kuh-i-Malik Siab, the Sartip, who was now Deputy Governor, the Hashmat-ul-

Mulk being at Tehran, ordered the Chah-i-Nima Canal to be extended. Accordingly the Mahals of Sharaki and Nahru first sent two men per plough for 10 days. After that the *hashar* came from the Pusht-i-Ab for 10 days at the same rate per plough; and then the men from the Shib-i-Ab came after they had finished the repairs of the Band-i-Kuhak.

From the Pusht-i-Ab all the cultivators came, even the tahwil and those belonging to sayyads, mullas and hajis; but the bazgars of Deh Kamali and Deh Gazbar, two villages belonging to the sons of Kadkhuda Ali Murad Bandani, were exempt. These kadhudas do much work for the Hashmat-ul-Mulk (see Chapter XLIII on Saiyāds).

The work on the extension of the canal was finished in 30 days, except the tunnel under the *dasht* through which the canal had to be taken to reach the depression of the Chah-i-Nima, which, as will be explained further on, was made in 18 days.

Duration of the work.

Before the canal was extended, it irrigated only four to six *pāgāo*. But in the

The irrigation done by the newly extended Chah-i-Nima Canal in the spring crops of 1904-05. Exemption of the cultivators from *ghami* work.

spring crop of 1904-05 it irrigated 2 *tahwil* and 20 *ghami pagao* in addition to the former four ploughs. In all 2

*tahwil* and 26 *ghami pāgāo* were sown. As new land was broken, only 120 to 150 *man* Seistāni seed was sown per *pāgāo*, and instead of six cultivators only four or five worked on one plough. So that the area done per plough was only about a fourth of the usual area done by a plough in Persian Seistān. The area will be further extended in the next year.

The Sartip has made a concession to the men who did this cultivation, and has given them a written order that they are exempt from all kinds of *ghami* for three years, including the year 1904-05; this exemption includes work on the Band-i-Kuhak and in the City.

It is said that Sardar Said Khan, Nahrui, son of Sardar Sharif Khan, had obtained from the Shah of Persia the grant of all the villages in Mahal-i-Nahrui, but he died on his way back from Tehran in April 1905. So that early in May 1905, after the news of his death reached Seistan, Khudadad Khan, his son, went to the Yamin-i-Nizam and asked him to confirm the rights of Sardar Said Khan to his sons. The Shah was telegraphed to; and an order was received that the sons of Sardar Said Khan should at once be given the villages of Mahal-i-Nahrui. So in the first week of May Khudadad Khan sent his own mushrif to Chah-i-Nima village and turned out the mushrif whom the Deputy Governor had appointed.

On the 15th May 1905 the Deputy Governor is said to have written to Khudadad Khan that they were very close relatives, and that he expected Khudadad Khan would retain him as a partner in the Chah-i-Nima village. But if this was not acceptable, then Khudadad Khan ought to pay two thousand *kran* to Kadkhuda Ghulam Ali Khan, being the sum of money spent by the latter on the extension of the Chah-i-Nima Canal. To the latter part of these proposals, Khudadad Khan is said to have agreed; but he turned Ghulam Ali Khan out of the village.

*The tunnel or kán on the Chah-i-Nima Canal.*

The length of tunnel through the *dasht* was about 200 feet, the top of the *dasht* being about 25 feet high above the bed of the canal. The soil was hard and the tunnel could not be made by the cultivators without the aid of skilled labour. So the *kán kan* or *kariz* diggers were sent for from the city, and they made the tunnel in 18 days.

When the Amir, Alam Khan, came to Seistán, he considered it advisable to get from Neh and Bandan some experts in making *kariz*. So he called these *kán kan* and persuaded them to live in the City, so as to be available to dig *kariz* when required. These *kán kan* have got lands in Neh, and when there is no work to do in Seistán, they obtain permission from the Amir and go to their homes for a short time.

The Amir pays from the Government grain 3 *kharwar* of grain to each of the four men every year at harvest time; 15 *kran* in cash and one *sar-á-pá* or dress. When the men bore a tunnel, they get their wages in cash in addition to the above annual gratuities.

The Diwan, *i.e.*, the Amir supplies them with the necessary tools which are the following:—

Tools supplied free.

- (1) *Kuling-i-Yaksar*.—Pickaxe with one head.
- (2) *Kuling-i-Dosar*.—Pickaxe with two heads.
- (3) *Bel* or spades.
- (4) *Tisha* or *phaorah*.

These *kán kan* decided that it was not necessary to dig wells (*chákh*). They cut a tunnel through the *dasht*. Such a tunnel they call a *sagh*; this is the word for the tunnel between two wells of a *kariz*.

The tunnel is about 200 feet long, about five feet wide and 6.5 feet high, so that a man can pass through it with his head erect. Two *kán kan* worked with their *kuling* at one end, and two at the other. All the boring was done by the *kán kan*, and the earth was carried away by the *hashar* working at either end. It was the business of the *kán kan* to see that both gangs were working in the same straight line.

The men carrying the earth were furnished with a *saruk* (Baluchi *ju*). This is a piece of cloth, the two ends of which are tied on to the shoulder of a man, and the other two ends he keeps in his hands. The men with *tisha* fill earth

Carriers of earth.

and the other two ends he keeps in his hands. The men with *tisha* fill earth

into the *saruk*; the carrier then carries the load on his back, and when he gets out of the tunnel lets go the ends of the cloth from his hands; the earth falls away and the man comes again to take more earth.

This tunnel was completed in 18 days. The *kán kan* were paid 8 *kran* per day per man for the number of days they worked on the tunnel in addition to what they get annually. The *hashar* was not paid; but the *pakar* got their food either in the morning or in the evening for 18 days. So that 200 lineal feet of tunnel of this size cost 576 *kran*, or nearly 3 *kran*, a lineal foot for the labour of the *kan kan* alone; this rate works out to about 115 *kran* or nearly 32 rupees a thousand cubic feet of earth removed.

In making a *kariz* the wells are dug by experienced coolies.\* They are supplied with pulleys (*charkh*), buckets (*tobra*) and ropes, with which they draw out the earth dug in the well. But the *sagh* or the tunnel between two wells is always bored through by the *kán kan* who understand how to bore in the proper direction, and how to keep the level of the bed and the top of the tunnel as required. When any person wishes to make a *kariz* or *sagh*, he applies to the Amir for the services of these *kán kan* and he orders them to go and do the work.

Kadhuda Ali Murad, Bandani, was a very enterprising man. He took these *kán kan* with him to the west of the Sabari Hamun to make a *kariz* from the *karez* on the west bank of the Sabari Hamun started by these *kán kan*, Rud-i-Khurmaka for the Zamin-i-Kalak, near Ziarat Khwaja Sabari. He dug four wells from the head of the spring downward; and 50 more wells would have brought water to the Zamin-i-Kalak, but unfortunately Ali Murad got ill, he was brought home to Seistán and died there. His scheme has not yet been carried out. It is said that the water from that spring would have sufficed to irrigate lands for 15 *kharwar* Seistání of seed or about 200 acres.

#### The Chah-i-Nima depression used as an escape.

The Chah-i-Nima depression seems to be used in years of great flood as a reservoir into which to escape the flood in the Rúd-i-Seistán. It appears to have been so used about the year 1875-1880, 1885 and 1891. In 1891 the kadhuda of Kaftargi is said to have cut the *band* by stealth in order to save the crops of his village. The Rúd-i-Seistán at that time ran past the mouth of the depression and was only kept out by a strong *band*. In 1891 the *Rud* was diverted to some distance from this *band*. On each occasion the whole volume of the *Rud* is said to have poured in, so that when water was needed for the crops it could not be obtained as the cultivators were powerless to close off the flow until the water in the depression had risen to the level of that in the *Rud*. The Chah-i-Nima depression holds 54 feet depth of water, as our measurements of evaporation give a rate of about 10 feet a year (of shallow rather than such deep waters) one would not expect the water to last more than six years. But the people say that the water lasts much longer, and it is certain that the water that was received in the flood of 1891 did not finally dry up till the hot dry year of 1902. Major Benn saw water in this depression in 1901, and it was quite dry in 1903 when we first saw it. It is possible that the cultivators of the Chah-i-Nima Canal allowed escape from this canal to flow into the depression and thus prolonged the life of the lake.

The people say that the floods that have filled the depression have brought in silt and that its depth has been reduced by at least 10 feet. The line of a *kariz*† leaving the banks of the present river about two miles above the Band-i-Seistán made in ancient times can be traced shewing that the depression was irrigated from the river in the past. The people say that the first modern canal was made about 60 years ago by Kadhuda Shah Baz of Deh Baz. After each flood has dried up, the canal has been re-dug: in 1904 it was re-dug by the Deputy Governor, Mir Masum Khán, as described in this Appendix.

\* The gang of coolies who work with the *kán kan* is called *amla*. In fact a gang of coolies working with a mason or any other artisan is *amla*.

† The fact that a *kariz* was brought from the south-east for this purpose shews that there was no river flowing conveniently past the north end as there is now; some pottery was found on the wells of the *kariz*, bits of the broken water vessels of the excavators, and made over to the Director-General of Archaeology in Simla.

APPENDIX 15.  
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NOTE ON THE MANUFACTURE OF FELT IN SEISTÁN.

By Terence Keyes, Esq., His Britannic Majesty's Vice-Consul, Seistán.

Character of the felts made—Process of manufacture—*Kálib* or mat—*Kírâ* or fork—*Kaman* or bow—*Mushta* or mallet—*Pashm-b ur* or wool cutter—Articles made—*Sarkush* or horse clothing—*Araggir* or saddle cloth—*Tappar* or cloaks—Price of felt.

APPENDIX 15.

NOTE ON THE MANUFACTURE OF FELT IN SEISTÁN.

By Terence Keyes, Esq., His Britannic Majesty's Consul in Seistán.

Felt (*namad*) is manufactured in most of the villages of Seistán that are not inhabited by Balúchis, but not in sufficient quantities for the requirements of the country. With the exception of that made in Luf it is generally of poor quality, the best sorts being imported from Ispahan.

The process is as follows :—

A mat of the exact size of the *namdah* (felt) required is spread on a carefully plastered floor: this mat, or *kálíb*, is made of parallel strips of the outer cover of reeds sewn together at frequent intervals. The outlines of the pattern are then laid out on the *kálíb* in brightly dyed woollen threads, the detail being filled in by small boys.

When the pattern is completed, it is sprinkled with water and the wool is spread over with a five-pronged wooden fork or *kirk*. When the wool has been evenly spread water is again sprinkled on it to make it lie down, and the *kálíb* with the wool is tightly rolled up. The evenness of the felt depends on the care with which this process is carried out. The *kálíb* is then secured with string and stamped on and pounded till the wool adheres together: this usually takes two days.

The wool is prepared with a bow or *hamán* much the same as that used in India, but with the exception that, instead of being suspended from the roof it is supported by hand.

The string is struck with a short mallet or *mushta* instead of with a stick. All the processes, with the exception of the laying out of the main lines of the pattern and the rolling of the *kálíb* are carried out by boys or women. The other instruments employed are the *pashm-bur* or wool cutter and the *saim* or file for sharpening the same.

The articles most commonly manufactured are the *sar-kash* or horse clothing including head piece, and the *arak-gir* (perspiration protector) or saddle *namdah*, both of white felt with patterns in red, blue and yellow; long, narrow strips of black felt for the sides of rooms and carpets (*namad*) usually of white wool with elaborate designs. Long felt coats (*tappar*) of an uneven and inferior texture are also made by nomad tribes of Seistán.

The price of the best felt is about 1 *túmán* (ten *kran*) per 20 square feet when wool is about 12 *kran* a Seistání *man*.

## APPENDIX 16.

## CONTENTS.

## NOTE ON CARPET-MAKING IN SEISTAN.

*By Terence Keyes, Esq., His Britannic Majesty's Vice-Consul, Seistan and Kain.*

The people who employ themselves in carpet-making—The loom—Method of making a carpet—Patterns—The dyes and colours used—The articles usually made.

## APPENDIX 16.

## NOTES ON CARPET-MAKING IN SEISTÁN.

By Terence Keyes, Esq., His Britannic Majesty's Vice-Consul for Seistán and Kain.

The manufacture of carpets in Seistán is entirely in the hands of the nomad tribes of whose *siáh-khána* (lit. black houses or tents) there are some 800\* in Persian and Afghán Seistán. The work is carried out by the women, girls and small boys; several taking it in turns to work at the same rug. The looms, unlike those of the *kárkhána* of the villages and towns in other parts of Persia, are horizontal. The warp or *shat* (lit. bank), which consists of double strands of white wool, is fixed at either end to a stick called *putu*†; these *putu* are fixed in frames at a height of about a couple of inches above the ground.

The work is commenced by weaving about three or four inches of *safha* (lit. side) or *kinára* (lit. edge) in parallel stripes of dark colours; this woven end is one of the distinguishing marks between nomad rugs and those made on the upright frames of the fixed *kárkhána*. In order to facilitate the weaving the alternate threads of the warp are lifted in the following manner; a *sishpái* or tripod is fixed in the ground at the end of the carpet; this tripod supports a *makri* or lever, from the ends of which are suspended two sticks; one of these, called the *gota*, passes alternately under and over the threads of the warp; the second, or *khali*, lies over the whole of the warp, but is furnished with loops attached to those threads of the warp that pass under the *gota*. Two cords attached to the lever enable the woman to raise either of its ends, and thus manipulate the *gota* and *khali* alternately. Each thread of the woof, called *putu*, is beaten back on to the preceding one with a long handled comb or *dúk* (lit. spindle). The weaving of the ends is generally done by small children. As soon as the required length of *safha* has been woven, the knotting commences: the woman picks up two adjoining threads of the warp in the left hand, rapidly forms a knot round them with a piece of wool held in the right hand and then cuts off the ends of the wool close above the knot or "lop". When a line of knots has been made, half of the threads of the warp are lifted by means of the lever, and a thread of woof is inserted, this thread which is always of natural black wool, is then beaten back on to the line of knots; another line of knots is then formed and so on.

The woman sits on the rug moving forward as the work advances. The most critical period of the manufacture is when the knotting approaches the end; if the warp is not kept evenly stretched, the rug turns out *kaj* (lit. crooked), or with one end drawn tighter than the other; this causes wrinkles to appear, and the rug very soon wears out; the proportion of rugs that have this defect is very great. When the knotting is finished another woven end is added; the rug is then taken from the frame and the ends of the *shat* are tied together.

In most encampments the women know one pattern by heart and never use any other, but some of them are very clever at copying. A rug of 10 feet by 4, the commonest size, takes from six weeks to two months to make; the few larger carpets which are obtainable in Seistán are made by Balúch of the Chakhánsúr district. There is an extraordinary uniformity in the patterns; in fact, almost all the carpets to be seen in the country belong to one of three types. By far the commonest type is divided into three panels, each panel containing a series of diamonds one inside the other; the second diamond in each of the panels is usually white, the contrast with the dark colours of the remainder of the rug being too violent for European ideas. The lines dividing the panels and the border are dotted with rectilinear figures usually in irregular order. In the older rugs these small figures are very well formed and are the same as those found in the borders of Sárik Turkoman (of Panjdeh) and Afshár rugs; in those made now-a-days, however, they are much rougher, generally consisting of

(61) (66)

\*In Per-ian Seistán 442, in Afghan Seistán 358.  
*Kárkhána* or *Kergah* (lit. workshop) means weaver's instrument supporting the web.

† Corruption of *put* meaning woof.

diagonal stripes containing three dice of a different colour or of a series of figures something like the letter Z. The second commonest type of pattern consists of lines of diamonds, each containing a cross; these carpets are made exclusively by the nomads inhabiting the country near Bunjar.

The third type consists of a centre of camel's wool slightly coloured with henna with one or three conventional trees running down the centre. The trees are formed of a straight line about half an inch broad with stalks at intervals of six inches, each stalk bearing a single rectilinear trefoil leaf, the pattern being generally in red and black.

Camel hair centres as described above are seldom found except in a "*jâ namâz*" (lit. place of worship, prayer carpet) or *bâlišht*, or a carpet made for a mullâ or sayyad, the reason being that the camel is looked on as a sacred animal owing to the prophet having ridden one.

The prevailing colours in all Balûch rugs are three shades of dark, red; two shades of dark blue and black; a few minor figures occasionally being in green. The camel hair varies from a rich chestnut to a light fawn.

The brick red colour or *zardchak* is arrived at by immersing the hanks of wool first in a decoction of willow leaves then in a decoction of a root called *rodang*: a maroon red *zard* and a dark brown red, *surkh*, are obtained by first steeping the wool in water mixed with a burnt clay, called *pulmak*;\* after the wool has been kept for six months it is again soaked in a decoction of the gum of the *khanjak* (the mastich) tree and then in another of the *rodang* root; *zard* dye is then finished by a bath of water mixed with the ashes of a plant called *misk*, while for the *surkh* the *misk* bath is preceded by a soaking in a bath of water coloured with another burnt clay called *mak*.

*Abin*\* and *kulfin* medium and dark blue are obtained from indigo; *sabz* or very dark blue is obtained by dyeing wool already to the *kulfin* shade in baths of *khanjak* and *mak*.

\* *Abi* (lit. watery) means blue. *Kulf* means black, mixed with yellow and *kulaf* a colour inclining to a dirty back red.

The green or *gunaki* colour is obtained by dyeing wool of the *abin* shade with *pulmak* and willow leaves.

Black wool is obtained by boiling natural black wool with water mixed with *mak*.

The wool is spun into thread on a hand spindle or *jallak* and then wound into hanks, the whole hank being immersed in the vats.

The price of carpets has gone up very much in the last few years, chiefly owing to the large number purchased by the Seistan† Arbitration Mission. A rug 10 feet X 4 feet can be bought for from 60 to 40 *kran*; the price varies according to the flatness, dye and closeness of the work, but little difference being made for unevenness in pattern.

Besides rugs the following articles are also made of carpet work: *jâ namâz* or praying rug, *bâlišht* or pillow, *kisajal* or bag, *tobra* or nose bag, *khurjin* or saddle bag (for horses or camels), *gahwara*, *jalunt* or *junt* cradle.

*Bâlišht* are usually about 16 inches by 32 inches; they are edged with cowries and filled with down to form pillows or used as receptacles for small articles; they are usually of finer work than the ordinary rugs and are made in more patterns; they range in price from 12 to 4 *kran*. The best work of all is reserved for the cradles, which are very difficult to buy; they are formed of a slip of carpet about 4 feet by 3 doubled lengthwise and decorated with tassels and cowries. *Kisajal* and *tobra* can be purchased for from 15 *kran* to 5 *kran*, and *khurjin* for from 30 to 15.

Woven carpets are also made in large numbers by nomads; these are called *palâs* or *shâl* in Seistan and *gilim* in other parts of Persia; they are made

\* Alurogen, or hair salt; see paper on *The occurrence of Melanterite in Baluchistan* by Dr. David Hooper in the Journal of the Asiatic Society, Bengal, Volume LXXII, Part II, No. 4, 1903. *Mak* is a soft ferruginous lithomarge, see same paper.

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in the manner described for the woven ends of the carpets, in strips of about two and a half feet by ten feet; two strips are usually sewn together and the carpet thus formed is sold for from 60 to 30 *kran*.

They are almost invariably made in parallel stripes of red, black, yellow and blue, but occasionally have some design in every third or fourth stripe.

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## APPENDIX 16A.

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(For Gardens—see page 66 of Chapter X.)

## NOTES ON VINE-GROWING AND FRUIT-TREES IN SEISTÁN.

*By Terence Keyes, Esq., His Britannic Majesty's Vice-Consul, Seistán.*

Preparing the soil—The three varieties of vines from Jalálábád—Two from Herat—  
Four from Káin—The difficulties of growing trees in Seistán.

## APPENDIX 16A.

(For Gardens—see page 66 of Chapter X.)

## NOTES ON VINE-GROWING AND FRUIT-TREES IN SEISTÁN.

*By Terence Keyes, Esq., His Britannic Majesty's Vice-Consul, Seistán.*

Mr. Terence Keyes, His Britannic Majesty's Vice-Consul, Seistán, has kindly furnished the following information about vines and fruit-trees:—

When vines are planted sand is added to the soil to make it less binding, and in the second and subsequent years it is enriched with sheep droppings. It is said that fifteen years ago there were no vines in Seistán except at Jalálábád. Before the lands of that village were swept away a few gardens had been started in Nasratabad from cuttings obtained from the Jalálábád gardens. There are only three kinds of those grapes now cultivated—(1) *Stah*, a sweet purple grape with very few grapes on a bunch, (2) *Shast-i-Arus* (bride's thumb), a long yellow grape, (3) *Chashm-i-gav*, a rough tasting large purple grape. Two other kinds have been grown from seed imported from Herat (1) *Lal* and (2) *Lal-i-girdana*; both small white grapes. The earliest grape to ripen, Kishmisi, was imported from Farah; the bunches are so tightly formed that the grapes are pressed out of shape. From Tan and Káin were imported the following *fakhari*, long, white, early; *rocha*, small, white, early; *sangak*, small, sweet, hard with many seeds, fairly early; and *husaini*, a long, small, tasteless grape.

Besides grapes, a few very indifferent pomegranates, apples, mulberries and damsons are grown, the oldest fruit-tree in Seistán is said to be only 12 years old. The tallest trees are mulberries of about 15 feet and apples of about 12 feet high. It is only since the establishment of the British Consulate that the people have taken to bringing down trees from the Káinat. Two or three men made a start at Colonel Trench's suggestion. The frosts after *Nauruz* are even more inimical to the planting of young trees than the *bad-i-sad-o-bist ruz*. Mr. Keyes had upwards of 500 seedlings and young trees (exclusive of willows), of which only about fifty, including two acacia and babul, survived the blizzard of the 29th March 1905.

## APPENDIX 17.

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## SOME NOTES ON THE BREEDING PLACES OF THE SEISTANI FLY.

## Three varieties:—

*Magas sufid*—Its life history—The effect of its bite on the horse, camel, donkey and cattle.

*Magas Sabs*—*Magas Sabs dang*.

## APPENDIX 17.

*Some notes on the breeding places of the Seistáni fly.*

The Seistáni recognises three varieties (*taifa*) of the fly *Magas* (Seistáni and Baluchi); *Magas Sufid*, *Magas Siah* or *Pat Kanak*, *Magas Sabz* or *Sabz dang*.

*The Magas Sufid*.—The variety of camel-thorn, which bears red blossoms, known to the Seistáni as *khar-i-shingar*\* that grows on high lying dry lands (*samin-i-khuskab*), is the favourite breeding place of this fly. Up the stem of this bush a thick white froth appears—so thick that as it melts and sinks to the ground, each bush is surrounded by a dark patch of soil made wet by the froth. From this thick white froth (*kaf*) the young fly† (*chucha magas*) appears in great numbers, and it is then that the froth flows down the stem to the ground. In a few days the young animals get wings and fly away to a place where there is a good growth of tamarisk jungle (*sul=jungle*). These flies are usually born about 45 days after *Nauruz* (21st March), but in 1904, a particularly warm spring, they came out in large numbers before the end of March. The rooks (*garg*) that arrive in large flocks in the autumn eat them, and the cold of winter destroys them, so that by the end of October their numbers are much reduced and after November none are seen. The Seistáni says they die in Ghous (December). Only small numbers of the species are ever seen in the Naizár. From the bite of this fly the Seistáni attributes the following illness in horses, camels and donkeys.

*The horse*.—The fly draws much blood when it bites. To protect the horse it is swathed in thick wraps of blanket or felt, and kept loose in an open stable where there is free movement of air, and the horse too is able to move freely and protect himself from the flies. If a horse is badly bitten, he becomes ill in five days. From the illness the lips and mucuous membrane generally become white; the horse gets thin and dies in the winter or early spring. A Seistáni only gives his horse the lightest of work and light feeding during the sickly season.

The camel when badly bitten eats less and becomes thin, but this animal does not die so quickly as the horse.

*Donkey*.—The fly draws blood from a donkey, but not so much as from the horse, nor does the donkey suffer like a horse. But if very much bitten, they also become ill in about 30 days. The donkey, like the horse in bad cases, suffers from swellings on the chest which pass down along the body. Firing with a heated ramrod sometimes effects a cure.

*Cattle*.—Cows that are badly bitten give less milk and being thin do not bear. Sheep and goats are believed not to be affected by the fly.

*Magas Sabz or pat kanak*.—The breeding place of this fly is in the thick grass that grows where there is much water, but its young have not been observed appearing in the same way as those of the *magas sufid*. The bite of this fly is not considered to be so poisonous as that of the *magas sufid*, and it is believed not to cause sickness to horses, camels or donkeys. But it is thought to cause sickness to cattle who graze in the Naizár where this fly most abounds. They are most prevalent in spring and become less numerous in the hot weather and disappear when the cold comes.

*Magas sabz dang*.—This fly is born in August (*Famadi-ul-Sahni*) on the *trat*‡ (salsolæ) and *taghaz* (desert tamarisk) in the same way as the *magas sufid* is born on the *khar* (camel-thorn). The head of the full grown fly is a beautiful turquoise blue colour, whereas that of the *magas sufid* is a washed out white. The *trat* and *taghaz* only grow on lands far removed from water along the banks of the Sar-i-Shela and other parts of the inundated area that are seldom flooded. These flies are considered to be more poisonous than the others; the bite draws more blood and swellings along the lymphatics quickly follow. Horses, camels, donkeys and cattle are affected in much the same way as from the bite of the *magas sufid*. A horse exposed to the bite of this fly on the Sar-i-Shela in September 1903 died in two days from these swellings. The horse was exposed for six or eight days to the bite of the fly and doing hard work all the time.

\* Specimen sent to Botanical Gardens, Calcutta.

† Specimen sent among the Zoological collection to Calcutta.

‡ Specimen sent to Botanical Gardens, Calcutta.

APPENDIX 17.

Some notes on the breeding habits of the tamarisk fly.

The tamarisk fly (Cynipid) is a small insect which feeds on the leaves of the tamarisk tree. It is a common pest of the tree in the Baluchistan region. The fly is a small, black, oval-shaped insect with a long, thin proboscis. It is found on the leaves of the tamarisk tree, where it feeds on the sap. The fly is a common pest of the tree in the Baluchistan region. The fly is a small, black, oval-shaped insect with a long, thin proboscis. It is found on the leaves of the tamarisk tree, where it feeds on the sap. The fly is a common pest of the tree in the Baluchistan region.

APPENDIX 18.

CONTENTS.

SOME NOTES OBTAINED FROM THE BALUCHIS ON PLANTS POISONOUS TO CAMELS.

The cure for colic caused by the desert tamarisk—The cure for colic caused by *taran*—The cure for colic caused by *ashg*—The *jaur* plant and remedies for its ill-effects—The *jak* plant.

The cure for colic caused by the desert tamarisk—The cure for colic caused by *taran*—The cure for colic caused by *ashg*—The *jaur* plant and remedies for its ill-effects—The *jak* plant.

Prepared by the British Indian Council, Bombay, 1907.

[Signature]

## APPENDIX 18.

*Some notes obtained from Baluchis on plants poisonous to camels.*

*Siah taghaz* (desert tamarisk), *taran* and *marung* are camel fodders, but when the camel has been starving and eats them greedily he is apt to die suddenly. The green *taghaz* is apt to be greedily eaten under such circumstances. If so, the camel's stomach does not swell, but he lies on the ground, and is not able to open his mouth properly, and is in great pain.

The first thing to do is to bleed the camel by making a cut on the tail; this escape of blood relieves the pain. Then one and-a-half pounds of sand mixed with 12 lbs. of water are poured down the animal's throat. The Baluchi believes that the *taghaz* has blocked the throat and the sand and water washes the obstruction into the stomach. This remedy is only efficacious if carried out as soon as the camel becomes ill; after delay the remedy does no good.

*Taran*\* is a plant that becomes green in the spring and has no flowers and it remains more or less green all the winter. When he has eaten greedily the stomach of the camel swells; the remedy used is to put 2 lbs. of dates into 12 lbs. of boiling water and stir till the dates have dissolved. The stones are removed and the lukewarm mixture is poured down the animal's throat. The camel is then made to move quickly. If the animal stales he will get well: if not, more of the remedy must be given. *Shira kutak*, or the juice extracted from the water melon, is also used as a remedy if dates are not obtainable.

*Marung*\*.—This is said to be an ever green plant that grows in the bed of the Sar-i-Shela and has red flowers. If eaten greedily by a starving camel, it causes the stomach to swell, so that the animal dies in two or three days; the pain is so great that he throws himself on the ground. The remedy is the same as that for an animal suffering from a surfeit of *taran*.

*Ashg* known in the Punjab as *lana*, a salsolæ. After rain, when the leaves of this plant are clean, the starving camel is apt to overeat himself; if so, his stomach swells up. The remedy is the same as that used for a surfeit of *taran*.

If dates or sugar are not obtainable, 5 or 6 lbs. of fresh sheep's milk is given.

*Jauri*† is a poisonous plant found in the Kuh-i-Malusân and near Baluch Âp and other places in the hills. It is an ever green with white and red flowers. The camel does not eat it intentionally, but the wind sometimes blows its leaves among other grazing, and it is eaten by mistake. The camel's stomach swells; it is constipated, and flatulent noises are made. Poisoning from this plant is called *jauri*. The first remedy is to give *ojka*; this is the contents of the stomach of a sheep mixed with the blood thereof. If this remedy fails, the flesh of the sheep is boiled down into a jug soup and poured down the camels throat. If this fails, dates stirred into boiling water are given. If this fails, a decoction of a plant found on the *dasht* (high dry alluvial plains), called *shaud*,‡ is given; about 1½ lbs. of the plant are used to 10 to 12 pounds of water. The decoction is given cold; it is of a black colour; this is the last remedy.

*Jak* is a plant like a *padah* (poplar willow, *Populus Euphratica*), but its leaves are smaller; the camel mistakes it for the *padah*. It is fatal in about 10 or 12 days unless the remedies described for *jauri* are successful.

\* No specimens obtained.

## APPENDIX 19.

## CONTENTS.

(Vide Chapter XXXI.)

## SOME INFORMATION ABOUT THE VILLAGES ON THE HELMAND RIVER ABOVE RUDBAR.

- A brief note on the revenue system by Captain Webb Ware—Canal systems—Organization for cultivation—Government share of the produce—Allowances paid—Shares of *basgar*, *baaar* and *khan*.
- List of the villages along the Helmand River in the Garmser district of the Pusht-i-Rud Province.
- List of the number of ploughs and number of families in the villages along the Helmand.

## APPENDIX 19.

*A brief note on the revenue system in the villages along the Helmand from the Kuh-i-Khan Nashin to Rudbar by Captain F. C. Webb Ware, C.I.E., Political Officer, Chaghai.*

In this note I will describe briefly the system obtaining in the valley of the Helmand.

First and foremost I would say that the lands in the Helmand valley are crown.

The irrigation system in the valley consists of large irrigation canals which take out from 7 to 14 miles above the lands they cultivate.

Each irrigation canal is provided with its own khan and an official termed *mirab*, who is assisted in his duties by a subordinate termed *kotwal*.

From each main canal a series of minor canals take off, each of which is presided over by a *kadkhuda* nominated by the khan.

Each *kadkhuda* in consultation with the khan appoints the zamindars (or *kashtgir* as they are termed) who cultivate the lands irrigated from his cuts and each of these *kashtgir*, who never does any manual work himself, appoints his own *bazgar*.

*Kashtgir* provide their *bazgar* with—

- (a) Tools;
- (b) Plough;
- (c) Seed;

and in addition pay for the hire of the bullocks which are used for ploughing and threshing whether the bullocks are or are not the property of the *bazgar*.

In addition to the foregoing every *kashtgir* is bound to give his *bazgar* 20 *kran*, termed *kafshi*, as pay for his labour in cleaning out canals.

*Distribution of the grain.*

The produce of each *kashtgir* is divided into seven equal heaps, and the *tahwildar* takes one of these shares (*haft koti*), and from the others collectively 70 *Garmsel man* (a *Garmsel man* is about two seers Indian) termed *haftad mani* as Government revenue.

The remaining grain is then heaped together and the following allowances are paid :—

- The *mirab* of 15 *Garmsel man*.
- The *lohar* of 12 *Garmsel man*.
- The *sutar* of 12 *Garmsel man*.
- The *hajam* of 5 *Garmsel man*.
- The *kotwal* of 5 *Garmsel man*.

The owner of the plough oxen 2 *Garmsel man* per yoke of oxen for every day's work the oxen were engaged on ploughing, etc.

The remaining wheat is then divided into six equal shares and the *bazgar* is given one and the *kashtgir* the remaining five.

The advantages enjoyed by the khans are as follows :—

They are allowed the Government share on the revenue of all the lands presided over by any one of the *kadkhudas* they may choose. They usually cultivate all the lands irrigated by the branch channel they select themselves and they pay no *kafshi* to any of their *kashtgir*.

All the labour they may stand in need of is supplied them free. Their bhoosa, firewood, grass, etc., is brought in by their *bazgar* free of cost of carriage.

The *mirab* is entitled to the Government revenue on one *kashtgir* free. And the kakhuda to half the Government revenue of one *kashtgir* free.

The above system is in vogue down the valley of the Helmand as far as Khwaja Ali. From Khwaja Ali onwards to Bandar-i-Kamal Khan the revenue of most of the villages has been assigned to the Sanjarani Sardars. I would note, however, that the Sardars of these revenue free villages take only  $\frac{1}{10}$  of the gross produce for themselves; they explain this by saying it has always been the custom of the country to do so.

NOTE.—Bhoosa is valueless and *kashtgir* distribute it as they like, giving khans, tahwīldar, etc., whatever they may be called on to do.

*List of villages of the Garmser district of the Pusht-i-Rud Province in Afghanistan situated on both banks of the Helmand River.*

Prepared by Khan Bahadur Mir Sham Shah.

Serial number.	Name of village.	Situation on the river.	Name of the Khan.	Tribes of cultivators.
1	Goragai ...	Right bank (western).	Abdul Aziz Khan, Barakzai, Durrani Afghan.	Barakzai Afghan, Farsi.
2	Khusroabad ...	" ...	Pir Muhammad Khan, Khunsezai, Barakzai Durrani, Afghan, and Muhammad Akram Khan, Malikdirizai, Barakzai Durrani Afghan.	Ditto.
3	Khalach ...	" ...	Sher Muhammad Khan, Barakzai Durrani Afghan.	Ditto.
4	Zaruss or Zarist ...	" ...	Muhammad Jan Khan, Barakzai Durrani Afghan, Nizamud Din Khan, Popalzai Durrani Afghan.	Ditto and Popalzai Afghans.
5	Surukhdoz ...	" ...	Balal Khan, Nurzai Durrani Afghan.	Mirzai Afghans and Farsis.
6	Shamalan ...	" ...	Bahram Khan, Nurzai Durrani Afghan.	Ditto.
7	Kharakoh ...	Left bank (eastern).	Mulla Salim, Nurzai Durrani Afghan.	Ditto.
8	Hazarjuft* ...	" ...	Shah Pasand Khan, Nurzai Durrani Afghan.	Ditto.
9	Deh ...	" ...	Abdur Rahman Khan, Nurzai Durrani Afghan.	Ditto.
10	Durveshan Loi...	" ...	Khairud Din Khan and Haji Muhammad Khan, Nurzai Durrani Afghan.	Ditto.
11	Durveshan Kuchna.	" ...	Sher Ali Khan, Nurzai Durrani Afghan.	Ditto.
12	Kushti ...	" ...	Muhammad Halim Khan, Nurzai Durrani Afghan.	Ditto.
13	Kirtaka ...	Right ...	Muhammad Aslam Khan, Nurzai Durrani Afghan.	Nurzai Afghan and Farsi.
14	Kirtaka-i-Fakir Sartor.	" ...	Lal son of Fakir Sartor, Barakzai Durrani Afghan.	Barakzai Afghan, Farsi Baluchi.
15	Mian Pushta, I	Left ...	Said Muhammad Khan, Alezai Durrani Afghan.	Alezai Afghans and Farsi.

\* Some people say that the Garmser proper is from Landi Barechi up to Hazarjuft.

Serial number.	Name of village.	Situation on the river.	Name of the Khan.	Tribes of cultivators.
16	Mian Pushta, II	Left ...	Akrəm Khan, Alezai Durrani Afghan.	Alezai Afghan and Farsi.
17	Lakki	... ..	Muhammad Afzal Khan, Alezai Durrani Afghan.	Alezai Afghan and Farsi.
18	Saffar	... ..	Safdarjang Khan, Nurzai Durrani Afghan.	Nurzai Afghans, Kheskhi Afghans and Farsi.
19	Sar Binadar	... ..	Wazir Khan, Nurzai Durrani Afghan.	Nurzai Afghans and Farsi.
20	Mian Binadar	... ..	Abdul Aziz Khan, Nurzai Durrani Afghan.	Nurzai Afghans and Farsi.
21	Pai Binadar	... ..	Din Muhammad Khan and Muhammad Akbar Khan, Nurzai Durrani Afghan.	Nurzai Kheskhi and Ghilzai Afghans and Farsi.
22	Bhaghat (Bakat)	... ..	Ghulam Khan, Popalzai Durrani Afghan.	Popalzai Afghans and Farsi.
23	Dewalak	... Right	Muhammad Sarwar Khan, Ishakzai Durrani Afghan.	Ishakzai Afghans and Farsi.
24	Khan Nishin	... ..	Muhammad Munir Khan, Ishakzai Durrani Afghan.	Ishakzai Afghans and Farsi.
25	Landi Muhammad Amin.	Left	Muhammad Amin Khan, Ishakzai Durrani Afghan.	Ishakzai Afghans and Farsi.
26	Kala-i-Nau	... Right	Muhammad Afzal Khan, Ishakzai Durrani Afghan.	Ishakzai Afghans and Farsi.
27	Khairabad	... ..	Kundil Khan, Ishakzai, Durrani Afghan.	Ishakzai Afghans and Farsi.
28	Taghar	... ..	Khuda Nazar Khan, Ishakzai Durrani Afghan.	Ishakzai Afghans and Farsi.
29	Mala Khan	... ..	Shah Nawaz Khan, Ishakzai Durrani Afghan.	Ishakzai Afghans and Farsi.
30	Desho	... Left	Dost Muhammad Khan, Ishakzai, Durrani Afghan.	Ishakzai Afghans and Farsi.
31	Sar Khwaja Ali	... ..	Sardar Taj Muhammad Khan, Muhammad Hasni, Brahui, and Durvesh Khan, Sanjarani Baluch	Muhammad Hasni, Brahui, Sanjarani Baluch and Farsi.
32	Pai Khwaja Ali	... ..	Sardar Atta Muhammad Khan, Sanjarani Baluch of Chaharburjak, Sardar Muhammad Umar Khan, Sanjarani Baluch of Bandar-Kamal Khan, now at Kabul.	Muhammad Hasni, Brahui, Sanjarani and Rakhshani Baluch.
33	Palilak	... ..	Muhammad Ibrahim Khan, Barechi, Afghan.	Barechi Afghans and Farsi.
34	Landi Barechi*	... ..	Bahawal Khan, Barechi Afghan	Barechi Afghans and Farsi.

\* Sardar Azim Khan, son of Sardar Shuh Gul Khan, Idozai Muhammad Hasni; Brahui, who is the Sardar of the flock-owners, resides in this village.

Note.—Villages Nos. 33 and 34 are granted revenue-free to the Barechis; the other villages pay revenue in kind at 1/4th of the actual produce. Government also enjoys other village cesses. Most of the villages are charged a stipulated annual quantity of revenue in kind called *Jara*, fixed on the average produce of a few years. Some villages, however, pay revenue both in kind and cash.

2. The Brahui and Baluch flock-owners occupy the Registan on both banks of the Helmand River during winter and proceed in summer to the villages situated on the banks of the river.

List of the number of ploughs and families in the villages along the Helmand River from Kala-i-Bist to Khwaja Ali obtained from the Arbab Saif-ud-Din, as he remembered them to be when he went up the valley about 30 years ago; the list must be quite out of date, but may be of help to any one travelling down the valley.

The Helmand above Khwaja Ali.

Number of the village in Khan Baha-dur Mir Sham Shah's list.	Names of villages.	Number of ploughs.	Number of families or khanah.
1	Aenak* ... ..	150	1,000
2	Khusroabad ... ..	30	200
3	Khalach ... ..	30	200
4	Zarist ... ..	30	200
5	Surukht Doz ... ..	30	200
6	Shamalan ... ..	30	150
7	Kharakoh ... ..	30	100
8	Hazarjuf† ... ..	50	300
9	Deh ... ..	10	...
10	Durveshan Kalan... ..	50	200
...	Amir Buland ... ..	10	...
11	Durveshan Kherd ... ..	20	100
14	Kirtaka ... ..	15	100
15	Mian Pushta ... ..	45	1,000
...	Basabad ... ..	15	...
16	Dabbi or Mian Pushta ... ..	20	100
17	Lakki‡ ... ..	130	400
18	Saffar§ ... ..	100	300
...	Khwaja Sultan ... ..	20	...
19	Binadar Wazir Khan ... ..	30	200
20	Binadar Aziz Khan ... ..	20	200
...	Binadar Umar Zai¶ ... ..	50	200
	Carried over ... ..	915	5,150

\* This is 'Ja-i-Saiyad' or the abode of Saiyad families. Ziarat-i-Harrat, Saiyad Salim, is at Aenak, which was the birth place of Bibi Dost.

† Large number of maldar people come here for grazing their cattle.

‡ In former times one thousand *Juf-gas* or ploughs are said to have cultivated in this village hence its name Hazarjuf. Now the land is divided into several villages.

§ A large number of maldar people come here for the grazing.

¶ Saffar Jang Khan, Nurai has built a small fort for himself.

*The Helmand above Khwaja Ali.—contd.*

Number of the village in Khan Bahadur Mir Sham Shah's list.	Names of villages.	Number of ploughs.	Number of families or <i>Khanah</i> .
	Brought forward	915	5,150
22	Bakat Ghulam Khan	40	...
...	Bakat Meero Khan	50	100
23	Dewalak	20	200
24	Khan Nashin	30	120
25	Landi Muhammad Amin Khan	30	...
...	Landi Wali Muhammad Khan	25	100
26	Kala-i-Nau	25	150
27	Khairabad	20	100
28	Taghaz	30	150
29	Malakhan	30	200
30	Deshu	20	70
	Total	1,235	6,340

One *khanah* or family consists of 4 to ten souls, including children (at an average 7 souls.)

All the revenue grain collected is first stored in the villages and afterwards carried to Girishk by the *basgar* who are not paid.

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960	961	962	963
964	965	966	967
968	969	970	971
972	973	974	975
976	977	978	979
980	981	982	983
984	985	986	987
988	989	990	991
992	993	994	995
996	997	998	999
1000	1001	1002	1003

APPENDIX 20.  
CONTENTS.

NOTE ON THE CULTIVATION DONE IN THE VILLAGES AT THE TAIL OF THE FARAM RUD.  
Weight used—List of villages and the cultivation done—Ownership of the land—  
Method of distributing the produce of the harvest.

*(Faint, illegible text)*

## APPENDIX 20.

Note on the cultivation done in the villages at the tail of the Farah Rud. Information obtained from local men by Zilladar Amir Singh.

The weight used in Aukat-i-Seistan is the *Man-i-Yusain*, which is equal to 60 *sir* Seistani or  $\frac{1}{4}$  of a Seistani *man*. In this statement for facility of comparison *Man-i-Yusain* have been converted into *Man-i-Seistan*.

The acreage has been calculated at 22 Seistani *man* of wheat and barley seed per acre.

No.	Name of village.	Name of <i>Yam</i> .	Number of ploughs.	Number of <i>Bazgar</i> on a plough.	Seed sown per plough.	Probable area of wheat and barley.	<i>Kanasi</i> paid to <i>Ghazni</i> <i>Bazgar</i> .	Share of the balance of produce after paying Government share <i>Sarkat</i> and expenses of cultivation that is paid to the <i>Bazgar</i> .
					Seistani <i>Akorwar</i> .	Acres.		
1	Khoga ...	Jan Muhammad Khan, Saghsai ...	8	6	225	20	2	†
2	Guch ...	Sher Ali Khan, Saghsai ...	13	6	375	34	2	†
3	Dumbli ...	Khwaja Muhammad Khan, Popalzai.	8	6	300	27	2	†
4	Darg ...	Muhammad Azim Khan, Popalzai	17	6	375	34	4	†
5	Jai-Darg ...	Ditto ...	2	6	300	27	2	†
5	Kausha ...	Dost Muhammad Khan, Popalzai	2	6	225	20	2	†
6	Samur ...	Sardar Mudad Khan ...	20	6	450	41	4	†
7	Juwain ...	Sardar Mudad Khan, Saghsai ...	100	6	525	48	10	†
	Porkha ...	Kadkhuda Agha Muhammad Akram Khan, Saghsai.	8	6	525	48	10	†
	Regwak ...	Said Kalan ...	4	7	525	48	10	†
8	Panjdeh ...	Ghulam Muhammad Khan, Saghsai	15	6	375	34	10	†
9	Laitan Left Bank ...	Yar Muhammad Khan, son of Abdul Wahab Khan, Saghsai.	23	6	450	41	6	†
10	Khairabad Left Bank ...	Dost Muhammad Khan, Popalzai	17*	6	450	41	8	†
	Jai Nau Left Bank ...	Muhammad Yusuf Khan, Saghsai	6†	6	375	34	3	†
11	Salian Left Bank ...	Muhammad Azam Khan ...	7	6	225	21	2	†
			234			518		
						Average 34.50 acres per plough.		

\* Of these 8 are Tahwil.

† Kishigar own the land.

NOTE.—Ownership of land.—In nearly all, if not all, of these villages the cultivators have some right of ownership in the land.

All the cultivators are *ghami*; that is, must serve on canal and band repairs.

Spring harvest.—The produce of wheat and barley is divided out in much the same way as in the Helmand Dolts of Afghan Seistan.

From the *Sarkat* the following payments are made:—

Sarmashrif 20 *man* (Juwain).

Tahwidar 20 *man* ditto (or two *ragas*).

Then the Government takes one-fourth of the balance.

The following payments are then made:—

Blacksmith ... 30 *man* (Juwain), half wheat and half barley.

Carpenter ... 30 " "

Barber ... 30 " "

*Pakar* ... 20 " "

Qazi ... 10 " "

Mashrif ... 3 *bran*.

*Gardani* ... 40 per cent. of seed.

*Takpai* ... 2½ per cent. of produce.

The balance is now divided between *Badar* and *Bazgar*. If the latter receive only 2 or 4 *bran* *Kauski*, they get half; if much more *Tauski* is received, they only get one quarter of the balance of the produce.

The *Bazgar* are not allowed to do *Sarkat* cultivation, but they are allowed to cultivate 10 *man* *Yusain* as *Kulgiri* *Bazgar*.

Autumn Crops.—The supply so low down the Farah Rud as these villages are situated does not normally last long enough to irrigate much if any autumn crops. At Juwain, it is said, that only one in every 8 or 10 years some melons and millet are grown, but at Darg again rather more autumn crop seems to be done than at Juwain.

*Sargali*.—The tax on animals is 1 *bran* per cow or bullock; half rates for animals 2 years old and under; 1 *bran* for 4 sheep.

[C639FD]

## APPENDIX 21.

## CONTENTS.

## DETAILED DESCRIPTION OF THE FORDS ON THE HELMAND FROM GIRISHK DOWNWARDS.

Sources of information—*Girishk*—Connolly's account—Ferrier's account—Captain Sander's account—Major Todd's account—Boat ferry and bridge—Khán Bahádur Mir Sham Sháh's account.

Temporary bridge at Babaji—Kala-i-Bist—Guzar-i-Ahinak—Guzar-i-Khusrabad—Guzar-i-Khalach—Guzar-i-Zarist—Guzar-i-Surkh Doz—Guzar-i-Hazar Juft—Guzar-i-Shamalan—Guzar-i-Darwishan-i-Kalan—Guzar-i-Darwishan-i-Khurd—Guzar-i-Mian Pushta—Guzar-i-Mian Pushta Kalán—Guzar-i-Safar—Guzar-i-Binadar-i-Sar—Guzar-i-Binadar-i-Minjeen—Guzar-i-Diwalak—Guzar-i-Bakat—Landi Wala Muhammad Amin—Guzar-i-Khan Nishin—Guzar-i-Khairabad—Kala-i-Sabz or Taghaz—Mala Khan—Mel Gu'dar of Dr. Bellew—Khwa'ia Ali—Guzar-i-Go Kushi—Guzar-i-Pulálak—Guzar-i-Regáa—Landi Bahraichi—Rudbar.

*Puz-i-Máshi*—Ancient and modern *band* at this site—Volumes of the river at which ford appeared and disappeared—Kukro.

Guzar-i-Khajo—Guzar-i-Marinki.

*Chahárburjak*—Volumes in the river at which the ford appeared and disappeared—Used by the Mission of 1884.

Guzar-i-Karodi—Guzar-i-Kawargi.

*Bandar-i-Kamal Khan*—Volumes in the river at which the ford appears and disappears—Traditional site of a great weir—The effect of the great flood of 1885 on the ford.

Guzar-i-Gambad-i-Nadiri—Mirabad—Guzar-i-Mastian—Guzar-i-Sharifa—Guzar-i-Jalai.

*Máshi*—Used by the Mission in 1903—Need of ramps at fords—Mr. John's experience of this ford—New ford that appeared in 1904—Guzar-i-Khwabgah—Ford above the Band-i-Seistan—The Band-i-Seistan.

*Fords on the river Helmand below the Band-i-Seistan and on the Rúd-i-Parían.*

Guzar-i-Lakri.

*Guzar-i-Parían*—Scientific explanation of the presence of this ford—Volumes of river when ford appears and disappears—Ferrying the Mission baggage—Guzar-i-Jahánábád—Site of ford—Volumes of river when fordable.

*Guzar-i-Maliki*—Site of ford—Volumes of river when fordable.

Guzar-i-Margo—Guzar-i-Kundal.

*Guzar-i-Musjid-i-Gurgali*—Nature of site of ford—Details of volumes of river when fordable—Flooded country to the west of the ford—The best fords on the Rud-i-Parían.

Guzar-i-Shaikh Waisi—Shaikh Waisi ford in 1905.

*Fords on the Nad-i-Ali channel or Rud-i-Afghán.*

General account of this distributary—Guzar-i-Khoja—Burj-i-As.

*Fords on the Rud-i-Seistán.*

Guzar-i-Khwája Ahmed—Guzar-i-Sharistán-i-Kuhna—Guzar-i-Shahristán-i-Nau—Guzar-i-Burj-i-Sarband—Guzar-i-Pulgi—Guzar-i-Dashtak—Guzar-i-Muhammadábád—Guzar-i-Chiling.

*Ferries.*

*Sai* or gourd or skin raft—*Tutin*—*Chosal*—*Tutin* ferries in the Delta—Sites; and allowances paid—Ferries on the Rúd-i-Seistán—Ferry at Deh Karim Dad on the main river—Ferries on the Rúd-i-Parían—*Tut*—*Tutin* poles.

Swimmers—Skins—Swimming camels across—Swimming horses across—Rafts of *padah* wood.

*Navigation.*

No boats in Garmsel—The boat brought down by the 1884 Mission.

## APPENDIX 21.

VIDE Chapter XLVI, page 297.

*Detailed description of the fords on the Helmand River from Girishk downwards.*

The notes on the fords from Girishk to the Khan Nishin ford have been obtained from books or from the people of the country. Those from the Khan Nishin ford to the Band-i-Máshi were examined on the march down the Helmand in February 1903. Those from Band-i-Máshi ford to tails of the various branches of the Helmand were examined or used many times by the Mission during their 2½ years' stay in Seistán.

*Detailed description of the fords from Girishk to the Band-i-Seistan.*

Girishk 50 miles above the junction of the rivers at Kala-i-Bist, is the ford on the Helmand on the road from Herat to Kandahar. Lieutenant Connolly\*

<sup>Girishk.</sup>  
\* Connolly's "Overland journey to India," 2nd edition, 1838. Richard Bentley.

crossed this ford on the 27th October 1830 and said the banks of the River Helmand are about one thousand yards apart; the right bank is low and sandy, but the left rocky and high; the stream was at its lowest and stirrup deep at the ford flowing smoothly but with force in a clear stream of three hundred and fifty yards wide. In summer the water of the Helmand is so clear that people are liable to be deceived about its depth. Two months or so prior to Lieutenant Connolly's crossing the Sardárs lost their best gun in consequence of the drivers mistaking the depth of water at a part they attempted to ford. In winter the rise of the river commences as much rain falls then; in the spring it is swelled from the melting snow and is broad and of great depth. Two large crazy boats are provided, the watermen in charge being singularly ignorant how to manage them; the boats will hold forty souls and six horses; the crossing takes 6 hours at flood time and the boats are carried three miles down stream by the current before they can be brought into the shore.

Lieutenant Connolly crossed the river at night on the 27th October 1830 at a ford three-and-half miles below the fort, lead by a guide; one baggage pony lost footing and fell, and a man, who came afterwards alone, got into difficulties.

General Ferrier says of this ford—"We forded the Helmand on the 28th August 1845, a quarter of an hour from the fortress. This can only be done in the three summer months; for the rest of the year the river is so much swollen by the rains and the melting snows on the mountains of the Paropamisus† that it can only be crossed by the ferry boat which the Sardar lets to the highest bidder".

† Hazarajat?  
Captain Sanders of the Engineers crossed the ford at Girishk on the 27th June 1839 and says "crossed the Helmand River at a ford nearly a mile above the usual ferry. The stream is barely fordable for infantry taking off their arms and accoutrements, and with a strong wind and ripple on the water, could not be deemed fordable at the point where the detachment crossed it. There are however, easier fords within a short distance, higher (*sic*) up the stream. Laden camels crossed the river with ease".

Its depth was about 3' 9"; width of the widest branch 70 yards, there being two others shallower and narrower; velocity of the current three miles per hour. Since May 21st this river had fallen upwards of four feet. The stream was at that time crossed by rafts made of rumkegs, rowed across by sappers. Lieutenant Sanders goes on to suggest a suspension bridge of ropes and trestles suitable for use in flood which could be made from material with the army of

Discharge—			
Deep.	Wide	4	3 x 3
375	x 210	x	2
= 2,835 cusecs,			
1,000 cusecs added for branches,			
3,835			
say 4,900 cusecs against 11,300 cusecs at the Band-i-Seistan on 27th June 1903.			

† Gives a volume of 5,250 cusecs against 2,110 cusecs the volume at the Band-i-Seistan on 27th October 1903; each October followed a year of great flood.

W. of.	Average depth.	Mean velocity.
1,030 x	2	x 2.5

occupation at Kandahar (Journal, Asiatic Society, Volume 13, Part I, page 124).

On 3rd June 1838 Major Todd crossed the river on an elephant and the water was seven feet deep in some places. The boat had been destroyed a short time before (Journal, Asiatic Society, Volume 13, Part I, page 349).

In October 1885 an Intelligence Party crossed this ford on its way from Quetta to join the Afghan Boundary Delimitation Commission. The dafadar in charge said that "the Helmand had much water in it, nearly up to the horse's back; our horses could just cross without swimming. All the men of the party went over in a boat together with one horse. The camels went over loaded.

(Page 126 of Volume V of Records of Intelligence Party of Afghan Boundary Delimitation Commission.)

The Hakim of Girishk sent 50 men to assist who stripped and swam. All animals crossed without accident".

Colonel McMahon says that the late Amir sent boatmen to Girishk from Lalpura on the Kabul River and they built boats, so that there are now twenty boats in addition to unserviceable boats.

Most of the boats are used in a boat bridge at Shorakai near Girishk. The boats are of the pattern usual on the Kabul River and carry about 300 maunds Indian.

Two boats were sent down with supplies by the Amir for the Seistán Mission in January 1903, but they did not get lower down the river than Malakhan; it is said because the boats got into a bye channel of the river and went aground. They were not seen by any of the officers of the Mission.

Khán Bahádur Mir Sham Sháh says that in 1893, when he passed through Girishk, there were 60 families of boatmen living on the east bank of the river opposite Girishk at the village of Deh Ab Bazan, who said they were brought there by Nádír Sháh. There are about 40 boatmen in the service of the Amir, who get one-third of the ferry dues received.

He also says a temporary bridge is built early in the autumn at Babaji between Girishk and Kala-i-Bist. The

Temporary bridge at Babaji.

bridge is made of gabions of tamarisk, filled with boulders, placed side by side in pairs and spaced a short distance apart. Long poles of *padak* or tamarisk are used as a platform. The construction is similar to that adopted for making the Band-i-Puz Mashí, but the groups of gabions are placed further apart so as to obstruct the water way as little as possible.

Kala-i-Bist is above the junction of the rivers Helmand and the Arghándab, or Tarnak, as the branch, which

Kala-i-Bist.

brings down the combined waters of the Arghandab, Tarnak, Arghastán and Dori, seems to be variously called.

Dr. Bellow\* says—"The river is from 250 to 300 yards wide between straight banks about twenty feet high; but the stream at this season (20th February 1872) is only about eighty or ninety yards wide over a pebbly bed. It was forded at several places opposite our camp by horsemen going across in search of fodder. The water reached the saddle and flowed in a clear gentle stream."

This ford was about 3 miles above the junction of the Arghandáb which Dr. Bellow says was then 40 yards wide and 2 feet deep, flowing in a turbid stream on a sandy bottom. This would give a discharge of about 270 cusecs (120 feet wide, 1.5 mean depth, 1.5 feet a second mean velocity), which is small for a turbid stream. At Girishk Lieutenant Connolly thought the river 1,000 yards wide, while 30 miles lower down Dr. Bellow thought it 300 yards wide. Nothing is more difficult to estimate by the eye than the width and depth of streams or the heights of their banks. These unusual physical objects strike the imagination and the judgment is misled; such objects should always be measured, however, roughly. If the estimate by eye is written down first and the measurement made afterwards, it will be seen how difficult it is to estimate by eye.

The Arbáb Saif ud-din, an old and observant man, who has been up the Helmand to Kandahar, says that at Kala-i-Bist, which is on the left bank of the Helmand and the right bank of the Arghandáb, there are two fords above the junction and one ford below the junction. The ford opposite the central tower of the fort of Kala-i-Bist which leads to Aeenak (Abinak) on the right bank of the river, a little below Kala-i-Bist, is a very good one; there are boulders in the river bed at this ford. The river channel remains always at the same place; there are no trees on the banks, but a luxuriant growth of the grass *Ajrak* or *Aerez*.

He describes the following fords between Kala-i-Bist and Kuh-i-Khán Nishin; two other guides have also been up the river and the information is the result of comparing the notes. It cannot be guaranteed and needs to be checked by trained observers.

*Guzar-Ahivak* or *Aeenak* is a very good ford opposite the west end of the tower at Kala-i-Bist.

*Guzar-i-Gorgi* opposite Deh Gorgi, one of three small villages belonging to the Barakzai.

*Guzar-i-Khusrabad*, a good ford.

*Guzar-i-Khalach* a good ford; the river flows under the left bank from Kala-i-Bist to Hazarjuft and the cultivation is on the right bank.

*Guzar-i-Zarist*, a very good ford opposite a village; the canal has good command. This is probably the ford Dr. Bellew calls *Gudar-i-Barhana*, which he says is half way between Kala-i-Bist and Hazarjuft, opposite the highly cultivated district of Zaras. Zaras is 9 miles below Kala-i-Bist and 16 miles above Hazarjuft by the map.

*Guzar-i-Surkh Doz*, a good ford.

*Guzar-i-Hazarjuft*, a very good ford, but is said to appear late. Hazarjuft is on the left bank and the road goes to Surkh Doz and Shamalan. The direct road from Kandahar and Kala-i-Bist across the *Dasht* returns to the river here. The guides say that Hazarjuft is 2 miles upstream of Shamalan, and Karkuh and Shamalan are nearly opposite each other and not as shown on the 16 miles to the inch map.

*Guzar-i-Shamalan*.—This is called *Guzar-i-Badshahi* and appears first of the fords in this vicinity. It is used by caravans, it lies between Shamalan on the right bank and Kharako on the left bank. Shamalan is 25 miles below Kala-i-Bist. General Ferrier mentions having used this ford on the 25th September 1845 when travelling up the valley.

*Guzar-i-Darweshan-i-Kalan* a very good ford but appears late. The village belongs to Katal Khán, son of Sardar Khán, Gorazai.

*Guzar-i-Darweshan Khurd*, a very good ford on the road to Shamalan at a village of many gardens belonging to Wali Muhammad Khán, son of Dad Muhammad, Lalzai.

*Guzar-i-Mian Pushta*, a good ford on a road to the Dasht-i-Margo at a village of 400 families.

*Guzar-i-Mian Pushta Kalan*.—The river here flows under the right cliff, and there is no cultivation on that bank. The village has about 800 families and belongs to Sherdil Khán, Alezai.

*Guzar-i-Lakhi*, opposite a large village of 100 families belonging to Aslam Khán, Alezai. Kutaba-i-Khurd is said to be a small village of only 5, or 10 "Kulba" of land on the right bank built a few years ago.

*Guzar-i-Safar*, a large village of 2,000 families belonging to Salár Khán, Kanozai. There is no cultivation on the right bank.

*Guzar-i-Binadar-i-Sar* between the ruins of Shahr-i-Khwaja Sultan and Binadar-i-Sar, the village belonging to Wazir Khán.

*Guzar-i-Binadar-i-Minjeen*.—This village is called Binadar Sala Khán and belongs to Aziz Khán, son of Makran Khán.

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*Guzar-i-Diwalak or Binadar-i-Pae.* The ford is between Binadar-i-Pae on the left bank and Diwalak on the right bank; it is said to be *glo-sang* (*glo*, a melon; *sang*, a stone); that it has boulders on the bed. The cultivation on the right bank begins at Diwalak and extends to Pae-Gil-i-Malakhán.

*Guzar-i-Bakat.*—The village belongs to Ghulam Khán, Popalzai.

The Arbáb says that the fords are at *Rung* or rapids on the river, and, at most of the fords, water-mills have been built, the head race being situated above the ford and the tail race below; the head and tail race aggregate one mile, or a mile and-a-half, and the drop through the mill is about 3 feet.

On the 1st February 1903 the camp of that part of the Mission that crossed

Landi Wala Muhammad Amin.

the Registan by the routes which reach the river above the Kuh-i-Khán Nishin was pitched in the cultivation of Landi Wala Muhammad, between the canal and the river near a big fixed sand hill that overlooked a ford in the river. The road over this ford led to the big highly cultivated village of Khán Nishin on the right bank belonging to Muhammad Buner Khán, Sagozai. The ford is at a sudden bend of the river, the left being the concave bank; above the bend the river had divided into two channels and the main stream was then in the left channel which under-cut the left bank, so that the descent to the ford was down a cliff, 15 feet high, which had been roughly scarped. The ford\* is at a bar of boulders; the crossing ascended the glacis of the bar and reached the far bank near its crest; a low permanent island, with a growth of tamarisk on it, had then to be crossed to the smaller arm of the river which was about 50 yards wide and 3 feet deep; the path then led across the river bed which was then dry, but had been about 2 feet deep under water at a recent flood. The river during this flood could not have been fordable for loaded camels.

The transport camels crossed the ford and brought back supplies of grain and *bhusa* (chaff). It was an easy ford to ride across; though the current was strong, the ford was good, as the bottom was hard and very even.

The Arbáb Saif-ud-din calls this ford *Guzar-i-Khan Nishin*, and says that it is *Guzar-i-Padshah* and much used by caravans.

He describes two fords between here and *Guzar-i-Taghaz*.

*Guzar-i-Kala-i-Nau*, a good ford at the large village belonging to Mir Afzal Khán, son of Khán Muhammad Khán. The cultivation along the left bank ends against the spurs of the Kuh-i-Khán Nishin, but exists on the right bank from Diwalak to Tághaz.

*Guzar-i-Khairabad.*—The ford is good and is opposite the village which belongs to Haji Muhammad Khán. A water-mill is worked by utilising the rapid at the ford. The head race being above the ford and the tail race below. In about  $1\frac{1}{2}$  miles of channel a 30 feet fall is thus acquired.

Dr. Bellew says on the 27th February 1872 they camped on the left bank

Kala-i-Sabz or Tághaz.

of the river midway between Kala-i-Sabz and Tághaz, both villages on the opposite bank of the river; the supplies were all brought from the cultivation on the opposite bank and the river was forded at many places, the water being stirrup deep and about 200 yards wide, the banks low and overgrown with tamarisk. Baluchis in Seistán call this ford *Guzar-i-Tághaz* and say it is in the land of Khuda Nazar Khán, Ságzai. The cultivation on the right bank is said to end at Pae Gil-i-Mala Khán, an area of 20 ploughs that was cultivated in olden times.

That part of the Mission that came down the Helmand from Landi Wala

Mala Khán.

Muhammad camped opposite the old fort of Mala Khán. The fort of Mala Khán is an island in high river, thickly overgrown with tamarisk; at low river the main

\* The following are some details:—

The greatest depth at the ford was 33 feet; the flood mark of normal spring flood was 76 feet above the water level of the river. The fall in the river at the ford was 2-32 feet a mile. The maximum velocity at the ford 2-62 miles an hour (285 feet a second).—The direct width across the river was 350 feet; the discharge of the main stream was about 2,500 cu. ccs and of the lesser stream 700 cu. ccs. The whole river discharge being about 3,200 cu. ccs on the 1st February 1903.

stream is along the left bank, 180 feet wide and 3'0 feet deep, a long straight reach of even flow with a good bottom. I saw a man riding across on the 3rd February when the discharge was about 3,500 cusecs; loaded camels could have crossed. The Baluchis in Seistán describe 3 fords at Mala Khan—*Guzar-i-Gurguri* opposite Kala-i-Mala Khán, about 2 miles upstream of the old fort of Mala Khán; *Guzar-i-Mala Khan* at the ancient fort; *Guzar-i-Deshu* or *Guzar-i-Sangi*; this last is said to be a very good ford with boulders on the bed between the ancient fort and the village of Deshu. It is one of the *Guzar-i-Badshahi*. The Arbáb Saif-ud-din says Sardár Kuhndil Khán crossed here on his way to Teheran about A.D. 1840 with elephants, horses and camels. It is said to be so broad (*i.e.*, the dimension measured in the direction of the stream) a ford that an army could go over at one time. It is the best ford above Band-i-Máshi and appears 4 or 5 days before that ford.

Marching from Kala-i-Sabz, Dr. Bellew camped at Mel Gudar, where there was a ford in a dense jungle of tamarisk and willow trees; as Mel Gudar was the same distance below Mala Khán, as Mala Khán is below Kala-i-Sabz; it must have been between Kuigi and Khwája 'Ali; this position answers to Dr. Bellew's description in other particulars. Baluchis in Seistán do not know this name.

The Mission encamped on the river a little upstream of the ruined fort of Khwája 'Ali. The river was fordable here during the time (4th—10th February 1903) the Mission was in camp. The discharge of the river was 4,136 cusecs; the maximum velocity was 2'5 miles an hour (3'7 feet a second). The stream was about 200 yards wide at the ford and about 3'0 feet deep. It was not a good ford, as the bottom was very uneven; it was then only fit for horsemen and not for loaded camels; a very small rise in the river would have closed the ford. Our men crossed here to survey on the right bank of the river.

Baluchis in Seistán describe two fords at Khwája 'Ali; this one or *Guzar-i-Khwája 'Ali* opposite the village of Táji Muhammad Khán, Khán Khel and *Guzar-i-Páte* opposite a small village of that name, which lies midway between the two villages of Khwája 'Ali, *viz.*, that already mentioned and that of Sardár Atta Muhammad Khan, Sanjarani. They also describe the three following fords between Khwája Ali and Landi Bahraichi.

*Guzar-i-Go Kushi*.—The ford opposite Puz-i-Pulalak; there is a *habristan* with the tomb of Sakhi Dost Muhammad Khán, Barechi on the *Puza* (promontory) on the left bank.

*Guzar-i-Pulalak* opposite the village of that name.

*Guzar-i-Regan*.—The ford is on the boundary or Sim-i-Landi-o-Pulalak.

Regan is the name of a small piece of land on the right bank of the river.

Kharif irrigation on *Sailaba* used only to be done, but in 1903 a small canal was made and this year (1904) some wheat has been sown. The place is not marked on our map.

Some of the surveyors came down the right bank of the river from Khwája 'Ali, and crossed back again to this camp by a ford similar to that at Khwája 'Ali.  
*Landi Bahraichi.*

The ford is at the downstream end of the sand-hill where the *band* is made in the river for the Rudbar Canal.

Baluchi guides in Seistán describe a ford opposite Kuhna Kalat *Puza-i-Lat*, called *Guzar-i-Lat* between Landi and Rudbar.

The ford is opposite the village of Sardar Muhammad Reza Khan at Rudbar; it is similar to that at Khwája Ali.  
*Rudbar.*

The Mission camp was pitched near the ford, and Mr. Tate crossed the river at it, but in a boat.

The Baluchi guides in Seistán say there is a ford between Rudbar and Puz-i-Mashi near Dam-i-Sikandar under the ruin called Kala-i-Zulekha; the ford is called Guzar-i-Zulekha.

All the fords on the river and its branches below the ford at Puza-i-Mashi and all the roads across the Naizár and the fords across the Sar-i-Shela have been examined by us. The position of the fords as they existed in the years 1903 to 1905 have been shewn on the sketch maps made by the irrigation party from the traverses that they made when running lines of levels.

*Puz-i-Mashi or Ziarat Panja Kash.*—This ford is below the site of the *band* or weir made at the head of the Chaharburjak Canal. The big canals which irrigated the lands on which the large ruins at and around Kala-i-Fath were built took out at this site also; these canals probably worked during the 15th, 16th, 17th and perhaps in the 18th centuries. The result of building a weir here for a long time is clearly shewn on the longitudinal section of the river by the raising of the bed of the river at this site, giving a long reach of low fall above the weir site and a sharp fall below it. As a consequence the stream has spread out into a wide shallow stream of moderate velocity providing one of the best fords on the river; the "bar" gives an excellent bottom and the ford is one of the first to appear. When I was at Mashi in June 1903 the river was still discharging 15,000 cusecs, and the water was at least 5 or 6 feet deep over the ford. Camels were taken across with ease swimming.

The ford is about one and-a-half miles above the ruin of Kala-i-Madar-i-Padshah. The Ziarat of Panja Kash is on the lower bluff just over the river where the road along the right bank of the river drops down from the Dasht-i-Margo on to the culturable plain. The *Puz* or nose refers to the bluffs of the higher cliffs further from the river; there are two such bluffs, each called Puz-i-Mashi, one upstream and the other downstream of the site of the *band* of that name at which the ford exists. The people of the valley consider this as good a ford as that at Chaharburjak or Bandar-i-Kamal Khan. It became fordable for camels about the first week of July 1903 when the river was discharging 8,000 cusecs; it ceased to be fordable on the 10th March 1904 when the river rose suddenly from 6,617 cusecs to 11,604 cusecs; it became fordable again at the end of May when the discharge fell to 9,000 cusecs. It would, therefore, seem that a ford exists here for loaded camels so long, as the river is not discharging more than 8,000 cusecs.

Major Maitland describes a ford, called *Kukro*, above Kala-i-Madar-i-Padshah which the Russo-Afghan Boundary Commission were to have used but did not. (*Vide* page 61 of the Intelligence Branch Records of that Mission.) This name is not now applied to any ford, but it is probable the Mashi ford was referred to, as this is the only ford here good enough for so large a caravan to cross. The Baluchis say *Kukro* is a tamarisk thicket in which cattle thieves may lie concealed. The thick tamarisk on the right bank of the river opposite Kala-i-Madar-i-Padshah is called *Kukro*.

*Guzar-i-Khajo* between Deh Khajo and Kala-i-Ashkinak, both on the right bank, not a good ford.

Major Maitland at page 61 of Volume I of Records of Afghan Boundary Delimitation Commission of 1884 says that the ford appeared for the first time in 1884. Captain Peacock crossed by it. It was not a good ford.

*Guzar-i-Husainabad*, the ford is now on a direct line between Kala-i-Husainabad on the right edge of the river and Kala-i-Chilmarez on the low *dasht* on the left bank. This is a very good ford and is much used by *kafilas* taking grain from this small piece of cultivation to the Sarhad. On 20th June I was told that a loaded *kafilas* had crossed here about the 25th June when the river was discharging about 12,000 cusecs. I cannot be sure that this was correct. The ford is said to become fordable at about the same time as the Guzar-i-Mashi above described, and in that case it should not have been fordable for loaded animals for nearly a fortnight later.

*Guzar-i-Londo* and *Guzar-i-Manai*, the first above and the second below Kala-i-Husainabad are not good fords.

*Chaharburjak.*—The river spreads out here and is usually forded in two places both with hard bottom. There are two good fords, each over rapids—one is now a mile above the village, and the other three miles and a half lower down, opposite the place where the Naib's garden, till washed away, was,

hence the ford is called Guzar-i-Bagh-i-Naib or Nasir; but the upper ford is very  
 \*The largest stones measured 6" to 7" long and much better than the lower. The bed is of  
 were 10" in circumference. large gravel\* or shingle.

The upper ford was easily fordable when the Mission were in camp here on the 13th February 1903, when the river volume was about 5,000 cusecs. Mr. Johns, Executive Engineer, marched up from the Band-i-Seistán and crossed here with loaded camels on the 13th February 1903, when the volume in the river was about 8,000 cusecs. He tried all the fords below, but none were fordable. It was not fordable for loaded camels when I passed at the end of June 1903 the river discharge was 11,000 to 12,000 cusecs. In the spring of 1904 it was only unfordable for horsemen at the height of the flood, but for loaded camels it remained unfordable till the end of May. These and the other fords between Dak-i-Dila and Kala-i-Madar-i-Badshah were connected to the level traverse run in September 1904, *vide* sketch plan on a scale of two inches to a mile No. 1-A.

The Afghan Boundary Commission on the 22nd October 1884 crossed the river at the ford which was then on a line with the upstream face of the Fort (*vide* map at page 64 of the Records of the Intelligence Party); but it is now a mile higher upstream between the Dakma (tower of silence) on the right bank and the ruins of Chahar Shaklak on the low *dasht* on the left bank. In October 1884 even small mules and ponies carried their loads across. The return party crossed here in the winter of 1885-86 (27th December) and found the ford entirely altered by the great flood of April 1885 and not so good, probably there was more water flowing in the river than when they first saw it, as the ford still shares with Bandar-i-Kamal Khán the reputation of being the best ford at this important part of the river.

There are two fords between the Guzar-i-Naib and Kala Mir, a well known ruin on the right bank. Each is at a rapid, but often by riders and footmen. The upper is called *Guzar-i-Karodi* and is to the west or downstream of Khel-i-Sahib Khán and almost due north of Kala Roden.

Guzar-i-Karodi.

neither are much used for loaded camels,

The lower is called *Guzar-i-Kawargi* and is about a mile below the Roden

Guzar-i-Kawargi.

Fort and a mile above a *Nelak* (mud pillar) on the right bank.

*Karodi* be it explained is a bank that is being under-cut by the river.

*Kawarg* is a pretty creeper that produces an edible fruit. Neither of these names are likely to last. Though the Russo-Afghan Mission were told that the bare gravel plain on the right bank at this part of the river was called *Dasht-i-Karodak*.

On 27th June 1903, I crossed my camp at this part of the river when the volume was 11,500 cusecs, but the loads had to be boated across. None of the fords had up to then appeared for loaded animals.

This ford is immediately opposite the village and a little above the point where the Helmand leaves the gorge at the old river bed which goes due west through the ancient southern delta. The river having deserted this arm now turns suddenly due north and flows through the northern delta to the Hámún near Tappa-i-Kuhlak. At the ford the river spreads out in an even stream of low velocity and great width, the bottom is of big gravel, hard and excellent. I saw men with unloaded donkeys crossing here on the 29th June 1903 when the volume in the river at the *band* was 10,650 cusecs. The river was not fordable for loaded camels till the end of the first week of July when the discharge had fallen to about 8,000 cusecs. The river remained fordable till the 10th March when the volume rose suddenly from 6,617 to 11,600 cusecs, and was not fordable again for loaded camels till the first of June when the volume fell below 9,000 cusecs. On the 20th March 1905, when the river suddenly rose to 15,216 cusecs, this ford remained fordable for men, although all the other fords up the river were not fordable to men on horseback. It was not of course fordable for loaded camels. This ford shares with the upper ford at Chaharburjak, the reputation of being the best and most reliable ford on the river, and is the point that *kafila* from Sarhad to Chakhánsúr make for. The name

of *Bandar* (Arabic for port or market town plural *Banadīr*) has thus been given to the ford. Kamal Khan, Sanjarani, built a fort\* here which is described by Dr. Bellew; it was much damaged in the flood of 1885 and is now deserted.

Tradition says one of the great *band* of the Helmand was formerly built in the reach of the river between Kala-i-Kamal Khán and Kala-i-Roden. When the river bifurcated here this is certain to have been the site of a *band* to regulate the supply just as the Band-i-Seistán now regulates the supply at the bifurcation at Kúhak.

The effect of the great flood of 1885 on this ford is described at the end of the Appendix 25 on that flood.

*Guzar-i-Gambad-i-Nádiri*.—This is a ford, a little lower down the river, opposite the sundried brick mausoleums of that name which are built on the high plain on the left bank. It is at present a useful ford and appears soon after the Bandar ford appears.

The river was easily fordable at Banjar Kushta where the Mission camp was pitched on the left bank of the river on the 16th February 1903, near the Dak-i-Dila Canal head and a little above the village of Mirábád on the right bank. The discharge was 3,600 cusecs and the velocity  $2\frac{1}{2}$  miles an hour (3.6 feet a second). The ford was about 700 feet wide and 3.0 feet deep, with a sandy bottom, which is apt to scour, and the condition of the ford varies with every flood and freshet. My loaded camels crossed a mile and-a-half lower down the river on 19th August 1903 when the discharge was about 3,400 cusecs; this was said by the guides to be the proper Mirábád ford. It is 7 miles below the Gambad-i-Nádiri.

*Guzar-i-Yakdast*.—This ford is at the head of the Deh Dost Muhammad (Arbáb) Canal and 15 miles below Gumbad-i-Nádiri; the bed of the river is sandy and the ford is like that at Mirábád unreliable. Gumbad-i-Yakdast is a burnt brick tomb on a low spur of the Dasht-i-Margo overlooking the cultivated valley. There are high sand-hills on the bank of the river at the ford.

*Guzar-i-Mastian*.—This ford is near Reg-i-Ibrahim, about 3 miles upstream of Kabr-i-Haji, about  $16\frac{1}{2}$  miles below Gumbad-i-Nádiri; it is the name of a small village on the left bank which is irrigated by a water-course from the river. It is said to be a good ford, much used by Kala-i-Fath people and appears about 15 days after the ford at Chahárburjak.

*Guzar-i-Sharifa*.—A good ford at a place where the river flows over gravel; it is much used by the Kala-i-Fath people. It is called Yak Pada as a conspicuous poplar willow (*Salix Babylonica* or *Populus Euphratica*) stood here till the flood of 1885. It is near the ancient canal called by Dr. Bellew† *Yakháb*.

† Page 215 of—'From the Indus to the Tigris.'

*Guzar-i-Falai*.—The approach to the ford on the right bank is over a ridge of sand-hills which it did not seem possible to avoid; it is considered a good ford, because there is a gravel bottom; I crossed on the 16th August when the discharge of the river was 3,650 cusecs. The stream was strong and about 3.5 feet deep for a width of 20 feet under the left bank and had not the bottom been hard and even loaded camels could not have crossed. The ford is between the village of Deh Dost Muhammad Arbáb and Kabr-i-Haji, a Ziarat  $2\frac{1}{2}$  miles downstream of the head of the ancient Canal Yakháb. The ford appears about a fortnight after the ford at Chahárburjak. It became fordable to men about the 1st June 1904 (8,800 cusecs) and to loaded camels about the 15th June (7,000 cusecs).

*Guzar-i-Deh Sabz Gazi or Deh Bájzai*.—I saw this ford in use at the end of July 1904; it seemed a better ford than the one at Kabr-i-Haji, as the stream was spread out more evenly. The bottom was gravel and the approaches were good, but it is said to be unreliable and is seldom used for loaded

camels. It is 3 miles below the Jalai ford and  $3\frac{1}{4}$  miles above the Mashi ford.

*Máshi.* (Near the Ziarat Padah Sultan.)—This is the ford at which the Mission camp crossed the river from the left to the right bank on the 19th

February 1903; the ford is opposite Gulab Kushta; a beacon on a small piece of "Dasht,"\* about 300 yards to the right of the ford. It is  $6\frac{1}{2}$  miles below the Jalai ford at Kabr-i-Haji and eleven miles above the Band-i-Seistán. The river had spread out into a broad stream with a low sand bank in the middle; the deeper channel was under the right bank where the water at the time the Mission camp crossed was 4'0 feet deep; at the take off on the left bank the water was 3 feet deep. The current throughout was gentle; the bottom was sand, and at the deep part worked up under traffic and reformed lower down, so that the ford gradually travelled downstream, making a sharp curve round which the camels had to be carefully steered or they got off this curve and into difficulties. The right bank was high and steep and had to be scarped or ramped; *trangar* or nets made of stout rope in which miscellaneous bundles are carried on camels, were spread out on the ramp, to make a firm landing for the dripping camels, when leaving the water.

It may be noticed here that nowhere on the Helmand are the banks at the crossing of the rivers or canals artificially ramped; the rough slopes worn down by traffic is all that can be expected. If a canal cuts off a homestead from its land, the cultivators will build a rough bridge or make a rough ramp. But through roads used only by travellers are seldom provided for. The same thing used to obtain in India; unless the road was important enough to attract the notice of the Provincial Government, it was often unbridged, as the natives only draw attention to roads that cut off their homesteads from their lands. It is, therefore, essential in marching in a country intersected by channels like Seistán to have a party of beldars in advance to ramp the road and save the camels from falls and the loads from damage.

On the 1st March Mr. Johns tried to cross here when the discharge had risen from the 3,600 cusecs of the 19th February to 4,100 cusecs and was rising, and he was unable to do so. He went up the river trying all the fords and finally crossed at Chahárburjak about the 7th March when the volume of the river was probably† 8,000 cusecs.

In July 1904 we found that a new ford had appeared about one mile upstream of the Máshi ford opposite the Ziarat of Padah Sultan near the ancient bridge of burnt brick revealed in the bed of the Khwabgah Canal. Loaded camels crossed easily on the 11th July when the volume was 2,415 cusecs.

Ziarat-i-Padah Sultan was the site of the camp of the Russo-Afghan Commission on the 25th October 1884 and this Mission on 19th February 1903. The two conspicuous Euphrates poplars noticed at the Ziarat in 1884 were washed away in the great flood of the spring of 1885. The Ziarat is now only marked by the mound on which the accumulations of sticks and stones of the usual Balúch Zíarat are placed.

*Guzar-i-Khoga or Khwabgah.*—This is a sandy ford, seldom or never used for loaded animals. It appears much later than the fords higher up the river. On the 25th June when the discharge of the river was about 5,500 cusecs the river was only fordable for men and horsemen. The heading up of the water after the *band* is made affects the ford, so that it is only in use for a short period each year.

There is an uncertain ford somewhere above the Band-i-Seistán for riders and footmen after the floods subside in June or July and before the *Band* is made about the middle of September. I crossed twice in August 1903 when the river was about 3,500 cusecs and found it a difficult and treacherous ford.

\* Really an ancient protection embankment.

† The river discharge rose to 4,100 cusecs on the 1st March and on the 3rd rose suddenly to some 6,000 or 8,000 cusecs; on the 9th it was gauged to be 10,000 cusecs; the volume afterwards gradually fell again.

When the tamarisk *band* across the river is in existence, it is used to cross the river below the bifurcation. When first made it presents a level bed of springy tamarisk right across the river, very difficult to walk on, except at the path made of grass and earth that the builders used when carrying forward the bundles of tamarisk during construction. Soon after the *band* is made the tamarisk subsides at places to fill holes scoured under the structure. The surface is then very uneven and at places under water. Even so flocks and herds are sometimes brought across. The road could be made much better if a surface of grass and earth were laid. This roadway exists from the time of the completion of the *band* about the 15th September to the first flood at the end of December or beginning of January. The bridge built by the Mission across the Nad-i-Ali channel was of this nature. Such works are called by the Scistáni *gazgán*; they often make crossings on small shelas in this way.

The Band-i-Seistán.

Fords on the River Helmand below the Band-i-Seistán and on the Rud-i-Parian.\*

*Guzar-i-Lakri*.—When the *band* is in existence the river is fordable at the broad shallows below, unloaded camels could ford here with difficulty at the end of February 1903, when the discharge below the *band* was 3,000 cusecs. But a good and long established ford exists at the end of the long sweep which the river makes to the north-east. The ford is opposite Deh Lakri and is about 4 miles below the *band*. It has a bottom of small gravel and is often used for loaded camels. The river here became fordable on the 4th August 1903 when the volume above the *band* was 4,000 cusecs, and became unfordable on the 20th February 1904 when the volume of the river above the *band* became 5,000 cusecs; the ford re-appeared on the 30th June when the volume of the river became 4,300 cusecs.

*Guzar-i-Parian or Guzar-i-Milak*.—But known to the Mission as the "Shah Gul Ford" is situated just below the off-take of the Nad-i-Ali channel or Rud-i-Afghan. The ford is due to the sand bar which forms at the heads of channels at the bifurcation of the parent stream. This is due to the sudden drop in velocity as the stream enters the distributaries; the drop in velocity is due to the increase of sectional area as the water from the parent stream escapes down the distributaries. As a result the parent stream† as it approaches the bifurcation is narrow and deep, while the heads of the distributaries are shallow and wide. When searching for a ford at such a bifurcation one is not likely to be found above the bifurcation, but the several

† This formation is found at all the bifurcations not only at Shahgul but below Burji-Az in the Nad-i-Ali channel; at Jalalabad where the Rud-i-Parian breaks up into shelas; at Girdi Chah where an old channel of the Helmand dispersed its waters; at the tail of the Sard-Shela where the Shohag distributes its waters to the Gaud-i-Zireh. The wells at Sar-i-Zireh on the road from Bandar-i-Kamal Khaw to Kirtaka are in the deep parent channel above the bifurcation. The wells at Girdi Chah are also in the deep parent channel. For a long time after the river dries the water remains in this pool held back by the bars and is eventually conserved in the sand that filled the hole scoured in the clay.

branches are probably fordable at their heads.

The Shahgul ford appears later and disappears earlier than other fords down the Rud-i-Parian, but it is a good ford with a hard sandy bottom and good approaches. When the scour had taken full effect a bed of gravel appeared in the river near the ford. The ford disappeared about the end of February 1903 when the discharge of the Rud-i-Parian was about 2,800 cusecs and the main river 4,000 cusecs; it re-appeared on the 8th August 1903 when the discharge was 1,822 cusecs, the main river being 3,850 cusecs. It disappeared on the 11th March 1904 when the discharge rose suddenly from 2,845 to 7,500 cusecs.

When the Mission arrived at the Shahgul ford in March 1903, it was no longer fordable. The baggage was ferried

Ferrying the Mission baggage across. across on *tutin*. To effect this more speedily two large *tutin* were lashed together with ropes and formed into one raft which was pulled across the stream by ropes; two ropes were attached to the raft,

\*Rud-i-Parian or "river of the faries"; though Major Brazier Creagh said in 1897 that the word is Rud-i-Parian or "river of abrupt flow," and this was the word used by the Mission; but Khan Bahadur Maula Bakhtish says Rud-i-Parian is the word used in correspondence among cultivated Persians.

one going to each shore. The baggage was rapidly ferried across on a number of these rafts. A large quantity of log line and light manilla rope which the Mission had brought with them made the working of these rafts possible. The *tutin* could have been lashed together into rafts with country-rope made from wool, but such ropes were not strong enough to haul these large rafts against the very strong current that existed at this site. The rafts carried from 20 to 30 Indian maunds.

*Guzar-i-Jahanabad*, six miles below the Parian ford, is situated by the side of the ruins of Muzafar-ud-Daulah's city of Tilfak (local corruption for *Tifak*) near Deh Khadung. One of the small mounds or ruins being near the ford on the left bank, called Tappa-i-Tirah or the mound of the ford. On the right bank the road passes north of Deh Yusuf.

This is now (1903 to 1905) the best ford on the Rúd-i-Parían; the bed is sandy and the stream flows in one broad channel with an even bottom, 350 feet wide. The camels of the Mission without their loads crossed at this ford at the end of March 1903 when the volume of the Rúd-i-Parían was about 4,500 cusecs and that of the main river 6,000 cusecs. The ford appeared again for loaded camels about the end of July 1903, when the volume in the Rúd-i-Parían was about 2,400 cusecs and in the main river 4,200 cusecs. The exact date is not known, but judging from the volume of appearance and disappearance in 1904, it would be about 15th July when the discharge was 3,000 cusecs. The ford disappeared on the 10th of March 1904 when the main river rose suddenly from 6,617 cusecs on the 10th to 13,600 cusecs on the 12th; and the Rúd-i-Parían from 2,845 cusecs to 8,707 cusecs. The ford appeared again on the 11th June 1904 for horsemen and pedestrians only when the volume in the main river was 7,209 cusecs and in the Rúd-i-Parían 5,000 cusecs; and for loaded camels on the 24th June when the volume in the river above the *band* was 5,600 cusecs and in the Rúd-i-Parían 4,000 cusecs.

The *daé* service of the Mission preferred this ford on the Rúd-i-Parían to all others; it is the favourite ford between the city and the district of Miankangi, the bit of Persian territory between the Parian and the Nad-i-Ali channel.

*Guzar-i-Maliki*, five miles below the Jahanabad ford, is on the important and well-defined road from the City through Bunjar, Kasimabad, Siadak and Deh Dost Muhammad to Chakhansur and Khash. It crosses the Parian at the conspicuous tower called "Dikki," a bit of a ruined sundried brick building standing on a mound in the middle of a tamarisk covered island. The river is not in one stream; there are several shelas, a broad and deep one with steep sides, that should be ramped, is crossed on leaving the river-bed on the east bank at Deh Maliki, where there is a stubby modern tower of sundried brick which marks the ford. The crossing at the main shela is also bad at times; in the year 1903-04, there was one place, 30 feet wide, which was 5 feet deep and which spoilt the ford. The ford is seldom useful for loaded camels except at low river.

The ford appeared about the 20th August 1903, or about 3 weeks after that at Jahanabad, when the supply in the Rúd-i-Parían had fallen to 1,679 cusecs and the main river to 3,357 cusecs. The ford disappeared in the sudden rise of the river on the 11th March 1904 and re-appeared on the 20th June for horsemen and footmen about 10 days after that at Jahanabad when the volume of the Rúd-i-Parían had fallen to 3,990 cusecs and the main river to 5,700 cusecs; and for loaded camels on the 2nd July, 8 days after the Jahanabad ford, the discharge of the Parian being 2,185 cusecs. The greatest depth measured on the 12th July 1904 was 3'8 feet.

*Guzar-i-Margo*, between Jalalabad and Margo, six miles below the Maliki ford.

There are seven shelas to be crossed at this ford when the river first becomes fordable; the bottom is uneven and uncertain; it is not a good ford for loaded camels. At the end of December 1903 the Mission camels crossed with some difficulty when the discharge at the ford was only about 1,000 cusecs. This ford appears about the same time as the Maliki ford. The greatest depth on the 12th July 1904 was 4'3 feet, loaded camels could only cross such a depth if the bottom was good, current small, weather warm, and loads very high upon the saddles.

*Guzar-i-Deh Kundul* or Gurg 'Ali, two and three quarter miles below the ford at Margo.

This is not a good ford for loaded camels; besides the main river there are three other shelas to cross; the bed is very uneven and loaded camels can only cross at low river. The sides are steep and need to be ramped, as the soil is very slippery. The ford appears about the same time as that at Maliki, but is not so good. A surveyor's loaded camel crossed here on the 23rd February when the discharge of the Parian was 2,100 cusecs. The greatest depth at the ford on 12th July 1904 was 3'0 feet.

*Guzar-i-Musjid\*-i-Gurg 'Ali*.—About six miles below Jalalabad all the streams

\*The ruin-d mud walls of the masjid are on the left bank at the ford.

of the Rúd-i-Parián collect to pass through a ridge of sand-hills and do so in a broad shallow stream of low velocity; the ford on the 19th and 20th March 1904 was just feasible for loaded camels when the discharge of the river was 8,861 cusecs and of the Parian 5,700 cusecs; the ford was then 800 feet wide and 4'0 deep at the deepest places. Loaded camels were only able to cross, because the velocity was very low and the weather warm. The ford is about 100 yards wide in the direction of the stream and has an excellent firm sandy bottom. The approaches to the ford are excellent. The disadvantage of the ford is that when the Parian rises above 3,500 cusecs, or so, the waters escape to the west by shelas above and below Jalalabad, flooding the low-lying country which lies between the Rúd-i-Parián and the high ridge made by the ancient canal which served the ancient ruins from Tappa-i-Rindan to Tappa-i-Adira. The Mission camels after crossing the main stream of the Parian at *Musjid-i-Gurg 'Ali* marched up the left bank of the stream and got across the main spill on the sand bar at its head where it left the main stream two miles below Jalalabad. There was no possible road over the flooded country to the west of *Musjid-i-Gurg 'Ali*; the land as soon as flooded becomes too soft for traffic. The road then went from Jalalabad to Tappa-i-Rindan crossing some broad shallow† flooded lands where the going was not good—chiefly on account of water channels which intersected the flooded area and made deep places into which the unwary fell.

† In March 1905 the water in the shela that passes under Tappa-i-Rindan and flows into the Chung-i-Surkhaki was reported to be 17 feet deep at the deepest part where the road crossed. Unless this deep part could be avoided or bridged, the ford of *Musjid-i-Gurg 'Ali* would be useless. It seems that the shelas to the west are developing; probably the present main stream is silting its bed, and if so, diverting more of its water into the shelas to the west.

The depth at the ford of *Musjid-i-Gurg 'Ali* is not likely to be affected by the height of the water in the Hámún, as this cannot be considered to begin till two miles below Tappa-i-Kakha, or 10 miles below this ford.

During the stay of the Mission in Seistan this ford and that at *Jáhanabád* were the first to appear on the Parian; the former was the ford most used by those who were going to Lash Juwain *viá* Takht-i-Shah and Tappa-i-Kharan and Pesharwan. It became fordable again on the 16th June, or 8 days before the *Jahanabad* ford, when the volume of the Helmand was 6,816 cusecs and the Parian 4,852 cusecs. On the 12th July 1904 the greatest depth was 2'75 feet when the discharge of the Parian was about 1,700 cusecs.

*Guzar-i-Shaikh Waisi*.—Five miles below *Musjid-i-Gurg 'Ali*; it is only a ford when all the shelas to the west of the main stream have dried up and the water has retired from the *ashkin* lands around Tappa-i-Kuhlak and Tappa-i-Akbarábád. The Parian then flows in a single stream under its east bank beneath Deh Shaikh Waisi; at times loaded camels take this road to the City from the villages to the east of Shaikh Waisi. Horsemen and footmen can get across the flooded lands to Tappa-i-Adira at low Hámún.

The ford appears about the same time as that at *Jáhanabád*, but being in an out-of-the-way and sparsely inhabited part is not much used. It could not have been used on the 20th March 1904, as there was then no way for loaded camels across the flooded lands.

In 1904 it re-appeared for loaded camels on the 20th June, or four days later than the ford at *Musjid-i-Gurg 'Ali* and 4 days before the ford at *Jáhanabád*.

In January 1905 the Mission was in camp at Deh Shaikh Waisi, while the volume of the Rúd-i-Parián was about 600 cusecs. The ford at the village of Shaikh

Shaikh Waisi ford in 1905.

Waisi has a very soft bottom, but there is a ford with a hard bottom a mile or so further down the stream between the village of Deh Mardan on the right bank and the Ziarat of Hasrat Abbas on the left bank. This ford was often used by those going to the City; at that time there was not much water coming from the west of Jalalabad by the Shela-i-Narcharan.

*Fords on the Nad-i-Ali channel of the Helmand, now beginning to be called the Rud-i-Afghan.*

Up to 1895 this channel carried the main stream of the Helmand towards Burj-i-As, where it bifurcated to the Shelas, Shamshiri, Lakhshak, Sikhsar, Charkh, etc.; it was a very broad stream with marginal embankments and tamarisk thickets. When the Rúd-i-Parián finally formed (as we knew it) in the spring of 1896 only a reduced volume found its way down the Nad-i-Ali channel, so that the superfluous area in the channel was silted up and now forms wide berms inside the marginal embankments. The stream is now narrow and as a rule deep with very few broad and shallow places, so that it is not easy to ford and becomes unfordable very early in the flood season.

At the village of Milak near the sundried brick pillar of that name, and a little below the junction of the Afghán leading cut, the river spreads out into shallows and is fordable when the discharge of the Nad-i-'Ali channel is not more than 800 cusecs. There are some beds of small gravel near this site; there are no gravel beds further north than this on the river that I know of.

At *Deh Mandozai* a collection of huts in Afghán-Seistán; at the junction of the Afghán channel and the Nad-i-'Ali channel is a ford.

*Guzar-i-Khoja* or *Reg-i-Sohbat*, known to the Mission as "Bela's" ford. This ford is at the bend of the river  $1\frac{1}{2}$  miles below Milak village where the path from the Parián ford near Shahgul to Nad-i-'Ali crosses the river. The ford is marked by some high sand-hills on the left bank, called *Reg-i-Sohbat*. It is  $\frac{3}{4}$  mile above the village of Deh Khoja which is at the conspicuous Padag tree on the right bank of the river. This ford was used while the Mission camp was at Nad-i-'Ali in February 1903. It became unfordable to loaded camels when the discharge of the Nad-i-'Ali channel rose to 800 cusecs, though it was fordable for horsemen up to a discharge of about 1,000 cusecs. This ford is an instance of the neglect of cross country communication by the inhabitants. There are no ramps, and when I crossed here in the first week of December 1904, a ramp had to be made to get a riding camel across; the depth was then 2'5 feet, the volume being 360 cusecs.

*Burj-i-As*.—There are uncertain fords near the curves in the river above and below Burj-i-As, the tower on the right bank of the river to the north-west of the fort of Nad-i-'Ali. These fords disappear when the discharge becomes 800 cusecs. The Mission had to build a tamarisk bridge across the river above Burj-i-As, because there was no ford for loaded animals though the discharge was only from 800 to 1,000 cusecs. On 19th December 1903, the ford was a little above the head of the Sikhsar at the bifurcation, and loaded camels crossed in 3'0 of water (365 cusecs). The ford disappeared on the 1st March 1904 when the discharge was 800 cusecs.

The reason that the ford is here above the bifurcation, and not below, is that the site was once used for tamarisk *band* to regulate the supply to the Shelas, and a ford is obtained over the remains of these *band*.

The Nad-i-Ali channel bifurcates about a mile below Burj-i-As. The Sikhsar is fordable at the bifurcation of the Shela-i-Go Kushta, about 2 miles below Burj-i-As. This ford disappears also for loaded camels when the Nad-i-'Ali channel discharge is 800 cusecs. But the shelas being narrow can be easily bridged with tamarisk which grows there in large quantities.

*Fords on the Rud-i-Seistán.*

The fords on the Rúd-i-Seistán are differentiated from those on the Parián and Nad-i-'Ali channels by the supply from September till the floods set in being kept up by the *band*. The Rúd must also be considered in three parts, the upper broad and deep main channel as far as Kimak; in this length some large canals, the Rud-i-Hasanki or Asiniki, the Madar-i-Ab and other smaller ones

have taken off a considerable volume of water; the next reach is from Kimak to Dashtak where the river spreads out into a wide shallow stream that is very favourable for fording; the third reach is below Dashtak where the tail clusters of the distributing channels are situated. In this reach the river has acquired the regular section of a canal; floods are passed off by the many tributary channels with comparatively small rise of supply in each individual stream. Below Kimak, the fords in the Rúd-i-Seistán disappear only during the height of the flood season. Above Kimak, they disappear earlier and re-appear later than those on the Rúd-i-Parián.

The following is a list of the fords:—

*Guzar-i-Khwája Ahmed.*—This ford is 4 miles below the head at Kúhak at the site of the village of Khwája Ahmed; that was destroyed in the flood of the 1st May 1903. The tower and the sundried brick domed buildings of the village still stand to mark the ford. It is said up to 30 years ago a large Padah tree stood here and the ford was then called Guzar-i-Padah-i-Dad Shah; the ford is said to be 100 years old. It was not fordable for loaded camels when the Mission came here on the 1st April 1903. It remained unfordable till about the 15th June when the volume of the Rúd-i-Seistán was 1,400 cusecs. The ford did not disappear on the 13th September when the *band* was completed (discharge 800 cusecs), but remained till the 10th January 1904 when the discharge rose from 1,400 to 1,800 cusecs. The ford re-appeared on the 5th June 1904 when the discharge fell to 1,200 cusecs.

On the 28th March 1904, camels without loads found a ford over the sand bars at the bend of the river just below the village; the volume was 1,800 cusecs.

*Guzar-i-Shahristán-i-Kuhna*, immediately above the head of the Rúd-i-Hasanki, near the old ruins and  $7\frac{1}{2}$  miles below the Band-i-Seistán. This ford is on the road from Kala-i-Nau to Sharifábád. The ford disappeared on the 10th January, but it did not re-appear till the 5th July when the discharge was 532 cusecs. Men could wade across on the 20th June when the volume was 735 cusecs.

*Guzar-i-Shahristán-i-Nau* appears each year opposite the village where the bed of the river has hard soil. The road from Kala-i-Nau to Kaod crosses here. It is 9 miles below the *band*. The ford disappeared on the 10th January 1904 and re-appeared on the 8th June when the discharge was 1,028 cusecs.

*Guzar-i-Burj-i-Sarband*, 11 miles below the head at Kúhak, is on the road from the Mission camp to the City. It disappeared on the 10th January and re-appeared on the 5th June when the volume was 1,216 cusecs. It is said to be a very old ford; in 1903, it was spoilt by a local scour; this is said to have silted up and the ford has become a good one. It is an important ford just under the village around which the river turns; the upper ford to the east of the village leads to a difficult path through many sand-hills; the lower ford to the west of the village to a certain extent avoids the sand-hills on the right bank.

*Guzar-i-Kimak*, 15 miles from the head of the channel at Kúhak. The river spreads out into a very wide shallow channel which is maintained by a hard bed. The ford only disappears in the time of high flood. It disappeared on 31st March in 1904, when the volume was 2,581 cusecs, and re-appeared on the 15th May when the volume was 2,191 cusecs. General Pollock forded here on the 6th March 1872 on his way from Kandahar to the City, then called Nasirabad. Dr. Bellew says that the ford was very narrow and cattle who got off the direct line went into deep water.

*Guzar-i-Pulgi.*—The channel here is also very wide and the bed sandy; in the year 1904 the ford remained throughout the floods, but in 1903 it disappeared for a few weeks at the height of the flood. The ford is 7 miles below Burj-i-Sarband and 18 miles below the head at Kuhak.

On the 1st February 1905 when the Rúd-i-Seistán was in flood and discharging between 3,000 and 4,000 cusecs this was the only ford fit for loaded camels. The way over the ford twisted a great deal and had to be explored before being used.

This exploration should be finished before the *kafila* arrives or the impatience of ignorant camel drivers will end in camels being driven out into deep water.

*Guzar-i-Dashtak*.—The ford is opposite the village; the river spread out wide among sand-hills. It is  $3\frac{1}{4}$  miles below Pulgi and 4 miles above Muhammadabad.

*Guzar-i-Muhammadabad*, four miles below Dashtak and 6 miles above Chiling. The river flows in an even regular channel, much reduced in volume owing to the canals given off, and to a large escape known as the Noro-i-Muhammadabad, *noro* being an escape.

The ford appears and disappears about the same dates as the ford at Kimak. The road from Robat to the City through Muhammadabad is more direct than that through Chiling, and the ford is better for loaded camels, but there are no villages on the direct road to the City, so pedestrians and equestrians prefer the road *vid* Chiling which passes through the most populated part of Seistán.

*Guzar-i-Chiling*.—The ford is at the cluster of canals at the tail of the river, above the head of the Daudi canal. The *Rah-i-Baishahi* from Robat to the City crosses here. General Goldsmith's party crossed here in February 1872 on their way from Bandar Abbas to the City; the canal was said to be 30 feet wide and 6 feet deep. The ford is in a canal, narrow and shallow. The road taken by the postal riders crosses here and passes through Chah Muhammad Raza, Warmal, Pusht-i-Dasht, Daulatabad, Jo-bakhsh, Akbarabad, Chiling, Jumalabad, Daudi, Afzalabad, Nasirabad Saiyad, to the city. The Amir Ali Akbar, Hashmat-ul-Mulk, makes the kadhudas responsible that the canals in their villages where crossed by this road are bridged.

The kadhuda is responsible for loss or damage by defects in the bridges on the canals.

#### Ferries.

On the River Helmand rafts, called *Sai*, are made by placing a frame work of sticks, preferably of willow, across gourds or inflated goat skins; such rafts are said to be made large enough to carry 3 camel loads of baggage and to be 8 feet by 6 feet and borne on 12 large inflated skins. The largest goat skins I have met with only hold 20 seers Indian of water. So that the skins must be underestimated or the load overestimated, probably the latter, as a little looks a lot on a rickety raft in a big river. Such rafts are often used by individuals in the delta.

Tutin are not known up the river; there is no *tut* and there are no Saiyád people, and apparently *tut* has never been carried up the river for use at ferries.

*Tutin.*

An arrangement is also in use to take goats and sheep across the river called a *Chosal* (from *Chobsal*, a pole raft). This is a log of willow wood to which 6 to 10 goats or sheep are tethered, so that their heads come on the wood, an experienced man will take the sheep across a full river in this way, he himself being supported on gourds or skins.

*Chosal.*

#### *Tutin ferries in the delta.*

There are certain well known fords on the Rud-i-Seistán, Rud-i-Parian where bulrush rafts or *tutin* are maintained. No ferries are kept on the Nad-i-'Ali channel. Those on the Rud-i-Seistán are nearly all maintained by order of the kadhuda for the convenience of the village. No *tutin* are apparently kept at the orders of the Governor. The cultivators pay the Saiyád an allowance\* of grain from the threshing floor at harvest time, varying from two to four *man* Seistání of wheat and barley per plough. The only *tutin* ferry on the Rud-i-Parian maintained by the villagers is that at Guzar-i-Parian, called Shahgul ford by the Mission, which is maintained by the cultivators of Milak, where the saiyáds live, and by the culti-

*Ferries how and where maintained.*

\* Such allowances are sometimes referred to as *Rogez*. The sieve used to clean the grain after winnowing has been done is called *Rogez*. The cultivators use this as a convenient measure to divide out their own grain among themselves. The saiyád turns up at this function and receives a certain number of *Rogez* or measures of grain; hence the colloquial use of the word as an allowance.

vators of Deh Shahgul and Deh Khudadad, but the amount of the allowance is not fixed and varies at the pleasure of the individual, but if he uses the *tutin*, he must pay the usual allowance or the hire. Travellers pay hire at the rate of about half a *kran* to a *kran* a head according to their rank. The payments are also made in kind. The *tutin* are maintained during flood time when the river is not fordable; they are generally abandoned in the hot weather when the ford appears, but are again made when the weather becomes cold to carry pedestrians, who prefer to pay rather than walk through cold water.

On the Rud-i-Seistán *tutin* ferries exist at Khwaja Ahmed, Shahrastan-i-Kuhna, Shahrastan-i-Nau, Burj-i-Sarband, Kimak, Muhammadabad and Chiling. At

Ferries on the Rud-i-Seistan.

Kimak the *tutin* is worked above the ford at the narrow and deep channel. All these ferries are owned by three *saiyáds*, named Shahgul, Muhammad Kor and Husaina. They have to pay 30 *kran* a year rent to the *kadkhudas* of the village at which the ford is, except at Kimak.

At Muhammadabad and Chiling, where the stream is narrow, the *tutin* is not worked by a *pachao*\* or pole, but is hauled across by a rope of kirta grass (*Chilik*). The *tutin* being tied to the middle and the ends of the rope being on either bank. No *tutin* seem ever to have been kept at Dashtak and Pulgi; the Rud is easily fordable except in very high flood, and *tutin* do not seem to be required even in winter.

\*Pa = foot.  
Chub = pole.

A *tutin* is kept by a *saiyád* at Deh Karim Dad on the main river between Deh Karim Dad on the main river below the Kuhak and Shahgul to serve the road from *band*. Deh Karim Dad to Khwaja Ahmed. He is said to collect 2 to 4 *kran* a day either in coin or in kind. He is not subsidised by any village. At this part the river forms the boundary between Afghan and Persian Seistan and crossing is discouraged.

When the Afghan Commissioner was in camp at Khwabgah he maintained a ferry above the *band*. Otherwise Deh Karimdad is the first ferry on the river.

On the Rud-i-Parian in addition to the one at the Parian ford above mentioned *tutin* are kept at Jahanabad ford, Maliki, Margo, Kundil, Masjid-i-Gurg Ali and Deh Shaikh Waisi.

Ferries on the Rud-i-Parian.

The *kadkhudas* arrange with the *saiyáds* to maintain ferries here, but they do not take any share of the *saiyád's* earnings as the *kadkhudas* on the Rud-i-Seistán do. The charge is half a *kran* a man, and there is no subsidy as on the Rud-i-Seistán. When the river is low and the weather warm the *tutin* at the Jalalabad, Margo, crossing is the only one not withdrawn.

*Tut* for the *tutin* is brought by the *saiyád* from Bahringak at the tail of the Rud-i-Parian. But the material for the *tutin* at Deh Karimdad and Shahgul ford is got from Shoro village on the Jharuki Shela in Afghan-Seistán. The *tutin* is said by these *saiyáds* to last a week, but the Mission *tutin* at Kuhak lasted about three weeks. If the *tutin* is systematically overloaded, it soon becomes waterlogged and useless. The *tutin* at the ferries are always in a moribund state and only able to take a man and a few things across. The Mission have had on every occasion to make new *tutin* at any ferry they required to use for even a small party.

Tut.

*Tutin* poles are got from the tall tamarisk or *padah* growing in the Miankangi or along the main river near Kala-i-Fath. *Padah* is preferred, because it is lighter and stronger; a pole costs one or two *kran* and will last two or three years with care. They are 10 or 12 feet long.

Tutin poles.

The construction of a *tutin* has been described at page 269 of Chapter XLIII.

#### Swimmers.

Single men cross the river swimming with the assistance of inflated skins or gourds. A man can be supported on one skin or on two gourds connected by a

strong piece of rope which the swimmer passes under his chest, thus confining the gourd to his body. A *Sarhaddi*, not knowing the use of this rope, tried to cross the Rūd-i-Seistān opposite the main camp with the help of two gourds free to slip from his grasp. This happened as soon as he struggled with the current and he was drowned. No Seistāni attempts to cross a stream without a float of some sort; bundles of dried grass are used if no gourd can be got. In spite of this many deaths\* from drowning occurred in the delta tract during May 1903, while the river and its distributaries were in flood.

The skin of the goat is used to hold water, churn milk and when inflated to support a body in water. These skins are the best method of carrying water in the desert; water carried to Garmashki by the Afghans for the Russo-Afghan Mission in October 1884 was all delivered in these goat skins. They have no seams that leak as the '*pakhal*' made from bullock hides have. The number available in the country is limited, however, and the Mission on more than one occasion bought up all that were available, paying 8 annas to one rupee four annas a skin according to the size.

Camels are swum across the river with the aid of two good inflated skins, one tied over either shoulder; one man on an inflated skin or on gourds goes ahead pulling at the nose rope, whilst a second man sits over the tail and drives the camel. Sometimes two camels will be tied nose to tail and will be taken across by three men, one ahead and one on each camel. The camels were taken across the Helmand at the *band* when the volume was about 30,000 cusecs and at other places higher up when the volume was not much less without difficulty. The charge is a *kran* a camel.

Swimming horses. The people up the river like those in Seistān are expert at swimming horses across the river.

#### Navigation.

The people of the valley say that in 1884, when the Russo-Afghan Boundary Delimitation Commission passed through Garmasel, marching from Khwaja Ali to Chaharburjak, Mr. Merk brought a large boat down the river with supplies; the Mission forded the river at Chaharburjak and the boat was sent back. Fifty men were required to tow the boat upstream; the *bazgar-i-gham* of each village towed the boat up to the next village. That is the only boat the people of Garmasel can remember to have ever seen.

Mr. Merk says the boat had a flat bottom and had been brought from Girishk by men of the boatmen class, called *Aubaz* or *Nilabi*. The men asserted that it took a month to descend the river, but Mr. Merk thought this time must be exaggerated. The *Aubaz* at Girishk, he adds, speak Persian and are evidently at Girishk, as elsewhere in Afghanistan, a caste quite distinct from the rest of the people (Mr. Merk's diaries).

It is said that no one is allowed to use the river for rafting without permission from the local Governor. The permission is obtained by the *kadhuda* in whose village the *padah* trees grow. He takes one-fifth or one-fourth of the sum realized for the wood as his share. The wood is usually taken down the Rūd-i-Seistān and sold for making ploughs, doors, rafters, etc. Most of the wood is now brought from near Mashi opposite Kala-i-Gawak and from Kala-i-Fath. It is said that very fine logs of *padah* were obtained from Khwaja Ali before the village was established. Wood not sold is left at Chiling. Such rafts were seen on the river in 1903; the man walked by the side of the river if the raft was small; on the raft were generally some goods.

\* Many of these accidents are due to the fact that when the stream dries up, as it did in 1902, the Seistāni makes his well in the bed of the stream where the path or ford to his village crosses; men of the village itself have been drowned in these holes when the stream flows again in sudden flood.

## APPENDIX 22.

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## THE NAIZAR —ITS POOLS, CHANNELS AND VEGETATION.

*A detailed description of the system of pools and channels by which the water from the River Helmand circulates in the inundated area.*

Chung-i-Husan Ali—Chung-i-Baringak.

*Series No. 1—Chung-i-Baringak, Shela-i-Chung-i-Shor, Chung-i-Shor and Chung-i-Deh Surkh.*

Chung-i-Shor—Chung-i-Deh Surkh.

*Series No. 2—Chung-i-Baringak, Shela-i-Gurguri, Chung-i-Gahi, Chung-i-Mesh Kushi and the Puzak Hamun.*

Chung-i-Gahi—Chung-i-Mesh Kushi—Chung-i-Barat—Hamun-i-Puzak.

*Series No. 3—Chung-i-Baringak, Aukan-i-Barfi, Chung-i-Barfi, Chung-i-Shahbeg and the Sabari Hamun.*

Chung-i-Barfi—Chung-i-Tiratki—Chung-i-Narmika—Chung-i-Jangi—Chung-i-Saruni.

*The series of Chungs from the tail of the Parian Rud to the Sabari Hamun through Chung-i-Gardan Reg, Chung-i-Shahbeg, Zainal and Sabari.*

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*The series of Chungs from the tail of the Parian Rud on Chung-i-Surkhaki near Tappa-i-Kuhlak down to Hamun-i-Sabari through Chung-i-Shor, Chung-i-Rahsai, Shela-i-Ziarat and Hamun-i-Gharkando.*

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*Hamun-i-Gharkando—Chung-i-Alabakhsh Shahbeg—Chung-i-Bungali—Chung-i-Narmika.*

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Names of localities in the southern part of the inundated area.

## APPENDIX 22.

## THE NAIZAR—ITS POOLS AND CHANNELS.

A detailed description of the systems of pools and channels by which the water from the River Helmand circulates in the inundated area, compiled by Lala Thakur Dass, Supervisor, from personal inspection, the notes and surveys of the party and from information obtained from experienced Herd-owners and Saiyáds.

All the places named in this account are shown on Plan No. LV on a scale of 4 miles to the inch made by the Irrigation Party, and more in detail on sketch Plans LIII-A to I on a scale of one inch to the mile.

Name.	Why it is so-called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-saiyád does it belong.	General remarks.
Chung-i-Hasan-i-'Ali.	So-called after the name of a saiyád, who is about 90 years old and still lives. He caught wild fowl in this Chung.	At the annual floods of the Parian, some silt passes into Chung-i-Hasan-i-'Ali. But for the greater part of the year, whatever silt travels with the water is caught by the thick reed and <i>tut</i> growing abundantly on the edges of the Chung and on the banks of Shela-i-Tutigah.	<i>Tang</i> grows well; but <i>Khargoyah</i> and <i>Gak</i> grow scantily. The silt brought down by the annual floods covers the seed; and these weeds being very delicate and feeble cannot sprout or grow up from under a thick layer of silt.  <i>Tut</i> grows abundantly on the edges of this Chung.  In 1904-1905, <i>Ab-risham</i> did not grow in this Chung; and therefore the coot did not visit it.	The water in this Chung is sweet; and remains drinkable as long as it lasts.	This Chung belongs to the Khel-i-Gaz-i-Jamal which is on the road to Ziarat Khwaja Musá and Chashmaka.	This Chung is the first to receive the waters at the tail of the Parian near Deh Shaikh Waisi. It is fed by a Shela called Shela-i-Tutigah. When the water rises in the Hamun <i>tutin</i> work from Gazbar to Tappa-i-Kharan, the road for <i>tutin</i> passes through Tutigah and Chung-i-Hasan-i-'Ali.
Chung-i-Baringak.	So-called after the small sand hills formed at this place in ancient times when the country was dry.	From the Parian side, a very small quantity of silt passes into Chung-i-Baringak. But at heavy rainfalls, or at big floods a large amount of silt is carried into Chung-i-Barfi and into Baringak from the country near Tappa-i-Machatak and Shagalak. Rud-i-Bandoki a spill channel of the Farah Rud, also carries silt into Barfi and thence into Baringak.	<i>Tut</i> grows in abundance on the shores of this Chung. Before 1885, the saiyáds from Kuhl-i-Khwaja, Adimi, etc., all used to come to this Chung for <i>tut</i> ; but after 1885, the perennial stream of the Helmand turned into Naizar-i-Adira and Chashmaka, and <i>tut</i> gradually grew up at other places also.  <i>Tang</i> , <i>Khargoyah</i> and <i>Gak</i> also grow abundantly. But <i>Ab-risham</i> the favorite of coot does not grow luxuriantly in this Chung. It is not considered a good place for sport as the water is not deep and the weed <i>Ab-risham</i> does not grow well.	The water remains drinkable as the bed is covered with a good deal of silt from the river which keeps the water sweet.	This Chung belongs to Khel-i-Saiyád at Dahani-Farah Rud.	This is an important Chung, as it has three outlets running in three different directions.  Meshedi Ali, son of Shah Nur, resident of Deh Gazbar, says that before 1885 this Chung was very deep. The flood of that year brought a large amount of silt from the Rud-i-Farah and also from the Parian and Helmand into the Chung, as it is situated in a locality which receives water from all directions. After the flood of 1885, each successive year has brought more or less of silt into this Chung, its bed is therefore being gradually raised.

There are three outlets from Chung-i-Baringak, which form three series of Chungs and Shelas.

Series No. 1—Chung-i-Baringak, Shela-i-Chung-i-Shor; Chung-i-Shor and Chung-i-Deh Surkh.

Series No. 2—Chung-i-Baringak, Shela-i-Gurguri; Chung-i-Gaki; Chung-i-Meshkushi and the Puzak Hámún.

Series No. 3—Chung-i-Baringak, Aukan-i-Barfi; Chung-i-Barfi; Chung-i-Shahbeg and the Sábari Hámún.

## The Naizar, its pools and channels—Chung-i-Baringak.

Name.	Why it is so-called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyad does it belong.	General remarks.
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## Series No. 1.—The last to carry water from Chung-i-Baringak.

Chung-i-Baringak. Chung-i-Shor	It is called 'Shor' because its bed contains alkaline matter. If a well is dug in its bed, the water obtained is brackish and undrinkable.	This <i>Chung</i> was very deep before the flood of 1885. That flood filled it with silt to a great depth as it was at the tail of Rud-i-Talai, an arm of the Helmand when the main stream flowed along the boundary. Now-a-days very little silt from the tail of the Parian river passes into this <i>Chung</i> as its bed is far higher than the bed of Chung-i-Baringak.	<i>Abrisham</i> the grass that attracts the cool sprouts in <i>Tirmah</i> ; and in autumn this <i>Chung</i> has either no water at all or very little water. No weeds for wild fowl grow on its bed. In spring <i>Tasg</i> and thin reed grow on the outskirts, but not very thick, as water does not stand in sufficient depth for a long enough time to nourish them.	The bed consists of soil which is mixed with a large quantity of alkaline matters. When the water is flowing, or the depth is about 5 ft., the water is drinkable, but as soon as the depth is reduced to about 3'0 ft., the water becomes brackish and undrinkable.	As no weeds grow on the bed birds do not visit this <i>Chung</i> in large numbers; hence no family of Saiyad claims this <i>Chung</i> as its own.	This <i>Chung</i> receives water from Chung-i-Baringak through a broad shallow 'Sheia.' The bed of this <i>Sheia</i> is at a very high level, so it does not carry any water into Chung-i-Shor, until <i>Sheia</i> -i-Mesh Kushi begins to flow into Chung-i-Puzak.
Chung-i-Deh Surkh.	In former times there was a village near this place called Deh Surkh. This <i>Chung</i> has since been called after that village.	This <i>Chung</i> was at the tail of Rud-i-Talai, when the main stream of the Helmand flowed through <i>Shela</i> -i-Shamshiri and <i>Shela</i> -i-Talai. It was then very deep; and its edges were covered under thick Naizar. In 1885 it received a large amount of silt, and was to a large extent filled thereby. Since then no weeds grow on its bed. Now-a-days no silt passes into this <i>Chung</i> of the tail of the Parian river.	Before the flood of 1885, weeds grew richly on the bed. But after the bed became covered with earth mixed with alkaline matters, the finer kinds of weeds ceased to grow here. All around this <i>Chung</i> there are huge mounds covered with ' <i>Kallar</i> ' or ' <i>Shar</i> '. Every rain-fall brings a good deal of the salt into the <i>Chung</i> making it impossible for the finer weeds to grow here. The silt of the Helmand they say is always sweet; and some day it may again be possible for weeds to grow on its bed.	The bed of Chung-i-Shor contains much salt; and hence when the depth of water is reduced to about 3'0 feet, the water becomes brackish and undrinkable.	There are no weeds in this <i>Chung</i> to attract birds, and no Saiyad claims it.	Before the main stream of the Helmand turned into the Parian, the water of Rud-i-Talai tailed into Chung-i-Deh Surkh. All around this <i>Chung</i> the Naizar was very thick. There were three <i>Shelas</i> running from Rud-i-Talai into Deh Surkh, named Gurguri, Kurra, Lando. <i>Asi</i> -i-Haji Karim, an old wind mill now in ruins stands on the southern shore of this <i>Chung</i> . When the Hamun is full, <i>tutin</i> work from <i>Asi</i> -i-Haji Karim to <i>Tappa</i> -i-Barez. These <i>tutin</i> are worked when <i>Shela</i> -i-Mesh Kushi is flowing full and the road across it to <i>Peshawaran</i> and <i>Lash Juwain</i> is not fordable.

## Series No. 2.—This outlet draws water after Chung-i-Barfi which is on the Series No. 3 is full.

Chung-i-Baringak Chung-i-Gaki.	So-called after the weed <i>Gak</i> which it is said flourished well here in previous years.	This too was much silted up along with other <i>Chung</i> . Now-a-days it does not receive any silt worth the name from the tail of the Parian.	This is a very shallow <i>Chung</i> ; and water dries up very fast. No weeds grow on its bed. <i>Tasg</i> and some reeds however grow.	When the water is flowing, it is drinkable. But soon after it ceases to flow, it becomes brackish.	This <i>Chung</i> is not claimed by any of the Saiyad families.	This <i>Chung</i> is connected to Baringak by a short depression called <i>Shela</i> -i-Gurguri. It is deep and much cut up at its head, but about half a mile lower down it becomes broad and shallow.
Chung-i-Mesh Kushi.	So-called because some person had lost his sheep in this <i>shela</i> while crossing them. <i>Mesh</i> sheep <i>Kushi</i> from <i>Kushian</i> to kill.	It does not receive any silt now-a-days. This <i>Chung</i> has also been much silted up like Chung-i-Deh Surkh.	No weeds grow on its bed. <i>Tasg</i> also only grows scantily.	When the depth of water is less than 3'0 feet, the water becomes brackish and undrinkable.	No Saiyad claims this <i>Chung</i> .	This is a long <i>Chung</i> connecting Chung-i-Puzak and Chung-i-Baringak. Before the Helmand turned into the Parian channel, the water from Puzak first ran into Chung-i-Mesh Kushi and then into Baringak. Now-a-days the water of Baringak first runs into Puzak; and when the latter is full, it overflows and water begins to run back into Baringak through <i>Mesh Kushi</i> and several other small <i>shelas</i> across <i>Lurg</i> -i-Sar-i-Luf and <i>Lurg</i> -i-Shalgami.

## The Naizar, its pools and channels—Hámún-i-Puzak.

Name.	Why it is so-called	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyád does it belong.	General remarks.
Chung-i-Barat.	It is called after Barat, a Gaodar whose grand son, Najaf, still lives on Lurg-i-Istuz Kushta at Dahan-i-Farah. Rud-Husam, son of Barz, and father of Najaf was a notable man among the Saiyád and Gaodars in the reign of Ali Khan, Sarbandi.	Along with Mesh Kushi and Puzak this Chung also received silt, and was nearly filled up.	This is a shallow <i>Chung</i> . <i>Taug</i> and other reeds grow on the edges, as water dries up very soon; the weeds which are liked by the coot do not grow here.	The water is drinkable when it is flowing. But when the depth is reduced to about 35 feet it becomes brackish and undrinkable.	No Saiyád family lives here, as there is no sport.	Shela-i-Mesh Kushi tails into Chung-i-Barat first; and then the water runs into Hámún-i-Puzak.
Hámún-i-Puzak.	It is so-called after the high and prominent vertical cliff cut by its waters out of the high alluvial plateau. This cliff is called Puzak-i-Dak-i-Tir or the <i>Dakht</i> close by the mound from which the amarisk for an arrow ( <i>tir</i> ) was got by Rustam in his fight with Isfandyar. It is said he was wounded because Isfandyar was <i>Rostan</i> or the iron bodied. The arrows of Rustam had no effect on his body. At last Rustam's father Zal suggested that Rustam should go to Puzak and fetch a tamarisk from a mound there which had two branches and one root. Out of that tamarisk Rustam made a two pointed arrow, which was finished with poisonous drugs by Zal who was an expert in medicines. Rustam armed with this weapon fought with Isfandyar, shot his two-barbed arrow into the eye of Isfandyar and killed him. After that <i>tir</i> of Rustam; this Puzak is called Puzak-i-Dak-i-Tir and the Hámún, the Hámún-i-Puzak-i-Dak-i-Tir.	Before 1885 the Khash Rud used to bring some silt at flood times into the Hámún-i-Puzak; and the Helmand too, at flood times, sent a good deal of silt from its tail called Rud-i-Talai. Thus the Khash and the Helmand year by year raised the level of the bed of the Puzak Hámún. In the flood of 1885, however, a large quantity of water escaped from the Farah Rud, north of Juwain through a Sheka called Shela-i-Banduki-Juwain, Near Juwain a break in the <i>Dakht</i> or plateau exists, that is about 2 miles wide, and through this gap the waters of the Farah Rud came rushing into the Puzak Hámún, destroying the Gaodar's huts and drowning many of them; the flood brought with it large amounts of <i>Shor</i> , gravel and earth. Thus the Puzak Hámún was to a large extent reduced in depth. Practically no silt now reaches the Puzak Hámún from the Helmand. From the Khash Rud side only in years like 1903, when the rainfall is great some silt comes into the Puzak Hámún with the rain water.	Before the flood of 1885, the bed of the Puzak grew all the grasses of the Hámún. The sport was good and in plenty. Since 1885 the bed has risen and a large amount of <i>Shor</i> has been mixed with the sweet silt from the Helmand. Now-a-days the water grasses or weeds such as <i>abrisham</i> , <i>gok</i> , <i>chariak</i> , etc., grow scantily there. <i>Taug</i> and reed grow but <i>tut</i> is scanty. The Hámún-i-Puzak now-a-days dries up soon. Last year, i.e., in 1904, the water in this Chung dried up in November 1904, except in the lowest beds.	The water of the Hámún-i-Puzak is drinkable when the depth is greater than 4 feet. Last year in 1904, the water became undrinkable about the 10th August 1904. When the depth in parts was 4 feet and the general depth of the Hámún was about 3 feet.	The Hámún-i-Puzak has only 2 <i>tufts</i> of Saiyáds now. When Takht-i-Shah was a thick Naizar the Saiyáds from Seistan went to the Puzak, caught wild fowl, and paid the tax, i.e., 6 <i>kran</i> per family to the Arab in Persian Seistan. Now-a-days only 32 families live there. But they have to pay the tax to the Arab of Seistan. <i>Vide</i> Chapter XLIII on Saiyáds.	All the older people in Seistan say that Puzak is called Shikargah-i-Rustam. Tradition says that Rustam used to take the waters of all the canals that came to Seistan from Band-i-Yeko on the Helmand and filled Chung-i-Puzak once a year. There he enjoyed himself with sport. At that time it is believed that the Puzak Hámún was <i>Gand</i> or very deep. When the Band-i-Yeko was destroyed, the river flowed down to Takht-i-Shah and into the Puzak. The people believe that the Puzak was the Hámún at a time when the <i>Sibari</i> was quite dry, and the latter bed was under cultivation. By degrees they say the tail of the Helmand river called Rud-i-Talai found another outlet towards Chung-i-Deh Surkh; so that the water of the Helmand ran into Deh Surkh, and thence into Baringak. When the Puzak filled, it also overflowed into Shela-i-Mesh Kushi and then into Chung-i-Baringak. From Chung-i-Baringak to the west two branches or Series of Chungs were formed gradually year by year, till the <i>Sibari</i> was reached.
		All concur that the Puzak Hámún was very deep at first, so deep that when there was only a few feet of water in the <i>Sibari</i> , the Puzak Hámún had several <i>Nasas</i> of water (1 <i>Naiza</i> = 7 or 8 feet). Gradually it silted up. Even now the water from Chung-i-Baringak goes into Chung-i-Mesh Kushi and then into the Puzak Hámún; and only when the Puzak is filled up, does the water return back.				In 1904, the water of the Khash Rud did not reach the Hámún-i-Puzak. The flood was small, and it spread itself out in the Naizar. From the Chung-i-Baringak, some water reached the Puzak, but very little. The bed of the Puzak Hámún must be much higher now as water does not stand for a long period on it.

## The Naizar, its pools and channels—Chung-Barfi.

Name.	Why it is so-called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyid does it belong.	General remarks.
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*Drying up of the Puzak Hámún.*—In November 1904, the Puzak Hámún had practically dried up, but Meshedi Ali says that in its lower portions about 2% of water still stood, though it was brackish and unfit to drink. It became undrinkable when the depth was reduced to about 3 or 4 feet. In 1902, all except some very small pools dried up. The Puzak Hámún is not so exposed to the action of wind as the Sábari Hámún, as it is protected by the high *Dasht* on the north that is on the side the wind blows. The water is not carried backwards and forwards by the wind and therefore is not absorbed or dissipated so rapidly as the waters in the other Hámún are. This protection from the full force of the wind helps the Puzak Hámún to retain water a little longer than it otherwise would.

*Bed of the Puzak Hámún.*—When the water in the Hámún-i-Puzak is not less than 4 feet to 5 feet men and cattle can safely cross the lake, for though the bed is soft owing to the deep deposit of silt, yet the feet of the cattle are soon released from the mud, as the water helps the cattle by making them buoyant. But when there is about 1 to 1½ feet of water, neither men nor cattle can cross, as once a man and more especially an ox is caught in the mud, he is held fast and can be saved only with difficulty. The Naizar is everywhere else hard and cattle graze without any danger.

Series No. 3 which is the first to receive water from Chung-i-Baringak.

Chung-i-Baringak.	This name is said to have been given to this <i>Chung</i> because one year when there was a heavy snowfall in Seistán a thick layer of ice remained on the surface of the water of this <i>Chung</i> for a long time; and the cattle who went to drink water were caught in the ice and perished there of cold. Since then it is called Barfi. It need hardly be explained that the Seistán is very quick to make up little stories to explain names. Sometimes he believes them himself; at others he only wishes you to understand what chain of ideas the name suggests to him. This in itself is valuable information.	Only at the annual floods does some silt pass into Chung-i-Barfi from the Chung-i-Baringak. But at a heavy rain-fall, the washings from the high lands on the north which are covered with " <i>shor</i> " come into this <i>Chung</i> to a certain extent. Such a fall of rain occurs nearly every year in the winter.	In former times, <i>i.e.</i> , before the 1885 flood Chung-i-Barfi was very deep and all sorts of grasses grew on its bed. The flood of 1885 brought much earth mixed with a good deal of <i>shor</i> washed off the Farah Rud Delta and now no weeds grow on its bed. On the skirts, however, <i>Bunun</i> grass grows up richly as the water recedes; and on its southern shore, reed and <i>Tazg</i> also flourish, because the bed has not so much <i>shor</i> on that side.	When the depth of water is less than 30 feet the water becomes brackish and undrinkable. But below the layer of newly arrived silt which contains <i>shor</i> , the bed of Barfi consists of sand and if the upper layer of <i>shor</i> is removed and a well dug in the bed it gives sweet water. Aukan-i-Barfi and Gajgalak which are deep channels always remain sweet. In a year like 1902 this and Shela-i-Gharut Khar were the only places in the northern inundated area where wells gave really sweet water. The bed of Barfi is just like the bed of these <i>uikan</i> .	It was a good sporting place, when it was deep and grew the grasses loved by birds. Now-a-days it has very little water at the time when the wild fowl begin to come to the Hámún. For these reasons no Saiyid claims this <i>Chung</i> .	Before* the flood of 1885 the northern shore of Chung-i-Barfi up to Salian and the big Tappas Khakah, Shagah, etc., was covered under <i>Gas</i> , <i>Khar</i> and <i>shor</i> (Salsolae) plants. The alkali did not rise up and collect on the surface of the ground as they do now. The waters of that flood rising high destroyed the roots of the vegetation for the most part, and the place became denuded of vegetable growth. Soon after the whole plain became white. Hence it is that the rains twenty years before did not annually send into Chung-i-Barfi so much washing of alkali soil as they do now. Chung-i-Barfi receives water from Baringak by a deep channel called Aukan-i-Barfi. It is about 30 feet wide and 6 to 9 feet deep at places.
Chung-i-Tiratki.	So-called because of the excellent growth of <i>traf</i> (a Salsolae† plant near here in former times.	The bed of this <i>Chung</i> is much higher than that of Chung-i-Barfi. From Chung-i-Baringak water passes very soon into Chung-i-Barfi, but further than this the ground is high and the progress of the water is very slow. From Chung-i-Tiratki, the water flows into Shela-i-Gajgalak; then into Chung-i-Narmika, Chung-i-Jangi, Gamsbad and then into Chung-i-Saruni.				
Chung-i-Narmika.	So-called because its bed is very soft and cattle cannot go into it.					
Chung-i-Jangi.	Sardar Ibrahim Khan, Sanjarani, had pounced upon the Gaodars in the vicinity and a Gaodar, named Jangi, was killed at this spot. This <i>Chung</i> is called after him.					

\* In this connection please see page 34, Volume I of Eastern Persia; Major Euan Smith in March 1872 wrote after he rode over this plain from the Naizar to Salian—"Leaving the Naizar the road runs over a saline desert plain thickly covered with tamarick, *būta*, *traf* saline and has a less growth of vegetation.

† (Salsolae, *i.e.*, Potash plant).

The Naizar, its pools and channels—Chung-i-Saruni.

Name.	Why it is so called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyád does it belong.	General remarks.
Chung-i-Saruni.	The Saruni <i>Taifa</i> of the Gaodar have monopolised the <i>Chung</i> to themselves; and allow none to graze their cattle here. It is therefore named after that <i>Taifa</i> .	Chung-i-Saruni does not receive any silt from the Hielmand side. But if the Farah Rud is in flood, and Rud-i-Bandaki brings water some silt gets into Chung-i-Saruni.	Chung-i-Saruni is a big Chung separated from the Sábari Hámún by Lurg-i-Buz Kushta and Lurg-i-Gaz-i-Kopal. Weeds grow abundantly as it is deep and retains water enough to grow the weeds at the right season. <i>Tut</i> and reed also grow luxuriantly on its shores.	The water remains sweet till it is reduced to a depth of about 10 feet. So long as the fish do not die, it remains drinkable. The depth of water at its deepest part on 17th December 1904 was 60 feet and it teemed with sport at that time. The Mission shot here during December 1904 and January 1905.	Chung-i-Saruni belongs to Khel-i-Sari-i-Gaz-i-Jamal which lives near Kala-i-Nau on the southern shore of the Hámún.	On the northern slope of Chung-i-Saruni <i>Bunna</i> grass grows up richly as soon as the flood water recedes. When Chung-i-Saruni is filled, the water passes into the Hámún-i-Sábari through Lurg-i-Buz Kushta. But the neck of these two <i>askan</i> is rather high; and it is only when Chung-i-Saruni is quite full that water runs into Hámún-i-Sábari.

II.—Series of Chungs from the tail of the Parian river to the Sábari Hámún through Chung-i-Gardan Reg, Chung-Shahbeg, Zainal and Sábari.

This is the course of the water running from the tail of the Rud-i-Parian through the Naizar into the Hámún-i-Sábari. In 1903-04 that is from March 1903 to December 1904 the water continued to flow into the Sábari Hámún through the series of Chungs and Shelas mentioned below :—

Chung-i-Gardan Reg.	So-called because on the northern shore of it there is a long neck of loose sand running along the <i>Chung</i> .	This <i>Chung</i> does not receive much silt now-a-days though at flood times the Rud-i-Parian carries some silt into it.	This <i>Chung</i> was very deep before the Parian river was formed. When this occurred a large amount of silt came into it. But this silt was sweet. Hence Chung-i-Gardan Reg still grows all the grasses of the Hámún, and is therefore a notable place for sport. Reed and <i>Tut</i> grow in abundance along it.	The water remains drinkable. In the first place it receives and passes on fresh water almost throughout the year and again because the soil of its bed has no alkaline matter.	The <i>Chung</i> belongs to Khel-i-Mulla Muhammad Saiyád, north of Kala-i-Nau. The <i>Chung</i> being noted for sport the Saiyáds keep a keen watch there.	At the tail of the Rud-i-Parian, one small Shela runs towards Tappa-i-Bahring, but the main arm joins the Shela called Dehno which flows from Chung-i-Surkhaki near Tappa-i-Kuhlak into Chung-i-Gardan Reg. While other arms of the Parian dry up, this arm which runs into Gardan Reg still carries water, being the deepest of all.
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Before the Parian river was formed, the water to this *Chung* used to come from Deh Surkh, *vif* Baringak and Hasan Ali and Tappa Bahring. One arm near Tappa Bahring used to run to the south into Shela-i-Dehno and ran into Chung-i-Adira, Chung-i-Shor, Chung-i-Rahsai.

Chung-i-Gaz-i-Buk-i-Sahibdad.	<i>Gazg</i> means a broad shallow channel; <i>Buk</i> a net. Sahibdad was the name of some Saiyád, who used to come for sport to this place.	The Shela does not receive any silt. All the silt brought by the Parian is caught by the Shela-i-Gardan Reg.	<i>Tut</i> , reed, <i>Tasg</i> , <i>Gak</i> , <i>Khar-yah</i> grow in abundance in this Shela.	The water is drinkable throughout the year.	.....	This is a rather deep channel connecting Chung-i-Gardan Reg and Chung-i-Shahbeg. It ran the whole season of 1903-04 and carried water into the Hámún-i-Sábari.
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## The Naizar, its pools and channels—The Aukan.

Name.	Why it is so-called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyád does it belong.	General remarks.
Chung-i-Shahbeg.	So-called after the name of a kadkhuda of Gaodars, who lived here in former times.	No silt reaches this <i>Chung</i> . This is a very deep and large area.	All the weeds grow on its bed, and the Saiyáds sport here for the most part of the year. <i>Tut</i> and reed also grow luxuriantly about this <i>Chung</i> .	The bed has no alkaline matter and water remains drinkable even when the depth is 10 foot when it generally becomes very dirty.	This belongs to the Khel-i-Saiyád at Sar Gaz-i-Jamal.	This <i>Chung</i> is very deep. In 1903-04, it received water from Chung-i-Gardan Reg. and passed it on into the Sábari Hámún.
Chung-i-Zainal.	So-called after the name of a kadkhuda of Gaodars, who lived here in former times.	No silt reaches this <i>Chung</i> . This is a very deep and large area.	All the weeds grow on its bed, and the Saiyáds sport here for the most part of the year. <i>Tut</i> and reed also grow luxuriantly about this <i>Chung</i> .	The bed has no alkaline matter and water remains drinkable even when the depth is 10 foot when it generally becomes very dirty.	This belongs to the Khel-i-Saiyád at Sar Gaz-i-Jamal.	It receives fresh water from Chung-i-Shahbeg and passes it on into the Sábari Hámún.
Deh Hasan-i-Karbalai.	So-called after the name of a kadkhuda of Gaodars, who lived here in former times. "Deh" is used for a small area of open water.	No silt reaches here. The <i>Chung</i> is a small one.	All the weeds grow on its bed, and the Saiyáds sport here for the most part of the year. <i>Tut</i> and reed also grow luxuriantly about this <i>Chung</i> .	The bed has no alkaline matter and water remains drinkable even when the depth is 10 foot when it generally becomes very dirty.	This belongs to the Khel-i-Saiyád at Sar Gaz-i-Jamal.	This is a small <i>Chung</i> at the head of the two <i>aukan</i> called Aukan-i-Shib and Aukan-i-Bala.
Aukan-i-Shib Aukan-i-Bala.	<i>Aukan</i> is a deep narrow channel through a ridge cut by the water escaping from one <i>Chung</i> to another.	These <i>aukan</i> receive no silt.	In the parts where the <i>aukan</i> are about 15 feet deep, no weeds grow, but in the shallow parts of the <i>aukan</i> weeds grow luxuriantly.	The water is good and drinkable.	.....	These <i>aukan</i> are not very long. They carry water from Chung-i-Hasan-i-Karbalai into the Hámún-i-Sábari. Their necks are not so deep as the length in the middle. On the 28th January 1905, the downstream neck had only about 4.5 of water, while the centre had more than 15 feet.
Chung-i-Mian Tali.	So-called as it is situated between the <i>Aukan</i> and the three Naizars on the east shore of the Sábari.	No silt reaches here.	All the grasses of the Hámún grow here in abundance and it teems with sport. No reed or <i>tut</i> grow here.	The water is good.	Khel-i-Pusht-i-Adimi owns this <i>Chung</i> .	This <i>Chung</i> is not broad, but it extends north by south at the mouths of the <i>Aukan</i> between Lurg-i-Buz Kushta and Lurg-i-Autak-i-Kalan.

Chung-i-Mian Tali is the backwater or lagoon between the bench and the bar thrown up by the winds on the lee-shore of the Sábari Hámún. This formation is found at all the lee shores of the ancient Hámún at Sabz Kim and Surdaghal for instance.

## The Naizar, its pools and channels—Shela-i-Dehno.

Name.	Why it is so called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyád does it belong.	General Remarks.
III.—Series of Chungs from the tail of the Parian river in Chung-i-Surkhaki near Tappa-i-Kuhlak down to Hamun-i-Sábari through Chung-i-Shor, Chung-i-Kahsai, Shela-i-Ziarat and Hamun-i-Gharkando.						
Chung-i-Surkhaki.	It is so called after the name of the old ruin which the people call Diwai-i-Surkhaki.	It receives a good deal of silt at flood time but it is deep. On 15th January 1905, it had 5/8 of water in it.	This is noted for sport. All weeds grow abundantly. All around it on the higher ground which is subject to the annual inundations of the Parian, <i>ashk</i> grows rich. The <i>Chung</i> is surrounded by high reeds.	The water is very good and remains so, as it receives fresh water for the most part of the year.	This belongs to the Khel-i-Saiyád opposite Deh Kala-i-Nau and west of Tappa-i-Adira.	Two big shelas and one small shela at the tail of the Parian river which are said to leave the latter near Jalalabad were running into Chung-i-Surkhaki about the middle of January 1905. They said that these big Shelas ran throughout the year and fed Chung-i-Surkhaki; this is the first <i>Chung</i> which receives water direct from the Parian. These Shelas are likely to develop and become the main stream.
Chung-i-Adira.	So called after Tappa-i-Adira. The Tappa is said to have been the site of a graveyard in ancient times.	This <i>Chung</i> is said to have been very deep when the Helmand ran to Takht-i-Shah. Now Chung-i-Adira receives much silt at flood times.	It is not deep. On 15th January 1905, the greatest depth was measured 30 feet; after the strong hot wind of the summer of 1904 only about 10 feet of water had remained in it and there were no weeds growing. <i>Kharayyah</i> grows well here. <i>Abrisham</i> and other fine weeds do not grow. <i>Tut</i> in small quantities grows. The reeds are very thin on the south-east side but thick towards the north.	The water is drinkable when the depth is not less than 30 feet. In the middle of January 1905, it was drinkable as fresh water had been coming in to the <i>Chung</i> since one month.	This <i>Chung</i> belongs to the Khel-i-Saiyád west of Tappa-i-Adira.	The people have a tradition that when Tappa-i-Adira was populated the land where Chung-i-Adira now stands was all under cultivation. When the Shela-i-Dehno brought water from the Helmand, this <i>Chung</i> was formed and was then very deep. In 1835, and after the Parian was formed, it received much silt and has now become shallow.
Shela-i-Dehno.	A new village was built when this Shela first brought water from the Helmand. Since then this Shela is called Shela-i-Dehno, in literate Persian Dihnau.	This Shela takes out from Chung-i-Surkhaki. It is narrow and deep. Its first reach is called Shela-i-Narharan. In January four Shelas were running between the Akbarabad and Kuhlak Tappas. Over this area <i>tut</i> and reed do not grow thick. They are found only in patches. The Gaudars generally burn this Naizar every year. Shela-i-Dehno is well known in Seistan.	On the bed of Shela-i-Dehno no weeds grow, as the water flows for the most part of the year. On its banks <i>tug</i> and some other reeds and <i>tut</i> grow. The Naizar about this place is scanty and small.	The water is drinkable throughout the whole year.	It is not a <i>Chung</i> and wild fowl do not come on to this Shela.	When the Helmand went to Takht-i-Shah Shela-i-Dehno connected Chung-i-Deh Surkh and Chung-i-Shor with this Chung-i-Shor and Chung-i-Rahni. The area which then formed Shela-i-Dehno is still called Shela-i-Dehno. The same Shela now brings water from the tail of the Parian into Chung-i-Shor and Raisai. The tail portion of Shela-i-Narharan, taking out from Chung-i-Surkhaki is also called Shela-i-Dehno, as it joins Chung-i-Shor in the same area which was under Shela-i-Dehno when the Helmand went to Takht-i-Shah. To the Gaudars who live in villages near Kasanabad, Jukil, etc., Shela-i-Dehno is a notable place.

## The Naizar, its pools and channels—Shela-i-Chashmaka.

Name.	Why it is so called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyád does it belong.	General Remarks.
Chung-i-Shor. Depth 30 feet on 18th January 1905.	So called because the water gets brackish very soon.	This <i>Chung</i> was very deep before. When the Parian was formed, a good deal of silt passed into it and raised its bed.	<i>Khargoyah</i> grows on the bed of Chung-i-Shor; but it has not those fine weeds which attract <i>Char</i> (goat) and other water birds. Though it receives water for most of the year its depth is not great. Water becomes undrinkable soon.	So long as the water runs in from the river it is drinkable, but when the depth is not more than 2½ feet it becomes undrinkable. The cattle however drink it.	This belongs to Khel-i-Saiyád opposite Kala-i-Nau village.	Shela-i-Dehno connects the tail of the Parian and Chung-i-Shor. Hence this <i>Chung</i> receives fresh water for the most part of the year. In 1904-05, some water passed into this <i>Chung</i> even when the river was at its lowest. But from Chung-i-Shor no water passed into Chung-i-Rahsa.
Chung-i-Rahsa. Depth 42 feet on 18th January 1905.	So called after the name of the tribe of Gaodars who stayed at this place for a long time.	This <i>Chung</i> also receives a little silt. It is said to have been very deep before 1885. On the 18th January 1905, the depth of water was 42 feet.	Weeds grow abundantly; and sport abundantly. Fine weeds like <i>abrisham</i> , <i>susak</i> <i>alaf</i> also grow in this <i>Chung</i> . There is thick <i>tut</i> and reeds all around it.	The water remains drinkable throughout the year, unless the <i>Chung</i> almost dries up when it becomes undrinkable.	This <i>Chung</i> belongs to Khel-i-Saiyád at Gaz-i-Jamal.	It was formerly very deep, but it is not so deep now. The silt brought down by the Parian in the year it was formed filled it up. The outlet from this <i>Chung</i> is rather high, and unless it is quite full no water passes towards the Sábari Hamun.
Shela-i-Chashmaka. Depth 40 feet on 18th January 1905.	So called after the name of the Lurg called Chashmaka.	It has thick Naizar on both banks, and at its head. Hence little silt passes down the Shela.	No weeds grow on the bed.	The water remains drinkable throughout the year.	.....	In 1904-05 Shela-i-Chashmaka ran till the end of August. Then it stopped flowing. About the 20th December 1904, it again began to flow, that is, fresh water reached it.
Shela-i-Ziarat. Depth 20 feet on 12th January 1905.	So called after the name of Zinat-i-Khwaja Musn, which is situated on its bank.	This Shela is high and does not receive any silt.	No weeds grow on its bed.	The water is drinkable when the Shela is in flow. It becomes foul and undrinkable soon after the flow stops, as the depth is small.	.....	Shela-i-Chashmaka and Shela-i-Ziarat both feed Chung-i-Khugi.
Chung-i-Khugi.	So called after <i>Khug</i> , a hog.	It does not receive any silt.	<i>Khargoyah</i> grows on its bed. The depth is not great, therefore fine weeds like <i>abrisham</i> do not grow.	The water is drinkable when it is flowing, but as the depth is not great it becomes brackish very soon.	It belongs to Khel-i-Gaz-i-Jamal.	When this <i>Chung</i> overflows, the water goes to the south as well as to the west. The Naizar about this place is very thick and is not much frequented.
Chung-i-Talaki. (Depth 30 feet). Chung-i-Arabi. (Depth 25 feet). Chung-i-Nadiri. (Depth 40 feet).	.....	These are small <i>Chungs</i> and are surrounded with thick Naizar; therefore no silt gets into them.	They were visited by Lala Thakur Dass. <i>Khargoyah</i> and other weeds grow on the <i>Chung</i> , but they are small.	The water remains drinkable, but if the depth is less than 10 feet, it becomes foul and is undrinkable.	These belong to the Khel-i-Saiyád at Sar Gaz-i-Jamal.	When these are filled up, the water travels to the south as well as to the west. On the west is the big <i>Chung</i> called Hamun-i-Husain Madaki.

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## The Naizar, its pools and channels—Hámún-i-Husain Madaki.

Name.	Why it is so called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyád does it belong.	General Remarks.
Chung-i-Siaho. Depth 80 feet on 25th January 1905.	The bed is hard and of a black colour. The water always remains clear, because the wind does not disturb its waters. Hence it is called Siaho.	This <i>Chung</i> is situated in a place which is surrounded by very thick Naizar and practically no silt gets into it. When the waters of the Sábari Hamun rise being driven by the wind some silt is brought into the riámún-i-Garkando. But the silt does not reach Chung-i-Siaho.	This Chung is very deep, so deep that some Gaodars consider it even deeper than the Sábari. In 1902 when all the <i>Chung</i> dried up Hamun-i-Garkando, Chung-i-Siaho and Chung-i-Hasan Madaki had some water, and all the cattle from the Khels on Lurg-i-Tesha Kani came to drink water at these <i>Chung</i> . The weeds grow in abundance and the <i>Chung</i> is considered very good for sport.	The water does not become undrinkable. In 1902 when the water in the Sábari Hámún became undrinkable, it was sweet to the last drop in this <i>Chung</i> ; when the depth was barely 10 feet the water became somewhat unpleasant.	This belongs to the Khel-i-Saiyád at Adimi.	The water of Chung-i-Siaho then runs into Hamun-i-Garkando. Between Chung-i-Siaho and Hámún-i-Hasan Madaki on the east, and the series of <i>Chung</i> in the Hamun-i-Garkando on the west runs a Lurg called Kang-i-Saiyád. There was about 30 of water on this <i>Kang</i> on 28th January 1905. It is called Kang-i-Saiyád because when the Saiyáds go about these <i>Chung</i> they generally settle themselves in their <i>tutin</i> on the <i>Kang</i> , i.e., island which is covered with thick reeds. Here the Saiyáds are protected from the winds and they find good hiding places from which to snare the birds.
Hámún-i-Husain Madaki. Depth 80 feet on 25th January 1905.	It is so called after the name of some Saiyád.	This <i>Chung</i> does not receive any silt; it is a favorite place with the Saiyáds.	All weeds grow on its bed, <i>abrisham</i> and <i>sovak alof</i> grow in abundance and sport abounds. When the water is very deep, <i>abrisham</i> does not grow.	The water remains drinkable to the last drop. Some Saiyáds say this <i>Chung</i> is deeper even than the Sábari Hámún; but it is not so.	It belongs to the Khel-i-Saiyád at Adimi.	This is a very large and deep <i>Chung</i> . Meshedi Ali, son of Ismail Gaodar of Adimi visits it frequently. He says that in 1902 the water in this <i>Chung</i> remained drinkable to the last drop; and perhaps it would not of itself have completely dried up had it not been drunk up by the cattle. This <i>Chung</i> is considered a reservoir, and the Saiyáds prize it very much.
Chung-i-Alabakhsh Shahbeg. Depth 60 feet on 24th January 1905.	So called after the name of some Saiyád.	These <i>Chungs</i> receive silt from the west. The Sábari Hámún scours its eastern shore and throws the material on to the eastern slope of the small Lurg called Lurg-i-Tesha Kani and Astak-i-Kalan. About 30 years ago the western edge of this Lurg was about a mile to the west of where it is now. The action of the wind on the water of the Sábari Hámún caused it to gradually cut away the Lurgs and the stuff thus scoured was deposited in the <i>Chung</i> of Hámún-i-Gharkando. These Lurgs are therefore the leeward beach of this Hámún.	This Hámún is much prized by the Saiyáds as it abounds in sport. The <i>daghad</i> or the clear part of the <i>Chung</i> is great and it is surrounded by thick Naizar. These two conditions are very favourable to the Saiyáds. All sorts of weeds grow in this Hámún. The reeds are very tall and thick.	The water remains drinkable to the last drop unless it becomes dirty. In 1902 when other <i>Chungs</i> dried up, this and Chung-i-Siaho and Husain Madaki had water.	Hamun-i-Gharkando belongs to the Khel-i-Saiyád at Adimi.	It is so called because it was very deep—even deeper than Sábari (from <i>Gark</i> drown). This Hámún receives water from the Chungs Siaho and Husain Madaki. So long as there is no wind and the water is rising, the water from this <i>Chung</i> flows into the Sábari. Of course covering the Lurg-i-Tesha Kani and Astak-i-Kalan. But the wind drives a good deal of water into Gharkando and with it a large amount of silt scoured from the west bank of the Lurg.
Chung-i-Bungali. Depth 70 feet on 28th January 1905.	So called after the name of some man.					
Chung-i-Namika. Depth 35 feet on 28th January 1905.	So called because its bed is very soft and cattle do not frequent it.					

It is said that Sardár Kurdíl Khán, Sarbandi, dug a small cut across the Lurg to connect the Hámún-i-Sábari with the Hámún-i-Gharkando, so that his *tutin* might come and go from one to the other. This cut called Shela-i-Tesha kani is now almost level with the ground. They say that for a while it was deepened and widened by the action of the water from the Sábari Hámún, but afterwards it gradually filled up. *Tishokani* means cut with a *tisha*, the Seistani hoe or "phaora."

## The Naizar, its pools and channels—Rah-i-Nai Rez.

Name.	Why it is so called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyád does it belong.	General Remarks.
Chung-i-Garundi. Depth 3.0 feet on 25th January 1905.	An onomatopoeic word indicating the sound made by the water.	Chung-i-Garundi receives some silt from the Sábari. It is not a very deep <i>Chung</i> .	It does not grow any fine weeds, because the depth of the water is not much. Nor does it abound in wild fowl. But it is a place for the Góodárs who live on Paran-i-Chheda, a Lurga close by the <i>Chung</i> .	The water becomes undrinkable when it is about 1.5 feet, but as soon as fresh water comes in it becomes drinkable.	This belongs to the Khel-i-Saiyád at Adimi.	Chung-i-Garundi receives its supply from Hámún-i-Husain Madaki. It is surrounded on the north by thick Naizar. On the southwest the Naizar is not so thick.
Chung-i-Khugi. Depth 3.5 feet on 24th January 1905.	So called after <i>Khug</i> , a hog.	It practically does not receive any silt as it is surrounded on all sides by thick Naizar.	<i>Teag</i> grows in abundance. But fine weeds do not grow and wild fowl are few.	The water remains drinkable so long as the depth is not reduced to 2.0 feet.	This belongs to the Khel-i-Saiyád at Adimi.	This is a big <i>Chung</i> and the last one on the north of Ráhi-i-Teshakani. When the water in the Naizar rises, it just fills up Chung-i-Khugi and then takes a southern course by Rah-i-Nai Rez.
Ráhi-i-Nai Rez.	This road runs from Adimi to Lurg-i-Tishakani, when the Hámún is low after the 170 days wind. From Lurg-i-Tishakani, it goes to Lurg-i-Buz Kúshá and then to Dahán-i-Faráh Ráfd. Rah-i-Nai Rez is very noted, because the <i>Lurg</i> , on which it runs, separates the Naizar consisting of Hámún-i-Garkando and Husain Madaki from Chung-i-Daraz. This <i>Nai Rez</i> was only about 7,000 feet or about 1.5 miles long with 1.5 feet of water on 24th January 1905. The rest of the road was quite dry. When the water in the Naizar rises, it just passes through the <i>Nai Rez</i> , which is also called 'Garg-i-Adimi' or Shela-i-Adimi, and then runs into Hámúnák. This Garg or Shela-i-Adimi is important because it is the connecting link between Naizar-i-Tosi and Naizar-i-Adimi.					
Hámúnák Depth 2.7 feet on 24th January 1905.	So called because it is very long and broad, and first receives water from Garg-i-Adimi.	Hámúnák does not receive any silt.	It has <i>Teag</i> and reed and some <i>Tut</i> also; but fine weeds are not common. The water too is shallow. It is not a good place for wild fowl.	The water is drinkable. It was drinkable on 24th January 1905 but smelt very bad.	It belongs to Khel-i-Saiyád at Adimi.	From Hámúnák, the water first passes into Chung-i-Daraz; and when the water rises still higher, it then runs into Chung-i-Rogani.
Chung-i-Rogani. Depth 8.0 on 26th January 1905.	So called because it abounds in reeds, etc., and cattle feed well so the milk yields a large quantity of <i>Rogun</i> or butter.	It receives some silt from the Sábari when the strong wind blows; but the silt has not reached the deep part of the <i>Chung</i> .	This is also a good place for wild fowl, and the Saiyáds prize it very much. Weeds grow in abundance. It is surrounded on all sides by thick reed.	The water remains drinkable as it does in Chung-i-Siáho or Husain Madaki.	This belongs to Khel-i-Saiyád at Adimi.	To the north of this <i>Chung</i> there is a Shela called Shela-i-Mian Kang, which connects the Sábari Hámún with Chung-i-Rogani. When the wind blows strong, a large quantity of water from the Sábari comes into Chung-i-Rogani. Levels in this part were taken in January 1905.
Chung-i-Daraz. Depth 6.0 feet on 25th January 1905.	So called because its length is great and width comparatively small.	It does not receive much silt. But in strong winds Shela-i-Charáka Báld and Shíb bring a large quantity of water from the Sábari into this <i>Chung</i> , and with the water a small quantity of silt also comes.	All the weeds grow in abundance. But <i>abresham</i> and <i>Sasak alaf</i> are not so abundant. It is a good place for wild fowl.	The water is drinkable, but on 30th March 1904 it was noticed that in the middle of the width of the <i>Chung</i> where water was about 3.0 feet deep it was so foul that it could not be drunk.	North of Rah-i-Chung-i-Daraz, i.e., the <i>Kung</i> for <i>tuin</i> the <i>Chung</i> belongs to Khel-i-Saiyád at Adimi; but south of that line it belongs to those who live at Aizalabad.	At Rah-i-Chung-i-Daraz, the road is the shortest, because men alight on Dak-i-Gaz Al-i-Gurg, and thence they go to Mil-i-Nadir. But when Dak-i-Gaz Al-i-Gurg and Lurg-i-Tiratki are under water, this road is abandoned. Across this <i>Chung</i> there is another road called Rah-i-Kundil Khani which has not been used for a long time now.

## The Naizár, its pools and channels—Rud-i-Gharut Khar.

Name.	Why it is so called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyád does it belong.	General Remarks.
Rud-i-Gharut Khar.	So called because the Gaodars on the banks of this Shela were very prosperous; and they had plenty of Gharut ( <i>Karut</i> or <i>Karnad</i> ), curds specially prepared so as to keep.  Gharut Khwar is also the name of a <i>taifa</i> , vide Chapter 1.	This Rud receives a very large amount of silt from the Sábari Hámún. On 26th January 1905 when soundings of the Rud were taken in a boat, it was found that about 15 feet of silt which was quite soft was deposited on the banks only recently. Ali, son of Ismail Gaodar of Adimi, who has been in this locality during the last 20 years, says that in 1902 the Shela was very deep and there were deep wells in its bed. In 1903 the depths at its head were more than 60 feet; while on 26th January 1905 they were only about 35 feet. This is because the waters from the Sábari Hámún were then filling the Shela with silt.	No weeds grow on the bed; but on the banks only <i>Tasg</i> , <i>Tut</i> and reed grow. No fine weeds grow here.	The water is drinkable. The wells in the bed of this Rud in 1902 when all the water in the Naizár had dried up gave sweet water and most of the Gaodars brought their cattle to Rud-i-Gharut Khar.	This Rud belongs to Khel-i-Saiyád at Adimi.	When the wind blows strong over the Sábari Hámún it sends a large volume of water down the Rud-i-Gharut Khar. Part of this water escapes back again into the Sábari Hámún from the tail of the Rud-i-Gharut Khar through the Rud-i-Mamun and a large quantity of water runs into Shela-i-Charaka and then into Chung-i-Daraz. The velocity of the water running into Rud-i-Gharut Khar during strong wind is said to be equal to that of the Rud-i-Helmand. Hence the alternate scouring and silting.  When the wind dies away the water returns again into the Sábari Hámún by the same route that it flowed out.
Shela-i-Charaka (Bala and Shib).	So called because it is said in ancient times there was a <i>Charkh</i> or Persian-wheel on a well at this place.	These Shelas receive much silt from the Sábari, but at the head of these Shelas the Naizár is thick; much silt is brought there and little or no silt reaches Chung-i-Daraz except in very strong winds.	On the banks of these shelas <i>Tasg</i> , <i>Tut</i> and reed grow thick, but in the bed there are no fine weeds.	The water is drinkable even when the depth is small.	.....	In <i>Nuh-i-Nahum</i> (vide page 503) the wind forced such a large quantity of water into Chung-i-Daraz and Hámúnák that the ground between the Naizár and the protection bank at Adimi was under water; and some lives were lost in the <i>Khel</i> on this land. The high wind causes a great velocity in the Shela-i-Charaka.
Chung-i-Khugia.	So called after <i>Khug</i> , a hog.	It is a small <i>Chung</i> surrounded by thick Naizár on all sides. It therefore does not receive any silt except in high wind when the Hámún is full.	No fine weeds grow on its bed. <i>Tasg</i> is the chief plant which grows here.	Water is not drinkable when the depth is less than 30 feet. When fresh water comes in the water becomes good.	This belongs to Khel-i-Saiyád at Afzalábád.	This <i>Chung</i> is at the tail of Chung-i-Daraz. It is surrounded on all sides by thick Naizár.
Chung-i-Swajgi.	.....	It receives silt only at the high wind when the Hámún is full and the wind sends the waters of the Sábari into this <i>Chung</i> also.	No weeds grow here to attract birds; but there are <i>Tasg</i> and thin reeds with very high roots. <i>Tutin</i> cannot work in this <i>Chung</i> unless the water is 5 or 6 feet.	On 31st January 1905, when the camp of the Surveyors was on this <i>Chung</i> the water was brackish and had a bad smell. The survey people drank it because there was no water close by. The Gaodárs drink the water at all times.	This belongs to Khel-i-Saiyád at Afzalábád.	South of this <i>Chung</i> the Naizár is high down to Ráh-i-Gardowak along which the telegraph line runs.

## The Naizár, its pools and channels—the Shúr Rád.

Name.	Why it is so called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyád does it belong.	General Remarks.
Ráh-i-Surkh Gazi.	So called, it is said, after the name of a ruined village of this name which existed at this place in ancient times.	Ráh-i-Surkh Gazi is the <i>Rung</i> or road for <i>tulin</i> which work between Afzalábád and Mil-i-Nadir, when water in the Naizár rises high and Ráh-i-Gardowák is not passable for man or animals. Along this Ráh-i-Surkh Gazi runs the low Naizár from which start the three Shelas named Khwája Ali, Gardowák and Shor Rád. The water into this low Naizár comes from Chung-i-Swajji and Chung-i-Khugi when both of them overflow.				
Shela-i-Khwája Ali.	.....	This Shela is at the east end of Ráh-i-Gardowák. In former days there was a <i>Paran</i> called Parani-Khwája Ali, a little to the east of Shela-i-Khwája Ali. The bed of the Shela is very high and it is the last of the three Shelas named above to begin to flow. It is very broad and shallow, and its bed is covered with <i>Tuzg</i> and thin reeds. When the Hámún dries up and these three Shelas cease to flow, the bed of the Shela-i-Khwája Ali and Shela-i-Gardowák become slippery and the Saiyáds then make <i>Nai Rez</i> , i. e., they put reeds and rushes ( <i>Tuzg</i> ) on the slippery bed to allow loaded camels to pass safely. For this reason Ráh-i-Gardowák is sometimes called Ráh-i-Nai Rez.				
Shela-i-Gardowák.	.....	This Shela is the first to draw water from the low Naizár near Surkh Gazi. Its head reach down to the Telegraph line, being low, the water fills that up very soon; but beyond the backbone of the <i>Lurga</i> the bed is high and water does not flow into Hámún-i-Sangal till some time after the Shor Rád begins to empty itself into that <i>Chung</i> .  Shela-i-Gardowák is very wide and shallow. Its bed is covered with <i>Tuzg</i> and thin reeds. The slippery parts on this Shela also are strewn with <i>Tuzg</i> and reeds when the road from Afzalábád to Mil-i-Nadir along the <i>Lurga</i> called Ráh-i-Gardowák is opened after the water level of the Hámún falls.				
Paran-i-Soofi.	.....	Paran-i-Soofi is a small <i>Paran</i> on this <i>Lurga</i> between Shela-i-Khwája Ali and Shela-i-Gardowák.				
Shor Rád ...	It is so called because soon after it ceases to flow its water becomes brackish and undrinkable. From <i>Shor</i> (in literature Persian <i>Shúr</i> ) meaning alkaline.	The head of this <i>Shela</i> in Ráh-i-Nai Rez is rather high, and water fills it later than it does the Shela-i-Gardowák. But once the water reaches its bed, it flows rapidly and the Shor Rád is the first to pour a good supply into the Hámún-i-Sangal. Thus the Shor Rád is the first to carry water across Ráh-i-Gardowák into the Naizár-i-Káh-i-Khwája. The Shor Rád is not wide, but is deep. The Máldárs dug wells in its bed in 1902. The water was not good for men to drink. The bed of the Shor Rád where it is deep is free from weeds; but whenever it is broad and shallow, there <i>Tuzg</i> and thin low reed grow.				
Kurg-i-Kal.	So called, because it is low lying land which was cultivated for two years before it became Naizár <i>Kal</i> means cultivated land. <i>Kurg</i> is a pit.	Rád-i-Bandan brings lots of silt in this <i>kurg</i> .	The bed is clear of weeds. But on the slopes <i>Tuzg</i> and <i>Khanggyah</i> grow. This <i>Kurg</i> is high and water dries up soon.	The water becomes undrinkable when it is 25 feet deep.	<i>Taiifa</i> Ghor of Saiyáds on Dak-i-Gaz-ali-Gurg own this <i>Chung</i> .	The father of Kurbá'í Abbas, an old man of about 60 years living in Deh Gaz-bar, used to say that he himself ate the wheat sown in bed of Kurg-i-Kal. This land was irrigated from the river Helmand when its main stream flowed towards the Káb-i-Khwája. The first year the crop came all right. The next year about spring the Sábari Hámún rose high and destroyed all the crops. No more crops were raised after that in Kurg-i-Kal.
Chung-i-Do-díwal.	Abbas Rehan in the days before the Persians took Seistán, tried to enter Seistán; the people did not allow him to cross the Hámún. He built huts there and after the remains of those huts, this <i>Chung</i> is called Chung-i-Do-díwal (two walls).	This does not receive any silt from the river or from the Hámún. But when strong wind blows alkaline earths from the <i>Dashá</i> and high plains on the north are carried into this <i>Chung</i> .	No weeds grow on its bed, as the soil contains too much salt, on the slopes, however, " <i>Karan</i> " grows which is the name for the grass like <i>Bannun</i> that grows under water.	When the depth is less than 25 feet the water becomes undrinkable.	The Khel-i-Saiyád at Kul-i-Khwája owns this <i>Chung</i> .	This is the first <i>Chung</i> to receive water from the Shor Rád across Ráh-i-Paran-i-Soofi or Ráh-i-Gardowák.

The Naizár, its pools and channels—Hamun-i-Sangal.

Name.	Why it is so called.	Does it receive any silt.	What weeds grow on its bed.	Is the water drinkable.	To what Khel-i-Saiyád does it belong.	General Remarks.
Hámún-i-Sangal.	It is said that there were several big white stones lying in the bed of this <i>Chung</i> when it was formed. It was therefore named Sangal.	It does not receive any silt. The bed is hard and has large boulders on it. Some very large stones as big as a table are also said to be found in the bed. On the southern shore of Hámún-i-Sangal there are deep pits formed at the foot of the <i>Lurga</i> scoured out by the wind driven water. The wind makes high waves on the Hámún just as it does on the Hámún-i-Sábari.	No weeds grow on its bed. The northern shore grows some reed. On the east shore there is thick Naizár.	When the depth of water is less than 35 feet, it becomes undrinkable.	This <i>Chung</i> belongs to the Saiyáds at Kúh-i-Khwája.	This is very big and deep, next in size only to the Sábari Hámún. It is subject to the action of the wind; and the waves rise very high, as they do on the Sábari Hámún.
<p>The Saiyáds say that owing to the peculiar nature of the bed of this Hámún the fish grow big very quick. In two years after the drought this Hámún became full of fish. They are very large and heavy, even larger and heavier than those in the Sábari Hámún. Though the water is brackish the fish prosper well.</p> <p>The Saiyáds also say that the wild fowl <i>Arab</i>, <i>Chashk</i>, <i>Lagan</i>, <i>Ghullak</i>, <i>Bazook</i>, visit this <i>Chung</i> in large numbers about the time of reaping the <i>Rabi</i> crop. They lay eggs on the small <i>Lurga</i> in the middle of the <i>Chung</i>.</p>						
Lurg-i-Damán.	It is so called because Sardar Ali Khán, Sarbandi, laid a large number of nets on this <i>Lurga</i> . At that time this <i>Lurga</i> was not commonly known to the people in Seistán.	This is a <i>Lurga</i> which is very well known in the Naizár as it is never completely deserted by the Gáodárs and Saiyáds. In 1903, too, though the flood was high, the Gáodárs were able to stay here in the <i>Paran</i> . This is the second of the two <i>Lurga</i> s in the whole of Naizár-i-Helmand where people grow <i>falta</i> , the first being <i>Hash-i-Dábar</i> on the eastern bank of the Sábari Hámún. To the south of the <i>Lurga</i> , they grow <i>falta</i> .				
Lurg-i-Haidar.	So called after the name of some man.					
Chung-i-Kúh.	So called after the Kúh-i-Khwája.	Some silt from the escapee from Rúd-i-Seistán gets into this <i>Chung</i> .	All kinds of weeds grow on this <i>Chung</i> . Birds visit it in large numbers.	The water is good for drinking purposes so long as it is more than a foot deep.	This belongs to Khel-i-Saiyád Kún-i-Hauzdari families.	
<p>This <i>Chung</i> extends on all sides of Kúh-i-Khwája. In connection with Naizár-i-Karchuk which is north of Lurg-i-Daman in Hámún-i-Sangal, a story often told in Seistán says that Khán Jan Khán the Baluch Sardar at Chakhanzur sent one of his men Mírad by name to Persian Seistán to rule the people. The grandfather of Meshedi Ali, son of Shah Nur, killed Mírad in Naizár-i-Karchuk where he had hidden himself. Khán Jan Khán being very strong, demanded the price of the blood of Mírad. For seven years the Gaodars used to pay Sardar Khán Jan Khán compensation in cows, etc.</p>						
Chung-i-Sar-i-Sang.	This is so-called because the stones in the bed of the Hámún end here.	It does not receive any silt.	All kinds of weeds grow here.	The water is drinkable so long as water is more than 10 foot in depth.	Khel-i-Saiyád at Kúh-i-Khwája.	.....
Lurg-i-Sar-i-Nal.	So called because all this <i>Lurg</i> is covered under reed.					
<p>Before 1835, when the main stream of the Helmand flowed towards Takht-i-Shah, all this Naizár had become dry; the roots even of reeds and <i>tut</i> disappeared. In 1835 water got into this Naizár; and after that the water of the <i>Noro</i> or escape channels from the Rúd-i-Seistán has been helping the growth of reeds around the Kúh-i-Khwája and to the south of it. Even now there is no Naizár worth the name south of the Kúh-i-Khwája. The Saiyáds do not own any <i>Chung</i> to the south of the Kúh-i-Khwája and hence no names have been given to these <i>Chunga</i>. The localities of this part of the Hámún are known by the names of villages that occur opposite to them or by the names of the prominent objects such as <i>Darya-i-Barabari-Sihkuha</i>, or the Hámún opposite <i>Sihkuha</i> and so on. After 1895 when the <i>Parian</i> channel became more important, the Naizár-i-Kúh-i-Khwája received water almost every year; and therefore reed and <i>tut</i> are slowly growing up, as the main stream of the Helmand moves more to the west, as it is likely to do the growth of weeds (<i>alaf</i>), reeds (<i>nal</i>) bulrushes (<i>tut</i>) and rushes (<i>tuzg</i>) will increase in this part of the inundated area and the pools (<i>Chung</i>) and reed beds (<i>Naizár</i>) around the Kúh-i-Khwája will grow in importance.</p>						

## APPENDIX 23.

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## APPENDIX 23.

## THE HAMUN-I-SÁBARI.

NOTES COLLECTED BY LALA THAKUR DASS, SUPERVISOR, ON THE SPOT.

*Traditions connected with Kala-i-Sabar Sháh.*

Karbalái Abbas, son of Meshedi Muhammad, *Taifa Karim, Gaodar*, resident of Deh Gazbar, is a literate man, and is well versed in the traditions and stories that have descended from father to son in Seistán. He says that tradition tells that Zahidan, Pesháwarán, and the city of Sabar Sháh were all 'abad' in the same period. The ruler of the city now at the bottom of the Sábari Hámún was Sabar Sháh; and the ruler of Pesháwarán was Pesháwar Sháh. The latter was the father-in-law of Sabar Sháh; and both of them were remotely related to Malik Kutb-ud-din, Kayáni, of Zahidan. Another tradition often heard in Seistán from people, old or young, is that from Zahidan to Pesháwarán *via* Gazbar, Tappa-i-Kúhlah, Tappa Bahring, Tappa-i-Shagali, etc., etc., teemed with population, so much so that the tops of the houses were in one continuous line; a 'buzghala,' i.e., a kid started from Zahidan city and went over the tops of the houses to Pesháwarán without coming down to the ground. The ruins now remaining do not justify the literal acceptance of this story, but it graphically indicates their continuity and nearness to one another.

The canals to irrigate lands about Pesháwarán\* and Kala-i-Sabar Sháh came from Band-i-Yeko;† and one of the branches went to Kala-i-Sabar Sháh.

† From *yak áb*.

In the course of time a son was born to Sabar Sháh. When this boy and his mother went to see Pesháwar Sháh, who was the grand-father of the boy, Sabar Sháh instructed him not to accept any money or lands from his grand-father; but to ask him to increase the supply of water which was allowed to Sabar Sháh. The Seistánis say that the boy asked his grand-father to make their outlet in the *band* or weir one brick instead of a half one (or "a *khisht* from a *zhau*"). And accordingly this was done at Band-i-Dartang,‡ with the result that Band-i-Yeko could not be controlled any longer. The water therefore destroyed the city of Sabar Sháh. This version of the tradition agrees with that of the Arbáb Saif-ud-din. With the destruction of the Band-i-Yeko all the cities of Seistán

‡ Some say this name is Karan.

were ruined and deserted; and the Hámún which extends from Tappa-i-Kharan§ down to Adimi formed. Year by year the *Chung* developed, and the Naizár grew up. It was then that the Sábari Hámún was formed. These traditions, as well as those given in the last Appendix, should perhaps have been omitted; many of the people have a valuable store of traditions, but leisure and previous training are needed to do justice to them. They will be fully dealt with by Mr. Tate in his work. *Peshawar*, be it said, means an artisan.

Meshedi 'Alí, son of Shahnur, a man of about 45 or 50 years of age, says that in 1902, when the Hámún-i-Sábari dried up, he went several times to the place where the ruins of Kala-i-Sabar Sháh stand. This fort lies to the south-west of Kuh-i-Ghuch in a line with Zíárat-i-Khwája Sábari. It is like the mounds of Tappa-i-Kharan or Akbarabad, but is larger than Tappa-i-Kharan. It is almost rectangular in shape. Inside the heaps resemble the remains of houses. Large burnt bricks, 2½ feet × 1½ inches, are found in plenty all over the place. But no trace of the canals can be found. The ditch around the fort is still there

\* The levels show that it is impossible to irrigate Pesháwarán from the Helmand.

† This means the *band* at the place where the gorge narrows. This occurs near Kals-i-Mir and Kals-i-Roden, the site of the traditional Band-i-Yeko; we have not found any trace of a masonry dam on the Helmand and there is no reason to think there was any need of one. The dam that Timur destroyed is supposed to have been near Roden also. There is no reason to think that this was a masonry structure either in spite of the statements of historians and local traditions to the contrary.

and held about 2 feet of water while the bed of the Hámún hardly had dried up.

The bed of the Hámún-i-Sábari is flat and very hard. In 1902 when the Hámún dried the bed was found to be covered over with small and big shells, in such large quantities that men could not walk bare-footed on it. The bed is so hard that horses' hoofs do not leave any mark on it.

It is said that the bed of the Hámún-i-Sábari does not change except on its south-eastern shore. The bed proper, *i.e.*, where the depth of water is not less than 5 feet (as measured from the level of the water in March 1905) does not change at all. The Sábari depression is too deep to allow the waves to scour the bed; and whatever silt is brought down by the Faráh Rúd, Harud Rúd and several other drainages on the western shore of the Sábari depression is carried into the Naizár near by the mouths of the streams and there deposited, the clear water only flowing into the Hámún-i-Sábari. Thus no silt is being deposited on the bed, nor is the bed being scoured.

The wind plays an important part on the Hámún-i-Sábari. It is changing the shape of the Sábari depression on its south-eastern shore. Meshedi 'Ali says that he has been brought up on the shores of the Sábari, and has been there from his infancy till now. About twenty years ago the eastern shore of the Sábari extended about half a mile further into the Hámún from Lurg-i-Autak-i-Kalan and Teshakani. The wind has been cutting this Lurg away and throwing the material east of the Lurg, filling up the shore of the Hámún-i-Garkando, etc. Now a Lurg of hardly 500 feet wide is left between the Hámún-i-Sábari and the Hámún-i-Garkando.

At the place where this Lurg has been scoured away, the action of the waves from the Hámún-i-Sábari is making deep small holes of varied size and depth quite close to one another. In 1902 when the Sábari dried up, these holes were prominent. They were so close to each other that a man could not go across but by passing through them, and the area on which these holes has appeared is that from which the Lurg has been cut away during the last 20 or 25 years to a distance of about 3,000 feet. These holes are called by the Gáodárs *Chughur*; and they are increasing every year in size.

These *Chughur* are only on the south-eastern shore of the Sábari depression between the *Aukan* and Lurg-i-Siahsar. They do not extend towards Bahring.

The wind forces the water towards the south and south-east, and drives it into the Naizár; Lurg-i-Siahsar, Kang-i-Haidar and the Naizár about Lurg-i-Dák-i-Gaz Khoom-i-Gao and Mian Kang, as well as Kang-i-Gharutkhar catch a good deal of silt. Every time that a strong wind blows, some silt is deposited in this Naizár; and the clear water again flows back into the Hámún-i-Sábari. In this way Lurg-i-Siahsar, a narrow piece of Naizár projecting into the Hámún-i-Sábari from Lurg-i-Takhtak is being raised and widened year by year. Kang-i-Haidar was not so high formerly as it is now. It extended towards the north-west, on which side it is being scoured, but the southern end is being extended, and the back or top of the Lurg too is being gradually raised. This is the place where the Hashmat-ul-Mulk keeps his private herd.

On the eastern shore near the *Aukan* the three *Bash* called Bash-i-Dilbar and Bash-i-Juwain and Bash-i-Jo Bakhsh were very deep, the silt from Rúd-i-Faráh is gradually raising the Naizár in these *Bash*. A *Bash* is a very dense thicket of reeds.

Along the banks of the Rúd-i-Gharutkhar one to two feet of soft silt in which the foot of a man sank, was seen when the lines of levels were being run on the south-eastern shore of the Sábari depression in January 1905, silt was being deposited in that season. The Gáodárs of this locality said that only so

short a time ago as 1903, Rúd-i-Gharutkhar was very deep at its head in the Hámún-i-Sábari, but in January 1905 when soundings were made at the head of Rúd-i-Gharutkhar, the depth was only 3'5 feet.

When the north by west wind blows strong, the waters of the Hámún-i-Sábari are forced over the Lurg which runs north to south forming the southern eastern shore of the Sábari depression, that Lurg is 2 to 3 feet above the usual water level in the Hámún-i-Sábari. In January 1905, a strong\* wind blew for three days, *i.e.*, on 20th, 21st and 22nd; and the level to which the water was raised was 2'0 feet on Lurg-i-Teshakani, Dak-i-Gaz Khoom-i-Gao and Mian Kang; while it was 4 feet on Lurg-i-Tiratki near Kurg-i-Kal; on Lurg-i-Teshakani it was not so high because the water of the Hámún-i-Sábari flowed away through several Shelas across the 'Lurg' into the *Chung* called Rogani, Shor, Garkhando, etc., and the water having found an outlet, it did not rise so much there. But across Lurg-i-Tiratki there is no outlet for the water and it was raised high and dammed back against the wind. Thus it is that in Chilla-i-Tar or the 40 days of winter when the cold is greatest the Gáodárs are in danger of being drowned by the waves that rise suddenly with the wind from the Hámún-i-Sábari. The wind that blew on 26th, 27th, 28th and 29th of March 1905 caused some cattle and some men to be drowned in the Naizár. The Gáodárs who stay on the *lurga* do not immediately leave them when the wind starts blowing as they linger on hoping that it will die away soon. It is only when it blows stronger and continuously for some days that the retreat of the Gáodárs is cut off and their cattle are overtaken by the water which is ice cold. The cattle and the men thus overtaken die from cold and drowning where they are caught.

So long as the Hámún-i-Sábari does not cover Lurg-i-Teshakani and the wind too is not high, the water from the different *Chung* which are connected to the Sábari flows into the Sábari Hámún, but as soon as the floods fill up the Sábari depression and cover the *Lurga*, the same *Chung* receive water in their turn from the Hámún-i-Sábari and carry it towards the Kúh-i-Khwája. In high wind, however, even when the Sábari is low its water flows into those *Chung* nearest and to the windward of it. The north-west shore of the Hámún-i-Sábari becomes dry for one *Farsakh* ( $3\frac{1}{2}$  miles about), and when the wind stops the water comes back to its proper place leaving the silt in the Naizár to the south-east.

#### *Nuh-i-Nahum or the great storm in the month of Nahum.*

Twelve years ago, *i.e.*, in the winter of 1892-1893, Meshedí 'Ali and all his family, together with many other Gáodárs, were living on Lurg-i-Dak-i-Gaz, Khoom-i-Gao and Lurg-i-Mian Kang as usual. The level of the water in the Hámún-i-Sábari was even lower than it was in January 1905. It was in the afternoon of the 9th day of the month of *Nahum*† that the wind began to blow severely. Some drops of rain had fallen in the morning. The first blast of the wind was a strong one. Some people were of opinion that they should start for Adimi before the wind rose higher. But the elders said that there was nothing to fear, and that the wind would become lower soon. The wind however rose higher and higher, and the level of the water of the Hámún-i-Sábari in that neighbourhood began to rise. By dawn the water had risen very high. Meshedí 'Ali went out in the twilight to see how far the water had risen, and saw that a wave about 3'0 high was coming towards him. He ran back to his hut and implored his relatives to leave the place, but they only laughed and said "'Ali was a boy and was afraid." By sunrise the worst fears were confirmed, and about one and a half feet of Lurg water covered the Lurg.

\* The Mission anemometers were not read during this time, but the wind was as high as any wind in the previous July which on some days averaged 50 miles an hour throughout the day, and reached a maximum of 70 to 100 miles an hour.

† This corresponds in the year 1905 to the month of January, *i.e.*, when the Survey Party's camp reached Kahak, on the 3rd February 1905, the month of *Nahum* was over, and this month of *Nahum* always falls at the same period of the year.

Meshedi 'Ali had, through prudence, put all the *tut* and reed that he had got to make *Ting* (shelters) for the cattle in his hut, and so raised its floor by about 4 feet, he placed all his children on top of this, and was thus saved from the ice cold water. All the other Gáodárs too had to take shelter in his hut. By midday about 3'0 feet of water rose on the top of the Lurg where the huts stood. The cattle were kept in the *Ting* or shelters so long as the water had not risen much. But when 3'0 feet of water stood on the Lurg, the wind now and then caused the waves to rise over the cattle, who began to swim and were carried into Chung-i-Rogani; there the intense cold killed them all. During the day the water had not frozen. But when night came all the water froze. For four days and nights the wind blew strong. After that it dropt and the water began to flow back again into the Hámún-i-Sábari. The men in Seistán had given up all the Gáodárs for lost. When the wind stopped, they came to the *lurga*, cutting the ice with axes and *fisha*, and made a way for Meshedi 'Ali and others to come to Adimi. No human life of Meshedi 'Ali's *khel* was lost except a little child who had fallen into the water.

The *khel* on Mian Kang had 570 cows; all of them were drowned or killed by the cold. It was estimated that in all 450 men and 14,000 cattle were killed in the Naizár. Most of the Saiyáds that had gone out for sport in the *chung* were killed by cold. For the first day and night the water of the Hámún-i-Sábari did not freeze. But after that every lap of the waves

The waters of the Hamun-i-Sábari froze.

that came with the wind froze in layers till the surface of the waters of the Hámún-i-Sábari to a depth of about 2'5\* feet froze solid. Muhammadi, brother of 'Ali, son of Ismail (Adimi), said that he had walked on the ice across the Sábari from Lurg-i-Autak-i-Kalán to due west, and reached Sar-i-Nesh, the then end of Naizár-i-Khadromi, on the western shore of the Hámún-i-Sábari. This is the shortest cut across the Sábari depression and is called *Tangi* or a narrow place.

The wild hogs of the Naizár were killed by the cold by hundreds, and they too sought shelter in the *Ting* which the Gáodárs had made for their cattle and which were then quite deserted.

Destruction to pig.

#### *Sal-i-Mushla Bandi.*

Meshedi 'Ali says that it was in Chilla-i-Tar or the winter 2 or 3 years after Taj Muhammad Khan, Sarbandi, left Seistán, *i.e.*, in 1879 or 1880, that one evening the clouds appeared on the sky. Till the sleeping hour, there was neither rain nor wind, but at midnight rain began to fall; and at the same time the wind began to blow strong. The cold was intense. The drops of rain that fell on the reeds of the Naizár froze as they fell and the ends of the reeds became

\* *Mushla* is a word used in weaving for a bobbin of yarn.

*Mushla†* or cylindrical in shape. The weight became too heavy to support and

the reeds fell. The reeds of all the Naizár in this way were levelled, and the men, who were on Lurg-i-Teshakani, could distinctly see Adimi and other villages of Seistán, because the reeds having fallen there was nothing to arrest the sight. The next morning the sky had cleared, but the wind was very strong. The river had also partially frozen. On the Rud-i-Seistán men galloped their horses across the ice on the Rúd. The water of the Hámún-i-Sábari had also frozen; and the cattle that survived could not find water to drink in the Naizár. A very large number of cattle died of cold. Most cattle lost the upper and thinner part of their ears being frost-bitten.

That year the prices reached famine rates and the people were hungry. The Saiyáds and other people were seen eating the flesh of dead cows, which is '*haram*' or proscribed by the Koran.

\* This doubtless is only the thickness of ice the eye witness saw piled on the leeshore.

*The great flood of 1885 in the Hámán-i-Sábari.*

Meshedi 'Ali and his *Khel* was at Paran-i-Sufi on Ráh-i-Gardó which is also called Ráh-i-Paran Sufi. Long before the flood came down, the water in the Naizár had risen and reeds had shot up green. The cattle moved freely in the Naizár to graze on the green *tut* and reed. Before the flood, the *shela* on Rah-i-Gardowak were running, but the road was open. The cattle were in thriving condition. The rains were early and extraordinary that year, and the grazing in the Naizár and on the land was excellent. The people were not hungry. Six or seven weeks before Naurúz the water rose in the Naizár, and the people removed themselves and their cattle on to higher places. But again the water receded; and the men with their cattle again went into the Naizár. Six or seven days after Naurúz, under orders from the Amir, Kadkhuda Ali Murád, Bandani, whose house was in Deh Kamali, sent round men and sowers in the Naizár to inform all the Gádárs that a very big flood was coming down. A man reached Paran-i-Sufi in the evening. Meshedi 'Ali and his men moved themselves to several small pieces of gravel plain high above the bed of the Naizár called Dashtak.\* The next day the flood reached Rah-i-Gardowak. Meshedi remained on Dashtak for five days. The water spread all round Dashtak up to Mil-i-Nádir within three days of the time that it first reached Ráh-i-Gardowak. Eight days after† Naurúz, *i.e.*, on the day next to that on which Meshedi removed to Dashtak, Ali Murád, Bandani, himself came to Dashtak. He ordered the Saiyáds to take all the *tutin*, and save those men and their families, who were perched on the higher places in the Naizár, and were so surrounded by water that they could not escape. He paid three *kran* for two *tutin* out of Government money. The *tutin* were large like those kept on the Ráh-i-Tiratki. He also made proper arrangements with the Saiyáds to keep *tutin* at all times on the road between Afzalábád and Mil-i-Nádir.

Twelve days after Naurúz, *i.e.*, within six days of the time that the flood first reached Ráh-i-Gardowak the water reached the toe of the cliffs on the western bank. But 22 days after Naurúz, *i.e.*, 15 days after the water first reached Rah-i-Gardowak, the water rose to the highest level.‡ Between Dashtak and Mil-i-Nádir the depth of water was then about 4'5 feet. From Mil-i-Nádir to Afzalábád there was one sheet of water, all reed and *tut* having been submerged under water.

The rainfall having been plentiful, the cattle fared well on the *Dasht*. There was no difficulty in obtaining fodder for the cattle after they were driven away from the Naizár. But the *gaodar* had nothing to eat. They had to go to Bandan to bring flour for themselves. For 20 days the people did not dare to go across the water on *tutin*. The water was above all reed and *tut*. There was no shelter from the wind and the lightest breeze caused a big wave, overturning the *tutin* and drowning everything on it. After 20§ days, however, the Saiyáds gained courage by degrees and they began to bring flour, etc., from Seistán for the *gaodar* on the western shore of the Hámún.

A big *kafila* was coming into Seistán from Sarhad. They found the Sar-i-Shela running in full force and not fordable. The *kafila* people rounded the Hámún and came to Mil-i-Nádir. There, too, they found no crossing; and they remained half-starved near Mil-i-Nádir for about 20 days; one of the *kafila*, an Afghan, named Doran, who is still living in Seistán, was annoyed at this state of things, and asked the Saiyáds to carry him and his *asbab* across the Hámún into

\* Colonel McMahon's camp was pitched here in May 1903; at a certain stage of the Hamun *tutin* start from here; see Rah-i-Surkh gazí page 562 of Appendix 28.

† The flood probably occurred on the 7th April. If so, this date is not correct.

‡ Meshedi 'Ali says the flood water took 10 days to go from Rah-i-Gardowak to the Sar-i-Shela; flock-owners, who were on the shela, say it arrived four days after the Traka flood.

§ Meshedi says he himself came to Afzalabad with Kadkhuda Ali Murád on a *tutin* 16 days after Naurúz.

Seistan. Men protested, but he heeded not. All people tied their loads on to the back of the *tutin*, but Doran did not follow their example. In the result when the *tutin* had reached nearly to the Shor Rud, a blast of wind came, the bales of cloth (four), some boxes of sugar and rice, etc., which belonged to Doran, all tumbled into the water, and the poor man was himself saved with much difficulty.

The dodge to work the *tutin* at that time was to lash 20 to 30 large *tutin* together. The *tutin* were tied to one another and made into a long raft, four *tutin* wide and four or six long. All the *asbab* were tied on to the decks of the *tutin*. Expert Saiyáds only were allowed to pole such a *tutin*. The distance was long. It took a whole day to cross the Hámún on this road.

The rate for a single man was one *kran*; and for a whole *tutin* to carry loads, the rate was 4 *kran*. The normal rates were very low at that time compared to what obtain now-a-days.

Rates of hire for *tutin*.

The water in the Naizár rose up to Nasirabad Saiyád and Allahabad and Kala-i-Gulamo. It destroyed all the standing crops of the villages close to the shore of the Hámún.

Damage done by the rise of the Hámún water.

The water from the Rúd-i-Seistan spread all around the city of Nasratábád. A *hashar* was collected and a protection *band* thrown round the city. A *hashar* from the whole of Seistán was assembled; and work continued for 20 days. Had this *band* breached, the city would have been destroyed. Traces of this *band* can still be seen.

Protection *band* to save the city.

#### *The drying up of the waters in the Hámún-i-Sábari in 1902.*

In the spring of 1902, the Helmand rose only in very small flood. In the spring of 1901 too the rivers had not been in high flood; therefore the Hámún-i-Sábari was low in the spring of 1902. The flowing water reached as far as Buk-i-Sáhbád and Chung-i-Sárúní, but did not reach the Hámún-i-Sabari. Neither the Faráh Rúd nor Harud Rúd brought water enough to reach the Hámún-i-Sabari.

The character of the spring flood.

Six or seven weeks after Naurúz Meshedi 'Ali went on a *tutin* from Autak-i-Kalan to Kharika to pay *fatiha* or condolences on the death of a few relatives. He says that there was one *had* or about 60 of water in the Hámún-i-Sábari at its deepest part. Taking the depth of the Sabari in January 1905 to be 9'0 feet, the Hámún at that time of the year 1902 was 3'0 lower than it was in January 1905. The water was drinkable.

When the hundred and twenty days wind stopped, the water began to become undrinkable. In *tirmah* (autumn) when the depth of water was reduced to 1'5 feet at the places where Meshedi measured 6'0 in the spring, the water became quite undrinkable. Still in the deeper portions of the Hámún there was about 4'0 of water. One deep hole about 5 miles by 2½ miles was north of Bahring, opposite Sabz Kim; and the other was opposite Kuh-i-Guch about 1½ miles by 1½ miles. As the bed of the Hámún-i-Sábari is not intersected by "Lurga" the water in different parts was not separated; and when the wind blew, all the water was mixed together and rendered brackish.

So long as the water was not so bitter, and men and cattle even reluctantly drank it, the fish had not suffered. But when the water became undrinkable the gradually they were blinded. When the high ground, remained there and died. When the salt\* in the water increased, so that the hands of men were whitened when washed in the water, the fish died. So immense was the quantity of the fish that died that year in the Hámún-i-Sábari that a high and broad beach was formed on the leeward shore of the lake as it then was. Men could not walk bare-footéd, as the needle like pricks of the bones of the body of the fish went into the soles of the feet.

The fish.

\* The Seistanis are confident that the brackish water killed the fish. They may have died from overcrowding and want of the requisite air in the water.

The water of the Hámún-i-Sábari did not entirely dry up, but water was left only in the ditch of Kala-i-Sabar Shab, and in the two low places opposite Sabz Kim and Kuh-i-Guch. These two holes had some water even up to the time when fresh water from the Helmand reached the Sábari. The bed of the Sábari at all other places had completely dried up. The Sábari remained in this state for about four months.

Chung-i-Garkando did not dry up till about one month after the water in the Sábari had become undrinkable. The water remained drinkable till the last drop.

The pools that did not completely dry up.

As no flood water reached the Naizár, the gáodárs burnt the reeds in almost all places. This was to clear the area and to allow the growth of new reeds.

The Naizar.

In 1902, though there was no water in the Naizár, the reeds sprouted and reached to a height of 4 to 6 feet; but did not bring forth flowers (*bolak*) except in solitary places. The cows fed on green reed as usual. Whatever portions of the Naizár were left unburnt in the spring of 1902 were cleared by burning in the winter in the expectation of water. Excepting the Naizár at Bahring, Sabz Kim and certain small portions near Lurg-i-Tiratki, all the reeds of the Naizár were burnt. Reeds reach their full height in one year, so that now in 1905 those reed beds which were burnt down in 1902 are as thick as ever.

Rúd-i-Gharutkhar had a very large number of wells in its bed; and the largest number of Máldárs had settled themselves on this Rúd. The water from these wells was sweet. The other places where the water from the wells was drinkable though not so sweet are Aukan-i-Galgalla near Khel-i-Kula Khan; Mian Tali at the tail of the Aukans; in Chung-i-Alabakhsh near Autak-i-Kalan; Shela-i-Teshakani; Bahring; Sar-i-Sang and Shand-i-Daman to the south-west of the Kuh-i-Khwaja: at other places the water from the wells even if dug deep was not sweet. According to Meshedi 'Ali wherever sand appears at the bottom of the well, water is sweet; otherwise it is brackish. This is the case all over the Seistán Delta\* and not only in the bed of the inundated area.

The cattle also drank water from the wells; no mortality occurred among those cattle that were collected here. They escaped the disease which destroyed the cattle in the villages and obtained just sufficient food and water to live till the scarcity ended.

The cattle.

*The effects of the strong wind in January 1905 and in March 1905.*

On the 18th January 1905, the morning was clear; but after 10 A.M. the weather became cloudy; and a light wind began to blow. This wind stopped towards the evening at Adimi. On the 19th, it

Strong wind at the end of January.

remained cloudy the whole day; and the wind also blew, getting strong towards the afternoon. In the evening thick clouds appeared in the sky, and a few drops of rain fell at Adimi. The 20th morning was clear and the sun appeared. There was no wind. Lala Thakur Dass, Babu Amir Singh and Babu Hari Singh of the Irrigation Establishment were in camp at Adimi just on the edge of the Naizár. About 10 A.M. the clouds appeared, and the wind began to blow suddenly followed by rain. The work of levelling was stopped. The rain stopped, but the wind gained in severity. It rose high and reduced the temperature. This strong wind continued day and night till the evening of the 23rd January 1905. In the evening almost every day the wind lowered a little. At Adimi the canal froze and men and goats easily passed over it without breaking the ice. The *Nairez* or the road which goes from Adimi to Dahana-i-Rúd-i-Faráh *viâ* Lurg-i-Teshakani and Autak-i-Kalán was all frozen, and cattle could not pass for fear of breaking their legs. Gáodárs on urgent work only went to and came from Lurg-i-Teshakani towards the City. This wind did not lead to the loss of any human life or cattle.

\* The wells at Chah Muhammad Razz are in a local sand bed buried under the silt of the inundated area. Those Girdi Naluki etc. are in sand beds in old river beds.

But the wind that blew from the evening of the 25th March to the morning of the 29th March 1905 caused some loss of life to cattle and men in the Naizár. From 20th to 23rd March the weather was very sultry and hot and clouds covered the sky. On the 24th in the afternoon, there was rainfall accompanied by big and small hailstones; and on the 25th evening the strong wind began to blow. The Gáodárs of Adimi say that it was not so cold\* at this time of the year, as it was at the time of *mushla bandi*; or in *nuh-i-nahum* and therefore the loss of life was not great. The wind, too, they said, was not so strong as in those years, and hence the Sabari did not rise so high as to cover all the *Lurga* and *Paran*. The following is the list of damage done to life:—

Human life	...	...	4	One man who went to save his cattle. Two children burnt to death in a conflagration of huts, and one old woman died of cold.
Horse	...	...	1	
Donkeys	...	...	6	
Cattle	...	...	13	
Sheep and lambs	...	...	36	

The wind in January 1905 had raised the water of the Hámún-i-Sábari by about 2'0 feet on Lurg-i-Teshakani; more in Kang-i-Gharutkhar; and 4'0 feet on Lurga-i-Tiratki at Khel-i-Gharutkhar. Lurg-i-Teshakani runs almost north and south, and therefore the rise was not so much. But Lurg-i-Tiratki is on the south-east shore of the Sábari; also there are no big Shelas running out of the Sábari on Lurg-i-Tiratki; therefore the rise of water was high here. No damage was done at the Kuh-i-Khwaja as that Naizár was dry.

In March 1905, no levels were taken to show the rise of the Sábari. But the man who went to find out the loss of life and cattle said that the Hámún-i-Sábari had risen higher than it did in January 1905; and that Kurg-i-Kal, the dry *chung* to the west of Lurg-i-Tiratki, was filled with water from the Sabari. The people living in Khel-i-Gharutkhar on Lurg-i-Tiratki made *kopal†* in their huts and perched themselves on these platforms when the water was rising. They had made a *Paran* or a small *band* around their huts which prevented water getting into the *gash†* and huts. The ground where these huts stood was 5'5 feet above the water surface of the Sábari on the 31st January 1905. The rise of the Hámún-i-Sábari in March therefore may be taken as 6'0 feet, while in January 1905 it was only 4'0 at this place.

*The greatest depth of the water in the Hámún-i-Sábari as observed by Fakira boatman on the 29th and 30th December 1904.*

Between Kuh-i-Chako to the tail of Harud Rúd, about 2½ miles from the north shore of the Hámún-i-Sábari, the depth was 9 feet.

From Harud Rúd to Kuh-i-Guch, about one mile away from the edge of the water, the depth was 8'0 feet.

From Kuh-i-Guch to Dahan-i-Faráh Rúd, about 1½ miles from Kúh-i-Guch the depth was 9'0 feet; and further on at two places only it was 9'25 feet, otherwise it was everywhere 9'0 feet up to within about three miles of Dahan-i-Faráh Rúd, when the depth gradually began to diminish. The reduced level of the water according to the Irrigation Survey datum was 1598'80.

Fakira accompanied Colonel McMahon and took the soundings under his orders. The bed of the Hámún-i-Sábari is therefore at a level of about 1590'0 of the Irrigation Survey datum. The deeper pools that are said to have lasted out the drought of 1902 are perhaps some two or three feet lower than this.

\* All information of this blizzard will be found in Appendix 15.

† A *kopal* is a raised platform; on such occasions it is made of reeds and rushes

At the end of Chapter XLIX a note will be found shewing how often the  
 The years in which the Hámún has overflowed in- Hámún has overflowed into the Gaudi-  
 to the Gaudi-Zireh. Zireh during the last 30 years.

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## APPENDIX 24.

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- The year 1845, General Ferrier's account of the river—Some remarks on General Ferrier's account.
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- The year 1904, *Kálabi*—The normal autumn and winter supply—The average ten daily discharges at the *Band*, and at Bandar-i-Kamál Khán.
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## APPENDIX 24.

VIDE CHAPTER XLIX, PAGE 315.

*Detailed description of the phases of the river from all sources.*

## Part I.

*From A. D. 1830 to A. D. 1876 information from the accounts of travellers and from those among the local inhabitants, who possessed a reliable and an intimate knowledge of the river.*

1830.—Lieutenant Connolly\* crossed the Helmand at night at Girishk on the 27th October 1830 ("Overland Journey to India.") He describes the stream as stirrup

deep flowing with force in a clear stream of 150 yards wide. He says the rise of the Helmand commences in winter, much rain falling at that season, the stream is swelled to great depth and breadth in spring, when the snow melts and on the quantity of snow that falls on the mountains during winter depends its fulness and rapidity. So much snow fell during the cold season of 1829, and winter broke up so suddenly, that very early in the next spring a great torrent came down from the mountains, which at night swept everything away, and flooded the whole country on the right bank of the river.

With reference to this flood the following extract from Rawlinson's "Notes on Seistán" (page 279 of the Royal Geographical Society's Journal, January 27th, 1873) is of interest and importance:—

"Captain Connolly, who was in Seistán in 1839, learnt on the spot that the Helmand first broke into its present bed (*i.e.*, the bed of 1873 at the time of the Goldsmid award) nine years before, or in 1830, the main stream previous to that date having probably passed by Kimmak and Chilling to the lake in the vicinity of Koh-i-Khoja." Connolly himself says—"About nine years ago an unusually large inundation changed the whole face of the country. The main stream of the Helmand deserted its old bed, and cutting for itself a wide channel out of that of the small branch† which went off from Khwajeh Ahmed carried the greater part of its waters to the Duk-i-Teer."—(*Asiatic Society's Journal No. 130, page 715*).

† I doubt if it is possible for the river to do this, such a branch would be on a ridge. It probably followed the low lands near by some smaller branch.

Dádí, Kadkhuda-i-Kalán, who thinks he was born in 1839, the year Sháh Kámran came to Seistán, and the Arbáb Saif-ud-din, who thinks he was born 8 or 10 years earlier, say that they do not remember this flood themselves, but they have always heard it spoken of as a great flood like that of 1885; these were the only two extraordinary floods they could recollect to have heard of. No other old people we met could recollect any other such floods. The flood of 1830 is said to have extended to the Kurdo Fort and to have levelled many old ruins lying between Kala-i-Guwak and Kala-i-Kurdo, so that many coins, etc., were found after the flood passed away by those, who went to search for them. Such searchers are locally called *Daghal gardi*, *i.e.*, those who roam on level open bare plains, the coins being found, as a rule, on level open hard stretches of land littered with minute fragments of pottery; they are seldom or never found in the ruins themselves.

1832.—The dam on the Karun river at Shuster is said to have been breached in this year—*vide* Lord Curzon's *Persia*, Volume II, page 374.

1838.—Arbáb Saif-ud-din says when the British took Kabul and Kandahar the river very nearly dried up; only a small stream like a canal flowed in the river after the wheat crop was harvested. In that year the Arbáb went with his relatives to Kandahar and met Colonel Leach. The river began to rise again about the

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usual time. Grain was exported from Garmseel to Kandahar; before the export began the price of grain was one Seistáni *man a kran* but, the export made grain scarce and dear and the price became  $1\frac{1}{2}$  *man* Kandahar or 45 *sír* Seistáni per Indian rupee ( $6\frac{3}{4}$  Indian seers a rupee). The rate of exchange was 4 Indian rupees for 5 Kabulis.

Major Todd crossed the Helmand at Girishk on an elephant on the 3rd June 1838 and says it was a broad exceedingly rapid formidable river, the water being at places 7 feet deep.—(*Asiatic Society's Journal, Volume 13*).

1839.—Captain Sanders, Bengal Engineers, crossed the Helmand at Girishk on the 27th June 1839. His account of the river has already been given in Appendix 21 in the description of the ford at Girishk.

1842.—The masonry dam on the Karun River was breached in this year—*vide* Lord Gurzon's Persia, page 374, Volume II.

1845.—General Ferrier\* reached Girishk in September 1845 and spent some time in those parts; finally he arrived at Khan Nishin in October 1845, and travelled down the Helmand to Jahánábád and went thence through Jalalábád to Dashtak, where he crossed the river on a raft, travelled through Daulatábád Sikkúba, Kunder to Ser Jadda (*sic*) where he rounded the Hámún and travelled along its western shore to Lash Juwain. Ser Jadda he says "is the most southern extremity of the lake." In riding down the river he says, they repeatedly forded the river to shorten the journey. But having occasion to cross from the right to the left bank somewhere above "the point where the Helmand diverges into several streams of water" he crossed on a raft.

Dashtak, he says, "is situated on the banks of the Helmand which at this point is very deep and 300 yards wide. Having crossed the river on a reed (*sic*) raft we made our way through the brush wood and cultivation and entered the desert passing Daulatábád arrived at Sehkoha, where we spent the night with Sardar Muhammad Reza Khán with whom I was travelling."

He rounded the lake 44 miles south of Sikkoha (Kunder being half way). The ford at the head of the Sar-i-Shela at Tump-i-Mir Dost where General Goldsmid crossed the Hámún on his way from Bam to Seistán is a little short of these measurements, and the ford across the Sar-i-Shela on the trade route at Gumbad-i-Liddi is a little more than the measurements. Ser Jadda† is perhaps synonymous with Sar-i-Shela, which might be used for either of these fords. There are only these two fords in this neighbourhood when the waters are out. The road from Jalalábád across the Hámún to Pesháwarán was closed owing to the Chiefs of Lash Juwain and Chakhánsúr being at war. So General Ferrier had to round the southern end of the Hámún.

This was a year of cholera. General Ferrier was present at a cholera riot at Kandahar in August and saw people dying of cholera in the snow on his return to Tehran in the winter of 1845-46.

General Ferrier's notes lead us to think that the main stream of the river flowed west past Dashtak to the Hámún near the Kuh-i-Khwája which would account for the large amount of water in the Southern Hámún. The road to the north, which was open, was probably the one from Takht-i-Shah to Pesháwarán across the Shela-i-Mesh-Kushi, the more direct road from Kala-i-Nau through Lurg-i-Chashmaka was probably flooded. But Captain Connolly says that in 1830 the Helmand main stream went to the Duk-i-Teer. (This is the Puzak Hámún, the Dak-i-Tir being the cliffs on the east thereof—*vide* Appendix 22.) The main stream could not have returned again in the short period of 15 years. The large flow in the western branch was therefore due to the diversion of the water down that channel by the annual band which we are told by the people Sardar Muhammad Reza Khan, Sarbandi, built annually. At the present time the Rúd-i-Seistán is always fordable at or near Dashtak; but the *bandhaf* and others all describe it as much deeper and swifter in the past.

\* Ferrier's Caravan Journeys.

† Jadda is a Persian word for a road. It has inflections of meaning suitable to its use here.

It is worth noticing that the *tutin* ferry across the Hámún from Afzalábád to Bahring was not in use in those days; had it been, Sardár Muhammad Raza Khán would have sent his friend that way, as the water at the end of October is not too cold for horses or camels to wade across behind the *tutin*. The floods must have been extraordinary or the Ráh-i-Gardowak would have been available.

1859.—The Afgháns are said to have invaded Seistán and in the confusion no crops were sown. The Akhundzada's brother, Muhammad Salih Khan, was Hakim of Herat. Ibrahim Khán killed Dad Shah of Margo. Muhammad Khán, Ala Kazi, nephew of Wazir Yar Muhammad Khán, took Chakhánsur and Sárdar Ibrahim Khán fled to Rudbar. Sardar Kamal Khan, who had hitherto lived at Kala Kharan, now built Kala-i-Bandar-i-Kamál Khán.

In the previous winter (1858-59) there was a heavy fall of snow which lasted a week; it was 2 feet thick and lay on the ground for 20 days. The old Arbáb Saif-ud-dín, who remembers the heavy fall of snow in the winter of 1858-59, says that after the snow melted the river was in high flood, but it left no impression on the minds of the people, because no crops were grown during the war and all the cattle had been raided and carried off.

Dadi, once a kadhuda kalán of Afghán Seistán, a Bamri Fársi, who is an old man, about 70 years of age, who has built many canals and made the annual *band* on the lower branches of the River Helmand since he was a boy, says he remembers but one red flood of rain water in the summer months, and it occurred in the summer after the snowfall above alluded to, which was the heaviest fall of snow he remembers. He says that in *Loar* in the *chilla* of *bad-i-*

*garm*, about the middle of July, a big flood came down the river about the same as an ordinary spring flood; the water continued to rise for three days, but on the 4th day it began to fall, and in three or four days had again subsided. The flood came about the time of the ripening of melons, but not too late to sow a second late crop, which was done and an abundant harvest of melons was secured. These melons ripened in 50 or 60 days. Owing to the strife in the land the *band* had not been made in the previous year, and there was very little water in the Rud-i-Seistán when the flood came. But this flood filled all the canals. The flood was due to rainfall in the valleys of the tributary rivers of the Helmand. The water was so thick and red that people could not drink it; they had to dig wells. The layer of silt then deposited can still be distinguished by its bright red colour when it is met with in excavations.

The members of the Mission noticed that on 2nd of July 1903 the water of the Helmand suddenly became red; the volume increased that day from 10,350 to 10,950 cusecs. The spring of 1903 was one of exceptional rain in Afghanistán and Persia and the summer was an exceptionally wet one in Kashmir and Northern India.

The expression *Sel-i-ab-surkh* is applied by the Arbáb Saif-ud-dín to floods that are very red in colour that come in the spring. He says that sickness always follows such floods, and for this reason such very red floods are sometimes called *áb gasht* or water that is changed. Early in April 1904 such a flood came down the river and lasted four days. In 1866, and again in 1884, the old Arbáb says the water at one period of the spring floods was so thick and red that careful people dug wells and drank well water; those who did not, suffered much from sickness. He says these floods come from the Tarnak and Dhuri, where there is much red soil, and also many snakes. The people believe that it is the pieces of the bones of the snakes taken with the thick water that produce the sickness.

1864.—The flood was a little less than in 1903. The Hámún-i-Kúh-i-Khwaja was full and some water went down the Sar-i-Shela. It was a prosperous year and is known as the year before Muzuffar-ud-Daula came to Seistán.

1865.—The flood was like that of 1903. The Sar-i-Shela began to flow before the *Bad-i-sad-o-bist-rus* began to blow, as the Hámún was already full. It was a

year of political happenings in Seistán. Mir Alam Khán of Káin took Jahánábád. Two months after Naurúz Sharif Khán, Nahrúf, retreated from Seistán by the road that crosses the Sar-i-Shela at Gardan Reg and found that it was not fordable. About 20 days later Muzuffar-ud-Daula crossed from Mil-i-Nádir by the Ráh-i-Taratki on 170 *tutn*. Tilfak at that time was a *daghai*, i.e., flat bare plain and was chosen by the Muzuffar-ud-Daula for the site of his city. This city was soon destroyed by the floods, and only the remnants of some of the buildings remain on the left bank of the Rúd-i-Parián. The Gaud-i-Zireh received water. No water went down the Trakú channel.

1866.—Major St. John\* says the rains of the winter of 1865-66 were good, whereas from 1863-64 to 1870-71 all other winter rains were below the average.

Arbáb Saif-ud-din says the flood this year was like that of 1904, but some water flowed down the Sar-i-Shela.

1870.—Major St. John says that in the winter of 1869-70 hardly any snow fell in Persia. Following on previous years of drought flocks and herds died all over Persia.† Lakes, springs, and *kanat* all over Persia got lower and lower each summer from 1863-64 onwards.

1871.—Major St. John says the rains of 1870-71 were again very scanty in the north and east of Persia.

The Arbáb Saif-ud-din says the flood at Nauruz was a little less than in 1904. At the time of the *bad-i-garm* and *loar*, i.e., July and August, the river practically dried up, only a small quantity equal to the volume of a small canal flowed in the bed. The river thus remained nearly dry for 3 months. At winter the volume gradually increased. The Sábari Hámún is said to have dried up and dead fish formed a high bank along the shore. Caravans numbering thousands of camels came and carried off the grain of Seistán to the famine stricken areas of Persia.

1872. The Goldsmid Mission arrived in Seistán on the 1st February 1872 and left by the middle of March. Major St. John says that the winter rains commenced early and were heavy and there was a good fall of snow.

Major Euan Smith said that there had been only poor floods in the rivers for the previous 3 or 5† years; only detached stagnant pools remained in the Hámún; the *bunnun* grass was becoming less and less and threatened to cease to grow, because no inundations had reached the head of the Sar-i-Shela for about 5‡ years. Major Euan Smith says that for three years the Helmand supply had been little more than enough for the Rúd-i-Seistán. On the 19th|| February he remarked that the water in the river was unusually low for this particular season of the year and had been so for the past two years. The Mission marched out of Seistán, in the middle of March, across the Hámún from Bunjar through Deh Rahdar to Pesháwarán, and their reports¶ describe the plain as quite dry. But Captain Beresford Lovett who went from Chakhánsúr to Lash at this time found the Kásh in flood and water in the Puzák Hámún.

The Balúchis say that the floods this year were much less than in 1904, but the crops were average.

1873.—The floods of this year were like those of 1904. The crops did well. Sharif Khán laid siege to the city of Seistán in October for 3 months.

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\* *Wide "Eastern Persia"*. An account of the journeys of the "Persian Boundary Commission," 1870-72, Volume I, page 95.—Messrs. Mc Millan & Co., 1876.

† This drought extended all over the world. In South Africa the Orange River dried up at Hope Town—an event that did not occur again till the drought at the end of the century.

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‡ Eastern Persia	...	...	...	...	...	272
§ Ditto	...	...	...	...	...	283
¶ Ditto	...	...	...	...	...	285
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This is called by the Balúchis the year of the rebellion of Seistán. For an account of this rebellion see the report by Lieutenant the Hon'ble H. D. Napier of his journey to Seistán in 1893 (Foreign Department Proceedings, July 1893, Nos. 176-181.)

1874. The floods were about the same as in 1904, but at the end of July the river was much lower than it was this year;

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at the ford over the main river between Deh Karimdad and Sharifábád the water was only 2 feet deep and its volume is estimated at half that of the river in 1904 in July and August. The supply at the time of sowing wheat was deficient, but the river afterwards rose gradually. The year is described as a dry one. The Samsám-ul-Mulk is said to have come to Seistán this year, and Sharif Khán fled to Nad-i-Ali, where he obtained a grant from the Amir Abdur Rahman. He commenced to dig the Kala-i-Fath canal.

1875.—Although the river rose at highest flood to much the same height as in 1904, yet the duration is said to have

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been only for one day and one night, and the river was a low one the whole season. At the end of the hot time (*loar*), i.e., end of August, there was only  $2\frac{1}{2}$  feet of water on the fords. The *band* was made water tight and all the water was sent down the Rúd-i-Seistán where it amounted to not more than the volume of a small canal far less than the volume in the Rúd towards the end of August 1904 (say 200 cusecs). This supply only reached to Kala-i-Nau and Kala-i-Kuhna. The river remained thus low for two months.

1876. The floods were much the same as those of 1904, but the spring rains were heavy *A:hg*, a variety of *lana* grew profusely. The year was a normal one.

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## Part

Statement, by years from 1877 to 1902, showing throughout every year the state  
Collected and arranged by Lala

Year.	Height of flood.	Duration of flood.	Period of low river.	Winter floods.
1877. * <i>Sal-i-Barf-i-Kalan</i> or <i>Barf-i-Eid</i> <i>Sol-i-Kalan.</i>	The highest flood level was higher than that of 1903. The crops at Kuh-i-Khwaja and other places were destroyed.	One month before Nauruz the river was in full flood. As in 1903, the river was full till the time when the reaping of crops was finished.	The river fell slowly, and the fords appeared late as in 1903. There was ample water at the harvest of melons.	The river was <i>Bakaida</i> or at its ordinary level at the time of sowings. The sowings were done in time in Seistan. Amal and Gulmir guides say that Taj Muhammad Khan burnt the Band-i-Seistan and sowings of wheat were not done properly. Also the winter floods were not normal. They fell short of the demand.
1878. <i>Kalabi</i> ...	The river was within its banks at the time of flood. The volume was less than in 1904.	The flood passed away very soon, even sooner than in 1904.	The flood lasted long enough to ripen melons, but the river fell soon. The <i>Bandar-i-Kamal</i> Khan in Garmel and the <i>Jharuki</i> canals did not get any water as the flood of 1877 had blocked their channels with silt.  The fords appeared very soon. Only a small area of melons and millet was sown as the river was not high enough for early sowings.	At the time of sowings, the water in the river just met the demand. The sowings were done in time.
1879. <i>Kalabi</i> ...	The river at flood time flowed within its banks. The flood was less than in 1878, and much less than in 1904.	There were a few low floods which passed away soon.	The river had water enough to ripen the melons. The fords became unfordable only for some days. The river generally remained fordable at good fords.	The river had sufficient water at the time of sowings, which were done at the proper time.

\* *Remark to 1877.*—The heavy fall of snow occurred two months before Nauruz on the Id and lie two feet thick on the *Dasht*. Many cattle and sheep died of cold.

Sardar Kamal Khan only saved his crops in the bed of the *Traku* depression by vigorously making a *band* across the head of the depression near the *Kabristan*. Young locusts are said to have destroyed the autumn crops; owing to fighting, the floods and locusts the food supply was deficient.

## II.

of the River Helmand, the Hamun, the Sar-i-Shela and Gaud-i-Zireh.

Thakur Dass, Supervisor.

State of the Hamun before the flood.	Effect of flood on the Hamun.	Sar-i-Shela.	Gaud-i-Zireh.
The level of water in the Hamun before the flood of 1877 was about the same as in March 1903, i.e., the level was very low.	The flood of 1877 filled up the Hamun to overflowing like that of 1903.	The Sar-i-Shela flowed for 4 months. For 3 months it was <i>Zinda ab</i> or flowed itself. In the fourth month it ran when the wind blew strong. Safar, son of Nur Dip, says that the Sar-i-Shela continued flowing with the wind till the end of the <i>Bad-i-nad-o-bist rus</i> of the next year.	The deep part of Gaud-i-Zireh was filled down to Ziarat-i-Sultan. * General Sir Charles Macgregor and Captain Lockwood visited Gumbad-i-Shah-i-Mak-sud where the road from Bandar to Kirtaka crosses the Sar-i-Shela on 22nd February 1877 and found the Gaud-i-Zireh and Sar-i-Shela quite dry. They got water to drink by digging in the bed of the Shela. * Vide his "Wanderings in Baluchistan."
The Hamun was full before the flood.	The flood of 1878 filled the Hamun to the point of overflowing; but not so much as to cause the Sar-i-Shela to flow of its own accord.	The Sar-i-Shela did not flow of itself, but when the wind was strong the water was driven into the Gaud-i-Zireh. For the 4 months of <i>Loar</i> or hot wind, the Sar-i-Shela continued in flow with the wind when it was strong.	The deep part of the Gaud-i-Zireh was full; and received some more water in 1878. <i>Malidar</i> had settled themselves on Gaud-i-Zireh.
The Hamun was full as in 1903 before the flood time.	The flow of 1879 added some water to the Hamun which reached Regowak. But the Sar-i-Shela did not flow, not even with the strongest wind.	The Sar-i-Shela did not flow at all.	The deep part of the Gaud-i-Zireh had still some water.

Year.	Height of flood.	Duration of flood.	Period of low river.	Winter floods.
1880. <i>Sal-i-Khara- bi-i-Kada or Sal-i- Mushla Bandi</i> (vide notes in Appendix 23). So-called be- cause the Aig h a n s made an attack on Kada on the Khash Rud. <i>Kalabi</i> the Baluchies say, but from the description it seems more like <i>sel</i> .	The river began to rise at Nauruz. The flood was like that in 1904 or perhaps a little less in volume.	For two months before and after Nauruz, the river was full. Except some good fords high up the river all other fords disappeared. But in the third month the river fell, and the fords appeared, but the river was full.	The melons and millet got sufficient water in Seistan. No damage was done to the wheat crop this year. The river fell gradually, and became very low; but at the time of making the Band-i-Seistan it had sufficient water for wheat sowings.	The sowings were done at the proper time. There was no scarcity of water. The wheat crops received proper waterings.
1881. <i>Kalabi</i> ...	The river rose often at flood time; but fell soon. It did not rise higher than it did in April and May 1905. But Gulmir says the river rose a little higher than in 1904.	The river kept rising and falling for about two months after Nauruz. The fords disappeared only for a short while.	No damage was done to the wheat crop, nor did any melons or millet die for want of water. The Seistanis say <i>Janab dada watan ra</i> ; i.e., met the demands of the people and did not rise higher.	The river had sufficient water at the time of sowing wheat.
1882. <i>Kalabi</i> ...	The river rose higher than in 1881, about the same as the flood of 1904.	It rose in time to give sufficient water to mature the wheat crop and kept on rising and falling for about two months. The river fell soon and fords appeared.	No damage was done to crops. The river fell very low at the time of <i>band</i> -making; but it rose soon and wheat sowings were done properly.	The river had sufficient water to ripen the wheat crop. No complaint was heard of any scarcity of water.
1883. <i>Kalabi</i> ...	The river did not rise higher than 1882. It was less than in 1904.	The flood lasted for a short while. The river rose and fell successively as in 1905 for about six months.	The Seistanis say that <i>Ab ba farman bud</i> , i.e., the river was under control. It did not do any damage, but had sufficient water to meet all demands.	The winter floods were as desired. The wheat crop ripened all right.
1884. <i>Sal-i- Khashk</i> . (According to Safar, son of Nur Din, and Meshedi Ali, son of Shah Nur.) (Gulmir and Dadi say that the river rose higher than in 1904.)	The flood was less than in 1882 and 1883, so much less that in some places they had to introduce <i>Mohrus</i> on the canals, i.e., to distribute water by turns. This is seldom done at the time of ripening of the wheat crop. When the water is generally more than sufficient in Seistan. The cultivators matured the wheat and left the barley to perish in such places, where they could not get water for all the standing crops. The area that suffered was however very small.	The flood came and passed away like that of 1905, or even less than that. This alternative rising and falling continued for about one month, when the river fell to its ordinary level.	The area of melons and millet sown was much less than in ordinary years, as the flood water did not inundate the lands. The early <i>yalis</i> ripened all right. The late sowings were all lost for want of water; villages like Khwaja Ahmed and Sharlabad suffered much. But otherwise the year was a prosperous one. The rate of grain was low as usual; and there was no scarcity of food, nor did prices rise in the following winter.	At the time of making the Band-i-Seistan the river was <i>Ba baida</i> , i.e., it had an ample supply to meet all demands. People sowed wheat in very large quantities and very early too, as the water was in plenty and they were not hungry.

*Remarks to 1884.*—The Russo-Afghan Boundary Commission passed through Seistan on its way to Kushan, in October 1884. The cold weather supply was good, as the discharge of the river was about 3,000 cuses and the depths on the ford 2.6 to 3.6 which is high for that time of the year. The water in the

State of the Hámún before the flood.	Effect of flood on the Hámún.	Sar-i-Sheh.	Gaud-i-Zireh.
Before the flood of 1880 the Hámún was not low. The water extended to Regowak.	The flood of 1880 filled up the Hamun to overflowing. All the Naizars were under water.	The Sar-i-Sheh flowed for one month without the help of the wind; and for one month it flowed with the strong wind. Meshedi All crossed the Sar-i-Sheh at Gardan Reg, while it was flowing.  The above two statements do not tally. In 1903 the water went to the very end of the Sar-i-Sheh and the flow did not last two months. Probably the Gaud-i-Zireh received some water.	The Gaud-i-Zireh did not receive any water as the water did not go beyond Rah-i-Shamshiri on the Sar-i-Sheh.
The Hámún was not so full as in 1880 before the flood time.	The flood of 1881 had but little effect on the Hamun which was full to the satisfaction of the Gaodars.	The Sar-i-Sheh did not flow this year.	No water reached the Gaud-i-Zireh this year.
Colonel Maitland was told on the 23rd October 1884 at Ziarat Padah Sultan that three years before (i.e., either in 1881 or 1882) the flood waters spread over the plain at the Ziarat. This would be a flood as big as that of 1903, which according to the Seistanis had not occurred since 1877.			
The Hámún was 'Ba kaidá,' i.e., was full to the satisfaction of the Gaodars.	The Hamun rose a little by the flood of 1882; but it had fallen during the previous year.	No water flowed into the Sar-i-Sheh.	No water reached the Gaud-i-Zireh this year. It had become quite dry. The Seistani seldom or never visits the Gaud-i-Zireh when it is dry or nearly dry and he does not speak on this point from personal knowledge.
The Hámún had fallen much before the flood of 1883.	The flood of 1883 added some water to the Hamun, but it did not rise high. Still there was enough water for the Gaodars purposes.	The Sar-i-Sheh did not flow.	No water reached the Gaud-i-Zireh.
The Hámún had fallen a good deal and the Gaodars had penetrated into the Naizar around the deep <i>Chung</i> .	The flood of 1884 had no effect on the Hámún. The fresh water did not reach the tail of the Hámún, yet there was no complaint for want of grazing among the Gaodars.	The Sar-i-Sheh did not flow at all.	No water reached the Gaud-i-Zireh.

Puzak Hamun round which the Mission marched did not appear to have been so great as when we saw it in February 1904, and as it then received the main volume of the Helmand it should have been very full if, 1884 had been a year of great flood.

Year.	Height of flood.	Duration of flood.	Period of low river.	Winter flood.
1885. <i>Nuh-i-Kalan.</i> (Autumn, winter and spring rainfall at Quetta 1957 inches.)	This was a most extraordinary flood. In the upper reaches of the Helmand it rose 15 to 20 feet above the level of the flood of 1903; all the tamarisk that grows on the banks of the river is said to have been covered under water. The Taraku old bed carried a large volume of water. In Persian Seistan many villages were destroyed.  The probable date of the flood was about the 7th of April.	In the month of "Ghous" or December, a flood had come down suddenly and overtook the Gaddars, who had penetrated into the Naizar. There was some loss of cattle and human life took. The level of the water from this flood reached the Kuh-i-Khwaja. The Hamûn again fell and the people again penetrated into the Naizar. 30 days before Nauruz, the Hamûn began to rise, as the river was very full. For 53 days the river was very high, <i>i.e.</i> , for 30 days before and 23 days after Nauruz; after this the river began to be about normal for the time of the year in great floods. For 4 months more the river was full and the volume was large like it was after the flood of 1903.	The wheat and barley crop of many villages that came in the way of the river was destroyed. Early sowings of melons could not be made; but the people sowed melons and millet when the river fell. On the banks of the Hamûn a large area of melons was sown. People say that never had such an immense quantity of melons been grown in Seistan as in this year. The river was full to the banks for a great part of <i>Leaz</i> or the 4 months of the hot wind, when it gradually fell, till the time that the <i>Bandi-Seistan</i> was made. The people found it difficult to make the <i>band</i> , but the <i>band</i> was made and the wheat sowings of the ensuing season were done in good time.  <i>Mr. Mark was told that the band was not repaired that year.</i>	The river at the time of the sowings of wheat was full, <i>i.e.</i> , had more water than in ordinary years. The winter floods, were as desired; wheat was sown as usual and the crops came up all right.
1886. <i>Sel.</i> (Autumn, winter, spring rainfall at Quetta 930 inches.)	The flood was bigger than that of 1904. It did no damage to crops; but flooded as usual a large area for the sowings of melons.	For three months the river was in flood, <i>i.e.</i> , rose and fell alternately, as it did in 1904. In the fourth month, too, it kept a high level after which it fell.	The river had sufficient water to ripen the melons and millet. The spring and autumn crops matured all right. No damage was done. The supply in the river at the time of wheat sowings was good.	In the winter the river was as its ordinary level. The wheat crop received full waterings and no complaints were heard.
1887. <i>Kalabi.</i> (Autumn, winter, spring rainfall at Quetta 409 inches.)	The flood was like that of 1904, if not less than that. The river did not overflow its banks and did no damage.	The river rose and fell alternately for 6 or 7 weeks after Nauruz. The people in Seistan itself did quite well, but in the Garmsel prices were still at famine rates; at Nauruz, wheat sold at 20 <i>sir</i> Seistani and barley 30 <i>sir</i> Seistani a <i>kran</i> .	The river assumed its ordinary level very soon this year; but had its usual supply when the <i>band</i> was made. Wheat sowings were done in good time. Melons and millet were good and in abundance.	In the winter the volume of the river was good and no complaints were heard of scarcity of water.
1888. <i>Sel.</i> (Autumn, winter, spring rainfall at Quetta 480 inches.)	The flood was higher than in 1904; but it did no damage to the wheat and barley crops.	For three months the river rose and fell alternately. It began to rise some weeks before Nauruz.	For two months of the hot wind the river was above its ordinary level. Afterwards it fell and remained at its ordinary level. At the time of wheat sowings the supply was quite sufficient; and sowings were done properly. Melons and millet ripened properly.	The winter floods were as usual. No damage was done to crops. The supply in the river was good.

*Remark to 1886.*—The autumn crops were abundant, turnips are said to have sold at 25 *man* Seistani a *kran* mash 5 *man* a *kran*, millet 7 *man* a *kran* and wheat 5 *man* a *kran* (110 seers, Indian per rupee).

*Remark to 1888.*—A disease is said to have spread among the sheep in the hills, but not among the flocks in Seistan itself.

State of the Hámún before the flood.	Effect of flood on the Hámún.	Sar-i-Shela.	Gaud-i-Zireh.
<p>Before the big flood came the Hámún was not very full. The Gaudars had penetrated into the Naizar to the <i>Chung</i> that were deep and had much water. But the rise of the river in December 1884 had added much water to the Naizar, so that before the big flood at the Nauruz of 1885, the Hámún was <i>Ba knida</i>, i.e., had enough water for all the purposes of the Gaudars.</p>	<p>The flood rapidly filled the Hámún and 23 days after Nauruz it was full to overflowing. The city of Nasratsbad was saved by making a protection <i>band</i> to cut off the waters from the outlets of the Rud-i-Seistán which were collecting around the City; it was also feared that the Hámún might rise so high as to flood the City. The Hámún was full to its furthest limits at all places. <i>Tutin</i> worked from Afzalabad to the Mil-i-Nadir only. The reeds in most places were hidden under water.</p>	<p>The Sar-i-Shela began to flow on the 23rd day after Nauruz, and continued flowing with much force for 3 months. During the first month no one dared to go across the Sar-i-Shela either on rafts or on skins. In the fourth month it still flowed without the assistance of the wind, but the depth of water had decreased. After the fourth month it flowed with the wind.</p> <p>No <i>intin</i> are ever made for work on the Sar-i-Shela. The people make rafts of gourds and skins to take sheep and themselves and their goods across.</p>	<p>Gaud-i-Zireh was filled to the fullest extent known; a large number of Mairdar removed their camps to the shores of the Gaud-i-Zireh, where they sowed melons as the water subsided. The tamarisk grew high and thick in the delta of the Sar-i-Shela in the Zireh Hámún. Opposite Oruk spring the flood mark of 1885 was about 30 feet above the bed of Gaud-i-Zireh.</p>
	<p>On the 1st January 1886 Mr. Merk measured at Bahring that the water level had subsided three feet since the high flood. At the time he saw it, the level of the water must have been about that of the Hámún in June 1903.</p>		
<p>The Hámún was already almost full, so the flood of 1885 filled it to the point of overflowing, so that flood water reached to the head of the Sar-i-Shela.</p>	<p>The flood filled the Hámún to the level at which the water was just on the point of overflowing.</p>	<p>The Sar-i-Shela did not flow of its own accord, but only when the wind blew. Safar says that it kept flowing with the wind throughout the year 1885-86.</p>	<p>The Gaud-i-Zireh was full. No water reached the Gaud-i-Zireh after the 4 months' wind of 1886. During these 4 months some water now and then passed into the Gaud-i-Zireh.</p>
<p>The Hámún was full as in the year 1903 at spring time.</p>	<p>The flood of 1887 filled the Hámún down to the head of the Sar-i-Shela.</p>	<p>The Sar-i-Shela did not flow of its own accord, but on days of exceptionally strong wind, some water passed into the Shela and filled up the holes in its bed.</p>	<p>Some say that no water reached the Gaud-i-Zireh in this year, but it is probable that some did.</p>
<p>The Hámún was well filled as in the year 1904 at Nauruz.</p>	<p>Some say that the floods did not raise the level of the water in the Hamun very much, and that the water did not reach even as far as Regowak. But <i>Amal</i> says that the Hamun was full.</p>	<p>Some Baluchis say that the Sar-i-Shela did not flow at all, but <i>Amal</i> says that it flowed for some time and water reached the Gaud-i-Zireh in appreciable quantities, as the Hámún was full and wind strong.</p>	<p>People are not agreed whether water reached the Gaud-i-Zireh or not.</p>

Year.	Height of flood.	Duration of flood.	Period of low river.	Winter flood.
1889. <i>Sel.</i> (Autumn, winter and spring rainfall at Quetta 9.29 inches)	At the flood time the river rose higher than in 1903. It did not do much damage to the crops, but flooded a large area for <i>falla</i> . The wheat of Deh Abbas Khan, part of Daudi, Muhammad Safer, Diwana Muhammad Azam, Deh Tuti and some other villages in the Hamun-i-Kuh-i-Khwaja was much damaged, as was also that of Deh Sharifabad and Khwaja Ahmed along the river. Sardar Purdil Khan by great exertion saved the crops of Daulatabad.	The flood lasted for about four months. In the last eight or nine weeks of the hot wind it assumed its ordinary low level. The melons and millet ripened all right.	The melons and millet ripened properly. At the time of making the Band-i-Seistan the river fell very low, but there was sufficient water for wheat sowing as in 1904.  But silt had deposited in the Rod-i-Seistan from Burj-i-Sarband to Dashtak. The cultivators had to clear out this silt. This made the sowings very late especially in those villages of the Mahal-i-Shibi-Ab that are below Dashtak.	The supply in the river was good. Whatever wheat was sown was watered properly.
1890. <i>Kalabi.</i> (Autumn, winter and spring rainfall at Quetta 3.87 inches.)	The flood did not rise higher than in 1904. It was <i>Ba kasia</i> . It did no damage.	The flood lasted as in 1904. Early in the period of hot wind the river assumed its ordinary level.	There was an ample supply in the river to ripen melons and millet. Sowings of wheat were made at the proper time.	The river kept its usual supply level in the winter. The wheat crops ripened properly.
1891. <i>Sel-i-Kalan.</i> (Autumn, winter and spring rainfall at Quetta 12.00 inches. In Northern India there was exceptional rain in the autumn of 1890 and the spring of 1891.)	The river began to rise before Nauruz. Two big floods came down the river approaching to the volume of that of 1903. Some crops were damaged.	The high floods did not last long. The river on those occasions rose and fell soon. The duration of flood was not long, but like that of the flood of 1904.	Wheat ripened properly melons, and millet was sown extensively. But melons were diseased, though the supply in the river was larger than ordinary the melon crop was spoiled by the disease.	The river in the winter kept its ordinary level. Wheat was sown in time and ripened properly.
1892. <i>Sel-i-Kalan.</i> (Autumn, winter and spring rainfall at Quetta 2.86 inches.)	Some say the river rose higher than in the flood of 1904 but less than that of 1903, but others say the flood was the same as that of 1904.	The flood lasted as long as it did in 1903, though the level of the river was not so high.	Melons and millet received full waterings and ripened properly. At the time of <i>band</i> -making the river had as good a supply as in 1903, and the wheat sowings were done properly.	No damage was done by the winter floods. The canals had their proper share of water and the wheat crop ripened properly.

*Remark to 1889.*—Colonel Yate was told that a flood 4 years before 1894 destroyed the crops of Milak at the time that the produce was about to be divided out, this would be June or July or even August. But no spring floods have ever occurred much later than those of 1903, *viz.*, May 1st to 5th.  
A disease is said to have spread among the sheep in the hills.

State of the Hámún before the flood.	Effect of flood on the Hámún.	Sar-i-Shela.	Gaud-i-Zireh.
The Hámún was low before the flood of 1889. But it had sufficient water for all the purposes of the Gaodars.	The flood of 1889 filled the Hámún to such an extent that the Shelas on Rah-i-Gardowak flowed for some time.	The Sar-i-Shela did not flow.	No water reached the Gaud-i-Zireh.
Before the flood of 1890 the water in the Naizar nearly dried up. Water remained only in the Chung or deepest pools.	The flood sent some water into the Naizar, but it had no appreciable effect on the Hámún, which was very low.	The Sar-i-Shela did not flow.	No water reached the Gaud-i-Zireh.
The Hámún was very low as in the winter of 1902. Only the Chung or pools held water.	The big floods filled up the Naizar and the Hámún was full down to Regowak.	No water passed into the Sar-i-Shela.	No water reached the Gaud-i-Zireh.
The Hámún was as low before the flood as it was in 1904.	The flood of 1892 filled up the Naizar and the Hámún down to the head of the Sar-i-Shela.	For about a month water flowed into the Sar-i-Shela with the strong wind. For 8 or 9 days it passed across the Gardan Reg Ford; but generally the water was spent in filling holes above the Gardan Reg Ford. This Ford is about $\frac{1}{2}$ of a mile above the point where the boundary line crosses the Sar-i-Shela.	No water reached the Gaud-i-Zireh.

*Note to 1892.*—Lieutenant the Hon'ble H. D. Napier crossed from Bahring to Afzalabad in December 1892; the water of the lake was about one mile from Bahring. The march across the Naizar was a distressing one through deep mud. On the left of the road water and reeds alternated. The road was a clearing through very high and dense reeds. There had recently been rain; from this description I judge that the floods must have retreated later in the year from the road than they did in 1903 and therefore that the flow to the Sar-i-Shela lasted much longer.

Year.	Height of flood.	Duration of flood.	Period of low river.	Winter flood.
1893. <i>Sab-i-Khushk</i> (Autumn, winter and spring rainfall at Quetta 16.96 inches.)	The river did not rise even as it did in 1904. No rain fell.	The flood was small and did not last long; but the supply was sufficient to ripen the wheat crop. The river fell very soon this year.	The melons and millet however got enough water and the crops were not much below the average except in the Shib-i-Ab. At the time of making the <i>band</i> , the supply became very low, and sowings of wheat were delayed.	Supply in the river rose late and sowings of wheat were done. Though the sowings were late, the area sown was the same as in ordinary years.
1894. <i>Kalabi</i> . (Autumn, winter and spring rainfall at Quetta 14.05 inches.)	Some say the year cannot be called a year of high floods and that the river was lower than in 1904 and like the river in April of 1905, while others say the floods were higher than in 1904.	The flood came now and then and passed away soon. The duration of the flood was not so long as that in 1904. The wheat and barley crops were ripened properly, and melons and millet were sown as usual, though there was no self-flooded area.	The melons received water to mature them, but soon after the river fell very low, and at the time of the <i>band</i> -making the supply was far less than usual. The sowings of wheat were done very late.	In the winter the river had less than its normal supply, and the crops did not receive proper waterings. In December and January, <i>i.e.</i> , <i>Chilla-i-Kalan</i> the water supply was not adequate.
1895. <i>Sel-i-Kalan</i> . (Autumn, winter and spring rainfall at Quetta 5.02 inches.)	The river began to rise in February, <i>i.e.</i> , <i>Chilla-i-Khurd</i> . The flood approached that of 1903 but it did no damage. A large area was flooded for melons. The protection <i>band</i> running from Shahgul to Milak was breached and the flood water went for the first time down the Parian channel from Shahgul.	The volume of maximum flood approached that of 1903. During the first month the rise was not much. In the 2nd month it rose very high; and after two months more the river fell to its normal level. Melons and millet were sown extensively.	At the time of ripening of the wheat crops of 1891-95, the river was low for two months. After the spring floods, it remained at its normal level. At the time of <i>band</i> -making it was at its usual level.	In <i>Chilla-i-Kalan</i> , <i>i.e.</i> , in January the supply in the river was below normal. The water of Rud-i-Seistan was distributed by turns. This the people call <i>Nushk</i> . They allowed a certain period to the villages of the Pushbi-Ab Mahal and then to Shib-i-Ab. The canals too were worked on the same system. The crops of the villages near the Kuh-i-Khwaja suffered a good deal. In <i>Chilla-i-Khurd</i> , <i>i.e.</i> , in February the river began to rise and all complaints about water were removed. The wheat sowings were done in time.
1896. <i>Sel-i-Kalan</i> . (Autumn, winter, spring rainfall at Quetta 8.90 inches.)	The flood was higher than in 1903. It did some damage to crops sown on lands subject to high floods.	For one month the river was full as in the flood 1903 and for the next two months it ran within its banks, but fords did not appear till late in the season.	The melon and millet crops received proper waterings; but at the time of harvesting the wheat, locusts appeared which destroyed all the young melons and millet. Only in some places, the melons escaped destruction; at the time of wheat sowing the supply in the river was the same as in 1904 and quite sufficient for sowing.	The winter floods were normal. The wheat crop received full waterings.

*Remarks to 1894*—Colonel Yate visited Seistan from January to March. He crossed from Bahring to Aizabad in the dry. But the winter was a wet one, and the flood of March seems to have been quite as high as in 1904. he had considerable difficulty to get out of the Miantangi—*vide* Chapter L. On the 10th March the northern road to Peshawaran was reported to be closed and he got through to Bahring just before the water reached the road. The Seistan is very partial to camel man in the cold weather, at such times guides must be chosen with the greatest circumspection or camels will be lost in bogs. He noticed that the people were vigorously employed in repairing the embankments along the left bank of the river.

Colonel Yate and Major Massy visited the Gaud-i-Zireh in the middle of February. He crossed the Sar-i-Shela at Gardan Reg where Mr. Merk crossed in 1885-86, and he said no floods had been down for 5 years. There were pools of water at Shali-i-Mardan. He also camped near the domes visited by Sir Charles McGregor in 1877 and Colonel McMahon in 1895, and which are near where the Shela bifurcates; this is also the place where the road from Baudar-i-Kamal Khan to Kirtaka crosses the Sar-i-Shela. Colonel Yate found that the tamarisk extended 6 miles beyond the Gumbad-i-Sar-i-Zireh and a plain of salt efflorescence began. The dead tamarisk had nests of birds 4 or 5 feet from the ground, which the guide said were full of eggs two years before. At 9 miles water was met. The soil was soft and the party dismounted to approach the water; the saline crust on the soil was very thin just enough to cause a glare;

State of the Hámún before the flood.	Effect of flood on the Hámún.	Sar-i-Sheia.	Gaud-i-Zireh.
The Hámún was full.	The flood in 1893 had no appreciable effect on the Hámún, which continued falling during the year.	The Sar-i-Sheia did not flow.	No water reached the Gaud-i-Zireh.
The level of the water in the Hámún had gone down very low. Only deep <i>Chung</i> had water.	The flow had little effect on the Hámún; water was left only in the deep <i>Chung</i> .	The Sar-i-Sheia did not flow.	No water reached the Gaud-i-Zireh.
The Hámún was nearly dry. Only the deeper <i>Chung</i> had water and the Gaodars had collected around those <i>Chung</i> .	The flood filled all the Naizar, and the water in the Hámún extended to the Hauzdar and Kunder ruins.	The Sar-i-Sheia did not flow.	Gaud-i-Zireh did not receive water this year.
The Hámún was full to overflowing.	The flood of 1896 filled the Hámún to overflowing; Meshedi Ali says that a westerly wind blew suddenly when the Hamun was full, and breached the protection band at Ziarat Pír Sabz near Deh Muhammad Safar.	Early in May the Akhundzada returning from the Kuh-i-Malik Siah after bidding good-bye to Colonel McMahon found the Sar-i-Sheia in flood and crossed it at Rah-i-Shamshiri. A considerable volume probably entered the Gaud-i-Zireh; but some say that for 20 days only the Sar-i-Sheia flowed. After that it carried water only with the strongest wind.	Water probably reached the Gaud-i-Zireh.

the water was beautifully clear and only slightly salt. Water brought from as far out in the lake as a man could go was not so salt. The water extended to the eastern horizon; on the south it was bounded by sand-hills and on the north by the edge of the *Dash*.

*Remarks to 1895.*—The flood burst the left protective embankment running from Shahgúl to Milák; the flood water destroyed the crops of Tilak and joined the main river near Maliki and thus escaped to the Naizar. This flood embankment was built by Sardar Khan Jan Khan to protect Jahanabad and was noticed by Major Euan Smith on his ride from Kuhak to Nadi-Abi and also by Colonel Vate on his way to Milák. After the flood subsided the embankment was repaired by the people of Jahanabad and Tilak. This was the last year Sheia-i-Jahanabad or Poluk carried water to Maliki and Dilki.

*Remarks to 1896.*—At Nauruz a big flood came down the river which according to Shahdad, who has lived at Bandar-i-Kamal Khan all his life, was 175 feet higher than the flood of 1903. This flood again burst the Milak embankment, which had been breached but repaired again in the previous year. The Farian channel

Year.	Height of flood.	Duration of flood.	Period of low river.	Winter flood.	
1897.	<i>Kalabi.</i> (Autumn, winter and spring rainfall 8.40 inches.)	The river in the spring of 1897 rose almost to the level of 1904. It did not overflow its banks and did no damage.	The river rose and fell alternately for about two months.	<i>Falis</i> and millet matured all right. When the Band-i-Seistan was made, the supply in the river was normal, and wheat sowings were made as usual.	The supply in the river was normal; and wheat crops were properly watered.
1898.	( <i>Kalabi.</i> Autumn, winter, spring rainfall 6.85 inches.)	The river rose to the level of 1904. Khan Bahadur Maula Bakhsh noted that no rain had fallen in Seistan in the spring of 1897 or 1898.	The duration of flood was more or less like that of 1904.	Melons and millet ripened all right. At the time of wheat sowings the supply was normal.	The supply remained normal, and wheat crops matured all right.

then left the old main stream at Shihgul and Shela-i-Jahanabad or Shela-i-Pokuk which Colonel Yate crossed 3 miles north of Milak silted up and never flowed again.

*Remarks to 1896—continued.*—The spring and autumn harvests were abundant and good. The Afghans and Persians consulted together and built the Parian *band* some distance below the head of the Nad-i-Ali channel at a place where there had been a piece of *Dasht*; Dadi, *handhaf* and canal builder, selected this site. This *band* was made in co-operation, but each State dug their own channel from the *band* to the Nad-i-Ali channel opposite Khoja village where the big *padah* trees grow.

Colonel McMahon, Dr. Maynard and Mr. Tate visited the Gand-i-Zireh in April 1896 and found a "large lake of clear deep blue water some 25 miles long and 5 miles broad standing in the midst of a margin of solid salt the waters are so salt that wild fowl will not visit them. A few pools of salt brine are still to be found here and there in the bed of the Shela."

The Afghan Commissioner and the Akhundzada had to ferry themselves and their supplies across the river at Bandar-i-Kamal Khan on their way to Gudar-i-Shah in April. The flood occurred some time after Nauruz and lasted to days at its height. When the Akhundzada returned from Robat-i-Nahrui 45 days after the flood he crossed the flowing Sar-i-Shela at the Gudar-i-Shamshiri.

The year is known in the Rudbar tract as the *Sal-i-Godam*, or the year that supplies were collected for the above mentioned Mission. The supplies were collected at Chahar Shaklak and the Gumbad-i-Nadiri and the managers (*sukhsur*) of the horses of the sowars are still visible.

*Remarks to 1897.*—Major Brazier Creagh learnt that the floods of 1897 were very much less than normal

State of the Hámún before the flood.	Effect of flood on the Hámún.	Sar-i-Shela.	Gaud-i-Zireh.
The Hámún was full, and the Gaodars had all that they required.	The floods of 1897 added some water to the Hámún, but they had very little effect on its extent.	The Sar-i-Shela did not flow.	Gaud-i-Zireh received no water.
The Hámún had fallen; but at the Kuh-i-Khwaja and upwards it had ample water for all the purposes of the Gaodars.	The flood added some fresh water to the Naizar down to the Kuh-i-Khwaja. Khan Bahadur Maula Bakhsh crossed on <i>tutin</i> in May 1898 on his way from Meshed to Seistan. He got into <i>tutin</i> at Dashtak and must have crossed by the Rah-i-Surkh Gazi (see Appendix 28) for he said all the traffic went by Dashtak, till the water on this route became shallow when it would revert to Bahring. The extent of water was about 12 miles and the passage took 6 hours, the landing was two miles short of Afzalabad. The water was from 4 to 7 feet deep. This shows that the flood level in the Hámún north of the Rah-i-Gardawak must have reached the level it did in 1903. But the overflow into the Kuh-i-Khwaja, Hámún was not so great as in 1903, as the water was only sufficient to reach the head of the Sar-i-Shela in a high wind.	The Sar-i-Shela did not flow.  The Khan Bahadur crossed it at the Gumbad-i-Liddi on the 11th June and was told that during a very hot wind early in June the water of the Hámún was driven down the Sar-i-Shela and wetted its bed as far as the ford.	Gaud-i-Zireh received no water.  He was told that for the last 10 years* no water had flowed down the Sar-i-Shela and the Gaud-i-Zireh had nearly dried up.

By the middle of August there was great scarcity of water, especially on the Rud-i-Seistan as the *band* was said not to have been properly repaired in 1896. The repairs of the *band* were not made till October. Local Baluchis think the floods were as good as those of 1904 and the crops both *Rabi* and *Khari* were satisfactory and no losses were sustained. Major Brazier Creagh's remarks give the impression that the floods were higher than in 1904, as on the 7th June he records that the river was in high flood (*sic*) at the Parian Ford at Milak and he lost a horse crossing. There were 6,000 cusecs at the Parian on 7th June 1904 hardly enough to cause the drowning of a horse. The Mission lost no horses by drowning.

Khan Bahadur Maula Bakhsh met the Hashmat-ul-Mulk in Meshed in April 1898 and was told that the Band-i-Seistan had been damaged by floods and the area under cultivation had been considerably reduced owing to insufficiency of water and the crops had suffered from blight. If the *band* were badly gapped by a high and early flood and then the river fell very low there might be difficulty in maturing crops. But the difficulty could be entirely overcome by action to be initiated by the Hashmat for the repairs of the *band* or the regulation of the canals. The Hashmat was complaining of the exactions of the Persians and may have greatly exaggerated the damage to crops. The floods of 1897-98 must have been large enough in total volume to nearly fill the Northern Hámún for Khan Bahadur Maula Bakhsh had to take *tutin* to cross the inundated area from Dashtak near Bahring to Afzalabad in May 1898, *vide* Confidential Report made in 1898 by the Khan Bahadur on his journey from Meshed to Qucha.

Year.	Height of flood.	Duration of flood.	Period of low river.	Winter flood.
1899. <i>Sal-i-Khushk</i> (Autumn, winter, spring rainfall 6 44 inches.)	The floods this year were small much less than in 1904. No area was flooded for melons and millet.	The floods did not last long. The fords disappeared only for a short period.	There was sufficient water for all purposes of cultivation. The melons and millet which was sown got water. The wheat was sown at the proper time.	The river in the winter had sufficient water for all purposes.
1900. <i>Kalabi</i> (Autumn, winter, spring rainfall at Quetta 917 inches.)	The river rose as in 1904. It did not overflow its banks. No area was self flooded for <i>falis</i> , etc.	The floods did not last long. Like the months of April and the first-half of May 1905, the river rose and fell alternately. This lasted for about 8 weeks.	The river remained low for the most part of the year. But it had sufficient water to ripen melons and millet sown from the canals, as well as to sow wheat at the proper time.	The river in the winter had a supply sufficient to run the canals. The wheat crop did not suffer.
1901. <i>Sal-i-Khushk</i> (Autumn, winter and spring rainfall at Quetta 1067 inches.)	The river was very low for the spring period. It did not rise higher than in May 1905.	For two months only, now and then a small flood came down the river, but subsided soon.	The river remained low for the most part of the year. But melons, etc., were sown and ripened with the aid of the canals. Wheat was sown in time.	The wheat crop received water in sufficient quantities.
1902. <i>Sal-i-Khushk</i> (Autumn, winter, spring rainfall at Quetta 131 inches.)	There was no rainfall this year at the time of Nauruz. The river only once rose to the level of April 1905. The canals therefore did not run with full supply.	The floods did not last long and only once the river rose in flood, and then fell soon after. The fords only once disappeared for a few days. The best fords in the Garmel remained fordable throughout the year.	The wheat in the tract irrigated by the canals around the Kuh-i-Khwaja did not all get water to mature. In some few villages too barley did not receive the last watering. The distribution of water in the Rud-i-Seistan was made by turns called <i>methra</i> . The <i>achar</i> practically sold the water. Very little <i>falis</i> was sown and as the river dried up below the head of the Rudhar canal at the end of July even that small area could not be matured.	Water arrived at the end of September and wheat was sown though late. In winter of 1902-03 the river was often in flood from timely rains and wheat and barley crops received sufficient water. But there was famine in the land till the spring herbage came and the harvest was reaped.

*Remarks to 1899.*—Major Sykes and Mr. Tate arrived in Seistan about March 1899 and visited the Kuh-i-Khwaja together, both visited Kuhak, but not together. There was a great deal of water out in the country between Wormal and the City much of it deliberate flooding as there was a petty civil war on between the two brothers for the Deputy Governorship. Major Sykes afterwards visited the Hamun at Adimi and Garbar crossed the Rud-i-Parian at Jalalabad by fording; went to Tappa-i-Talai, Takhta Pul, Karku Shah, Siadak and was ferried over the Parian at the head and left Seistan early in April by the dry road across the Hamun. He came back to Seistan in October rode north

State of the Hámún before the flood.	Effect of flood on the Hámún.	Sar-i-Shela.	Gaud-i-Zireh.
The Hámún had fallen.	The flood had no great effect on the Hámún, which was quite dry beyond Warmal.	The Sar-i-Shela did not flow.	Gaud-i-Zireh received no water.
The water in the Hámún gradually fell during the year.	The flood had no effect on the Hámún. The Naizar began to dry.	No water flowed into the Sar-i-Shela.	Gaud-i-Zireh received no water and must have become dry. No certain information has been obtained when the Gaud-i-Zireh water eventually disappeared.
The Hámún was drying up. It was very low.	The floods had practically no effect on the Hámún which was falling fast.	The Sar-i-Shela did not flow.	Gaud-i-Zireh was probably dry.
The Naizar and the Hámún dried up after the 4 months of the hot wind in 1902. There was some water left in the deepest part of the Hámún-i-Sábari and in the Kurg-i-Gard at the tail of the Farah Rud.	The flood had no effect on the Hámún.	The Sar-i-Shela did not flow in 1902.	Gaud-i-Zireh was probably dry.

from Nasirabad to the Hámún and eventually left *via* Warmal to Isf. There was about the same amount of water at the Kuh-i-Khwaja in March and April 1899 as in March 1904 and the same in the Naizar at Gazbar. The Parian stream seems to have been less than in 1904 and more than in 1905. The country around Tappa-i-Talal was quite dry. Two good falls of rain occurred towards the end of March. Weather was hot and flies swarmed. In October there was only water in the *Darpaq-i-Sábari*. The rest of the Hámún area had dried up. Major Sykes' Kafilá crossed from Bahring to Nasirabad by the Rah-i-Surkh Gazi.

## Part III.

*Detailed narrative account for the years 1903-04-05 from the Records of the Mission.*

1903.—The Records of the Mission begin on the Helmand at the Kúh-i-Khan Nishin on the 1st February 1903.

The great drought ended very suddenly early in the autumn of 1902. Major Benn recorded that the water arrived at the Band-i-Seistán on the 22nd September; whereas rain did not fall in Seistán till the 29th October, the first shower since the 15th March 1901.

The water reached the city on the 24th September; it went down the Helmand to Milak on the 25th, but had not reached the Sikhsar on the 6th November. By the 15th November Major Benn was able to report that the river had risen considerably and between the 1st and 15th December the *band* at Kúhak and Shahgul were demolished by unusually early floods; all through December and January there were heavy floods in the Helmand.

During February the river was unusually high; there was no abnormal fall of rain, but the latter half of the month was warm and that must have melted the snow, as there was a sudden big rise of the river early in March of nearly clear water. Early in March there was a strong cold wind which was followed by a fall in the river. About the middle of March there was unusually heavy rain, and early in April the river began to rise very much higher than it had done, so that about the middle of April, 42,666 cusecs were gauged. At the end of April there was extraordinary rain in Seistán; much heavier rain was reported at Kandahar and at Quetta; as a result the maximum flood of 70,000 cusecs occurred on the 1st May.

The noteworthy feature about this flood was that the discharge subsided very slowly, so that the total volume discharged into the Hámún was very great.

The average volume month by month in 1903 was as follows:—

January	...	...	...	...	4,000
February	...	...	...	...	4,500
March	...	...	...	...	6,778
April	...	...	...	...	26,165
May	...	...	...	...	38,759
June	...	...	...	...	16,541
July	...	...	...	...	6,135
August	...	...	...	...	3,330
September	...	...	...	...	1,893
October	...	...	...	...	2,080
November	...	...	...	...	2,543
December	...	...	...	...	2,700

All the other rivers also flowed in large volume for a long time.

The Hámún, all except a small shallow area in the deepest part of the Hámún-i-Sabari, was dry when the water began to flow into it in December, but by July the lake had filled and was overflowing down the Sar-i-Shela.

The winter was windy and cold; the late rains made a late spring and the harvest was from three weeks to a month late. The crops were excellent; a large area was sown in spite of the difficulty in obtaining seed.

The autumn harvest was a bumper crop, so much so that the harvesting thereof interfered with the sowing of the following spring crop.

*Minimum river.*

The river reached its minimum on the 14th September (1,609 cusecs).

The building of the *band* was begun on the 17th August and finished on the 13th September. It was closed with difficulty, as the volume in the river was large (1,713 cusecs). The river rose steadily through the autumn and was 3,000 cusecs at the end of the year.

1904.—From the study of the river made in this Appendix it would appear that the volumes of the river, from low river of 1903 to low river of 1904, were as near normal as the actual volume of the river is ever likely to be. These volumes at the Band-i-Seistán are given below; the estimated corresponding discharge at the Band-i-Kamál Khán are also added.

*Spring crop supply.*

10-day period.				Average discharge for 10-day periods at the Band-i-Seistán.	Corresponding estimated discharge at Bandar-i-Kamal Khan.
1903.				Cusecs.	Cusecs.
<i>Autumn supply.</i>					
21—30	September	...	...	1,881	2,162
1—10	October	...	...	2,009	2,360
11—20	October	...	...	2,117	2,502
21—31	October	...	...	2,111	2,442
1—10	November	...	...	2,215	2,612
11—20	November	...	...	2,528	2,965
21—30	November	...	...	2,882	3,481
1—10	December	...	...	2,698	3,162
11—20	December	...	...	2,625	3,062
21—31	December	...	...	2,767	3,252
Total				23,833	28,000
Average				2,383	2,800
1904.					
<i>Winter supply.</i>					
1—10	January	...	...	2,945	3,450
11—20	January	...	...	*3,765	4,420
21—31	January	...	...	3,655	4,280
1—10	February	...	...	4,364	5,110
11—20	February	...	...	4,710	5,525
21—29	February	...	...	4,940	5,800
1—10	March	...	...	5,751	6,750
11—20	March	...	...	†10,320	12,100
Total				40,450	47,435
Average				5,056	5,930
Total 21 September to 20 March				64,283	75,435
Average spring crop supply				3,571	4,191

\* Band breached in middle of January by a flood that followed a fall of snow.

† Big rise of the river that closed the ford occurred about the 10th March.

*Autumn crop supply.*

10-day period.				Average discharge for 10-day period at the <i>band</i> at Seistán.	Corresponding estimated discharge at <i>band</i> at Kamal Khan.
1904.				Cusecs.	Cusecs.
<i>Spring supply.</i>					
21—31 March	...	...	...	10,097	11,850
1—10 April	...	...	...	21,949	25,800
11—20 April	...	...	...	23,227	27,300
21—30 April	...	...	...	17,071	20,100
1—10 May	...	...	...	20,492	23,300
11—20 May	...	...	...	18,017	21,300
21—30 May	...	...	...	11,660	13,700
1—10 June	...	...	...	8,342	9,900
11—20 June	...	...	...	6,824	8,100
Total				137,679	161,350
Average				15,297	17,928
<i>Summer supply.</i>					
21—30 June	...	...	...	5,166	6,060
1—10 July	...	...	...	2,875	3,380
11—20 July	...	...	...	2,158	2,520
21—31 July	...	...	...	1,712	2,020
1—10 August	...	...	...	1,624	1,900
11—20 August	...	...	...	1,229	1,440
21—31 August	...	...	...	905	1,060
1—10 September	...	...	...	1,078	1,270
11—20 September	...	...	...	1,231	1,450
Total				17,978	21,100
Average				1,997	2,344
Total 21 March to 20 September				155,657	182,450
Average autumn crop supply				8,648	10,136
Total for the whole year				219,940	257,885
Average for the whole year				6,109	7,163

The volume of the river rose to 17,000 cusecs at the *band* at the end of March; the maximum volume occurred on the 13th April and was 27,000 cusecs. The volume fell to 16,180 cusecs on the 24th April; from this it rose again by small floods which reached about 22,000 cusecs. After the 10th May the volume steadily declined, till the minimum of 903 cusecs was reached on the 19th August remaining steady at this till the 30th August when the rise began.

The *band* was begun on the 30th August and was completed on the 11th September when the volume was 1,220 cusecs.

The average monthly volumes in 1904 were—

	Cusecs
January ... ..	3,462
February ... ..	4,662
March ... ..	8,767
April ... ..	20,749
May ... ..	16,560
June ... ..	6,777
July ... ..	2,231
August ... ..	1,241
September ... ..	1,199
October ... ..	1,441
November ... ..	1,802
December ... ..	2,438

The sowing of spring crops was made late, because the cultivators were busy thrashing the previous good spring and autumn harvest. The spring crops promised well, but cloudy warm weather in March and April brought on rust which reduced the yield; much damage was also done by mice. Many ploughs in Afghan Seistán and in the villages around Daudi did not recover the seed sown. The autumn crops were also poor; the melons suffered from disease and the other crops from deficient supply at maturing time. The year was one of exceptional high wind which began as usual about the 20th May and blew till the end of August, very hot and very strong.

The area of Hámún at the height of the floods did not reach the level of 1903, and rapidly diminished by evaporation during the hot dry season and high winds. All but the deepest pools in the Hámún-i-Puzák and most of the isolated *Chung* in the Naizár dried up.

1905.—A useful fall of rain occurred in the last week of November 1904; the weather then became beautifully clear and bright and remained so till nearly the end of January; as a result the autumn supply was lower than that of the previous autumns with which we had acquaintance. On the 20th January the great blizzard began and brought intense cold, but only a little snow fell, and the rainfall of the winter and spring was slight. A second blizzard also accompanied by intense cold finished up March and introduced a summer of intense heat; the thermometer in July registered 121½ in the shade much higher than any temperature recorded during the stay of the Mission; the same intense heat; as well as the great cold of the winter, was experienced over the Frontier and over most parts of India.

The '120 days' wind was probably normal, and so too was the autumn; but on the 15th December an unusually heavy rain began; this rain spread over Baluchistan and into Northern India. At the Consulate a rainfall of an inch was recorded and at Diwan Chah (Kuh-i-Malik Siah Ziarat) the torrent rose in flood twice between the 15th and 20th, and carried away the bricks being prepared therein for the house of the Vice-Consul. The rain water collected in the bed of the Sar-i-Shela and made the fords on the trade route slippery and bad.

The flood in the river came down about the 20th, breached the *band*, overflowed\* the banks at Kuhak and flooded lands at Khwaja Ahmad, Jazinak and Dashtak; in these villages the water did damage to both buildings and crops, showing that the *band* must have been very strong and held so long that a very high flood went down the Rud-i-Seistan. The flood passed away quickly and ploughings were then pushed on vigorously everywhere, and people said that this would be a *Sal-i-Nuh*.

The great cold of the winter and spring kept the snow in the mountains at the head-waters of the river on the ground so long that it melted gradually, so that there was no big flood in the spring, while the great heat of the summer seasons

\* In May 1903 the Rud-i-Seistán overflowed its banks when the volume in the River rose to 50,000 cusecs, but the *band* had been previously carried away.

to have wasted the supply, so that the river was abnormally low in August and September. The first rapid rise was at the beginning of February, but the *band* was not breached till the 20th of March when a short sharp flood of only 15,216 cusecs came down the river and breached the *band*; the supply fell again to 6,760 cusecs on the 13th April. It rose again to 16,329 cusecs on the 25th April, but the maximum volume of the season was from the 4th to 7th May when the gaugings shewed a discharge of 16,853 cusecs; this is the maximum volume for this season.

The Mission left Seistán on the 15th May\* when the discharge was 13,764

\* During a spell of high wind which made the weather very cool and pleasant, the people said this was the preliminary center of the *Bad i-soud-e-bist ras*, which occurred every year about harvest time, but was not always so well marked as on this occasion.

cusecs; the figures and information in this note later than this date were supplied by the kindness of the members of His Britannic Majesty's Consulate.

The year was evidently typical of the dry years that follow soon after a period of extreme drought and precede the period of good years and the figures are

Volume of the River.

therefore very valuable.

The average volume for each month in 1905 was as follows:—

	Cusecs.
January ... ..	2,481
February ... ..	3,145
March ... ..	5,115
April ... ..	10,667
May—1 to 15 ... ..	15,539
May—whole month ... ..	13,687
June ... ..	6,700
July ... ..	2,167
August ... ..	711
September ... ..	573
October ... ..	825
November ... ..	1,150
December ... ..	2,500

The notes and gaugings made by Mr. Keyes shew that the river reached its minimum (360 cusecs) on the last day of August when the usual characteristic rise began; it is worth noting that the increase of volume during the autumn is much the same for each day of the month; this will be evident from the following figures:—

Month.	MONTHLY INCREASE OF VOLUME.		
	1903. Cusecs.	1904. Cusecs.	1905 Cusecs.
September ... ..	505 to 506†	408	370
October ... ..	206	182	.....
November from 1st to 21st ... ..	650	270	.....
Ditto from 1st to 30th ... ..	900	398	.....
From 10th October to 24th November ... ..	800	524	583

† From the minimum river which that year was on the 14th September to the end of the month.

These volumes are a measure of the saving of water due to the decreased evaporation that occurs over the springs in the catchment and along the river on its way to the lake; they also shew how constant the draw of the canals along the river must be; our notes and observations on the discharges confirm this.

Major Macpherson gauged the river on the 24th November and fixed its volume (1,213 cusecs) at this very important stage.

The volume in the river at the *band* on that date was 1,213 cusecs distributed as follows :—

*Persian Seistán.*

Rúd-i-Seistán ... ..	943*
Rúd-i-Paríán ... ..	184
Lakhsak ... ..	31
Deh Dost Muhammad ... ..	13
Afghán Seistán by Charkh ... ..	42
	1,213
Add probable volume used by Afghans from Bandar-i-Kamal Khan to Band	200
	1,413

The Persians were therefore using 83 per cent. of the water and the Afghans 17 per cent.

The *band* was breached, as has already been said by the flood on the 20th December, so that the volume then became ample and the people looked forward to a prosperous spring harvest.

The following valuable information about the crops, Naizár, etc., in this year of exceptional interest has been kindly furnished by Muhammad Ashraf Khán Popalzai, Vice-Consul at Kúh-i-Malik Síáh Zíarat. The larger part of the supply of the river was secured for some favourably situated canals on the Rúd-i-Seistán by the early repairs of the *band* on the 20th of August. The small balance of the supply was taken by the Jahanábád and Lakhsak canals of the Míánkangí, as these were fed from above the Band-i-Paríán. But the area of crop matured by the water was very small; there was a total failure of all crops in Afghán Seistán and except the small area saved on the favoured canals alluded to above a total failure in Persian Seistán.

The small supply in August in such a hot year could not be expected to mature more than 20,000 to 30,000 acres.

The early sowings of wheat and barley were deficient for want of water, but the early and timely flood rectified this. Up to the end of July rates of wheat remained one Seistani *man a kran*, but after that an export to Káin began and the rate rose by the end of October to half a Seistani *man a kran*; and there was much anxiety among the cultivators to get grain to sow; it is one of the virtues of the system of cultivation that it is entirely to the interests of Government that the cultivators should have seed; in consequence, at the end of November, orders came from Meshed to sell the Government grain. The rate fixed for sale to the Consulate was one Seistani *man a kran*, and to the people 113 *kran* per one *kharwar* Seistani. Since the Rúd-i-Seistán secured the greater part of the supply early sowing of wheat was done on the more favoured canals around Kimak, Aliabád and Kaud, while those about Warmal, Síkuha, Bunjar, Iskíl got water later: in November a silt clearance was done by Sardar Purdíl Khán in the bed of the Rúd-i-Seistán near Jazínak and Dashtak in the interests of the villages near the Kúh-i-Khwája, who were the last to get water. At the middle of November there was green wheat nearly ready to cut around Kimak in the Mahal of the

\* 0.78 of the supply.

Nahrui and Shahraki, while the water had only just filled the Deh Dost Muhammad canal in the Miánkangi, and ploughings were going on in the areas intermediate between these two extremes. It will be seen that the Shíb-i-Ab Mahal did better than the Pusht-i-Ab, although the draw down the Rud-i-Hasanki is great, yet the influence of Sardar Purdil Khán, whose interests lie in the Shíb-i-Ab is greater and by his energy in silt clearance the sowings in the villages in his circle near the tail of the Rúd-i-Seistán were more advanced than those on the Rúd-i-Hasanki, which is the first big branch of the Rúd-i-Seistán.

Until the Afghans made the cunette down the Nad-i-Ali channel, described further on, the canals from the Rúd-i-Parián got a useful supply, and water even reached Takht-i-Shah, but when the cunette was opened sowings were suspended till the flood came.

A new canal called Ju-i-Hamidábád after the name of the Persian Commissioner, was made as a branch of the Ghurghuri for the irrigation of lands near the boundary at Takht-i-Shah; the extension sufficed for twelve ploughs of cultivation, and it was hoped that extensions enough for eight more ploughs could be made. Agha Khán, the Kadkhuda of Deh Ghurghuri, is the Kadkhuda of this extension. Sultán Mír Husain, Arab, has made a new canal from the Nad-i-Ali channel above Burj-i-As for the irrigation of a tract near Deh Pokuk. Further notes on extensions of canals will be found in Major Macpherson's note at the end of Appendix 31.

The Nad-i-Ali channel was dry for the two months of September and October, and even at the end of November when the cunette described in the next paragraph was made, the water only flowed in the Shela-i-Charkh, the bed of which seems quite 2 feet below that of the Sikhsar. After the departure of the Mission the Akhandzada Fakir Muhammad went to Kabul, and had not come back up to December, but in his absence Sardar Musa Khán cleared out and deepened all the canals, so that just before the flood came they were drawing well. Among other works the cunette already referred to was dug down the Nad-i-Ali channel from the main stream to the head of the Shela-i-Charkh. This was done to draw the water away from the Rúd-i-Parián, which till then had drawn a good volume. The water thus secured was passed from the Charkh into the Sikhsar and used for cultivation around Deh Gul Muhammad, but turns were given to supply drinking water for men and animals in the villages towards Kala-i-Kang. The Sultáni canal was of course improved and extended and its favourable situation up the main river enabled about half its area to be sown before the flood came, and this cultivation must have been as well off as that around Kimak on the Rúd-i-Seistán.

The canals towards Nad-i-Ali and Jharuki were also deepened and connected to the main river above the Band-i-Parián and the cultivation thereon was about as well off as that in the Pusht-i-Ab Mahal.

The price of grain at sowing time was one-third of a Seistani *man* at Chakhánsúr and half a Seistani *man* at Rudbar. It is a defect in the Afghán administration that they charge heavily for grain at all times; it is an indirect method of getting a large share of the profits of the bádár: but it is open to the grave objection that it kills enterprise and makes the extension of cultivation very slow. The Government and the people suffer most from this short-sighted policy, which compares unfavourably in business aptitude with that pursued on the left bank of the river.

The description of the crops of the year has been given in considerable detail, because many valuable lessons are to be learnt from the experience of this year; the first is that of the certain rise of the river after the wind drops—both doubtless due to the same cause; the shorter and therefore cooler days; in such a year the valuable autumn crop cultivation is prevented in the tracts along the main stream in the Miánkangi and in Tababa-i-Nad-i-Ali by the construction of *band* to divert the water into the old established villages controlled by the influential men. This must of necessity be so, and it is the only way to get any value out of the small supply that flowed. A large area of valuable wheat was

sown before the flood came, probably quite as large an area as was sown in the same time in 1903 due entirely to the great skill with which the people distribute the water when compelled to in tight times. The winter flood too was early a characteristic of such years. The grazing in the Naizár is not affected by such a dry year, as the following note will shew that it was better than the average, as it was easier to get to.

The floods of the spring were sufficient to provide a good crop of grazing for the cattle who were able to graze in great comfort, because the ground in which the reeds thrive became dry early in the season. The herd-owners in December were well satisfied with the grazing of the year and the Saiyáds looked forward to a good winter of sport. There was enough water in all the large *Chung* lying between Rah-i-Gardowak and Dahana-i-Faráh Rúd to enable a *tutin* to be freely used, while the best *Chung* at the tail of the Rúd-i-Parián also had water in them, so that the growth of weeds that attract the wild fowl was good. The Hámún-i-Púzák was dry and also Chung-i-Mesh Kushi, Deh Surkh, Hámún-i-Kúh-i-Khwája, Naizár-i-Adimi, and of course all the shallower *Chung* as well as those that are further removed from the inflow of the river at flood. The fish must have suffered much from the poor supply for early in October Mr. Keyes said the smell of dead fish was so great at the tail of the Rúd-i-Parián that he was not able to pitch his camp within four miles of Musjid-i-Gurg Ali.

The Mastansir-ul-Mulk made very heavy assessments at the time of letting the contracts, and there was some doubt at first whether the contracts made would be realised. This official is said to have severely taxed every source of revenue and himself counted the shops, mills, Saiyáds, gardens, etc.; many of the allowances to Mullahs and Saiyáds have been withdrawn or reduced. His assessment has since been received and is given in Appendix 41.

## APPENDIX 25.

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- The Great Flood of 1885 in the Faráh Rúd—The flood in the Rúd-i-Bandukí Juwain—The flood in the Rúd-i-Kharika—The flood in the Naizár of the Faráh Rúd—Prices after the flood—Estimated flood volume.
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## APPENDIX 25.

*The Great Flood of 1885.*

The marks of this flood have been recovered and the volume that flowed at the height of the flood has been calculated at many places from Rudbar to Kala-i-Guwak; the results shew that a flood of between 600,000 and 700,000 cusecs came down the gorge of the Helmand; over 1,10,000 cusecs of this passed down the Trakú channel; further down the river some water escaped towards Palangi and Paisáf, leaving the river near Dam-i-Kálán; in spite of this escape 400,000 cusecs, at least, must have passed at the height of the flood to the Northern Hámún past the Band-i-Seistán; whereas in 1903, which was itself a year of great flood, only 70,000 cusecs reached the Band-i-Seistán at the height of the flood and no water escaped from the main channel anywhere up the river.

The winter\* of 1885 was a well known wet year on the frontier. Mr. W. A. Johns, Consulting Engineer for Railways, who was the Railway Reconnaissance Officer on the Mission, writes that he clearly recollected the year; he was building that part of the Hurnai line that is near Baba-Kachh; the floods were frequent, and he was always having his works upset by them. The biggest flood came down between the 1st and 7th of April and established a record in floods on the Nari river. There had been general rain that week all over Balúchistán and Afghánistán. March had been on the whole dry, though there had been floods in January and February. At Sharigh 17 inches of rain was recorded that spring against an average of some three inches. Mr. Johns is confident that the big flood on the Helmand occurred about the 7th of April 1885.

The Russo-Afghán Boundary Commission passed through Seistán in the previous October travelling from Khwája Ali down the river past Nad-i-Ali and thence through Khwája Girak round the Puzák Hámún. At the end of December 1885, Mr. Merk brought a party back this way to Chahárburják and there bid good-bye to them. On his return journey he took advantage of the ample supply of water left by the flood in the Rúd-i-Trakú to travel down that channel and crossing the Sar-i-Shela at the Gardán Reg ford went round the Hámún to Bahring and thence to Bandan.

The late Khán Bahádur Shaikh Mohi-ud-din made his 8 miles to the inch survey of Seistán just after the flood. He was able to make a most complete survey

\* At Quetta there was no rainfall in November or December 1884, though more than usual in July, August and September, but in 1885 there was the following rainfall:—

Month.	In 1885.	Average of 21 years, 1884-1904.
January	6'37	2'06
February	2'13	1'93
March	3'84	1'89
April	5'08	1'02
May	2'05	0'51
Whole year	20'84	9'45

of the *Dasht*, because there was water all along the Rúd-i-Trakú left by the flood; rain water also had collected in large volume at all favourable places. The Khán Bahádur's 8 miles to the inch map of this desert tract is most complete and

valuable. He gave me great help in my enquiries about this flood made in June 1903.

The date of the flood, and the general state of the country after the flood, has been very completely fixed by our own men, and all that the Balúchis, who had "experiences" in that flood, say can be verified from Mr. Merk's diaries published in one of the volumes of the records of the Intelligence Branch with the Afghánistán Boundary Delimitation Commission.

The flood reached Rudbar about midday and Sardár Muhammad Raza

The flood in the valley.

Khán sent off a sowar at once to warn the people down the river; the sowar reached Bandar-i-Kamál Khán at sunset just as the flood arrived, so that the flood entered Seistán during the night. The villages in the valley lost the grain that was in pits in the ground, and much of the property that was in their houses, but they did not lose much, if any, life, because the flood

\*An eye-witness said it rose 4 feet in 15 minutes. passed down during the day. The flood rose suddenly\* on a river that was already in flood, perhaps as great as that of May the first 1903; the low lying tamarisk covered lands were all quickly submerged and the water rose above the top of the tamarisk. The river is said to have reached its highest level at midnight and remained so till the next evening, when it began to subside and in three days the level had fallen six feet: on the third day another flood came down; but it did not rise so high as the first flood; this flood went down about six feet in two days. From the 7th to the 10th day after the flood the stream down the Trakú channel was fordable and soon after became dry, for seven days it was too deep to be crossed.

The level reached by the flood waters was about 15 feet higher than that reached by the flood of 1903 in all places up the valley from Bandar-i-Kamál Khán to Rudbar. At Kala-i-Guwak, where the flood began spreading out over the delta, the level of the water was 7 or 8 feet higher than that reached by the flood on the first of May 1903. At Rudbar the water rose to the bank of the old Gurshasp canal noticed by Bellew and this Mission, and covered the site where the camps of all the Missions that have been down the valley have pitched. The two forts at Rudbar, described by Bellew and by the Mission of 1884, were destroyed and the fort of Sardár Kamál Khán at Bandar was also very much damaged. The flood reached the foot of the wall of Kala-i-Madar-i-Padshah. At Kala Ján Beg the water was about one "Sar" deep; that is the height of a man, on the level open plain on which our camp was pitched. At Kala Roden the water reached the canal bank and submerged the crops, but some of the crops were afterwards reaped. At Kamál Khán's Fort the river escaped down the Trakú trough, the stream flowing 8 or 9 feet deep and half a mile wide with a volume greater than that which came down the river in the height of the flood of 1903, and as already said this stream flowed for about two weeks being unfordable for one week. The Akhanzadá Fakir Muhammad said, that had it not been that the water was so heavily laden with silt that it could carry no more, it would have scoured out the bed of the Trakú channel and established a permanent stream in that long abandoned trough. At Dak-i-Dila the water passed into the Sena Rúd, but near the head of the Sena Rúd there is an ancient canal whose banks formed a high and strong bar, and the water did not rise over these banks but flowed in the canal and spread over the lower lying parts at the head of this trough and eventually drained back into the river. North of Kala-i-Fath near Dam-i-Kalán the water escaped to the east by an ancient trough and filled up the large area of *bád kanda* or wind scour that lies between the present cultivated valley and the sand-hills of the Sar-o-tar desert; the water did not rise high enough to damage any ruins.

Near Kala-i-Guwak the flood found its way down an old canal that is cut through a gap in the *Dashit* and flowed out into the tract covered with sand-hills. The water also found its way by old channels along the Zarkan and Zorkan towards Lashkaran and Shoro. The water extended to the small culvert south of Kala-i-Kurdo ruin. It reached Chakhánsúr Fort, and Aliabad, a small village to the south of Chakhánsúr, was destroyed. Somewhere near here the nearly still water of the Hámún must have been reached.

The Hámún-i-Puzák is said to have risen suddenly by four feet. Many graziers were overtaken in their huts on the *lurga* and only escaped with difficulty themselves, and lost most of their cattle. The highest part of the Lurg-i-Takht-i-Sháh and Lurg-i-Ziri near Boundary Pillar No. 70, and the many high *tappa* to the south of Takht-i-Sháh, just shewed above the water like small *kula*, i.e., the felt hat worn by the Seistáni.

*Tutin* began to work from Shela-i-Dehno to Tappa-i-Jumalika about 20 days after the flood. The Lurg-i-Takht-i-Sháh did not appear till four and half months after the flood, that is, until the strong wind had blown for about 40 days.

The flood of 1895 opened up a new *shela*\* to the south of Pokuk which destroyed old Jahánábád known to Ferrier and Bellew. A large number of cattle and some lives were lost in the Míánkangf (see Appendix 30, Biography of Gulmir). A *shela* on the east bank of the Helmand near Burj-i-As also did much damage in Afghán Seistán and was only closed with difficulty later on by the energy and skill displayed by the Akhundzada and Dádí, Kadkhuda-i-Kalán. The old village of Deh Saiyád was destroyed and the people only saved their lives by escaping to a *tappa* near by; here they remained several days till the waters subsided. There was much loss of human life as well as great destruction of property in animals, cultivation and huts.

In the Rúd-i-Seistán tract the water did much damage to crops and destroyed grain in pits; the City is said to have been saved by the energy of the Hashmat-ul-Mulk, who built an embankment to protect it from the water of the Rúd-i-Seistán. Much damage was of course done to the villages near the shores of the Hámún from the extraordinary height to which the level of the water in the Hámún reached.

The effect of the flood on the Hámún-i-Sábari has been described on page 505 of Appendix 23. The Hámún filled rapidly and flowed off towards the Sar-i-Shela, which it is, variously, said to have reached in from 4 to 10 days† after the flood that came direct down the Trakú channel. Kundar, Tappa-i-Asak, Tappa-i-Khak and Tump-i-Mir Dost were surrounded by water. The flood waters nearly reached Hauzdar, but not Macchi. The water was about three feet deep on the road (Ráh-i-Muksir) across the head of the Sar-i-Shela from Tump-i-Mir Dost to the hills.

The flood down the Trakú channel was observed by a large number of Balúch flock-owners, because the extraordinary heavy rains of the winter had filled the water pools and caused the shrubs to sprout at all the *nawar* (enclosed basins) on the *dasht*, and many of them had moved out to good places along the Trakú trough and were living there preparatory to going to the hills a little later. The flood water is said to have reached Gina and Adáli by the next day; the main body of the water went down the big channel going to Ramrúd, and from there past Cháh Saif-ud-din Nawar and thence past the Gumbad-i-Liddi, where it fell into the Sar-i-Shela by the big conspicuous old channel which one sees to the east of the trade route. The Balúchis say that no water from the Trakú-Rúd went north of Girdi Cháh to the inundated area above the head of the Sar-i-Shela, but all flowed into the Shela near the Gumbad-i-Liddi. The sand-hills prevented it spreading south. The tract of country around Girdi Cháh was under water. Ramrúd, Naluki, Nawar Saif-ud-din, Adáli, Kachauli and Liddi stood up like islands they say.

As already stated, the waters from the Northern Hámún *via* the Kuh-i-Khwája are said to have reached the Sar-i-Shela from 4 to 10 days after the flood down the Trakú Rúd arrived at the Sar-i-Shela.

\* This is said to be the original beginning of the Rúd-i-Parádn, that part north of Jahánábád has existed since this time.

† These times may or may not be accurate, but the accounts of all eye-witnesses agree very closely. Mr. Merk was told that the Hámún filled in 20 days.

The Sar-i-Shela ran full level with the surrounding country, the depth of the flowing water was over 30 feet, the width about 1,000 feet and the discharge at the height of the flood about 1,40,000 cusecs, that is, twice the volume of the Helmand at the height of the big flood of 1903.

The Sar-i-Shela.

About 15 days after the flood came down Edu, Pahlawan, a celebrated character, still living near Saindak, crossed the Sar-i-Shela at the Gardan Reg ford, a short distance upstream of the newly demarcated boundary; he had with him ten men and two camels. Five days after Amal, an influential flock-owner, crossed at the same place with twenty men and five camels. Amal says it took them three days to get across; they made a *sal* or raft of about 20 inflated skins which could take about 5 men across at a time: they swam the camels over, buoyed up in the usual way with inflated skins. By this time the water in the Sar-i-Shela had fallen 2 feet; when Edu crossed, the flood was still at its highest level. About three weeks later Amal came back again and found that the flood had subsided to about 6 feet below its highest level. Amal says he came again from the hills three months after the flood to reap the melons he had sown on the Helmand; he was just able to ford at the crossing near the Gumbad-i-Liddi which is 5 miles above the Gardan Reg crossing previously referred to. From the Sar-i-Shela to Girdi Cháh a wide expanse of water stood which could not be crossed because of the many deep *shela* that intersected it. The fords at Sháh-i-Mardan and Guzar-i-Shamshiri further down the Sar-i-Shela were also fordable.

In November he had occasion to cross again, but a strong\* wind was blowing and he was delayed on the banks of the Sar-i-Shela three days till the wind stopped and the water became fordable, even so it was up to the bellies of the camels. This state of affairs continued to the end of the next flood season. The people say that this flood enlarged and deepened the Sar-i-Shela at its head, so that since that date the floods flow off from the northern inundated area earlier than they formerly did.

The Gaud-i-Zireh filled up to a depth of about 30† to 34 feet, ascertained from the flood marks at the Oruk spring. The

‡ The Gaud-i-Zireh.

Sar-i-Shela has a delta in the Gaud-i-Zireh, and the water flowed through this delta by many channels. It is probable that when the flood first arrived it overpowered all the channels, and flooded the delta, as the Máldárs who arrived first seem to have had great difficulty to find suitable places to sow millet and melons. Some say that no sowings could be made at all in 1885. As the water rose in the Gaud-i-Zireh a return flow came along the scarp which makes the north-western boundary of Gaud-i-Zireh to Fakir Ganj Nawar, where there is a big depression in the *Dasht* or plateau which was filled to a depth of 12 feet. This water seems to flow back along a depression that must exist between the toe of the talus or fan and the foot of this scarp that ends the *Dasht-i-Zireh* of our maps.

This scarp is called by the Balúchis the *Dasht-i-Paskunaki*. Paskunaki has the same meaning as our word "back water". All Balúchis agree in saying that the Paskunaki does not fill till the water has first risen in the Gaud-i-Zireh, so that it seems certain that the arms of the Sar-i-Shela extend far out into the Gaud-i-Zireh and first deliver the water to some deeper depression from which it returns to Fakir Ganj Nawar, which is in itself a deep depression.

There are several *Shela* which leave the Trakú trough and cross the fan on its southern bank and end on the margins of the Gaud-i-Zireh depression; the principal is the Rúd-i-Kuchk or Johns' Nala, but there are others too: these are ancient distributaries of the Helmand; when they are in flow after rain they must bring a large quantity of silt into the depression. So that it is most probable that the Gaud-i-Zireh area is divided up into separate smaller depressions by ridges just as the Northern Hámún area is now known to be. From the descriptions the Balúchis give of the circulation of the flood waters in the depression it would seem that the Paskunaki bears the

\* Mr. Mark crossed on the 24th December 1885 and noted this fact. From the dimensions he gives a discharge of 3,000 cusecs was flowing at the time, no wind blowing.

† The Balúchis say the water reached the Ziarat of Pir Kisi, but as none of us have been there the full force of the expression cannot be explained.

same relation to the deeper part of the Gaud-i-Zireh that the Hámún-i-Puzák bears to the Hámún-i-Sábari; and that the two depressions are separated by minor depressions and Shelas just as is the case of that Naizár that lies between the two above-mentioned Hámúns.

An interesting detail given by the flock-owners, who in large numbers took their flocks to the shores of the Gaud-i-Zireh and remained there about three years or more, is that the Ráh-i-Shamshiri, which crosses the Sar-i-Shela by the Guzar-i-Shamshiri, is a high *lurga* which was not covered even in this very high flood. The flock-owners put their *palas* on the banks of the Shela-i-Paskunaki. While the Gaud-i-Zireh was full the road to Sháh-i-Mardán, and the road to

\* Or Chah-i-Gumbád, or Chah-i-Sar-i-Shela. Kirtaka that crosses the Sar-i-Shela at the Gumbád-i-Sháh\* (where General MacGregor (1877), Colonel McMahon (1896) and Colonel Yate (1894) saw the Sar-i-Shela) were under water.

Another interesting detail about this flood is the flood mark on the Dasht-i-Paskunaki. I examined this and found two marks—one about 6† or 8 feet lower than the other. The upper mark was eagerly pointed out as that of the flood of 1885; it was near the toe of the cliff; the lower mark was a little way down an old beach; the ravines in which were filled up by the silt of this flood mark, and I thought that this would be the mark of a later flood, but the Balúchis said that the waters of the Gaud-i-Zireh subsided more or less rapidly to the lower mark and then remained standing at the lower mark for some time, perhaps kept at this level by the good floods of 1886 and perhaps 1887. The matter is of interest and wants further study.

*Changes made in the bed of the river at Bandar-i-Kamál Khán by the flood of 1885.*

During the height of the flood about one-sixth of the supply escaped down the Trakú channel; the volume in the river was between 600,000 and 700,000 cusecs; of this about 110,000 cusecs escaped down the Trakú channel. The escapage continued for two or three weeks before it finally ceased to flow. As has already been said, the flood water was so heavily laden with silt that the old Akhundzada Fakir Muhammad attributes to this circumstance alone the fact that the river did not scour out a new channel for itself down the Trakú trough. When this large decrease in volume took place in water so heavily silt laden a large deposit of material was to be expected below the outlet. When Lala Thakur Dass was levelling along the river in September 1904, he found a pool 25 feet deep about one mile down stream of the village of Deh Dost Muhammad (Ghulam Haider). Enquiries among the Balúchis elicited the information that a large deposit of material occurred here in the flood of 1885, so that a big rapid was formed downstream of the deposit and this pool was the result of this rapid.

The Balúchis say that before the flood of 1885 the river hugged the left bank at Bandar-i-Kamál Khán. The present bed was occupied by the green fields of Deh Ghulam Haider. During the flood the river under-cut and brought down a large amount of material from the cliff on the right bank and this, the Balúchis say, caused the obstruction that raised the bed. But it is more probable that the material was deposited, because the velocity was reduced when so large a part of the volume escaped down the Trakú channel.

The course of the channel before 1885 is shewn on the sketch map of the Irrigation Party on the 2 inches to a mile scale. At that time the river flowed under Kala-i-Mir, and the present bed was cultivated by the people of Bandar-i-Kamál Khán. The people say that before 1885 the ford used to be opposite to Sardár Kamál Khán's Fort, and the direct road across the ford lie between the Fort and

† The exact difference of level between these marks on the southern shore of the Gaud-i-Zireh at Kala-i-Siah close to the wells at Gumbád-i-Sháh is 7 feet, viz., higher flood mark reduced level 1307.90, lower flood mark reduced level 1,500.90.

the village of Sardár Ghulam Haidar; there is a ramp at this place; the ford is now about a mile further up the river at the village. It is probable that Sardár Kamál Khán and Sardár Ghulam Haidar built their villages on the ford: it is usual to find villages on either bank of a good ford. The people say that the deposit below Bandar-i-Kamál Khán is now gradually being lowered and each year the fords at the Gumbad-i-Nadir are less serviceable. In September 1904 the ford at Karodi was even better than that at Bandar-i-Kamál Khán, but this was no doubt due to a chance spreading out of shingle at that rapid.

The Balúchis gave many illustrations to shew that the bed of the river here had been raised by the flood of 1885. They say that the command of the Kala-i-Fath canal on the right bank and the Kala-i-Kubna canal on the left bank, which take out some distance above Bandar-i-Kamál Khán, have improved. The depth of excavation in the former canal has been decreased by two *sar* (10 or 12 feet) they say. They also say that the shingle bar at Puza-i-Máshi, where the head of the Chahárburjak canal is situated, has been raised and that the Band-i-Puza Máshi has not been built since 1885, except in 1902 when the river dried up and then it was built only to catch all the water coming down the river. Here too they say the canal bed has been raised two or three *sar*. Want of time did not permit us to investigate the height the bed has been raised.

*The great flood of 1885 in the Faráh Rúd.*

The Rúd-i-Faráh has already been described in Appendix 33; this river also came down in great and extraordinary flood, so much so that the big embankment across the mouth of the old trough known as the Banduki-i-Juwain was carried away and a volume of water, some say even greater than that which went down the river, passed into the Púzak Hámún, which, it is said, was converted by the enormous quantity of silt brought down from the deepest depression of all the Hámúns to one of ordinary depth. The river also overflowed on its right bank down the trough known as the Khush Rúd or Rúd-i-Kháriká. Wazirat south of Kala-i-Káh was destroyed they say.

The graziers, who were living near Tappa-i-Machatak (Musjidak), say that they escaped to the higher lands near Salián, and that there was four feet of water on the road that we used between Tappa-i-Machatak and our camp at Dahan-i-Faráh Rúd. The flood marks have been traced and mapped. The sheet of water covered all the grazing and the water was too deep for *tutin* to work. The cattle\* were removed to Juwain where they fed on a luxuriant growth of *kirta* grass until the water subsided and uncovered the slopes, so that the *bunnum* grass shot up in great luxuriance. The cattle fed on *bunnum* and *tuqz*, and the people on water melons which were grown in so great abundance that they were left to rot on the land. This food supply was a great boon, because the flood destroyed so much of the crops that the price of wheat rose from four *man* Seistáni a *kran* to 40 or 30 *sir* Seistáni a *kran*. This high rate continued till the next harvest, but even then the rate was 3 *man* Seistáni a *kran*.

With the flood water, corpses of men and animals as well as the *palas* of huts of the people came down the river. A large boat that would hold 50 men belonging to Sardár Muhammad Yusuf Khán of Faráh was carried down the river and never found again.

We took sections of the river as far up the channel as we went, *i.e.*, to opposite Pesháwarán and from these sections and the flood marks made an estimate of the maximum flood volume that came down the river in 1885; it was from 65,000 to 70,000 cusecs, just about double that which is estimated to have passed down in 1903. Eye-witnesses say a volume equal to this went down the Rúd-i-Banduki-i-Juwain and a volume equal to that which normally flows in the Rúd-i-Seistán (say 1,700 cusecs) passed down the Khush Rúd (Rúd-i-Kharika). So that we may estimate the maximum volume of this river in the great flood of 1885 above Lash Juwain at from 125,000 to 150,000 cusecs, or about one-fourth or one-fifth

\* It is said that the Governor at Lash Juwain charged one *kran* per head for this grazing from the well-to-do, and half a *kran* from the poorer cattle-owners.

of that which came down the Helmand. In 1903 a much smaller volume of water spilled down the Rúd-i-Banduki-i-Juwain, and it is probable that the maximum flood of 1885 was 4 or 5 times that of 1903.

*The great flood in the Harud Rúd in 1885.*

It is said by intelligent men, who were then living at Kala-i-Káh, that the sowing of wheat in 1884-85 was done from water from *karez* and the water from the river came very late, and much of the wheat suffered for want of water. The river rose in moderate flood before Naurúz, but no damage had been done. The big flood after Naurúz came very suddenly and carried away all the standing wheat and destroyed about 60 villages, around Kala-i-Káh, and damaged all the *karez*. Half the village of Islamábád was swept away, and for one month no one knew who had escaped; the people had scattered to high places for refuge. After about one month the fords began to appear and the people collected; after two and a half months there was about four feet of water at the Kabrak Ford. From the Harud Rúd Delta to the Sufaid Kim was one sheet of water.

A new Shela is said to have formed leaving the river above Kala-i-Káh and forming two other Shelas, Gazindan and Mathokh, rejoined the river below Kala-i-Káh.

*Flood discharges in 1885.*

The sections that we took for estimating the flood discharges were situated below the off lake of some important *shela*, which we afterwards learnt had flowed in the year 1885 and, therefore, the maximum discharge of the great flood can only be conjectured. To guide us in our estimate, some Balúchis were sent to measure the section of the river above the Kuhna Rúd-i-Harud (*vide* Appendix 35); from these sections a calculation of the flood volume of 1885 gives 35,550 cusecs, against 14,234 cusecs for 1903, and 1,874 cusecs for 1904. In the Helmand River, we know that the maximum flood volume of 1885 was quite 6 to 8 times that of 1903, and from the accounts of eye-witnesses the flood on the Harud Rúd was just as extraordinary. However, we may guess the maximum flood volume of the Harud Rúd to have been on that occasion about 50,000 cusecs, or about  $\frac{1}{10}$  or  $\frac{1}{12}$  of the volume of flood that came down the Helmand on the same occasion.

The great flood in the *Rud-i-Bandan* is described in Appendix 34 on that river, and need not be repeated here. Unfortunately it did not occur to me to take a section of this stream, but this omission can easily be rectified by any one who reads this, and who is resident in Seistán. The hills are close by, so the floods are sudden and great.

*The great flood of 1885 in the Rúd-i-Khash.*

We do not know much of this river; in Appendix 32 all the information collected is given. It is said that the old beds down some ancient troughs flowed, but we do not know with what volume. To arrive at some figures to guide us in our conjectures as to what the flood volume was in 1885, some

Estimated volumes. Balúchis were sent to measure the volume of the river flowing at the time and to measure a flood section. With this data we estimate that about 13,000 cusecs passed Aleli in the great flood of 1885, or about double the volume that passed down in 1903, and four times that in 1904. It is noticeable that the flood volume of 1885 in the Faráh Rúd should have been about four or five times that of 1903, whilst that in the Harud Rúd is only about three times and that in the Khásh only double the maximum volume of 1903, whilst that in the Helmand River was 8 or 10 times. But it must be remembered that on the Helmand River all the measurements were made by ourselves, whilst on the Faráh Rúd, though we made the measurements, we did not go far enough up the river to measure the spill down the Banduki-i-Juwain, and the volume of this is so large as to upset the figures if the Balúchi estimate of its volume is wrong; the Harud and the Khásh were measured only by the Balúchis.

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APPENDIX 26.

CONTENTS.

VIDE CHAPTER XLIX, PAGE 315.

*The years in which floods have reached the Gaud-i-Zireh.*

**Floods that reached the Gaud-i-Zireh described**—The number of times in 31 years that the Gaud-i-Zireh received considerable volumes of water—The years in which the Sar-i-Shela flowed.

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## APPENDIX 26.

VIDE CHAPTER XLIX, PAGE 315.

*The years in which floods have reached the Gaud-i-Zireh.*

The detailed description of the phases of the river given in Appendix 24 shows that in the year 1830 there was a big flood, nearly as great as that in 1885, which must have filled the Gaud-i-Zireh. Our information about the river after that is only at long intervals and meagre, till we come to the sixties. In this period the advent of the Persian Government in Seistán and Major St. Johns' observations give us most of the material facts we need to know. About the year 1865 a big flood came down that must have nearly, if not quite filled, the Gaud-i-Zireh, not of course to the same depth as the great flood of 1885 afterwards did. It is from this year our record really begins.

The years of drought and famine which extended all over the world began then, so that water did not again reach the Gaud-i-Zireh till 1877; the Sar-i-Shela flowed and probably a large area of the Gaud-i-Zireh was covered with water. Sir Charles MacGregor and Captain Lockwood visited this desolate region in the February before the flood came down. The depression was dry.

In 1878 the Sar-i-Shela is said to have flowed a little.

In 1880 the Sar-i-Shela flowed and more water probably reached the depression.

In 1882 the Gaud-i-Zireh is reported to have become dry again.

In 1885 the great flood came which filled the Gaud-i-Zireh and established a record.

In 1886 water still overflowed to the Gaud-i-Zireh.

In 1887 the Sar-i-Shela occasionally flowed, but it is said that no water reached the depression.

In 1888 water may or may not have flowed in the Sar-i-Shela; probably none reached the depression.

In 1891 and 1892 water only entered the Sar-i-Shela.

In 1894 Colonel Yate and Major Massy visited the Gaud-i-Zireh and a large lake still existed.

In 1896 Colonel McMahon visited the Gaud-i-Zireh in April and the area of water, he saw in the depression, is that shewn on the  $\frac{1}{4}$ " map then prepared.

The flood that made the present Rud-i-Parián came down the river that spring and water probably reached the Gaud-i-Zireh, because the year 1895 was also one of big flood and the Hámún was filled by it.

In 1898 Khán Bahádur Maula Bakhsh records that the floods only reached the head of the Sar-i-Shela. The dry years then set in and culminated in a world-wide drought. In 1903 this great drought ended in a year of abnormal rainfall which caused so big a flood that the Hámún overflowed down the Sar-i-Shela, but the water was only sufficient to fill pools in its bed; none accumulated in the depression.

When we became acquainted with the Gaud-i-Zireh early in 1903 it was dry; no certain information has been obtained of the exact year that this happened, but there was water enough in the depression when Colonel McMahon saw it to last two years and perhaps four, and the probability is that the Gaud-i-Zireh eventually dried up about the year 1898 or 1900. We have reason to believe that the rate of evaporation of the water of this Hámún is only about five feet a year, while that on the Hámún-i-Sabari may be seven, and on the Kúh-i-Khwája Hámún ten feet a year.

The 31 years that elapsed from 1872 to 1902 began and ended with a great drought; during that period there was one extraordinary flood which filled the Gaud-i-Zireh to a record height. Previous to this great flood in 1877, and subsequent to it in 1896, considerable volumes of water must have reached the Gaud-i-Zireh.

During this period of 30 years the Sar-i-Shela is said to have flowed in the following years (including the years already mentioned) :—

The years in which the Sar-i-Shela flowed.

1877—*Sel-i-Kalán*.

1878—*Kálabi*.

1880—*Kálabi* or perhaps *Sel*.

The Gaud-i-Zireh became dry in 1882.

1885—*Núh-i-Kalán*.

1886—*Sel*.

1887—*Kálabi*.

1888—*Sel*.

1891—*Sel-i-Kalán*. The Hámún had become very low.

1892—*Sel-i-Kalán*.

1896—*Sel-i-Kalán*. The year 1895 was also *Sel-i-Kalán* and filled the Hámún.

That is in 10 years\* out of the 30 the Northern Hámún was full to overflowing. See the Statement at the end of Chapter XLIX.

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\* As a matter of fact, it was full, but did not overflow in the years 1879 and 1881 also.

## APPENDIX 27.

## CONTENTS.

## GAUD-I-ZIREH.

*Cultivation, Grazing, Salt, Roads and Sweet Water.*

Gaud-i-Zireh in the flood of 1877—*Shora Gas*—*Lees Gas*—*Tirmi* or the sugar yielded by tamatisk—Price of *Tirmi*—Share of Sardár Muhammad Umar Khán.

Gaud-i-Zireh in the flood of 1885—Flock-owners in the Gaud-i-Zireh—*Tirmi* after the flood of 1885—Melons and millet grown on the bed.

Salt in the Gaud-i-Zireh and Sar-i-Shela—Roads across the Gaud-i-Zireh—Wells in the Gaud-i-Zireh—List of the wells which give waters from two to three years after the Gaud-i-Zireh dries up—List of wells which always give drinkable water—Description of Cháb-i-Oruk.

## APPENDIX 27.

## GAUD-I-ZIREH.

## CULTIVATION, GRAZING, SALT, ROADS, AND SWEET WATER.

Notes collected by Lala Thakur Dass from Balúchi flock-owners.

N.B.—The personal knowledge of the Irrigation Party is confined to a survey made down the Sar-i-Shela to its end and to a visit to the Oruk Spring from Kala-i-Madar-i-Padsháh.

In 1877 some water reached the Gaud-i-Zireh after the spring floods, and filled up its deep portion down to Ziarat-i-Pir Kisri. The flock-owners went to the Gaud-i-Zireh in small numbers, as the water soon became brackish. But three years after Sál-i-Barf (1877) the tamarisk grew to its full height on the areas from which the water had receded. This kind of tamarisk the Baluchis call *shora-gaz* in contradistinction to the tamarisk which grows on the banks of the river and is subject to annual inundations. This latter is called *Lees Gaz*.

The one variety is called *shora gaz*, because it is weak and brittle; and its branches big or small can be broken by the hand without any very great effort, while *lees gaz* is strong and hard and cannot be so easily broken. Unfortunately no sample of the *shora gaz* was collected, but the Consul at Seistán would get samples if asked.

The *shora gaz* of the Gaud-i-Zireh yields in very large quantities a kind of sugar, called *tirmi*. The Máldárs who had gone there collected a good deal of it; and a large number of men from Bandar-i-Kamál Khán and Rudbar also went to the Gaud-i-Zireh for this very purpose.

Three years after the flood of 1877, i.e., in 1880, the *shora gaz* began to yield *tirmi*. People cut off the branches of the tamarisk growing in the bed of the Gaud-i-Zireh, and dried them, when the branches of tamarisk were completely dry; they beat them into small pieces and continued beating till the *tirmi* was separated; it is a very hard substance that grows on the tamarisk branches in round lumps equal in size to a walnut or even smaller. When beaten with mallets along with the branches, it does not become powder; but is broken into pieces, the size of peas.

One strong man could collect daily 8 *man kru* or 4 *man* Seistání (48 lbs.) of *tirmi*. The price of one *man* Seistání of *tirmi* in those days was three to four *kran*. This was, therefore, a very good and paying job.

Sardár Muhammad Umar Khán, son of Sardar Kamál Khán, Sanjaráni, of Bandar-i-Kamál Khán, took one-fourth of all the *tirmi* collected by the men; and he filled a small *gambad*\* with all that fell to his share.

In the great flood of 1885 the Gaud-i-Zireh was filled to a level never remembered before or since. The water that poured into the Gaud-i-Zireh in 1885 and 1886 did not completely dry till about 1898; and therefore a large number of sheep-owners settled themselves here. These men only left the Gaud-i-Zireh in the spring season when they took their flocks to the hills. The flockowners remained on the Gaud-i-Zireh till 1902; till then there was plenty of *khar* (camel-thorn) and other grazing for the sheep and goats; the remnant of the growth after the flood of 1885. Each year the rains, even though slight, washed the shrubs; and the sheep and goats ate it well. In 1902 there were no rains and the vegetation, too, ceased to grow. The reeds too completely dried up and had died in most places by the year 1902.

Máldárs (flock-owners) in the Gaud-i-Zireh.

Gaud-i-Zireh in the flood of 1885.

Price of *tirmi*.

Share of Sardár Muhammad Umar Khán.

\* A domed room that might contain from 500 to 1,000 cubic feet.

Five years after the flood of 1885 the tamarisk in the Gaud-i-Zireh reached its full size and yielded *tirmi*. This time Sardár Muhammad Umar Khán did not take a share of what was collected.

After the flood of 1877, people did not go to the Gaud-i-Zireh in very large numbers. The water soon became undrinkable; and only those men went there who found it paying to collect *tirmi*. But after the flood of 1885, as soon as the water began to recede, people sowed extensive crops of melons and millet on the slope\* or the shore left dry by the water. Every year till 1892 the Balúchis sowed melons; and they say that the soil in the bed of the Gaud-i-Zireh is so fertile and suitable that the melons grown were larger in size and better in flavour than those grown in Seistán. The yield too from the seed was much higher than in Seistán.

There is no salt tax in Seistán. Every man can take into Seistán as much salt as he likes. Salt is found in very large quantities at the following places in the Gaud-i-Zireh:—

- (1) Near Gambad-i-Liddi, at the junction of old Shela-i-Trakú with the Sar-i-Shela, there is a *kurg* or pit in the bed about 100 feet long by 50 feet broad. The thickness of the salt layer is about 1½ feet. This salt is very pure; people carry it into Seistán, as this place is the nearest, and water can be got from the sweet wells at Cháh-i-Saif-ud-Din Nawar, Girdi Cháh, etc., which are not far off. The building parties on the boundary pillars passed this way and collected much excellent salt. My syces collected enough for my horses for 6 months. These pools were replenished in 1903, and while the Sar-i-Shela was flowing were sweet. But when the flow stopt the water became undrinkable within a week; up to May 1905 the water had suffered much less diminution than would have been expected. The pools are in a channel 30 feet deep and are themselves very deep. Evaporation too is, perhaps, not so great as in the Hámún.
- (2) In Nawar-i-Fakir, there is about 9 inches of salt. This is not such good salt, as it is mixed with a little earth.
- (3) In the bed of the Sar-i-Shela where Ráh-i-Kirtaka† crosses it, the depth of the salt is about 1·25 feet. The salt is pure and quite free from foreign matter and pure white. Under the salt is hard soil.
- (4) At the place, where Ráh-i-Kachau from Bandar-i-Kamál Khán leaves the high *Dasht*, there is a large area under salt. This salt is not good, as the washings from the *Dasht* bring earth which mixes with the salt.
- (5) The deep parts of the Gaud-i-Zireh are all covered with salt. No one goes there, as salt can be obtained readily from other places more easily to get to. On the line of levels from the Oruk spring to the central deep part of the Gaud-i-Zireh a wide belt of salt was crossed. The depth of this salt was 1 to 1½ feet. The salt, however, was not very good, as it contained some earth.
- (6) Large numbers of *kafila* are said to come from Afghánistán to Sultán Pir Kisri in the cold weather. The salt at this place is good. The water of the Robat Nalla at this place is said not to be drinkable and the *kafila* take water with them from the Helmand River. Captain Webb-Ware crossed from Rudbar in February 1903 and his diaries will give personal observations on this point.

\* I think this cultivation must have been confined to the alluvial fan of the Sari-Shela. All the old melons and millet stalks I saw were on this fan.

† This is the ford where the road from Bandar-i-Kamál Khán to Kirtaka crosses the Sar-i-Shela at the sweet wells, also called Gambad-i-Cháh, because the 5 tombs mentioned by General MacGregor are near by. In 1903 we saw no signs of salt here. The water was very good. But Colonel McMahon describes it as pure brine in 1896.

There is only one road across the Gaud-i-Zireh depression itself and that is near its eastern extremity. This road goes from the Oruk spring to Amir Cháh. The traveller takes water from the Oruk spring. This road leaves the river near Kala-i-Madar-i-Padsháh which is only 8 miles from the edge of the Gaud-i-Zireh at the Oruk spring. The road from Rudbar to Amir Cháh passes through the Ziarat-i-Sultan Pir and so goes along the eastern boundary of the depression. The road from Oruk to the Ziarat also goes along the eastern boundary.

The other three roads from the Helmand to the Balúchistán and Persian hills are Ráh-i-Kachau, Ráh-i-Sháh-i-Mardan and Ráh-i-Shamshíri. They all pass the western extremity of the Gaud-i-Zireh basin and cross the Sar-i-Shela at well known fords where drinkable water can be got.

#### *Wells in the Gaud-i-Zireh.*

When the water of the Gaud-i-Zireh becomes undrinkable some can be got at the following places :—

Near Adira.

Cháh-i-Lal Muhammad in the bed of the Paskunaki.

Cháh-i-Shamsho.

Cháh-i-Nur Muhammad.

Cháh-i-Kulli.

Nawar-i-Fakir.

Cháh-i-Koi.

Cháh-i-Alam Khan.

Chah-i-Wali Muhammad Tutizai.

Terok spring three miles south-east of Oruk spring.

The water remains drinkable in these wells for about two years after the water in the Gaud-i-Zireh dries up. All, except the last, are in the vicinity of Nawar-i-Fakir, a place described on page 542 of Appendix 25 and shown on the Mission maps, to be ten miles to the north by east of Ziarat Sháh-i-Mardán. The wells have been marked tentatively from the description of the Balúchis on map No. XV among the Irrigation Party plans. We know little or nothing about these wells; the names indicate that the Gaud-i-Zireh is visited after the water becomes brackish and in fact till the grazing dries up.

The water at the following wells has always been sweet both before\* and after the great flood of 1885. The wells marked with an asterisk have been visited by members of the Mission; the others have been described by Balúchis; the situation and value of the latter is very uncertain—

\*Girdi Cháh.

\*Chah Saif-ud-din Nawar or Nawar Cháh.

Chah Muhammad Kushta in the bed of the Sar-i-Shela, about 6 miles below the point, where the boundary crosses. Zilladar Amir Singh went to look for drinkable water required to build boundary pillars, but the wells gave undrinkable water. There is a pillar here to mark the site where Muhammad, a free-booter, was slain.

\* It is very difficult to find out if these wells were as good as they are now before the great flood. The wells at Barri, Cháh Aladad, etc., have dried up and they probably owed their origin to the big flood. The Balúchis are confident that the wells near Girdi won't dry up. They say they are replenished from rain water.

Darajah, somewhere on or near the Sar-i-Shela.

\* Ab-i-Guzar-i-Shamshíri on the Sar-i-Shela.

\* The wells† near the Gumbad where the road to Kirtaka crosses the Sar-i-Shela.

Ab-i-Ahu or Jai-i-Shikari somewhere further down the Sar-i-Shela, south of Reg-i-Kumai, wherever that may be.

\* Oruk Spring.

\* Cháh-i-Oruk.

Oruk and Teruk are about 3 miles apart; the latter was dry in 1904 when visited by Lala Thakur Dass. Oruk is 8 miles south of Kala-i-Madar-i-Padshah on the northern edge of the Gaud-i-Zireh basin.

Oruk spring is called Oruk Pitok by the Balúchi. Details are given on the sketch map made by Lala Thakur Dass. The water trickles out from the side of a high vertical cliff of alluvial and is collected in small pot holes; in September 1904 only 17 gallons were got during the night; this is the autumn supply; in winter the supply would be more and in summer less. The water is sweet, but some care is required to prevent it from becoming brackish by contamination from the salt incrustations on the cliff.

Cháh-i-Oruk is near the above spring and is a well about 30 feet diameter and 20 feet deep; the water is brackish but drinkable. It is said that the well has lately been enlarged. Some Balúchis from the Sarhad started work to make a *karez* here in 1902 or 1903, but Sardár Atta Muhammad Khán of Chaharburjak turned them out and sent his own men, who have enlarged the well, but have not succeeded in bringing the water out to the surface of the ground that they wish to cultivate, although a water-course, some 600 feet long, has been dug. It was said that Sardár Atta Muhammad Khán intended to push on the work and do some cultivation. The cultivation would be done on the wash down of the cliff which is sweet; the salt lands begin about 5 miles from the Cháh-i-Oruk.

† This important water has no definite name, though the five *gumbad* (tombs) near by clearly mark its situation; the Balúchis with Sir Charles MacGregor (1877) called it Gumbad-i-Shah Máksúd; those with Colonel Yate (1894) Gumbad-i-Sar-i-Zireh; those with Colonel McMahon Gumbad-i-Shah and Kila-i-Sakáid. It is known as Cháh-i-Sar-i-Shela, Rábi-i-Kachsá and *Gasgan* (a place of tamarisk). Though the latter is perhaps a couple of miles higher up the Sar-i-Shela.

For Sir Charles MacGregor's Account see *Wanderings in Balúchistán*.

For Colonel Yate's see *Kharasan and Sistán*, p. 100.

For Colonel McMahon's see *Southern Borderland of Afghanistan*, Royal Geographical Society's Journal, Volume IX.

## APPENDIX 28.

## CONTENTS.

## DETAILED DESCRIPTION OF THE ROADS ACROSS THE INUNDATED AREA.

## LIST OF TWELVE ROADS ACROSS THE NAIZÁR.

*Roads across the inundated area lying between the mouth of the Khásh Rád and the Hámún-i-Pusák.*

The road *viâ* Khwája Robát—Description of the road by Major Maitland in 1884.

*Roads across the Naizár between the Hámún-i-Pusák and the Káh-i-Khwája.*

The road from Takht-i-Shah past Tappa-i-Kharan—Ráh-i-Mesh Kushi—State of this road in 1903—Rah-i-Shela-i-Dehno—Detailed description—Bifurcation of the road—The roads in 1904—The road the Mission made here in 1904—Ráh-i-Chashmáká—Detailed description—General Goldsmid's Mission, 1872—Road in March 1904 and in December 1904—*Tutin* cross the Hámún-i-Sábarí just south of the boundary.

The *Tutin* road *viâ* Chung-i-Shahbeg—Ráh-i-Sargazi-i-Jamal—Ráh-i-Nairez or Ráh-i-Teshakani—Detailed description—The road in 1904—The road in the great blizzard of 1905—Season at which the road is open.

Ráh-i-Chung-i-Daraz—Detailed description—Used by the Hashmat-ul-Mulk in 1904—Used for conveying limestone across the Hámún.

Ráh-i-Kundil Kháni—Ráh-i-Chargan or Ráh-i-Tiratki—Detailed description—The road in January 1905—Charges for *tutin*.

Ráh-i-Surkh Gazi—Rah-i-Gardowak or the road along the telegraph line—Ráh-i-Kuh-i-Khwaja.

*Roads round the southern end of the Hámún or inundated area.*

Difficulties in using *tutin* roads in high floods—The road south of the Kuh-i-Khwája—The Sar-i-Shela—The ford at the head of the Sar-i-Shela—The Sar-i-Shela unfordable in years of extraordinary flood—Fords on the Sar-i-Shela—Gardan Reg ford—The three fords east of the Gardan Reg ford—Sweet waters at the fords.

## APPENDIX 28.

*Detailed description of the roads across the inundated area.*

There are many roads across the inundated area, and a detailed description of each, as they were in 1903-1905, will be of interest. The details will shew that not only do the roads vary a great deal according to the state of the floods, but they also vary according to the position of the main stream for the time being. The information therefore cannot be used without reflection, but an intelligent study of it will help those who may have to discover the best road at some future time when the Naizár is in a quite different position.

The roads that will be described are—

- (1) The road by Khwája Girak.
- (2) The road by Takht-i-Sháh and Tappa-i-Kharan or Ráh-i-Mesh Kushi.
- (3) Ráh-i-Shela-i-Dehno.
- (4) Ráh-i-Chashmáká or Bak-i-Sahibdád.
- (5) Ráh-i-Sargaz-i-Jamál.
- (6) Ráh-i-Nai Rez, Pusht-i-Adimi, or Ráh-i-Teshakani.
- (7) Ráhi-i-Chung-i-Daraz.
- (8) Ráh-i-Kundil Kháni.
- (9) Ráh-i-Chargan or Ráh-i-Tiratki.
- (10) Ráh-i-Surkh Gazi.
- (11) Ráh-i-Gardowak, or Ráh-i-Paran-i-Soofi or Rah-i-Kucha, the road along the telegraph line.
- (12) Rah-i-Kuh-i-Khwaja.

*Roads across the inundated area lying between the mouth of the Khash Rud and the Hámún-i-Puzák.*

1. *The road via Khwája Robot and Khwája Girak.*—When the Helmand River delivered the greater part of its volume into the Naizár to the east of Takht-i-Sháh there was more difficulty in passing from the direction of Nad-i-Ali to the roads on the desert on the north-eastern shore of the inundated tract than there is now. The Afghan Boundary Commission passed this way round the inundated area and Colonel Maitland records that "the road we came along the edge of the Naizár is never absolutely closed by water, but about Khwája\* Girak people have to wade across the shallow arms of the Naizár when it is filled after the flood season. The whole area covered with reeds is usually under water from about the beginning or middle of March to the middle of May. The water then goes slowly down for two months and by the end of July is about the same height as we saw it." This was written in the autumn of 1884 just before the great flood of 1885. Much the same road was followed by General Beresford Lovett, R.E. (then Captain), in March 1872.

In 1903 the floods spread out far to the east of the route from Nad-i-Ali to Khwája Girak, and these roads were for a short time closed. But in February 1904 the Mission were able to go to the Puzák Hámún past Tappa-i-Talai almost straight across the Naizár to Ziarat-i-Hadira. Water only remained in the *chung* (pools).

\* A narrow Lutga (ridge) connects Khwája Robot and Khwája Girak and water seldom rises more than 20 feet on this. Deeper water is said to be met at Dahan Gaskari between Khwája Girak and Shaad (the gravel beach or shore of the Hámún).

The road from Kala-i-Kang through Khwája Robat, Khwája Gíraf and so along the eastern shore of the Puzák Hámún is a well known one, but of course is not as much used by Seistánis as the one by Takht-i-Shah. The information collected by Colonel Maitland is correct and up to date. The state of this road depends also on the floods of the Kásh and the direction which they take, but it is not probable that the road would now ever be closed for long, seeing that the main stream of the Helmand enters the Naizár so much further to the west than it did in 1884.

The important roads to Kandahar and Kabul up the Khásh seems never to be interrupted by floods as the inundated area can be rounded to the south if necessary.

*Road across the Naizár between the Hámún-i-Puzák and the Káh-i-Khwája.*

2. *The road from Takht-i-Shah past Tappa-i-Kharan, often called the Ráh-i-Mesh Kushi*, because the only difficult portion of the road is the crossing of the Shela-i-Mesh Kushi when it is in flood. This Shela connects the Hámún-i-Puzák with the series of *chung* at the tail of the Rud-i-Parián. It is a narrow shallow and slowly moving volume of water, which early in the flood season flows to the Hámún-i-Puzák, and when that is full the overflow comes back again by the same Shela.

In the big flood of 1903 the width of deep water on the Shela was about two miles; it was not fordable for loaded animals for about 15 days (3rd\* to 18th May) only; but *tutin* could not be obtained because the Saiyáds had not been able to secure any *tut*; none had been stored in the previous summer and the new growth had not had time to come on. But in normal years the Saiyáds maintain *tutin* here when the volume of water makes them necessary. In 1904 the depth of water on the Shela became 4 feet for a short time when the wind blew strong; at all other times it was fordable. *Tutin* were provided for those who preferred not to wade and wished to cross in comfort. Since the main volume of the river has discharged itself by the Parián mouth this has been the only road for loaded animals to the north across the Naizár. The road goes from Takht-i-Shah and the Shela-i-Mesh Kushi is crossed about five miles north of that place. The road then runs to the north-east of Tappa-i-Kharan (or Karun) and thence through Salian, Pesháwáran to Lash Juwain and various villages in Aukat-i-Seistán (Hokat).

The road follows a ridge (*lurga*) of the Helmand fan from Takht-i-Shah and having crossed the Shela at the drainage between the two fans, then ascends the Delta of the Faráh Rúd on a ridge of that fan.

Travellers coming from the parts of Seistán lying to the west of the Rúd-i-Parián have of course to cross that river by one of the fords.

In the days when the main volume of the river discharged itself by the Shelas coming from Burj-i-As and tailing into the Naizár to the east of the Lurg-i-Takht-i-Sháh there was much more water on this road than there was in 1903. At that time the waters of the Helmand crossed the Lurg-i-Takht-i-Sháh at narrow and deep gaps (*Aukan*) which are very noticeable features of the ridge, and when in flow must have been very similar to the *Aukan* in the Lurg-i-Buz Kushta south of the Dahana-i-Faráh Rúd (*vide* page 492 of Appendix 22).

3. *Ráh-i-Shela-i-Dehno* (so-called after Shela-i-Dehno).—Before the Parián river carried the main volume of the river, the southern shore of the Hámún at Tappa-i-Adira remained generally dry down to Tappa-i-Shela-i-Dehno. People going from Seistán to Aukat-i-Seistán came to Shela-i-Dehno and crossed the Naizár *viâ* Shela-i-Tutigah, † *Chung-i-Bahringak*, *Chung-i-Barfi* and Tappa-i-Jumalika south-west of Tappa-i-Kharan; or went to Takht-i-Sháh by the usual road and crossed Shela-i-Mesh Kushi on *tutin*. In the present phase of the river the road across the Naizár between Shela-i-Dehno and Tappa-i-Jumalika remains under water longer, and people having with them a large number of

\* Up to 3rd May the flow was towards the Hámún-i-Puzák; then for 20 days the flow was towards the Hámún-i-Sabzi.

† Shela-i-Tutigah is so called, because *tutin* were kept at this place before the Parián was formed.

animals or large quantities of baggage prefer to go *viâ* Takht-i-Shâh. Now that the waters of the river flood the lands up to Tappa-i-Adira people use this road only when the Naizâr between Adira and Shela-i-Dehno is dry, it is a shorter cut to Lash Juwain than the road *viâ* Takht-i-Shâh. In the winter of 1904, the Naizâr from Adira to Tappa-i-Jumalika *viâ* Shela-i-Dehno was dry and people went by this road, but in January 1905 the water began to rise over the road and then only single men with no baggage were seen to use it.

Near Shela-i-Dehno this road bifurcates. One road goes to Tappa-i-Bahring and then to Kula-i-Khân,\* 3 miles to the south of Tappa-i-Machatak (Musjidak) on the north shore of the Naizâr. This road is now generally under water; only Gâodârs or occasional travellers well acquainted with the Naizâr use it. It was often used in January 1905 by members of the Mission. The other road goes to Tappa-i-Jumalika *viâ* Chung-i-Bahringak and Barfi. This road too is not much frequented now, because few people come by this road; when the Naizâr is flooded they either go by Takht-i-Shâh and take a road along the Naizâr of Chung-i-Bahringak; or if they have no baggage to carry make direct for Tappa-i-Jumalika from Deh Kurki or Deh Shaikh Waisi. In January 1905 the Mission camp marched from Dahan-i-Farâh Rûd to Deh Shaikh Waisi by this road.

In the year 1904 both these roads were almost dry for a short time about the end of November. The road from Tappa-i-Bahringak to Khel-i-Kula-i-Khân was under water by the middle of December 1904, but the road from Deh Kurki and As-i-Haji Karim to Tappa-i-Jumalika remained dry till the end of January 1905.

When the Seistân Mission was in camp at Dahan-i-Rûd-i-Farâh, the road from Kula-i-Khân to Tappa-i-Adira *viâ* Tappa-i-Bahring, Shela-i-Dehno was put into good order. Wherever water had covered the road, reed and *tut* were spread (such work is called *Na-res*). Shela-i-Dehno too was filled with tamarisk; this sort of bridge for crossing a channel is called in Seistân *Gaggân*. The road on the 20th December 1904 was fit for horses and mules, cattle and men. But the water in the Naizâr rose rapidly at the end of the year and the road soon became useless.

The cattle-owners are able to control the *shela* by closing them with embankments, and thus confine the flow of water to the main *shela* during low river. The water is not allowed to spread through the reed beds until the river rises in flood and breaches the embankments; before this happens the cattle-owners clear out with their camps, and burn the reeds so as to get green shoots in the spring.

4. *Râh-i-Chashmâkâ* or *Buk-i-Sahibdâd*.—Is so called because the road passes over Lurg-i-Chashmâkâ, and across the *Gazg* or channel called Buk-i-Sahibdâd after the fishing nets of some Saiyâd named Sahibdâd. This is the straight road from Nasratâbâd to Aukât-i-Seistân. It passes through Deh Râhdâr, Ziarat-i-Khwâja Musa, Khel-i-Chashmâkâ, Lurg-i-Gaz-i-Julla, Lurg-i-Gamshad, Kulâ-i-Khân and thence to Dahan-i-Farâh Rûd, or else straight up the Farâh Rûd *viâ* Peshawaran. When the Naizâr is dry or the water is very low the reeds in the Naizâr become thin and people going to Aukât-i-Seistân use this road. When the Hâmûn is high and the road is under water people seldom go by this road.

This is the road that Generals Goldsmid and Pollock used on the 13th March 1872. At that time the Naizâr was dry owing to the great drought that had just ended, but the party passed through about 5 miles of thick reeds and bulrushes (*vide* "Eastern Persia," page 314).

On the 16th March 1904, Lala Thakur Dass, Supervisor, and Babu Gopal Singh, Sub-overseer, with 12 Seistânis and 3 Khalasis crossed the Naizâr from Kulâ-i-Khân to Chashmâkâ. The road had probably not been in use except in years

\* Kula is a refuge in the Naizâr for men, a high spot where huts are made from the time the floods subside till they rise again.

when the Naizár was dry since the flood of 1885; it was under water; the reeds and bulrushes were very thick and had to be cut by sickles to make a clearance before the horses could proceed. The start was made at 10 A.M. from Khel-i-Kulá-i-Khán and Khel-i-Chashmáká was reached at 8 P.M.

In December 1904 some repairs were done to this road by the Mission from Kulá-i-Khán to Khel-i-Ali; but the water then began to rise and the road was diverted to Tappa-i-Bahring as already described on the previous page. From Deh Ráhdár to Ziarat Khwája Musa, the road was quite dry up to the 17th January 1905. Some water flowed in Shela-i-Ziarat Khwája Musa and from Chashmáká to Kulá-i-Khán the Naizár was all under water.

From Chashmáká there is a road for *tutin* *viâ* Chung-i-Shahbeg and Chung-i-Zainal across the *aukan* to the Lurg-i-Buz Kushta and thence to Dahan-i-Faráh Rúd and Aukát-i-Seistún (Hokat), but only Gáodárs use it.

*Tutin* road *viâ* Chung-i-Shahbeg.

5. *Ráh-i-Sargaz-i-Jamál*.—This also is only a *tutin* road, but much used by the Saiyáds and Gáodárs. About 100 *tutin* called *tutin-i-saiyád* or *tutin-i-shikar* are kept at Khel-i-Sargaz-i-Jamál to the east of Kala-i-Nau, but no big *tutin* for carrying loads. This road or rather *way* runs from Khel-i-Sargaz-i-Jamál to Lurg-i-Buz Kushta through Chung-i-Arabi, Talaki, Garkando, Zainal, Aukan and so to Lurg-i-Buz Kushta. Men who go by this road have to pass the night on the Lurga by the Aukan; and therefore travellers other than Saiyáds or Gáodárs seldom use it.

6. *Ráh-i-Nai Rez Pusht-i-Adimi* also called *Ráh-i-Teshakani*.—This road or *way* is called *Ráh-i-Nai Rez*, because it can only be used if the Gáodárs put reeds, etc., on the *Gazg* or shallow channel which the road crosses before it reaches the higher level on Lurg-i-Teshakani. The derivation of Teshakani is given in Appendix 22, page 495. The road starts from Adimi at Khel-i-Saiyád, crosses *Gazg-i-Adimi*, passes by Paran-i-Chheda on Lurg-i-Teshakani and Auták-i-Kalán to the four *Aukan* which must be crossed on a *tutin* to Lurg-i-Buz Kushta. From Lurg-i-Buz Kushta to Dahan-i-Faráh Rúd, the road runs on a high sandy ridge in the dry.

From the *Aukan* to Lurg-i-Buz Kushta, the *tutin* are worked in a *rung* or small deep rut and the horses of the riders follow the *tutin*.

This is the shortest road from the city of Nasratábád to Dahan-i-Faráh Rúd, and, unless the Hámún is so full as to cover the Lurg-i-Teshakani and Auták-i-Kalán, is available every year after the four months of hot wind, when the waters of the Naizár and Hámún are usually low.

The road becomes fit for the passage of men and animals in autuma (*tirmah*) about November. In 1904, the Saiyáds made the *Nai-rez* at the end

The road in 1904.

of November, the part of the Naizár from Adimi to the Sábari Hámún, except the *Gazg-i-Adimi*, had then become dry. This *Gazg* is about one mile wide, and the greatest depth of water on the 24th January 1905 was 1'3 feet; loaded camels crossed it easily. The road was only about 30' wide, but the people had cut the reed on either side and loaded camels passed without any obstruction.

The camp of the Irrigation Surveyors was pitched on Lurg-i-Teshakani in order to run a line of levels to the Aukans. Here they were overtaken by the great wind which lasted for 3 days from the 21st to the 23rd January 1905, and which was accompanied by so great cold that the waters all froze and bore. The waters from the Hámún-i-Sábari driven by the wind rose and filled up the shallow channels across Lurg-i-Auták-i-Kalán, so that the camels could not be marched as far as the *Aukan*. From the *Aukan* to Lurg-i-Buz Kushta camels can never go as the water is too cold in winter for them to swim, and in spring of course the road is usually under water and not feasible. Hence in ordinary years when Lurg-i-Teshakani is dry, loaded camels can go from Adimi to the *Aukan*, but not further along this road.

The road remains open for men and animals so long as the water in the Naizár remains low. The Gáodárs stay on the *lurga* till *Nauruz*; but the road is not used by the people in general after the several shallow channels across the

road have been filled by the flooding of the Naizár that takes place towards the end of winter in normal years.

A way across the *Hámún-i-Sábari* to the south of the boundary line may be noticed here; it was used by the Persian Commissioner on the 24th of December 1904 to save himself the march round the north of the *Hámún*. Saiyáds and Gáodars all know this way across the *Tangi* or narrow of the *Hámún*, and use it when there is no danger from currents set up by high wind or by floods in the *Faráh Rúd*. They start from some place on the beach on the lee shore of this sheet of water, such as *Lurg-i-Buz Kushta* or *Autak-i-Kalán* and land at *Kharikar*, a tract of good grazing on the deltas of the torrents that come from the *Bandan* hills and enter the *Hámún* near *Zídrat-i-Khwája Sábari*; there are extensive reed beds on either shore which shew that the water is shallow, due probably to the material brought by the torrents on the west side and the silt deposited by the wind driven waters of the *Hámún* on the east side.

7. *Ráh-i-Chung-i-Daráz*.—So called because the road crosses *Chung-i-Daráz*. When the *Hámún* falls low and *Lurg-i-Tiratki* and *Dak-i-Gaz Al-i-Gurg* are out of water, people going from *Adimi* to *Mil-i-Nádír* sometimes use this road. A large number of *tutin* are kept at *Adimi*. The *tutin* are big as well as small. When *Dak-i-Gaz Al-i-Gurg* is out of water the width of the *Naizar* on this road that must be crossed on a *tutin* is only about 4 miles. Horses easily follow the *tutin*.

Amír 'Alí Akbar Khán, Governor of Seistan, crossed the *Naizar* by *Rah-i-Churg-i-Daraz* in March 1904. His two-wheeled carriage was also carried over on a large *tutin*. Lala Thakur Dass, Supervisor, and Babu Gopal Singh also crossed here at the end (31st) of March 1904. The *tutin* took two hours to cross. From *Dak-i-Gaz Al-i-Gurz* to *Mil-i-Nádír* the road is dry. As soon as the *Sábari Hámún* rises and the shallow channels across *Lurg-i-Dak-i-Gaz* and *Lurg-i-Tiratki* are filled the road is no longer used.

The Saiyáds bring over limestone on *tutin* from the cliffs on the western shore of the *Hámún* near *Bahring* by this road. A large number of *tutin* were employed to get limestone for the works at the British Consulate and Imperial Bank.

8. *Ráh-i-Kundil Kháni*.—This road is not used now a days; it was opened by Sardár *Kundil Khán*, Sarbandi, for himself. It starts from the *Khel* opposite *Deh Isa*, and crossing *Chung-i-Daráz*, leads on to *Lurg-i-Tiratki*. From the *Lurg-i-Tiratki* the road goes to *Bahring*. As this road is not now used no *tutin* are kept here.

9. *Ráh-i-Chargan* or *Ráh-i-Tiratki*.—When the road along the Telegraph Line, called *Ráh-i-Gardowak*, is under water and camels and men cannot pass by it, *tutin* are placed on the *Rah-i-Tiratki* to meet the wants of the traffic. A larger number of big and small *tutin* are kept on this road; and people with their luggage and horses, as well as their camels, go by the road. Men and luggage cross on *tutin*. The animals follow the *tutin* walking, and occasionally, though seldom, swimming. *Ráh-i-Tiratki* is thus used until *Ráh-i-Gardowak* becomes dry enough for camels and men to use it.

But if the *Hámún* rises very high, and *Lurg-i-Tiratki* on to which *Ráh-i-Tiratki* leads is under water, or is liable to be flooded by the waves of the *Sábari Hámún*, the *tutin* are taken from *Rah-i-Tiratki* to *Ráh-i-Surkh Gazi*. This is another and shallower road for *tutin*, a little to the south-west of *Rah-i-Tiratki*.

When the level of the water in the *Hamun* falls and *Lurg-i-Tiratki* is again dry, *tutin* are again brought to *Ráh-i-Tiratki*, as the distance is shorter than *Ráh-i-Surkh Gazi*. Babu Hari Singh, Irrigation Surveyor, crossed over on *tutin* at *Ráh-i-Tiratki* in December 1903; and Lala Thakur Dass and Babu Gopal

\* Lala Thakur Dass, Supervisor, also came this way on the 31st January 1905. Singh on 1st April 1904. At both these\* times the *tutin* worked at *Ráh-i-Tiratki*.

On the 31st January 1905, *Ráh-i-Tiratki* or *Ráh-i-Chargan* was quite dry. The *runq* or the small channel for working the *tutin* contained only foul water; the

Naizár was dry, and men with loaded camels came from the western shore of the Sábari Hámún to Afzalábád by this road without meeting any water. Ráh-i-Surkh Gazi and Ráh-i-Gardowak were, of course, quite dry.

The rate for a whole *tutin* is 2 *Gajri*\* or 4 *bran* on this road. A *tutin* cannot carry more than 3 men and one *saiyád* who poles the *tutin*. For horses that are led behind the *tutin*, nothing is charged.

Charges for *tutin*  
\* More correctly *Kajari*.

10. *Ráh-i-Surkh Gazi*.—So-called it is said because there stood in old times a town called *Shah-i-Surkh Gazi*. This is a way for *tutin*. As has already been explained under *Ráh-i-Tiratki* when the Hámún is full, and *Ráh-i-Gardowak* and *Lurg-i-Tiratki* are under water, *tutin* are kept on this road to carry travellers between Afzalábád and Dashtak near *Mil-i-Nádír*. When the Hámún falls, and *Lurg-i-Tiratki* is dry, *tutin* are taken to *Ráh-i-Tiratki* and this road is not used. *Ráh-i-Surkh Gazi* is a little to the north of *Ráh-i-Gardowak* (also called *Ráh-i-Paran Soofi*) and about a mile to the south of *Ráh-i-Tiratki*.

When *Lurg-i-Tiratki* is dry the distance the *tutin* must be poled on the *Ráh-i-Tiratki* is shorter than that along *Ráh-i-Surkh Gazi*. But when *Lurg-i-Tiratki* is under water, the reverse is the case. The charges for *tutin* are the same as on *Ráh-i-Tiratki*.

11. *Ráh-i-Gardowak, or Ráh-i-Paran-i-Soofi, or Ráh-i-Kúcha, or the road along the Telegraph Line*.—This road follows on a 'lurga' or high ridge across the Naizár between Afzalábád and *Mil-i-Nádír*. The Persian Telegraph line put up in 1904 has been taken along this road.

It is called *Ráh-i-Kúcha* because when the Hámún is full and the Naizár thick, this is the only road (*kúcha*, a lane in Persian) by which people can come and go to Persia from *Seistán*. It is sometimes referred to as the *Ráh-i-Khushk* or dry road.

It is also called *Ráh-i-Paran-i-Soofi*, because there is a *paran* or a small enclosure formed by an earthen embankment to keep out water when a sudden wind causes the waters of the Hámún to rise. The road is also called *Ráh-i-Gardowak*, because it crosses *Shela-i-Gardowak*, which is said to have once been very deep.

This is the chief road from *Seistán* to *Birjand*, *Neh*, *Bandán*, *Meshed* and to *Teheran*. It runs on high ground across the inundated area from Afzalábád to *Mil-i-Nádír* and crosses three *shela* which carry water into the Naizár-i-Kúh-i-Khwája. So long as the road remains dry and these *shela* are fordable, loaded animals and men use this road, but when it is flooded *tutin* are kept at *Ráh-i-Tiratki* or *Ráh-i-Surkh Gazi*.

When the level of the water in the Hámún falls, and *Shela-i-Khwája 'Ali* and *Shela-i-Gardowak* become dry the *saiyáds*, by order of the Governor, put reed and bulrushes on those parts of the road that are wet, slippery or muddy; and therefore this part of the road is sometimes called *Ráh-i-Nai Rez*.

12. *Ráh-i-Kúh-i-Khwája*.—When the Hámún is full and *tutin* can work, people going to *Neh* from *Warmal* and *Sihkuha* cross the Hámún on *tutin* by a more direct road. The road or way for *tutin* starts from *Khel-i-Saiyád* near the *Kúh-i-Khwája* and the people alight on *Lurg-i-Damán*. From *Lurg-i-Damán* to *Neh* the road is dry.

When the water is low *tutin* cannot be worked, and this road is not fit for men or animals. No big *tutin* are kept at *Khel-i-Saiyád*. Only *tutin* of the *saiyád* or *shikar*, i.e., small ones carrying one man only are kept. But these have in large numbers.

*Roads round the southern end of the Hámún or inundated area.*

When the inundations are large, as they were in the spring of 1903, large numbers of camels cannot be safely taken across by the direct roads between *Bahring* (also called *Labi Bahring* or *Baring*) and Afzalábád, even though their

loads are carried on *tutin*, while they have only to walk in the water behind the *tutin*. Some camels are sure to become exhausted and die from wading so long in water. If the water is cold even horses, who can stand more cold than most animals, die of exhaustion. Mr. Merk saw three ponies come across on the 1st January 1886 to Bahring, of which two died of exhaustion; of course the depth and extent of the water was then phenomally great, and this was in a very cold time of the year. On such occasions *kafla* go round the south of the inundations, sometimes as in 1904 the inundations can be rounded not far to the south of the Kúh-i-Khwája. There are well known ridges which should be chosen for this purpose. But when the inundations reach the Kúh-i-Khwája the wind periodically drives the water over the low-lying lands to the south and makes them wet and unfit to cross. The road then taken is that which crosses the Sar-i-Shela\* or the Shelag (Balúchi).

The formation at the head of the Sar-i-Shela is due to the talus of the ancient Trakú channel of the Helmand having blocked the depression, leaving only a narrow drain around the toe of the talus to carry off the surplus waters of the Hámún to the north into the Gaud-i-Zireh. This channel is the Sar-i-Shela and it is the drainage line between the wash down of the hills to the south of it, and the talus or alluvial fan of the Helmand.

There is a good ridge across the inundated area where this channel begins to take shape; and it is used by flock-owners going to the hills, and was used by General Goldsmid's Mission on their way from Bam through Tursháb to Seistán. The flock-owners sometimes call the road Ráh-i-Safidava or Ráh-i-Muksír. The road starts from the east side of the inundations from the wells at Regowak near Tappa-i-Mir Dost. This is a good ford when the inundations are not high.

But when the inundations are high the Sar-i-Shela may become unfordable from the great depth of the flood waters ordinary flood. that come down it from the north from the Hámún; or the Sar-i-Shela may only be unfordable when the strong wind is driving these waters before it.

The Sar-i-Shela was last unfordable for any length of time in 1885, but previous to that it was unfordable on more than one occasion when local events required a sudden descent on Seistán from Káin, notably in 1865, when Mir Alam Khán of Káin brought a Persian Army against Taj Muhammad and was delayed at the Gardan Reg Ford to the east of the Gumbad-i-Liddi by the floods in the Sar-i-Shela.

In the note on the flood of 1885 in Appendix 25, at page 542, it is said that the Bakúchis state that the volume of the flood of 1885 was so great that it deepened and widened the Sar-i-Shela, and the waters now do not accumulate to so great a depth to the north of the Sar-i-Shela. In 1885 the flood waters covered all the lands round about Girdi Cháh.

The sides of the Sar-i-Shela are vertical and very high; at the fords near Gumbad-i-Liddi and Gardan Reg they are 35 feet high. The bottom at the sides consists of soft treacherous material, whilst the centre is usually occupied by a pool of beautifully blue intensely saline water, which seems neither to be absorbed by the soil or evaporated by the hot dry air. For pools only a few feet deep lasted from August 1903 to May 1905, and did not seem to have appreciably diminished, whereas the evaporation in the Northern Hámún goes on at the rate of about 10 feet a year.

\* The great or chief Shela.

† In this connection and with reference to the roads round the Hámún in general please read page 71 of "The report by Khán Bahádur Maulá Baksh on his journey from Meshed to Quetta in 1898."

The fords are therefore few. The most famous is that at Gardan\* Reg

where the Sar-i-Shela meets the sand belt. The ford† is about one mile upstream of the Perso-Afghán Boundary, and is at the place where a *shela* from the hills has

formed a delta in the bed of the Sar-i-Shela. It is on the direct road from Girdi Chah through Kachauli to Robat. It is some times called Guzar-i-Robat. I have also heard it called Gudar-i-Shah. But the distance between sweet water is very great by this road; and the trade route crosses at a ford six

‡ When the Shela is not running there is a third and more direct ford near this ford. miles higher up near the Gumbad-i-Liddi‡ which is also where a ravine runs into

the Sar-i-Shela from the hills. Both these are good fords and are only closed in years of very great and extraordinary floods, and then only from about May, when the waters may be expected to reach the Sar-i-Shela till about October, by which time the hot winds will have dissipated the waters and reduced the discharge through this Shela to the more normal level. It is said that water collected on the fords in the heavy rain of December 1905, and made the crossing difficult.

There are three other fords further down the Sar-i-Shela which serve roads

The three fords east of the Gardan Reg ford. which come from the direction of Bandar-i-Kamál Khán and go across to the hills to the south of the Sar-i-Shela. It may be noticed that a broad long belt of almost impenetrable sand occupies the left bank of the Sar-i-Shela from Gardan Reg to the Zírat-i-Sháh-i-Mardán and the roads from the west make for the Gardan Reg ford and avoid this belt of sand, whilst the roads from the east make for the fords near Zírat-i-Sháh-i-Mardán with the same object in view. The three fords are:

Guzar-i-Shamshírf, 14 miles below the Gardan Reg Ford.

Guzar-i-Sháh-i-Mardán at the Zírat of that name which is 7 miles below the Guzar-i-Shamshírf.

Guzar-i-Sar-i-Shela-i-Ráh-i-Kirtaka, 7 miles below the Zírat of Sháh-i-Mardán.

This is the place visited by General Sir Charles MacGregor in February 1877 and called by him Gumbad-i-Maksud, being the name given by his guides to the 5 domed tombs a little to the south-east of the water. It was also visited by Colonel Yate in March 1894 and called by him Gumbad-i-Sar-i-Zireh. Colonel McMahon visited it in April 1896. It was frequently used by the Mission transport going and coming from Quetta.

All these fords are good fords, and are available except in exceptional years when the Gaud-i-Zireh is full. There is

Sweet water at the fords usually sweet water to be got by excavating into the sand buried in the bed of the Sar-i-Shela at the fords. The best water is that at the Gumbad-i-Maksud and this water lasts longest. Sir Charles MacGregor got water here for his small party just before the floods of 1877 came down to renew it. Colonel McMahon got water here for his large party, in April 1896, just before the floods of that year came down and renewed the water. Both said it was the worst they had ever had to drink; in April 1905 it was said to be bad but drinkable.

I went down the Sar-i-Shela after the flood of 1903 had renewed the water, and there was sweet water in all the pools below the point where the Perso-Afghán Boundary crosses the Sar-i-Shela; above this point the Sar-i-Shela passes through soil of such strong alkaline properties that the water is only drinkable when it is flowing.

\* Gardan Reg, neck of sand-hill, i.e., the sand belt.

APPENDIX 29.

CONTENTS.

NOTE ON MILLS FOR GRINDING CORN BY KHÁN BAHÁDUR MÍR SHAM SHÁH.

Wind, water and bullock mills—Outturn of mills—Hand mills—Price of stones—  
Cost of grinding—Water mills.

APPENDIX 29.

Note on Mills for grinding corn by Khán Bahadur Mir Sham Sháh.

There are four kinds\* of mills for grinding corn in use in Seistán. Wind-mills, bullock-mills, water-mills and hand-mills (*asia dast*). From Statements A and B it will be seen that there are 34 wind-mills, 42 bullock-mills and three water-mills in Persian Seistán.

Wind, water and bullock mills.

More water-mills\* could be arranged if the people desired them, but in the open plain of the delta the wind-mill is more easily arranged and is more useful; whereas up the river the water-mill is preferred; the fall is easily got and the supply is always available, whereas the winds are uncertain.

There are 12 water-mills in Afghán Seistán, half of which belong to Government to grind the wheat for the garrison; but there are no wind or bullock-mills, and the district depends for its meal on hand-mills.

A good wind-mill will grind 7 Indian maunds of wheat in 24 hours in a suitable wind. An ordinary bullock mill will grind about three Indian maunds of wheat in 24 hours.

Outturn of mills.

A woman grinds about three-tenths of an Indian maund of wheat a day without working at night.

There are about 18,000 hand-mills in Seistán, one in almost every house.

Hand-mills.

Those who cannot afford to purchase borrow. It is *infradig* for a man to work a hand-mill, all the labour of grinding is done by women, and the whirr of the hand-mill can be heard in their homes from long before dawn to long past dark. The surface of the stone needs to be made rough about once a week; this is done with a long hard stone (*chakush sang*) or with a small iron hammer (*chakush ahani*) made for the purpose. The latter is the tool most used in the city. The former is a stone brought by the flock-owners from the hills; it is a boulder chosen because it is hard, and worn to a long thin cylinder. The rapping of the tool on the mill stone relieves the monotony of the whirr of the stones heard as the traveller rides through a village or encampment at dawn. This rapping often serves to guide him to an encampment otherwise hid.

The price of stones at the quarry is said to be one *kran* per span of diameter; the usual price is 4 to 6 *kran* for a pair of hand-millstones and about 100 to 120 *kran* for a pair of large stones (30 inches diameter) for a wind or water-mill.

Price of stones.

The cost of grinding wheat with hand-mills is usually one-third part of the corn ground, and with bullock or wind-mills one-fourth part of the corn ground.

Cost of grinding.

The Mission at times paid cash rates; these varied a great deal from  $\frac{1}{2}$  to  $\frac{3}{4}$  of a rupee for hand-mills and  $\frac{1}{4}$  to one rupee for wind-mills per Indian maund ground.

It is not easy to get large quantities of grain ground and almost impossible to purchase it ready ground. The Mission had as much as 7,000 Indian maunds of wheat ground at Kala-i-Nau by the people of the Shahraki and Nahrúf Maháls, the maximum quantity outturned daily was 100 Indian maunds. Great care had to be exercised to prevent the fraudulent adulteration of the meal with earth, etc.

Water-mills.

On the first page of Chapter XXV an account of the water-mill at Deh Ghulam Haidar is given. A water-mill examined at Landi Wala Muhammad Amin had a pair of stones 2' 10" in diameter and four inches thick, and was worked by a fall of 3 feet, the stones outturned about 2  $\frac{1}{2}$  Indian maunds in the 24 hours; the discharge of the mill race was about 2 cusecs.

The rate charged for grinding was 7 per cent. (1 seer in 15 seers).

The revenue of the mill was divided as follows; 9 shares to the Khán of the village, and one share divided equally between the miller, who tended to the mill, and the carpenter who repaired it.

Drawings and photographs were made of wind and water-mills and are filed among the plans.

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APPENDIX 30.

CONTENTS.

BIOGRAPHIES OF SEISTÁNI GUIDES.

- Meshedi Ali, son of Sah Nur, Bandáni—His parentage—His father's history—Ali as a cattle dealer—Loss of cattle in 1885 and 1892—Servant of Haji Mulla Ali Akbar—Aga Mulla Muhammad Mehdi—Cultivates at Salián and Gazbur—The range of his experience.
- Gulmír, son of Dost Muhammad, Balúch—Kadhuda of Kafárgi—Loss of all his cattle in 1885—Kadhuda of Surkh Dik—Becomes a *basgar*—His qualifications.
- Old *Arbab Saif-ud-din*—His age—Europeans he has met—His antiquarian knowledge—His home and ancestors—His sons—Some of his experiences.
- List of guides with the Irrigation Party—For Afghán Seistán—For Persian Seistán—Boatmen.

## APPENDIX 30.

## BIOGRAPHIES OF SEISTÁNÍ GUIDES.

*A short biographical sketch of Meshedí 'Ali son of Sháh Núr of Deh Gazbar.*

Meshedí 'Ali, age about 45, is the son of Sháh Núr, Gáodár of Taifa Mishmust, Bandáni. The grandfather of Meshedí 'Ali was a big man. He took cattle from Seistán and sold them in Shiraz, Ispahan and Meshed. Meshedí's father Sháh Núr was given the Kadkhudá of Adimi and Mansúri by Sardár 'Ali Khán, Sarbandi. He was a very notable man in Seistán, and had great influence over the Gáodárs and Saiyád people.

When Mir Alam Khán came to Seistán, and established himself in Nasratábád, he wanted Sháh Núr to be Kadkhuda of the villages of Adimi and Mansúri. But as Sháh Núr had sided with the Sarbandis, he feared Mír 'Alam Khán; and so refused to take office under him.

Sháh Núr then devoted himself to the profession of his father; took cattle from Seistán and sold them in the cities of Persia. He had got some land and gardens in Bandán over which he had hereditary rights. Meshedí 'Ali is now the owner of the estate, and every year either Meshedí 'Ali goes himself, or sends his brother to Bandán to collect his share of the land produce, and on the income from the date trees in his gardens.

When Sháh Núr died, Meshedí 'Ali followed in the footsteps of his father. He continued buying and selling cattle, till in the great flood of 1885, most of his cows were drowned by the floods of the Rúd-i-Bandán as described in Appendix 34; and he became an almost property less man. After that he steadily made up the loss and by 1892 had collected again a large number of cattle. But the *Nuh-i-Nahum* in the winter of 1892-1893 described in Appendix 23 killed all his cattle by the sudden rise (due to wind) of the waters of the Sábári Hámún, and he became again almost without resources.

One year later he accepted employment under Hají Mullá 'Ali Akbar. He kept the accounts of the contracts, which Hají Mullá 'Ali Akbar made with the Amir, and of the collections of revenue from the cultivators. He used to count the cattle of the Hají, and indeed was his right hand man for six years in the management of his affairs.

For over two years after this he was the Munshi of Aga Mullá Muhammad Mehdi of Husainabad, where he performed the same duties as he did for Hají Mullá 'Ali Akbar.

After this he got some lands in Salián, where he had lived many years before; and put some cultivators to work to sow the lands for him.

Next year he remained at Gazbar, and took some land from the son of the Kadkhuda 'Ali Murad, Bandáni, which he cultivated as Bádár.

In the winter of 1904-05 he was at Deh Gazbar when he came into the employ of the Seistán Mission.

Meshedí 'Ali says that, as he had to buy cattle from the Naizár, he knows every nook and corner of and every *Khel* in the Naizár. He had to deal with the Saiyáds also; and being the son of an influential man, every Saiyád and every Gáodár respected him. He went to Neh, Bandán, and to Sarhad once every year, and by different routes. He therefore had to cross the Faráh and Harud Rúd, and he knew all the country in Aukat-i-Seistán, and about the Naizár very well. His father had got some lands near Salfán in Aukat-i-Seistán, which Meshedí 'Ali also cultivated as Bádár for several years.

Meshedí 'Ali also went to the Puzák Hámún to collect taxes for Kadkhuda Muhammadi from the Saiyád people living on the Puzák; and therefore he has

been all over the Puzák Hámún also.

*A short biographical sketch of Gulmir, son of Dost Muhammad.*

Gulmir is the son of Dost Muhammad, Balúch, Taifa Shaikh Hasaini, resident of Deh Shahgul, on the bank of the Parián river. His age is about 45 years; he is a strong man, and very smart, and is a good guide for Persian Seistán. He says that, when Sharíf Khán, Nahrúí, besieged the city of Nasratábád, he was with the besiegers. He was then (1873) a boy and could hardly carry a rifle. When he came of age, he got the village of Kaftárgí from Mír 'Alam Khán; and remained Kadkhuda of that village for some years. Then he had to give up the village of Kaftárgí for some reason, and he became the Mushrif of Deh Khalikdad; after a few years he went into Afghán Seistán; and became a Gádár near Nad-i-Ali. He had then got a very large herd of cattle, and Akhonzada Mullá Faqir Muhammad Khán, Hakim of Chakhánsúr, knew him well. He used to graze his cattle between Nad-i-Ali and Jahánábád, and about Karko and Margo.

In the flood of 1885, Gulmir was at Jahánábád. He had stationed himself on a big mound, and his cows were kept at the foot of the mound, when all of a sudden one midnight the water reached this place, and in a few hours covered all the country around. The cows, calves and the sheep were suddenly surrounded by water, and Gulmir could with difficulty save three cows and a few goats; for these he had to bring fodder from distant places by swimming.

When the floods subsided, Gulmir went to Surkh Dík, a very small village near Shahrístán-i-Kuhna. By selling, or mortgaging all that he had left, he got the Kadkhuda of that village, which he kept for several successive years.

But the Kadkhudas of Seistán are liable to become bankrupt very soon; and Gulmir soon found himself unable to keep the village. He therefore became an ordinary Bazgar, and tilled lands till he was employed by the Irrigation Party of the Seistán Mission in March 1903. Since then, till May 1905, he was in the employ of the Mission as guide for Persian Seistán.

Being a man of industrious habits, he is known to almost all men in the Sharaki and Nahrúí villages. Once in the company of Taj Muhammad of Kimak he went to Herat; and when Kadkhuda of Kaftárgí and Surkh Dík villages, he had many occasions to go and see the city of Nasratábád, and other notable villages in Seistán. Having been a Kadkhuda and Mushrif, he knows everything about cultivation, and therefore is in a position to supply good and reliable information about the system of cultivation in Seistán.

*Biography of the old Arbáb Saif-ud-din.*

The Arbáb Saif-ud-din is a very old man full of energy with a large store of legendary knowledge. He says that he is 96 (in 1904), but he also states that he went with his people to meet Colonel Leach at Kandahar at the time of the Kabul war, and that he was then about 10 or 15 years of age. This would make him about 80 years of age. He had an English rupee which he said was one of the many that Colonel Leach gave his relatives and himself. He has a retentive memory and recollects Lieutenant Pattinson, and introduced his name in conversation and that of many others, who were well known in Afghánistán at the time of the Kabul war. He also met the members of General Pollock, General Goldsmid and Colonel West Ridgeway's Mission.

As a youth he was passionately fond of riding and hunting, and travelled about the deserts around Seistán with parties organised by the Sanjaráni Sardárs to hunt antelope and wild ass; at that time the *arbáb*, who now lives at Deh Dost Muhammad near Kala-i-Fath, lived at Chahárburjak. He had a great talent for remembering all the historical and revenue details that he heard from his elders; many of whom were men like himself with a genius for antiquarian lore, and knew the traditions of Seistán.

But the last of these disappeared with Malik Gulzar Khán, Kaiyáni, who died in May 1903; the oral traditions are now but imperfectly known among the people, and the old Arbáb often said that he himself had but a smattering of the subject compared to the knowledge possessed by men, whom he had met, and who are long since dead.

The old Arbáb's family managed the revenues of the Garmsel for generations, and he points out near Chigini, the home where his immediate ancestor lived in the days when the buildings along the river, that are now in ruins, where inhabited.

The old arbáb married a cousin, a daughter of Arbáb Sháh Jahán, who was one of the last of the men who kept the revenue accounts of the Garmsel. He has four sons—Nasir-ud-din, who is a cultivator at Deh Kaliq Dad in Persian Seistán, Akhtar Muhammad, who is a trader and goes to Quetta, Lal Muhammad and Burzu (named after a hero of the Shah Namah), who are young and live at Deh Dost Muhammad Arbáb near Kala-i-Fath.

When Muzaffar-ud-daula, Wakil-ul-Mulk, came to Seistán the Arbáb acted as go-between for Sardárs Kamál Khán and Imám Khán and received a *khillat* and 500 *kran* for his services.

He was among the besiegers when Sardárs Sharif Khán and Ibrahim Khán attacked the city of Nasirabad.

In 1884 he married a Kaiyáni girl, a relative of Malik Gulzar Khán. His father Arbáb Ismail Khán was a man of means and left him very well off, so that he has never needed to follow any settled occupation. But he is now dependent on his sons, and on the Sanjaráni Sardárs and Kadkhuda Dost Muhammad, Arbáb, who allow him a small share of the grain of one of their ploughs.

*List of Guides with the Irrigation Party.*

No.	Name of guide.	Father's name.	Tajfa, or tribe.	Residence.	Occupation.	Remarks.
1	Arbab Saif-ud-din	Arbab Ismail Khan	Arbab family of Garmasel	AFGHAN SEISTAN. Doh Arbab Dost Muhammad, near Kalle-i-Fah.	Arbab Saif-ud-Din is a Khana Nashin. His sons are other merchants or cultivators.	Works on which he was employed. Remarks about general usefulness.
2	Safar	Nur-Din	Muhammadsani Baluch	Shoro, near Nad-i-'Ali	Was a cultivator and a <i>Maldar</i> before he took employment with the Mission in March 1903.	An old man gifted with remarkable memory. Can give much information about Garmasel; knows the traditions about ruins in Afghan and Persian Seistan such as Kalle-i-Fah, Sar-o-tar, Taraku, Reshwaran, Zahidan, etc. He met Colonel Leach at Kandahar in 1938, and has met most of the members of the Mission since then. He is a very talkative and popular old man and tells every one everything he sees.
3	Ghafur	Hasan	Gurgej Baluch	Khoga or Khwabgab, near Kallak.	A cultivator	Is a good guide for Gulgula, Sar-o-tar and Chihil-burj ruins.
4	Mulla Dur Muhammad	Mulla Hakim	Barechi Afghan	Shoro near Nad-i-'Ali	Mulla and also a cultivator.	Can read and write Persian character; collected information with Safar, son of Nur Din.
5	Wakel	Kamran	Arbabzai	Doh Ghulam Haidar, Sanjabad, near Bander-i-Kamal Khan.	Cultivator	Can give good information about the cultivation and irrigation of lands in Garmasel.
6	Radho	Nur Din	Muhammadsani Baluch	Shoro, near Nad-i-'Ali	Maldar	Is a strong young man; knows Pashtu; has been to Herat; is a guide for the country at tail of Khast; knows something about Farah Rud.
7	Dur Muhammad	Din Muhammad	Gurgej Baluch	Kavg-i-Din Muhammad	Gaodar and cultivator	Is a strong man; has been of use in surveys; is a guide for the tail of the Klush Rud.

8	Shahdad	Harun	Shaozai Baluch	Lutak, near Shikhu	Maldar	A quiet and very hard working man of about 45 years; one of the best guides for Gaud-i-Zireh, Harud, Sar-i-Shah, Sarhad, and the barren country lying between the Heimand valley at Rudbar, Bundar-i-Kamal Khan, Dik-i-Dela and Kuhak down to the Kuh-i-Malik Shah.
9	Lal Muhammad	Zulfqar	Ditto	Ditto	Maldar and cultivator	Was a Kadkhuda near Dik-i-Dela. Has a command over labour, supplied guides on the Kuhak to Kuh-i-Malik Shah part of the boundary; knows the country about Sarhad and is a good guide.
10	Azad	Amir	Ditto	Ditto	Maldar	An energetic man, an intelligent guide for the country between the Heimand valley and the Sar-i-Shah; worked as a guide on the Kuhak to Kuh-i-Malik Shah part of the boundary.
11	Pir Muhammad	Harun	Ditto	Ditto	Ditto	Worked as a guide on the Kuhak to Kuh-i-Malik Shah part of the boundary and is a good guide for the Gaud-i-Zireh.
12	Mulla Khoja	.....	Khoja Khel Afghan	Deh Kalai-Kah-i-Shib on Harud Rd.	Cultivator	Has some knowledge of writing Persian; has been collecting information about sheep, etc., with other guides; is a guide on Harud and Farah Rudi.
1	Gulmir	Dost Muhammad	Shakh Husaini Baluch	Deh Kundal, near Deh Shahgul.	Cultivator for some time Kadkhuda of Kafargi village.	One of the first men who took employment in March 1903; is a good guide for Persian Sistan; has been of much use in collecting information about the cultivation of lands and the census, etc., of Sistan. Has a command over labour and is considered as 'Sahib-ul-Ulus'.
2	Var Muhammad	Taj Muhammad	Ditto	Shahrisan-i-Kuhna	Cultivator	One of the first men employed in March 1903; is a very hardworking and taciturn man; a very good guide for Sistan; has been of much use in collecting all sorts of information about the country. Far Muhammad is a man of influence among those enumerated under the name of Gulmir.
3	Atta	Sultan	Ditto	Deh Kundil, near Deh Shahgul.	Cultivator	One of the first men employed in March 1903; has been of use in collecting general information; is a clever and intelligent man.

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List of Guides with the Irrigation Party—contd.

No.	Name.	Father's name.	Tarfa, or tribe.	Residence.	Occupation.	General remarks as to usefulness.
4	Khani ...	Sultan ...	Shaikh Hussaini Baluch ...	PERSIAN SEISTAN—contd. Bunj-i-Sae-i-Band. ...	Cultivator ...	One of the first men employed in March 1903.
5	Mulla Agai ...	Lashkar Khan ...	Bamri Farsi ...	Kasimabad near Banjar ...	Cultivator and Gaodar ...	Can read and write Persian; is a good guide for Seistan; has been of much use in collecting information about cultivation of lands; count of cattle and sheep, census, etc., of Seistan.
6	Amal ...	Jada ...	Shaozai Baluch ...	Luf, near Alinbad ...	Maldar ...	Is a hardworking and quiet man; a good guide for the tract along the Sar-i-Shela; has been of much use chiefly in the count of sheep and in collecting plants, pottery, etc., from the <i>deh</i> ; has been of much use on the boundary work and surveying in the tract about the phases of the river during the last 20 years.
7	Mulla Durra ...	Mulla Madar ...	Shaikh Hussini ...	Deh Kundli, near Deh Shah Gul, ...	Is a Mulla; his father was also a Mulla.	Can read and write Persian; has been with Yar Muhammad, Guincir and other guides, collecting information.
8	Mulla Mohammad ...	Lashkar Khan ...	Bazi, Gaodar, Farsi ...	Takht-i-Shah ...	Gaodar ...	Has some knowledge of Persian; collected information with other guides.
9	Yar Muhammad ...	Hason ...	Kadai Farsi ...	Ceh Pudeh, near Deh Dost Muhammad, Miankang.	Cultivator ...	Is a hardworking man; is a guide for Miankang; has been of some use in collecting information about cultivation.
10	Taj Muhammad ...	Muhammad Khan ...	Shaikh Hussaini Baluch ...	Kimak ...	Cultivator; was once a Kadkhuda.	Knows much about cultivation; is an intelligent man; has been collecting information from Persian Seistan.
11	Malik ...	Loar ...	Agizai Baluch ...	Lurak, near Silcuba ...	Maldar ...	A good guide for the Sar-i-Shela; has been collecting information about sheep; was of much use in the Kuhak to Kuh-i-Malik Shah Boundary.

12	Mesheef 'Ali	...	Shah Neer	...	Mishmast, Báfándáni, Gáodar...	Dah Gae-i-Bar of Áli Murád, Báfándáni.	Trade and cultivation	...	An intelligent man of much experience and knowledge about the Naizar, the Gaodars, the Hámdán-Sibari and all the <i>Chang</i> ; also a very good guide for the country. Hámdán-Sibari used to work to Báfándáni and he knows much about the Naizar. Harud Rud; a man of some influence with the bigger men in Seistan, was of help in collecting some manuscripts; is a good guide for Nar Abu hill. <i>Vide</i> biography at the beginning of this Appendix.
13	Mesheef 'Ali	...	Ismail	...	Pedna, Gáodr, Féráí	Adimi	Gaodar	...	The best of guides for the Naizar and the Hámdán-Sibari; knows all about the <i>Chang</i> , cattle, etc.; gave good information and help in surveys of the Naizar in 1904 and 1905.
14	Muhammadi	...	Ismail	...	Ditto	Ditto	Ditto	...	A very good man; a good guide for the Naizar and the Hámdán-Sibari.
15	Mesheefi Abbas	...	Kazim	...	Basi, Gáodar, Féráí	Takht-i-Shah	Gaodar and cultivator	...	A guide for <i>Chang</i> near Faraúd. Tappá-i-Kharan was of use in surveys of the <i>Chang</i> in that part of the Naizar.
16	Sahib Khan	...	Khan Muhammad	...	Dah Mardá Baluch	Dah Ali Mardán at tail of Sibnar.	Maldar	...	A young man; was of use on the Boundary from the Hámdán to Kúh-i-Nar Abu; is a guide for Faraúd and Harud Rud and towards Nar Abu and Mada Abu hills.
17	Jumman	...	Gul Muhammad	...	Shaozal Baluch	Milak, near Shahgul	Ditto	...	A good guide towards Harud Rud and Nar Abu hills.
18	Dadi (Kadkhuda) played an important part in Afghan-Seistan in the latter part of nineteenth century A. D.	...	Husain	...	Bamri Farsi	Sharifabad in Persian Seistan. His residence in Afghan-Seistan was till recently at Kang-i-Din Muhammad. He crossed the boundary at the end of 1904 being for the time out of favour.	Cultivator; has been a Kadkhuda throughout his life; was formerly one of the 10 Kadkhuda Kalam of Afghan Seistan.	...	A man of advanced age of much repute in Seistan, well known to all the built-up places in Afghan Seistan and Ibaraki, Sibki, Kala-i-Kang, etc. Deh Dadi near Kala-i-Kang was in charge of him; knows the history of the changes in the country below Kuliak; knows everything about cultivation as it is done in Seistan. Was in fact the Consulting Irrigation Engineer for the Afghan side of Seistan.
19	Ibrahim	...	Mir Bag	...	Charákha Chun Baluch	Shahristan-i-Nau or Nawab Khan.	Gaodar and cultivator	...	Is a young man; worked as a coolie for some time. Being a Gaodar he knew how to pole a <i>fatris</i> ; has learnt how to work a boat.
20	Muhammad	...	Shahmir	...	Ditto	Shahristan-i-Nau	Cultivator	...	Has learnt how to work a boat.
21	Fakir	...	Masafir	...	Alado Farsi	Khwabgab, near Kuhak	Taibán and cultivator	...	Musafr is a <i>fatris</i> on the Helmand near Khwabgab. Fakir had learnt to pole a <i>fatris</i> from his father; now he has learnt how to row a boat.
22	Asghar	...	Ditto	...	Ditto	Ditto	Ditto	...	Musafr is a <i>fatris</i> on the Helmand near Khwabgab. Asghar had learnt to pole a <i>fatris</i> from his father; now he has learnt how to row a boat.

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## APPENDIX 31.

## CONTENTS.

SOME NOTES ON THE SHELAS OF THE OLD MAIN STREAM OF THE HELMAND, NOW CALLED THE NAD-I-'ALI CHANNEL, OR RŪD-I-AFGHAN; AND ON THE *BAND* THAT WERE ONCE MADE AT THE HEAD OF THESE SHELAS; COLLECTED BY LALA THAKUR DASS, SUPERVISOR, FROM KADKHUDÁ DÁDI AND OTHERS.

*Band-i-Jharuki—Shela-i-Jharuki—Re-opened in 1888 by Dádi—The various band—The aqueduct—Sultáni canal.*

*Shelas on the left bank of the river below Sháhgul—Shela-i-Jáhánábád—Janjal—Shela-i-Lakhsbak—Shela Ghargarruki.*

*Band across the Sikhsar above and below Burj-i-Ás—How the Sikhsar became the boundary—Band-i-Marungi—Band-i-Dádi—Band-i-'Ali Khán—Band-i-Shámshíri—Band-i-Bahlol.*

*Some of the main Shelas below Burj-i-Ás—Rud-i-Shagalak—Shela-i-Shámshíri—Shela-i-Kharkbusta—Burj-i-'Alam Dar—Chilingak.*

*The account brought up to date by Major Macpherson.*

## APPENDIX 31.

SOME\* NOTES ON THE SHELAS OF THE OLD MAIN STREAM OF THE HELMAND, NOW CALLED THE NAD-I-'ALI CHANNEL, OR THE RUD-I-AFGHAN; AND ON THE BAND THAT WERE ONCE MADE AT THE HEADS OF THESE SHELAS, COLLECTED BY LALA THAKUR DASS, SUPERVISOR, FROM KADKHUDA DADI AND OTHERS.

*Band-i-Jharuki.*

Twenty years before Sál-i-Barf, *i.e.*, about 1857, Shela-i-Jharuki was a river that left the main stream about 5 miles below the Band-i-Seistán and it ended at Menu beyond which was Naizár. People used to sow melons and millet on lands irrigated from its water. In 1871, when the river almost dried up, Sardár Shárif

Khán, Nahrúí, and his son, Sa'id Khán, made the canal† which takes out immediately above the Band-i-Seistán, and dropped it into the Shela-i-Jharuki. From Shela-i-Jharuki they carried the water to Nad-i-'Ali, and sowed *kharif* crops there. Next year in 1872, they sowed wheat and barley as well as *kharif* on this canal. In 1873, too, wheat was sown, but the rebellion broke out; and Sharif Khán besieged Shahr-i-Seistán. The crops were destroyed, and the canal was also neglected.

After this only *sabzar* (*kharif*) was done on the Jharuki. Six months before the flood of the Sál-i-Barf came, Sardár Khán Jáhán Khán, employed men for months together to open the mouth of the Jharuki. They succeeded in carrying a little water and sowed some wheat. That year they built a spur‡ nearly across the river, up to within 200 feet of the left bank. The flood of 1877, however, silted up the head of Shela-i-Jharuki.

In 1888, Dádi was given the Kadkhudái of the villages on the Shela-i-Jharuki. Dádi put his *hushar* on the head reach. The depth of digging was tremendous, and there were *panj alanu* or five lifts for the diggers to raise the earth with their *tesha*, which means that five men stood on the slope, and worked to throw the earth from the bed on to the banks. Dádi then made the first§ *band* across the river at the head of Shela-i-Jharuki, and irrigated all the lands.

The same year, Sultan Muhammad Gurgej of Khoga cleared out the canal which Sardár Shárif Khán had dug in 1871, and made a tamarisk aqueduct at the head of the Shela-i-Jharuki to pass the water of the canal on to the lands

of Kang-i-Rahimdád. This *kang*|| was afterwards called Kang-i-Din Muhammad, and a part of it is now called Kang-i-Karimdád. From the year 1888 to about the year 1901, Dádi built his *band* across the main river at the head of Shela-i-Jharuki every year; and reclaimed a very large area along the Shela. The tamarisk aqueduct, too, was made every year, till 1903 when the flood further silted up the head of the Shela; after this the Hakim of Chakhánsúr put two earthen *band* across this Shela, and carried the water of the Sultáni canal across it down to Nad-i-'Ali.

Up to 1903-04 a large bed of high and well grown bulrushes (*tut*) grew at the end of the Shela. But now that its head is closed by the Sultáni embankment the *tut* will probably dry up and disappear.

\* It may be useful to note here that the strip of country along the boundary from Kubak to Tapa-i-Talai was surveyed on a scale of two inches to the mile by the Survey of India. The Shelas referred to in this Appendix will be found therein, and this Appendix may perhaps be a useful help to understanding that map. The vagaries of the river described in this Appendix are typical of all the 'flowing' channels in the Helmand Delta (and also of all the other deltas in the Seistan basin); industry alone is needed to compile similar accounts of every channel to be found in the country that has been in flow within the experience of men still alive.

*Shelas on the left bank of the river below Sháhgul. Shela-i-Pokak or Shela-i-Jahanabad.*

Before the flood of 1885, the lands where Pokak and several small villages in the *Jam* of Pokak now stand, belonged to Deh Aga Ján. The land on which Shela-i-Jahánábád now runs was all under cultivation; it was a strip of land lower than the land on either side. The River Helmand had breached its banks at this very place two or three times before 1885, but the cultivators repaired the breach in the protection embankment and saved their fields. But in 1885 the flood was an extraordinary one; it burst through the embankment at the place where Pokak now is, and swept away Kala-i-Nau, Jahánábád, Aga Ján, etc., etc.

Since that time Shela-i-Jahánábád carried water till the year 1895 and 1896, when the present channel of the Rúd-i-Parián was formed, the head of the Shela-i-Jahánábád then silted up or was left high and dry, and it has not carried water again. The head of Shela-i-Jahánábád was at *Chaluki*, so called because there was a big hole just under the protection embankment, from which men used to take earth to repair the embankment. The river burst its banks at this place 2 or 3 times; and the pit was usually full of water and contained numerous fish. The Shela was therefore called Shela-i-Chaluki. It passed south of Pokak, southwest of old Jahánábád, then past the Diwal-i-Duzdan, Dikki and Malikki; and then to Daulatábád, Khamak and so into the Naizár. Margo and Jalálábád were destroyed by the flood, and the lands beyond Jahánábád became Naizár.

*Fanjál.*

In 1896 Dost Muhammad, son of 'Ali Khán, Saruni, moved the head of his canal from near Deh Lalla to where it is now, *i.e.*, below Burj-i-'As on the Nad-i-'Ali channel. This was done because the Shela-i-Chárkh drew at this time almost all the water of the Nad-i-'Ali channel of the Helmand, so that the Sikhsár was often nearly dry. When Dost Muhammad moved the head of this canal upstream to the head of the Shela-i-Chárkh, there was a quarrel about water. Dádi made the two canals, one called Go Kushta, which ran to Ibrahimabad, and the other Nobar-i-Sikhsar, which he made from the head of the Shela-i-Chárkh, and dropped it into the Sikhsar; he then closed the Chárkh altogether. To feed the Chárkh Dádi made a *Páling* or feeder from the river about 500 feet upstream of the head of the Chárkh. The water in the river soon rose and all quarrels were settled. Moladád Khán came from Faráh to settle this quarrel. Two

\* The Afghan cut or Ju-i-Afghan.

years after this, *i.e.*, in 1898 the Afghans made Nobar-i-Sháhgul\*. The Lakhshak carried water from its old head in the Nad-i-'Ali channel below Burj-i-'As. In the next year 1899 the Afghans said that they would give water only for the Dost Muhammad canal; and they closed the Lakhshak at its head. Khán Ján Khán opened it; the Afghans again closed it. This was done, as there is a big draw of water from the Nad-i-'Ali channel into the Shela-i-Lakhshak and the supply can only be controlled with difficulty. At last Khán Ján Khán made a *páling*, *i.e.*, feeder from above Burj-i-'As. The Afghans closed this also and there was another quarrel, and therefore this *páling* was sometimes called *Fanjál*. Khán Ján Khán then did what the Afghans had wanted him to do all along and made a cut from the Ju-i-Jahánábád, which took out of the Rúd-i-Parián above the Band-i-Parián, and fed the Pokak series of canals from it.

In 1903, this *páling* was cut into by the river, and re-opened direct from the Nad-i-'Ali channel; it ran till March 1904. In July 1904 the Afghans and Persians amicably co-operated† and put a good deal of tamarisk into its head to control the amount of water to the Lakhshak series of canals.

The Lakhshak series of canals were fed from this *páling* all through the cold weather of 1904-05 and up to the time that the Mission left Seistán. Sardár Khán Ján Khán collected his cultivators and worked on the Band-i-Parián to divert water into the Nad-i-'Ali channel, and so feed this system of canals.

*Shela-i-Lakhshak.*

The lands where the Shela-i-Lakhshak runs were also under cultivation up to 1885, as was the case with the lands under the Shela-i-Jahánábád already

† In 1905 they quarrelled throughout the period of low river about the regulation of this channel and finally on the 30th of November the Persians burnt the tamarisk weir that the Afghans had built a few days before.

described; these lands too were low. The embankments at the head of the Chárkh and lower down, on the main stream of the Helmand tended to raise the level of the river. On both banks of the river there were strong protection embankments, but the level of the country on the left bank of the river was generally lower than that on the right.

The Shela-i-Lakhsak was formed at the time of the flood of 1885. After the flood the land of Milak was given to Sardár Khán Ján Khán who put an embankment around the lands of Milak and cultivated them. A flood of ordinary dimensions which came a few years later (probably 1889) carried away the crops of Milak. Khán Ján Khán then went to Chilingak and made a home there for himself. Deh Saiyád was the first village established after the flood of 1885 by him. Deh Shaikh, Deh Yár Muhammad, and Kang Lalla followed.

In 1894, an earthen *band* was put across the Shela-i-Lakhsak, below Jahánábád, to feed several small canals for Siádk, one of which irrigates lands near Karko Sháh in the *Jam* of Deh Dost Muhammad. From 1894 to 1896, at flood times this earthen *band* was swept away almost every year; but since 1896 no damage has been done to this *band* as the Shela-i-Lakhsak has been fed from the canal, and is under control.

In 1894, Siádk was established and most of the lands near Siádk were reclaimed.

#### *Shela-i-Ghar Gharruki.*

This was a branch of Shela-i-Jahánábád running to the south of Diwal-i-Duzd, and dropping into the Shela-i-Lakhsak west of Karko Sháh. The bed of the Shela-i-Lakhsak was at a very much lower level, and the slope in the bed of the Shela-i-Ghar Gharruki was therefore steep. The water therefore made a gurgling sound as it flowed down this Shela, and Ghar Gharruki is an onomatopætic word expressing this sound.

#### *Band across Sikhsar above and below Burj-i-As.*

Táj Muhammad guide who used to live in what is now the Miánkangi says that before the flood of 1885 the main stream down to Deh Taus was called the Helmand, and below that it was called the Sikhsár. Long before 1885 when the

Native account of how the Sikhsar became the boundary.

Persians took Seistán, they took possession of all the villages on the left bank of

\* About 1866.

the river, which belonged to Sardár Ibrahim Khán, Sanjaráni. Sardár Ibrahim Khán saw that he could not resist the Persians; he therefore gave his daughter in marriage to Mir 'Alam Khán, of Káin and thus made friends with him. 'Ali Khán, father of Dost Muhammad Khán, was the Kadkhudá of Deh Margo formerly a village belonging to Sardár Ibrahim Khán, Mir 'Alam Khán won him over to his side and gave him the control of the collection of the cattle tax, etc. 'Ali Khán, being a Balúch, became a mediator between the Persians and the Sanjaránis, and made the Sikhsár the boundary between Persian Seistán and the territory of Ibrahim Khán; since then the Sikhsár has been the *Sim* or boundary between Persian and Afghan Seistán.

(1) There were five *band* across the Helmand and Sikhsár below Milak. The first was called Band-i-Marungi or Band-i-Balach. Balach was a Rakhsháni Balúch. He was a big Kadkhudá. His son, Zaman Khán, was killed in a skirmish about 5 years ago. The Akhonzada Fakir Muhammad, Hakim of Chakhánsúr, took the daughter of Zaman Khán in marriage. This *band* was made a little above Reg-i-Shohbat called by the Mission *Beld's ford*, near Deh Shamsudini, west of Nad-i-'Ali: the canal was a big one, and it became very wide and deep after a few years. This canal went to Marungi, Dasht-i-Paran, passing between Safid Dik and Surh Dik at Nad-i-'Ali and to Diwalak and Deh Fakir Muhammad. Shela-i-Marungi can still be traced. The *band* was never built after the flood of 1885.

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(2) The second *band* was called Band-i-'As or Band-i-Dádi, so called after the name of Kadkhudá Dádi of Afghán Seistán. This *band* was built at the head of the Sikhsár, or about one thousand yards below Burj-i-As. It was made to divert water into Shela-i-Dádi, now called Shela-i-Chárkh. Dádi had made a cut (now called the Chárkh canal) to feed the Shela-i-Dádi. This cut was at that time called Nobar-i-Dádi. Shela-i-Dádi was not so deep as it is now. It was deepened by the flood of 1885. It used to irrigate the lands of Deh Dádi,\* Kala-i-

\* The Russo-Afghan Boundary Commission Kang, etc., as it does now. The surplus camped at this village on the 29th October 1834. water used to go into the Naizár. The Akhundzada took away the village from Dádi later on. This *band* was never made after the flood of 1885.

(3) The third *band* was Band-i-'Ali Khán. This was made where Deh Lala and Deh Gul Muhammad Beg now are. The traces of the *band* are still visible. This *band* was made by 'Ali Khán, Saruni, and Dost Muhammad Khán, his son, to divert water into the Dost Muhammad canal. The Afgháns also took out a small water-course above the *band* for Deh Taus, Deh Gul Muhammad Beg, Deh Ido, etc. This *band* was built every year even after 1885, till Dost Muhammad shifted the head of his canal to the site where it is now. This was done about 1896 or 1898.

(4) The fourth *band* was called Band-i-Shamshíri.† This was built by the Afgháns, opposite Deh Ido. The site of this *band* was about  $1\frac{1}{2}$  miles below the site of Band-i-'Ali Khán. Muhammad Ján was a big Kadkhudá, and an athlete too; he used to make this *band* to carry water to Ibráhimábád, Kacholi, etc.; he continued to build this *band* every year even after the flood of 1885, till he died about 4 years ago. His son, Sher Ján, is still the Kadkhudá of Deh Muhammad Ján.

(5) The fifth *band* was called Band-i-Bahlol. It was made every year by Kadkhudá Bahlol of Sikhsár, to irrigate lands in Afghán Seistán. When the supply falls very low, an earthen *band* is even now put across the Sikhsár, and all the water is run into canals on the Afghan side; Bahlol's son, Madad Khán, now makes this *band*. When the supply of the Sikhsar is ample, some water is allowed by the Afgháns solely at their own discretion into water-courses belonging to the Persians. This earth *band* is still made every year.

*Some of the main Shelas below Burj-i-As.*

*Rúd-i-Shagalak.*—In Sál-i-Barf, a Shela was formed which took out from the Sikhsár near the place where Deh Lalla is now, and ran into the Naizár south-west of Karkú Sháh. In 1881 Ghulam Haidar first made an earthen *band* in the Sikhsár below Deh Luch, and Dádi made a canal from the Shela-i-Shagalak at its head, and dropped it into the Sikhsár below the *band* of Ghulam Haidar. In 1885, this Shela became a big river. It was called Shagalak because the lands through which it passed were called by the name of Shagalak. The first *band* was put across this Rúd in 1886, and every year till 1895, when the Parián was formed, this *band* was renewed. Rúd-i-Shagalak ran to the south-west of Karkú Sháh, and then flowed northward, then to the north-east, and ran into Rúd-i-Shamshíri north of Deh Khamar. In 1895 Rúd-i-Shagalak became silted up, and in 1896 completely dried up.

*Shela-i-Shamshíri.*—Long before *Sál-i-Barf*, i.e., 1877, Shela-i-Shamshíri flowed into the Naizár. Dádi says that, in 1881, when he made Naubár-i-Sikhsár, it was flowing. But a year or two afterwards 'Ali Khán, Sárúni, banded it at its head, and built his village of Deh Dost Muhammad on its banks. Rúd-i-Shamshíri is also called Rúd-i-Ashikan, because the *kang* between Shela-i-Shamshíri and the Sikhsár was a place of excellent grazing, and much liked by *Goadar* and *Shikari*. *Ashik*, literally means a lover. After this name

† It is mentioned by Major P. M. Sykes in his book on Persia in the Chapter on Seistan. for this piece of land, Rúd-i-Shamshíri is also called Rúd-i-Ashikán.‡

‡ The site of the Mission Camp at Deh Gul Sháh (February to March 1904) was in the Kang-i-Ashikán.

'Ali Khán used to grow some melons and millet in the *kang* before 1879, but afterwards when he banded off the Shela-i-Shamshíri, he sowed wheat and began to reclaim lands in Miánkangi. Rúd-i-Shagalak, Rúd-i-Lakhshak and Shela-i-Ghar Gharruki ran into the Naizár at the same place north of Karkú Sháh.

*Shela-i-Khar Kushta.*—This Shela also exists from olden times. When the Helmand ran into the Naizár at the tail of the Sikhsár, Khar Kushta was one of the many Shelas there. The people say it is so called because a donkey was drowned while crossing it. This Shela took out from the Sikhsár north of Deh Dost Muhammad, and ran into Shela-i-Shamshíri south of Deh Khamar, when 'Ali Khán reclaimed lands about the site of the village of Deh Dost Muhammad; he banded Shela-i-Khar Kushta also.

*Burj-i-Alamdar.*—This is a small mound with a few walls of an ancient ruin, north of Deh Ibráhimábád. This mound was in the Naizár, and men who have seen the place can still recognize the mound (according to Dádi). The old Arbáb says that 'Alam Khán, son of Sháh Dost, Sanjaráni, came to live here with Ján Beg Balúch; at that time Seistán was in chaos and confusion. He made a small tower and stationed himself in it with 100 men. Since then, it has been called Burj-i-Alamdar.

*Chilingak.*—This is a series of small ruins on small mounds from ancient times. The *jam* of Khán Ján Khán is called Jam-i-Siádk and Chilingak. Before Siádk was reclaimed, this tract was Naizár, called Naizár-i-Chilingak. Now that the lands about the place are reclaimed, the circle is called Chilingak and Siádk.

*The account brought up to date by Captain Macpherson.*

The following note of the alterations made in the canals near the boundary since May 1905 has been kindly supplied by Captain A. D. Macpherson, His Britannic Majesty's Consul, Seistán.

- (1) The Jahánábád canal now takes off at the separation of the Nad-i-'Alí channel from the Helmand and just above the Band-i-Parián.
- (2) The Lakhshak takes off at *janjal* opposite Burj-i-As.
- (3) The village of Milak is now situated about three quarters of a mile to the north of its present site on the map.
- (4) A small canal has been cut by Sa'id Khán (our late Jemadar of levies) from about the centre of the Ju-i-Afghán or New Cut towards Jaroki.
- (5) A small canal has been cut by Ghulam Khán, Ghilzai, from just below the junction of the Ju-i-Afghán with the Nad-i-'Alí channel towards the land known as Zamin-i-Chulk.
- (6) A light *band* has been thrown across the Helmand during the last few days by the Afgháns at Shahgul to feed the New Cut.
- (7) A substantial *band* has been built across the mouth of the Lakhshak canal by the Afgháns to prevent too much water flowing down that stream; I do not know yet whether the Persians will allow the above two *band* to remain there will probably be a dispute over the latter\*.
- (8) There was no water in the Sikhsár stream on the 27th November. Such water as reached the mouth of it all flowed down the Ju-i-Chárkh. The bed of the Sikhsár appeared to be a couple of feet above the present level of the water in the Ju-i-Chárkh.

\* It was but a few days after the above was written.

## APPENDIX 32.

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## FORDS ON THE RUD-I-KHASH.

- Guzar-i-Aerandaz—Guzar-i-Kadda—Guzar-i-Alefi—Band-i-Kadda—Padag-i-Sardár  
 —Gurguri—Guzar-i-Razac—Guzar-i-Band-i-Khâsh—Karez-i-Khunian—A  
 spring—Guzar-i-Puza-i-Khâza—A well on the *Dashi*—Guzar-i-Mazrak—  
 —Guzar-i-Pusht-i-Hasan—Band-i-Lûkhi—Perennial supply in the Rûd-i-  
 Khâsh—*Nohor* from the Khâsh Rûd—The volume in the Rûd-i-Kâsh in  
 1905.

*Ancient river beds of the Khâsh Rûd.*

## APPENDIX 32.

## FORDS ON THE RÚD-I-KHÁSH.

*This information about fords, etc., on the Rud-i-Khash was collected by Lala Thakur Dass, Supervisor, from the Baluchis. No one belonging to the Irrigation Party was able to go and visit these places to check this information.*

This is so called after the name of an ancient fort called Kala-i-Aerandaz.  
 It is about 13 miles along the river  
 Guzar-i-Aerandaz. from Chakhánsúr. The bed of the river has  
 no gravel, but the ford is not slippery. When the river is in flood, the people  
 cross on gourds or rafts.

This ford is for the village of Kadda; at flood time this ford disappears;  
 in 1904 at flood time it was not fordable.

Guzar-i-Kadda.

This road is between Aleli on the left bank and Gikán and Kadda on the  
 right bank. The ford is a good one. When  
 Guzar-i-Aleli. there is one *had* or about six feet of water  
 at Guzar-i-Aerandaz, there is about 4'0 feet at Aleli.

Band-i-Kadda is well-known, and is about three hours' walk below Guzar-i-  
 Aleli. It is made with shingle put in gabions. When the supply in the river is low  
 Band-i-Kadda. not a drop of water goes below Band-i-Kadda. Ju-i-Kadda takes out above  
 Band-i-Kadda, and is a big canal of about 12 feet bed width. The bed of the  
 river here has small gravel on it.

About six miles above Guzar-i-Aleli is the Padag\*-i-Sardár Ibrahim Khán.  
 From this ford to Gurguri there is no  
 Padag-i-Sardar. tamarisk on the Khásh Rúd. The chan-  
 nel runs through a gorge in the *dasht*; the plain or *dasht* is so level that the  
 gorge has no distinguishing mark that would catch the eye of a man travelling  
 over the *dasht* towards the Rúd, so that he comes upon the gorge suddenly and  
 only realizes its presence when he stands on the edge overlooking the river. It  
 is said that some years ago four travellers died of thirst only a short distance  
 from the river, because they did not know that the river was so close to them.  
 The same effect is obtained at some parts of the *dasht* of the Helmand  
 gorge above Bandar-i-Kamál Khán and along the Rúd-i-Sena. At places the  
 traveller descends from one terrace to another; at others he moves over a level  
 plain and there is no indication of the proximity of the gorge on its level surface.

At Gurguri the river is said to fall two or three *Sar*, *i.e.*, about 10 or 15 feet  
 over a vertical cliff. The river then flows  
 Gurguri. through the gorge in the *dasht* above descri-  
 bed. Above Gurguri the river flows with a gentle current, but when it ap-  
 proaches Gurguri it flows swiftly. Though the depth of the river is not great, yet  
 people do not cross here through fear of being carried away into the whirlpool  
 below the rapid.

*Gurguri* is an onomatopœtic word to imitate the noise of the water over the  
 fall, and which the Balúchis say is like *Ghám Ghám*. The pool below is  
 said to be about 300 feet long and 50 feet wide with an inconceivable depth.  
 This pool never dries. According to Saffar and Hamid Khán, it is *Zindu-áú*,  
*i.e.*, there is a spring. The water from this pool always overflows in a small  
 stream in the bed of the Rúd-i-Khášh, and when it reaches Gikán (about 10  
 miles below Gurguri) it disappears in the gravel (*shana*). The people of  
 Gikan are not energetic enough to utilize this water. Whatever small efforts  
 they have made to carry this water into their canal have so far failed. The  
 water in this pool is sweet.

The ford is between the two villages† Razaé Ismail Khán (left) and Razaé  
 Mir Afzal Khán (right bank). The bed of  
 Guzar-i-Razaé. the river has big gravel and never changes.  
 The ford is very good, as the river at this place is very wide. On both the

\* Babylonian Willow  
 † Hamid Khan says that the fall is about 40 feet. When the river is flowing, the noise is so great that a rifle  
 shot cannot be heard.  
 ‡ These names are not on the maps.

banks lands are cultivated. A man can ford at this place so long as there is not more than 3.5 feet of water in the river.

This ford is about two miles above Deh Khásh\*; the ford is below the Band-i-Ju-i-Khásh. The bed of the river has gravel. This ford lies between Deh Khásh (left bank) and Zírat Dwazda Imam (right bank). If the depth is more than 3.5 feet a man cannot ford here. In 1904 the ford did not disappear, but in 1903 it did.

Guzar-i-Band-i-Khash.

About six miles north of Kala-i-Khásh on the right bank of the river, a *karez* takes out through the *dasht*. This *karez* passes by the Zírat-i-Dwazda Imam, and trees have been planted there; the flow is perennial. The utmost extent of cultivation that can be done with the water of this *karez* is two ploughs of land or three† *kharwar sang* of seed in the lands of the village of Khunian. The *karez* ends near Deh Shishawá.

Karez-i-Khunian.

† About 40 acres or so.

In the bed of the Khásh Rúd a little above Band-i-Khásh is a spring called Ab-i-Shand. The flow is small and is brought into the village by the Khásh canal where it is ordinarily used for drinking purposes only. But if the river dries up at least 12‡ *kharwar sang* of wheat or barley seed can be sown and matured from this flow.

A spring.

‡ About 170 acres.

This ford is a well known one. It is at the junction of the Khásh Rúd with the Rúd-i-Rezi, a small stream coming from the east which only flows after rain. In 1904 this ford did not disappear, but in 1903, the river rose high and was not fordable at the time of high flood.

Guzar-i-Puza-i-Khaza.

At the top of the *dasht* near Puza-i-Kháza there is a deep well. It is now dry, but there is a tradition that an ancient king who had a very beautiful daughter promised that he would give the hand of his daughter to that one of the two suitors who first finished his task. The tasks were making the Band-i-Lukhi, and digging this well. The suitor, who was digging the well, stealthily poured water into the well from above, and so gained the daughter. But his deceitfulness became a curse to him. So much so that the Balúchis believe that if a living animal is lowered into the well by a rope, and again pulled out the corpse comes up without the head. This well is called Cháh-i-Náhák.

This ford is for Garu on the left bank. If the river has 4.0 feet of water, it is a *Zor Guzar*, only fordable by a powerful man. But in 3.0 feet of water a man can ford it easily. The bed of the river has big and small gravel.

Guzar-i-Mazrak.

This ford is between Pusht-i-Hasan village on the right bank and Kisht‡ village on the left bank. This ford is just like Guzar-i-Mazrak. Below this ford a small spring gives some water, which is carried away to Garu village through a small canal. This is also *Ab-i-Shand* or *Sabe-áú*.

Guzar-i-Pusht-i-Hasan.

A Spring for Garu.

Guzar-i-Pusht-i-Hasan is about 500 feet below Band-i-Lukhi. This ford is *Padshahi*. The river is very wide and has big gravel on the bed.

Band-i-Lukhi.

Band-i-Lukhi is a very far famed, and very ancient *band*. It is made of gabions filled with stones, just like the *band* that were made on the Helmand at Puza-i-Mashi. During the ordinary flow of the river, this *band* does not allow a single drop of water to pass. It is renewed every year by the people of Lukhi, a very big village having about 500 families.

Safar and Mullá Dúrrá, who went to Aleli, asked some men about Band-i-Lukhi; they said, that the *band* is about 20 feet in width, and is made of stones.

\* Khásh by the map is 30 miles above Aleli.

‡ Kisht by the map of Lord Curzon is 21 miles above Khásh.

It is never entirely washed away by the flood. When the river rises, the water overflows the top of the *band*. People to repair it add more gabions and stones to the top. The canal is very ancient. There is no necessity to clear silt from this canal. It draws a large supply of water. No one now remembers who first made this *band*.

About 20 miles above the Band-i-Lukhi is the head of Ju-i-Deh Pusht-i-Hasan. The water in the Rúd-i-Khášh reaches the head of Ju-i-Deh Pusht-i-Hasan throughout the whole year. This canal is as big as the Khwája Ahmad canal (carrying say eight cusecs). Half of Deh Pusht-i-Hasan belongs to Arbáb Ghulam Haidar, who possesses Lukhi village; and the other half belongs to Mir Afzal Khán, son of Abdul Nabi Khán, Afghan.

Above Kadda, as has already been said, the Rúd-i-Khášh flows through a deep narrow gorge cut through high *dash*t. Below Kadda there are small channels from the Rúd-i-Khášh, that flow into the Naizár, such channels are called *Nohor*\* or escapes or distributaries. On the right bank there are only two such channels :—

- (1) Khaluki, or Kalb Ali, takes out from the Khášh Rúd near the boundary of Chakhánsúr and Kadda; passes Dik-i-Gwani and the ruins of Gwani; crosses the old Zarkan and Zorkan canals; passes Dik-i-Arbáb, and goes south of Post-i-Gáo, Sar-i-Kang, and then tails into the Chung-i-Zírraki.
- (2) Nohor-i-Shah Ghes takes out from the Khášh near Chakhánsúr, and runs into the Nohor-i-Kalukhi at Dik-i-Arbáb. Nohor-i-Shah Ghes runs through cultivated lands; while Kalukhi runs at the foot of the *dash*t. Nohor-i-Shah Ghes was flowing on the 16th of April 1905.

On the left bank of the Khášh Rúd there are four *Nohor* :—

- (1) Nohor-i-Sahib Khán; this *Nohor* takes out above the head of Nohor-i-Kalukhi.
- (2) Nohor-i-Safar Khán.
- (3) Nohor-i-Rahmat.
- (4) Nohor-i-Makhi which was in flow on the 16th April 1905.

All these four *Nohor* were made by people to irrigate lands. The river at one time or another made them useless as canals, and they are now like shelas.

The water in the Rúd-i-Khášh came down on the 15th March 1905, and it reached Chakhánsúr the same day. After that it daily increased. Safar, son of Nur Din, and two other Balúch guides were sent to take the measurements of a section of the Rúd-i-Khášh at a place where the channel was regular and undivided. They went to Aleli, one day's journey above the tail of the Rúd-i-Khášh, at Chakhánsúr. At Aleli the river runs between high banks; the bed has gravel, and the channel is regular for some distance both up and down stream of the point, where the Balúchis measured their section. The discharge on the 18th March 1905 was 458 cusecs, and the mean velocity 2.6 feet a second.

The measurements of the same section were again taken by the same Balúchis on the 16th April 1905, the discharge was 1,473 cusecs and the mean velocity 3.33 feet a second. There is a steep slope in the bed of this part of Rúd-i-Khášh; at the fords a man cannot cross the stream when the depth of water is more than 3.5 feet.

In 1903 the flood in the Rúd-i-Khášh must have come down very early in the winter, and lasted later than usual into the summer for about 200 cusecs where still flowing early in August when Sub-overseer Hari Singh took his level section of the delta.

In 1904 the flood water reached Chakhánsúr on the 24th February; the supply was ample to sow and mature the crop, but the river dried up early in June.

\* Perhaps the word is Nabru.

*Ancient river beds of the Khash Rud.*

The Balúchis describe three ancient troughs as leaving the Khásh Rúd above Razae, which they say are like the troughs of the Sena Rúd and the Trakun Rúd. These troughs, they say, have each a canal in their beds just the same as the canals in the two troughs of the Helmand just mentioned. Going upstream, 18 miles from Gurguri, the first trough is called\* Tal-i-Udáád, the next is named Puda Tal, the third is called Kotori. The heads of these three canals are said to be cut through a hard alluvial cliff which shews no sign of weathering. The canals run in the direction of Amírán, and the old Naib Sultan of Chaharburjak told the gallant Khán Bahádúr Shaikh Mohi-ud-din that these canals were the original Zorkan and Zarkan, which took out from the Khásh, and came across to the Helmand Delta, and the Khán Bahádúr hoped to investigate this when he reached the Khásh Rúd. Our levels since taken shew that it is not possible for canals of the one river to go far on to the Delta of the other. It is said that, in the 1885 flood, water found its way down all three of these canals. It is, also, said that the water from the Razae canal can be run to escape into the Kotori.

All this is very interesting and indicates that the old beds and canals of the Khásh Rúd are as important a feature of the country as those of the Helmand.

\* Tal is a low bed.

Puda means ruined or destroyed.

Kotori is a thorny shrub which grows there in abundance. It is used elsewhere on the top of garden walls.

## APPENDIX 33.

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## FERRIES AND FORDS ON THE FARAH RUD, AND OTHER MISCELLANEOUS INFORMATION.

**Ferries at**—Pir Murad,—Muhammad Darwish—Husain-i-Khuda Dad.

**The fords**—At the mouth of the river—Kucha-i-Nahak—Bahring-i-Sabz—Khwaja Kasim—Khairabad and Darg—Samoor—Lásh—Panjdch—Sar-i-Band-i-Juwait—Pir-i-Kunder—Tujg—Takht-i-Twist—Naudi—The perennial flow of the Faráh Rúd—Dárábád—Faráh—Bahring-Tut—Gazgán—Sibasti.

**Miscellaneous information**—Kurg-i-Gard—Old channels or escapes from the Rúd-i-Faráh.

**The floods**—The flood of 1903—The flood of 1905.

## APPENDIX 33.

## FERRIES AND FORDS ON THE FARÁH RÚD.

*The Ferries near the mouth of the Faráh Rúd, and the Fords below Guzar-i-Khwája Kásim have been seen by the Mission. All the other information is collected from the people by Lala Thakur Dass, Supervisor, and has not been checked by visits to the spot.*

## Ferries.

*Guzar-i-Pir Murád* or (*Já-i-Kashak-i-Tútin* or ferry).—So called after the *Ziárat* that is close by.

The bed of the river consists of clay with a little gravel. At this site the river is 220 feet wide, with still water 26½ feet deep.

*Tutin* are kept here and people generally cross at this ferry until the fords further up the river appear. The current is so rapid, even at the ford of Khwája Kásim, that sheep cannot cross the stream when there is only about 9 inches of flowing water.

So long as the river at Khwája Kásim is unfordable to men, and during the time that the depth of water there is about one *kad* or 5½ feet; the *tutin* at this ferry of Pir Murád is worked with difficulty. When the river is in high flood they say that the ferries cannot be worked at all owing to the swiftness of the current.

These *tutin* are worked by a tribe of Balúchi called 'Taifa-i-Saliman'; as a rule, they cultivate lands, but they are also the best swimmers in Seistán. At this ferry and two others up the river, *tutin* are kept by this tribe. They charge one *kran* for 20 to 30 sheep, or for 4 to 5 men. They collect their dues in grain.

The *tutin* are large ones. A thick rope made of *kirta* grass is stretched across the channel, and made fast at both ends. When the river is full and flowing it takes some time and pains to stretch this rope. The ends of the rope are tied on gourds, and some of the strongest and best swimmers, bouyed on gourds, take the ends, and start about half a mile upstream of the ferry. After 2 or 3 trials they succeed in tying the ends of the rope across at the site of the ferry.

*Guzar-i-Ju-i-Muhammad Darwish* (*Já-i-Kashak-i-tutin* or ferry).—The bed consists of clay with a little gravel. Width of the river at the ferry 227 feet, depth of still water 22 feet. This ferry is worked just like the one at Ziarat-i-Pir Murád.

*Guzar-i-Hasan-i-Khuddúdd* (*Já-i-Kashak-i-Tutin* or ferry).—The bed consists of clay with a little gravel. This is also a ferry, just like that at Pir-i-Murád or Ju-i-Muhammad Darwish. But *tutin* are not always kept here, if necessity arises, a *tutin* is placed temporarily at this place. In 1903 and 1904, no *tutin* were kept here.

## Fords.

*The fords at the mouth of the river.*—While the Mission was in camp on the left bank of the Rúd-i-Faráh at Ziarat Pir Murád, there was a good ford about 2 miles down, and below the Kurg-i-Gard; the camels had to cross the mud flats on either side of the water, but the mud was just sufficiently hard to enable this to be done. It was a chance ford, and a very useful one.

*Guzar-i-Kucha-i-Nahak* (Ford).—The bed was dry and consisted of gravel overlying hard alluvial.

The story is that long ago some innocent people were killed at this place; and hence it is called Kucha-i-Nahak.—*Kúcha* is a road, or rather a lane.

This ford appears last of all. The banks of the river, are very high; and there are deep pools in the bed of the river, only one chain below the ford. People cross here when the depth of water is about 2½ feet or less; if the depth is greater, there is great danger of being carried into the deep holes and drowned. When the depth of water at Khwája Kásim is 20 feet; they say it is 5 feet at Kucha-i-Nahak.

*Guzar-i-Bahring\*-i-Sabz* (ford).—The bed consists of small gravel. The ford appears later than the ford at Khwája Kásim, but earlier than Guzar-i-Nahak.

\* A fixed sand-hill.

The current is not so strong as at Kucha-i-Nahak. But when a man once loses his foothold, he is carried away by the current into deep water.

When at Guzar-i-Khwája Kásim the depth is 3 feet, it is said to be 4 feet at Bahring-i-Sabz.

*Guzar-i-Khwája Kásim* (ford).—The bed consists of small gravel and is hard. This is the best ford in the vicinity. The river has a sharp bend here, and the current helps a man to go from one bank to the other. The ford is very wide, and there is no danger of a man being carried away into deep holes. When the depth of water is more than 3 feet a man cannot ford, nor can a camel cross in more than 3.75 feet of water. In its ordinary rise the river is fordable here, while at other places it is not.

† *Guzar-i-Khairábád and Dárg* (right bank).—The former village is on the left bank of the Faráh Rúd. This ford is better than the one at Khwája Kásim, as the width of the river is greater; and depth comparatively small. This ford appears before the one at Khwája Kásim.

In 1904, the river at Khairábád was not fordable for about 5 days only.

The water for drinking purposes is got from wells in the village.

About 30 or 40 days before Naurúz the Faráh Rúd is generally in flow. Even if water comes 10 days before Nauruz, they sow wheat. Later on they cannot sow wheat, and in the years when the Rúd-i-Faráh remains dry till Naurúz no wheat is sown in this village.

The cultivators at Dárg obtain water from a small spring, which takes out from near Zíárat-i-Imam Záda about 2 miles above Dárg. This spring is at the foot of a vertical cliff, 2 miles away from the Rúd-i-Faráh. The water is perennial. A small water-course carries the water to Dárg.

*Guzar-i-Samoor* (right bank).—This ford is even better than the ford at Khairábád, as the river is wider here. Upstream of Samoor there is a spring in the bed of the Faráh Rúd, which constantly flows. No one remembers it ever being dry. The water from the spring is enough to sow, and ripen 6 or 7 *juft*

† Enough for 10 or 12 acres.

*gao*, each *juft gao* sowing about 100 *man*†  
Seistáni of seed. Generally they do more

sowings, as the water in the Faráh Rúd arrives in time to ripen the crops.

Meshedi 'Ali says that the spring takes out from the *dasht* north of Jawain, and is about 3 miles away from the bank of the Faráh Rúd.

*Guzar-i-Lash* (right).—This ford is even better than the one at Samoor. The *Dák* between Faráh and Lash crosses on this ford. It appears earlier than the ford at Samoor and Khairábád. In 1903, the river here was not fordable for 6 days when the river was full.

*Guzar-i-Panjdeh* (right).—Lash has no cultivation. The river passes under a high vertical cliff like Kim-i-Sufíd. The fort in which the Regiment of the Amir-i-Kabul is stationed is situated on this high *dasht*. This ford is like Khwája Kásim. The valley is narrower than at Lash or Samoor; and the fords appear about a week later than the fords at Lash and Samoor.

Below Panjdeh the people of the villages drink either well water or the water that stands in pools. But above Panjdeh, water can be got by removing the boulders, and making a pit about 2 feet deep. Pools also occur in the bed, but the bed is said to have *áb-i-chashma* under the boulders. Water got in this way is called *áb-i-shand*. No cultivation can be done, as the land lies very high.

† Three months after Nauruz in 1885 or eleven weeks after the flood came down the Faráh Rúd, Meshedi 'Ali, son of Shéhúr, said he crossed the Faráh at Khairábád. He says that the ford at Khwája Kásim had appeared a few days before he crossed at Khairábád.

*Guzar-i-Sar-i-Band-i-Juwain* (left) or *Karawanrez*.—This is like the ford at Panjdeh. It is not a very good ford. This ford is also called *Karawanrez*, as it is on a big road; and *karawan* halt here to rest their camels.

Juwain is about 7 or 8 miles from Rúd-i-Faráh. The people drink water from wells. The people of Juwain put a strong *band* across the bed of the Faráh, so that if any water comes down, they take it away in their canal and sow wheat. If the quantity of water is greater than they require, the surplus is utilized by the village lower down.

The bed has *Ab-i-Shand*. The pools in the bed are also very deep.

*Guzar-i-Pir-i-Kunder*.—This ford is so named after a *Ziárat* called Pir-i-Kunder. The ford is used by Máldár people chiefly, as it is better than the ford of Juwain. The river here is wide and shallow.

*Guzar-i-Tujg* (right).—This ford is better than the ford at Juwain, as the river is broad and shallow.

Tujg is said to be a big village having about 30 *Juft gao*. It has two small canals—one is fed by a spring from a small hill, and the other is fed from the springs in the bed of the Rúd-i-Faráh. The people of Tujg sow wheat early from these springs. The village has many gardens. The water mill is said to grind 100 *man* Seistáni of flour in 24 hours.

*Guzar-i-Takht-i-Tecosh* or *Twist* (left).—This ford is like that of Juwain not a very good one, as it appears late.

This village gets drinking water from the Rúd either from pools or from *Shand*. As at other villages there is a *band*, which is repaired annually so as to hold up the water when it comes down the river.

*Guzar-i-Naudi* (left).—Naudi village is said to be half a day's journey from the town of Faráh. The ford is about  $1\frac{1}{2}$  miles upstream of Band-i-Naudi. This is a very good ford, as the river is very broad and shallow here.

Naudi is said to be the biggest village under the Hakim of Faráh. It has 40 *Juft gao*. Naudi is a notable place, because the low river supply of the Rúd-i-Faráh does not go further than it. To Naudi the supply in the river is perennial. No one remembers the river ever having dried up. When a high supply comes down the river, the surplus quantity is passed over the Band-i-Naudi. There are two small canals for Naudi village. Each of which is equal in capacity to the Khwája Ahmad canal. Thus the water coming down to Naudi may be estimated at about 20 cusecs; and this supply is said to be perennial.

*Dárábád* (right) or *Guzar-i-Khán-i-Pulan*.—The ford is a very good one. It is said that there are ten piers or rather remains of piers of a big bridge which stood here in old times.

The ford is a little north of this line of piers. The river is broad and shallow, and unless the river is in flood, the ford is serviceable.

There are two canals for Dárábád—one is named Gamar and the other is called Ju-i-Kashán. Dárábád has about 30 *Págáo*; and a large number of gardens.

*Guzar-i-Shahr-i-Faráh* (left).—The river here is very broad and shallow. It flows just under the town of Faráh. This ford is considered the best in the neighbourhood, as it appears first of all other fords after a flood. When Dárábád and Naudi fords have about 3'0 feet of water the ford at Faráh has about nine inches less of water. The bed of the river is also hard and does not change at all.

Faráh is a big town. The people say that the taxes on (1) *gáodárs*, (2) *sar khanaí*, (3) *sar ramai*, (4) camels, (5) cattle, and (6) weavers, etc., recovered in cash amount to 12 lakhs of *kran*. The Government assessment on produce is in addition to this.

*Guzar-i-Bahring Tut* (right).—This ford is better than *Guzar-i-Shahri*.

*Guzar-i-Gajgan* (right) and *Kunisk* (left) (about 25 miles above Faráh).— This ford is just like the ford of Shahr-i-Faráh. There is a water-mill in Kunisk.

*Guzar-i-Sibasti*.—There was a village called Sibasti here, which is in ruins now.

#### Miscellaneous information.

*Kurg-i-Gard* or *Dahana-i-Faráh Rúd* in the Hámún-i-Sábari. *Kurg* means hole, *Gard*\* means deep or great. The people of Juwain, Kalala and other villages on the banks of the Faráh and Harud Rúd call this *Kurg-i-Zárd*, because they say the water in this hole becomes yellow, when not replenished for a long time as in 1902. But the people of Persian Seistán call it *Kurg-i-Gard*.

This is a long deep hole in the bed of the river about 6 miles long, 200 feet wide and from 20 to 30 feet deep; this long hole gets shallower as the river approaches the Sábari Hámún, so much so that at the tail the depth is only 1'6 feet (January 1905), and we were able to cross our camels here with ease.

Local tradition says that the *Kurg-i-Gard* is the Gilkan-i-Pesháwarán. The soil at this place was eminently good for brick manufacture. They dug up the earth, mixed water with it, and used bullocks to pug it. Mullá Ibrahim of Khel-i-Gaz-i-Yakka, near Machatak, says the tradition is that when Pesháwarán was being built, the Rúd-i-Faráh did not flow into the Sábari Hámún. The present river channel stopped at Lásh and Juwain, and at its tail was a big canal, which irrigated the lands near Machatak, etc. In course of time this very canal became the river channel; and *Kurg-i-Gard* which was shallow at first gradually changed into what it now is.

No one in Seistán remembers the Faráh Rúd flowing in any other direction. The river has found a very direct course to a deep part of the Hámún and the great velocity down the steep slope has scoured out this deep channel. Doubtless when a delta has been built up the velocity will gradually slaken and the hole silt up. The banks are well dotted with padah trees and a great number of trunks of trees are scattered over the delta; perhaps the accumulation of a long time, as no one seems to remove them; they are too far from the markets. Such trees on the Helmand are eagerly used.

In 1902, when the Hámún-i-Helmand dried up, there was about 10 feet of water still left in *Kurg-i-Gard*. They say that a huge number of fish from the Sábari Hámún migrated into *Kurg-i-Gard*. So much so that *Kurg-i-Gard* was crowded, and people from all parts of Seistán came and caught the fish, but when the water became foul and black, the fish died in large quantities. After a while, all the fish died and the water became undrinkable; the people then dug holes on the banks of *Kurg-i-Gard*, and thus got sweet water. No one remembers to have ever seen the *Kurg-i-Gard* dry. There is a proverb in 'Iran' or Persia that so long as there is water in the *Kurg-i-Gard*, the people of Seistán cannot die of hunger.

#### The old channels or escapes from the Rúd-i-Faráh.

The Rúd-i-Faráh has three old channels by which water overflows and escapes to the Hámúns in very high or extraordinary flood; these are—

- (i) The *Bandúki-i-Júwain*.
- (ii) The escape towards *Kala-i-Káh* and the *Harud Rúd*, known as the *Khush Rúd*, or *Rúd-i-Kháriká*.
- (iii) The *Rúd-i-Bandukí*, also known as *Banduki-i-Pashmika*, or *Banduki-i-Kucha-i-Nahak*.

The *Banduki-i-Juwain* flowed in great volume in the flood of 1885; this old channel has not been seen by any one belonging to the Mission, but from the descriptions of the Afgháns and Balúchis, there is a wide trough through the *dasht*, which leaves the gorge of the Faráh Rúd, a little to the south of Juwain and leads direct into the Hámún-i-Puzak. The distance along this trough is said to be about 20 or 25 miles, and the general width of the trough throughout is said to be about five miles, though at places it may be only a third of that width. The opening or gap in the bounding *dasht* on the left bank of the Faráh Rúd is about 5 miles wide and extends from Juwain to Puza-i-Laftan, and forms a wide,

So the people said; but the usual meaning of *gard* is for the winding of a river or for a whirlpool.

open, low-lying plain covered with mounds, sand-hills and scrub bushes and in ancient times was cultivated; river spills were kept out by a large embankment, which extended from Juwain to Puza-i-Laftan; even now the higher lands are cultivated, the cultivation being protected by embankments from the floods from the river: but in the great flood of 1885 the big embankment was swept away, and the water flowed in a broad deep stream to the Puzák Hámún. Some eye-witnesses consider that more water went down this channel direct to the Puzák Hámún, then went down the Rúd-i-Faráh itself to the Sábari Hámún. It is said that although the flood of the Faráh Rúd was itself red with silt, a large amount of sand and soil was washed\* off the bed of the trough and carried into the Puzák Hámún, so that the depth of that depression was much reduced. In the bed of the Banduki-i-Juwain there are said to be many *shela* which collect water at every rains, where it remains till evaporated by the hot winds.

The Kush Rúd or Rud-i-Kháríká has been described on the first page of Appendix 35 on the Harud Rúd and need not be further noticed here.

The Rúd-i-Banduki-i-Pashmika is a small channel which takes off at the sudden bend of the river about 3 miles above our camp at Dahana-i-Rúd-i-Faráh and flows towards Tappa-i-Máchatak. *Pashmika* is a weed eaten by cattle, or sheep which produces a fluff like wool (*pashm*); this weed grows luxuriantly on the bed of this spill channel; hence the name. The *shela* is deep, and in a great flood is not fordable; in 1903 the stream in flood was about 500 feet wide and 8 feet deep.

#### Floods.

*The flood of 1903.*—In 1903, the water in the Faráh Rúd first came about the 15th January; *i.e.*, in time to sow wheat extensively. Seven days later Sahib Khán, an experienced flock-owner, tried to go across the river on a camel, but failed. Twelve days after, *i.e.*, about the end of January, he crossed on a camel; and then the river became fordable to men also.

Seventy days after this, *i.e.*, about the end of March, another flood came down, which lasted for three days.

In 1903, the Rud-i-Banduki is said to have flowed for 30 days; and the ford Rud-i-Banduki or Banduki-i-Pashmika or Banduki-i-Kuzha-i-Nahak at Khwája Kásim was not fordable to men for 30 days in all. The flood was a big one. No crops were, however, damaged, nor was there any loss of life, or property, except two men who were swept away while crossing at the ford of Khwája Kásim.

After the flood the river was in flow down to its tail in the Sábari Hámún till *Tirmah*, *i.e.*, about the end of August 1903. But the river was in flow down to the Band-i-Juwain throughout the year 1903-1904. The village of Juwain therefore sowed a good deal of wheat and melons.

Some water passed down the old channel of the Faráh Rúd, which leaves the present river near Juwain, and goes to the Puzák Hámún, which has already been described as the Banduki-i-Juwain. The flow is said to have reached the Puzák Hámún and soon after stopt. The distance from the river to the Hámún by this channel is said to be about 25 miles, but the flow in 1903 was down the narrow *shela* in the bed, and never exceeded  $1\frac{3}{4}$  miles in width.

*The Rúd-i-Faráh in 1905.*—On the 10th of March 1905, water in the Faráh Rúd reached Bahring-i-Sabz, and then the Hámún-i-Sábari the same day; this was only a small flood. On or about the 26th March 1905, another flood came down, which swept away the *tutin*, which was at Reg-i-Pir Murad, when our camp was there; it had been moved down to Khel-i-Meshedi Imam to be near the *Khel*. After the flood had come down the men had to make a new *tutin*.

On the 30th March Balúch guides were sent to bring measurements of the water that was running in the Rúd-i-Faráh. They took measurements at Bahring-i-Sabz on the 1st April 1905. The depth of water in the middle of the stream was 4.8 feet; the surface width was 205 feet and the volume 2,957 cusecs; the maximum surface velocity 4.5 feet a second.

The Balúchis again took measurement on the 10th April 1905; and this time at Guzar-i-Nahak. The river was full; and at the fords at Nahak and Bahring-i-Sabz it had been twice unfordable for two days together. On this occasion the surface width was 210 feet, and the depth 4.6 feet, giving a volume of 2,512 cusecs and a maximum surface velocity of 3.7 feet a second.

\* Soil scoured and brought off the surface of the country by rain, or flood water is called *dush mal*.

## APPENDIX 34.

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## RÚD-I-BANDÁN.

- Comparison of its size and volume with that of the Harud Rúd—The two distributaries—The great flood of 1885.
- The fords—Guzar-i-Yek Farsukhi—Guzar-i-Balakman—Guzar-i-Kurá Gaz—Guzar-i-Shand-i-Yek Farsukh—The best fords.
- The Spring in the bed of the Rúd-i-Bandán—Groves and cultivation at Bandán—Mill stones.

## APPENDIX 34.

## RÚD-I-BANDÁN.

*Notes obtained by Lala Thakur Dass, Supervisor, from Meshedi Ali, son of Sháhmoor, Gaódar of Deh Gazbar.*

Rúd-i-Bandán is not *zinda ab*, *i.e.*, not a permanent stream. Nor is it *chashmá khez*, *i.e.*, it has no springs in its bed. It flows only when rain falls on the hills and on the country in its catchment area. After a heavy fall of rain on the hills, Rúd-i-Bandán will remain in flow for 5 or 6 days, while the Rúd-i-Harud continues flowing for 2 to 3 months, if the rainfall on the hills is good. But if the rainfall in the Bandán hills is extraordinarily heavy, the volume of water brought by this Rúd is sometimes greater than that brought down by the Harud Rúd. The Rúd-i-Bandán stream is not so wide as that of the Rúd-i-Faráh, and its depth too in most places is less than that of the Rúd-i-Faráh. In 1904, Rúd-i-Bandán brought only a small quantity of water, but in 1903, it was in great flood and discharged a large volume into the Kurg-i-Kal for a week.

At Guzar-i-Yak Farsukh, which is one *farsukh*, or about 4 miles above Bahring, the Rúd-i-Bandán\* bifurcates; the smaller branch runs into the Sábári Hámún near Kala-i-Mir 'Alam Khán; the larger branch empties into the Kurg-i-Kal. The bed of the Rúd-i-Bandán is of shingle; and its slope is very great.

*Flood of 1885.*—In the flood of 1885, the Rúd-i-Bandán brought down some water at the time of Naurúz. Meshedi 'Ali had removed himself from the Naizar on to the high ground near the tail of the Rúd-i-Bandán, and all his cattle were grazing in the bed thereof. The banks of the Rúd above the place where it enters the gentle slope of its delta in the Hámún are vertical; the cattle found good grazing between these vertical banks. The big flood in the Helmand had come, and had begun to subside, so it was not expected that the Rúd-i-Bandán would bring any very large volume of water so long after the Helmand flood. But 15 days after Naurúz, one midnight when all the cattle were in the bed of the river, the Rúd-i-Bandán came down suddenly in great volume, and carried away all the calves, and a large number of the cows, the total number of animals lost being about 250. The Rúd-i-Bandán thus ruined Meshedi 'Ali; and he was no longer a *gaódar* except in name.

*The fords on the Rúd-i-Bandán.*

The following are the places where the Rúd-i-Bandán can be forded when it is in flood:—

One *farsukh*, or about 4 miles above Bahring, is the ford called Guzar-i-Yak Farsukh. This is a good ford. The river is wide and has a shingle bed. If the river has about 6 feet of water at other places on its bed, the depth on this ford is only about 3.5 feet. When the depth is more than 4 feet a man cannot cross the stream.

Six *farsukh*, or about 24 miles above Bahring, is the other ford, called Guzar-i-Balakman. Here, too, the bed is broad and has shingle. The bed does not change.

One *farsukh* above Guzar-i-Balakman is the ford called Guzar-i-Kúrágaz. The bed is very hard. No shingle, *i.e.*, loose stone, is found on the bed. The soil itself is very hard at this place both above and below the ford. It is a very good one, much better than No. 2 above.

\* Major Wanless crossed the Rúd-i-Bandán during the heavy fall of rain at the end of April 1903. He described the volume of the flow as very great.

We crossed the delta on the 30th April. The volume was quite small, perhaps 100 cuses. We came down the channel from Bandán about the 5th May. It was then practically dry.

Unfortunately I did not think to measure any flood sections. These would have been very interesting. They can easily be got by any one living at Nasratábá who has a bent for Engineering or Survey.

Eight *farsukh*, or about 32 miles above Bahring, is the ford called Guzar-i-Shand i-Yak Farsukh. This ford is one *farsukh* below Bandán. If the river is flowing at all high a man cannot cross. Thus the ford is not a good one.

Of the four fords named above, Guzar-i-Yak Farsukhi near Bahring is the best. It appears first of all; and disappears last of all the fords. Next to this is the ford called Guzar-i-Kúrágaz. People crossing the Rúd-i-Bandán when it is flowing use either of these fords.

The best ford.

One *farsukh* north of Bandán, opposite Deh Zainálábád, there is a spring in the bed of the Rúd-i-Bandán. This spring flows throughout the year, *i.e.*, in summer as well as in winter. It is a large spring; and in summer the water-course that flows out of it is 2.5 feet wide and about 1.5 feet deep. In the winter season, the flow is even greater. In the opinion of Meshedi 'Ali six *kharwar* or, *i.e.*, 600\* *man* Seistání of seed can be sown and ripened with the water that this spring yields.

The spring in the bed of the Rúd-i-Bandán.

All the gardens and the date palms about Bandán are irrigated from this spring. There are not more than two ploughs† of cultivation at Bandán. But there are any number of gardens with date and other fruit trees. The people of Bandán exchange dates and other fruit for wheat and barley from Seistán.

Some of the people of Bandán work at making mill stones in the Bandán hills. The head of the establishment, or the man who is in charge of the quarrying is 'Ali Mahdi who is known by the name of 'Ali Mahdi *As Kot*.

\* Enough for 75 acres of land; on the 4th May 1901, I measured the flow in the Zainálábád *karez*, and found only 0.4 of a cusec, about 120 gallons a minute. The width of the *karez* was 7.5 feet and depth half a foot. The Bandán *karez* was not measured. About 125 acres of wheat and barley are cultivated at Zainálábád and 100 acres at Tabásin, and perhaps 40 acres at Bandán.

† The small area of cultivation was noticed by all of us as we rode through on 5th May 1903.

## APPENDIX 35.

## CONTENTS.

## THE DETRIBUTARIES AND THE FORDS OF THE HARUD RÚD.

Main Shelas on the Harud Rúd—The Shelas in the Delta—The Khush Rúd spill from the Faráh Rúd—The site of the head of the spill channel—The flow in 1903.

Fords—Dahana-i-Harud—Kabrúk—Shand-i-Kokan—Dahana-i-Do—Shír Kúhak—Zalik—Puzá-i-Baraká—Cháh-i-Nafa—Ráh-i-Ori—Tingak—Khariábád—Kalat-i-'Alam Khán—Band-i-Kala-i-Káh—Band-i-Islámábád—Jeeja.

The floods—of 1903, 1904 1905.

## APPENDIX 35.

## THE DISTRIBUTARIES AND THE FORDS OF THE HARUD RÚD.

*Information collected from Balúchis by Lala Thakur Dass, Supervisor.*

About seven miles above the place where the Harud Rúd tails into the Sábari Hámún, there is a good ford, called Main Shelas on the Harud Rúd. Guzar-i-Kábrák. Most of the shelas, that are crossed, when passing round the north of the Hámún take out below this ford; and are said to have been formed by the flood of 1885, a very few of them take out above this ford. None of these shelas are large enough to have a name. About 8 miles above Guzar-i-Kábrák, Kuhna-i-Rúd Harud takes out. This is a big shela; the slope of its bed is not steep; but it was not fordable at the flood time in the year 1903. In 1904, however, it had about 4 feet of water at the highest rise of the Harud Rúd; and remained fordable the whole season. The Kuhna Harud runs in a deep channel down to Kábrák. Below this it spreads out over the plain and is not distinguishable.

About 7 miles above the head of Kuhna Harud, or about 23 miles above the mouth of the river in the Hámún-i-Sábari, a shela which separates from the Faráh Rúd between Faráh and Juwain, falls into the Harud Rúd. Local men call this Khush Rúd, but the Máldárs call it Rúd-i-Kháriká. According to Meshedi 'Ali, son of Sháh Noor, this shela takes out from the Faráh Rúd below Tujg and falls into the Harud Rúd at Dahan-i-Do. In 1903, some water flowed in this shela. Meshedi saw water flowing in it with his own eyes. But others say that the spill is down the Ju-i-Shaikh\* Mahmud, whose head is near Tavisk, a village on the left bank of the Rúd-i-Faráh; it irrigates the villages on the wide open plain around Kala-i-Káh. Dr. Bellew, who passed through with the Goldsmid Mission in March 1872, says that Kala-i-Káh is irrigated by streams that take off from the Faráh Rúd, and that the soil is highly saline and almost impassable when wet. In 1903 a little water came down the Rúd-i-Kháriká but in 1904 no water flowed. Only in times of extraordinary flood, such as that of 1885, does this shela get much water from the Rúd-i-Faráh, because its bed is very high above the channel of the Rúd-i-Faráh. The bed slope of the Khush Rúd is said to be great; so much so that it is not fordable to men when in flood, if its depth is even 3 feet.

The junction of the Khush Rúd with the Harud Rúd is called Dáhán-i-Do. Above Dáhán-i-Do there is only one deep channel; and no other distributing shelas leave the Harud Rúd.

*Fords on the Rúd-i-Harúd.*

This ford is at the place where the Harud Rúd joins the Sábari Hámún, and where the British Commissioner's camp Guzar-i-Dahana-i-Harud. crossed on the 23rd December 1904, when going to the Kúh-i-Chako to build the Boundary pillars. The ford is good and remains a ford so long as the Hámún is not full, or the Rúd is not running brimful. Even when the Sábari Hámún is full the river here is fordable so long as the wind blows strongly. But when the weather is calm, the water keeps its level, and the river channel here becomes too deep for a man to cross. In this way, this ford is very dangerous for ignorant people, and some times men have been drowned here.

In 1904, the river remained fordable at flood time at this place.

\* Some of our guides called this canal Ju-i-Shaikh Bahlor, and said there was a *siarat* to this saint at Kala-i-Káh. The saint had caused the canal to flow when the diggers had given up the work as hopeless. The canal even now needs no silt clearance.

\* A little above this ford and by the *palas* or tents of the graziers, there is another ford which appears later on, as the channel there is rather deep. Both

Guzar-i-Kabrak.

these fords are called Guzar-i-Dáhana-i-Harud. Guzar-i-Kabrak is so called because there is a large number of graves on a Puza-i-Dasht under which the river flows. This is not a good ford, as men and camels cannot easily cross here. The bed has sand mixed with earth, but the approaches are bad; and it is hard for loaded camels to ascend or descend. The channel is deep and the ford is *zor guzar*. It is used because between Dahan-i-Rúd and Guzar-i-Shand-i-Kokan, a distance of about 18 miles, there are no other fords by which to cross the river.

About 6 years ago, Sahib Khán and his men threw a tamarisk bridge across the Harud Rúd near the Kabrak ford. This bridge was about 4 or 5 feet above the water that year, and it stood for 2 or 3 years, but in 1903 the flood was a big one, and the river swept away whatever remained of the bridge.

At the spring time all the Máljár from Miánkangi (Jalálábád to Deh Dost Muhammad) go to the Atishkhana mountains, and they have to cross the Harud either at Kabrak, Shand-i-Kokan, or at Dahán-i-Do. Therefore these fords, being the only fords on the Harud, are well known, and much used by the people.

Kokan is a Persian tribe, who have cattle and sheep. One of these men used to come for sport here, and take his supply of water from the bed of the Harud

Guzar-i-Shand-i-Kokan.

Rúd. Hence this ford is called Guzar-i-Shand-i-Kokan.†

This ford is better than the ford at Kabrak, as the bed is hard and the river is a little broader with easy sloping sides. But Kabrak, being a little nearer to the direct road from the Miánkangi to Nar Ahu and Mada Ahu, Máljár generally use the ford at Kabrak.

The depth of water, however, is said to be the same on both the fords of Kabrak and Shand-i-Kokan.

Shand-i-Kokan is well known, because the water in the bed of the Harud Rúd at this place is sweet. Sweet water can be

Sweet water in the bed.

obtained at Shand-i-Kokan and Dahána-i-Do. Everywhere else between the mouth and Dahána-i-Do the water obtained from the bed is said to be brackish and undrinkable.

At the place where the Rúd-i-Kháríká, or Khush Rúd joins the Harud, there is a ford called Guzar-i-Dahána-i-Do. The

Guzar-i-Dahana-i-Do.

river there is very broad; and the ford is very good.

In 1904, the Harud Rúd remained fordable at this place the whole of the spring season. In 1903, it was not fordable on those days when the river was in flood. A man and a loaded camel can easily cross at this ford in 4 feet of water. The water at this ford in the bed of the Harud, when it is dry, is sweet.

Two *farsukh*, or about 7 miles above Dahána-i-Do, is the ford called Shír Kúhak. There is a small hill of whitish

Guzar-i-Shír Kúhak.

stone here, and the grazing is abundant. The sheep and goats yield much milk, and hence the hill and the ford are both called Shír Kúhak. The ford is just like the ford at Dahána-i-Do.

This ford is about two *farsukh* or 7 miles above Shír Kúhak. The ford is just like the ford at Dahána-i-Do. When the river dries, the water in its bed gets brackish. Near this place on the left bank of the Harud there is a spring called Chashma-i-Lulingi.‡ This is said to be just like the Hurmak spring on the trade route. The water is very sweet.

Guzar-i-Luling or Zalík.

\* It may be noticed here that the Delta of the Harud Rúd is occupied by flock-owners who cultivate a very small area to melons, and millet in most years. There is excellent grazing, but the water-supply is too uncertain for cultivation.

† Water thus got from below the boulders in the bed of a dry stream is called *ab-i-sand*.

‡ Luling is a tamarisk.

About 3 *farsukh* or 11 miles above Guzar-i-Lulingi, is the ford called Puza-i-Baraka. This ford is very good, even better than Lulingi and Dahána-i-Do; it is on the big road from Kala-i-Káh to Daroh in Káin.

At Puza-i-Baraka and above it the *ab-i-shand* in the bed of the Harud is sweet and remains always sweet.

There is a village, called Kopal, belonging to Kala-i-Káh, near Puza-i-Baraka. Above Kopal, on both banks of the Harud Rúd, the lands are culturable.

This ford is better than the ford at Puza-i-Baraka, as the river is broader. Máldárs from Kala-i-Káh generally use this ford.

Guzar-i-Cháh-i-Nafa.

This is a *Zor Guzar*. Unless the river falls very low, it is not fordable to loaded camels.

Guzar-i-Rah-Orl.

This is one of the best fords on the Harud Rúd. The bed consists of big boulders, and is very wide, and hence the ford appears first and disappears last of all the fords in the vicinity.

Guzar-i-Tingak.  
(On the road between Anjiran and Musa Kala.)

In 1904 this ford remained a ford at flood time; but in 1903 the river was not fordable for about 15 days. After that the ford appeared.

Guzar-i-Khairabad.

An ordinary ford.

Guzar-i-Karzak.  
(On the road between Kala-i-Káh and Anardara.)

This is a very good ford.

This is just like the ford at Tingak. On the Harud Rúd there are no better fords than those at Tingak and Kalat-i-Alam Khán.

Guzar-i-Kalat-i-Alam Khán.  
(On road to Faráh.)

Guzar-i-Zekin

This is a *Zor Guzar*.

Guzar-i-Gurkak.

A good ford.

There are two Kala-i-Káhs—one is called Kala-i-Káh-i-Pusht-i-Kúh, the other is called Kala-i-Káh-i-Shib-i-Kúh from Puzar-i-Baraka up to Band-i-Kala-i-Káh all the land is under cultivation. These two Kala-i-Káhs form a district belonging to Herat; and the two together pay 900 *kharwar Tabriz*, or about 450 *kharwar Seistáni* of wheat as revenue besides 21,000 *kran* in cash. Kala-i-Káh gets water from *karez*. Late sowings of wheat are made with the water of the Harud Rúd. Early sowings are done from the *karez*. This ford is a good one. The river is wide and the depth small. The distance of Band-i-Kala-i-Káh from Puza-i-Baraka is about 50 miles.

Guzar-i-Band-i-Kala-i-Káh, or Band-i-Mirkoh.

One *farsukh*, or about 4 miles above Band-i-Kala-i-Káh, is Band-i-Islámábád. The ford is very good, at Islámábád a band across the river turns the water into the canals. The supply down to Band-i-Islámábád is perennial. No one remembers having ever seen the river dry at the Band-i-Islámábád. The water that reaches Islámábád is about twice as much as in the Khwája Ahmad canal, or 20 cusecs and suffices for 60 ploughs of land.

Band-i-Islámábád.

As on the Helmand and the Faráh Rúd, so on the Harud Rúd too; each village has a *band* of its own. When the supply in the river exceeds the requirements of Islámábád; the village next to it utilizes it and so on.

Above Band-i-Islámábád the name of the Harud Rúd is the Rúd-i-Jeeja.

Guzar-i-Jeeja. (Between Faráh and Anardara.)

This ford is very good. It is on the big road that runs from Faráh to Anardara.

There is a ford here down stream of the *band*. The canal for Deh Jeeja takes out above this *band*. Jeeja belongs to Faráh.

Guzar-i-Sar-i-Band-i-Jeeja.

In 1884, 18 guns are said to have passed this way *en route* from Kabul to Herat.

The flood of 1903 was a big one, but no damage was done to villages or *karez* or crops. The river was *kálíbi* or ran between its banks full to the brim. In

The flood of 1903.

1885, a shela was formed taking out from the Harud above Band-i-Kala-i-Káh, called Takht-i-Kala-i-Káh. This shela joins two other shelas, Gazindan and Mathokh, and again falls into the Harud Rúd down stream of Kala-i-Káh. In 1903, these shelas drew away an appreciable quantity of water, and thus the fields of Kala-i-Káh were saved.

People say that the Harud Rúd when in ordinary flood, such as that of 1903, is the swiftest flowing of all the streams that enter Seistán; the noise made by its water can be heard quite a mile away.

In the year 1904 the Rúd-i-Harud brought an appreciable quantity of water at flood time. A section with the bed slope of the flood marks of 1904 and 1903 was

Flood of 1904.

obtained about 3 miles above the tail of the Harud Rúd in the Sábari Hámún; the site was below many of the spill channels, and therefore not suitable to obtain maximum flood discharges; so Balúchis were sent up the river to measure sections above all the spill channels; with the surface slopes got near the tail and with these sections the maximum flood discharges were calculated and found to be as follows: Flood of 1885, 36,000 cusecs, that of 1903, 14,000 cusecs, and that of 1904, 2,000 cusecs.

No water had come down the Rúd-i-Harud up to the 10th May 1905.

1905.

Balúchi guides were sent at short intervals to see if any water had come down this river. When they came back the last time early in May 1905, they said that some water had passed Band-i-Islámábád, and had reached the Kala-i-Káh village, where the people were using it. But below Kala-i-Káh the bed was quite dry.

## APPENDIX 36.

## CONTENTS.

BRIEF NOTE ON HOW THE CANALS ALONG THE RIVER BELOW RUDBAR WERE DUG.

Rúdbár—Chahárburjak—Dak-i-Dila—Bandar-i-Nau—Bandar-i-Kuhna—Mir-  
ábád—Kala-i-Fath—Deh Dost Muhammad (Arbáb)—Deh Merek—Khwab-  
gah—Menu—Jharúki.

## APPENDIX 36

*Brief note on how the canals along the river below Rúdbár were dug.*

It will be useful to describe briefly how the present canals along the Helmand in the Chakhánsúr district were made.

The *Rúdbár Canal* was dug about 130 years ago by Sardár Ján Beg Khán; half the canal is said to have been dug by payment, and half by the cultivators themselves. The annual repairs on this and all other canals are done by the *ghami* cultivators; the *báár* of this canal pay them a *kaushai* of about 20 to 30 *kran* a year.

The *Chahárburjak Canal* was also dug about 130 years ago by the Sanjárani chief. It is said that the people were paid for excavating the canal. The annual repairs are done by the *ghami* cultivators in the usual way.

The *Dak-i-Dila* or *Deh Rustam Canal*\* was begun in 1896 by Rustam Khán, who is said to have dug the canal with his own money, paying each labourer daily half a *kran*, but stipulating for a certain task each day in return. His labour gang is said to have been 30 men from the villages along the Helmand from Chahárburjak to Seistán. The canal took two years to dig, though a small area of autumn crop was done at the end of the first year, but it was not till the third year that a really good supply was obtained.

The canal irrigates low-lying land, and like the *Mirábád Canal* on the opposite side of the river is on an easier alignment than most canals along the river.

The *Bandar-i-Nau Canal* was dug in 1896 by Mala Khán Naib of Sardár Muhammad Razá Khán and Sardár Kamál Khán. The labour was paid.

The *kaushai* is only two *kran*.

The *Bandar Kuhna* or *Trakú Canal* was dug in 1853 by Sardár Kamál Khán who, it is said, paid daily wages to the labourers. The canal was destroyed by the flood of 1885, and was redug in 1888 by Saróár Muhammad Razá Khán, Sanjárani, with money furnished by Sardár Muhammad Umar Khán at a cost of 10,000 *kran*.

The *Mirábád Canal*.—The canal is said to have been dug about 1853 by Mir, uncle of Sardár Sarfraz Khán of Chaghái, who got this grant of land from Sardár Ibrahim Khán. But Mir only cultivated for 3 years and retired to Chaghái and died.

In 1872 it is said Sardár Dost Muhammad Khán obtained a large† number of unpaid labourers from Mir Alum Khán, Hashmat-ul-Mulk, and in 20 days dug the canal. It is said that Dost Muhammad Khán fed the labourers to the extent of giving them 20 sheep and two cows.

Mustapha Khán, son of Mir, is said to have then gone to Kabul and petitioned to be put in possession of the canal, as it belonged to his father. In the end Dost Muhammad Khán was dispossessed from the canal, but eventually Sardár Sharif Khán took it away from Sarfraz Khán, and used it to feed his own Kala-i-Fath canal; Sarfraz Khán had to dig a second canal along side, this is the channel now called the *Mirábád canal*. The channel that Dost Muhammad dug is now the head reach of the Kala-i-Fáth Canal.

This new *Mirábád canal* was dug in 1877; it is said the labour was first paid 1 *kran* a day, but after 10 or 15 days, when a large number had been collected only half a *kran* a day was paid. It is said 500 to 600 labourers worked each day and the canal‡ was dug in two months.

Sarfraz Khán expended on this work 110 camels, 1,500 sheep and 2,000 Indian rupees. Besides paying wages he gave the labour each week a feed of meat and bread.

\* 6,000 is the number mentioned. Probably with the idea of developing the country and establishing a claim to it before General Goldsmid arrived. Nothing, however, is said of this canal in Sir Frederick Goldsaurd's book.

‡ The canal has a bed width of 70 feet, and this portion of it was some 5 or 6 miles long.

He took no revenue from the lands for 3 years, and a village of 400 or 500 homes became established here under his liberal and generous management. This village has almost disappeared, *vide* Statement 8 of Afghán Seistán.

The *Kala-i-Fath Canal* head reach was taken from Sarfraz Khán by Sardár Sharif Khán as above described, and in 1876 he extended the canal past Kala-i-Fath, and finished it as it at present exists. He is said to have spent 10,000 *kran* on the canal.

*Deh Dost Muhammad (Arbáb) Canal*.—The Hakim of Kala-i-Fath, Gilan Khán by name tried to dig this canal by forced labour, but was only able to dig a short length. In 1893 he gave a grant of land to Dost Muhammad, Tájik, who then lived at Chahárburjak, and traded in cloth to Quetta and Karachi. Dost Muhammad had 100 followers of his own race who worked without payment. But he collected outside paid labour as well, and he fed the Tajiks, when on work, giving them two meals of bread a day with *ghi* at the evening meal and meat once in 8 days. When the work was finished 60 sheep and 100 *man* of flour were distributed among the labourers; and when the canal was opened 3 oxen were slaughtered at the head, and 4 more were slaughtered when the water reached the village.

The *Deh Merek* or *Sabz Ghazi Canal* was begun in forced labour by Sardár Gilan Khán, then Hakim of Kala-i-Fath in 1897, but when half the work was done Fakir Muhammad and Dost Muhammad Bázaí undertook the work and completed it. They are said to have spent 6,000 *kran* on this canal.

The *Ghami Bazgar* (cultivators), who do the repairs, received 20 *kran Kaushai*.

The *Khwabgah* or *Khogah Canal* was dug in 1895 by Sultan Muhammad, Amar Shah and Haji. The work was measured out to the labourers each day and payment was made according to the work done. The excavation is said to have cost 8,500 *kran*, and the three Kadkhudás mentioned above are said to have sold their cattle herds and camels to raise the money.

The bazgar, who do the repairs receive, 22 *kran* a year as *kaushai*. Dádi, who had made many canals, says that he originally started the excavation of this canal and dug about 5 miles of it at a cost of about 2,000 *kran* in food to his men. When the three Kadkhudás above mentioned secured the canal from Maula Dad Khán, Hakim of Faráh, Dádi received no compensation for the work he had done.

The *Menu Canal* is said to have been dug by Dádi some 30 years ago (in 1873) in the time of Sardár Khán Jahan Khán.

The canal took out some where below the head of Shela-i-Jharuki. He probably dug it with his own men at the cost of feeding them.

It is said that Sardár Khán Jahan Khán wanted Dádi to keep the canal in repair, and extend it, but when he refused to do so the canal was given to Khán Mubammad to make, but at Bagh Mullá Rasul the channel passed through soil full of burnt bricks, which broke the *fishz*, and the Kadkhudá stopped work. Dádi was again called on to dig the canal, but got off by paying the Sardár 300 *kran* and 1 riding camel. The Sardár then arranged to dig the canal himself, Dádi received one privileged (*tahwil*) plough of land on the canal.

This canal appears to have at one time done irrigation down to the Zíarat of Amírán.

The *Jharúki Canal* was made about 1853 by Dádi with his own labour, whom he fed at a cost of about 200 Indian maunds of grain. It took three years to make, and he is said to have had 20 men a day at work on it.

## APPENDIX 37.

## CONTENTS.

NOTE ON THE ROAD FROM GALUR UNDER THE CHAGHAI HILLS THROUGH  
NAWAB KHÁN CHÁH TO LANDIWALA MUHAMMAD AMIN ON THE  
HELMAND RIVER ABOVE THE KÚH-I-KHÁN NASHIN.

Work done *en route*—The road to Alangi Pat—Alangi Pat—Road to Nawáb  
Khán Cháh—Nawáb Khán Cháh—Haiyát Cháh and Ghamí Cháh—Nature  
of formation in which the water is found—Gravel plains to the north of  
the wells—Masiti Náwar—Gazi Náwar—Saiyad Muhammad Langar—  
Pániám Nala Fakir Ganj Náwar—Road to the Helmand—Sand dunes  
remarkable as travelling from west to east.

## APPENDIX 37.

Note on the road from Galur through Nawáb Khán Cháh to Landiwala Muhammad Amin on the Helmand River above the Kuh-i-Khán Nashin.

A small party\* under Captain Webb-Ware consisting of Major Wanliss, Intelligence Branch Officer, and Mr. Ward, Irrigation Officer, marched to the Helmand River by the direct road from the Galur spring through Nawáb Khán Cháh to the Helmand River at Landiwala Muhammad Amin.

The opportunity was taken to make a longitudinal section or profile of the road; the distances were measured by a cyclometer, and the vertical heights by aneroid barometer; the readings of the aneroid cannot be accurate, because the weather was disturbed, but the readings were taken at every half mile or so; the station where the last reading was made was in sight; the variations due to weather were at once noticed; the general features of the section are therefore correct.

From Galur the road descended the skirt of the Chaghai Hills to Alangi Pat. At first the road passed over bare ground covered by small, very sharp stones, the wash-down of the hills close by. But these were soon buried in the sand-drifts or dunes which were quickly reached.

The sand has drifted up from the desert or Registán. Further on the hills were covered with a good growth of grass and grazing plants, conspicuous amongst them being *taghaz*, or the desert tamarisk. In the spring the flock and camel-owners must come here in large numbers, as numerous camp sites were seen marked by the remains of the wind breaks of *taghaz* which they had built round their blanket huts. These camps were situated a long way from the water, as is the custom of these people all over these parts of Asia.

Our party camped for the night at Alangi Pat using water brought in *pakhal* from Galur. Alangi Pat is a large basin, or *Náwar* having a hard level bottom, which collects the water off a large tract of country. The main catchment area runs up to the hills at Chah Ismail, as is shown on the map made by the Mission. No water was found on the basin when we visited it on the 28th January 1903, though there had been several good showers not long before, and further along the road good supplies of water collected from these showers were found. The probable reason why no water is stored at Alangi Pat is that the *Náwar* is large and flat, so that the water collected is spread out in a thin sheet, and is quickly evaporated by the hot sun and dry air. Probably if deep tanks were dug at suitable places in the *pat* the water collected in them would last a useful time because of the greater depth. It is also possible that these deep tanks would catch sand, and the water in the sand† being protected from evaporation would last still longer. This question is discussed in detail in the accompanying (Appendix 38) on a proposal to make a tank in a smaller *Náwar* between Amalaf and Humai on the trade route.

From Alangi Pat the party marched to Nawáb Khán Cháh, a distance of 13 or 14 miles over a country of fixed sand-hills whose general direction was east and west; these hills were clothed with grass and with *taghaz*. Many thin layers of block, as well as nodular kankar, were noticed chiefly on mounds and high ridges. There was no gravel or stones in this section of the road.

The well at Nawáb Khán Cháh was through hard alluvial to water at a depth of 52 feet. The first thirteen and the last ten feet of depth was so sandy that a steining of logs of *taghaz* had been made to hold up the sides. These logs

† The water at Galur seems to be held in a rocky depression which catches drainage from the hills. This depression is filled with sand and very excellent water is got by excavating in the sand.

were neatly laid and notched into one another, so as to form a strong close lining to the well. The remaining 29 or 30 feet was of hard compressed alluvial such as we often saw afterwards in sections in the trough, and the delta of the Helmand River, and also in sections exposed in the Paniam Nala further along this route.

The well was situated in a small area surrounded by high sand hills; the track from Galur was well marked, easily found and led straight on to the well. The Balúchis, living in blanket tents hidden among the sand-hills at some distance from the well, said that there were two other wells in this small hollow, buried in sand, but that they were cleared out when required. They could give no information how old the well was, but the tackle, which consisted of a pulley supported on posts, as well as the sides of the well were deeply grooved worn by the rubbing of the leather\* thongs by which the water was withdrawn.

\* The part of the rope that goes into the water was made of *manj* fibre.

At 5 and 9 miles to the north-east of Nawáb Khán Cháh two other wells Haiyat Cháh and Ghami Cháh were surveyed and measured by Babu Jamal Dhin the former to be 65 feet deep and the latter 45 feet deep, and it is believed that there are many other similar wells in the Registán.

The diameter of these three wells is small, being only  $2\frac{3}{4}$  feet. The water in Nawáb Khán Cháh and Haiyat Cháh is excellent, but that in Ghami Cháh is said to be slightly brackish, the wells hold 4 or 5 feet of water when not drawn upon. Besides being fitted with a windlass and tackle; there is a trough for watering camels and sheep, made by stakings of desert tamarisk. The flock and camel-owners live in this desert in the winter and spring, and move to the river in the hot weather. The owner of the blanket huts said that only 80 camels were being watered from this well at the time of our visit, that the water was plentiful and never dried; they watered the camels every 4 days in the winter and every 2 days in the warmer weather.

The water seems to be held in a sand bed beneath the alluvial; in the same way that the water is held at Cháh Muhammad Razá, Girdi Cháh and other places in the Helmand Delta, described in the note on wells of sweet water in the inundated area—*vide* the third page of Chapter XLVII and, also, Appendix 23.

The map shews a dozen or twenty wells in the Registán, probably all like these wells in sand pockets in old drainage lines from the hills. Whether or no the flock-owners have found all the available sites for water it is impossible to say from our limited experience in this tract.

About 2 miles north of Nawáb Khán Cháh the sand-hills end and the bare plain strewn with water worn stones and gravel commences and extends to the river. The vista shews the characteristic lines of ancient lake margins and river beds.

Twelve miles north of Nawáb Khán Cháh water was found in an artificial earthen tank at Masjid or Masiti Náwar, the summit (3,295 feet) of the country crossed by the road; the water was retained by the bottom of the tank being lined with a natural deposit of lime; the catchment area did not exceed 5 acres; the tank was about 50 feet in diameter, and held about 6,000 gallons of water.

The next water was at Gazín Náwar (at an elevation of 3,100 feet), a depression having a catchment of several thousand acres; the water covered an area of about 13,000 square feet on the 29th January 1903, the depth was 6 inches, though it had been over a foot deep when the rain fell about a month previous. By the side of the water grew some tamarisk (*gaz*) of a species, which Captain Webb-Ware said, never grew where the spring level was more than 16 feet below the surface. The guide was surprised to find water here, as the soil is not retentive, but he expected to find water about a mile further north near the sudden

drop into the Paniam Nala. We saw this supply of water the next morning; it is also an artificial earthen tank similar to, but much larger than, Masjid Nawar. The catchment area of this tank is about 200 acres, and the tank is 90 feet long by 30 wide, and the depth of water was 2 feet on the 31st January 1903; 20,000 gallons of water had been retained on the local deposit of lime to which the tank owes its existence.

Half a mile further on is the Saiyad Muhammad Langar, a road-side Ziárat, a collection of sticks bedecked with rags torn from the garments of anxious travellers, surmounting a pile of odds and ends such as tamarisk sticks, camel bells, etc., contributed by passing caravans.

From the Ziárat a rapid descent is made into a gorge which comes from the east; the width and depth of this gorge is somewhat less than that in which the Helmand flows, but the two gorges are exactly similar in other respects. The lowest part of the gorge is occupied by a dry nala, 125 feet wide; by calculation it had carried a flood discharge of some 4,000 or 5,000 cusecs. We do not know the catchment area of this nala; the rainfall, however, must consist of light showers only, and a run off of half an inch an hour would very seldom occur.

Eight miles below the Ziárat, the nala escapes from the main gorge by a narrow gap a hundred feet wide out into a more open country of fixed sand-hills, covered with excellent *taghaz*, *phog* and grass grazing, and finally discharges itself into a large and deep depression called Fakir Ganj Náwar; the camp however, was pitched at a pool in the bed of the Paniam Nala, about 6½ miles short of the tail depression and 12 miles from the Ziárat.

This pool in the nala bed was due to a local deposit of stiff red clay; it was 100 feet long and about 30 feet wide; the water, about 15,000 gallons, was one foot, but it had been about 2½ feet deep. It was the only pool in this last length of 20 miles of the nala. The large capacity of the nala shews that at times a large volume of water must be collected in the Fakir Ganj depression. This water could never overflow into the Helmand, and it is probably all dissipated by evaporation by the dry heat and high wind that follow after the spring rains.

The road from Fakir Ganj Náwar to the Helmand passed over bare plains strewn with water worn gravel. At bluffs large stones or boulders had collected. Across these plains *barkan* or dunes of red sand travelled from west to east; this direction is unusual, as the dunes in Seistán\* travel from north by west to south by east. Similar dunes were met with between Nawáb Khán Cháh and Masiti Náwar which were travelling on a bearing of 260°, that is, they were coming from a point 10 degrees south of west, and going to a point 10 degrees north of east.

\* The dunes at Jazmak are shaped by a wind on a bearing of 335°; and those between Boundary Pillar No. 13 and the Sar-i-Sheila are shaped by a wind that varies from 331° 10' to 353° 30'; all this information has been given in the geological notes made over to the Director-General of the Geological Survey of India.

## APPENDIX 38.

## CONTENTS.

## NÁWÁR SCHEME BETWEEN AMALÍF AND HUMAI ON THE NUSHKI SEISTÁN TRADE ROUTE.

- Effect of evaporation on shallow sheets of water—Works already carried out—
- Alternative way of making the reservoir—How to staunch a tank or reservoir—
- How to calculate the size to make the tank—How to prevent evaporation—
- Some concluding remarks on the value of setting up and recording rain-gauges.

## APPENDIX 38.

*The Náwar scheme between Amaláf and Humai on the Nushki Seistán trade route.*

This Náwar\* is a level plain of hard impervious *pat* surrounded by bare hills, off which it collects the rain water. After a good fall of rain the water collected may be one foot, or a little more deep. The water is spread out in a sheet of small depth, so that the maximum of area is exposed to be evaporated by the hot sun and dry air. A defect of all such Náwars; they are found in great numbers in these deserts.

The evaporation measured in Seistán in small lakes a few feet deep was as follows:—

						†Feet in the month.
January	...	...	...	...	...	0'21
February	...	...	...	...	...	0'15
March	...	...	...	...	...	0'43
April	...	...	...	...	...	0'97
May	...	...	...	...	...	1'22
June	...	...	...	...	...	1'65
July	...	...	...	...	...	2'22
August	...	...	...	...	...	2'00
September	...	...	...	...	...	0'70
October	...	...	...	...	...	0'37
November	...	...	...	...	...	0'40
December	...	...	...	...	...	0'32
				Total	...	10'64

Since the rainfall in Baluchistán is in the winter or early spring, the water caught on the Náwar in January and February, when the days are short and cool, will last a useful time, but as soon as the longer days of April come, when the air is hotter and drier, the shallow depth of water will be quickly dissipated by evaporation alone.

To get a greater depth of water, two useful and well-conceived embankments have been made across the delta of two ravines to catch the water flowing down them before it has had time to spread out over the level plain of the Náwar. But from the nature of the ground it is not possible to get reservoirs of sufficient depth of water to hold out against the great depth that is evaporated here in summer. Moreover, after a really good fall of rain, the reservoir above the embankments would be filled to overflowing and the embankments breached. A bye wash channel could be made, but not easily, or in such a way, as would be likely to give satisfaction, because the configuration of the ground is not favourable.

As the site is not favourable for deep reservoirs made by holding up the water with embankments, it would be well to try to make deep reservoirs by excavating tanks in the bed of the Náwar. The deeper the tank the longer the water would last; but the depth of the tank would depend on the material met with in excavation, whether it was possible to excavate it, and when excavated whether the tank would hold water.

\*At a guess the Náwar is about  $1\frac{1}{2}$  miles long by  $\frac{1}{2}$  of a mile wide, or one square mile in area more or less. The catchment area did not seem to be large, the maps I saw did not show this Náwar, so the catchment could not be measured from them. Even if we knew the catchment area, we do not know enough of the rainfall, or the proportion of the rainfall that runs off. So we cannot calculate how much water is likely to be caught here. The catchment area can be got by survey, but the rainfall information can only be collected by recording rainfall at the Thanas for some years.

† If the number of feet in a month is divided by the number of days in the month the depth evaporated daily will be got.

It is probable that there is a considerable depth of shingle below the hard

*How to staunch a tank or reservoir.* *pat*, which is porous and would allow the water to escape. If so, it would take a long time to make this staunch. Because the rainfall comes but seldom, while the best way to staunch a tank is to run in very muddy water; the silt in the water percolates with the water into the interstices of the bottom and sides and is deposited there, and thus gradually closes them, until the tank is made staunch and retains water.

The best action to take now is, I think, to dig shafts or pits at places in the area of the Náwar to see if any one place is more suitable than another for a tank.

The earth taken out from these pits should be so deposited and put to spoil that the inflow of rain water to the tank is not blocked; so that the pits may serve as experimental tanks as well as give information about the nature of the subsoil. If it is found that the soil can be excavated, and also that it is of such a nature that it is staunch, or if not staunch, that it can soon be made staunch; the next thing is to discover how deep the tank may be made without losing these advantages: the deeper the tank the longer the water will last. Having determined on the depth the next thing to ascertain is the best area or size for the tank.

The most suitable size to make the tank will depend on the volume of water that is likely to be caught by the tank; *How to calculate the size to make the tank.* limited of course by the amount of money\* which is available to be spent on the tank. It is a waste of money to make the tank too large; at the same time it is better to make as deep a tank as the nature of the subsoil will permit, so that the area of the tank is more likely to be fixed by the sum to be spent than by considerations of volume to be stored. The largest size that it is of any use to make the tank can be estimated by measuring the area of the present Náwar, and the depth of water usually collected in it. This can be got from the water marks, either by sighting† or by levelling with an Abney's level.

Then if A is the area of the Náwar—

D the usual average depth of water collected in it.

H the depth it is possible or it is proposed to make the artificial tank.

X the area the tank should be to hold all the water collected—

$$\text{Then } X \times H = A \times D$$

$$X = A \times D \div H$$

In this particular case A is guessed to be about 640 acres; H may be about 6'0 feet say; D is guessed to be 1 foot—

$$\text{Then } X = 640 \times 1 \div 6 = 107 \text{ acres.}$$

This is a much larger tank than there is ever likely to be money to make. The calculation shews that the volume of water in these Náwars is large, but since the water is spread out in a thin sheet and exposed to a hot dry air, it is soon dissipated.

The way to calculate the minimum tank required is to estimate the water that will be needed allowing for loss by evaporation. But this calculation is not of much avail, seeing that a tank, 6 feet deep, will become dry by evaporation alone by the end of July, unless this evaporation can be prevented. The possibility of preventing loss by evaporation will now be discussed.

It was noticed that sand had been collected by the embankments made for the reservoir. If this sand could be caught in the tank, when made, it would preserve

*How to prevent evaporation.* the water indefinitely.

\* It is assumed of course that the constructor of the tank knows how much his tank will cost per thousand cubic feet of contents. If not, he should find this out from some man who has experience of similar work in the province.

† A useful way of sighting is with the *boning* staff. These are three sticks, or staves of equal height; two are set up, one on each flood mark, and the third is held over the deepest part till its top comes on the line of sight got by looking over the tops of the other two. Then D the distance between the bottom of the staff and the ground is the depth of the water. Boning staves are usually made "T" shaped to give a better mark from which to sight; they can be improvised from walking sticks, bits of jungle, or anything handy; the three sticks must of course be all exactly the same length.

Water in a basin of some impervious material hidden in the interstices of sand is preserved from evaporation and neither wastes by absorption or evaporation. The surface of sand is always dry, and the grains lie far apart. Below the dry grains is damp sand; the moisture cannot rise through the dry sand above, because the spaces between the grains of sand are too large for the water to be drawn up by capillary action.\*

It is probable that, if the tank held water in the months of May and June when the winds that move the sand are blowing, it would be filled up by sand and the water preserved. The water collected in shallow Náwars is evaporated before the sand begins to travel, whilst it is probable that some of the places where water is found among sand-hills are deep basins that hold the water till the sand comes. Sand is readily caught by damp, and once the moisture is covered by the sand, it lasts a long time and so helps to retain the sand. This has long been recognized and is often given as the explanation why water is found in sand. But I think the explanation may be carried a step further, so as to account for the water being there. The water is caught in a deep basin where its depth was sufficient to withstand the evaporation till the sand carrying winds blew. All sand accumulations do not contain water, only some; those sand accumulations are likely to hold water, which are situated in a depression to which drainage flows, and cannot escape; the water at Galur (*vide* Appendix 37) seems to be an example to the point. I am of opinion therefore that where water is required at such Náwars a deep tank† should be made, and the spoil from the tank so disposed, that not only is the rain water caught in the tank, but also the sand, that comes with the winds in the hot weather.

It may be useful to notice that the telegraph stations along the route afford Some concluding remarks on the value of setting up and recording rain gauges. an excellent opportunity to measure the rainfall. It is only necessary to supply the telegraph master with a zinc tube such as can be bought at Rurki‡ for a few rupees. The rain gauge need not be established by the Meteorological Department, but by the District authorities. When rain falls, the information would be readily available to the local officers, and would be of use to them in many ways. The record should be preserved because the information is most useful to the engineer.

In such schemes as this tank at the Náwar between Amalaf and Humai the area off which the water drains to the Náwar is easily obtained from the map, or if the survey is not sufficiently complete by a plane-table reconnaissance. But the knowledge of the catchment area is only of a very limited use till we have some knowledge of the intensity of the showers that fall.

An inch of rain is—

43,560 square feet to an acre multiplied by  $\frac{1}{2}$  foot of rain = 3,630 cubic feet of water off each acre of land in the catchment of the Náwar, supposing all of it ran off and none soaked in.

But some of the water that falls sinks into the ground, and never reaches the Náwar or the stream; this amount varies with the nature of the ground. A hard rocky soil at a steep angle retains little or no water, whereas a porous soil more or less level retains all. Light showers soak in more than heavy down pours. It will be realised therefore that a record of rain got from a rain gauge at each Thana, where the man in charge was intelligent enough to write down the amount measured would be invaluable. Moreover, it is most useful to know how long the shower lasted: this is an important item of information that is always overlooked in rain records.

\* See "The Soil" by F. H. King, Macmillan & Co., and also "The Water in the Soil" by Dr. J. W. Leather, Agricultural Chemist to the Government of India, (Superintendent, Government Printing India).

† In the arid parts of India and South Africa and many other parts of the world such tanks are made, and the fact that they are not made in Baluchistan would lead one to expect that for some reason that I have not discovered they are not feasible.

‡ The cost of a Rain Gauge zinc, with turned brass rim, float and cast iron stand as approved by the Board of Revenue, United Provinces of Agra and Oudh, will be Rs. 11 exclusive of packing charges, which will be Rs. 1-8-0 extra.

## APPENDIX 39.

## CONTENTS.

## PRACTICAL METHODS OF MEASURING SMALL FLOWS OF WATER.

To measure a small flow by baling—To measure a small flow over a notch board, or weir—To measure the discharge of a small channel by timing floats—To ascertain the water a well will give—Springs should be measured both in summer and winter.

APPENDIX 39.

Practical methods of measuring small flows of water.

When the discharge of a water-course or *kariz* is less than half a cubic foot a second, it becomes too small to measure with sufficient accuracy by timing floats, and measuring the sectional area of the flow. It is then better to measure the discharge by baling the water. This is done by blocking the flow of the water-course and causing a small pool to form. A mark is made in the pool, and as the water rises above this mark, the surplus is baled out.

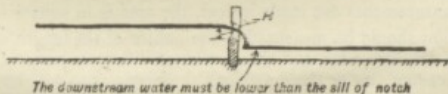
A bale having a known capacity may be used, and the number of times it is filled, and emptied in a given time, must be noted. Or the water may be baled out, and thrown into a tin, or tank of known capacity, and the time it takes to fill this tank must be noted. The principle is that, you remove the whole of the flow of the small stream for a certain time: you measure what you remove, and you note the time during which you remove it.

Such small flows are best measured in gallons per hour; you get a figure that people can grasp, or understand. Whereas one-tenth or one-fifth of a cusec has no meaning to any one outside of irrigation work. A gallon of water weighs 10 lbs.; a *chagal* and a bucket usually hold a gallon. A cubic foot of water weighs 62.5 lbs. nearly, and is therefore  $6\frac{1}{4}$  gallons. A *kariz* at a Thana that discharged a gallon a second would only discharge about one-sixth of a cusec; expressed in this way, the volume would be meaningless to many. But if it was said that it delivered 3,600 gallons an hour, and the listener knew that one gallon was a bucket full; he would have information that he could make use of.

This method of gauging a small flow can be used for channels up to about half a cusec. It is difficult to make arrangements to bale out more than three gallons a second. Above a speed of two or three gallons a second the operation becomes troublesome. A little practice will soon shew what can be done.

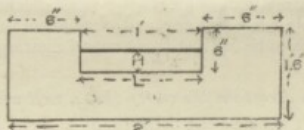
To measure a flow over a notched board or weir.

It is then convenient to gauge over a board, or weir. Streams only discharging from half to one and half, or two cusecs are most accurately gauged over a board.



The downstream water must be lower than the sill of notch

The channel is obstructed by a board in such a way that all the water falls over the notch in the board.



The board may be of the above dimensions\* as a convenient size for such small flows.

The edges of the board which are touched by the flowing water should be bevelled and made sharp.

\* The discharge of such a notch when running quite full would be—  
Area =  $1' \times \frac{1}{2}' = \frac{1}{2}$  square foot. Mean velocity =  $5.0$  (co-efficient)  $\times \sqrt{0.5} = 3.55$  ft. second.  
Discharge =  $\frac{1}{2} \times 3.55 = 1.78$  cusecs.  
Perhaps a width of notch  $\frac{1}{2}$  of a foot would be even better. A little practice will soon shew what is the best form of board to use.

When the water is falling through the notch in the board ;—

Measure the width of the notch = L.

The depth of flow = H.

If these measurements are made in feet, then the discharge is in cubic feet a second ; and the area of the water flowing over the notch *multiplied* by the square root of the depth of water in the notch

\*A more accurate co-efficient for a weir board is  $\frac{3}{5}$ , but the edges must be bevelled to a sharp edge.

*multiplied* by a co-efficient which varies and which may be taken to be five.\*

So that the discharge is 5 (co-efficient) *multiplied* by area of flow *multiplied* by the square root of the depth of flow over the notch.

*To measure the discharge of a small channel by timing floats.*

When the flow is too great to measure conveniently over a board, it can be measured by taking a discharge with floats. For this purpose a run must be marked out by sticks along some straight part of the water-course. The little channel should be cleared of weeds, and obstructions throughout the length of this run. The length of the run may be 10 feet in channels of slow moving water to 100 feet in channels of very fast flow; usually 25 feet is a good length to choose. If the transit of the float is very rapid, and the run is short, the percentage of error in timing is apt to be large.

When the run has been prepared, then time floats down the centre or along the fastest flowing water in the little channel. This can be done with the second's hand of a watch, or with a pendulum.

A *pendulum* is made by attaching a lead bullet, or other convenient weight to a fine cord, so that the length from the point of suspension to the centre of the bullet is 39 inches. Each swing of the pendulum is one second. If the pendulum is made  $\frac{39}{8}$  inches long, it will beat half seconds.

Any light substance such as dry cow-dung serves as a float.

Having found the velocity in feet† per second, measure the section of the flow. This for practical purposes is the width of the surface *multiplied* by the depth of water near the centre of the width of the little channel *multiplied* by four-fifths.

† If a float traverses a run of 25 feet in 25 seconds, the velocity is a foot a second; if in 50 seconds it is half a foot a second, and generally length of run in feet divided by time in seconds equals feet per second.

If the measurements are made in feet, the area is in square feet.

The section should be measured at the centre of the length of the run; but if the channel is very irregular, and the section at different parts of the run varies much, then measure two or three sections so chosen as to get the mean section of the length over which the velocity was measured; in very small channels it is more satisfactory to take a spade and trim the channel.

The discharge in cubic feet a second will be the velocity in feet per second multiplied by a co-efficient.

The co-efficient for small channels under 5 or 10 cusecs may be taken as  $\frac{1}{10}$ , and above that  $\frac{1}{10}$ .

These different methods of measuring small discharges should be practised till the observer feels quite at home, and familiar with them; otherwise when the critical moment arrives he will be anxious and distraught and have no confidence in his work.

*To ascertain the water that a well will give.*

This is difficult because the delivery of a well depends so much on the source of the water.

For instance, if the well derives its water from a spring that is flowing in a fissure in a rock, or in clay or gravel, you can imagine that it is a *kariz* of small flow that you have blocked and bale the water out.

Make a mark in the well at the level of the water and bale out the surplus water, noting the volume and the time. The difficulty comes in here; if you let the water rise till it stands still, and then make your mark, you cannot bale, for

the water won't flow. Every bale reduces the level of the water below the mark, or at any rate you get only a very small delivery. You must therefore reduce the level of the water somewhat and then make your mark. The flow of the spring increases, as you reduce the level of the water, because you relieve the pressure on the spring.

Many wells are dug down to water in sandy soil, and then only hold about two feet of water; if a greater depth of water is attempted the sides fall in. It is easy to reduce the water one foot and make a mark, and your operations then become exactly similar to those for measuring a small *karis* by baling.

Another way is to bale the well dry, and measure the volume of water obtained, noting the time it takes to bale the well dry. The volume may be obtained by counting the buckets full withdrawn, or by pouring the water into a tank. Then note the time it takes the water to come back into the well again. You can then calculate how much water you can get out of the well in twenty-four hours, or whatever time you are interested in.

By the time you have measured the capacity of a dozen wells you will have invented a method of your own.

The value of wells that do irrigation are best gauged by ascertaining the area of cultivation. This can be done by direct measurement of the area under cultivation or by ascertaining the quantity of wheat or barley seed sown.

The quantity of seed sown per acre varies from 30 seers to one maund in India to from 40 to 60 Indian seers in Seistán.

The number of times the seed is returned at harvest to the sower is also a very useful thing to ascertain; it is a quantity well known to the intelligent cultivator. If the seed sown, and the yield are ascertained, the acreage sown is of quite secondary importance.

It is a well known fact to all on the Frontier that springs yield more in winter than in summer, and measurements should be made in both seasons to obtain a correct knowledge of the supply yielded by the spring.

*N.B.*—See Technical Paper No. 178 on the "Inflow of water into wells in the Punjab" for a description of the gauging of masonry wells sunk into the sand that underlies the Punjab Plains.

APPENDIX 40.

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## APPENDIX 40.

*Note on the Persian years, months and seasons by Khán Bahádur Maulá Bakhsí, Native Political Attaché to the Seistán Mission.*

Considerable difficulty is experienced by British officers going to Persia in understanding the Persian years, months and seasons. It is impossible to collect accurate information on revenue, customs, crops or anything connected with seasons unless one understands how the Persians reckon them, and this note is drawn up with the object of explaining the years, months, etc., used by the Persians in their official and private transactions and calculations.

The ancient Persian year was a solar year consisting of 365 days. The Persian historians and astronomers claim it to be of very high antiquity and carry it back to more than 800 years before the Christian era, tracing its origin to Jamshid, an ancient Persian King, who is the subject of much fable and—who is often confounded with Bacchus, Solomon, and Alexander the Great—and is supposed to have invented various arts and sciences with the help of Pythagorus, who is said to have been his Prime Minister.

The ancient Persian solar year consisted of 12 months of 30 days each, and five days were added to a particular month to make the number in all 365. The Persian historians attributed the commencement of the year to the day when Jamshid, after completing his famous city, Istakhr (literally praise of sun), the ruins of which lie not very far from Shiraz, the head-quarters of the Fars Province of modern Persia, made his first public entry into it. This important event took place at the true Vernal Equinox when the sun entered Aries, and that day was instituted as *Naurúz* or New (Year's) day, and was celebrated as a public festival with extraordinary rejoicings. For some time there was no embolism similar to the Christian leap year, in consequence of which the New Year's day made retrograde progress drifting back into Pisces. To remedy this a month of 30 days was intercalated at the end of every 120 years and was celebrated with great festivity throughout the Persian Kingdom.

A particular name was given to every month in the year and a particular name to every day in the month, no sub divisions of the month being made by weeks. All these names were adopted from certain angels supposed by ancient Persians to control and influence all the actions of the periods committed by Omnipotence to their care. These angels were divided into two classes, viz.—(1) those who presided over the months, and (2) those who ruled over the days. The former were considered superior to the latter who were called *kárkún* (literally workers), i.e., Ministers. One day was, however, assigned to each of the archangels in his particular month which was believed to be peculiarly favoured by him and was consequently distinguished with unusual attention. A distinct *Zamzama* (prayer) was assigned to every angel; and it was considered highly disrespectful to mutter the *Zamzama* of one angel on a day patronized by another. The Kings of Persia, in obedience to this belief, used a new charm every day, on which something relative to the superintending angel was engraved; they wore a new garment every day and had a new and peculiar dish every day at table. It was considered an object of the highest importance to conciliate the favour of these angels, and in consequence thereof a number of festivals were established having both a religious and a political tendency, the days supposed to be under the protection of the angels of the month being, in general, most particularly honoured.

As mentioned above, the first month commenced at the Vernal Equinox, and was formerly named *Azur*, i.e., fire, or the angel supposed to preside over it. The order of the month was, however, changed about the end of the eleventh century when Sultán Jalal-ud-din reformed the Persian Calendar. Since then the following order has been preserved:—

(1) *FARVARDIN* (March—April).—This month was so named from an angel supposed to be the *Kházin* (treasurer) of paradise and to have the particular care of the souls of the blessed.

On the first of this month, called *Naurúz*, or New (Year's) day, began the principal festival among the Persians which continued for six days. On the first, the King gave his chief attention to promote the happiness of the body of the people; on the second, he entertained the doctors and astrologers; on the third,

the priests and counsellors of state; on the fourth, the princes of the blood and grantees; on the fifth, the royal children; and on the sixth, which was considered as the King's particular day, his subjects made him free gifts according to their rank. On the eve of *Naurúz*, a young man of an elegant figure, personating the New Year, was stationed at the door of the royal bed-chamber, which he entered, without ceremony, the moment the sun appeared above the horizon. The King immediately addressing him, said:—"What art thou? Whence dost thou come? Whither dost thou go? What is thy name? Wherefore dost thou approach? What dost thou bring?" To this he answered:—"I am the fortunate and the blessed; I am sent hither by God, and bring with me the New Year." Then he sat down, when another appeared with a large silver dish, in which were wheat, barley, peas, vetches, sesame and rice (seven ears and nine grains of each), with a lump of sugar, and two new coined pieces of gold, which, as an offering, was placed before the King. Then entered the Prime Minister, the general of the forces, the lord high treasurer and the superintendent of war; after whom followed the nobles and the people, according to their dignity and respective classes. A large loaf, made of the above mentioned grains, was then presented to the King. After eating part of it, he offered some to those who were around him, saying:—"This is the new day, of the new month, of the new year, of new time; when all things consistent with time must be renewed. Then investing his nobles with rich robes, he blessed and distributed amongst them the presents which had been brought. Although this programme is not followed exactly in all its details at present, the modern programme is based on it and many of the ceremonies are still performed. The *Naurúz* has in fact been preserved and is still maintained as the chief national festival and celebrated throughout Persia with great rejoicings for thirteen days during which the Persians of all classes visit and entertain each other.

The 19th of the month was this angel's peculiar day during which it was reckoned fortunate to shape or put on new garments and to take a general survey of the state of herds and flocks in the kingdom. This belief still prevails and even now during this month herds and flocks throughout Persia are supposed to be counted. Whether this is actually done or not, the annual tax on herds and flocks (*sargala*) falls due at *Naurúz*, and has to be remitted to the Shah by every Provincial Governor during this month.

(2) *ARDIBIHISHT* (*April—May*).—This angel was supposed to have the charge of the keys of paradise, of mountains and the sacred fire. On its third day, which was the angel's name day, it was thought auspicious to give battle, to go to the fire-temple and to approach the king, under the idea that all petitions then put up to their heavenly or earthly sovereign would be favourably heard.

(3) *KHÚRDÁD* (*May—June*).—Under this angel's care were placed all seas, rivers, and waters of every kind, together with trees and herbage. The angel's day was the sixth when it was held fortunate to marry and to offer up prayers to God and the angels for relief from all distress and for the supply of every want.

(4) *TIR* (*June—July*).—This angel was entrusted with the guardianship of cattle under the general supervision of *Khúrdád*. The thirteenth was solemnized by the festival of *âbrizgân* during which all classes of people sprinkled one another with water. This ceremony of sprinkling water, however, was not confined to this festival, as it also formed part of the entertainments of *Naurúz*, *Mihrgân*, *Khúrdád* and *Bahman*.

(5) *MÚRDÁD* (*July—August*).—*Múrdád* (literally death giving) was considered as the angel of death and was supposed to be the guardian of trees, herbs, fruits and seeds. The seventeenth was his day when the *Jashn-i-Nilúfar* (feast of the herb *Nenuphar*, which was used in the ceremony) was held. It was believed that on that day all petitions presented to the king and great men were generally granted.

(6) *SHAHRIYÁR* or *Shahrawar* (*August—September*).—This angel was the custodian of all metals and minerals. Nothing remarkable distinguished his festival, which was on the fourth day. Another festival was held on the 18th day which was called *Khizán* (autumnal feast).

(7) *MIRR* (*September—October*).—This angel was supposed to be the intelligence which regulated the sun. It was also supposed to preside over love and friendship and was imagined to be the distributor of rewards and punishments on

the day of judgment. This angel's particular day was the 16th on which began one of the greatest festivals called *Mihrgân*. To the origin of this solemnity many traditional motives are assigned, but it appears to have been held in honour of the autumnal equinox. On the 16th of this month it was considered fortunate to wean or name children.

(8) *ABÂN* (October—November).—This angel was, like *Tir*, considered a subordinate of *Kiwarddâ*. He was supposed to control iron. The tenth, being his name day, was celebrated as a public festival in commemoration of a great rain which, by tradition, fell on this day, after a seven years' drought and famine. This month having been, in old times the last of the year, five supplementary days were annexed to it and formed the occasion for a continued festival for eleven days which began on the 26th of this month and ended on the fifth of the next month *Azur*. During this feast the ancient Persians used to place various kinds of rich food upon the tops of high towers for regaling the spirits of their departed heroes.

(9) *AZUR* (November—December).—This angel presided over fire, in consequence of which, on the 9th, his name day, the country all round blazed with flaming piles, while the ancient Persians after paring their nails and shaving their hair and believing thus to have thrown away all their sins and defects visited, with great solemnity, their fire temples.

(10) *DAI* (December—January).—This angel presided over this month as well as over all the days beginning with *Dai* such as *Dai ba Azur*, *Dai ba Mihr*, etc. On the 11th, which was this angel's day, another great festival of fire was celebrated all through Persia, and large bunches of dry herbs were fastened to wild beasts and birds, who were then let loose and temporarily made the fields, mountains and the air one universal blaze, which was often heightened by the accidental firing of the neighbouring woods to which these terrified animals naturally fled for shelter.

(11) *BAHMAN* (January—February).—This angel was supposed to be the superintendent of every created thing except man who was the peculiar charge of Ormuz, or Omnipotence. He was also the pacifier of rage and the mediator in all quarrels. On the 2nd day which was this angel's day the ancient Persians celebrated the feast of corn and meat which they boiled together, with white and red *Bahman*, flavoring the dish with those herbs and pounded sugarcandy. The white *Bahman* they also bruised in milk, and drank it as a strengthener of the memory. On this day it was considered fortunate to lay the foundations of houses; to shape or put on new clothes; to pare the nails and shave the hair; to search for medicinal herbs and roots in order to extract their perfumes, essences and oils for the composition of drugs and spells which were imagined to have qualities much superior to those prepared on any other day.

(12) *SPINDÂRMUZ OR ISPINDARMAD* (February—March).—This was the name of an angel to whom was assigned the care of the earthly globe and the guardianship of virtuous women, in consequence of which the fifth, his peculiar day, was highly auspicious to every circumstance relative to marriage.

The extra month of 30 days intercalated after 120 years at the end of the first period followed *Farvardin* (March—April); at the second celebration it was placed after *Arđibihisht* (April—May); and on the third it succeeded *Khwardâd* (May—June), the five ascititious days being annexed to it. In this rotation it continued till the year 636 of the Christian era, when Yezd-i-Jird III, the last king of the Sasanian dynasty being defeated by the Arabs, Persia became a province of the great Emperor of Khalifs, and the Muhammadan lunar computation being introduced in all civil and religious affairs, the intercalations of the Solar year were, from that period, neglected till 1079 A.D., when the Saljukian Sultan of Persia, Malik Shah Jalâl-ud-din (Amir-ul-Umara to the Khalif Muktađî) reformed the calendar, which has since borne his name, bringing forward the *Naurâz*, from the 15th degree of Pisces to the fifth of Aries and intercalating an embolismal day every fourth year which was thence called *Sâl-i-kabisa* or leap year. The astronomers in their tables add the five ascititious days, to the last month *Isfandârmuz* (February—March); though they are vulgarly annexed to *Abân* (October—November), because they happened to follow that month, in the intercalary rotation, at the defeat of Yezd-i-Jird, who had made an alteration in the calendar known by his name, which, however, in consequence of that event, soon ceased to be publicly attended to.

As already mentioned, the order of the months given above is that which prevailed in Persia since the reformation of the calendar by Sultan Jalal-ud-din, who, it is supposed, restored the most ancient mode, as originally established by Jamshid. In the middle ages of Persia, however, their position was different; *Azur*, corresponding, according to the above order, to November—December, answering then to March—April, *Dai* to April—May, and so on in rotation, the consecutive order being the same in both. This, however, has produced some disagreement amongst the different writers with regard to the attributes of the angels, and the origin of the various festivals which it is of no importance to reconcile. The above outlines will be found in general sufficient and answer the purpose for which they are introduced; that of explaining old Persian popular beliefs, some of which still exist, and giving an idea of the various customs and traditions to which allusions are so often made in eastern history, poetry and romance.

The *Yezd-i-Firdi* and *Jalali* years and months are still given in the Persian almanac (*Takwim*) every year for reference.

The *Yezd-i-Firdi* year begins in August, and the five asciticious days, which are called *Khamsa-i-Yezd-i-Firdi*, are added at the end of the month *Aban* (March—April).

The *Jalali* year begins at the Vernal Equinox on the 21st March, and the five additional days, called *Khamsa-i-Jalali*, are annexed to the last month *Isfandarmuz* at the end of the year.

As these years have practically fallen into disuse in Persian transactions, it will perhaps be sufficient to give below the months and dates corresponding with the Christian year 1905-06, as given in the Persian almanac, without entering into further details about them:—

*Yezd-i-Firdi year 1274-75 corresponding to 1905-06 A.D.*

1274		Days.
<i>Aban</i>	... 13th March to 11th April 1905	... 30
<i>Khamsa-i-Yezd-i-Firdi</i>	12th to 16th April 1905	... 5
<i>Azur</i>	... 17th April to 16th May 1905	... 30
<i>Dai</i>	... 17th May to 15th June 1905	... 30
<i>Bahman</i>	... 16th June to 15th July 1905	... 30
<i>Isfandarmuz</i>	... 16th July to 14th August 1905	... 30
1275.		
<i>Farvardin</i>	... 15th August to 13th September 1905	... 30
<i>Ardibehisht</i>	... 14th September to 13th October 1905	... 30
<i>Khordad</i>	... 14th October to 12th November 1905	... 30
<i>Tir</i>	... 13th November to 12th December 1905	... 30
<i>Murdad</i>	... 13th December 1905 to 11th January 1906	... 30
<i>Shahrivar</i>	... 12th January to 10th February 1906	... 30
<i>Mihr</i>	... 11th February to 12th March 1906	... 30

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*(Malik Shah) Jalali year 827, corresponding to 1905-06 A.D.*

	Days.
<i>Farvardin</i>	... 21st March to 19th April 1905
<i>Ardibehisht</i>	... 20th April to 19th May 1905
<i>Khordad</i>	... 20th May to 18th June 1905
<i>Tir</i>	... 19th June to 18th July 1905
<i>Murdad</i>	... 19th July to 17th August 1905
<i>Shahrivar</i>	... 18th August to 16th September 1905
<i>Mihr</i>	... 17th September to 16th October 1905
<i>Aban</i>	... 17th October to 15th November 1905
<i>Azur</i>	... 16th November to 15th December 1905
<i>Dai</i>	... 16th December 1905 to 14th January 1906
<i>Bahman</i>	... 15th January to 13th February 1906
<i>Isfandarmuz</i>	... 14th February to 15th March 1906
<i>Khamsa-i-Jalali</i>	... 16th to 20th March 1906

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With the Muhammadan conquest of Persia the Persians were not only forced to change their religion, but their calendar also and to adopt the *Hijra* calendar.

The *Hijra*, or migration (of the prophet Muhammad from Mecca to Medina), took place on the 15th July, A.D. 622, and the next morning, *i.e.*, 16th July, A.D. 622, was, in the reign of the Khalif Omar, ordered to be considered as the Muhammadan era.

The Muhammadan year is a lunar year consisting of the following twelve months:—

1. *Muharram*.—(The sacred month during which fighting is forbidden, and the anniversary of the martyrdom of Husain is celebrated).
2. *Safar*.
3. *Rabi-ul-Awal*, or *Rabi-ul-uld*.
4. *Rabi-us-Sáni*, or *Rabi-us-Sánia*, or *Rabi-ul-Ákhir*, or *Rabi-ul-ukhrá*.
5. *Jamádi-ul-Awal*, or *Jamádi-ul-úla*.
6. *Jamádi-us-Sáni*, or *Jamádi-us-Sánia* or *Jamádi-ul-Ákhir*, or *Jamádi-ul-Ukhrá*.
7. *Rajab*.
8. *Shá'bán*.
9. *Ramazán*.—(The fasting month.)
10. *Shawwál*.
11. *Zika'da*, or *Zilkáda*, or *Zulka'da*.
12. *Zihijja*, or *Zihijja*, or *Zuhijja*.—(The month of the *Haj*, or pilgrimage to Mecca.)

These months being lunar consist of 29 and 30 days alternately. To the last month an intercalary day is added eleven times in a period of 30 years. These are called abounding years and consist of 355 days. The common year contains only 354 days. Thirty-two solar or Christian years are very nearly equal to 33 Muhammadan lunar years. Every lunar *Hijra* year begins earlier than the preceding one, so that a month occurring in summer in the present year will about 16 years hence, be in winter.

The following table will show the intervals at which the first month (*Muharram*) of the Muhammadan year has corresponded with the same month (July) of the Christian year. It will be observed that during about 1,300 years the 1st of *Muharram*, which, in the first *Hijra* year, fell on the 16th of July 622 A. D., has fallen exactly on the same date only four times.

1st <i>Muharram, Hijra</i>	Y, corresponding to 16th July 622 A. D.
" " "	35, " " 11th July 655 A. D.
" " "	68, " " 18th July 687 A. D.
" " "	102, " " 12th July 720 A. D.
" " "	135, " " 18th July 752 A. D.
" " "	169, " " 14th July 785 A. D.
" " "	202, " " 20th July 817 A. D.
" " "	236, " " 15th July 850 A. D.
" " "	270, " " 11th July 883 A. D.
" " "	303, " " 17th July 915 A. D.
" " "	337, " " 11th July 948 A. D.
" " "	370, " " 17th July 980 A. D.
" " "	404, " " 13th July 1013 A. D.
" " "	437, " " 19th July 1045 A. D.
" " "	471, " " 14th July 1078 A. D.
" " "	504, " " 20th July 1110 A. D.
" " "	538, " " 16th July 1143 A. D.
" " "	572, " " 10th July 1176 A. D.
" " "	605, " " 16th July 1208 A. D.
" " "	639, " " 12th July 1241 A. D.
" " "	672, " " 18th July 1273 A. D.
" " "	706, " " 13th July 1306 A. D.

1st <i>Muharram, Hijra</i>	739,	corresponding to 20th July 1338 A. D.
" " "	773,	" " 15th July 1371 A. D.
" " "	807,	" " 10th July 1404 A. D.
" " "	840,	" " 16th July 1436 A. D.
" " "	874,	" " 11th July 1469 A. D.
" " "	907,	" " 17th July 1501 A. D.
" " "	941,	" " 13th July 1534 A. D.
" " "	974,	" " 19th July 1566 A. D.
" " "	1009,	" " 13th July 1600 A. D.
" " "	1042,	" " 19th July 1632 A. D.
" " "	1076,	" " 14th July 1665 A. D.
" " "	1109,	" " 20th July 1697 A. D.
" " "	1143,	" " 17th July 1730 A. D.
" " "	1177,	" " 12th July 1763 A. D.
" " "	1210,	" " 18th July 1795 A. D.
" " "	1244,	" " 14th July 1828 A. D.
" " "	1277,	" " 20th July 1860 A. D.
" " "	1311,	" " 15th July 1893 A. D.
" " "	1318,	" " 1st May 1900 A. D.
" " "	1323,	" " 18th March 1905 A. D.
" " "	1324,	" " 25th February 1906 A. D.

Each Muhammadan month is divided into weeks of 7 days. The following are the Persian names of the days of the week:—

*Shamba* (Saturday).

*Yak Shamba* (Sunday).

*Do Shamba* (Monday).

*Sih Shamba* (Tuesday).

*Chahâr Shamba* (Wednesday).

*Panj Shamba* (Thursday).

*Juma* (Friday).

The week begins on a Saturday and ends on a Friday, the latter being the Muhammadan Sabbath.

The day and night comprise 24 hours, but the day does not begin at midnight, as with the Christians, the sunset being considered the close of one day and the commencement of the next, so that what is called Friday night by the Christians, is maintained to be the night of Saturday by the Muhammadans; since, according to the latter, Friday had ended and Saturday began at sunset. This is a point worthy of note in making engagements with the Persians, otherwise confusions are likely to occur, causing disappointment to the parties concerned. To prevent misunderstanding the safest way of specifying a certain night in dealing with Persians is to describe it as the night between such and such days of the week or such and such dates of the month.

The first of the Muhammadan lunar months is the day following the evening on which the new moon is visible, and is called *Ghurra*; the last, if it happens to be the 30th day, is called *Salkh*, otherwise *Bist-o-nuhum*.

The Persians have certain superstitions about the lunar months also. They believe that looking on certain objects, after seeing the new moon, brings happiness and good luck. Acting on this belief, the superstitious people arrange to have the necessary objects ready at hand at the end of each month, so that immediately after seeing the new moon their eyes should fall on them. These objects are

given in the following table with the names of the months to the new moon of which they are assigned :—

Name of the Muhammadan month.	Objects to be looked on after seeing the new moon.
<i>Muharram</i> ... ..	Gold, green lawn, running water, turquoises, rings, books.
<i>Safar</i> ... ..	Mirror, red clothes, polished arms, hands of lads.
<i>Rabi-ul-Awal</i> or <i>Rabi-ul-âld</i> ... ..	Running or still water; faces of youths, green lawn.
<i>Rabi-us-Sâni</i> or <i>Rabi-us-Sânia</i> or <i>Rabi-ul-Akhir</i> or <i>Rabi-ul-Ukhrâ</i> .	Running water, faces of youths, books, animals.
<i>Jamâdi-ul-Awal</i> or <i>Jamâdi-ul-âla</i> ... ..	Silver, clear water, ring-stones, sheep.
<i>Jamâdi-ul-Akhir</i> or <i>Jamâdi-ul-Ukhrâ</i> or <i>Jamâdi-us-Sâni</i> or <i>Jamâdi-us-Sânia</i> .	Pearls, rings, jewels, the palm of the hand, sky.
<i>Rajab</i> ... ..	<i>Alkurân</i> , turquoises, green lawn and grass.
<i>Shâ'bân</i> ... ..	Faces of beautiful and virtuous persons, green lawn.
<i>Ramazân</i> ... ..	Sword and other arms, <i>Alkurân</i> , faces of wife and children, running water.
<i>Shawwâl</i> ... ..	Books, red clothes, burning fire, green clothes, gardens, melon-fields, turquoise rings, running water.
<i>Zikâ'da</i> or <i>Zilka'da</i> or <i>Zulka'da</i> ... ..	Faces of lads, learned men and saints.
<i>Zihijja</i> or <i>Zilhiijja</i> or <i>Zulhiijja</i> ... ..	Faces of holy men, philosophers and young women, pearls.

The names of the following Muhammadan months are generally used in writing, with the affixes given after them :—

- (1) *Muharram-ul-harâm*.—(The sacred month of *Muharram*).—*Muharram* literally means sacred, or forbidden; so-named, because in consequence of the martyrdom of Husain during this month, the month is considered sacred and fighting in it is forbidden. In consequence of this event this and the following month of *Safar* are regarded as months of mourning in Persia during which special prayer meetings are held everywhere and no marriages or public rejoicings can take place.
- (2) *Safar-ul-Muzaffar*.—(The auspicious month of *Safar*).
- (7) *Rajab-ul-Murajjab*.—(The honoured month of *Rajab* so-called on account of Muhammad's ascent to heaven on the night of the 26th of this month, which is called *Lailat-ul-Mirâj*).
- (8) *Shâ'bân-ul-Mua'zzam*.—(The important month of *Shâ'bân*).
- (9) *Ramazân-ul-Mubârak*.—(The blessed month of *Ramazân*).—The word *Ramazân* implies a consuming fire, whence it is by some conjectured, that this month originally fell in the most sultry period of the summer. This is the fasting month, and the festival of breaking the fast, called *Id-ul-fitr*, immediately follows it, and is celebrated on the 1st of the following month. This month is greatly revered on many accounts, but particularly from the belief that it was on the 27th night of this month, called *Lailat-ul-Kadr* (the night of power), that the *Alkurân* began to descend from heaven. On the anniversary of this night all orthodox Muhammadans continue most fervently in prayer under the impression that every petition then put up to Omnipotence will be favourably received. *Ramazân* is also one of the attributes of God, as the pardoner.

- (10) *Shawwâl-ul-Mukarram*.—(The revered month of *Shawwâl*).—In the beginning of this month the festival of *Bairam* is celebrated and *Id-ul-fitr* falls on the first of this month.
- (11) *Zika'dat-ul-harâm* or *Zikadat-ul-harâm* or *Zulka'dut-ul-harâm*.—(The sacred month of *Zik'ada*). This is the penult month.
- (12) *Zihijjat-ul-harâm* or *Zilhijjat-ul-harâm* or *Zulhijjat-ul-harâm*.—(The sacred month of *Zihijja*).—This is the last month of the Muhammadan year and is so-called, because the great pilgrimage to Mecca takes place on the 9th of this month and the next day is celebrated as '*Id-uz-Zuha* or '*Id-i-Kurbân* (the festival of sacrifice).

The third, fourth, fifth and sixth months, *vis.*, *Rabi-ul-Awal*, *Rabi-us-Sânt*, *Jamâdt-ul-Awal*, and *Jamâdt-us-Sânt*, are used without any affixes. *Rabi*, literally means spring, and it is conjectured by some that these two months were so-called, because originally they fell in the spring. *Jamâdt*, literally means withering or drying, and some conjecture that these months were so-called, because at the beginning of the era they happened to be in the autumn, and that the order of the months was afterwards changed.

On the overthrow of the Abbâside Khalif kingdom by Hulâku Khân the grandson of Jingiz Khân, and brother of Kublâi Khân, the importance of the *Hijra* era declined in Persia, particularly as Hulâku Khân paid more attention to solar calculations. He fixed his residence at Marâgha, a city in the Azarbâijân Province of Persia, and having drawn round him a distinguished body of men of science caused an astronomical observatory to be erected on a hill to the west of that city, and the "Tables of the Ilkhâni" compiled by his friend and counsellor Nasir-ud-Din, the greatest astronomer of the age, which have preserved his name.

The Tartars, in the fourteenth century, introduced yet another series of solar years into Persia. These are called *Sanavât-i-Turki*, or Turki years; they were originally supposed to begin, when the sun was in the centre of Aquarius, but now they are practically taken to commence at the *Naurûz* or Vernal Equinox and terminate on the day preceding the following *Naurûz*.

According to ancient Turk Astronomers of Kipchâk and Uighûr (or 'Ighûr) there is, in the heavens, an imaginary circle, or an interval of time, in which a certain succession of events or phenomena is completed, and then returns again and again uniformly and continually in the same order. This is called the cycle of the year. In Turki chronology the cycle of the year consists of 12 solar years; hence it is known by the name of *Daur-i-Asnâ Ashri* which means cycle of twelve. Each of these twelve years is assigned to an animal, on the supposition that the events and seasonal phenomena taking place in that year, are peculiar to the characteristics of that animal and can be easily predicted; and that the same events and seasonal phenomena recur in each cycle, which, when completed, commences again. Since the Turki years were introduced, the Persians compute time and seasons by regular divisions, or periods, fixed by this cycle, and they have adopted the Turki names of the years. These years are given in the table at the end of this Appendix with their corresponding A. D. years for twelve cycles, or a period of 144 years, beginning with the years 1852-53 and ending with the years 1995-96.

Since the introduction of these years, in deeds, bonds, accounts and historical and other important records and transactions, the name of the Turki solar year, as well as the lunar year and its date, began and continued to be mentioned together, and the practice of expressing seasons by signs of the Zodiac was established. The use of the Turki year gradually became so common that it was, and is still considered, essential for all educated persons to learn and remember their names. For facility of remembrance, the children are made to commit to memory the following couplets containing the meaning in Persian of the Turki years in the order followed by them:—

*Mûsh-o-bakar-o-palang-o-khargûsh shumâr.*  
*Zîn châr cho bugzari nihang âyad-o-mâr.*  
*Wungâh ba asp-o-gûsfand ast hisâb.*  
*Hamdûna-o-murgh-o-sag-o-khûk âkhir-i-kâr.*

These couplets literally translated mean:—

The mouse, the cow, the leopard, the hare you take,  
When you pass these, then come the crocodile and the snake.  
You then have the horse and the sheep in the log.  
The monkey, the fowl, the dog and the hog.

During the reign of the late Násir-ud-Din Sháh of Persia, or towards the end of the nineteenth century, His Majesty's Chief Astronomer, the Najm-ud-Daula, introduced, in the Persian Almanac, the solar Hijra year of 365 days and adopted the Arabic terms of the signs of the Zodiac as the names of the months of that solar year. These months are given below, together with their English and Persian equivalents—which latter are not used—and the number of days assigned to each month:—

*Names of the modern Persian solar months.*

Arabic	Persian.	English.	Number of days.
<i>Hamal</i> ...	<i>Barra</i> ...	Aries ...	31
<i>Saur</i> ...	<i>Gáv</i> ...	Taurus ...	31
<i>Jausa</i> ...	<i>Dopáthar</i> ...	Gemini ...	31
<i>Saratán</i> ...	<i>Khorchang</i> ...	Cancer ...	32
<i>Asad</i> ...	<i>Shir</i> ...	Leo ...	31
<i>Sumbula</i> ...	<i>Khúcha</i> ...	Virgo ...	31
<i>Misán</i> ...	<i>Tardá</i> ...	Libra ...	30
<i>Akráb</i> ...	<i>Gardum</i> ...	Scorpio ...	30
<i>Kaus</i> ...	<i>Kandn</i> ...	Sagittarius ...	30
<i>Jadi</i> ...	<i>Bughála</i> ...	Capricornus ...	29
<i>Dolv</i> ...	<i>Dúl</i> ...	Aquarius ...	30
<i>Hút</i> ...	<i>Máhi</i> ...	Pisces ...	29
Total number of days ...			365

The calendar of the 1284 *Hijra-i-Shamsi* (solar *Hijra* year) corresponding to 1323-24 *Hijra-i-Kamari* (Lunar *Hijra* year) and to 1905-06 *Anno Domini* is given below:—

1st to 31st <i>Hamal</i> 1284.	21st March to 20th April 1905.
1st to 31st <i>Saur</i> 1284.	21st April to 21st May 1905.
1st to 31st <i>Jausa</i> 1284.	22nd May to 21st June 1905.
1st to 32nd <i>Saratán</i> 1284.	22nd June to 23rd July 1905.
1st to 31st <i>Asad</i> 1284.	24th July to 23rd August 1905.
1st to 31st <i>Sumbula</i> 1284.	24th August to 23rd September 1905.
1st to 30th <i>Misán</i> 1284.	24th September to 23rd October 1905.
1st to 30th <i>Akráb</i> 1284.	24th October to 22nd November 1905.
1st to 30th <i>Kaus</i> 1284.	23rd November to 22nd December 1905.
1st to 29th <i>Jadi</i> 1284.	23rd December 1905 to 20th January 1906.
1st to 30th <i>Dolv</i> 1284.	21st January to 19th February 1906.
1st to 29th <i>Hút</i> 1284.	20th February to 20th March 1906.

The *Hijra-i-Shamsi* (solar *Hijra*) and the Turki year and the signs of the Zodiac (Arabic terms) have lately been adopted by the Persian Government for all official purposes, and are now used by the Belgian Customs Authorities in Persian employ, and all other Persian Officials in all documents and financial accounts throughout Persia, including Seistán.

The Priests and the common people still use Muhammadan lunar years, months and dates in their religious and private transactions, but they are also gradually adopting the Government practice in all important documents. The Muhammadan days of the week, however, continue to be used throughout Persia without any change.

Seasons have for a long time been and still continue to be expressed, for purposes of weather and agriculture, by names of the signs of the Zodiac by agriculturists and others, who believe that a change takes place as the sun enters each sign of the Zodiac, which entry is called *tahvil*, the entry into each sign of the Zodiac being denoted by the addition of its name, such as *tahvil-i-*

*áftáb dar hamal, takvil-i-áftáb dar saur*, or only *takvil-i-hamal, takvil-i-saur*, etc. The educated persons make use of these terms correctly, but ignorant people such as flock and herd-owners and agriculturists throughout Persia, including Seistan, who do not possess knowledge of the various changes that have taken place in the Persian calendar at different times, often get hopelessly mixed in trying to reconcile the lunar months with the solar terms of the signs of the Zodiac and the ancient Persian seasons. It will, however, probably be possible, with the help of this note, to make out what they are driving at.

The ordinary four seasons of the year are called by Persians:—

<i>Bahár</i> or <i>Fasl-i-Bahár</i> .	Spring or Spring season.
<i>Tábistán</i> or <i>Garmá</i> , or <i>Fasl-i-Tábistán</i> or <i>Fasl-i-Garmá</i> .	Summer or Summer season.
<i>Khizán</i> or <i>Fasl-i-Khizán</i> , or <i>Páíz</i> or <i>Fasl-i-Páíz</i> .	Autumn or Autumn season.
<i>Zamistán</i> or <i>Sarmá</i> , or <i>Fasl-i-Zamistán</i> or <i>Fasl-i-Sarmá</i> .	Winter or Winter season.

Each of these four seasons of the year, though supposed to be of three months' duration, retains its peculiarities of weather for only about sixty days or two months. During the remaining days, whether preceding or following that period, the weather is liable to changes and is not so marked as to make it clear whether it belongs to that particular season or the one preceding or following it. Although there may be occasional showers of rain in the Autumn and Winter the real *Bahár* or Spring, which begins at the Vernal Equinox, is the real rainy season of Persia which is called *Shisha* (literally sixes), since it is supposed to last for about 66 days after the *Naurúz*. Beginning with the 6th of *Naurúz* (Vernal Equinox) or six days after 21st March, the rain is supposed to fall, and often does fall in Persia, for about 66 days at intervals of about 10 days, *viz.*, on the—

6 days after <i>Naurúz</i>	corresponding to 27th March.
16 " " "	" 5th April.
26 " " "	" 15th April.
36 " " "	" 25th April.
46 " " "	" 5th May.
56 " " "	" 15th May.
66 " " "	" 25th May.

These rains are considered to be sufficient for the *daima* (unirrigated) crops which depend on the rains. In the southern, south-eastern and south-western parts of Persia, lying below the plateau, which are hotter than the uplands, the rains fall earlier or during the last part of the winter and the early part of the spring. This is the case in Seistán. There is of course no monsoon, and no rain falls in the summer. In the winter snow falls on the plateau and rain in the low-lying tracts.

The Persians believe that in most parts of Persia inferior animals begin to come to life about a week after the *Naurúz*; the nightingale begins to sing a few days later or about the end of March; and the winds begin to blow about 26th of May, when the summer is considered to commence.

The real *Tábistán*, or summer, which is supposed to last only about 60 days, is divided into two *Chilla* (literally forty) which are called *Chilla-i-buzurg-i-tábistán* (great *Chilla* of summer), and *Chilla-i-kúchik-i-tábistán* (small *Chilla* of summer). The *Chilla-i-buzurg*, or great *Chilla*, consists of forty days. It begins about the 21st of June and ends about the end of July. The sun is believed to reach its zenith about the 4th of July, and the middle of the *Chilla-i-buzurg* (great *Chilla*) that falls about the 13th July, or the period between that date and the 8th of August is considered to be the hottest part of the year in most parts of Persia. This period is also called *Tamúz* from the ancient Roman month of that name beginning on the 13th July.

The *Chilla-i-kúchik* consists of only 20 days. It begins about the end of July and ends about the 19th of August, when real summer is taken to end and a cool breeze is supposed to begin to blow.

The *Bád-i-sad-o-bist rúz* (120 days' wind) of Seistan blows all through the two summer *Chilla*.

The summer season is believed to finally end about the 24th of September, when the *Fasl-i-Khizán* or *Páiz* (autumn) begins.

The best time for cutting trees is considered to be about the end of October.

The autumn is supposed to end on the 23rd December or two days after the longest night which is called *Shab-i-Yaldá*, and the *Fasl-i-zamistán* (winter season) begins on the following day.

Real winter is, like the summer, divided into two *Chilla* (periods) of 60 days. The first or the *Chilla-i-buzurg-i-zamistán* (great *Chilla* of winter) begins on the 24th December and ends on the 31st of January. The *Chilla-i-kúchik-i-zamistán* (small *Chilla* of winter) begins on the 1st of February and ends on the 20th of that month.

The middle of February is considered to be the best time for planting trees, as the sap is supposed to begin to rise about the 25th February. The winter reaches its height about the 5th of February, and the severity of the weather continues throughout that month and the early part of March. The winter solstice is supposed to begin about the 10th of March, which is generally followed by a week of extreme cold called *Ayyám-ul-'ajúz*, or *hard-i-'ajúz* which means old women's terror. The winter is supposed to finally terminate on the 20th March, and spring begins the following day, which is the *Naurúz* or New (Year's) day. It should be explained that when the Vernal Equinox happens in the forenoon of the 21st of March, the new year begins the same day; but if it happens in the afternoon of that day then the new year begins on the following day, i.e., the 22nd of March. This has occurred in 1906.

Another short disturbance takes place in the weather about or soon after the *Naurúz* which is called *Ahman-Bahman*—names of two old Persian demons—and means the disturbance of *Ahman* and *Bahman*. It is supposed to be caused by an increase in the heat of the sun when it enters *Aries*. This disturbance results either in rain or another spell of cold for about a week or so. There are, however, exceptions to all the above rules which depend on circumstantial meteorological changes.

Under the heading of seasons may perhaps be mentioned the different *Id* festivals celebrated by the Persians.

*Id* is literally anything which returns (of happiness, care, grief or sickness), a solemnity, feast, festival, holiday, or a public ceremony held annually in commemoration of an important event. The term is, however, practically employed now for feasts of pleasure only. The *Id* festivals are numerous, but only the following are the principal ones which are observed in Persia at present.

*Id-i-Naurúz*.—Feast of the Persian New Year, celebrated at the Vernal Equinox, on the 21st March.

*Id-i-Saghír* or *Id-ul-Fitr*.—The festival of breaking the Ramazan fast, celebrated on the first of Shawwal.

*Id-i-Kabir* or *'Id-i-ashá* or *Id-us-Zuhá* or *Id-i-Kurbán*.—The festival of sacrifices. Celebrated on the 10th Zilhijja, the day after the *haj* or pilgrimage to Mecca.

*Id-i-Ghadir*.—A festival celebrated on the 18th of Zihijja on which the prophet is believed by the *Shia* to have announced to the pilgrims that All should succeed him.

*Id-i-Guldbá*.—A feast at the beginning of the spring when presents of flasks of rose-water are made. This festival is not of any importance.

*Id-i-Maulá'd-i-Hasrat-Rasúl*.—Anniversary of Muhammad's birthday, celebrated on the 17th Rabi-ul-Awal.

*Id-i-Maulá'd-i-Sháh*.—Anniversary of the Sháh (Muzaffar-ud-Din's) birthday, celebrated on the 4th of Jamá'di-us-Sáni.

*Cycles of Turkic years and corresponding A. D. years : beginning with the year 1852-53 and ending with the year 1995-96.*

Corresponding A. D. years.

Serial No.	Name of Turkic year.	Meaning.	1852-53	1864-65	1876-77	1888-89	1900-01	1912-13	1924-25	1936-37	1948-49	1960-61	1972-73	1984-85
1	<i>Stikür-ül</i> ...	The Mouse year	1852-53	1864-65	1876-77	1888-89	1900-01	1912-13	1924-25	1936-37	1948-49	1960-61	1972-73	1984-85
2	<i>Üd-ül</i> ...	The Cow year	1853-54	1865-66	1877-78	1889-90	1901-02	1913-14	1925-26	1937-38	1949-50	1961-62	1973-74	1985-86
3	<i>Pür-ül</i> ...	The Leopard year	1854-55	1866-67	1878-79	1890-91	1902-03	1914-15	1926-27	1938-39	1950-51	1962-63	1974-75	1986-87
4	<i>Tevişikür-ül</i> ...	The Hare year	1855-56	1867-68	1879-80	1891-92	1903-04	1915-16	1927-28	1939-40	1951-52	1963-64	1975-76	1987-88
5	<i>Lüt-ül</i> ...	The Crocodile year	1856-57	1868-69	1880-81	1892-93	1904-05	1916-17	1928-29	1940-41	1952-53	1964-65	1976-77	1988-89
6	<i>Yaldır-ül</i> ...	The Snake year	1857-58	1869-70	1881-82	1893-94	1905-06	1917-18	1929-30	1941-42	1953-54	1965-66	1977-78	1989-90
7	<i>Yant-ül</i> ...	The Horse year	1858-59	1870-71	1882-83	1894-95	1906-07	1918-19	1930-31	1942-43	1954-55	1966-67	1978-79	1990-91
8	<i>Kür-ül</i> ...	The Sheep year	1859-60	1871-72	1883-84	1895-96	1907-08	1919-20	1931-32	1943-44	1955-56	1967-68	1979-80	1991-92
9	<i>Püht-ül</i> ...	The Monkey year	1860-61	1872-73	1884-85	1896-97	1908-09	1920-21	1932-33	1944-45	1956-57	1968-69	1980-81	1992-93
10	<i>Taşlıkür-ül</i> ...	The Fowl year	1861-62	1873-74	1885-86	1897-98	1909-10	1921-22	1933-34	1945-46	1957-58	1969-70	1981-82	1993-94
11	<i>İt-ül</i> ...	The Dog year	1862-63	1874-75	1886-87	1898-99	1910-11	1922-23	1934-35	1946-47	1958-59	1970-71	1982-83	1994-95
12	<i>Tangur-ül</i> ...	The Hog year	1863-64	1875-76	1887-88	1899-00	1911-12	1923-24	1935-36	1947-48	1959-60	1971-72	1983-84	1995-96

ATTACHED  
CONTENTS

STATEMENT OF THE REVIEWS OF CERTAIN SECTIONS BY THE EDITORS

Copy of the Introduction, Chapter I, and the Preface to the Second Edition...  
The Introduction is a general statement of the scope and objects of the work...  
Chapter I contains the history of the subject from the earliest times to the present...  
The Preface to the Second Edition contains a statement of the changes made in the work...

CONTENTS

- (1) History of the subject from the earliest times to the present
- (2) History of the subject from the present to the future
- (3) History of the subject from the future to the present
- (4) History of the subject from the present to the future
- (5) History of the subject from the future to the present
- (6) History of the subject from the present to the future
- (7) History of the subject from the future to the present
- (8) History of the subject from the present to the future
- (9) History of the subject from the future to the present
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## APPENDIX 41.

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STATEMENT OF THE REVENUE OF SEISTAN ASSESSED IN 1905 BY MUSTANSIR-  
UL-MULK SAIYAD KHÁN.

*Copy of a letter from Captain Macpherson, His Britannic Majesty's Consul, Seistán, giving the information.*—Source of information—Comparison of revenue now assessed with that paid hitherto—An apparent discrepancy in the totals for Miankangi—The allowances— Estimated value of the revenue in rupee currency.

*Comparison of the revenue fixed by the Mustansir-ul-Mulk with that given in Chapter XIII of the "Revenue Report and Notes."*—Comparison by villages—By Mahal—Of the taxes other than causal revenue—The sum the Hashmut-ul-Mulk will pay—General remarks.

*Statement comparing the revenue assessed by the Mustansir-ul-Mulk with that estimated in Chapter XIII.*

*Statements furnished by Captain Macpherson.*

- (i) *Revenue assessment of Seistán by Mahal, as now made, compared with that formerly realised.*
- (ii) *Detail of Taxes other than Land Revenue.*
- (iii) *Allowances for the pay of the Governor and other Officials.*
- (iv) *Other allowances paid in grain —*
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  - Ulamas and Mullahs.
  - Khawanin.
  - Construction of the *band*.
  - Seistán Sowars.
- (v) *Detail of the assessment by villages—*
  - Mahal-i-Shib-i-Āb.
  - Mahal-i-Pusht-i-Āb.
  - Mahal-i-Sharaki.
  - Mahal-i-Nahrú.
  - Mahal-i-Miankangi.

## APPENDIX 41.

STATEMENT OF THE REVENUE OF SEISTAN ASSESSED IN 1905 BY  
MUSTANSIR-UL-MULK SAYAD KHAN.

Copy of a letter No. 6-C., from Captain A. D. Macpherson, I.A., His Britannic Majesty's Consul for Seistán and Káin, to the Secretary to the Government of India in the Foreign Department, dated Seistán, the 6th of January 1906.

I have the honour to enclose for your information a statement of the revenue of Seistán as recently assessed by Mirza Sayad Khan, Mustansir-ul-Mulk.

2. The information was obtained from original papers in the possession of the Mustaufi of the Hashmat-ul-Mulk, and can, therefore, be accepted as accurate.

3. It will be noticed that the revenue, as now assessed, amounts to 16,000 Seistáni *kharwar* of grain and 16,525 *toman* cash, which is approximately 4,000 *kharwar* of grain and 14,000 *toman* of cash in excess of the figures of the previous assessment of 1885. One *kharwar* Seistáni is equivalent to 2 *kharwar* Tabrizi, or approximately 15 Indian maunds.

4. The apparent discrepancy in the totals of the figures for the subdivision of Miankangi, as shown in the first of the statements of the revenue by Districts (page 637) and in the detail list of the revenue of that district, (page 643) is due to thirty *kharwar* of grain having been subsequently deducted from the revenue payable in kind and its equivalent value taken in cash.

5. In addition to the details of revenue, statements of the allowances paid to the various local officials are also attached. These latter amount in grain to 4,950\* *kharwar*, and in cash to *toman* 5,216.

6. Deducting the above allowances from the total assessed revenue, the balance actually creditable to the Central Government is grain 11,100 *kharwar* and cash *toman* 11,309.

7. The above figures worked out in Indian currency, assuming that the cash equivalent of a Seistáni *kharwar* of grain is *toman* 10: which may be taken as a fair average rate, stand as follows:—

	Ra.
Total assessed revenue	4,41,313
Allowances paid, deduct	1,36,790
Net amount creditable to the Central Government	3,04,523

Comparison of the Revenue fixed by the Mustansir-ul-Mulk with that given in Chapter XIII of the "Revenue Report and Notes."

In the opening sentence of Chapter IX it is stated that a separate chief revenue officer had been appointed in Seistán; Captain Macpherson has now sent his assessment of the revenue to be paid by the Hashmat-ul-Mulk to the Central Government. The assessment is in great detail, as it gives the name of each village, and, a new feature, the person with whom the revenue contract has been made. These villages are all given in Statement A and B for Persian Seistán, but it would occupy too much space to compare the revenue figures for each village; in a few cases the village appears in a different *mahal* in our Statements, a few of the names differ and the village can only be traced by the name of the *kadkhuda*; in others the *kadkhuda* has been changed; the reasons for such discrepancies can only be gathered by enquiries on the spot. They would no doubt reveal interesting phases of the political and revenue life of the country.

The revenue is to be paid part in *grain* and part in *cash*, the *grain* is usually understood to be two-thirds wheat and one-third barley; wheat includes pulses, and barley includes millet and maize. The cash is doubtless the value of the

\* The account is as follows —

Pay officials	975 0 0
Other allowances	4,005 10 30
	4,980 10 30
Deduct vide footnote, page 639	30 0 0

If this is correct the 11,100 *kharwar* in the next paragraph should be then

4,950 10 30
11,049 89 10

government share of opium, cotton, sesame, tobacco, and melons ; gardens, it will be noticed, have been separately assessed, for the first time, among taxes other than land revenue. The value of the government share on this classification of the produce of the crops has been made for each of the tracts shewn in the statement on page 93 of Chapter XIII, and it is found that in each case the assessment comes to 44 or 45 per cent. of the value of the government produce shewn by our figures ; and there is very little doubt but that the Mustansir-ul-Mulk has estimated the Central Government's share of each *mahál* in some such way as we have done.

To compare his assessment with the figures in Chapter XIII, it is necessary to assume that two-thirds of the grain to be paid is wheat and one-third barley, and to value the wheat at one *krán* a *kharwar* and the barley at  $66\frac{2}{3}$  *krán* a *kharwar*. The revenue derived from gardens must be deducted from that given in column 22 of the statement on page 93 of Chapter XIII. The comparison is given in the first statement immediately at the end of this note in this Appendix. It will be seen that the Mustansir-ul-Mulk has taken 45 per cent. of our estimate of the Government share of the produce of the ploughs. When the allowances are deducted from his settlement, and the cost of collection from the figures in column 22 of the statement in Chapter XIII, the revenue assessed comes to 38 per cent. of the value of the Government share of the produce of the "ploughs."

The "taxes other than Land Revenue" can be conveniently compared with our estimate of their value made on page 94 of Chapter XIII ; it will be seen that they are all about one-fourth less, except the shop tax which we over-estimated ; and the *rishta-gávi*, which we have calculated too low, evidently. The value of the new garden tax is given on the last page of Chapter X, *viz.*, 5,414 *krán* against 3,142 *krán* assessed ; that is more than two-fifths less than our estimate.

The Hashmat-ul-Mulk, it is presumed, will continue to pay the Wali of Meshed at 50 *krán* per *kharwar* for the grain, so he will pay—

	<i>Krán.</i>
11,100 <i>kharwar</i> of grain at 50 <i>krán</i> ... ..	555,000
Cash ... ..	113,090
	<hr/>
	668,090
Sum paid now, <i>vide</i> the top of page 88 of Chapter XIII ...	381,000
	<hr/>
Increase in assessment ... ..	287,090
	<hr/>

It would be interesting to know on what system the Mustansir-ul-Mulk worked in making his assessment. The people will be full of talk, and with the information given on the subject in the "Revenue Report and Notes", it will be easy to understand from conversation with them whether it is a good or bad settlement. A study of the figures shews that he has assessed the Miankangi as heavily as the Rúd-i-Seistán tract, and therefore that he does not think it necessary to continue to give inducements to the leading men to extend cultivation in that tract. The figures seem to shew that the Pusht-i-Ab Mahál has been assessed lower and the Nahrú higher than the other *mahál*. With reference to the paragraph on "guarding the *band*" in Chapter XIV, it is noticed that the Hashmat-ul-Mulk has been given, for the first time, an allowance of 2,500 Seistání *man* for this, and other expenses, connected with its annual reconstruction ; it would be interesting to know on what principle this has been given.

The revenue notes are all set up in type and the final proof under scrutiny, so that it is not possible to add any remarks therein on the valuable and interesting information now furnished by Captain Macpherson.

In conclusion it may be said that the spelling of the names of the people and places has not been altered to that adopted in these Notes, as there is not time to refer doubtful points to Captain Macpherson, and mistakes may be made, which will give more trouble to detect, than the uniformity in spelling would compensate for.

Statement comparing the settlement of the Mustansir-ul-Mulk with the figures given in the statement on page 93 of Chapter XIII.

Name of Districts.	Wheat at 100 <i>irān</i> a <i>kharwar</i> .		Barley at 66½ <i>irān</i> a <i>kharwar</i> .		Cash.	Total value.	*Total cash value of Government share, col. 23	Column 7 per cent. of column 8.
	<i>Kharwar</i> .	<i>Toman</i> .	<i>Kharwar</i> .	<i>Toman</i> .	<i>Toman</i> .	<i>Toman</i> .	<i>Toman</i> .	Per cent.
1	2	3	4	5	6	7	8	9
Pusht-i-Āb and Shīb-i-Āb ... ..	8,200	82,000	4,100	27,333	6,708	116,041	261,405	44.4
Miānkangī ... ..	2,467	24,670	1,233	8,220	3,718	36,608	80,025	45.7
Total ... ..	10,667	106,670	5,333	35,553	10,426	152,649	341,430	...
Deduct allowances ... ..	3,300	33,000	1,650	11,000	5,216	49,216	72,587†	38
Net due to the Persian Government ... ..	7,367	73,670	3,683	24,553	5,210	103,433	268,843	38

\* Less value of gardens.

† Deduct one-fifth of Shīb-i-Āb and Pusht-i-Āb and one-fourth of Miānkangī for the cost of collection.

### Statements furnished by Captain Macpherson.

#### (J) Revenue assessment of Seistān by Districts.

Name of District.	REVENUE AS FIXED BY MUSTOFI MIRZA MAHOMED HUSSEIN IN 1885.		REVENUE AS FIXED BY SAYAD KHAN, MUSTANSIR-UL-MULK IN 1905.			*DETAIL OF CATTLE TAX, ETC.	
	Grain Seistāni <i>Kharwar</i> .	Cash <i>Toman</i> , Cattle tax, etc.	Grain Seistāni <i>Kharwar</i> .	Cash <i>Toman</i> .	Cattle tax, etc.	Description of tax.	Annual yield.
Shīb-i-Āb ... ..	4,276	...	5,130	3,078	...	Cattle tax @ 1 <i>iran</i> per head	<i>Toman</i> 3,000 0 0
Pusht-i-Āb ... ..	5,115½	...	3,000	1,500	...	Sheep tax @ 1 <i>iran</i> per ten sheep.	2,000 0 0
Shahrakī ... ..	1,535½	...	1,580	500	...	Tax on Sayyids (fishermen and fowlers).	244 4 0
Nahrui ... ..	1,080	...	2,420	1,630	...	Garden tax ... ..	314 2 0
Miānkangī ... ..	...	...	3,700	3,718	...	Shop tax ... ..	241 1 0
						Tax on threshing grain ... ..	300 0 0
Total ... ..	12,027	2,500	16,000	10,426	6,092 7 0		6,092 7 0

\* These are the taxes other than land revenue.

## (II) Statement of the allowances.

Detail of allowances.	CASH.		GRAIN IN SEISTANI <i>kharwar</i> , maund and <i>seer</i> .					
	<i>Toman.</i>	<i>Toman.</i>	<i>Kharwar.</i>	<i>Maund.</i>	<i>Seer.</i>	<i>Kharwar.</i>	<i>Maund.</i>	<i>Seer.</i>
<b>Pay of the Governor and other officials.</b>								
1. Hashmat-ul-Mulk, Governor ...	2,100	...	68	50	...	...	...	...
2. Karguzar ...	...	...	50	...	...	...	...	...
3. Yamin-i-Nizam ...	...	...	67	50	...	...	...	...
4. 32 Topchis (artillerymen) ...	236	...	72	50	...	...	...	...
5. Karai Regiment (500) ...	...	...	586	75	...	...	...	...
6. Kain Regiment (500) ...	2,264	...	...	...	...	...	...	...
7. Sartip Mir Masum Khan ...	360	...	39	75	...	...	...	...
8. Sardar Purdil Khan ...	96	...	60	...	...	...	...	...
9. *Mustofi Koshid Khan ...	...	...	10	...	...	...	...	...
10. * Ditto and his son Ibrahim Khan. ...	80	...	10	...	...	...	...	...
11. *Nazir Ali Ashgar ...	80	...	10	...	...	...	...	...
Total ...	...	5,216†	...	...	...	975‡	...	...
<b>Other allowances paid in grain.</b>								
<i>Sayads.</i>								
1. Agha Mir Sayad Ali of Allabad ...	...	...	156	25	...	...	...	...
2. Hajji Mir Sayad Ali of Gauri ..	...	...	37	50	...	...	...	...
3. The Rukn-ush-Shariah of Dadi ...	...	...	22	50	...	...	...	...
4. Sayad Daud, Sheikh-ul-Islam of Chilling. ...	...	...	36	25	...	...	...	...
5. Agha Mir Baqar of Sehkoha ...	...	...	25	85	...	...	...	...
6. Other Sayads ...	...	...	224	31	10	...	...	...
Total allowance of Sayads ...	...	...	...	...	...	502	66	10
<i>Ulamas and Mullahs.</i>								
1. Mullah Mahomed Mehdi and family. ...	...	...	170	87	20	...	...	...
2. The Imam-i-Juma of Dunjar ...	...	...	60	...	...	...	...	...
3. Other Mullahs ...	...	...	99	80	...	...	...	...
Total allowances of Mullahs ...	...	...	...	...	...	330	67	20
Carried over ...	...	...	...	...	...	833	33	30

\* Please see the note at the foot of page 661.

† *N.B.*—In addition to the above the Karguzar receives a cash salary of *toaman* 1,500 from the Governor General of Khorasan; and the Yamin-i-Nizam a personal allowance of *toaman* 283 paid by the Customs Department. Nos. 8 to 11 are subject to a Government deduction of 20 per cent.

‡ This figure is 974 in Captain Macpherson's letter.

Detail of allowances.	CASH.		GRAIN IN SEISTANI <i>kharwar</i> , <i>maund</i> and <i>seer</i> .					
	<i>Toman</i> .	<i>Toman</i> .	<i>Kharwar</i> .	<i>Maund</i> .	<i>Seer</i> .	<i>Kharwar</i> .	<i>Maund</i> .	<i>Seer</i> .
Brought forward ...	...	...	...	...	...	833	33	30
<i>Khawanin.</i>								
1. Mir Jafar Khan, Sarbandi ...	...	...	25	...	...	...	...	...
2. Other Sarbandis ...	...	...	44	93	30	...	...	...
3. Malik Mahomed Azim Khan, Kaiyani. ...	...	...	50	...	...	...	...	...
4. Malik Gulzar Khan's family ...	...	...	33	37	20	...	...	...
5. Malik Hussein Khan's family ...	...	...	33	37	20	...	...	...
6. Malik Khan's family ...	...	...	33	37	20	...	...	...
7. Malik Bahram Khan ...	...	...	1	25	...	...	...	...
8. Malik Gulam Ali Khan ...	...	...	1	50	...	...	...	...
9. Sardar Ali Khan, Shahrakis ...	...	...	22	50	...	...	...	...
10. Other Shahrakis ...	...	...	25	93	30	...	...	...
11. Haidar Ali Khan, Nahrui ...	...	...	15	...	...	...	...	...
12. Other Nahrui ...	...	...	12	87	20	...	...	...
13. All the Katkhudas ...	...	...	152	64	20	...	...	...
Total allowance of Khawanin ...	...	...	...	...	...	451	77	...
Construction and guard of <i>band</i> ...	...	...	25	...	...	25	...	...
<i>Seistani Sowars.</i>								
1. 20 Chiefs ...	...	...	240	...	...	...	...	...
2. 400 Sowars ...	...	...	2,400	...	...	...	...	...
Total allowance of Seistan Sowars ...	...	...	...	...	...	2,640	...	...
Roza Khana (religious ceremony) ..	...	...	55	...	...	55	...	...
GRAND TOTAL ...	...	...	...	...	...	4,005	10	30

(III) Details of the Revenue fixed by the *Mustansir-ul-Mulk* on each village.

Name of village.	GRAIN.		CASH.			Name of Katkhuda.
	<i>Kharwar</i> .	<i>Man</i> .	<i>Toman</i> .	<i>Kran</i> .	<i>Dinar</i> .	
SHIB-I AB.						
1. Daulatabad ...	160	...	56	...	...	Sardar Purdil Khan.
2. Naigard ...	131	54	78	9	240	" " "
3. Deh Ali Akbar ...	90	...	54	...	...	" " "
4. Akbar Abbas ...	90	...	54	...	...	" " "
5. Sekkoha ...	507	4	35 <sup>8</sup>	2	240	" " "
6. Kesh-i-Suffa ...	174	94	104	9	640	Mir Jafar Khan.
7. Varmal ...	400	...	240	...	...	Katkhuda Mahomed.
8. Ibrahimabad ...	100	...	60	...	...	Mir Saif-ud-din.
9. Deh Mir ...	45	20	27	1	200	" "

N.B.—Of the 152 *kharwar*, 64 *man*, 20 *seer* drawn for Katkhudas, 30 *kharwar* are given to the Mustof, his son and the Nazir as shown in the list of pay of officials.

Name of village.	GRAIN.		CASH.			Name of Katkhuda.
	<i>Kharwar,</i>	<i>Man.</i>	<i>Toman,</i>	<i>Kyan,</i>	<i>Dinar,</i>	
SHIB-I-AB— <i>contd.</i>						
10. Afzalabad ... ..	73	50	43	8	900	Mahomed Hussein.
11. Baghak ... ..	57	...	34	2	...	Katkhuda Mahomed.
12. Bahramabad ... ..	186	30	111	7	800	Taj Mahomed.
13. Taimurabad ... ..	103	90	62	3	400	Ghulam.
14. Jafar-i-Shabaz ... ..	50	...	30	...	...	"
15. Chilling ... ..	308	80	185	2	600	Asad 'Ullah and Darwesh.
16. Jamalabad ... ..	82	60	49	5	600	Abbas.
17. Chang-i-Murghan ... ..	20	...	12	...	...	Ali.
18. Mulla Ali ... ..	53	34	31	4	40	"
19. Hussainabad ... ..	141	10	84	6	600	Muradi.
20. Dadi ... ..	275	...	165	...	...	Fakir Mahomed.
21. Deh Abbas Kori ... ..	20	52	12	3	120	Sultan.
22. Deh Akbar Jafari ... ..	19	...	11	4	...	Mahomed Amir Khan.
23. Sangchuli ... ..	118	50	71	1	...	Agha Sayad Raza.
24. Deh Sadaki ... ..	70	40	42	2	400	Ghulam.
25. " Allahi ... ..	64	40	36	6	400	"
26. " Jehan Bakhsh ... ..	91	82	55	9	20	Nazir Ali Ashgar Beg.
27. " Hussaina ... ..	41	55	24	9	300	Hussaina.
28. " Diwana ... ..	56	95	34	1	700	Ghulam Haidar.
29. " Rustam Mahmud ... ..	77	20	46	3	200	Agha Jan.
30. S'absar ... ..	21	10	12	6	600	Ghulam.
31. Shahrayari ... ..	19	50	11	7	...	"
32. Deh Abbas Khan ... ..	72	35	43	4	100	Mahomed Akbar Khan.
33. Gang ... ..	52	85	31	7	100	Son of Ali Nazir.
34. Deh Kul ... ..	72	35	43	4	100	Taj Mahomed.
35. " Lutfullah ... ..	72	35	43	4	100	Hussaina.
36. " Mahomed Azam ... ..	31	30	18	7	800	Mahomed Azam.
37. " " Safar ... ..	123	65	74	1	900	" Amir.
38. " Mir Beg ... ..	130	...	48	...	...	Mir Beg.
39. Tuti ... ..	436	60	261	9	600	Mahomed.
40. Sharak ... ..	67	20	40	3	200	Aghai.
41. Deh Ganda Bakhsh ... ..	30	80	18	4	800	Mir Darwesh Ajudan.
42. Koshah ... ..	42	10	25	2	600	Mir Jafar Khan.
43. Mahomedabad ... ..	151	10	90	6	100	Agha Mir Baqar.
44. Nasarabad ... ..	30	...	18	...	...	" " "
45. Deh Ismail Kambar ... ..	77	50	46	5	...	Ali.
Total for the Shib-i-Ab ... ..	5,130	...	3,078	...	...	

Name of village.	GRAIN.		CASH.			Name of Katkhoda.
	Kharwar	Mans.	Tomans.	Kron.	Dinars.	
PUSHT-I-AB.						
1. Adimi ... ..	160	...	80	...	...	Mahommed Amir, Kalantar.
2. Iskel ... ..	102	...	51	...	...	" " "
3. Allahabad ... ..	52	...	26	...	...	Mohamed.
4. Burj-i-Afghan ... ..	90	...	45	...	...	Sher Ali Khan.
5. Bunjar ... ..	259	...	129	5	...	The Kalantar and Mir Sher.
6. Nahr-i-Tappa Dar ... ..	40	...	20	...	...	" " " "
7. Bolai ... ..	110	...	55	...	...	Sartip Mahomed Raza Khan.
8. Jalla'abad ... ..	7	...	3	5	...	Mustofi Koshid Khan.
9. Husseinabad ... ..	136	...	67	5	...	Abbas.
10. Khadang ... ..	61	...	30	5	...	Mirza Mahomed Hussein.
11. Deh Arbab ... ..	80	...	40	...	...	Arbab Ali Akbar.
12. " Jangi Khan ... ..	7	...	3	5	...	" " "
13. " Jahangir ... ..	30	...	15	...	...	Amir.
14. Seh Kalah ... ..	50	...	25	...	...	"
15. Deh Hussein Khan ... ..	7	...	3	5	...	Mullah Abdullah.
16. " Kharan ... ..	26	50	13	2	500	Mahomed Ali Khan.
17. Dargi ... ..	54	...	27	...	...	Arbab Dad Shah.
18. Rahdar ... ..	70	...	35	...	...	Hamza.
19. Siabsar ... ..	25	...	12	5	...	Son of Naib Ahmed Khan.
20. Zahidan ... ..	56	...	28	...	...	" " " "
21. Deh Gul Mahomed ... ..	50	...	25	...	...	Mir Jafar Khan.
22. " Shaiban ... ..	50	...	25	...	...	Son of Mirza Nur Wahab.
23. " Isa ... ..	48	...	24	...	...	Mahomed Akram.
24. " Ghulam Ali ... ..	20	...	10	...	...	Mir Murtaza.
25. Kumali ... ..	50	...	25	...	...	Mahomedi.
26. Garabar ... ..	30	...	15	...	...	"
27. Deh Kalbi Ali ... ..	30	...	15	...	...	Karbelai Akbar.
28. " Masti Khan ... ..	50	...	25	...	...	Ali Murad.
29. " Nawab ... ..	25	...	12	5	...	Dad.
30. Tilfak ... ..	5	...	2	5	...	Mir Beg.
31. Kaud ... ..	145	...	72	5	...	" "
32. Aliabad ... ..	121	...	60	5	...	" Kasim.
33. Kasimabad ... ..	102	...	51	...	...	Kalantar's family.
34. Kachian ... ..	105	...	52	5	...	Malik Darwesh Khan.
35. Mansuri ... ..	40	...	20	...	...	Shah Jehan.
36. Nasrabad ... ..	25	...	12	5	...	Khojaha.
37. Nahr-i-Karbelai Abdullah ... ..	50	...	25	...	...	Hajji Aghai.
38. Deh Imam Juma ... ..	85	...	42	5	...	Imam Juma.
39. " Nahur ... ..	25	...	12	5	...	Karbelai Ghulam Ali Khan.

Name of village.	GRAIN.		CASH.			Name of Katkhuda.
	<i>Kharwar.</i>	<i>Mans.</i>	<i>Toman.</i>	<i>Kyan.</i>	<i>Dinar.</i>	
<b>PUSHT-I-AB—contd.</b>						
40. Balakhana ...	70	...	35	...	...	Mullah Mahomed Mehdi.
41. Half of Husseinabad ...	114	50	57	2	500	" " "
42. Deh Karbasak ...	30	...	15	...	...	Mullah Mahomed Mehdi.
43. " Piraz ...	80	...	40	...	...	" " "
44. " Kul ...	75	...	37	5	...	" " "
45. Taghazi ...	40	...	20	...	...	" " "
46. Killa-i-Nao-i-Namad Gul ...	60	...	30	...	...	" " "
Total for the Pusht-i-Ab ...	3,000	...	1,500	...	...	
<b>SHAHRAKL</b>						
1. Jazinak and Kila-i-Kang ...	520	...	168	7	500	Taj Mahomed.
2. Wasilan ...	256	...	70	...	...	Jahangir Khan.
3. Burj-i-Sarband ...	24	...	8	...	...	" "
4. Khamak and Ziarat Jah ...	178	...	56	2	500	Mir Mehdi Khan.
5. Dashtak ...	74	...	19	2	500	Sardar Ali Khan.
6. Gauri ...	230	...	71	2	...	Amir and Hajji Agha Syad Ali.
7. Nadam ...	6	...	1	7	500	Ghulam Khan.
8. Malik Haidari ...	105	...	38	5	...	Sher Mahomed Khan.
9. Deh Buzi ...	31	...	10	6	500	Ibrahim.
10. Deh Ibrahim Dabhashi ...	16	...	5	3	500	"
11. Luff ...	84	...	13	3	...	Gulam Hussein.
12. Pulgi ...	76	...	12	...	...	" "
13. Polgi ...	80	...	25	...	...	Agha Syad Mahomed.
Total for Shahraki Mahal ...	1,630	...	500	...	...	
<b>NAHRUL</b>						
1. Sharifabad ...	320	...	160	...	...	Sartip Mir Mausam Khan.
2. Muzaffarabad or Khwajah Ahmed ...	150	...	75	...	...	Khudadad Khan.
3. Shabaristan ...	250	...	125	...	...	" "
4. Deh Sukhta ...	205	...	125	...	...	" "
5. Aliabad, Ulla and Suffa ...	215	...	107	5	...	Haji Agha Saya4 Mir Ali.
6. Kila or Burj-i-Kohna... ..	400	...	400	...	...	" " "
7. Deh Kaftargi ...	50	...	10	...	...	Agha Syad Mahomed.
8. Kimmak ...	140	...	70	...	...	Sardar Abbas Khan.
9. Kalikdad ...	220	...	110	...	...	" " "
10. Deh Kalaf Baz ...	80	...	40	...	...	" " "
11. Kila or Burj-i-Nao ...	400	...	400	...	...	" " "
12. Chah Nima ...	60	...	30	...	...	Sartip Mir Mausam Khan.
Total for the Nahrul Mahal ...	3,400	...	1,600	...	...	

Name of village.	GRAIN.		CASH.			Name of Katkhuda.
	<i>Kharwar.</i>	<i>Moh.</i>	<i>Toman.</i>	<i>Khar.</i>	<i>Dinar.</i>	
<b>MIANKANGI.</b>						
1. Jahanabad ... ..	350	...	1,000	...	...	Mirza Mahomed Hussein.
2. Badrabad ... ..	120	...	60	...	...	" " "
3. Siadkak ... ..	350	...	1,000	...	...	Sardar Khan Jehan Khan.
4. Burj-i-Mir Gul ... ..	500	...	200	...	...	Sherdil.
5. Pulgai and Margan ... ..	300	...	200	...	...	Yar Mahomed.
6. Tappa-i-Khamak and Daulatabad...	350	...	300	...	...	Mir Kasim and Taj Mahomed.
7. Padai and Katamak ... ..	150	...	200	...	...	Nur Mahomed and Mir Hajji.
8. Deh Nur Mahomed ... ..	165	...	50	...	...	Nur Mahomed.
9. Ghurghuri ... ..	155	...	80	...	...	Hussein Khan.
10. Amirabad ... ..	110	...	38	...	...	Aghai.
11. Deh Mir Abu Turab ... ..	30	...	25	...	...	Mir Abu Turab.
12. Taikt-i-Shah ... ..	40	...	20	...	...	Mir Hussein, Sultan.
13. Deh Yar Mahomed Khan ... ..	10	...	100	...	...	" " "
14. Burj-i-Yusuf ... ..	80	...	50	...	...	Imam Juma.
15. Deh Mulla Mahomed Hussein ... ..	30	...	10	...	...	Mullah Mahomed Hussein.
16. Malaki and Dakki ... ..	10	...	5	...	...	Abdullah Khan.
17. Deh Dost Mahomed ... ..	900	...	700	...	...	Dost Mahomed and Mir Hajji Beg.
Total for Miankangi ... ..	3,670	...	4,038	...	...	

## APPENDIX 42.

*Glossary of Seistáni Words.*

A glossary of Seistáni words useful in conversing with the people on the soils, the River and Irrigation, the Hámún and Naizár, the Cultivation, the Herds and Flocks, the Weather, etc., was kept up in the note-books of Lala Thakur Dass, Supervisor, and Amir Singh, Zilladar, during our stay in Seistán; perhaps some of these words may be useful to others visiting the country.

Seistán being a rich oasis on the high road from India to Persia is a country whose dialect should be most interesting and instructive to study, but we were too fully occupied with our own work to make a study of the language; and we have only attempted to preserve the vocabulary of words needing special explanation. Many of these words are pure Persian used in the same sense as they are used elsewhere in Persia, but they will nevertheless be useful to the visitor from India. The dialect of Seistán differs both from modern Persian spoken by the well educated Persian officials met at the Consulate, and from the Persian spoken in India; though the Persian spoken by the Afghán officials and the Sanjaráni Balúch Sardárs along the Helmand is very like that spoken in India: our subordinates, who had read Persian as a classic at school, were able to understand, and converse with these without difficulty. A very large proportion of the inhabitants are Balúch who all speak Persian; those settled down in permanent villages near the City talk like the modern Persians, while those further removed from the City, in Afghán Seistán, up the river and the nomads speak a Persian similar to that of Afghánistán or India.

It will be seen that Seistán is a very interesting and instructive country to the linguist, for, in addition to these dialects of Persian, probably full of words used in their more ancient sense, there is Balúchi, Pushtu and Bráhúí; the Balúchís, as already said, almost without exception speak Persian. Pushtu and Bráhúí is spoken by some as a mother-tongue, though they all understand and speak Persian as well. But the Engineer or Revenue Officer, who is in a hurry to be put in a position to communicate familiarly with the people, and understood

\* The members of the Mission found the *Modern Persian Colloquial Grammar* by Dr. Fritz-Rosen, Luzac & Co., very useful.

something of all the interesting knowledge they possess, may be glad to have a glossary to help him at the start till he is able to compile a better one of his own.\*

The words have been arranged under the following subjects:—

	PAGE
Soils ... ..	646
River and Irrigation ... ..	650
The Hamun and Naizar ... ..	657
Cultivation ... ..	661
Cattle and Flock-owners ... ..	674
The Administration ... ..	680
Agricultural Implements ... ..	682
Seasons and Weather ... ..	683
Building Materials, Tools and Artizans ... ..	684
The Seistáni Wind-mill ... ..	686
The Seistáni Fishing-net ... ..	688

A number of words used in Spinning and Weaving are explained in Chapter XLIV, page 273, while those used by the potters are given at page 293 at the end of Chapter XLV.

Khán Bahádúr Maulá Bakhsh, Native Political Attaché to the Mission, has kindly read through the proofs and made many valuable corrections to secure uniformity in the spelling. The second word given in *italics* has been added by him as the correct word to use in literate Persian.

[C639FD]

## Glossary of Seistan Words.

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
		Soils.	
Aumál ( <i>آب مأل</i> )	II	18	Land along the river subject to annual inundation on which autumn crops of millet and <i>másh</i> are generally grown. See <i>másh</i> .
Bád awurd	II	18	Sand blown on to cultivated lands; Johnson's Persian Dictionary says <i>bád áward</i> is used for a windfall, as well as for a fan.
Bád kandá	...	...	The area under wind scour; the strong north by west wind drives sand across the country and scours out soft places in the alluvial.
Bahring	...	...	A mound of firm sand covered by a strong growth of bushes.
Burrau	...	...	The conical mounds of alluvial; a conspicuous feature along the edges of the plateau ( <i>áráh</i> ); and also the mounds in the Sur Dagh; both are formed by the scouring action of the wind which removes the softer material. Some mounds owe their existence to the protection of a hard substance on their windward face. The word seems to be derived from <i>buridan</i> to cut and <i>rafian</i> to go, i.e., scours.
Chaluki	App 31	578	An embankment with a great borrow pit at its toe. This occurs where a breach has been repaired.
Chagakki	II	18	The land on which the small <i>Yand</i> ( <i>Chagat</i> ) bushes grow abundantly.
Chur	...	...	A ravine made by water.

Dāghāl ...	...	...	...	XLIII	261	A bare open plain; such plains exist in the Sīr-o-lār desert; on them the coins are found. A large open sheet of water in the inundated area is sometimes so-called; a very large <i>wāzān</i> (q.v.) is also so-called. Johnson's Persian Dictionary says <i>Daghā</i> is barren ground where nothing grows.
Daghāl gardī	...	...	...	...	...	Those who roam the plain. The people who go to search for coins in the Sāf-o-lār tract are so-called, as the coins are found on the bare open plains where the minute pieces of pottery indicate that a village once stood.
Daabt ...	...	...	...	I	I	The gravel covered high lying plains so conspicuous a feature of Seisāfān; any outlier of these plateaux in the cultivated tract, or inundated area; gravel beaches, or gravel banks, or any high lying pieces of ground covered with gravel are called <i>daabt</i> ; as an instance, the beach near Labi Bāhring from which <i>labris</i> start for the Kāb-i-Surkh Gazi is called <i>Dashtak</i> .
Dak or Dik ...	...	...	...	...	...	A mound, usually reserved for small mounds, whether natural or artificial, as <i>Dak-i-Dila</i> a small isolated peak of alluvial, surmounted by a shapeless mud ruin. Sur-Dik and Safil-Dik very high ancient mounds at Nād-i-Āh rising about 100 feet above the plain. Dik-i-Dall and Dik-i-Firozā conical mounds that look as if they might be Buddhist Topes. See also <i>taḡpa</i> and <i>dam</i> .
Dam ...	...	...	...	...	...	A word that seems reserved for the shapeless remains of mud forts along the river from Dam-i-Sikandar below Rudbar to Dam-i-Kalān below Kala-i-Fath. These mounds have moats ( <i>khānāḡ</i> ), the beds of which are about 20 feet above present river level. The <i>dam</i> stand on the edge of the river, and it would appear that the moat was once filled by water from the river. See also <i>daḡ</i> and <i>taḡpa</i> .
Jāf ...	...	...	...	...	...	Small depression in the gravel plains or in ancient troughs where rain water collects.
Kalotā ...	...	...	...	...	...	Broken ground with deep impassable ravines met with in descending from the <i>dasht</i> to the river or lake valley such as the road to the Gaud-i-Zirch at Orak spring.
Kalward ...	...	...	...	...	...	Uneven and cut up ground, usually wind scours.
Karkati or Tar khishi ...	...	...	...	II	19	The layers of silt deposited on flooded lands which crack into bricks or cakes when dry.

Glossary of Seisiani Words—contd.

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Kharāba	II	18	Lands out of cultivation, or lands once cultivated now desett.
Khāri	II	18	Land on which <i>khar</i> the thorny bush known as camel-thorn grows abundantly.
Kim	XLIX	317	A high vertical cliff or bank. Mr. Keyes writes <i>kim</i> is the broken edge of anything; the jagged edge of a broken wall is called <i>kim</i> .
Kachrak	II	19	Land off which the inundations have dried, but the soil being hard and stiff in nature and having been trodden under foot by cattle while wet is unfit for cultivation.
Kún-ireg	II	18	The soil laid bare by a sand dune ( <i>harshak</i> ) when it moves on; <i>kún</i> in Persian being the posterior.
Lát	...	...	Waterless sandy wastes or barren extensive plains where no water can be got for miles.
Lálingi	II	18	The land over which the variety of tamarisk called <i>liding</i> grows.
Milk	II	17	Good culturable soil; used in describing the best lands.
Máshi	II	18	Lands along the river flooded in the spring that do not become dry in time to be cultivated to any crop but <i>másh</i> . See <i>amúsh</i> .
Okri	II	18	Land on which crops will mature with only a watering to sow.

Fúz	...	...	...	...	...	...	A promontory or cape of the cliffs overlooking the Seistán basin or trough of the river.
Ráu	...	...	...	...	...	...	Sow.
Rawi	...	...	...	...	...	...	Low ground.
Regí ( <i>rigí</i> )	...	...	...	...	II	18	Sandy soil.
Shand	...	...	...	...	App. 35	600	Soil containing a large proportion of fine gravel. Major Maitland said <i>shand</i> means 'gravel'. Dr. Bellow said it meant barren. Captain Percock was told it was a place where water is found close to the ground. <i>Shand</i> seems to be fine gravel whether containing water or not; though in river beds such gravel often contains water, which is called <i>ab-i-shand</i> . The coarse sand, driven over the plains to the south-east of Sár-o-tár was called <i>shand</i> by our Baluchi guides.
Shíra-i-Zamin	...	...	...	...	...	...	A sirup found in soils off which the inundations have dried. Samples sent to Dr. Hooper, Analytical Chemist.
Shorí ( <i>shárr</i> )	...	...	...	...	App. 22	490	Land over which <i>lana</i> (the potash plant) grows abundantly.
Shor ( <i>shár</i> )	...	...	...	...	II	18	Soil containing alkalis.
Sína-i-Milk	...	...	...	...	II	17	The best land for cultivation, rich soil, above the level of annual inundations.
Sirr	...	...	...	...	II	17	The hard alluvial forming the desert plains in Seistán, and underlying the cultivated lands; Mr. Keyes writes "ground where it is hard to dig with a <i>tisáa</i> ."
Surijki	...	...	...	...	II	18	The land on which <i>surjki</i> , a spinach plant, grows abundantly.
Tappa	...	...	...	...	I	4	Seems reserved for a large mound, or a collection of mounds, as Tappa-i-Rindan, Tappa-i-Kharan (Karun). They are usually quite shapeless masses of mud buildings. A study contrasting the ruins called <i>Dik</i> with those called <i>Dam</i> and <i>Tappa</i> should be fruitful of archaeological results. The Seistán has an inherited perception of antiquarian differences and those names probably describe ruins of quite different periods of history.

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Tarkhishti ...	II	19	The cracked dry deposits of silt. See <i>kariasi</i> . <i>Warshufti</i> is used just as our word silt; <i>warshufti</i> recent alluvial deposits; the silt berms in canals; the recently warped lands of the Miankaugi.
Warshufti ...	II	17	
Zehkhis ...	...	...	
Ab or Au ...	River and Irrigation.		Soil possessing moisture: seems to be used locally in the same way as our word <i>seepage</i> , <i>seh</i> and <i>khis</i> are both Persian words used for water that bubbles out, a spring— <i>vide</i> Johnson's Dictionary.
Ab-i-Awal ...	X	58	
Ab-i-Shand ...	App. 35	600	Water.
Aubakish ( <i>ab bakish</i> ) ...	XXI	147	The first watering for the ploughing to sow wheat.
Ashna ...	...	...	See <i>shand</i> under soils page 649.
Aubz ( <i>abbsz</i> ) ...	...	...	A bifurcation on a canal; a place where water is distributed into smaller channels.
Aukhorak ( <i>dikhorak</i> ) ...	LI	325	Literally means swimming; but is used to indicate deep water above the height of a man. A swimmer.
			Literally a manger from <i>akhsr</i> , a stable, but is also used for the gabions made of stakes and twigs of tamarisk, and used at the end of tamarisk weirs as wing walls or revetments. These are shaped like the mud mangers built in the east that are truncated cones.

Bād	...	...	...	IX	31	In Afghan Seistan <i>bād</i> is used, as in India, for upstream and <i>shīb</i> for downstream; but in Persian Seistan <i>bād</i> is up wind and <i>shīb</i> down wind, and the words are not used with reference to the river which there flows against the wind. Thus in Persian Seistan <i>bād</i> is used for the direction from which the great wind comes, that is north by west. See <i>shīb</i> .
Band	...	...	...	XIV	97	A porous weir across a river or canal the word is not used for an embankment ( <i>ghārd</i> <i>q. v.</i> )
Bandāf	...	...	...	XIV	99	The expert who knows how to make a weir.
Bandān	...	...	...	XIV	100	A watchman on the <i>bānd</i> .
Band-i-gazi	...	...	...	XIV	97	A porous weir built up of tamarisk fascines.
Band-i-khāki	...	...	...	XXVI	169	A closing <i>bānd</i> made of earth.
Band-i-sangi	...	...	...	LI	325	A weir made of gabions of tamarisk filled with stones. This sort of weir is made above Bandar-i-Kamāl Khān, where there is shingle or boulders in plenty on the river bed, and just sufficient tamarisk on the river bank to make the gabions.
Chakō or Chakul	...	...	...	...	...	A spring; at the Kūh-i-Chako there are springs where the ravines from the hills reach the alluvial cliff that bounds the lake.
Chāp-choṭ	...	...	...	...	...	Crooked; a Baluchi name for a channel that winds very much.
Charkh	...	...	...	...	...	A whirlpool.
Chashma	...	...	...	App. 33	590	A natural spring.
Chāf	...	...	...	...	...	A swamp.
Chīnak	...	...	...	XLIII	269	A rope made of <i>hiriz</i> grass used on the tamarisk <i>bānd</i> ; for making <i>tūtin</i> ; and for many other purposes.
Dana ( <i>dahana</i> )	...	...	...	...	...	A gap or break in an old canal or plateau. A breach in a canal is called <i>shīstast</i> ( <i>q. v.</i> )

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Dandāna ...	...	...	A rapid in the river over which water flows swiftly and with noise; literally the teeth of a saw or comb.
Darya ...	XLIII	261	In Seisān this word is used for the larger lakes such as the Sābarf, Sangal, and is never used for the rivers.
Dashāk ...	...	...	High level plain not subject to inundations. A ridge or watershed like the bridge of the nose. The old canal from Rud-i-Seisān to Jaldābād made by Malik Bahram Khān, Kavānī, is called <i>Dashāk</i> ; the Seisānis say because it followed the prominent ridge on which are the old ruins known to the Mission and literature as the Jaldābād ruins. But for a much more elaborate explanation of this word see Sir Henry Rawlinson's article on Seisān in the Royal Geographical Societies Journal of 1873.
Dastak ...	...	...	A branch water-course; literally a little hand.
Ghurchuri ...	App. 31	579	An onomatopoeic word describing the sound of rushing water; <i>shela</i> having rapid slopes that induce swift currents are so named.
Gorn ( <i>gōrd</i> ) ...	XIV	104	A protection embankment running along the river, or main irrigation channel.
Guzar, also gudar	XLVI	297	Ford.
Hashar ...	XIV	98	A large number of men collected to work on canals, protection works, weirs, or any other work; corresponds to our word <i>gang</i> .
Jaofāl ...	App. 31	578	The place of disputes; specially used for the site of the head of the Lakhshak just above Burj-i-As.

Ják	...	...	...	X	65	A small water-course.
Jái or Já	...	...	...	XIV	101	A canal.
Kachháná	...	...	...	XLIX	317	Measurement; the mark of a flood is also called <i>kachháná</i> .
Karod	...	...	...	XLIX	317	The vertical bank of the river which is being under-cut. <i>Karód</i> or <i>karód</i> is said in Johnson's Persian Dictionary to be a well so deep that it is with difficulty water can be withdrawn from it.
Khákrež	...	...	...	...	...	An earthen embankment.
Kurg	...	...	...	XI	79	Pit or hole.
Kúra	...	...	...	XLV	286	A vessel of clay shaped like a tumbler: a burnt clay pipe called in Northern India <i>kúrá</i> said to have been used in ancient times to distribute water from a canal or to line a <i>hariz</i> .
Langota kardan	...	...	...	App. 7	360	To measure ( <i>langota</i> , a turban); this term is used when work on a canal or protection embankment is distributed in proportion to the number of men in each gang; because distribution is made by turban lengths. In Indian Persian by Johnson's Dictionary <i>langota</i> is the waist cloth.
Lagush	...	...	...	...	...	Slippery ground.
Lapp or lappa	...	...	...	...	...	The waves, an onomatopoeic word from the noise of rising and falling water impelled by the wind.
Lidd	...	...	...	...	...	Cow-dung.
Ma'dan	...	...	...	XLV	292	A quarry: a mine.
Mádarak	...	...	...	XIV	98	When the cultivators are working on their canals or <i>land</i> , they are allowed one man in every 10 or 20 men to cook their food. This man is so-called.

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Roman Character.		REFERENCE TO THE TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
		Chapter.	Page.	
Malish	...	X	58	Level down; to rub down.
Mau	...	...	...	An aqueduct made of tamarisk conveying the water of one canal over another.
Meh	...	VIII	49	A period of 12 hours. A term used in the distribution of water from water-courses and canals.
Mehroz	...	VIII	49	The system of distributing water by 12-hour periods from canals; <i>i.e.</i> , rotational turns, called on the Northern Indian canals <i>márbandi</i> .
Móshlá	...	XLIV	277	The spindle loaded with spun yarn; anything resembling a spindle loaded with yarn.
Nakh	...	...	...	String.
Natra	...	...	...	The opening or cut in a small water-course or a canal to irrigate privileged areas in Afghán Seistán.
Neubar	...	...	...	A big artificial canal; Johnson says <i>bar</i> means a ditch.
Nává	...	App. 38	613	A pipe. In ancient times the distribution of water is said to have been done through pipes which the people call <i>nává</i> or <i>kíza</i> . Depressions in the desert ( <i>áashá</i> ) that catch rain water; this use of the word correspond to our word basin. Johnson gives <i>Naw</i> .
Nel( <i>náshil</i> )	...	...	...	Marsh land or mud in which the foot sinks.
Néh	...	XLIX	315	A very big flood. This term was (from 1903 to 1905) used only for the extraordinary flood of the year 1885: said to be derived from Noah, and to refer to the great flood that overtook mankind in his life.

Páchau	...	...	...	XLIII	270	The pole with which a <i>hufin</i> or raft is worked.
Pal	...	...	...	...	...	The small compartments (called in Northern India <i>harr</i> ) made for watering the fields to economize water; a field with a raised border.
Páling	...	...	...	App. 31	578	A feeder. A cut made to feed a canal.
Pashnaki	...	...	...	App. 33	592	An area covered under a bush called <i>pashmaki</i> which produces fluff resembling wool.
Paskúnaki	...	...	...	App. 25	542	Back water; in the Gaud-i-Zirch that part of the basin filled by a back flow from the Gaud-i-Zireh.
Páya	...	...	...	...	...	A pier.
Pfil	...	...	...	...	...	The wicker baskets or gabions of the shape of a frustum of a pyramid, filled with stones, which are used to make a weir up the Helmand in Afghán Seistán.
Pitok	...	...	...	App. 27	554	Water trickling from the side of a cliff or rock. A natural spring.
Pús	...	...	...	I	3	A promontory of the high plain surrounding Seistán.
Rand	...	...	...	...	...	A mark or trace as <i>rand-i-zel</i> meaning flood mark; also means 'after' for example; as <i>rand-i-náh</i> means after the big flood.
Rád	...	...	...	XIV	97	River.
Rád-i-Sina	...	...	...	App. 32	586	The people derive the word from <i>sina</i> or <i>sina</i> the chest, and say this trough lies across the plateau ( <i>dash</i> ) like the depression on the chest. There is a similar word given in Johnson's Persian Dictionary meaning small stones or gravel: <i>Rúd-i-Sina</i> may mean the trough in the gravel plain. See Sir Henry Rawlinson's paper on Seistán in the Royal Geographical Society's journal for 1873, Volume XLIII: there was a <i>Rúd-i-Sina</i> in the time of the Arab conquest.
Rara-i-Jú	...	...	...	App. 31	577	A spur.
Sai	...	...	...	App. 21	483	A raft made of inflated skins or gourds used up the river in Afghán Seistán.

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Shamahíri ...	App. 31	580	A name for a swift flowing distributary of the river or part of one as the Guzar-i-Shamahíri on the Sar-i-Shela.
Sangurak ...	...	...	A small basket-work vessel used to enclose stones when making a weir of gabions or when loading a tamarisk weir with gravel to compress the fascines and make the weir staunch; as was done at the Band-i-Sultáni.
Shand ...	App. 33	590	See <i>shand</i> on page 649 under the "Soils."
Shib ( <i>shíb</i> ) ...	IX	51	<i>Shífa</i> . Down the river in Afghán Seistán; but the word is never used with reference to the direction of flow of the river by the Seistanis on the Persian side, who form the bulk of the original inhabitants of the country. They use it for south, and also for the low-lying lands on the alluvial cone or fan. See also <i>shífa</i> .
Shela or shelag ...	XLIII	261	A spill channel of the river whether flowing or dry.
Sar-i-Shela ...	App. 28	563	The name of the channel by which the water overflows from the Kóh-i-Khwája Hámún to the Gaud-i-Zireh. Some, however, reserve it for the lands liable to inundations which lie between Warmal and Girdi Chah at the head of this overflow channel.
Shitkest ...	...	...	A breach in a canal or river bank.
Shlupp ...	...	...	This is an onomatopoeic word corresponding to our word splash, <i>shlupp kardán</i> to splash. The cliffs to the east of Cháh-i-Muhammad Razá against which the waves break when the Hámún is in flood are called <i>Shlupp</i> .
Shapallak ...	...	...	Shells found in the bed of the Hámún.
Shul ...	...	...	A basket.

Tirg	...	...	...	...	365	The trenches made on the flanks of a weir and filled with strong tamarisk to hold the weir to the bank.
Warshuft	...	...	...	II	17	Silt deposits. See <i>marshūfi</i> under Soils on page 650.
Zamin-i-Râd:	...	...	...	...	...	Bed of the river.
Zinda âb or zin ja au	...	...	...	...	...	A perennial stream.
Apak	...	...	...	Hâmun and Naizâr.	...	A wild shrub good fodder for camels and sheep.
Ashk	...	...	...	XXXIII	194	A rush, the <i>scirpus maritimus</i> .
Asil ( <i>Hasir</i> )	...	...	...	XLIII	267	Mats made of dry reeds.
Asi-i-Sarkhâni ( <i>Hâsir-i-sar-i-khâna</i> )	...	...	...	XLIII	268	Mats of reeds made for the tops of the huts used by the graziers, Saiyâds, etc.
Asû-i-Tahpâi ( <i>Hâsir-i-tahpâi</i> )	...	...	...	XLIII	268	Mats for the floor.
Aukan ( <i>âkân</i> )	...	...	...	App. 22	492	Where the waters of the inundated area breach through a dividing ridge, a narrow deep channel is formed through which the waters pour at flood time.
Bash	...	...	...	App. 22	492	Pieces of very thick Naizâr on the eastern shore of the Sahari Hâmun, south of the mouth of the Râd-i-Farâh.
Buânîsân	...	...	...	XXXIII	194	The gently sloping plains forming the shores of the inundated area on which Banûn grass grows richly.
Charkh	...	...	...	XLIV	275	Spinning wheel.
Cheghur	...	...	...	App. 23	502	Holes scoured by the wind driven waters of the Sâbari Hâmun in its bed on its iceward shore.

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Chung	XLIII	261	A small lake. The pools of open deeper water in the <i>Naizár</i> .
Diah or Deh...	XLIII	261	A small <i>cháng</i> ; or perhaps open water in the <i>Naizár</i> free from reeds, <i>hut</i> or any weed growth.
Dám	XLIII	266	A net.
Dáman	II	18	The shores of the <i>Naizár</i> as well as the skirt of the hills.
Gardo ( <i>giraddá</i> )	...	...	A place where the water whirls round and round; a whirlpool.
Gásh	...	...	A shelter from the wind for cattle made of high and strong reeds. See <i>ting</i> .
Gaagan	App. 28	559	Made of tamarisk. A tamarisk weir is sometimes so-called, but the word is usually reserved for a way made across a spill channel by filling it up with fascines of tamarisk.
Gazg	XLIII	261	A very broad and shallow channel connecting two <i>cháng</i> in the <i>Naizár</i> , and is distinguished from <i>shála</i> by its breadth and shallowness.
Gobur ( <i>gacbur</i> )	XLIII	262	When cattle pass the same way in the <i>Naizár</i> for a length of time, a track or rut is formed by their hoofs constantly cutting into the moist ground. At flood time such channels sometimes become streams of flow and are called <i>gobur</i> or <i>gacbur</i> .
Hámún	XLIII	261	A wide and deep expanse of water. The deep nearly permanent water in the inundated area of the <i>Seistán</i> basin. The word is never used for a plain of hard level ground in <i>Seistán</i> which is the meaning given in Johnson's Persian Dictionary.

Kang	...	...	...	...	577	An island; a high lying piece of land in the Nairár, as Kang-i-Haidár; land surrounded by water channels, as Kang-i-Karimidád, the triangle of land between the Afghan cut and the Nad-i-Ali channel above the take off of the Rud-i-Pariáda.
Kbel	...	...	...	XXXIV	197	A more or less permanent collection of the reed huts of graziers, or Saiyáds in the Nairár, or of blanket tents of flock-owners living in the cultivated tract.
Kopál	...	...	...	...	...	A platform made at a high place in the Nairár of reeds or <i>tut</i> to serve as a refuge at the rise of the Hámán.
Kúlah	...	...	...	...	...	See the word under cultivation, page 668.
Kurk	...	...	...	XLIII	260	The soft down of the wild fowl of the Hámán; or the fine selected hair of the goat.
Laguah	...	...	...	...	...	Slippery ground.
Lurg	...	...	...	XLIII	261	A ridge of high lying ground in the Nairár.
Mábigr	...	...	...	...	...	A fisherman.
Murgh	...	...	...	...	...	A bird of the Hámán; a bird.
Nai	...	...	...	XXXIII	195	Reeds. Recognised by Mr. J. R. Drummond as <i>arundo donax</i> . <i>Linu.</i>
Náiband	...	...	...	XXXIV	198	A small walled enclosure made on some high spot in the Nairár to store green reed, cut and dried to serve as fodder for cattle in winter.
Nairá	...	...	...	...	...	A spear; a strong reed 10 or 12 feet long; a measure for the depth of water used by the Saiyáda.
Nairár	...	...	...	XLVII	304	The portion of the inundated area over which reed and bulrushes and rushes grow. Sir Henry Rawlinson says <i>zaráyo</i> or <i>zaré</i> a lake, and <i>daráya</i> , the sea; both come from Sanscrit <i>dhara</i> green. <i>Zarayo</i> in Zend and <i>zaré</i> in Pehlvi are the original of the Persian <i>zár</i> in Nairár, a reedy swamp. Royal Geographical Society's Journal, 1873, Volume XLIII, page 273.

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Nai khazak ...	...	...	A kind of reed which does not grow up tall but creeps along the bed of the <i>ching</i> and becomes long. Specimen sent to the Botanical Gardens, Calcutta.
Nairez ...	App. 28	560	When the floods subside and the roads across the Naizár come into use, those parts that are low and not yet dry are strewn with reeds to prevent the hoofs of cattle sinking into the soft ground. Such works are called <i>Nairez</i> .
Nel ( <i>nihit</i> ) ...	...	...	Soft or slippery bed of a stream where men or animals cannot cross.
Par ...	XLIII	260	Feathers.
Paralk ...	...	...	The scum on water that has stood long in pools. This is a peculiarity of the standing water in Seistán. In some places crystals of some salt are left.
Paran ...	XXXIV	197	Some of the higher lying lands in the Naizár that are only flooded in high spring flood have a ring embankment at their highest point. The graziers pitch their huts inside this embankment, and in years when the floods are moderate need not move, but in some years they are caught by an unexpectedly sudden rise. The high flats where these embankments are made are called <i>Paran</i> ; the word is found in composition for names of places in the Naizár.
Pał-i-Saiyádi ...	XLIII	259	The annual tax collected from the Saiyád people.
Pushti ...	XLIII	268	A reed mat made for the back of the hut of a <i>Gesár</i> or <i>Saiyád</i> .
Rung ...	App. 28	561	A small artificial channel in the Naizár along which <i>tuín</i> are poled.
Saiyád ...	XLIII	257	A wild fowler; the people who have the monopoly of catching fish and birds in the Naizár.

Saiyad ( <i>saiyid</i> )	...	VI	43	A descendant of the prophet.
Saiyad-i-Ghami	...	XLIII	259	A Saiyad who pays the annual poll tax.
Talpa'i	...	XI	77	Threshing of the corn by bullocks treading it under foot; floor mats of reeds are called <i>ast-i-talpa'i</i> or <i>hasir-i-talpa'i</i> .
Ting	...	App. 23	504	A shelter made of reeds for sheep and goats. See also <i>ghasak</i> and <i>katlas</i> (page 668) and <i>topal</i> .
Tund or Turund	...	App. 23	503	Severe, strong, as <i>bad-i-tund</i> , the strong wind.
Tut	...	XXXIII	194	The bulrush from which rafts or cradles are made. See <i>tutin</i> . Specimens were sent to the Botanical Gardens, Calcutta, but the species has not yet been identified. In Persian <i>tut</i> is the mulberry and this word is also so used in Seistan.
Tutin	...	XLIII	269	A raft made of <i>tut</i> used to navigate in the Naizar, or to cross branches of the Helmand River in the delta. Only the most skilled of the <i>Saiyad</i> or <i>Ghadar</i> adventure out on to the open water of the Hamun-i-Sabari.
Cultivation.				
Abdari	...	...	...	Watering the fields from a canal.
Adas	...	X	61	<i>Masur</i> , spring crop pulse ( <i>eryum lens</i> ).
Ambar	...	XI	79	Store-house or granary similar to the word godown used in India; also used for manure. Used in the same way as defined in Johnson's Persian Dictionary.
Arran	...	X	65	<i>China</i> or <i>chahna</i> , a small millet ( <i>pennisetum miliaceum</i> ).
Azar	...	...	...	Disease of wheat and barley.
Badar	...	XI	70	The man who supplies the seed sown by the plough syndicate; the master of the plough.

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Bāgh	X	66	A walled enclosure in which fruit trees or grapes are grown.
Bāghīcha	X	66	Fields near a village enclosed by mud walls in which crops are grown.
Bā'giri	XLI	240	Import and export duty more used on the Afghan than the Persian side.
Bakhsh	XI	72	Share. Distribution.
Bakhsha-i-Kalān	XI	72	A system of distributing land by large plots or blocks in contra-distinction to <i>bary</i> <i>bākhā</i> , where the plots are very small.
Balad	App. 8	363	Guide; one who knows; an expert.
Baluma	App. 9	370	Small bundles of tamarisk.
Bazgar	XI	70	A cultivator who ploughs and sows the seed supplied by another (from <i>bazr</i> seed). Johnson's Persian Dictionary gives <i>bazirgar</i> , a cultivator.
Beghamī	XI	70	The cultivators who are exempt from giving their labour to Public Works; they cultivate the lands of the Kakhuda and do all his farm work. See <i>Takwīf</i> .
Begir	XI	72	The best land for cultivation.
Beja	XI	71	Casting lots.
Benchā	App. 9	370	A small bundle of tamarisk or any other thing.

Bar-i-awal ...	...	...	...	...	X	65	The first picking of the tobacco leaves, <i>bur-i-doyam</i> the second, <i>bur-i-oyam</i> the third.
Barg ...	...	...	...	...	XI	72	The 6 inch wide strip of uncultivated land left between the plots of land cultivated by separate ploughs.
Chargan ...	...	...	...	...	...	...	The Persian wheel used to draw water from a well; none now exist in Seisidin, but people say they have been used in the past, and the name is sometimes met with in names of places.
Cháshit ...	...	...	...	...	...	...	Breakfast; 10 o'clock in the morning.
Cháwoli ...	...	...	...	...	X	61	The dried pulp of a water melon.
Chungí ...	...	...	...	...	XI	75	An allowance of corn given at the in-gathering of harvest to the cultivators of a plough.
Dakhla ...	...	...	...	...	X	62	The heap of water-melons made as they are harvested.
Dámáni ...	...	...	...	...	X	63	The allowance formerly given at the in-gathering of cotton similar to <i>chungí</i> .
Damaghak ...	...	...	...	...	XI	80	One of the marks used to mark the fields of a plough.
Dárisht ...	...	...	...	...	X	55	Fallow areas.
Darogar ...	...	...	...	...	XI	76	A reaper. <i>Darogari</i> , the harvest.
Doshau ( <i>Belá</i> , shirag) ...	...	...	...	...	X	62	The coarse sugar obtained from the pulp of water-melons.
Gandum ...	...	...	...	...	X	57	Wheat.
Gandum-i-nau-mahi ...	...	...	...	...	X	57	The wheat sown in September and reaped in June; that is, 9 months on the ground.
Gandum-i-panj-o-shish mahi ...	...	...	...	...	X	57	The wheat sown late at the end of December or in January and reaped at the end of June.

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Gardani ...	XI	72	The allowance from the wheat and barley paid for the hire of the plough bullocks, perhaps from <i>gardan</i> neck.
Gardan-i-Shutar ...	XI	80	One of the field marks in shape like the neck of a camel.
Gaurni ...	XI	71	Ploughing the land from <i>gawarais</i> , a furrow.
Ghalor ( <i>kālor</i> ) ...	XLI	244	Crushed barley mixed in water to form a gruel to feed horses, camels or dogs.
Ghami ...	XI	70	The contribution of labour to village or Public Works that cultivators and others are liable to, but used more particularly for that of the cultivators; taxes in general; the literal meaning is of course sorrowful.
Gil ...	...	...	Mud.
Hashar ...	XI	73	A large number of men employed on some work; literally a concourse or congregation.
Hinduwana ...	X	61	A water-melon.
Hissa-i-mard-i-murda ...	XI	70	A sleeping partner in a plough of cultivation or any other business affair. The <i>Kadhuda</i> is usually the sleeping partner.
Hissa-i-Diwan ...	XVIII	129	The Government share of the produce.
Ijāra ...	XI	69	The contract for the collection of the Government share of the revenue whether from cultivation or animals made annually.



Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Katin ...	...	...	Heaps of refuse about a village.
Kaush ( <i>kaʃab</i> ) ...	XI	71	A boot from Persian <i>kaʃab</i> .
Kaushi or kaʃbi ...	XXIII	157	A cash allowance given by the <i>badār</i> to the <i>barzar</i> : the word is said by the people to be derived from <i>kaʃab</i> ; a shoe from some fanciful connection with the shoe leather worn out in going to the canal clearances or band repairs. Perhaps the derivation is from <i>kaʃidan</i> : to strive: to labour.
Khāki ...	XI	78	An allowance of grain given at the distribution of the grain heaps; based on the idea that the grain next the ground is the right of the cultivators of the plough.
Kharman ...	XI	76	Reaped corn, but unthrashed, and piled up in a large circular stack (Johnson's Persian Dictionary); the word is so used in Seistán.
Kharmanak ...	XI	80	A field mark in shape like a stack of corn.
Kharankash ...	XIX	133	The man who divides the grain at the thrashing floor; another name for the Sar Mashrif.
Kharwár ...	VIII	47	The weight of 100 <i>man</i> ; in Seistán 15 Indian maunds; said to mean literally an ass load. <i>Vide</i> Johnson's Dictionary.
Kharwári ...	XVIII	131	Grain allowance recovered from the wheat and barley harvest by the Afghán Government for the services of the individual who divides the produce.
Khāna-i-gili ...	...	...	A house built of sundried clay or bricks.

Khána-i-shingi or shingar	...	...	XXXIV	198	A wattle and daub hut made of tamarisk.
Khoshá	...	...	XI	77	An ear of corn or a bunch of grapes or dates.
Khoshá-chin	...	...	XI	77	A gleaner.
Khasil	...	...	XI	74	Barley or wheat cut green and given to horses or sheep as fodder.
Khurdi	...	...	XI	78	Heap of grain after thrashing and before winnowing.
Kilidán-i-Bágh	...	...	X	67	The wooden lock of ingenious construction used on the door of a garden in Saistán ( <i>kiid</i> , a key).
Kirmak zadá	...	...	X	61	An expression for the melon disease when attacked by maggots ( <i>irmat</i> , a small worm).
Kishtgar	...	...	XI	70	A cultivator who supplies his share of the seed, and also works on the plough.
Kisht-i-aera	...	...	X	57	Late sowings of wheat and barley.
Kisht-i-gadwad	...	...	X	64	Sowing of mixed seed.
Kisht-i-hashargáo	...	...	XI	73	All the <i>ghamis</i> ploughs meet once in the spring crop and plough and sow for a day for the Kadkhuda of the village.
Kisht-i-jufigáo	...	...	XI	70	Cultivation done by the cultivating syndicate on a plough.
Kisht-i-kalgr	...	...	XI	70	The cultivation of a <i>kalgr-kár</i> which see.
Kisht-i-pagáb	...	...	X	57	Early sowings of wheat from <i>pagáb</i> , the dawn.
Kisht-i-págáo	...	...	XI	70	The cultivation done by the cultivating syndicate on a plough.
Kisht-i-tahwil	...	...	XI	70	The cultivation of the Kadkhuda of the village.

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Káláh ...	...	...	A raised place of sundried brick or tamarisk made in the fields from which the <i>jabwara</i> guards the autumn crops. High lying land in the <i>Natár</i> , where <i>graziers</i> may pitch their autumn camp, is also called <i>Káláh</i> , as <i>Kúláb-i-Khan</i> near <i>Ipp-i-Machatak</i> ; a <i>Khál</i> is a more permanent collection of huts usually placed outside the reach of the normal spring inundations.
Káknár ...	X	60	The poppy-head. Johnson says <i>loknar</i> is the oil extracted from the heads from which the opium juice has been extracted.
Kunjad ...	X	64	Sesame, til or <i>gingili</i> .
Láh ...	X	61	The harvesting of melons or turnips.
Láhi ...	X	61	The grazing on the vines of melons.
Lásh-i-khar ...	XI	80	A field mark in shape like a three-armed star.
Mak ...	App. 16	452	An earth used in dyeing that is obtained from the hills.
Mák ...	X	64	An autumn crop pulse, probably <i>rewas</i> (Punjab), <i>Lúbia</i> (United Provinces), <i>vigna castana</i> .
Mál ...	XI	71	Government share of the harvest.
Mál-i-Diwán ...	XI	71	The Government share.
Mandau or mandáb ...	X	61	Taramira of the Punjab, probably <i>eruca sativa</i> .

Másh	...	...	...	X	64	An autumn pulse, probably <i>Phaseolus mungo</i> .
Máshúká	...	...	...	...	...	The beloved; a grain sown in Seistan not recognized by the camp followers.
Milk	...	...	...	II	17	Good culturable land.
Nán-i-Kadkhuda	...	...	...	XXII	133	Any grain allowance paid by Government to the Kadkhuda of a village.
Nakh	...	...	...	...	...	String.
Nasak	...	...	...	XI	71	The distribution of the land among the cultivators made at the sowing time of wheat. Hence used as an expression for the sowing time of wheat, or for the early autumn when such sowings begin. A revenue circle is also so-called. See <i>Jam</i> and <i>Tabáá</i> .
Nesh or ( <i>nish</i> )	...	...	...	X	60	Incisions on the poppy heads to extract the opium juice; the literal meaning is a lancet.
Nihál	...	...	...	X	65	Seedlings ( <i>paniri</i> in the Punjab).
Pageh	...	...	...	X	57	Early; in time.
Páogóo ( <i>pa'gáoo</i> )	...	...	...	XI	70	The cultivating syndicate who work a plough; literally the feet of oxen.
Pakháli	...	...	...	XXXVIII	219	Stubble; the tax recovered from flock-owners for grazing on this stubble.
Pal	...	...	...	...	...	Small ridges called in India "dowel" made in fields; a field surrounded by such ridges called in India <i>khari</i> .
Palaví	...	...	...	XI	75	(In Persian <i>palaví</i> ); handful of green wheat or barley corn, picked, bound, parched and eaten.
Palez ( <i>faliz</i> )	...	...	...	X	61	A field of melons. <i>Falís</i> or <i>falís</i> in good Persian.
Pandwana ( <i>panwa'ána</i> )	...	...	...	XLIV	275	Cotton seed.

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Par-i-Jalak ...	XI	80	The four-armed piece of heavy wood at the lower end of the spindle used in spinning wool yarn; its weight gives momentum in whirling, while the arms are required to control the yarn. <i>Par</i> is a feather; <i>jalak</i> , Johnson says, is a small melodious bird.
Fishkash ...	XIII	90	Presents made to a superior; the polite word to use, <i>shirini</i> (q. v.), is local Seistáni.
Fulgí ...	XXII	153	The allowance of <i>kházi</i> which is called <i>kházi wa fulgi</i> in Afghán Seistán; <i>fulgi</i> is also a word used for soil that is soft, and villages where such soil occurs are called <i>fulgi</i> .
Fúl-i-Rishagávi ...	XI	77	A tax on bullocks collected at the time of thrashing wheat and barley.
Fúl-i-Sarkhámai ...	XXV	167	House-tax.
Fúl-i-Sarnasakí ...	XI	71	The money paid to the Kadkhuda of the village by the cultivators of a <i>ghamsf</i> plough at the time of ploughing to sow wheat. See also <i>nasak</i> .
Qulba or Kálba ...	XXI	146	A plough in Afghán Seistán; <i>hulba-rén</i> ploughing.
Rásha ...	XI	78	The heap of winnowed corn ready for the division of the shares.
Rasúmat ...	XXIII	137	The established expenses of cultivation that are paid at the division of the produce.
Rishta ...	XI	77	A cord or line. The vermicelli made at the 'id. The word is frequently met with on the thrashing floor, where the rope, that connects the bullocks, is so-called.

Rishia Gáu ...	...	...	XI	77	The cattle used in agriculture on the thrashing floor, where the cattle ( <i>gáo</i> ) are linked together by a rope ( <i>rishia</i> ).
Rábáti-múshkár ...	...	...	XI	74	An allowance of corn given by the cultivators to the <i>Múshkar</i> at the in-gathering of harvest; looks as if the word were derived from <i>rábáti</i> ; vulpine cunning; a return for his assistance in throwing dust in the eyes of the officials.
Sabawán ...	...	...	XI	74	The watchman on the autumn crops.
Sabzbar ...	...	...	X	55	Autumn crops; <i>khurfi</i> in India.
Safidbar ...	...	...	X	55	Spring crops; <i>rabi</i> in India.
Sákr ...	...	...	XI	71	The leading man among the cultivators who works a plough.
Sau ...	...	...	...	...	Weeding, in literate Persian <i>siwa</i> .
Sarkut ...	...	...	XXIII	157	The grain set aside at the division of the produce to pay the expenses of cultivation; from this grain Government does not take their share. Only used on the Afghan side.
Sarnaeski ...	...	...	XI	71	The distribution of the land by a Kadkhuda at the sowing time of wheat. See <i>pál-i-sarnasakí</i> .
Shirabasta ...	...	...	X	61	An expression for the disease among water-melons in 1904; when opened the pulp was found to be dried up.
Sbál ...	...	...	App. 16	452	A woven carpet called elsewhere in Persia <i>giim</i> .
Shalwar ...	...	...	...	...	Trousers.
Shing ...	...	...	XXXIV	198	Poles of tamarisk used for the roof of the house, or for wattle and daub huts.
Shírfín ...	...	...	XI	69	The money given by the Kadkhudas to the Governor of Seistan at Nauráz and other festive occasion; cash presents made to a superior to retain his good will; the literal meaning is sweetmeat.

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Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Shîra	X	62	Molasses. The juice of melons, or of any other thing.
Shîra-i-kôknâr	X	60	The juice extracted from poppy-heads.
Shîra-i-afyân	X	60	Opium.
Solak	XI	108	Weevil in wheat.
Ta'âruf	XIII	89	Presents made to the Governor to retain his good favour; a more polite word than <i>shîrinî</i> .
Tabâbâ ( <i>tasâbâf</i> )	XVIII	127	Suburb; a revenue circle, or group of villages; a word used on the Afghan side only.
Tamâk ( <i>tasâbâk</i> )	X	65	Tabacco.
Tahpâi	XI	77	Threshing of the corn to extract the grain by treading it out under the feet of cattle.
Tiryâk	X	60	Opium.
Tiryâkî	X	60	An opium eater.
Tazkarachi	XXXV	204	A collector of export tax; passport dues from <i>tasârat</i> ; a list; a writer.
Tîr or bîja	XI	72	Drawing of lots.
Tukhm	X	57	Seed.

Tukhm-i-burband	...	...	X	57	Seed sown thickly in literate Persian <i>tukhm-i-burband</i> .
Tukhm-i-kál	...	...	X	57	The seed dropped in the furrows made by a plough by a man following the plough.
Tukhm-i-khudrau	...	...	X	58	Self-sown seed (barley).
Tukhm-i-sar	...	...	X	57	Wheat or barley or other seed sown by scattering it over the land and then ploughing it in.
Tukhm-i-sar-i-shalgham	...	...	X	66	Turnips specially grown for seed.
Tukhm-i-sar-i-zardak	...	...	X	66	Carrots specially grown for seed.
Tukhm-i-tunak	...	...	X	57	Seed sown thinly.
Tukhm-i-láshi	...	...	X	66	Turnips allowed to run to seed.
Warud	...	...	X	66	The carrots allowed to run to seed.
Wazifa	...	...	XIII	88	Stipend or allowance made to Saiyáds, priests, etc.
Yakchavi	...	...	XI	80	A field mark.
Yáraz	...	...	X	65	Leaves pruned from the tobacco plant.
Zang	...	...	XI	78	The grains of corn which have not separated from the ears in thrashing, and need to be re-threshed; used on the Persian side for an allowance of grain called <i>káddi wa sang</i> . See <i>Xiváti</i> .
Zurrat	...	...	X	62	One of the large millets.
Zarcha or Zardi	...	...	...	...	The rust disease of wheat from <i>sard</i> yellow. Johnson says <i>sardi</i> , smuts, mildew.

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Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
	Cattle and flocks-owners.		
'Alaf	XXXIII	195	Herbage in general on which sheep and goats graze.
'Alafchar	XL	231	The tax collected on grazing for sheep and goats.
Arakgír	App. 15	449	Saddle cloth; literally the protection from perspiration.
Avíst	XXXV	203	A female, whether cow, sheep or goat that is in bearing.
Ayo-i-Gáo	XXXVII	211	A herd of cattle.
Bálsht	App. 16	452	The carpet work pillow case; literally a pillow; also used for the span between the ends of the little finger and the thumb.
Balg or barg	...	...	Leaf.
Barra ( <i>bars</i> )	XXXVIII	219	A lamb.
Barra-i-kabábi	...	...	A lamb suitable for the roast, and a present from a fock-owner to the Kadkhuda of the village in whose lands he is grazing his flocks.
Bunún	XXXIII	194	The grass, which grows on the gentle slopes of the inundated area, so much liked by sheep.
Burgala	XXXIX	223	A flock of goats.
Burgáda	XXXIX	223	A kid.

Buz-i-máda ...	...	...	XXXIX	223	A she-goat.
Buz-i-nar ...	...	...	XXXIX	223	A he-goat.
Channaká-charán	...	...	XLI	242	The shepherd who looks after the sheep of one or more villagers.
Chapat ...	...	...	...	...	Shoe or slipper.
Chaupán ...	...	...	XLI	241	Shepherd ( <i>chopán</i> , Johnson).
Chaupán-i-námi	...	...	XLI	241	The shepherd who serves for a fixed number of lambs and kids, as his hire for the year whatever be the number of lambs born in the flock.
Chaupán-i-dahyaki	...	...	XLI	241	The shepherd who serves for one in ten lambs or kids born in the flock he tends.
Cheda ...	...	...	...	...	A land mark.
Dinó-i-chaupan	...	...	XLI	242	The sheep or goats whose milk is reserved for the shepherd.
Dégh ...	...	...	...	...	Butter milk.
Dodandém ...	...	...	...	...	When the lamb has both the lower and upper rows of teeth it is called <i>dodandém</i> .
Dokárd ...	...	...	XLI	237	A pair of sheep shears; they are formed of two knives ingeniously arranged to work as shears.
Gárgak ...	...	...	App. 22	487	A plant that grows in the Nairár; it is eaten by the cattle when dry.
Gastar ...	...	...	XXXV	204	A calf three years old.
Gáú ...	...	...	XXXV	203	Cow, bull or ox.
Gáodár ...	...	...	XXXV	201	A herdsman or cattle-owner; a grazier.
Gáú nar ...	...	...	XXXV	203	A bull.

Roman Character.	REFERENCES TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Gáu mádás	XXV	203	A cow.
Gáussáá	XXXV	203	A calf.
Gáv-i-tukhmi	XXXV	203	Bull.
Gáogíri	XXXVI	207	The cattle-tax collected yearly.
Ghúch ( <i>huch</i> )	XXXIX	223	A ram.
Ghúllín ( <i>húllín</i> )	XL	233	A carpet ( <i>ghílm</i> ).
Gharút ( <i>harúf</i> )	XLI	241	<i>Karásí</i> concentrated cards specially prepared from butter-milk.
Giyásh	...	...	Grass.
Gúsfand	XXXIX	223	A sheep.
Gullug ( <i>gulluk</i> )	XL	233	The payment or 'tip' of a <i>kraw</i> per flock made to the sowar who goes with the <i>Ijradár</i> to collect the sheep tax.
Gurg	XL	233	A wolf.
Ijára	XL	231	See page 664.
Ijradár	XL	231	See page 665.
Jigarjúsh	XXXVIII	219	A disease of the sheep; <i>jigar</i> is the liver.

J oman (kərbás) or Yáma ( <i>tir-bás</i> )	...	...	XLIV	281	A cotton garment, the cotton cloth made in the country.
Kalla-i-Gurg	...	...	XL	233	A tax of a sheep or lamb per flock formerly taken by the Governor in consideration of the arrangements he made to destroy wolves.
Khána-ba-dosh	...	...	...	...	Nomads.
Khassí	...	...	XXXV	204	A bullock. Johnson gives <i>khassí</i> .
Khassí bári	...	...	XXXV	205	A bullock used to carry loads.
Khassí shíshabar	...	...	XXXV	205	The pack bullock who has easy paces and is used for riding.
Khurjín	...	...	App. 16	452	A pair of saddle bags made of carpet work so arranged as to hang on either side of the back of a mule, horse or ox.
Kont gíri (shálgíri)	...	...	XL	233	It was formerly the custom to take annually a woven carpet from the flock-owner.
Káchak (sag)	...	...	XLI	243	A dog.
Lá	...	...	XLIV	279	A weaver's measure about one yard: the folds (about 1 yard long) in which cloth for sale is laid. See also page 291 of Chapter XLV.
Láshí	...	...	XXXVIII	219	The harvesting of water-melons. The grazing on the vines after the melons are harvested.
Maldár	...	...	XXXIII	195	<i>Gáudár</i> as well as <i>ramadár</i> , i.e., graziers and pastors are included in this term.
Mangas	...	...	XXV	203	A calf one year old.
Másaud	...	...	XLI	243	An unweaned lamb.
Mashk	...	...	XLI	241	A water skin.
Maska	...	...	XXXVII	213	Butter.

Roman Character.	REFERENCE TO TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Mesh ( <i>mishé</i> )	XXXIX	223	Sheep.
Myangar	XXXVIII	213	The man who undertakes to feed and look after a cow for a fixed share of her milk.
Nai	XLI	243	A reed.
Naigarán	XLI	243	The shepherd's reed flute furnished with leather bands having a shrill and clear tone.
Nai guí	XLI	243	A flute whose note does not travel far.
Nai búghí	XLI	243	Reeds grown in a garden.
Nai kábi	XLI	243	Reeds grown on the hills.
Nai zádani	XLI	243	A flute made from a reed.
Namadmd...	App. 15	449	A man who makes felt.
Nán-i-chaupán	XLI	242	The food given to the shepherd by the owner of the flock.
Nargáo	XXXV	203	A bull-lock.
Nauch	XXXV	203	A calf up to an age of three years.
Ori rama	XLI	242	Lost and strayed sheep or goats.
Pakháif	XXXVIII	219	The stubble of wheat and barley.

Paran	...	...	...	...	XLIII	262	See the word on page 660.
Pashm	...	...	...	...	XLI	237	Wool.
Pishkil	...	...	...	...	XI	72	Sheep droppings.
Pashm chinân ( <i>chidân</i> )	...	...	...	...	XLI	237	Sheep or goat shearing.
Pashmchin	...	...	...	...	XLI	237	A sheep shearer.
Fishnuud	...	...	...	...	XLI	241	The cash present given to the shepherd when he is hired. Johnson's Persian Dictionary says <i>handsel</i> ; the first money which a merchant receives in a morning.
Pâ-i-khardîf	...	...	...	...	XI	75	Fines recovered on animals that trespass.
Pû-i-sargala	...	...	...	...	XXXVI	207	Cattle tax.
Pû-i-sarrama	...	...	...	...	XXXVI	207	The tax on sheep.
Ragâh	...	...	...	...	XLI	243	A flock of lambs and kids set apart to be weaned.
Rama	...	...	...	...	XXXIII	195	A flock of sheep.
Ramadâr	...	...	...	...	XXXIII	195	A flock-owner.
Raughan	...	...	...	...	XXXVIII	213	Clarified butter ( <i>ghâf</i> ).
Shîr	...	...	...	...	XXXVII	213	Milk.
Shîr-i-Basta	...	...	...	...	XLI	241	Cards.
Taka	...	...	...	...	XXXIX	323	A goat kept for breeding.
Tappar	...	...	...	...	App. 15	449	A cloak made of felt.

Roman Character.	REFERENCES TO THE TEXT WHERE WORD IS EXPLAINED.		Explanation of the meaning and use of the word.
	Chapter.	Page.	
Tuzg	XXXIII	195	A rush of the <i>scirpus</i> family described by Mr. J. R. Drummond, I.C.S., vide his paper in the Bengal Asiatic Society's Journal, Volume 73, Part 2, No. 4.
Yakat or Zakát	XXVII	177	The cattle tax, used in Afghán Seistán only.
Zik ( <i>zihí</i> )	...	...	A skin used to hold butter or water.
Ajádán	IX	51	Adjutant; an officer's rank in the local regiment.
Ambárcbí	XI	79	Store-keeper.
Arréz	X	60	An assessor of the revenue to be paid on crops like melons, opium and gardens.
Gunruk	VI	43	Customs Department.
Hashmat-ul-Mulk	VI	41	A title of distinction granted to the present Governor of Seistán.
Ijárádr	XI	69	See page 665.
Kádkhudá	XI	69	The headman of the village.
Kaunsal	...	...	Consul.
Khatúb	XVIII	131	The head priest in Afghán Seistán who controls the village priests or <i>Mahid</i> .
Kotwál	XIX	134	In Afghán Seistán the man who keeps watch over the branches of a canal.

Muffatish	...	...	VI	43	The official who was sent to make enquiries into revenue matters, Johnson says an inquisitor; a commissary.
Miráb	...	...	IX	52	In Persian Seistán a superintendent of many canals. In Afghán Seistán the water bailiff.
Mirza	...	...	XXI	146	A scribe.
Mushrif	...	...	IX	52	The man who watches the crops in the interest of Government. Johnson's Persian Dictionary gives <i>Mashrif</i> an examiner, inspector; also <i>Mashraf</i> a high place; though the high places in the fields are only used for watching autumn crops by the <i>Sadegans</i> . See <i>Kázid</i> on page 668.
Mustaufi	...	...	IX	51	The Revenue Secretary to the Governor; he is paid by the Sháh's Government.
Móshkár or Mashkar	...	...	XI	74	The man who watches the crops in the interest of the cultivators.
Mústansir-ul-Mulk	...	...	VI	43	The title of the officer sent from Tehran to make enquiries into revenue matters. See <i>Muffatish</i> . Johnson's Persian Dictionary says 'one who asks aid.'
Náib	...	...	XXII	149	An assistant.
Nézir	...	...	XXI	146	A revenue clerk under the Governor.
Pánkár ( <i>pankár</i> )	...	...	IX	52	The water bailiff.
Pishkhidmat	...	...	...	...	A servant.
Sarbáz	...	...	VI	42	A soldier, <i>i.e.</i> , one who risks his head.
Sar Mushrif	...	...	IX	51	The official who divides the grain heap at harvest, when the Government share is collected direct. He is paid by the Governor and not by the Persian Government.
Sartip	...	...	...	...	A Colonel.
Tahwidár	...	...	IX	51	The official who takes charge of the Government share of the grain. He is paid by the Governor and not by the Sháh's Government.
Yamín-i-Nizam	...	...	VI	43	The personal title of the Persian Commissioner on the Seistán Arbitration Commission.

[C639FD]

Roman Character.	Explanation of the meaning and use of the word.
Agricultural implements.	
Alghá ... ..	The strap of iron on the plough that holds the plough share to the body of the plough.
Arrá ... ..	A sickle with teeth like a saw. <i>Arrá</i> , a saw.
Bel ... ..	A spade.
Chúb-i-miád ... ..	The wooden part of the plough share.
Chárshákh or ishtán ... ..	Four pronged wooden fork used to handle corn at harvest.
Dasta ... ..	Handle.
Gaok ... ..	A small piece of wood put between the body of the plough ( <i>chúb-i-hal</i> ) and the ploughshare ( <i>chúb-i-miád</i> ) as a strut, so that the former is tightly held to the latter by the iron strap ( <i>alghá</i> ).
Ghilbel or kalbel ( <i>ghírbaí</i> ) ... ..	A sieve.
Juwál ... ..	A sack; <i>vide</i> page 212.
Járú ... ..	Broom; <i>vide</i> page 19, Chapter II.
Jigáo ... ..	Yoke.
Kawának ... ..	Piece of wood used to attach the yoke to the plough.
Karú or Krú ... ..	A measure of capacity used in Afghán Seistán, which roughly holds half a Seistani <i>man</i> . Wheat was found to weigh three and a quarter Indian seers to the <i>krú</i> and barley three seers. <i>Vide</i> foot note to second page Chapter XVIII.
Málá or málag or málak ... ..	A flat-beam of wood drawn by bullocks over the field, which has just been ploughed and sown, to bury the seed. <i>Vide</i> page 58, Chapter X.
Mardak ... ..	A wood pin through the fore end of the plough against which the yoke, held by a rope of <i>kirta</i> , pulls on the plough.
Mikh-i-miád ... ..	A wooden pin used to attach the iron shoe to the wood of the plough share.
Mengál ... ..	A sickle for reaping corn.
Miád ... ..	The iron shoe to the plough share.
Muhra-i-tisha ... ..	The socket for the handle of the <i>tisha</i> .
Muhr-i-Mushrif ... ..	The seal made of wood used by the Mashrif to mark the grain heaps with seals of mud to protect Government interests in the grain till the division can be made. <i>Vide</i> page 78, Chapter XI.
Mushtak ... ..	Handle of the plough.
Nakh-i-simák ... ..	The string under the neck of the bullock attached at one end to the <i>yokeskey</i> , and at the other to the yoke, being threaded through a hole in the same. Only one skey is used, placed on the outer side of the neck of each bullock.

Roman Character.	Explanation of the meaning and use of the word.
Ráíkt ... ..	A plough. A complete plough was made over to the Director-General of Archaeology, with the name of each part written on it.
Rogez ... ..	A sieve used to cleanse wheat and barley at harvest. It also serves as a useful measure to distribute the grain among the cultivators; <i>vide</i> foot note to page 483, Appendix 21.
Saráwí ... ..	A rope of <i>kirta</i> grass used in attaching the yoke to the plough. It is passed round the fore end of the plough so as to pull against <i>mardak</i> , and is prevented from slipping on the yoke by <i>kawának</i> .
Sarúk... ..	A piece of blanket about 4 feet square with pieces of string at the four corners, used by the cultivators to carry the corn from the field to the thrashing floor. See bottom of page 70, Chapter XI.
Shampok ... ..	A broom made of tamarisk.
Simák ... ..	The yokeskey.
Tesha ( <i>tisha</i> ) ... ..	Mattock or hoe called in the Punjab <i>kassi</i> and in India <i>phaera</i> . The device for holding the handle differs from that used in India. A <i>tisha</i> , with the dies and punches used in the manufacture of the head piece has been made over to the Director-General of Archaeology. This word has been spelt throughout the work <i>tesha</i> , as the correction by Khán Bahádur Maulá Bakhsh came too late to be carried into effect. See also bottom page 34, Chapter V.
<b>Seasons and Weather.</b>	
Abr or jhumar (Baluchi) ... ..	Clouds.
Áb-i-páyá ... ..	Rain accompanied with thunder in the early spring.
Bád ... ..	Wind.
Bád-i-tund ... ..	Strong wind.
Bahár ... ..	Spring season.
Bálá ... ..	North. See page 651.
Bárán ... ..	Rain.
Barq ... ..	Lightning.
Grand ... ..	Thunder.
Kibla ... ..	West.
Lowar ... ..	The period of hot winds; normally from about the 20th May to the 20th August
Mashrik ... ..	East.
Shíb ... ..	South; <i>vide</i> page 656.
Tirmáh* ... ..	Autumn. The period of three months after the hot winds.
Zamistán* ... ..	Winter. A period of three months after the autumn.
Zhála... ..	Hailstone.

\* See also end of Appendix 40.

Roman Character.	Explanation of the meaning and use of the word.	
	Building	Materials, Tools and Artizans.
Ághéz	...	Spawls or chips of bricks put in masonry.
Áhangar	...	Blacksmith.
Áhak	...	Lime.
Amla ...	...	A gang of coolies working with an artizan.
Angusht	...	The finger ; a finger's breadth.
Banná	...	Mason.
Bar ...	...	Width.
Dálán...	...	A hall or court domed over, closed to the north but open to the south ; a feature of most Seistani houses, great or small, ancient or modern ; those who knew Persia said it was a common type of house all over Persia. The home of a cultivator often consists of two sundried brick domed rooms, about 10' x 10' in area spaced about 10 feet apart ; this space is domed over and forms the <i>dálán</i> .
Darázi	...	Length.
Dargáhi	...	Span of an arch.
Daraugár	...	Carpenter ; as well as a reaper.
Diwár-i-páyá	...	Abutment.
Dásh ...	...	Kiln ; <i>vide</i> Chapter XLIV.
Dáshak	...	A small kiln.
Gach ...	...	Lime made from the sulphate of calcium.
Gumbad	...	Dome.
Gil ...	...	Mud or mud mortar.
Gilmálá	...	A tool used in plastering ; a trowel.
Kárdgej	...	A tool used in pointing.
Káhgil	...	The plaster prepared with chopped straw used to plaster walls.
Kachháná	...	Measurements ; see also end of Chapter XLIX.
Khák...	...	Earth.
Khisht	...	Sundried brick.
Khisht-i-shushk ...	...	The brick forming the thickness of an arch or dome.
Khishtmál	...	Brick mould or a brick-moulder ; see also last page, Chapter XVIII.

Roman Character.	Explanation of the meaning and use of the word.
Kunj ... ..	Corner.
Mardúr ... ..	A labourer.
Najjár ... ..	Carpenter.
Nákhún ... ..	The thickness of a finger; a measure used by the masons as used by a weaver, it is <i>one fourth</i> of the breadth across the four fingers; <i>vide</i> Chapter XLIV.
Raf ... ..	Cornice or a step.
Raf-i-gumbad ... ..	Springing line of an arch or dome.
Shushk ... ..	An arch.
Sárun... ..	A fine layer of lime plaster and whitewash.
Sháhwal ... ..	A plummet.
Símkaśh ... ..	A tool used in drawing the lines of pointing of masonry.
Sarak... ..	Corner or groin. The four corner portions of a dome ( <i>gumbad</i> ) which are built first.
Iákcha ... ..	A nitche or recess in a wall,
Takhta pul ... ..	An arched masonry bridge.
Wajab ... ..	<i>Balish</i> or the measure (about 9" long) between the tip of the small finger and the tip of the thumb.
Zar' ... ..	A measure of length used by masons about one metre in length from the tip of the nose to the tip of the fore-finger. See also page 48 Chapter VIII.
Zau ... ..	A half brick.

## SEISTANI WIND MILL.

## NAMES OF THE DIFFERENT PARTS OF THE MILL.

*Complete working drawings of a wind and water mill have been filed among the Engineering, Archaeological and Industrial sketches; on these drawings the parts have been marked with their Seistani names.*

Roman Character.	Explanation of the meaning and use of the word.
Májú ...	The sole tree or lever on which the shaft stands.
Khunuk ...	That part of the shaft below the bedstone that is a bearing for the shaft proper and rests on the lever.
Tír ...	The wrought iron pedestal on which the shaft revolves.
Āhan ...	The wrought iron bearing on which the <i>tír</i> revolves.
Guluká ...	Small cross bar of iron set into the upper or running stone, and called in England a 'sile'.
Ustun ...	The shaft with its sails.
Parra ...	The sails.
Dastak ...	The arms of the shaft that carry the sails.
Tír ...	The horizontal beam which carries the journal in which the upper end of the shaft revolves. Horizontal beams in house roofs are called <i>tír</i> .
Dol ...	Grain bin or hopper.
Ārd-dán ...	Flour bin.
Murghak ...	The "clapper" or piece of wood which resting on the running stone agitates the shoe.
Kásá ...	The small trough along which the grain passes from the bin to the stones, called in England the 'shoe'.
Ās ...	The stones from <i>asádan</i> to grind.
Pik ...	Wedges under the lever to raise or lower the running or upper stone according as coarse or fine meal is required.
Ārd-gír ...	The casing around the running stone to prevent the meal escaping.
Achchá ...	A forked piece of wood that can be set at the foot of the wall to catch the sails, and prevent them from moving with the wind when they are not required to work the mill.
Āsiábád ...	The wind mill.
Āsiában ...	The miller.
Ghalla ...	The grain.

*N.B.*—See Appendix 29 for 'note on mills for grinding corn.'

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Roman Character.	Explanation of the meaning and use of the word.
Ard ... ..	The meal.
Kalak ... ..	The journal of wood in which the upper end of the shaft revolves.
Ās-i-āb ... ..	Water mill.
Ās-i-dast ... ..	A pair of hand mill stones.
Ās-i-gāu ... ..	Bullock mill.
Chakush-i-āhani ... ..	The little hammer used to roughen the surface of the mill stone.
Chakush-i-sang ... ..	A long cylindrical stone chosen from among the boulders of the river or from the hills for its convenient shape to roughen the surface of a mill stone.
Chārgau ... ..	A Persian wheel worked by bullocks.
Kharās ... ..	An oil extracting press; people said there was one at the City, and one at Kala-i-Kang in Afghān Seistān.

## SEISTANI FISHING NET.

## NAMES OF THE DIFFERENT PARTS OF THE SEISTANI FISHING NET,

*A complete drawing of this fishing net is filed among the Engineering, Archaeological and Industrial plans; on this drawing the use of all the parts of the net are explained.*

Roman Character.	Explanation of the meaning and use of the word.
*Bok	Platform on which the fisherman sits.
ráká	Each pole or prong of the frame of two tamarisk poles fitted together to form a fork which holds the net.
Shingalak	The strut which separates the two poles or prongs of the fork.
Achchá	A forked pole, here used as supports to the platform.
Āsak	The piece of wood which acts as a trunion or pivot on which the fork of the frame revolves.
Dahan-i-ráká	The taut rope which holds together the ends of the poles of the fork.
Dast kash	The rope by which the frame and net are raised or lowered, and by which it is maintained in its position in the water.
Pish-áb	The rope that stays the frame against the whirl of the water, as the net is usually set up where there is a swirl in the water.
Sarkash	A stay that is used when there is a strong wind.
faraká	The string which passes to the finger of the fisherman, and to which are connected the lines which are spaced across the mouth of the net. The fish touches these lines and warns the fisherman of its advent, whereupon he lifts the net out of the water.
Pásáo	The line which holds the upper side of the net, and is made fast to a stake on the bank. The lower side of the net is made fast to the lower pole.
Mushtak	A ring in the rope on the <i>dahan-i-ráká</i> where the <i>maraká</i> and <i>pásáo</i> are made fast.
Kisá	The pocket of the net.
Gislak	The line on which the fish that are caught are strung by the gills and kept in the water.
Shak	The handle of wood at the other end of the <i>gislak</i> for attaching it to a stake on the bank: it also acts as a needle to pass the line through the gills of the fish.

\* Note.—The Baluchis use the same words in describing the parts of this fishing net except that for *Bok* they say *Barmak* and for *Kisá* they say *Kito*.

Roman Character.	Explanation of the meaning and use of the word.
Dám ... ..	Is the net.
Dám-i-boki ... ..	This whole arrangement for catching fish.
Charkháb ... ..	Swirling back water forming a suitable place to set up this arrangement to catch fish.
Máhígír ... ..	Fisherman.
Mábí ... ..	Fish.

NOTE.—The net used is a bag about 7'0" long 9' diameter at the lower end and 6'x2' wide at the mouth. The net is held open by a pair of poles or prongs tied together at one end to make a fork. The fork pivots on a post on the bank. The fisherman sits on a platform. Across the mouth of the net fine lines are arranged, the lead string of which the fisherman holds in his hand to get timely warning that a fish has entered the net, whereupon he pulls the net up and removes the fish. The fork that holds the net is held in position by the strain of guy ropes. The net is placed on the bank near a pool at a place where there is a swirl or back water so as to intercept the fish moving along the edge of the bank; sometimes it is put up across the mouth of a small canal; a shallow channel is sometimes obstructed by a line of stakes along which the fish move till they come to the opening where the net is arranged and are caught. Below the Band-i-Seistan the net is arranged opposite a small leak in the *Band* and fish moving along the down stream face of the *band* are swept into the net by the force of the current at this place.

Note by Major H. F. Walters, Commanding the Escort and Camp Commandant.

The favourite spots for the big fish are in the slack back water close to where the backwater meets the force of the down flowing current. At such places the small fry, which at certain seasons work their way up the river in thousands, swimming as close to the bank as possible, are checked by the current and fall an easy prey to the larger fish which feed on them ravenously.

The autumn is the best season for fishing operations of this nature. The season of 1903 commenced as early as August, and continued for several weeks. In 1904 it was late in September before fish moved and not really well till October. March and April are also sometimes favourable if the river is not very full, but the fish do not move so freely then as in the autumn. During the hot weather (May-August) the fish are quite out of condition. The biggest fish I have seen caught was 12 lbs.; I caught many 10 lbs. and under. I have carefully examined the fish and believe them to be boney carp or *Telostei*, *Physostomi*, *Cyprinidae*, *Schizothorax*. They fall an easy prey to spoons, minnows and other forms of spinning bait; also to ground bait, but they do not afford much sport.