XXV. *Numerical Elements of Indian Meteorology.*

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FIRST SERIES.—*Temperatures of the Atmosphere, and Isothermal Lines of India.*

I. Materials collected: calculation of the Daily Mean.
II. Tables of 207 Stations of Mean Temperature—Months, Seasons, and Years.
III. Decrease of Temperature with Height in the Tropics.
IV. Thermal Types of the Year and the Seasons.

I. *Materials collected: calculation of the Daily Mean.*

THE numerical elements of the mean temperature* of the atmosphere for India and the Indian Archipelago here presented, I had occasion to collect during the years 1854–58. For judging of the value of the data I had obtained, and for working out the general results, it was very favourable that, for most of the stations, I had occasion personally to see the instruments employed and the mode of their being put up.

Already some years ago a considerable number of these stations had been published for the year 1851, by Dr. LAMBE in the Journal of the Asiatic Society of Bengal, as well as by Colonel SYKES in the Report of the British Association for 1852; but as the materials sent in consisted, nearly exclusively, of results presented as means, which however were but the plain arithmetical mean of the respective hours of observation without any further modification, it was particularly welcome to me that the Indian Government, by the mediation of Dr. MACPHERSON, handed me over the original manuscripts, now forming thirty-nine volumes in folio.

A new calculation of the mean temperatures showed for many of these stations, particularly for the warmer period of the year, results lower by many degrees than the values formerly adopted; the difference would have been greater still and more frequent, if for many of the Indian stations the daily variation of temperature had not been included altogether within comparatively narrow limits.

The publication of Colonel SYKES† in 1850, the observations communicated being his own, or those of contemporaneous residents, contains throughout means based upon hours carefully selected.

* All temperatures are Fahrenheit.

† "Discussion of Meteorological Observations taken in India," by Colonel W. H. SYKES, F.R.S., Philosophical Transactions, Part II. 1850.

Also the meteorological publications of DOVE and SCHMIDT* contained important contributions for completing the number of the Indian stations, and for comparing them with the surrounding regions†.

The hours of observation at the various stations had been in general selected so as to include the minimum at the time of sunrise and the hours 10 A.M., 4 P.M., these two nearly coinciding with the barometrical extremes; also the maximum of the day a little after 2 P.M., and an evening observation is very frequently contained in these Tables; but, with few exceptions, the latest period was 6 P.M., or sunset. This circumstance excluded therefore the introduction of an evening hour more distant from the maximum, such as 9 P.M. or 10 P.M., into the calculation of the mean. A very favourable modification it was, however, that hourly observations existed for several stations, very accurately made, though situated in regions where the daily variation of temperature is not a very great one. These stations are Bombay, Calcutta, Madras, Trevandrum. Already DOVE, so very careful in completing his collections of meteorological materials, has published several years for each of these stations‡. For calculating such Indian stations as show a more continental character in their variation of temperature, I could take advantage of the observations which we had occasion to make ourselves during our travels, a material which, I think, presented sufficient data for defining the mode of calculation, by their number as well as by their geographical distribution.

A combination of sunrise and sunset with either the maximum of the day or the observation at 4 P.M. showed very unfavourable results, even if variable coefficients were introduced for the different months, since, for the various geographical regions, the changes in the daily variation of temperature during the year are very great. Also the combination of the extremes with one morning hour, as I formerly had applied them to Alpine stations§, gave no satisfactory results, since in India the morning hours 9 A.M. or 10 A.M. had risen already considerably more above the mean of the day than is the case in the temperate zone.

* DOVE, "Tafel der mittleren Temperaturen verschiedener Orte in Réaumur'schen Graden," and "Ueber die nicht periodischen Aenderungen der Temperaturvertheilung," 6 parts.

† Amongst the 207 stations of the numerical Tables, pages 532–537, the following stations had to be taken over without recalculation, or without the addition of new material: from the publications of Colonel SYKES, Átăre Mállē, Ahmednăgar, Mahabaléshvar, Máhu, Phăltăn, Púna, Satára; from the series of the Medical Board Observations only Gughéra remained without the addition of new material; and from DOVE's Tables I took over, with their values unchanged, Álor Gája, Áva, Bangkók, Chandernagúr, Chúsan, Kălsi, Kándi, Kánton, Makáo, Manilla, Mozăfarpúr, Pondichéri, Trivándrum. DOVE's Seringapatám is the year 1816 for the neighbouring fort, French Rocks, for which I was able to add 1814, 1853, and 1854. In the "Lehrbuch der Meteorologie," von SCHMIDT, 1860, I found in addition, for the Archipelago, Banjuvángi, Palanbáng, Lahút. For want of details about the decrease of temperature with height in these regions I excluded them, their height being 2138, 2119, and 2104 feet.

‡ On the Daily Variations of the Temperature of the Atmosphere, Abhandl. Berl. Akad. for 1846, pp. 104–6.

§ SCHLAGINTWEIT, "Neue Unters. phys. Geogr. d. Alpen," page 325; I had obtained there the following coefficients for deducing the mean temperature from the extremes and 9 A.M.: for the minimum 0·5; for the maximum 0·4; for 9 A.M. 0·11.

The arithmetical mean of the extremes, where registering-instruments had been used, showed temperatures in general too warm throughout the year; but this very circumstance induced me to try the combination of 4 P.M. (which I had for all stations) with the observations at sunrise; the latter is nearly always identical (except at stations in very great heights) with the minimum obtained by registering-instruments, and four o'clock is cooler, though but little, than the true maximum; the result was a much more satisfactory one than I had expected.

The coincidence of the minimum of temperature with sunrise is particularly general in the tropics. It materially depends upon the rapid ascent of the sun above the horizon, whilst with us, especially in summer, the effect of *insolation* upon clouds and the higher strata of the atmosphere is partly felt already on the surface of the earth before the sun himself is visible above the horizon. In very great heights, again, chiefly if it be a peak in a very isolated position, the tropics show also modifications similar to those of the temperate zones. There I found, just as I formerly had seen, too, on the Vincent Hütte (southern slope of Monte Rosa), that the temperature frequently began to rise several hours before sunrise*.

As another characteristic modification of the morning period in the tropics, I may add here that very frequently the absolute minimum is followed by a second, though minor depression. This becomes best marked in the tropical seas; I found it greatest, when the sky was clear, five to ten minutes after sunrise, and it amounted not unfrequently to a full degree, but it never went lower than the absolute minimum preceding. I considered the cause of it to be the change in the relative humidity, which has attained its maximum nearly at the moment of sunrise. The appearance of the sun above the horizon coincides, too, with the heaviest precipitation of dew, and from this moment the relative humidity is rapidly decreasing whilst the temperature begins to rise. Not only is radiation now increased with the transparency of the atmosphere, but also the amount of heat becoming latent in consequence of the dissolving of vesicular vapours might participate in producing the second depression of temperature.

For presenting an immediate comparison of the value $\frac{\text{min.} + 4\text{ P.M.}}{2}$ with the mean of the 24 hours, I have given the corrections to be applied in the following Tables (with "$-$" if the calculated value is too large, with "$+$" if it is too small), and have added the corresponding corrections for three other combinations. At Bombay and Calcutta, hourly observations are made every day, Sundays excepted; I took 1855 as the year the least distant from any other observations. For Tónglo, Falút, Islamabád, and Leh, the periods of observation are only months. For Ambála I had no quite regular series completely including the daily period, but the considerable number of observations from morning to night, combined (by the particular kindness of the observer, Dr. TRITTON) with very good extremes and isolated nocturnal observations, allowed me to define with sufficient precision the form of the monthly curves, and to deduce from these the hours still wanted.

* Neue Unters. Geogr. Alpen, pp. 278–80.

I thought it not uninteresting to complete the comparison of my mode of calculating with those generally used, by adding the value of $\frac{\text{min.}+4\ \text{A.M.}}{2}$ also for some other stations, situated beyond India, and greatly differing in reference to their climatological character.

A. *From India, the Himálaya, and Tibet.*

Bombay in the Kónkan, lat. N. 18° 53′ 30″, long. E. Green. 72° 49′ 5″, height L.a.L.S.*

1855.	Mean.	$\frac{\text{S. R.}+\text{IV.}}{2}$.	$\frac{\text{Max.}+\text{Min.}}{2}$.	$\frac{\text{VI.}+\text{II.}+\text{X.}}{3}$.	$\frac{\text{VII.}+\text{II.}+2.\text{IX.}}{4}$.
January	74·7	−0·6	−0·9	+0·1	0
February ...	76·9	−0·5	−0·8	+0·1	0
March	79·3	0	−0·5	+0·5	+0·4
April	82·0	+0·3	−0·4	+0·6	+0·3
May	86·0	−0·3	−0·7	+0·4	+0·2
June	83·8	+0·1	−0·5	+0·2	+0·3
July	82·0	+0·1	−0·7	+0·1	+0·3
August	82·1	−0·5	−0·7	+0·4	+0·1
September ...	81·0	−0·2	−0·7	+0·1	+0·3
October	82·6	0	−0·7	+0·2	0
November ...	80·6	−0·7	−1·2	−0·1	−0·1
December ...	77·7	−0·7	−1·2	+0·1	−0·1
Mean ...	.....	−0·12	−0·38	+0·11	+0·08

Calcutta in Bengal, lat. N. 22° 33′ 1″, long. E. Green. 88° 20′ 34′, height L.a.L.S.

1855.	Mean.	$\frac{\text{S. R.}+\text{IV.}}{2}$.	$\frac{\text{Max.}+\text{Min.}}{2}$.	$\frac{\text{VI.}+\text{II.}+\text{X.}}{3}$.	$\frac{\text{VII.}+\text{II.}+2.\text{IX.}}{4}$.
January	66·5	0	−0·9	0	0
February ...	72·1	−0·8	−1·1	−0·3	−0·3
March	79·3	−0·6	−0·8	+0·4	+0·5
April	82·3	0·	−0·3	+1·1	+1·3
May	85·9	−0·6	−1·1	+0·3	+0·7
June	85·6	+0·1	−0·6	+0·4	+0·3
July	82·3	+0·4	−0·5	+0·1	0
August	83·7	+0·2	−0·5	+0·3	+0·3
September ...	82·3	+0·3	−0·6	0	+0·1
October	81·2	+0·2	−0·4	+0·3	+0·2
November ...	74·4	+0·2	−0·9	0	+0·3
December ...	66·9	+0·1	−1·2	0	0
Mean ...	.....	−0·02	−0·73	+0·11	+0·14

Ambála in the Pănjáb, lat. N. 30° 21′ 25″, long. E. Green. 76° 48′ 49″, height 1026 feet.

1855.	Mean.	$\frac{\text{S. R.}+\text{IV.}}{2}$.	$\frac{\text{Max.}+\text{Min.}}{2}$.	$\frac{\text{VI.}+\text{II.}+\text{X.}}{3}$.	$\frac{\text{VII.}+\text{II.}+2.\text{IX.}}{4}$.
January	50·1	−0·1	−0·6	+0·5	+0·5
February ...	59·5	−0·1	−0·7	+1·3	+1·0
March	56·5	−0·2	−0·3	+1·4	+0·4
April	76·0	+0·7	+0·2	+2·3	+0·2
May	92·1	+1·7	+1·1	+0·5	−1·1
June	95·4	+1·2	+0·9	+0·2	−1·0
July	83·8	+0·3	+0·2	+0·1	+1·3
August	87·9	+1·1	+0·5	−0·6	+2·0
September ...	82·4	+1·1	+0·9	+1·1	+0·4
October	73·4	+0·3	+0·1	+1·8	+0·7
November ...	60·2	−1·9	−2·2	−0·7	−1·7
December ...	55·9	+0·8	−0·2	−0·9	+0·8
Mean	.....	+0·41	−0·01	+0 58	+0·22

* This abbreviation is placed for "a little above the level of the sea." The feet are English.

Tónglo Peak in Síkkim, lat. N. 27° 1′ 50″, long. E. Green. 28° 3′ 55″, height 10,080 feet.

1855.	Mean.	$\frac{S.R.+IV.}{2}$.	$\frac{Max.+Min.}{2}$.	$\frac{VI.+II.+X.}{3}$.	$\frac{VII.+II.+2.IX.}{4}$.
May	48·1	+0·5	−1·5	−0·2	0

Falút Peak in Síkkim, lat. N. 27° 6′ 20″, long. E. Green. 87° 59′ 0″, height 12,042 feet.

1855.	Mean.	$\frac{S.R.+IV.}{2}$.	$\frac{Max.+Min.}{2}$.	$\frac{VI.+II.+X.}{3}$.	$\frac{VII.+II.+2.IX.}{4}$.
May	46·9	−0·1	−0·5	0	0

Islamabád in Kashmír, lat. N. 33° 44′, long. E. Green. 75° 8′, height 5160 feet.

1856.	Mean.	$\frac{S.R.+IV.}{2}$.	$\frac{Max.+Min.}{2}$.	$\frac{VI.+II.+X.}{3}$.	$\frac{VII.+II.+2.IX.}{4}$.
October	51·3	+0·7	+0·3	+1·3	−0·7

Leh in Ladák, lat. N. 24° 8′ 2″, long. E. Green. 77° 14′ 36″, height 11,527 feet.

1856.	Mean.	$\frac{S.R.+IV.}{2}$.	$\frac{Max.+Min.}{2}$.	$\frac{VI.+II.+X.}{3}$.	$\frac{VII.+II.+2.IX.}{4}$.
September ...	60·1	−0·1	−0·2	+0·7	−0·2

B.* *From the temperate zone in low elevations.*

Rome, lat. N. 41° 54′, long. E. Green. 12° 25′, height 170 feet.

	Mean.	$\frac{S.R.+IV.}{2}$.	$\frac{Max.+Min.}{2}$.	$\frac{VI.+II.+X.}{3}$.	$\frac{VII.+II.+2.IX.}{4}$.
January	49·95	−0·07	−1·15	−0·22	+0·09
July	75·47	+0·36	+0·20	+1·62	+0·97

Greenwich, lat. N. 51° 29′, long. E. Green. 0° 0′, height 156 feet.

	Mean.	$\frac{S.R.+IV.}{2}$.	$\frac{Max.+Min.}{2}$.	$\frac{VI.+II.+X.}{3}$.	$\frac{VII.+II.+2.IX.}{4}$.
January	35·45	−0·02	−0·40	−0·31	−0·22
July	59·65	+0·40	−0·34	+0·45	−0·13

St. Petersburgh, lat. N. 59° 36′, long. E. Green. 30° 18′, height L.a.L.S.

	Mean.	$\frac{S.R.+IV.}{2}$.	$\frac{Max.+Min.}{2}$.	$\frac{VI.+II.+X.}{3}$.	$\frac{VII.+II.+2.IX.}{4}$.
January	13·57	+0·16	−0·11	−0·29	−0·25
July	62·37	−0·12	−0·13	+0·47	−0·11

* The date is not added, the means being taken from various series, all of several years' duration.

Toronto, lat. N. 43° 40′, long. W. Green. 79° 22′, height 340 feet.

	Mean.	$\frac{S.R.+IV.}{2}$.	$\frac{Max.+Min.}{2}$.	$\frac{VI.+II.+X.}{3}$.	$\frac{VII.+II.+2.IX.}{4}$.
January.....	26·37	+0·22	−0·36	−0·18	−0·40
July	65·60	−0·06	−0·07	+0·94	+0·20

C. *From the Alps.*

Geneva, lat. N. 40° 12′, long. E. Green. 6° 10′, height 1334 feet.

	Mean.	$\frac{S.R.+IV.}{2}$.	$\frac{Max.+Min.}{2}$.	$\frac{VI.+II.+X.}{3}$.	$\frac{VII.+II.+2.IX.}{4}$.
January.....	30·81	−0·13	−0·54	−0·18	−0·16
July	64·16	+0·59	+0·43	0	−0·81

St. Bernard Hospital, lat. N. 45° 50′, long. E. Green. 6° 6′, height 8108 feet.

	Mean.	$\frac{S.R.+IV.}{2}$.	$\frac{Max.+Min.}{2}$.	$\frac{VI.+II.+X.}{3}$.	$\frac{VII.+II.+2.IX.}{4}$.
January.....	13·41	+0·14	−0·31	+0·02	−0·02
July	42·84	+0·61	−0·18	0	−0·31

II. *Tables of Mean Temperature for the Month, Seasons, and the Year* (207 *Stations*).

Ten geographical groups are formed of the meteorological materials, and within these the stations are arranged alphabetically.

The number of stations is 207, and they are distributed as follows:—

1. Eastern India: 1, Assam; 2, Khássia Hills 12
2. Bengál and Bahár, and Delta of the Ganges and Brahmapútra . . . 36
3. Hindostán, the upper Gangetic plain 27
4. Pănjáb, including the stations west of the Indus 24
5. Western India: Rājvára, Guzrát, Kăch, Sindh 10
6. Central India: Berár, Oríssa, Málva, Bandelkhănd 15
7. Southern India, hilly districts: 1, Dékhan and Maissúr; 2, Nílgiris . . 29
8. Southern India, coasts: Kónkan, Málabar, Karnátik 24
9. Ceylon 10
10. Indo-Chinese Peninsula, Archipelago, and China 20

The *transcription* of the geographical names is the same used and detailed by me in our 'Results'*; the vowels are written as in Italian and German, the consonants as in English, with very few modifications, such as "th" being an aspirated "t," &c. Nasal modifications of the vowels are indicated by a circumflex. Every word has its principal accent marked by the usual sign. The sign ⌣ above a vowel shows its imperfect phonetic formation, such as "e" in *herd*.

* The full detail is contained in vol. iii. pp. 139–60.

The *latitude* is north, unless an S is written before the respective numbers.

The *longitude*, east of Greenwich, is referred to the Madrás observatory, its value being adopted $=80°\ 13'\ 56''$. The sign * before the stations indicates that the latitude and longitude have been determined by the great Trigonometrical Survey of India; our own determinations are marked by the sign †. For the remaining stations the coordinates are taken from the most detailed maps.

The *height* is given in English feet; I took it from our "Hypsometry," vol. ii. of the 'Results.' Heights in round numbers, for which I had no detailed data, are put in brackets. To places very little elevated above the level of the sea L.a.L.S. is added.

The *seasons* are formed as it is usually done also for the stations of other latitudes; these groups coincide besides, for Central and Northern India, with the character of the climate in general. For the stations in lower latitudes, however, the type of the climate only allows of distinguishing a hot season, a rainy one, and a cool one.

The *numerical values** are corrected only for instrumental errors, or combinations of hours not sufficiently careful; but the influence of height, and in consequence the difference from the isothermal lines next to the respective stations, had to follow separately.

* The stations where no decimals are seen (but fractions or full numbers only) are stations of somewhat minor accuracy.

1. EASTERN INDIA.

1. ASSÁM.

Station.	Lat.	Long.	Height.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	D.J.F.	M.A.M.	J.J.A.	S.O.N.	Year.
			ft.																	
Bărpétah	26° 18′	91° 0′	(100)	62·2	66·2	71	75·7	78·5	80	82	83	82·5	88·5	71	65·2	64·5	75·1	81·7	80·7	75·5
Dibrugárh .....†	27 32	94 57·6	396	62·2	63·4	71·3	72·7	77·1	80·7	83·7	81·8	81	75·6	67·4	61	62·2	73·7	82·1	74·7	73·2
Goalpára .....*	26 11	90 36·6	(120)	63·2	67·8	73·7	78	80·2	79·8	81·4	81·6	81·1	78·5	70·6	64·9	65·3	77·3	80·9	76·7	75·1
Gohátti .....†	26 5·8	91 43·8	134	63·6	67·6	74·5	77·4	80·4	81·8	83	82·9	82·2	79·2	71·1	65·5	65·6	77·4	82·6	77·5	75·8
Golaghát	26 33	93 58	(350)	59·5	61·5	71·5	76·5	79·5	81·5	84·5	85	83	79·2	66	60	60·3	75·8	83·7	76·1	74
Lákhimpúr	27 31	94 55	410	61	62·5	68·5	73·5	79·5	82	...	...	...	...	66	62·5	62	73·8	...	...	...
Mángaldái	26 24	92 1	155	66·5	69	70	77	80	79·5	82·5	82	81·5	78·5	71·5	64·5	66·7	75·7	81·3	77·2	75·2
Naugóng	26 21	92 49	(250)	61·3	66·4	72	76·4	81·1	83·4	84	84·4	83·2	78·6	69·8	63·5	63·7	76·5	83·9	77·2	75·3
Naziruaghát	26 52	94 42	(400)	61·4	64·2	68	72	78·4	81·5	82·7	82	81·7	77·1	67·4	60·4	62	72·8	82·1	76·9	73
Sibságar	27 2	94 39	(370)	60	64·1	69·3	73·8	78·05	82·4	83·6	83·5	83·1	78·3	69·4	62·4	62·2	73·7	83·2	76·9	74
Tézpur .....†	26 34·6	92 46·8	278	59·7	63·8	69·5	74·5	78·9	82	82·7	81·2	81·3	77	68·5	61·3	61·6	74·3	82	75·6	73·4
2. KHÁSSIA HILLS.																				
Cherrapúnji .....†	25 14·2	91 40·5	4125	51·8	54·7	61·5	63·5	67·2	67·1	68·5	68·1	67·8	65·8	58·8	55·1	53·9	64·1	67·9	64·1	62·5

2. BENGÁL AND BAHÁR,

AND DELTA OF THE GANGES AND BRAHMAPÚTRA.

Station.	Lat.	Long.	Height.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	D.J.F.	M.A.M.	J.J.A.	S.O.N.	Year.
			ft.																	
Bákúra .....*	23° 14·8	87° 3·1	L. a. L. S.	63	72·7	79·7	85·5	87·9	87·2	84·2	84·3	81·9	74·4	70·5	63·2	66·3	84·4	85·2	75·6	78
Bárdván .....*	23 13·2	87 48·9	93	66·6	73·7	81·2	86	90	86·5	85·2	85·4	85·3	82	73·1	69·3	69·9	85·7	85·7	80·1	80·4
Barisál .....*	22 35·7	90 13·6	L. a. L. S.	64·1	70	72·2	80·4	84·8	81·8	81·1	81·8	81·9	81·3	72·9	65·1	66·4	79·1	81·6	78·7	76·4
Barrakpúr	22 42·6	88 21·8	L. a. L. S.	67·6	69·4	79·5	86·1	83·7	85·1	83·3	83·3	83·1	80·2	73·7	69·7	69·6	83·1	83·9	79	78·7
Bhágalpúr .....*	25 14·8	86 56·6	154	62 6	73·4	78·6	89·9	92·1	87·9	85·7	82·5	84	77·5	69·5	63·1	66·4	86·9	85·4	77	78·9
Birbhúm .....*	23 54·4	87 30·6	L. a. L. S.	67·1	72·9	81	86·6	89·3	86·6	84	83·7	83·8	80·2	73·7	68·5	69·5	85·6	84·8	79·2	79·8
Bógra	24 50	89 22	L. a. L. S.	63·8	64·8	74	77·9	82·9	81·3	83·5	82·0	82·4	78·3	71·1	64·3	64·3	78·3	82·3	77·3	75·5
Calcutta .....*	22 33	88 20·6	L. a. L. S.	65·60	71·06	77·99	83·37	85·37	84·18	82·69	83·05	83·06	81·35	74·68	67·70	68·12	82·24	83·31	79·70	78·34
Chaiabásso .....*	22 31·7	85 42·8	L. a. L. S.	67	70·9	79·6	86	88·6	86·4	82·8	81·5	81·3	78	71·5	65	67·6	84·7	83·6	76·9	78·2
Chandernagúr	22 50	88 23	46	60·8	68·8	77·3	88·2	93·7	94·2	86·8	87·2	83·7	79·7	72·7	63·7	64·4	86·4	89·4	78·7	79·7
Chápra..... .....*	26 45	85 25·8	250	69·7	67	75·4	86·4	89·6	86·1	85·1	84·2	78·8	79·1	68·5	60	62·2	83·8	85·1	75·5	76·6
Chittagóng .....*	22 20·5	81 44·1	191	63·6	69·4	76	80·5	83	79·7	80·2	80·7	81·1	79·7	72·2	66·2	66·4	79·8	80·2	77·7	76·0
Chunár .....*	25 7·5	82 51·6	(300)	68	62½	77½	84	89	88	90	85½	82¼	79¾	69½	63¼	61·2	83·5	87·8	77·2	77·4
Dáinajpur .....*	25 36·6	83 36·8	180	63	68½	80	87	90	80½	83½	81½	81½	80	72	66	66	86	81·8	77·8	77·8
Dámdám .....*	22 37·9	88 21·2	L. a. L. S.	66·2	72·7	79	85·7	86	85·1	82·7	82·8	82·9	81·2	74·7	68·7	69·2	83·6	83·5	79·6	79
Dháka ....†	23 42·7	90 20·3	72	65·6	69·6	80·1	82·8	85·1	83·5	82·7	83·8	83·8	81·6	74·1	67·7	67·6	82·7	83·3	79·8	78·4
Fárídpur ..... *	23 36·5	89 48·9	L. a. L. S.	65·8	70·2	78·9	81·9	78 5	82·2	82·4	82·1	82·1	80·1	73·8	67·2	67·7	79·8	82·2	78·7	77·1
Gáya	24 49	85 0	280	63·4	70·2	78·2	86·5	91·9	89·5	84·5	85·2	84·6	81·1	71·9	65·5	66·4	85·5	86·4	79·2	79·4
Hazaribágh .....*	24 0	85 20·9	1750	60	65·2	73·5	80·5	84·9	80·6	80·6	77·5	76·0	72·9	66·8	62	62·4	79·6	79·6	71·9	73·4
Húgli .....*	22 53·4	88 23·1	L. a. L. S.	63·4	68	80	85	87	83·2	80·7	80·9	82·5	80	72·2	64·6	65·3	84	81·6	78·2	77·3
Jessór .....*	23 9	89 7·1	L. a. L. S.	62	71·2	78·6	84·4	84·8	83·35	83·7	83·6	83·85	85·2	75·1	64·85	66	82·6	83·5	81·4	78·4

Kachár.....*	24 48·7	92 43·9	L. a. L. S.	62·95	66·65	73·45	76·8	80·95	82·2	82·4	82·9	82·45	79·65	71·6	65·6	65·1	77·1	82·5	77·9	75·6
Kishánpur.....	23 28	85 20	(200)	60·15	72·15	78·8	85·75	88·65	83·2	78·15	78·95	78·7	76·85	70·35	63	65·1	84·4	80·1	75·3	76·2
Maimánsíngh .....*	24 44·8	90 20·9	L. a. L. S.	62·45	65·95	75·8	74·45	83·8	82·3	83·5	82·9	82	81·3	72·7	65·55	64·6	78·0	82·9	78·7	76
Mídnapur .....*	22 24·3	87 17·9	L. a. L. S.	...	71	77·7	...	...	81·6	80·4	78·1	78·2	...	...	...	...	..	...	...	...
Monghír .....*	25 27·4	86 40·2	200	65½	68	76½	84½	92½	80	86	86½	85	80⅓	70½	...	...	84·5	87·5	78·7	...
Murshedabád .....*	24 11·8	88 9·9	L. a. L. S.	64	69·2	80·4	86	87	86·5	84·6	86·7	86·5	82·5	74	68	67·1	84·5	85·9	81	79·6
Noakólli .....*	22 45·5	90 57·8	L. a. L. S.	65·6	70·1	78·8	80·4	84·9	82·3	83·2	81·6	82·3	80·7	75	67·8	67·7	81·4	82·4	79·4	77·5
Pábna.....	24 1	89 12	L. a. L. S.	65·2	72·8	78·9	83·9	85·3	83·7	85·3	84·1	84·2	79·5	71·8	66	68	82·7	84·4	78·5	78·4
Párnea.....*	25 48	87 29·6	L. a. L. S.	63⅓	64⅔	70½	87	83½	84½	87½	83⅓	83·6	79·8	71·1	64	64	80·3	85·2	78·2	76·9
Pátna .....*	25 37·2	85 7·5	170	60·8	66·1	76·1	83·9	88·8	87·3	84·5	84·7	83·9	80·4	71·1	62·2	63	82·9	85·5	78·5	77·5
Rámpur Bólea.....*	24 21·8	88 34·3	56	64·8	69·7	77·2	82·5	85·8	83·5	83·8	83·7	83·8	81·1	71·5	66·8	67·1	81·8	83·7	78·8	77·8
Rángpur .....*	25 42·8	89 11·4	72	61·5	67·5	75·1	81·8	82·3	81·3	83	83	83·4	80·3	74·8	69·2	66·1	79·7	82·4	79·5	76·8
Silhét .....*	24 53	91 47·1	L. a. L. S.	65·5	69·9	75	77·4	81·1	80·6	82·2	81·8	82	79·1	71	68·5	67·6	77·8	81·5	77·4	76·2
Típpera .....*	23 27·5	91 2·3	L. a. L. S.	64·7	68·4	75·6	81·1	82	81·5	81·6	81·8	81·3	80·2	72·2	65·8	66·3	79·6	81·6	77·9	76·3
Tirhút .....*	26 7·3	85 22·8	255	58·2	64·9	73·7	82·3	87·2	86·8	80·7	80·3	84	79·2	69·6	61	61·4	81·1	82·6	77·6	75·7

3. HINDOSTÁN,

THE UPPER GANGETIC PLAIN.

Station.	Lat.	Long.	Height.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	D.J.F.	M.A.M.	J.J.A.	S.O.N.	Year.
			ft.																	
Ágra .....*	27° 10·2	70° 1·7	657	57·5	66·4	76	85·5	94·8	93·9	86	85·3	84	78·1	69·2	60·2	61·4	85·4	88·4	77·1	78·1
Aligárh.....†	25 53·8	78 39	750	58·6	63·3	75	83·9	91·4	93·6	87·2	86·3	84·4	78·4	68·3	60·6	60·8	83·4	89	77	77·5
Allahabád .....*	25 26	81 51·9	316	64·2	67·6	77·3	92·6	97·6	91·9	89·0	86·3	85·7	83·1	71·6	64·9	65·6	89·2	89·1	80·1	81
Azimgárh.....*	26 32	83 9·9	(550)	60	70·6	78·2	85·6	88·5	90	84·8	85·3	84·2	80·2	69·6	61·7	64·1	84·1	86·7	78	78·2
Baréli .....*	28 22·2	79 23·2	693	58·9	65·8	71·6	77·8	86·8	89·7	84·3	86·5	81	78·4	71·2	60·2	61·6	78·7	86·8	76·9	76·0
Benáres .....*	25 18·4	82 59·8	347	62·1	69·2	79·4	88·9	95·3	91	84·9	85·7	84·9	81·4	71·6	64·3	65·2	87·9	87·2	79·3	79·9
Bijnúz	29 22	78 9	530	53	64	74½	81	87½	92	86	87½	86·4	76·8	65·9	57	58	81	88·5	76·4	76·0
Déhli .....*	28 38·9	77 13·1	827	55	60·7	69·2	79·3	87	91·1	85·2	82·5	81·6	74·4	63	56·7	57·5	78·5	86·3	73	73·8
Étava .....*	26 45·5	78 59·9	550	58·4	64·8	74·4	82·4	89·9	92·5	85·3	84·4	84	77·8	66·5	57·6	60·3	82·2	87·4	76·1	76·5
Fátigárh .....*	27 23·3	79 37	635	57·9	65·8	74·1	82·4	91·2	90·7	86·2	83·7	83·4	76·9	67·8	59	60·9	82·6	86·9	76	76·6
Gházipur .....*	25 33·6	83 31·8	351	63·6	67·5	79	87	93·7	90·1	88	85·4	86	83·5	70·6	64·9	65·3	86·6	87·8	80	80
Gorákhpur .....*	26 46·1	83 18·7	340	62·6	66·8	74·5	83·1	88·3	87·8	84·5	84·5	84·2	78·3	70·1	63·4	64·3	82	85·6	77·5	77·3
Jaunpur.....*	25 43·8	82 40·7	(380)	57·5	63·4	74	82·3	86·2	87·2	...	82·5	83·2	80	67·4	59·3	60·1	80·8	...	76·9	...
Kálsi	30	77½	(1100)	58·3	61	62·6	77·7	81·1	86	83·7	80·2	77·2	70·8	63·2	59·7	59·6	73·8	83·3	70·3	71·8
Kánhpur .....*	26 28·3	80 20·3	525	58·3	66·4	75·7	86·3	93·8	93·4	85·2	85·9	84·8	78·1	69·8	61·7	62·1	85·3	88·2	77·6	78·3
Mainpúri	27 14	79 2	620	58	68	73	93	94	91	88	83	80	73	68	60	62	86·7	87·3	73·7	77·4
Máthra.....*	27 30·2	77 40·3	655	60·4	67·5	74·4	84·1	89·5	93·4	86·8	86·5	86	80·1	72	62·7	63·5	82·7	88·9	79·4	78·6
Mírath .....*	29 0·7	77 41·6	859	56·9	62·9	70·7	80·5	88·7	91·9	85·7	85·3	84	76·6	76·6	58·7	59·5	80	87·6	76·1	75·8
Mírzapur.....*	25 9·3	82 33·9	362	61½	64	75	83	90	90	87	86	85	80	70	64	63	83	88	78	78
Mozáfarpúr	26 7	83 21	(300)	56·8	64·6	73·6	77·1	86·9	86·4	84·4	83	82·6	78·1	67·5	60·1	60·8	80·7	84·7	76·1	75·6
Muradabád	28 49	78 56	673	58	60·9	72·6	80·6	86·75	88·75	84·1	84	83·5	74·9	66·1	58·75	58·9	80	85·6	74·7	74·8
Panipát	29 23	76 59	936	56·1	74·4	...	80·4	86	91·6	88·6	86·3	...	...	...	...	...	...	88·8	...	...
Saháranpur .....*	29 57·2	77 28·8	1002	55·5	58·9	70·5	78·5	88·3	91·8	87	86·5	83·1	77·4	67	60·7	58·4	79·1	88·4	75·8	75·4
Sáráuli	28 30	79 10	(700)	50·7	57·1	66·4	75·6	81	85·7	85·1	83·3	77·9	70·7	58·3	56·6	54·8	74·3	84·7	69	70·7
Shahjehánpur .....*	28 1·6	79 31·8	(1200)	56·1	59·5	67·5	78·3	86·3	91·9	85·7	86·5	82·4	77·3	67·6	61·8	59·1	77·4	88	75·8	75·1
Sítapur	27 35	80 44	(450)	...	...	...	76·95	85·9	87·6	86·95	83·05	82·7	74·5	...	...	...	...	85·9	...	...
Sultánpur.....*	26 15·6	82 33	(450)	60·7	68·3	76	87·1	...	...	85·4	...	...	...	...	58·9	62·6	...	...	...	...

4. PĂNJÁB,

INCLUDING THE STATIONS WEST OF THE INDUS.

Station.	Lat.	Long.	Height.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	D.J.F.	M.A.M.	J.J.A.	S.O.N.	Year.
			ft.																	
Ambála .....†	30° 21′·4	76° 48′·8	1026	54·5	61	69·9	78·4	86·5	91·1	85·8	85·7	84·3	75	63·2	56·2	57·2	78·3	87·5	74·2	74·3
Ásni	29 12	70 7	(410)	52	61	70½	79	86	93	90	86½	86	72½	...	...	...	78·5	89·8	...	...
Bănnu	32 40	70 30	(1800)	49·5	55	64	74	82	93	91	88·5	86·3	75	64·8	55·1	53·2	73·3	90·8	75·4	73·2
Dera Gházi Khan...	30	70 54	(430)	51·4	59·7	68·9	78·6	85·2	93·8	91·3	88·3	86·2	71·7	64·5	55·5	55·5	77·6	91·1	74·1	74·6
Déra Ismáel Khan †	31 39·6	70 56·5	478	49	58·6	70	79	86·5	94·5	95·6	91·5	90	81·2	67	52·7	53·4	78·5	93·9	79·4	76·3
Firózpur .....*	30 57·1	74 38·4	1120	51	58·5	66·9	77·1	83	91·1	88·2	86·4	85·4	73·4	62·2	53·7	54·4	75·7	88·6	73·7	73·1
Govindgárh	31 40	74 45	(900)	51	56	64·7	73·2	81·2	85·3	85 5	84	83·5	76·5	63·2	55·5	54·2	73	84·9	74·4	71·6
Gugéra	30 51	73	(600)	50	59	69½	77½	90	95½	...	89·5	82	...	58	...	...	79	...	...	...
Hánsi .. ..*	29 6·1	75 57·1	(1000)	55·5	62	71·5	88·1	95·4	96·9	86	82	79·8	72	65	57·5	58·3	85	88·3	72·3	76
Hoshiárpur .....*	31 32·2	75 53·9	1066	53·9	59	66·6	80·5	85·2	92·1	86·2	84·7	84·1	78·4	63	56·5	56·5	77·4	87·7	75·2	74·2
Jálhándar .....*	31 19·5	75 33·3	(900)	53·5	59·6	66·9	76·4	81·5	87·4	86·9	84·4	83·9	75·9	65·6	57·9	57	74·9	86·2	75·1	73·3
Jhílum .....*	32 55·2	73 42	1620	50·45	58	65·2	73·3	83·4	91·5	87·25	85·2	84·95	74·5	64·6	49·05	52 5	74	88	74·7	72·3
Kartárpur .....*	31 26·7	75 29·1	(800)	57	61·4	67·5	76·6	86·4	91	87·5	87	88·6	79·6	69	60	59·5	76·8	88·5	79·1	76
Kohát ....*	33 32·5	71 22·9	1725	51·8	59·4	68·7	75·9	86·7	91·3	90	87·6	86·7	78	62·2	57·6	56 3	77·1	89·6	75·6	74·7
Lahór .....†	31 31·1	74 14·6	839	52·3	60·7	68·3	78·6	87·1	92·2	87·6	86·4	85·7	77	66·4	57·7	56·9	78	88·7	76·4	75
Láya	30 59	70 57	(450)	49·5	59·3	66·6	76·5	83·2	91·9	88·6	85·9	83·8	71·6	58·8	50·5	53·1	75·4	88·8	71·4	72·2
Ludhiána..... .....*	30 55·4	75 50·2	893	51·5	61·8	67·8	77·4	84·7	91	87·8	87·8	84·8	75·3	...	53·4	55·6	76·6	88·9	...	...
Multán.....†	30 10·2	71 34·6	480	56½	61	67	80	84·7	94	92	90	88	79	70·5	59½	59	77·2	92	79·2	76·8
Nakódar.....	31 7	75 27	(840)	53·9	...	69·4	78·6	85·05	91·8	89	84·5	85·7	77·5	68·2	57·8	...	77·6	88·4	77·1	...
Naushéra.....*	34 3·1	71 58·4	(1200)	51·1	51·1	61·4	74	81·9	95·2	91·2	89·7	85·9	74	57·6	56	51·5	72·4	92	72·5	72·1
Pesháur .....*	34 3·2	71 33·3	1280	52·3	57·1	62·5	73·2	81	90·1	91·8	87·6	86·1	73·7	63·2	55·9	55·1	72·2	89·8	74·3	72·9
Raulpíndi .....†	33 36·5	72 59·8	1737	51·4	56·4	60·4	72·8	81·5	90·1	86·1	83·3	81	76	63·1	54·3	54	71·6	86·5	73·4	71·4
Shāhpur .....†	32 14	72 32·5	681	53	54	62	80	86	95	91	93	87	76	65	58	55	76	93	76	75
Vazirabád.....*	32 26·3	74 6·4	(900)	52	61·9	67·8	77·8	86·1	93·3	89·1	88	87·3	77·7	66·1	57·3	57·1	77·2	90·1	77	75·4

5. WESTERN INDIA,

RAJVÁRA, GUJRÁT, KÁCH, SINDH.

Station.	Lat.	Long.	Height.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	D.J.F.	M.A.M.	J.J.A.	S.O.N.	Year.
			ft.																	
Ábu	24° 45′	72° 46′	3850	...	...	74	76·7	78	78	74	...	...	...	...	...	...	76·2	...	...	...
Ajmír .....*	26 27·2	74 40·6	(1500)	61·7	69·3	78·3	87·4	94·3	92·5	85·6	82·7	83·5	82·2	73	65·1	65·3	86·6	86·9	79·5	79·6
Baróda	22 16	73 14	L. a. L. S.	69 3	73·2	81·7	90·6	94·7	88·4	80·8	81·4	82·1	79·8	73·3	71·2	71·2	89	83·5	78·4	80·5
Beávr	26 6	74 21	(2000)	...	64·75	75·1	88·2	94·5	91·7	85·8	82·6	82·6	...	68·9	...	...	85 9	86·7	...	...
Bhūj	23 17	69 40	281	65½	71½	79½	82	84	87	81	80	79	75	70	59	65·3	81·8	82·7	74·7	76·1
Erinpúra .....*	25 9·3	73 63	(1500)	48½	59	70·5	84·1	89·4	90·3	85	82·1	81·7	79·1	67·2	56	54·5	81·3	85·8	76	74·4
Kárrách .....†	24 45·5	67 0·9	L. a. L. S.	67	67	77	79	83	87	84	88	86	80	72	63	66	80	86	79	77·7
Khervára	26 4	74 20	(2000)	60·6	68·6	79	87·4	91·8	87·4	80·4	78·9	79·6	77·2	70·6	61·3	63·5	86·1	82·2	75·6	76·9
Nazirabád	26 18	74 42	1487	59·2	62·7	71·8	82·6	90·4	90·1	85·7	82·7	82·5	78·8	68·5	58·2	60	81·6	86·2	76·6	76·1
Nímách.....*	24 27·5	74 59	1356	63·9	70·8	78·6	86·8	90·3	86·6	79·5	78·1	78·5	78·7	73·5	65·2	66·6	85·2	81·4	76·9	77·5

6. CENTRAL INDIA,

BERÁR, ORÍSSA, MÁLVA, BÁNDELKHÁND.

Station.	Lat.	Long.	Height.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	D.J.F.	M.A.M.	J.J.A.	S.O.N.	Year.
			ft.																	
Báitul .....*	21° 51·2	77° 54·8	(2000)	59·3	62·3	72·2	83·1	84·8	80·4	76·8	75·6	78·3	73·8	63·3	60·8	60·8	80	77·6	71·8	72·5
Hamírpur	25 58	80 12	645	64·7	74·2	76·7	87·6	93·8	93·4	85·3	85·7	85	82·1	69	63·7	67·5	86	88·1	78·7	80·1
Hushangabád	22 45	77 42	1050	...	...	80·1	90	94·7	90·5	83·9	81·6	80·8	80	70·7	...	...	88·3	85·3	77·2	...
Jáblpur .....*	23 9·7	79 56·3	1396	62·8	66·8	75	85·3	91·3	87·8	81	80·4	81·5	75·1	67·9	60·8	63·5	83·9	83·1	74·8	76·3
Jhánsi	25 28	78 35	745	63·6	70·5	78·9	88·4	93·7	92·6	84·1	82·4	82·2	80·7	73·4	64·7	66·3	87	86·4	78·8	79·6
Kokonáda	17 6	12 14	L. a. L. S.	74·5	77·9	81	85·1	87·8	86·3	83·3	82·3	82	79	77·3	75·4	75·9	84	84	79·4	81
Máhu (Mhow)	22 33	75 49	1862	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	74
Nágpur	21 10	79 7	9535	71·4	74·9	84·3	93	96·3	86	81	81·1	81·5	81·6	75·4	72·6	72·9	91·2	82·7	79·5	81·6
Nársinghpur	22 57	79 8	1305	60·8	64·4	74	83·1	84·8	86·7	81·1	79·8	79·5	77·7	70·5	62	62·4	80·6	82·5	75·9	75·4
Naugóng .....*	25 3·5	79 27·6	(570)	60·9	73·3	76·4	82·7	91·3	92·4	85·7	84·1	83·7	80·2	71·1	63·4	65·9	83·5	87·4	78·3	78·8
Orái	25 59	79 31	(1700)	65	75½	80	90	96½	95·2	90·2	87·2	86·2	82·5	68·2	66	68·8	88·8	90·9	79	81·9
Púri .....*	19 48·2	85 45·8	L. a. L. S.	69·05	73·55	80·6	85	86·5	85·85	84·2	84·7	83·95	81·7	76·5	72·1	71·5	84	84·9	80·7	80·3
Ságar .....*	23 50·2	78 43·4	1906	58	71½	73	86	91·5	92	86	81¼	76½	76½	65½	63½	64·5	83·5	86·4	72·8	76·8
Sehór	23 12	77 1	1620	60·8	66·5	75	83·9	90·4	86·4	80·4	78·4	78	74·5	68	65	64·1	83·1	81·7	73·8	75·7
Vizagapatám	17 41	83 21	L. a. L. S.	71·4	75·9	81·2	...	87·1	...	...	84·5	...	...	...	...	...	...	...	...	...

7. SOUTHERN INDIA, HILLY DISTRICTS:

1. DÉKHAN AND MAISSÚR.

Station.	Lat.	Long.	Height.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	D.J.F.	M.A.M.	J.J.A.	S.O.N.	Year.
			ft.																	78
Ahmadnágar	19° 6′	74° 46′	2133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Bangalúr	12 57·6	77 33·5	2949	69·5	72·1	78·2	79·7	80·6	75·3	73·2	74·4	74·3	72·8	71·5	69	70·2	79·5	74·3	72·9	74·2
Belgáũ	15 50	74 32	2500	70	74	82	81·5	84	82	74	74·5	74	73·5	70·5	68	70·6	82·5	76·8	72·6	75·6
Bellári .....*	15 8·9	76 53·8	1538	73·8	78	84·8	87·5	86·4	83·3	80	80·1	78·4	78·8	77·3	73·5	75·1	86·2	81·1	78·2	80·2
Bíjapur	16 50	75 47	(1700)	78·7	75·3	84·8	88·4	88·5	85	81·2	78·7	78·2	76·6	76·7	79·2	77·7	87·2	81·6	77·2	81·7
Dharvár	15 27	75 1	2423	70·2	74·7	77·2	80·4	80·3	74·8	72·9	72·7	...	...	...	...	(70)	79·3	73·5	...	...
French Rocks	12 31	76 40	2620	72·8	77·6	81·4	83·5	83·9	79·2	75·4	74·3	76·9	77·1	75	73·7	74·7	82·9	76·3	76·3	77·6
Gúti .....*	15 6·9	77 38·1	1115	...	79·7	85·1	90·5	...	84·2	...	...	...	...	...	...	...	...	...	...	...
Hárihár	14 31	75 51	1900	74	78·9	86·1	87·7	86·7	81·2	75·8	78·7	79	80·7	79·3	75	76	86·8	78·6	79·7	80·3
Jálna	19 51	75 54	1652	74·3	75·7	83·2	87	90	83	77·2	79	77	79·4	77	72·5	74·2	86·7	79·7	77·8	79·6
Kádapa .....*	14 28·8	78 48·4	364	76·8	83·1	87	90·9	91·4	89	86·7	83·8	83·2	82·3	77·8	74·3	78·1	89·8	86·5	81·1	83·9
Kárnúl .....*	15 49·9	78 2·1	(900)	78·9	80·9	86·8	91·3	90·4	87	82·4	82·5	82·3	81·5	78·9	76·6	78·8	89·5	84·0	80·9	83·3
Kírki .....*	18 33·5	73 50·2	1850	71	75	81	81·5	82·5	78·5	77	75	75	80	77	71	72·3	81·7	76·8	77·3	77
Mahabaléshvar ...*	17 54·4	73 38·7	4300	64	66·3	71·5	74·5	72·4	66·3	63·2	63·2	63·9	66·6	64·4	63·2	64·5	72·8	64·2	65	66·6
Merkára	12 24	75 45	4506	69·4	72·4	76·8	75·9	74·2	69·1	67·3	67	67·8	69·6	70	69·3	70·4	75·6	67·8	71·5	71·3
Pháltan	17 59	74 26	(1700)	74·8	76·9	83·9	83·9	86·1	81·2	80·2	79·3	78·9	80	73·5	72·9	74·9	84·6	80·2	77·5	79·3
Púna .....*	18 30·4	73 52·1	1784	70·7	73·7	74·1	82	82·3	80·8	77·4	77·1	77·1	79·1	76·4	70·6	71·7	79·5	78 4	77·5	76·8
Purandár .....*	18 16·6	73 57·3	3974	67·3	70·2	77·6	80·1	77·6	69·6	65·2	64·7	64·3	67·6	68·2	65·2	67·6	78·4	66·5	66·9	69·8
Satára	17 41	74 2	2320	70	72·6	77·8	80·6	80·1	77	73·8	73	74	76·1	72	71·8	71·5	79·5	74·6	74·1	75
Shólapur	17 40	75 58	(1700)	74½	80	83	89	85	85	82	81	80	78	74	73	75·8	85·7	82·7	77·3	80·4
Sikándarabád .....*	16 26·7	78 27	1830	68·2	70·1	79·9	84·7	87·5	81·9	78	77·8	76·6	76·5	75·5	71·2	70	84	79·2	76·2	77·4

2. NILGIRIS.

Station.	Lat.	Long.	Height.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	D.J.F.	M.A.M.	J.J.A.	S.O.N.	Year.
	° ′	° ′	ft.																	
Átăre Mállē	8 31	77 10	(4500)	62·7	65	67·6	68·1	66·5	63·7	64·9	65·5	66·2	64·5	64·7	63·3	63·6	67·4	64·7	65·1	65·2
Dodabétta	11 23	76 44	8640	50·8	52·2	55·1	56·6	57·7	52·9	52·7	52·9	52·2	53	51·9	50·8	51·3	56·5	52·8	52·4	53·2
Jakunári	11 24	76 53	(5000)	57·1	55·2	60·8	62·9	63·5	62	64·3	62·5	58·3	61·8	57·1	59·7	57·3	62·4	62·9	59·1	60·4
Koimbatúr.....	11 1	76 58	1483	73·5	72·7	79·2	81·7	81	77	76·7	77·2	77·5	76	74·2	73·2	73·1	80·6	77	75·9	76·7
Koterghérri	11 26	76 57	6100	58·7	59·7	60·5	62	62·2	63·5	65	65·5	64	62	60·5	59	59·1	61·6	64·7	62·2	61·9
Manantvádi	11 48	76 1	2685	57	63½	70¾	71½	72	69	67	67	67½	67¾	68	65¼	61·9	71·4	67·7	67·7	67·2
Sírlu	11 22	76 55	(3500)	68·5	69·5	73·6	...	76·1	...	...	...	...	...	...	...	...	...	...	...	...
Utakamánd.....*	11 23·7	76 43·2	7490	51·5	52·8	57·3	60·1	60·8	57·9	55·8	56·1	56·4	55·9	53·9	51·9	52·1	59·4	56·6	55·4	55·9

8. SOUTHERN INDIA, COASTS,

KÓNKAN, MÁLABAR, KARNÁTIK.

Station.	Lat.	Long.	Height.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	D.J.F.	M.A.M.	J.J.A.	S.O.N.	Year.
	° ′	° ′	ft.																	
Anjarakándi	11 40	75 40	L. a. L. S.	79·7	81·9	83·5	85·6	83·7	79·8	78·4	79·1	79·6	80·7	80·6	80·2	80·6	84·3	79·1	80·3	81·1
Árkot .....*	12 54·3	79 19	599	74	76	82	87	85	88	87	85	83	81	78	73	74·3	84·6	86·6	80·6	81·5
Bombay .....*	18 53·5	72 49·1	L. a. L. S.	74·5	76·2	80	83·3	85·6	83·3	81·3	80·7	80·4	82·1	79·7	76·5	75·7	83	81·8	80·7	80·3
Chittúr.....*	13 11	79 6	1112	75·6	77·8	82·2	88·4	90	86·9	84·8	83·1	83	78·5	74	73·7	75·7	86·9	84·9	78·5	81·5
Gantúr.....*	16 17·7	80 25·6	L. a. L. S.	74½	78½	81½	84½	88	85½	84	83½	82½	82	81	78½	77·2	84·7	84·3	81·8	82
Kádalur .....*	11 43·6	79 45·7	L. a. L. S.	77·4	79·2	83·3	84·9	87·3	86·1	86	83·9	84·5	82·8	78·2	76·3	77·6	85·2	85·3	81·8	82·5
Kalikát.....*	11 15·2	75 45·4	L. a. L. S.	81·3	82·2	83·9	84·8	85·5	80	78·7	79·4	79·5	80·3	80·4	79·2	80·9	84·7	79·4	80·1	81·3
Kananúr .....*	11 51·2	75 21·3	L. a. L. S.	79·7	81·0	83·7	85	84·5	79·5	78·3	78·8	79·3	79·7	80·7	79·2	80	84·4	78·9	79·9	80·8
Karikál	11 5	79 56	L. a. L. S.	76·6	79·0	82	86·3	87·3	88·7	85·6	83·5	84·1	82	78·9	75·1	76·9	85·2	85·9	81·7	82·4
Kóchin.....*	9 58·1	76 15·6	L. a. L. S.	79·4	80·7	83·6	84·7	82·7	78·2	77·1	79·1	80·1	80·1	80·3	79·8	80	83·7	78·1	80·2	80·5
Madrás.....*	13 4·2	80 13·9	L. a. L. S.	75·9	77·8	81·1	84·3	87·2	87·6	85·6	84·4	83·9	81·7	78·4	76·3	76·7	84·2	85·9	81·3	82
Madúra .....*	9 55·3	78 6·3	600	79·3	82·5	86·2	88·7	90	88·6	87·2	86·2	86·9	84·7	80·1	79·1	80·3	88·3	87·3	83·9	84·9
Mangalúr.....*	12 51·7	74 49·2	L. a. L. S.	80·2	80·5	83·6	85·1	86·1	79·1	78·3	77·9	79·3	79·9	81	80·8	80·5	84·9	78·4	80·1	81
Masulipatám .....*	16 9	81 8·2	L. a. L. S.	78·2	79·5	83	87·6	90·4	92·6	84·0	87·1	83	81·8	79½	78½	78·7	87	87·9	81·4	83·8
Nellúr .....*	14 28	79 58·3	81	77·2	76·7	77·5	84·2	88·7	89·2	87·4	86·3	84·8	81·7	77·9	73·5	75·8	83·5	87·6	81·5	82·1
Pallamkótta.....*	8 43·5	77 43·3	209	79	79·8	84·1	85	87·8	86	85·1	84·9	86·4	82·6	80	78·5	79·1	85·6	85·3	83	83·3
Pondichéri .....*	11 56	79 49·1	L. a. L. S.	80·1	81·4	82·8	84·5	86·9	87	86·0	86·3	88·5	84·2	82	84·2	81·9	84·7	86·4	84·9	84·5
Rajamándri.....†	17 10·5	81 46·6	L. a. L. S.	72·9	76·8	82	87·3	89·1	90·5	82·2	84	79·9	85·1	82	77½	75·7	86·1	85·6	82·3	82·4
S. Thomas Mount...	13	80 8	314	79·9	80·5	81·8	86·9	90·8	90·3	89·5	88	87	83·7	80	79	79·8	86·5	89·3	83·6	84·8
Sálem .....*	11 39·2	78 8·4	907	75·9	77·4	81·3	85·4	85·7	83·4	81·7	81·4	82	80·2	76·7	76·6	76·6	84·1	82·2	79·6	80·6
Tinevélli .....*	8 43·8	77 40·4	120	81·2	81·7	84·5	88·6	88	88·8	85·4	85·1	86	84	80·6	80·9	81·3	87	86·4	83·5	84·6
Trichinápalli .....*	10 49·8	78 40·9	297	80·2	83·1	86·3	88·4	90·6	87·3	85·1	84·9	84·4	82·8	82·2	81·1	81·5	88·4	85·8	83·1	84·7
Trivándrum	8 29	76 56	L. a. L. S.	78·1	79·7	81·7	82·7	81·5	78·5	78	78·3	78·5	78·5	77·6	78·1	78·6	82	78·3	78·2	79·3
Vingórla .....*	15 51·2	73 35·9	L. a. L. S.	76	81	81	81⅓	...	...	...	...	...	...	...	78	...	...	...	...	...

9. CEYLON.

Station.	Lat.	Long.	Height.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	D.J.F.	M.A.M.	J.J.A.	S.O.N.	Year.
	° ′	° ′	ft.																	
Bádula	6 59	81 11	2450	66⅔	68⅓	68⅓	71⅓	72⅓	71	69⅓	72	72⅓	72⅔	71	70½	68·5	70·7	70·8	71·9	70·5
Battikótta	9 36	80	L. a. L. S.	78·5	80·6	82·4	85·1	85·4	84·6	83·3	83·2	82·9	82·3	79·9	78·4	79·2	84·3	83·7	81·7	82·2
Gálle .....†	6 2·5	80 10·8	L. a. L. S.	...	...	...	...	82·1	...	...	...	...	...	...	...	...	...	...	...	81
Kándi.....	7 17	80 49	1739	70·6	72·5	74	73·8	74·6	73·1	72·5	73·3	72·7	72·2	72·1	71·8	71·6	74·1	73	72·3	72·8
Kolómbo .....†	6 56·1	79 49·8	L. a. L. S.	78·7	79·5	81·2	82·4	81·8	81·3	80·7	80·5	80·3	79·1	78·8	78·1	78·8	81·2	80·8	78·4	80·2
Máteli	7 32	80 47	1187	70·6	72·6	75·2	78·5	79·7	79·7	78·9	77·6	77·2	75·6	74·5	72	71·7	77·8	78·7	75·8	77
Nurélia	7 13	81 52	6218	55·9	58	59·7	59	60·1	59·2	59·6	59·1	59	58½	58	57	57	59·6	59·3	58·5	58·6
Pátlam	8 2·8	79 53·6	L. a. L. S.	75·5	78·9	83	83·2	81·1	82·1	79·9	81·4	80·4	80·3	78·2	77·7	77·4	82·4	81·1	79·6	80·1
Peredénia	7 17	80 49	1650	73·4	74·9	76·5	78	77·7	75·7	76·1	75·5	75·9	74·4	74	73·1	73·8	77·4	75·8	74·8	75·4
Trinkonomalí .....†	8 33·5	81 13·2	213	77·8	78·6	81·3	83·9	84	81·5	84·4	83·1	82·3	80·8	79·8	78·4	78·3	83·1	83	81	81·4

10. INDO-CHINESE PENINSULA, ARCHIPELAGO, AND CHINA.

Station.	Lat.	Long.	Height.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	D.J.F.	M.A.M.	J.J.A.	S.O.N.	Year.
	° ′	° ′	ft.																	
Akyáb .....*	20 8	92 52·6	L. a. L. S.	70·8	73·4	78·8	83·5	85·6	81	81·8	81	81·7	81·9	77·2	72·8	72·3	82·6	81·3	80·3	79·1
Álor Gájah	2 11	102 17	L. a. L. S.	...	...	...	...	...	...	...	82·7	81·4	80·6	80·6	72·2	...	...	...	81·8	...
Áva.....	21 50	96 2	L. a. L. S.	64·7	73·5	75·9	86·2	84	85·5	82·8	82·5	82·7	80·6	74·2	68·3	68·8	82	83·6	79·2	78·4
Bangkók.....	14	101 30	L. a. L. S.	76·7	79	83·8	84·2	83·7	82·8	82	81·7	81·3	80·8	80·5	76·9	76·5	83·9	82·2	80·9	81·14
Batavia ..... S	6 10	106 58	L. a. L. S.	79	79·3	80·4	80·1	80·6	79·2	78·9	79	79	77	77·6	79·4	79·2	80·4	78·7	77·9	79
Chúsan	30 25	121 44	L. a. L. S.	40½	38¾	...	...	...	...	...	...	77¾	68½	57½	43½	40·9	...	...	67·8	...
Hong-Kong	22 11	114 7	(140)	68	63·2	65·5	73·8	80·7	84·4	86	83·1	83·5	78·5	71·9	65·4	65·5	73·3	84·5	78	75·3
Kánton	23 8	113 16	L. a. L. S.	52·5	55	62·5	70	77	81	83	82	80	73·3	65·2	57·1	54·8	69·8	82	72·8	69·9
Kyuk-phyú .....*	19 25·2	93 32·2	L. a. L. S.	74·15	73·3	80·7	87·35	87·4	80·75	79·7	77·6	80·7	83·3	77·9	74·05	73·8	85·1	79·3	80·6	79·7
Makáo	22 11	113 34	L. a. L. S.	62	54·9	64·3	71·3	78·4	82·7	82·9	83·1	81·6	76·1	67·4	61·2	59·4	71·3	82·9	75	72·2
Manilla	14 36	121 9	L. a. L. S.	77·1	77·5	79·5	81·5	81·7	81·3	80·2	78·9	78·8	79·9	79·7	78·3	77·6	80·9	80·1	79·5	79·5
Mérgui	12 27	98 35	L. a. L. S.	79·5	81·3	80·6	82·8	80	78·6	78·4	78·6	77·5	79·5	...	...	...	81·1	78·5	...	...
Pádang ..... S	0 59	100 31	L. a. L. S.	81·7	...	...	...	...	...	...	...	...	80·5	80·8	81·3	...	...	...	...	...
Rangún	16 48	96 17	L. a. L. S.	73·2	79·3	86·5	87	80·2	79·7	80·2	78	80·3	82·3	81·1	76·7	76·4	84·6	79·3	81·2	80·4
Sámarang ..... S	7	110 31	L. a. L. S.	80·1	80·8	80·5	82·6	82·5	81·1	80·5	82·1	83·1	84·2	83·6	81·3	80·7	81·9	81·2	83·6	81·9
Sarávak	1 34	110 29	L. a. L. S.	...	...	...	...	...	79·6	78·8	78·7	...	...	...	...	...	...	...	...	...
Sándove.....	18 25	94 30	L. a. L. S.	69·1	71·4	75·9	81·9	82·3	80·2	77·7	79	79·6	80·7	76·3	71·7	70·7	80	79	78·9	77·1
Shanghái	31 2	121 20	L. a. L. S.	40·2	39·5	46·7	56·9	65·7	69	81·9	81·6	74·4	67·3	55·8	45·1	41·6	56·4	77·5	65·8	60·3
Singapúr	1 18	103 53	L. a. L. S.	78·7	80·1	80·5	81·1	81·8	81·8	82	81·3	81	81	80·2	79·3	79·4	81·1	81·7	80·7	80·7
Tavái	14 7	98 18	L. a. L. S.	76·5	79·5	81	82·6	81·6	79·2	78·6	78·6	77·8	79·6	80·6	78·1	78	81·7	78·8	79·3	79·5
Áden	12 46	45 15	187	72·5	73·4	76·8	80·6	84·9	85·5	83·3	81·5	84·9	83·3	78·6	77·2	74·4	80·8	83·4	82·3	80·2

III. *Decrease of Temperature with Height in the Tropics.*

The decrease of temperature with height had to be taken into consideration, not only on account of its practical importance for the selection of stations and sanitaria, but also for comparing the different parts of India, independently of the accidental height of the observer's residency, and for drawing finally the general isothermal lines.

For the Dékhan and Central India, Púna, Purandăr, and French Rocks could be compared with the coasts of the Kónkan and the Karnátik; for the South I had three stations in the Nílgiris and one in Ceylon, which could be referred to the shores of the Indian Ocean.

The following Table shows the results I had obtained for the year and the seasons:—

A. Dékhan and Central India.

Places of observation.	Height above the level of the sea.	Height in feet = decrease of 1° F.				
		Year.	Dec. to Feb.	March to May.	June to Aug.	Sept. to Nov.
Púna	1784	410	370	360	310	595
Purandăr	3974	435	450	660	230	390
French Rocks	2620	750	900	1200	340	600

B. Nílgiris and Ceylon.

Places of observation.	Height above the level of the sea.	Height in feet = decrease of 1° F.				
		Year.	Dec. to Feb.	March to May.	June to Aug.	Sept. to Nov.
Nílgiris.						
Átare Mállē	4500	270	310	260	220	290
Utakamănd	7490	280	300	270	260	290
Dodabétta	8640	310	350	310	265	300
Ceylon.						
Nurélia	6218	280	290	280	270	290

For the Dékhan and Central India we see that the decrease is very slow; for the Alps, for instance, I formerly obtained 320 English feet for 1° Fahr.* As the principal cause of the decrease being not more rapid, we may consider, I think, the circumstance that the elevation, though not very considerable, extends itself with great uniformity over a large surface.

In the second group the values are less different from those in the Alps and in High Asia; for both groups of the Indian stations it is characteristic that the rainy season shows by far the most rapid decrease.

For showing *simultaneously* the variations of the decrease with the locality and the seasons, I have drawn three topographical profiles (see Plates XXIX.–XXXII.), and have indicated for each of the single seasons the difference of the respective decrease

* Neue Unters. phys. Geogr. d. Alpen, p. 584. The numbers I have given there are 540 French feet for 1° C.

from its annual mean value by drawing a dotted line in connexion with the topographical outline. The dotted line shows the contour which the topographical section ought to have for the actual temperature of the season, supposing the value of the decrease would have remained the same throughout the year; if, therefore, the decrease in the season is too slow, the new ideal position of the station will be below the real topographical outline, on account of the station having a temperature as if it were in a less elevated situation; if, *vice versâ*, the decrease is more rapid than the annual mean, as we see it particularly to be the case in the rainy season, the dotted line will show, from the same reason, a profile which is higher than the topographical contour. For Ceylon I further added the point of its highest peak, Péduru tálla gálle, 8305 feet, for the sake of completing the general topographical profile of the island, though I had no higher station for its mountainous regions than Nurélia. The decrease of temperature with height in the Himálaya, the Karakorúm and Kuënlün had not to be calculated in connexion with the construction of these maps. As I had direct data for the beginning of the isothermal lines along the western and the eastern margin of these mountainous regions, the form of the dotted lines which I now have drawn across them could be obtained directly by uniting the terminal points. This circumstance is very valuable, too, when I come later to examine the influence which is exercised by the topographical formation (including vast plateaux, ridges, and isolated lofty peaks), and by the extent of the snowy regions, upon the alterations of the decrease of temperature with height.

IV. *Thermal Types of the Year and the Seasons.*

The considerations about the distribution of temperature over the *surface* of India in general may best be combined with the analysis of the isothermal curves on the maps annexed (Plates XXVIII.–XXXII.).

In reference to the geographical details, I have limited myself to the principal river-systems; and to avoid interfering with the distinctness of the isothermal lines, the names of the stations, as well as the mountain-systems, are left out; for the means of the year, the Indian Archipelago and countries to the north-east of it are also added on a smaller scale.

In drawing the lines, I made these distinctions: besides the lines being dotted where they pass the regions of High Asia, also the thermal equator is distinguished, its line being a broken one. In consequence of the great difference in latitude between the western and the eastern end of the Himalaya, the curves extend along the western margin of the Map from 5° to 35° of latitude; along its eastern margin only from 5° to 30°. For the period corresponding to our summer, the isothermal lines could be continued for Central Asia somewhat further to the north, in connexion with our personal stay in these regions.

The eastern part in the higher latitudes of the Map is throughout cooler than the western part, as shown in the following Table, where the numerical values are nearly the same, though the difference in latitude amounts to 5°.

		Warmest isothermal line.	Minimum in the N.W.	Minimum in the N.E.
	Year	84°	73°	73°
Seasons.	December, January, February	80	57	60
	March, April, May	90	72	73
	June, July, August	92	89	81
	September, October, November	82	75	74

The isothermal lines of the year very decidedly show the influence of the topographical form of the Indian peninsula on the increase of the mean temperature: in the southern parts they follow the contours of the shores, or obtain forms evidently in connexion with them; in the northern part these lines are raised to the extent of a difference of five degrees of latitude where they pass over the central axis of India. At the same time, southern India presents one of those insular regions of greatest heat which are connected with each other by the thermal equator; the Indian archipelago shows us the next of these regions which follows to the east.

When comparing the seasons, we are particularly surprised by the unusually great *variety* of the four types, whilst in many of the more western regions of the tropics we see that it is more the numerical value of the lines which is changed than the type of their forms. In India and the Indian archipelago the thermal equator runs still to the south of the geographical one for all the three months of the cool season; but in the season corresponding to our summer, from July to August, we see it has been raised up to the latitude of 32° N. This part of the year is, for the greater part of the map, the rainy season, though for the region in the north-west it is the very season of an absolute maximum of heat. These variations have the more importance, as the territory here represented has a surface considerably larger than might be expected, perhaps, from the extent of European empires. The distance from the Bay of Biscay to the Caspian Sea can be considered as about equal to the difference in longitude of the borders of this Map; whilst 30° of latitude, referred to European regions, might be compared with the distance from the southern shores of the Mediterranean to St. Petersburgh.

The cool season.—This period already shows traces of the increase of temperature in the interior of the land when compared to surrounding seas; but, as it must be expected, the influence of insolation is, comparatively speaking, but little felt during this season in the provinces at some distance to the north of the equator, on account of the southern position of the sun. In the regions beyond the tropics the hibernal influence of continents, compared to that of the seas, causes depression of temperature. In reference to the Pănjáb, it must be further added that we have here, comparatively speaking, a greater number of stations for which the actual temperature is still lower than the values represented by the isothermal lines, as the latter had to be reduced to the level of the sea. The general elevation of the ground, and, throughout the season, a sky unusually clear, so favourable to nocturnal radiation, may be mentioned as the prin-

cipal causes. The decrease of temperature with latitude is by far the most rapid in the cool season.

The second period of the year (March, April, and May), which is generally called the hot season all over India, also in its north-western parts, shows a remarkable difference in the type of the curves when compared to the cool season; the influence of the topographical forms of the peninsula has become now considerably more apparent. The thermal equator enters the western border of the Map already at an elevation of 24° of latitude, passes through a central region of maximum temperature exceeding 90°, and descends from thence directly to the south, to the very southern end of India. Great dryness is combined in this period with the high temperature, and is an important element for making its difference from the other seasons still more apparent; but it would be erroneous to expect, as it might appear rather probable, that in consequence the heat is felt the heavier by the human organism. Though the central parts, compared to the shores of the sea, show a rapid increase of temperature with the progress towards the interior, I must add that, on account of the moisture being greater along the shores, not only the heat is felt there more close and more oppressive, but also its influence on the health, particularly of the Europeans, is decidedly still more unfavourable. For the coasts, and for the interior of India up to latitude 25° N., these months remain the period of the year which includes the highest means, and also the greatest heat of single days.

The third period (June, July, and August) is, for the greatest part of India, the rainy season; its setting in is connected, particularly in Central India, with the most rapid sinking of temperature. Nearer to the shores the difference is felt less beneficial; the humidity has increased, too, and makes, in the shade at least, the heat the more oppressive. The power of the insolation now being broken by a sky nearly permanently clouded, must be named as the particular cause why the beginning of this season in general is considered as a welcome period. For the state of health, however, it is less favourable; dyspeptic complaints and fevers are particularly frequent in the latter part of this season. In the Pănjáb, and partly already in the north-west provinces of Hindostan, this period has no more the character of a rainy season. The precipitation takes the form of our summer rains with thunder-storms, and also the amount of precipitation most rapidly decreases towards the north-west.

At the same time the meteorological observations showed for these very regions a maximum of temperature which was unexpected to me, not only on account of the number of stations formerly existing being not very great, but also since I heard from the inhabitants, the Europeans as well as the natives, no unusual complaints about the heat being much greater than in other parts of India. Nevertheless these provinces include a region for which the mean temperatures during the three months exceed 92°, which therefore must be considered as one of the very hottest regions of our globe; besides, we must take further into consideration that clear days are not unfrequent, during which the purity of the sky is not even limited, as it was in the period pre-

ceding, by dust suspended in the atmosphere. Therefore also the absolute maxima in the shade as well as in the sun are higher here than in any other region of India.

I may further draw attention to the fact that for this region also the non-periodic variations of temperature, the variations between different years, have become much greater than we find them to be in the more southern tropical part of the territory examined. The thermal equator enters the west of the Map at the latitude of 32°, and only leaves the Indian peninsula near Ceylon in an easterly direction.

The influence of height in the Pănjáb is not very considerable in this season, and the curves I have drawn remain for some stations even still a little below the respective means; but in the other regions, where the character of the "rainy season" prevails, the decrease of temperature with height is more rapid than during any other part of the year.

Autumn (September, October, November) is the only one of the tropical seasons which shows here a very regular form of its curves, and a very slow decrease of temperature with latitude; it is not less characteristic for this season that in most regions, particularly in those along the banks of the larger rivers, the drying up of vast surfaces formerly inundated is the cause of most deleterious miasmatic vapours; but in the Pănjáb, and in the hilly regions along the Brahmapútra and in Central India, where these dangerous modifications of the atmosphere are not to be feared, this season frequently approaches the mild and refreshing character of the regions of southern Europe.

A more descriptive detail, together with the personal data in reference to the observers' names and the duration of the different series, will be given by me, later, in the 4th volume of our 'Results'*. In the present memoir I considered it my particular object to lay down the materials officially entrusted to me, and to give them at the same time as critically worked over as my travels allowed me to attempt.

The temperature in shade, however, can but insufficiently define the climate as it is particularly seen in these parts of the tropics, where the power of solar radiation, rains, and storms differ in no less proportions from those in temperate zones. I will consider it a particular pleasure to be able to forward, in not too distant a time also for these elements, my numerical data, together with some remarks about the principal general results.

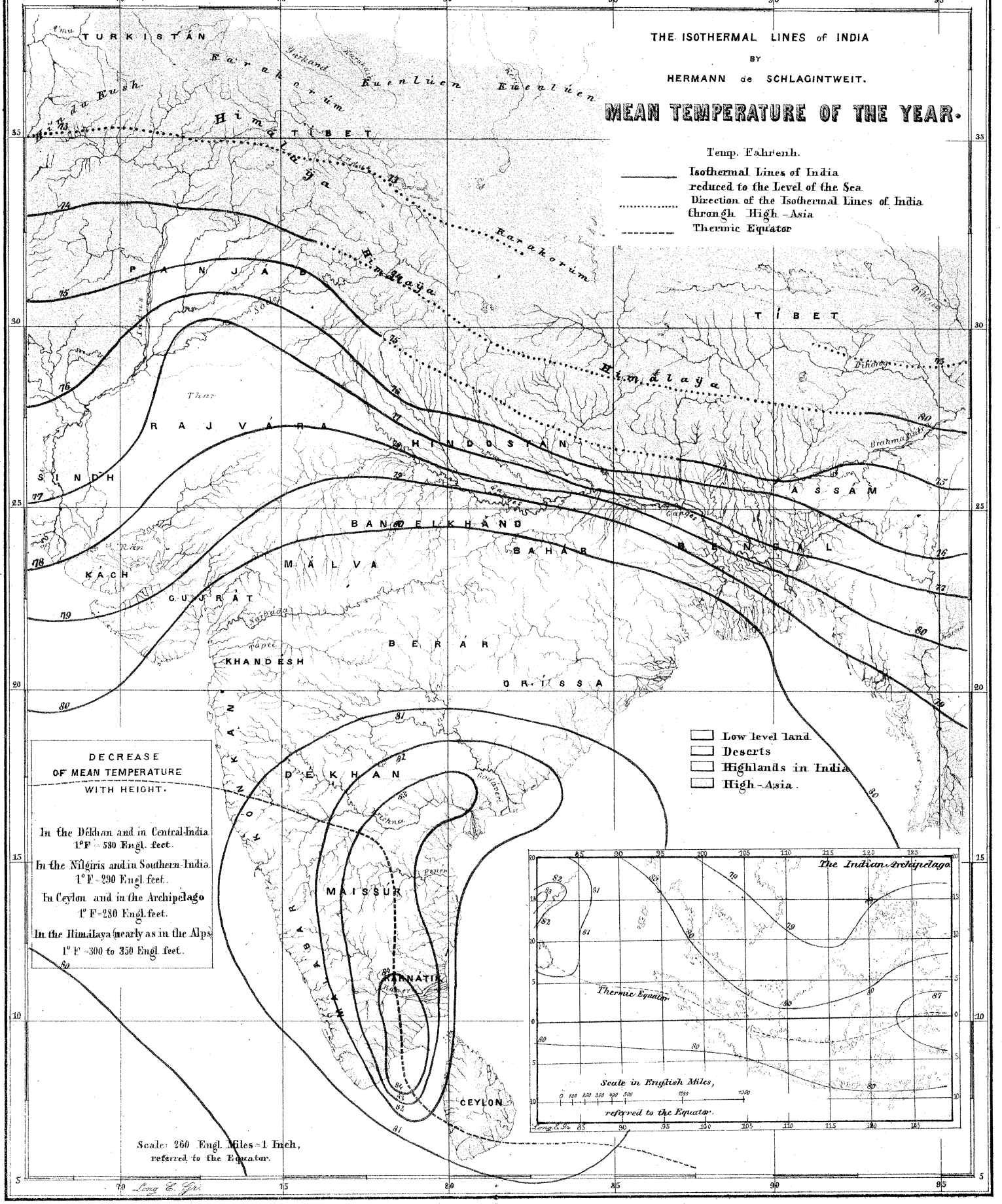
* It also will contain some additional stations from the materials I obtained, with their usual liberality, from the Indian authorities during my recent visit to England. Amongst the official publications, those of Glaisher and Macpherson have particularly to be quoted. These materials could no more be added to the present Tables, as most of these too will have to be recalculated for being reduced to true daily means.

THE ISOTHERMAL LINES of INDIA

BY

HERMANN de SCHLAGINTWEIT.

MEAN TEMPERATURE OF THE YEAR.



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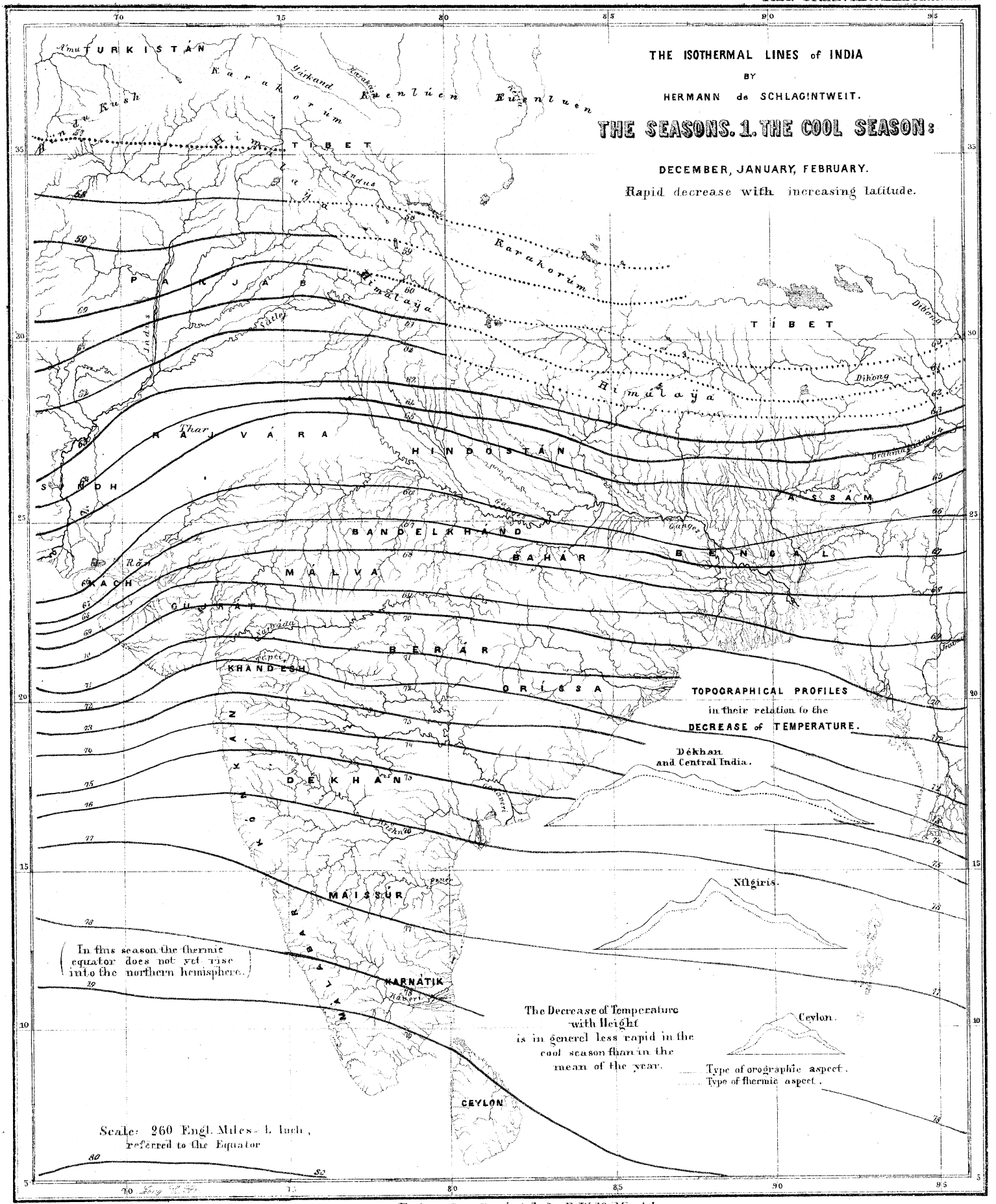

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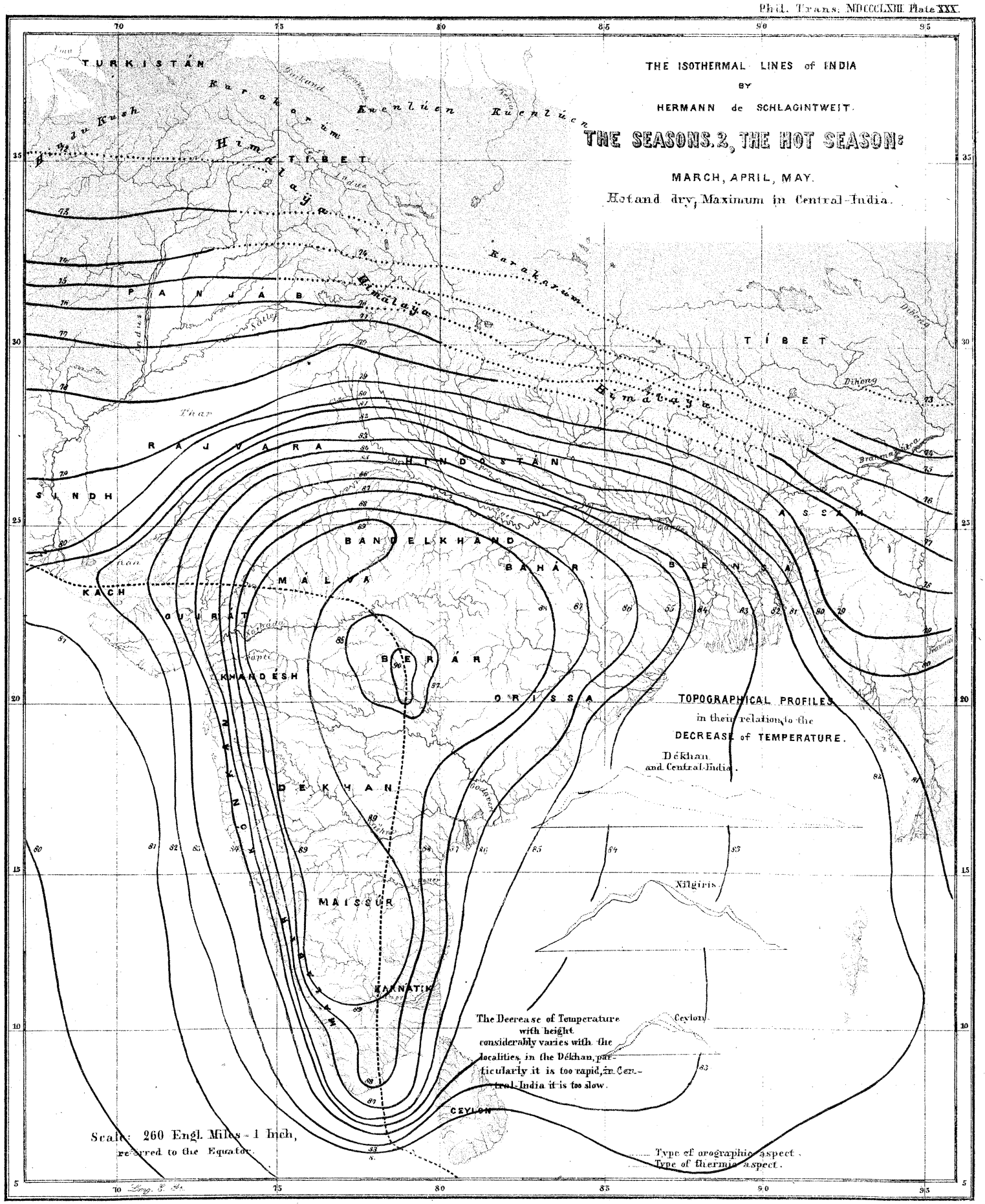

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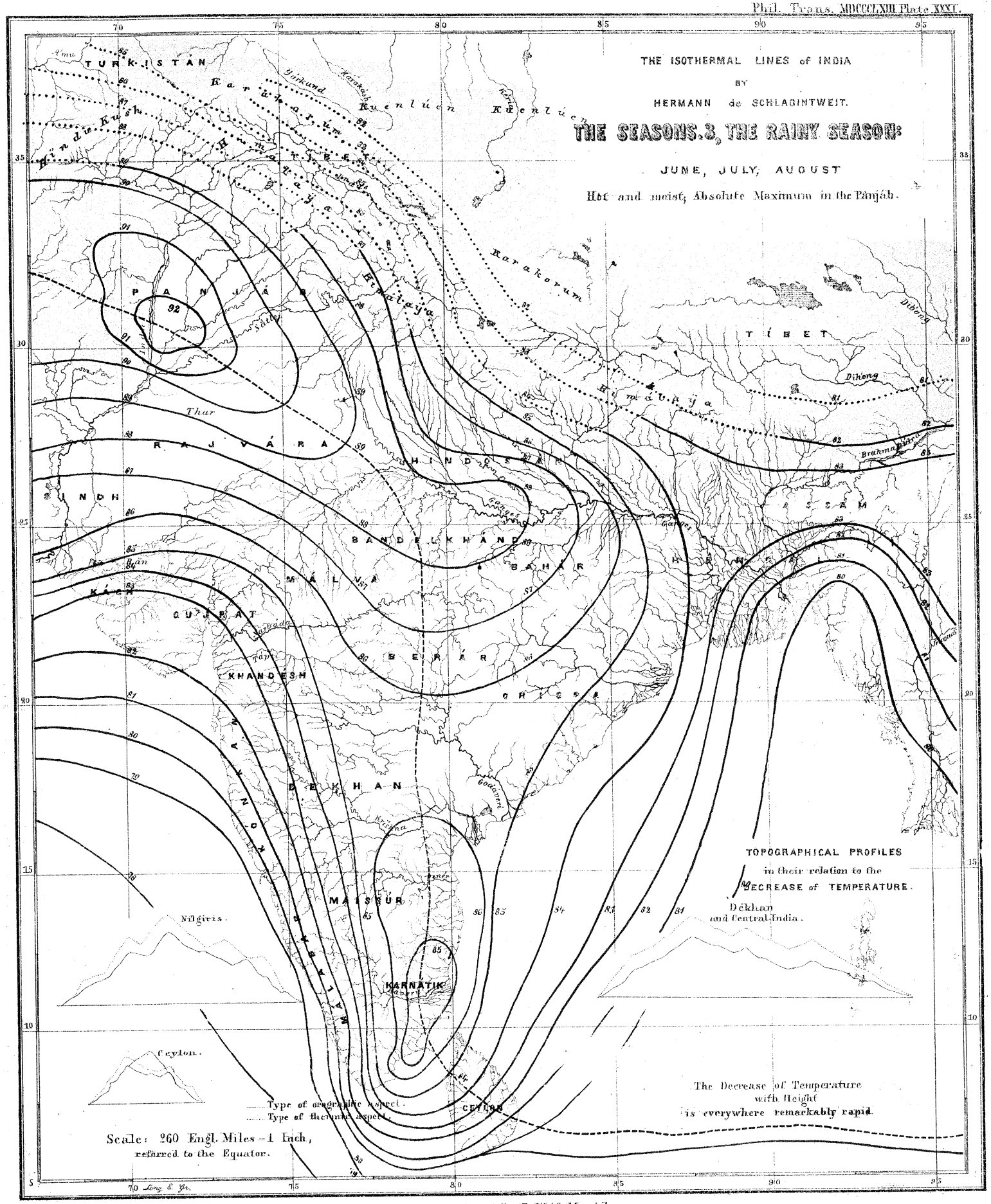

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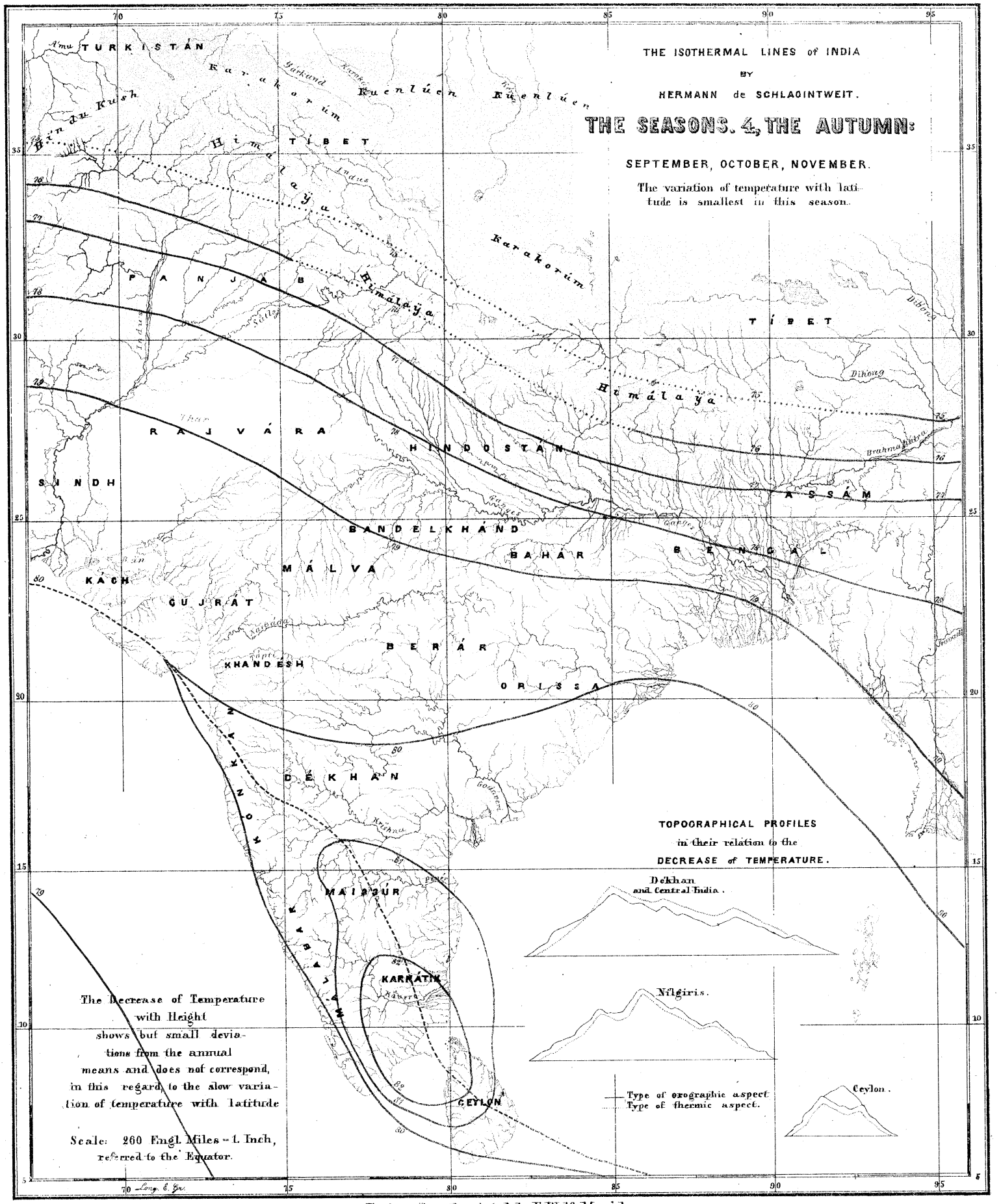

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THE ISOTHERMAL LINES of INDIA

BY

HERMANN de SCHLAGINTWEIT.

MEAN TEMPERATURE OF THE YEAR.

Temp. Fahrenh.

Isothermal Lines of India reduced to the Level of the Sea

Direction of the Isothermal Lines of India through High-Asia

Thermic Equator

TURKISTÁN

Karakorum

Kuenluen

Himálaya

TIBET

PANJÁB

Thar

RAJVÁRA

HINDOSTÁN

SINDH

ASSÁM

BANDELKHÁND

BAHÁR

BENGÁL

KÁCH

MÁLVA

GUJRÁT

BERÁR

KHANDÉSH

ORÍSSA

DÉKHAN

MAISSÚR

KARNÁTIK

CEYLON

Low level land

Deserts

Highlands in India

High-Asia.

DECREASE OF MEAN TEMPERATURE WITH HEIGHT.

In the Dékhan and in Central-India 1°F = 580 Engl. feet.

In the Nílgiris and in Southern-India 1°F = 290 Engl. feet.

In Ceylon and in the Archipelago 1°F = 280 Engl. feet.

In the Himálaya (nearly as in the Alps) 1°F = 300 to 350 Engl. feet.

Scale: 260 Engl. Miles = 1 Inch, referred to the Equator.

The Indian Archipelago

Thermic Equator

Scale in English Miles,

referred to the Equator.

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THE ISOTHERMAL LINES of INDIA

BY

HERMANN de SCHLAGINTWEIT.

THE SEASONS. 1. THE COOL SEASON:

DECEMBER, JANUARY, FEBRUARY.

Rapid decrease with increasing latitude.

TURKISTÁN
Amu
Yárkand
Karakorum
Kuenlúen
Hindu Kush
Himalaja
TIBET
Indus
PANJAB
Sutlej
RAJVÁRA
Thar
HINDOSTÁN
SINDH
Gangez
BANDELKHÁND
BAHÁR
BENGÁL
ASSÁM
Brahmaputra
Dihong
MÁLVA
KÁCH
Rán
GUJRÁT
Narmáda
Tapti
KHANDÉSH
BERÁR
ORÍSSA
DÉKHAN
Godávery
Krishna
MAISSÚR
KARNÁTIK
Káveri
CEYLON

TOPOGRAPHICAL PROFILES
in their relation to the
DECREASE of TEMPERATURE.

Dékhan and Central India.

Nílgiris.

Ceylon.

In this season the thermic equator does not yet rise into the northern hemisphere.

The Decrease of Temperature with Height is in general less rapid in the cool season than in the mean of the year.

Type of orographic aspect.
Type of thermic aspect.

Scale: 260 Engl. Miles = 1 Inch, referred to the Equator

70 Long. E. Gr. 75 80 85 90 95

Engraved and printed by F. Wolf, Munich.

THE ISOTHERMAL LINES of INDIA

BY

HERMANN de SCHLAGINTWEIT.

THE SEASONS. 2, THE HOT SEASON:

MARCH, APRIL, MAY.

Hot and dry; Maximum in Central-India.

TURKISTÁN

Karakorúm

Kuenlúen

Kuenlúen

Hindu Kush

Himálaya

TÍBET

PANJÁB

Himálaya

Karakorúm

TÍBET

Dihong

Thar

RÁJVÁRA

HINDOSTÁN

SINDH

ASSÁM

BANDELKHÁND

BAHÁR

BENGÁL

MÁLVA

KACH

GUJRÁT

BERÁR

KHANDÉSH

ORISSA

NERBUDDA

DÉKHAN

MAISSÚR

KARNATIK

CEYLON

TOPOGRAPHICAL PROFILES

in their relation to the

DECREASE of TEMPERATURE.

Dékhan and Central-India.

Nilgiris.

Ceylon.

The Decrease of Temperature with height considerably varies with the localities, in the Dékhan, particularly it is too rapid, in Central-India it is too slow.

Scale: 260 Engl. Miles - 1 Inch, reduced to the Equator.

Type of orographic aspect.

Type of thermic aspect.

Engraved and printed by E. Wolff, Munich.

THE ISOTHERMAL LINES of INDIA

BY

HERMANN de SCHLAGINTWEIT.

THE SEASONS. 3, THE RAINY SEASON:

JUNE, JULY, AUGUST

Hot and moist; Absolute Maximum in the Pânjâb.

TURKISTÁN

Karakorum

Kuenlúen

Himálaya

TÍBET

PANJÁB

RAJVÁRA

SINDH

HINDOSTÁN

BANDELKHAND

BAHÁR

MÁLVA

KÁCH

GUJRÁT

BERÁR

KHANDÉSH

ORICSA

ASSAM

DEKHAN

MAISSÚR

KARNÁTIK

CEYLON

Hindu Kush

Yárkand

Karakash

Amu

Sátlej

Thar

Ganges

Brahmaputra

Dihong

Godáveri

Krishna

Tápti

Narbada

Ran

Nilgiris.

Ceylon.

TOPOGRAPHICAL PROFILES

in their relation to the

DECREASE of TEMPERATURE.

Dékhan and Central India.

The Decrease of Temperature with Height is everywhere remarkably rapid.

Type of orographic aspect.

Type of thermic aspect.

Scale: 260 Engl. Miles = 1 Inch, referred to the Equator.

70 Long. E. Gr. 75 80 85 90 95

35 30 25 20 15 10 5

Engraved and printed by F. Wolf, Munich.

THE ISOTHERMAL LINES of INDIA

BY

HERMANN de SCHLAGINTWEIT.

THE SEASONS. 4, THE AUTUMN:

SEPTEMBER, OCTOBER, NOVEMBER.

The variation of temperature with latitude is smallest in this season.

TURKISTÁN
Amu
Karakorúm
Yarkand
Kuenlún
Hindu Kush
Himálaya
TIBET
Indus
PANJÁB
RAJVÁRA
Thar
HINDOSTÁN
SINDH
Sátlej
Dihong
Brahmaputra
ASSÁM
Ganges
BANDELKHÁND
BAHÁR
BENGÁL
MÁLVA
KÁCH
GUJRÁT
Tapti
KHANDÉSH
BERÁR
ORISSA
DÉKHAN
Godavery
Krishna
MAISÚR
KARNÁTIK
CEYLON

TOPOGRAPHICAL PROFILES
in their relation to the
DECREASE of TEMPERATURE.

Dekhan and Central India.

Nilgiris.

Ceylon.

Type of orographic aspect
Type of thermic aspect.

The Decrease of Temperature with Height shows but small deviations from the annual means and does not correspond, in this regard, to the slow variation of temperature with latitude

Scale: 260 Engl. Miles = 1 Inch, referred to the Equator.

70 Long. E. Gr. 75 80 85 90 95

Engraved and printed by E. Wolf Munich.