

*Remarks on the Alla Bund, and on the drainage of the Eastern part of the Scinde Basin ; with Meteorological Observations at Kurrachee in Scinde, from 1st May to 13th October 1844, and Meteorological Observations of Sukkur, and Register of a Watergauge in the Indus, from 1st May to 30th September 1844.* By Captain W. E. BAKER, Bengal Engineers, Superintendent of Canals and Forests in Scinde.

[Communicated by the Author.]

THE KOREE or Luckput creek has been called the eastern mouth of the Indus, and there are two channels through which it once received the waters of that River, viz. the Narra, which commencing to exist as a defined channel about the latitude of Roree, flows nearly south, skirting the desert to near Oomurkote, from whence it takes the name of "the Poorun;" and 2nd, the "Goonee," which under the name "Fulailee," leaves the Indus near Meanee seven or eight miles above Hyderabad, and formerly joined the Poorun twenty-six miles north of where the Alla Bund now crosses that channel.

The Eastern Narra has long ceased to flow as a branch of the Indus, probably since that river, deserting the passage through the rocks at Alore, took to its present channel between Roree and Sukkur. It has now no direct communication with the river, but receives a precarious supply of water from a remarkable depression which runs parallel with the Indus, to the eastward, from above Bahawulpoor; and being considerably lower than the flood height of the river, receives a good deal of water from it, through canals, and by direct overflow. The drainage of this natural hollow is collected in the Narra, but except under extraordinary circumstances, (as in 1826) is seldom in sufficient quantity to reach the Alla Bund.

The Goonee being directly fed from the Indus, would have proved a more certain source of supply had not its channel been obstructed by a series of Bunds thrown across it by the Ameers of Scinde, both of the Kulhora and of the Talpoora dynasties.

The effect of these natural and artificial obstructions has been to ruin a tract of country bordering the Koree, which was once the most fertile in Kutch, and in the hope of recovering so great a loss, the Rulers of that province made a reference to the Governor of Scinde, who deputed me in July last to enquire into, and report upon, the causes which led to it.

Having obtained permission of H. E. the Governor of Scinde to communicate to the Bombay Geographical Society the result of my enquiries, I annex a copy of a map and profile, which I made on that occasion, and subjoin a few remarks (chiefly extracts from my report) which may serve to explain them.

The "Goonee," a branch of the Indus, as mentioned above, is nearly dry during the cold weather, but carries a considerable body of water during the inundations. Throughout the course of this river

its banks are intersected by canals, through which the water is drawn off for the irrigation of the adjacent lands. Many of these canals are of considerable size and are navigated by boats, constituting in fact the high roads of the country for the conveyance of grain, which is seldom carried in any quantity by other means. By this process of exhaustion the Goonee is reduced to small dimensions before it reaches the Kaimpon district (about sixty-seven miles east and eight miles south of Tatta,) where it divides into four branches, of which the most westerly, under the name of the "Great Goonee," flows to the Kuddun district; the second, an artificial canal, called the Aliwah, passing west of the villages of Nunda Shahur and Mittee, joins the Pooraan at Chuttee Tur; the third, called the Sherewah, after following a parallel course with the second, to near Nunda Amhur, joins the little Goonee, and crossing it, sends a small branch in the direction of Wanga Bazar; the fourth, or little Goonee, passes East of Nunda Shahur to Mora, and five miles south of that village falls into the Pooraan.

The Pooraan, from the junction of the Goonee to Lallah Puttun, has a well-defined channel twelve to twenty feet deep and 600 to 1200 feet wide, and is hedged in by sand hills on both sides. The greater part of the channel is clear, but it is obstructed artificially by bunds, and naturally by sand drifts: in these localities, the bed is choked up with a dense jungle of tamarisk. Beyond Lallah Puttun the channel is occupied by a chain of pools of salt water, and is partially separated from the Lindree Lake by the Alla Bund.

The Bunds across the Goonee and Pooraan are as follows:—

The Mora Bund, the Bunds at Chuttee Tur and three miles below it, the Bunds of Alli Bunder and Lallah Puttun, and the Alla Bund.

The Mora Bunds are on the Goonee. The first or original embankment is supposed to have been constructed in 1762 by Meer Goolam Shah Kulhora: it bears marks of having been frequently breached or turned. The second Bund, about half a mile S. E. of the first, is across a ravine falling into the Goonee, and appears to have become necessary when the original Bund was turned by some unusual accumulation of water. The pond formed by the second Bund feeds a small canal flowing southward, and has also another natural outlet which falls into the Pooraan.

The Bunds at and below Chuttee Tur are across the Pooraan: they have had the mischievous effect of encouraging large deposits of salt at their several localities, and of rendering the onward progress of the water still more precarious. On the other hand, they retain pools of fresh water for the use of the scanty population and their cattle, and favor the cultivation of the open spaces in the bed of the river.

The Alli Bunder and Lallah Puttun Bunds have produced effects similar to those above described, and have at different times served the

additional purpose of separating the fresh water from the salt, and preventing the latter from spreading further up the channel and injuring the land. The Bund at Alli Bundur was so employed in 1808—when it was visited by Captain R. M. Grindlay; and a reference to the accompanying profile will shew that it might be so again were the channel through the Alla Bund to be deepened, so as to admit the waters of the Lindree Lake to flow back up the channel.

The Alla Bund or “Embankment of God,” as is well known was thrown up by an earthquake in 1819, the same convulsion of nature having destroyed the flourishing town of Lindree in Kutch, and depressed a large tract of land in its vicinity, which, being filled with salt water through the Luckput creek, now forms an extensive lake. This mound at first appeared calculated to cut off for ever the fertilizing streams of the Indus from the province of Kutch, but in 1826 an extraordinary flood passed down the Narra or Pooraun, and forcing for itself a narrow passage through the Alla Bund, found its way into the Lindree Lake. In March 1827, the spot was visited by Sir Alexander Burnes, and subsequently in August 1828. He describes the channel as  $2\frac{1}{2}$  fathoms deep, and on both occasions as conveying a stream of fresh water into the lake: since that period, however, it appears to have filled up so much (probably from the falling in of the sides) that is in now dry in some places, and being one foot higher than the level of the lake, and seven feet above that of the salt water pools of the Pooraun, it forms a barrier between them. The Mound, where it is cut through by the Pooraun, is nearly four miles in width, but in other places is said to vary from two to eight miles. Its greatest height is on the borders of the lake, above the level of whose waters (on the 11th July 1844) it rises twenty and a half feet. From this elevation it gradually slopes to the northward till it becomes undistinguishable from the plain. On the surface of the mound, the soil is light and crumbling, and strongly impregnated with salt: at the depth of one and a quarter to two feet it has more consistency, and is mixed with shells such as are now found abundantly on the shores of the lake. The length of the Alla Bund has not been ascertained, but it is said by the natives to extend fifty or sixty miles to the eastward. The Lindree lake, though of inconsiderable depth near the shore, appears to be of great extent. From the elevation of the Bund, no land could be seen across it, even with the aid of a telescope, and the ruined Fort of Lindree, which still lifts its head above the waters, alone breaks the uniformity of their surface. It was asserted, however, by an agent of the Kutch Government (and with much show of probability,) that the level of the water is much raised, and its extent increased, during the prevalence of the Southwest monsoon, which drives the sea water up the Koree into the lake; and that on the setting in of the north winds, a large proportion of the present expanse of water would become dry land. It is highly desirable that the extent of the Lindree Lake and of the Alla Bund should be accurately traced, but the survey would be a work of difficulty, in consequence of the barren nature of the country, and of the total want of fresh water.

*October 21st, 1844.*

**W. E. BAKER,**  
*Captain, Bengal Engineers.*

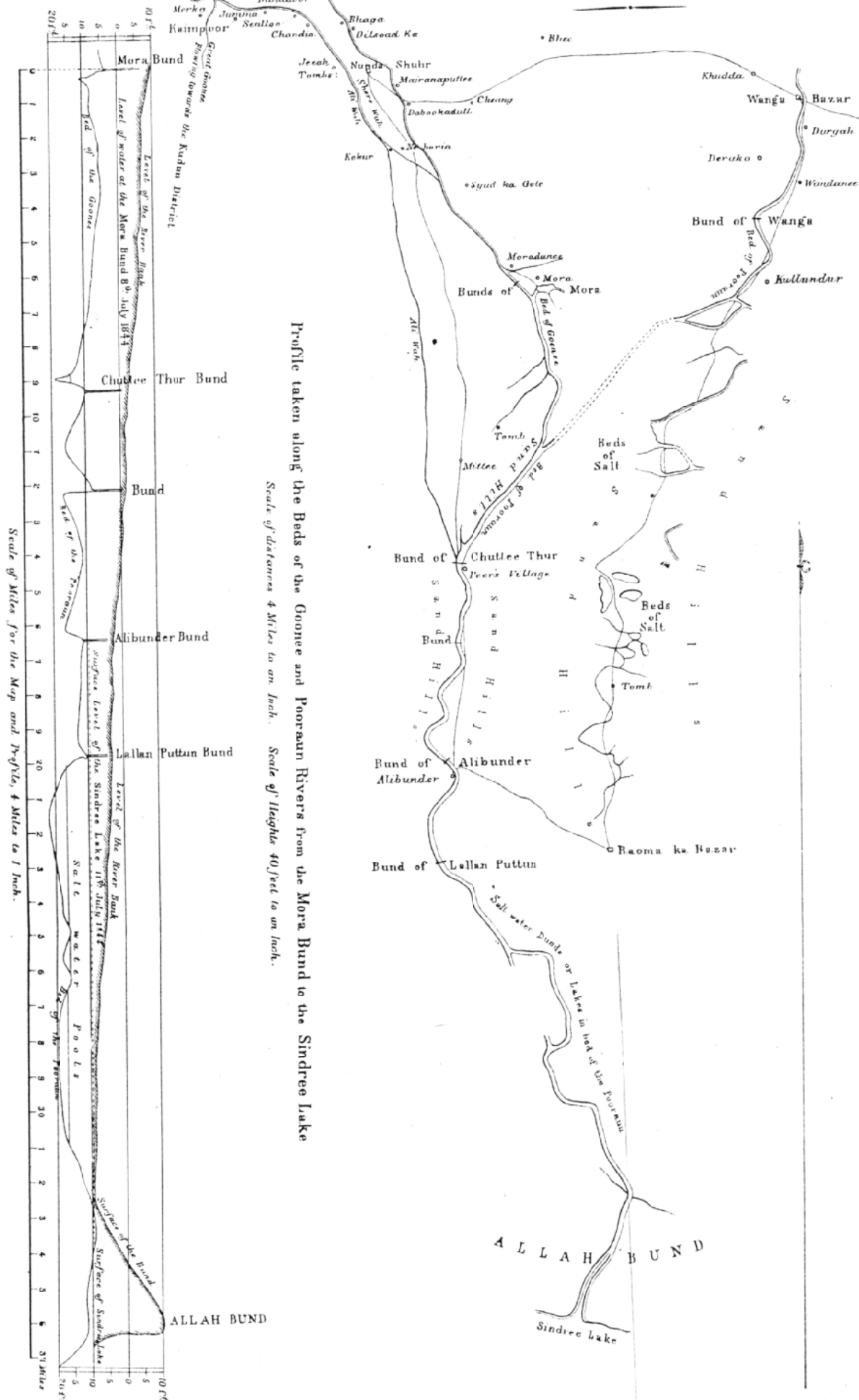
METEOROLOGICAL OBSERVATIONS AT KURRACHEE DURING THE MONTH OF MAY, 1844.

| Days. | OBSERVATIONS AT DAYBREAK. |           |              |       | OBSERVATIONS AT NOON. |           |           |          | OBSERVATIONS AT 9 P. M. |           |              |       | REMARKS. |        |   |
|-------|---------------------------|-----------|--------------|-------|-----------------------|-----------|-----------|----------|-------------------------|-----------|--------------|-------|----------|--------|---|
|       | Barometer.                |           | Thermometer. |       | Winds.                |           | Winds.    |          | Barometer.              |           | Thermometer. |       |          | Winds. |   |
|       | Attached.                 | Detached. | Wet bulb.    |       | Attached.             | Detached. | Wet bulb. |          | Attached.               | Detached. | Wet bulb.    |       |          | Winds. | Rain, Inches.   |
| 1     | 29.540                    | 81.       | 81.75        | 79.   | Calm.                 | 81.5      | 81.5      | W. by S. | 29.540                  | 82.75     | 83.          | 80.   | E. by S. | Lt.    | { *Taken at 11 P. M. Clear during day. Cloudy at sunset. Cloudy morning. Clear all day. Do. Do. Do. Do. { Clear morning. Clear all day. A few clouds in evening. Do. Do. Do. Do. Do. Do. Do. Do. Do. Do. Do. Do. Do. Do. Light clouds to west. Do. Cloudy. Do. Do. Do. Do. A few clouds. Clear. Clear. Clouds. Do. Do. Clear. Clear day. Clear. Do. Do. Do. Do. |
| 2     | 29.510                    | 81.2      | 81.5         | 79.   | N. by W.              | 82.       | 82.       | W. by N. | 29.471                  | 84.0      | 85.          | 82.   | S. by W. | Lt.    |   |
| 3     | 29.471                    | 82.5      | 83.          | 80.2  | N. W.                 | 83.5      | 83.5      | W. by S. | 29.540                  | 84.25     | 85.75        | 82.   | S. W.    | Lt.    |   |
| 4     | 29.587                    | 81.       | 83.          | 79.5  | W.                    | 83.75     | 83.75     | W. by S. | 29.563                  | 84.75     | 86.          | 83.   | W. by S. | Lt.    |   |
| 5     | 29.677                    | 82.5      | 83.6         | 80.75 | W.                    | 86.25     | 86.25     | W. by S. | 29.580                  | 85.60     | 86.75        | 81.75 | W. by N. | Lt.    |   |
| 6     | 29.531                    | 83.0      | 84.2         | 80.00 | N. W.                 | 87.75     | 87.75     | W. by S. | 29.500                  | 85.75     | 87.50        | 81.00 | N. W.    | Mod.   |   |
| 7     | 29.483                    | 82.5      | 83.7         | 79.00 | S. W.                 | 88.50     | 88.50     | W. by S. | 29.494                  | 84.50     | 86.25        | 81.00 | N. W.    | Lt.    |   |
| 8     | 29.470                    | 81.2      | 82.2         | 78.50 | S. W.                 | 86.00     | 87.90     | W. by S. | 29.524                  | 84.00     | 84.75        | 82.00 | W.       | Lt.    |   |
| 9     | 29.517                    | 80.5      | 81.4         | 79.0  | S. W.                 | 85.00     | 86.75     | W. by S. | 29.502                  | 83.80     | 85.20        | 81.75 | W.       | Lt.    |   |
| 10    | 29.493                    | 81.0      | 81.6         | 79.3  | W. S. W.              | 85.00     | 86.00     | W. by S. | 29.520                  | 83.2      | 84.25        | 80.00 | W.       | Lt.    |   |
| 11    | 29.510                    | 81.0      | 81.5         | 78.5  | N. by W.              | 84.70     | 85.50     | W. by S. | 29.565                  | 83.25     | 84.25        | 80.00 | W.       | Lt.    |   |
| 12    | 29.545                    | 81.2      | 81.7         | 78.0  | S. W.                 | 85.00     | 86.00     | W. by S. | 29.563                  | 84.00     | 85.00        | 80.75 | W. by N. | Lt.    |   |
| 13    | 29.539                    | 82.25     | 83.00        | 80.25 | W. by S.              | 85.75     | 86.50     | W. by S. | 29.545                  | 83.50     | 84.00        | 80.50 | W.       | Lt.    |   |
| 14    | 29.519                    | 82.25     | 83.00        | 80.40 | W. by S.              | 85.75     | 86.50     | W. by S. | 29.569                  | 83.75     | 84.50        | 81.00 | W.       | Lt.    |   |
| 15    | 29.543                    | 82.00     | 82.75        | 80.00 | W. by S.              | 83.30     | 86.20     | W. by S. | 29.562                  | 84.00     | 84.75        | 81.50 | W.       | Lt.    |   |
| 16    | 29.548                    | 81.00     | 82.75        | 79.50 | W. by S.              | 85.60     | 86.50     | W. by S. | 29.531                  | 83.50     | 84.00        | 80.00 | W.       | Lt.    |   |
| 17    | 29.545                    | 82.00     | 83.00        | 79.75 | W. S. W.              | 85.00     | 86.60     | W. by S. | 29.523                  | 83.80     | 84.50        | 81.00 | N. W.    | Lt.    |   |
| 18    | 29.517                    | 81.75     | 82.50        | 79.50 | W. by S.              | 85.60     | 86.50     | W. by S. | 29.558                  | 83.50     | 84.25        | 81.00 | N. W.    | Lt.    |   |
| 19    | 29.534                    | 82.50     | 83.25        | 80.00 | W. by S.              | 85.60     | 86.50     | W. by S. | 29.526                  | 83.80     | 84.50        | 80.50 | W.       | Mod.   |   |
| 20    | 29.446                    | 82.75     | 83.50        | 80.75 | W.                    | 85.75     | 86.75     | W. by S. | 29.478                  | 83.75     | 84.25        | 82.01 | W.       | Lt.    |   |
| 21    | 29.446                    | 82.75     | 83.50        | 80.50 | W.                    | 85.00     | 86.50     | W. S. W. | 29.475                  | 84.00     | 84.60        | 82.20 | W.       | Lt.    |   |
| 22    | 29.446                    | 82.75     | 83.50        | 80.25 | W. by S.              | 85.20     | 86.00     | W. by S. | 29.465                  | 83.60     | 84.30        | 82.00 | W.       | Lt.    |   |
| 23    | 29.446                    | 82.75     | 83.50        | 80.00 | W. S. W.              | 85.00     | 86.00     | W. S. W. | 29.431                  | 83.60     | 84.00        | 81.00 | W. by N. | Lt.    |   |
| 24    | 29.446                    | 82.75     | 83.50        | 80.00 | W. S. W.              | 85.00     | 86.00     | W. S. W. | 29.400                  | 82.75     | 83.50        | 80.75 | W. by N. | Lt.    |   |
| 25    | 29.446                    | 82.75     | 83.50        | 80.00 | W. by N.              | 85.00     | 86.00     | W. S. W. | 29.385                  | 85.25     | 85.75        | 80.75 | W. N. W. | Lt.    |   |
| 26    | 29.446                    | 82.75     | 83.50        | 80.00 | W. by S.              | 85.30     | 86.30     | W. by S. | 29.348                  | 85.75     | 86.00        | 81.50 | W.       | Lt.    |   |
| 27    | 29.446                    | 82.75     | 83.50        | 80.00 | W. by S.              | 85.00     | 86.00     | W. by S. | 29.343                  | 85.80     | 86.30        | 81.50 | W. by S. | Lt.    |   |
| 28    | 29.446                    | 82.75     | 83.50        | 80.00 | W. by S.              | 85.75     | 86.75     | W. by S. | 29.343                  | 85.80     | 86.30        | 81.50 | W. by N. | Mod.   |   |
| 29    | 29.446                    | 82.75     | 83.50        | 80.00 | W. by N.              | 85.00     | 86.00     | W. by S. | 29.490                  | 82.75     | 84.30        | 81.50 | W. by S. | Mod.   |   |
| 30    | 29.446                    | 82.75     | 83.50        | 80.00 | W.                    | 85.75     | 86.50     | W. S. W. | 29.456                  | 83.75     | 84.30        | 81.75 | W.       | Lt.    |   |
| 31    | 29.446                    | 82.75     | 83.50        | 80.00 | W.                    | 85.00     | 86.50     | W. S. W. | 29.403                  | 85.75     | 86.30        | 81.50 | W. by S. | Lt.    |   |

W. E. BAKER, Captain.

**MAP**  
of Part of Lower Sindh  
Shewing the Situation of the Bunds on the  
**GOONEE AND POORAN.**

Scale 4 Miles to 1 Inch.



Profile taken along the Beds of the Goonee and Pooran Rivers from the Mora Bund to the Sindree Lake  
Scale of distances 4 Miles to an Inch. Scale of Heights 40 feet to an Inch.

Scale of Miles for the Map and Profile, 4 Miles to 1 Inch.



TRANSACTIONS

OF THE

BOMBAY GEOGRAPHICAL SOCIETY,

FROM MAY 1844 TO FEBRUARY 1846.



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EDITED BY THE SECRETARY.

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BOMBAY:  
PRINTED AT THE TIMES PRESS,  
BY JAMES CHESSON.

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MDCCCLVI.

In paragraph two the editor mentions that Baker's figure would be included in a following volume. He forgot to do so & it was discovered in Bombay and published by Oldham in the Mem. Geol Surv India in 1898.

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## PREFACE.

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THE publication of the present number of the Transactions of the Bombay Geographical Society has been delayed for nearly a twelvemonth in consequence of the journey of the Secretary to England, and the circumstances which led to it. All the printing arrangements having been undertaken by him, it was impossible that the details should have been known to the able and most zealous officer who acted as interim Secretary, and the consequence has been that the papers have been longer detained at press than was expected, and portions of matter have crept in or been suffered to remain in them, which might probably have been left out or removed with advantage.

Several drawings and illustrations intended to have been included in the present issue have for the present been omitted to avoid further delay. The next number will be paged on with the present one so as to form a volume, so that the Map of Scinde which should have accompanied Captain Baker's papers, and the Barometric curves for the illustration of those of Dr Bradley, will appear in the forthcoming issue, and be fit for reference when the volume is complete.

An apology must be offered to the latter gentleman for the publication of portions of his paper desired by him to have been cancelled: it had been thrown off before his wishes became known to the Editor.