PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL.

EDITED BY

THE HONORARY SECRETARIES.

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JANUARY TO DECEMBER,

1876.

(With three plates and two woodcuts.)

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CONTENTS.

	Page
Proceedings for January, 1876,	1-16
Do. for February, including Annual Report and Remarks by the President,	17-46
Do. for March, 1876,	47-68
Do. for April, „	69-88
Do. for May, „	89-100
Do. for June, „	101-128
Do. for July, „	129-158
Do. for August, „	159-200
Do. for November, „	201-204
Do. for December, „	215-240
List of Members of the Asiatic Society of Bengal on the 31st December, 1875, Appendix to February Proceedings,	I
Abstract Statement of Receipts and Disbursements of the Asiatic Society of Bengal for the year 1875, Appendix to February Proceedings,	XIII
Index,	241-252

Meteorological Observations for January to December, 1876.

LIST OF PLATES AND WOODCUTS

IN

PROCEEDINGS, ASIATIC SOCIETY OF BENGAL, FOR 1876.

Pl. I (p. 14) Influence of Eosin on the photographic action of the Solar Spectrum upon the Bromide and Bromoiodide of Silver.
Pl. II (p. 114) Khond War-axes.
Pl. III (p. 184) *Amphistoma hominis*, a new parasite affecting man.

WOODCUTS.

Page 91. Gold coin of Náçir-uddín Mahmúd Sháh of Dihlí.
„ 185. *Amphistoma hominis*, longitudinal section.

GEOLOGICAL SURVEY
CALCUTTA

ERRATA

IN

PROCEEDINGS, ASIATIC SOCIETY OF BENGAL, FOR 1876.

Page 7, l. 12 from below. *Add*—It is perhaps better to take *rakhsh* in its usual meaning and translate, 'Akbar is that king whose steed passes &c.'.

„ 70, last line, *for* Tweena *read* Tween.

„ 104, l. 17, *for* W. C. McGregor *read* W. McGregor.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR JANUARY, 1876.

The Monthly General Meeting of the Asiatic Society was held on Wednesday, the 5th January, 1876, at 9 o'clock P. M.

T. Oldham, Esq., LL. D., President, in the chair.

The Minutes of the last meeting were read and confirmed.

The following presentations were announced—

1. From Dr. D. Brandis, a copy of "The Forest Flora of North-West and Central India."

2. From Capt. J. Waterhouse, a copy of his "Report on the Operations connected with the Observation of the Total Solar Eclipse of April 6th, 1875, at Camorta in the Nicobar Islands."

3. From Rájah Jai Kishn Dás, a copy of the Rig Veda Sanhita Bhashya by Pandit Dyananda Saraswati.

4. From W. H. Dall, U. S. Coast Survey, through the Rev. C. H. Dall, a copy of a "Report on Mt. St. Elias."

The President, seeing the Rev. C. H. Dall present, asked him to explain the objects of his son's paper—

MR. DALL said: At the call of our President, I will say a few words of the pamphlet on the table. It details a careful re-measurement of one of the highest mountains in North America, Mt. St. Elias; decidedly the highest in that north-western portion of the continent which Russia ceded to the United States in June 1867, for about a million and a half sterling. Dr. Oldham has made kindly reference to what he is pleased to call the repeated indebtedness of this Society to the same donor,—a son of mine William H. Dall, Acting Assistant, United States Coast Survey, who is getting to be known as the explorer of Alaska (Russian America), to the development of which country he has devoted the best part of a dozen years. The Government have left him in sole charge of this survey and exploration, and have given him, besides other means and appliances of discovery, first

one and then another vessel, the "Humboldt" and the "Yukon," specially built for the often dangerous work of sailing among unknown reefs and currents, and charting out (a dozen or more) good harbours, just now opened to commerce. One test of the general success of this work is found in the fact that Alaska has already paid back more, I think, than twenty per cent. of its cost to the United States. I may here say that when I was leaving America, less than three months ago, Mr. Dall gave me for this Society an Atlas of twenty-four new charts and maps of his, just published in good style, by the Coast Survey Department. These maps are coming to Calcutta, with other books, round the Cape. The Asiatic Society need hardly be reminded that the best surveys of the N. West coast of the American continent, antedating those of Mr. Dall, were made a century ago,—of course with instruments inferior to those we now possess,—by the faithful and able French explorer La Perouse. If I am rightly informed, he trusted mainly to observations taken with his quadrant or sextant; and generally from the deck of his ship. Important changes and adjustments must come of the instruments and facilities of observation that are ours to-day. These make it no wise incredible that Mr. Dall's rectifications of latitude and longitude should have shifted the whole coast line from 3 to 5 leagues westward, for hundreds of miles;—added eight hundred square miles to *British* (the Hudson's Bay) territory, and done many other things besides lifting Mt. St. Elias from being "13,000 feet high" to a clear elevation of over 19,000 feet. The quarto pamphlet, of thirty-two pages, now on the table, records attempts to measure the mountain, as made by several travellers since the time of La Perouse, and gives the results of sixty-four observations of it, taken by Mr. Dall, with better instruments, on sea and shore. The final working out of these has been done, with extra care, at his present home, and for the last ten years his hailing-point, the Smithsonian Institution in Washington, D. C.

Thanking the Chairman for his call upon me, I do not doubt that it will encourage and cheer the author of this pamphlet to learn that his persistent sacrifice of home and society for science, natural and geographical, from his nineteenth year, has the approving sympathy of the President and Members of this Society.

The following gentlemen duly proposed and seconded at the last meeting, were balloted for and elected ordinary members—

W. McGregor, Esq.

Ottokar Feistmantel, Esq., M. D.

The following are candidates for ballot at the next meeting—

R. B. Shaw, Esq., late British Resident at Kashgar, proposed by Dr. J. Scully, seconded by Capt. J. Waterhouse.

Col. J. F. Tennant, R. E., Calcutta, for re-election, proposed by Col. Hyde, seconded by Capt. J. Waterhouse.

G. E. Knox, Esq., C. S., Major H. H. Mallock, and Lieut. H. B. Urmston, have intimated their desire to withdraw from the Society.

The President laid before the meeting a statement from the Council regarding certain proceedings in connection with the rejection of a gentleman proposed by the Council for election as an Honorary Member, which was taken as read and ordered to be circulated to the members with the Proceedings.

The following letter from Major-General Sir A. P. Phayre, K. C. S. I., K. C. B., Governor of the Mauritius, to Mr. Blochmann, was read—

November 10th, 1875.

My dear Sir,—I observe in the Proceedings of the Asiatic Society for June 1875, a paper by Mr. V. Ball on stone implements of the Burmese type found in the district of Singbhúm. I beg to bring to your notice, that the stone weapons hitherto sent from Burma, have, I believe, all been found within the limits of the territory, in the delta and valley of the lower Eráwati, occupied from time immemorial by the Taláing or Mun people. The language of the Mun race of Pegu, is connected with that of the Ho or Mundá people of Chutiá Nágpur, called Kol. I beg on this subject to refer to my paper on the History of Pegu in the Society's Journal, Volume XLII of 1873.

The form of the stone implements remarked on by Mr. Ball, tends to indicate a connection in race, or intercourse in pre-historic time, between the Kols and the Mun of Pegu. The supposed origin of these weapons as thrown to earth in the lightning flash, is, as remarked by Mr. Theobald, the same among both peoples.

Mr. Wood-Mason exhibited specimens and read descriptions of several new or little-known species of phasmideous insects, amongst which were the following:

Phibalosoma Westwoodi, n. sp. ♀, from Nazirah and Sámágúting, Asám.

Lopaphus Iolas, Westw., ♂ ♀, from Johore in the Malay peninsula.

Lonchodes Austeni, n. sp., ♂, from the Dikrang valley, Asám.

Phyllium Celebicum, De Haan, ♀, from Karennee.

Phyllium siccifolium, Lin., ♀, from Mauritius.

Phyllium Westwoodi, n. sp., ♂ ♀, from S. Andaman and Pahpoon.

And of the following two new species of goliathideous beetles:

Heterorrhina Roepstorffii, ♂ ♀, from S. Andaman.
Heterorrhina annectans, ♂ ♀, from Sikkim.

Mr. Wood-Mason also exhibited specimens of a new species of freshwater *Astacidæ* from New Zealand, for which he proposed the name *Astacoides tridentatus* from the presence of three spines on the inferior edge of the rostrum, arranged and shaped like the teeth of a saw. He denied the existence of any special relationship between the New Zealand species of freshwater *Astacidæ* and the marine genus *Nephrops*, from which they differed, as indeed did all freshwater crayfish whatsoever, in having the last abdominal somite freely movable upon the preceding, and in having, like the species of the genus *Astacoides*, no appendages to the first and the appendages to the second post-abdominal somite similarly constructed to those of the following ones even in the male. Under these circumstances and as the species referred to *Paranephrops* differed less from those of *Astacoides* than these latter did from one another, and as, moreover, the latter name had priority,* he proposed, provisionally, to refer the New Zealand species of *Astacidæ* to it.

In continuation of his readings and translations of Arabic and Persian inscriptions, Mr. Blochmann exhibited the following from Dihlí, Rohtás, and Sahasrám. The Dihlí rubbings belonged to the batch received from Mr. Delmerick; those from Rohtás were taken by Mr. J. D. Beglar and were given to the Society, together with two rubbings from Sahasrám, by Major-General A. Cunningham, C. S. I.

I.

From the Rauzah Mírzá Muqím (*vide* Proceedings for December, 1875), in the niche of the gate of the Dargáh of Nizámuddín, south. *Rubá'í* metre.

فرزند مقیم بندهٔ حیّ قدیم * جا کرد درین روضهٔ پر فیض ونعیم
اورا نبود ز شر اندیشه وبیم * چون ساکن فردوس برین گشت مقیم
قایله نویدے کا . . . . حسین .....
آنها که بکوي قرب جا یافته اند * کام دل خود بمدعا یافته اند
این مرتبه داني زکجا یافته اند * از شیخ نظام اولیا یافته اند
قایله میر نوید ي نشاپوری ۹۶۹

1. The boy Muqím, the slave of the living and eternal God, dwells in this mausoleum which is full of bliss and beauty.

* *Astacoides*, Guérin, 'Revue Zoologique,' 1839, p. 109.
Paranephrops, White, Gray's Zool. Miscellany, 1842, p. 78; and Dieffenbach's New Zealand, 1843, vol. II, p. 267.

2. He has no thought nor fear of sin; for the dweller of the highest paradise has taken his place (here).

Composed by Nawedí, ...[written] by Husain.

1. Those who dwell in the lane of vicinity [to Nizám's tomb], have gained for their object the desire of their heart.

2. Dost thou know how they have obtained this high degree? They have obtained it from Shaikh Nizám Auliyá.

A. H. 969 [A. D. 1561-2]. Composed by Mír Nawedí of Nishápúr.

II.

From a tomb inside the enclosure of Nizámuddín, West. 1 ft. 3 in. by 3½ in.

این لوح باسم مرحوم مغفور خواجه دوست محمد که درجواني (؟) شهید شد
سنه سبعین و تسعمایه تحریرا فی الشهر صفر تمام شد ||

This tablet is erected in memory of the late Khwájah Dost Muhammad, who has obtained forgiveness. He was killed in...., in 970. Written in the month of Çafar [October, 1562].

The illegible word may be جواني, youth; but it may also be a geographical name.

III.

From outside Nizámuddín's tomb, West. 1 ft. 2 in. by 6 in.

در سنه نهصد هفتاد پنج مرحومي محمد امین سلطان در چتور شهید شد ||

In the year 975 [A. D. 1567-8], the late Muhammad Amín Sulṭán was killed before Chitor.

Regarding the siege of Chitor, *vide* the next inscription.

IV.

From a tomb in a *gumbaz* near the Ḳadam Sharíf. 1 ft. 2 in. by 7 in.

مرحوم نواب آصفخان بتاریخ بیست وپنجم شهر شوال برروز جمعه في سنه ۹۷۶ ||

The late Nawáb Áçaf Khán [died] on Friday, 25th Shawwál, 976 [12th April, 1269.]

His biography will be found in my Áín Translation, I, p. 368. After the fall of Chitor (25th Sha'bán, 975), Áçaf Khán was appointed governor of the fort. The year of his death was hitherto unknown.

V.

From a tomb outside Nizámuddín, West. 1 ft. 1 in. by 6½ in. *Rubá'í* metre; but the *nún* in *dín* (last line) is used as a *nún i ghunnah.*

چون کرد علاء الدین محمد نقل * از دار فنا جانب فردوس شتافت
تاریخ وفاتش همه کس مي‌جستند * عقلم بچنان رفت علاء الدین یافت

1. When 'Alá uddín Muhammad left and hastened from the perishable abode towards paradise,

2. All people searched for a chronogram, and my genius found one in the words "'Aláuddín went to paradise".

This gives 982 H., or A. D. 1574.

VI.

From a tomb within the courtyard (*çahn*) of Amír Khusrau's Dargáh, S. 1 ft. 2 in. by 6½ in.

نواب نظر بهادر خان در روز عاشورا سنه نهصد و هشتاد و دو بود که شهادت یافت ۱۱

Nawáb Nazar Bahádur Khán was killed on the 'Ashúrá day [10th Muharram] of the year 982.

This would be the 2nd May, 1574. Nawáb Nazar Bahádur was killed in Orisá; *vide* Aín Translation, I, 374. Hence the memorial tablet appears to bear a wrong year; for Nazar Bahádur was killed in 983.

VII.

From an old Masjid near the Dihlí Jail, within the enclosure of certain old walls, called 'Mahábat Khán kí Haweli', on the road to Nizámuddin. A beautiful inscription, 3 ft. 6 in. by 2 ft. 4 in. The inscription was composed by the renowned Faizí, the brother of Abul Fazl, for a mosque built by Shaikh 'Abdunnabí, the enemy of his father; *vide* Abul Fazl's biography in my Aín Translation, I, p. XV, and p. 546. Metre, *Khafíf.*

في زمان الخليفة الاكبر * ابد الله .... البقاع
قد بني بقعة مقدسة * مثلها لا يكون في الاقطاع
شيخ اسلام زائر الحرمين * شيخ اهل حديث بالاجماع
شيخ عبد النبي نعمائي * معدن العلم منبع الانفاع
سال تاريخ اين بنا فيضي * سأل العقل قال خير بقاع
كتبه .. نقشي

1. In the time of the greatest [*akbar*] Sovereign—May God perpetuate.....—

2. A sacred mosque, the like of which will not be found in the countries, was built

3. By the Shaikh of Islám, the visitor of both pilgrimages, the Shaikh of the people of the tradition by consent,

4. Shaikh 'Abdunnabí, the bestower of benefits,* the mine of knowledge, the source of advantages.

5. Faizí asked Genius for a chronogram for this building, and he answered, "The best of religious edifices". Written by.....

* *Na'mái*, from *na'má*, a benefit, in allusion to his office as Çadr, or bestower of religious benefits and lands.

This gives 983 H., *i. e.* A. D. 1575-6, or four years before 'Abdunnabí's banishment to Makkah.

VIII.

From a Mosque at Sarái Dáúd, near 'Chirágh i Dihlí', 1 ft. 2 in. by 11 in.

در زمانه حضرت جلال الدين محمد اكبر بادشاه باني مسجد و قبر چندن خواجسرة
صندل ابن علاو الدين ابن الهيه حلوايى سنه ۹۹۴ نهصد و نود وچهار (*sic*)
بمبلغ سيصد روپيه ॥

In the time of his Majesty Jalálu ddín Muhammad Akbar Bádisháh. The builder of the Mosque and the tomb is Chandan, [*i. e.*] the Eunuch Sandal, son of 'Aláuddín, son of Alhiah, the sweetmeat-maker. A. H. 994 [A. D. 1586], at a cost of 300 Rupees.

Fort Rohta's, in South Bihár.

Mr. Beglar took rubbings of the following inscriptions—

I.

From a loose stone from a Mosque, now in the palace of Rohtás, 1 ft. 10 in. by 2 ft. 10 in. Metre, *Khafíf.*

لا اله الا الله محمد رسول الله

اكبر غازي آنكه از رفعت * ميكند رخش او بگردون سير
در زمان چنين شهنشاهي * كه بفرمان اوست وحش [و] طير
بود درخاطر ابن حبش خان را * كه كند مسجد از براي خير
سال تاريخ مسجد عالي * شد زروي حساب بقعهٔ خير

در تاريخ شهر رجب سنه ۹۸۶

نصر من الله و فتح قريب و بشر المؤمنين ॥

1. Akbar, the defender of the faith, is that king whose brow, in its loftiness, passes over the heaven.

2. In the time of such a sovereign, who is obeyed by wild beasts and birds,

3. It occurred to this Habash Khán to build a mosque for the sake of a benefit.

4. The chronogram of this high mosque was found in counting up the letters in *Buq'ah i Khair*, 'a religious building'.

This gives 987 H., or A. D. 1579. The lower margin, however, gives the words—'In the month of Rajab, 986', *i. e.*, September, 1578. The margin on the top contains the creed, and the right and left margins the Korán verse, 'A help from God, and a near victory, and give the glad tidings to the faithful'.

II.

From the inner entrance to the Palace of Rohtás. The letters are in beautiful *Nasta'liq*, and numerous arabesques and flowers are between the lines and the letters. The Persian inscription measures 6 ft. 1 in. by 1 ft. 10 in.; and the Sanskrit inscription on the left of it, 2 ft. 4 in. by 1 ft. 10 in. Bábu Rájendralála Mitra has promised to furnish a reading and translation of the latter. The metre of the chronogram is *Muzára'*.

این تاریخ درزمان سلطان جلال الدین محمد اکبر بادشاه غازي خلد الله ملکه و سلطانه

دروازهٔ مقیم بناي چو شد تمام • دروازهٔ سپهر زرشکش سقیم شد
سالے عمارتش چو نمودم بطبع گفت • از راجه مانسنگه بناي مقیم شد

تحریر فی التاریخ بیست و هفتم ۲۷ شهر رجب المرجب سنه هزار و پنج الفي •

پروهت سریدهر
داروغه بل بهدر
زناردار صنعت گر
اوستاد مبارک

This chronogram (was written) in the time of Sulṭán Jalál uddín Muhammad Akbar Bádshâh i Ghází,—may God perpetuate his kingdom and his rule!

1. When the firm gate of the edifice was completed, the gate of heaven ailed from envy.

2. When the date of its erection appeared to Genius, he said, 'Rájah Mán Singh has erected a firm building.'

Written on the 27th of the honored month of Rajab, 1005, of the Alfí Era.

The family priest *(purohit)* [was] Srí Dhar; the Dároghah, Balbhadr the Bráhman; the architect (*ṣan'atgar*), Ustád Mubárak.

This is the first inscription that I have seen, in which the year is expressed in *Alfí* years—an invention of the emperor Akbar. As the 'restorer of the millennium' and founder of a new faith, he declared that Islám had done its work, and ordered a history of the first millennium to be written, in which the years were counted from the death of the Prophet, instead of from the flight (*hijrah*) to Madínah. The death of the Prophet was euphemistically designated '*rihlat*', 'departure'; but a manifest slur cast on Islám lay in the statement that Islám commenced with the death of the Prophet, as if his whole life belonged to what Muhammadan historians style the *jáhiliyyat*, or 'time of ignorance', *i. e.* the pre-islamitic period of Muhammadan history; *vide* Ain Translation I, p. 195; and Prof. Dowson, in Elliot's History, V, on the *Tárikh i Alfí*.

The chronogram of the inscription is ambiguous, on account of the *hamzah* in بناي; but as the date has also been expressed in numerals, it is

clear that the poet has taken it for half a *yá*, *i. e.*, for ½ of 10, which is rather unusual. The words without the hamzah, give 1000.

As the *Alfí* reckoning differs from the Hijrah era by ten years and two months, the inscription belongs to the end of 1015 H., or the end of the first year of Jahángír's reign. And yet Akbar is mentioned as the reigning monarch! We have thus mural evidence of the dissatisfaction which Mánsingh felt at Jahángír's succession.

III.

The following Persian inscription conveys the same information as the preceding, but the date is expressed in Hijrah years. The reading is incomplete, as many of the letters appear to be broken.

تاریخ ..... گفتا ٭ شنیده ..... آن سوار خنگ
یاجوج کوه .... روند ٭ سدے سکندري شده از راجه مانسنگه

سقداري پروهت سریدهر و گوپال داس چوهان و بعهدهٔ اهتمام بهاتیه [؟] خان
بني اسرائیل و داروغه بل بهدر نادا و صنعتگر استاد مبارك تحریر فی التاریخ غرهٔ
شهر ذي القعده سنه عشر و خمس و الف ۱۱

The 1st Zí Qa'dah, 1015 corresponds to 20th February, 1607, the very end of Jahángír's first regnal year. In this inscription, neither Akbar nor Jahángír is mentioned. The mention of Akbar in the preceding inscription was perhaps expected to be overlooked by people; for few might be acquainted with the *Alfí* era.

IV.

From a Báolí and Dargáh at the foot of Hill Rohtás. Four lines; 5 ft. 1 in. by 1 ft. The second line is ornamented with several rosettes, a duck, and a tiger. Several words in lines 3 and 4 are illegible.

در عهد شاه جهان پادشاه غازي که حکومت قلعه‌داري بمنصب سه هزاري
و فوجداري از مکراین و پرگنه سرس و کنبه تا بنارس و جاگیر پرگنهٔ چوند و پرگنه
منگرور و تلوتهو و اکبرپور وبلوچه و بجیگر و چیلا بنواب عالي مقدار اخلاص خان
مقرر و مسلم بود و اقل عباد الله ملك وصال که بمنزلهٔ فرزند سرفراز بود
و داروغگی قلعهٔ رهتاس و فوجداري بجیگر نواحی قلعهٔ مسلم بود درین اثنا
خویش [؟] نزدیکی برحمت حق پیوست بنا بران بتوفیق حق بخاطر رسید که
خانهٔ آخرت در حین .. چبوترهٔ و مسجد و ..... باولي و باغ طرف شمال
و جنوب بناکرد و شروع عمارت بتاریخ پنجم ربیع آخر سنه ۱۰۵۶ و بتاریخ رمضان
المبارک سنه ۱۰۵۷ هجري مرتب شد ۱۱

[It was] in the reign of Sháhjahán Pádisháh i Ghází, that the excellent Nawáb Ikhláç Khán held the command of the fort with a mançab of 3000 horse and the faujdárí of the region from Makráín and Parganah Siris and Kutumbah as far as Banáras, and the jágír tenure of Parganah Chaund and Parganah Maṇgror and Tilothú and Akbarpúr and Bilonjah and Bijaigar and Japlá, and that the meanest of God's slaves Malik Wiçál, who was honored with the rank of a son, was the Dároghah of Fort Rohṭás and Faujdár of Bijaigar in the neighbourhood of the Fort. In the course of time, a near relation died. Hence by God's grace it occurred to him [Malik Wiçál] that the house of the life to come at the time of.....and he built a *chabútrah* and a mosque....a well and a garden towards the north and the south. And the beginning of the building [was made] on the 5th Rabí' II, 1056, and it was ready in Ramazán, 1057 [October, 1647].

Parganahs Siris and Kutumbah border on the right bank of the Son; Tilothú is a small town on the left bank of the Son, N. E. of Rohṭásgaṛh. Parganahs Bilonjah and Japlá touch the right bank of the Son, and are separated from each other by the Koil River, which flows into the Son, S. of Rohṭás. Maṇgror lies on the Karamnásá, Long. 83° 17′, Lat. 25° 3′ (*vide* Beames, Elliot's Races of the N. W. P., II, 119), and adjacent to it, to the East, lies Parganah Chaund. Bijaigaṛh lies W. of Rohṭás. Akbarpúr and Makráín are the names of two adjacent parganahs in Máldah and extend along the Ganges opposite to Rájmahall; but I do not know whether they are meant.

Regarding the commandant of Rohṭás, Nawáb Ikhláç Khán, I find two Amírs of that title mentioned in the Pádisháhnámah. One Ikhláç Khán was a son of Báyazíd Beg, and was in 1042 appointed to Rohṭás. He rose to a command of 2000 horse, and died about 1050 H., in the 13th year of Sháhjahán's reign. He appears to be the Ikhláç Khán who is mentioned in the inscription. The second Ikhláç Khán was a grandson of Quṭbuddín, Jahángír's foster-brother (Áín Translation, I, 497); his name was Shaikh Ilahdiyah. I do not find Malik Wiṣál, the builder of the mosque, mentioned in the histories.

Sahasra'm, South Bihár.

From a loose slab, found by General Cunningham at the foot of the Chandan Pír Hill, Sahasrám. The name of the saint after whom the hill is called, does not occur in the biographical works on Muhammadan saints. *Vide* Buchanan.

بدور شاه نور الدین جهانگیر • زمان خان سرور صفدر القاب
علی اکبر چه وصجد بنا کرد • که تا لب تشنگان گردند سیراب
چو تاریخش طلب کردم خرد گفت • زبهر طاعت رزاق ووهاب

سنه ۱۰۲۲

1. During the reign of Sháh Núruddín Jahángír, at the time of Khán Sarwar, entitled Çafdar [Khán],

2. 'Alí Akbar built a well and a mosque, so that the thirsty might become satisfied.

3. When I searched for a chronogram, genius said, '[It was built] from obedience to God, the nourisher and giver.' A. H. 1022 [A. D. 1613].

The following inscription is quite modern, and records that Faḳír Muhammad Chaudharí, tobacco-seller, of the tribe of the sellers of vegetables, in 1211 Fasli, or 1218 H., [A. D. 1803], built or renovated the Dargáh of Chandan Pír.

بســـــم الله الرحمن الرحيم الله المستعان على ما تصفون بتاريخ پانزدهم شهر
شوال سنه ۱۲۱۸ هجري مطابق دوم ماه كاتك سنه ۱۲۱۱ فصلي .... [سقف؟]
مسجد دالان .... درگاه حضرت چندن شاه قدس الله سره العزيز فقير محمد
چودهري تماكو فروش قوم سبزي فروش تيار ساخت ॥

The following papers were read—

1. *On the Angámi Nágás and their Language.—By Capt.* J. Butler, B. S. C., *Political Agent, Nágá Hills.*

Capt. Butler's essay consists of an Introduction and four Chapters. Chapter I is historical and geographical; Chapter II treats of the government, the manners and customs, and the agriculture of the Angámi Nágás; Chapter III gives an outline of the Geology and Natural History of the country; and Chapter IV contains a valuable outline of Angámi Grammar, and a very complete vocabulary.

Eight plates of vivid sketches by Lt. Woodthorpe, R. E., accompany the paper.

The essay will appear in No. IV of Pt. I of the Journal, for 1875.

Colonel Thuillier said with reference to Capt. Butler's interesting and instructive paper which had just been read, he regretted having to inform the meeting that he had received information from Lieut. Woodthorpe, R. E., who was now with Capt. Butler, Political Agent, prosecuting the exploration of the whole of the Nágá country south of the Brahmaputra, subtending the district of Síbságar from Jaipur to Sámagúting and south-west of the villages in the vicinity of Jaipur, laid down last season, that whilst the Survey Party were cautiously proceeding through a new track, not more than 20 miles from Golághát, they were suddenly attacked on Christmas-day by Nágás between the villages of Lakhuti and Pángti—where they were concealed in ambush in the high grass jungle, and not discernible even a few yards distant, when Capt. Butler received in his right breast a spear-wound of a severe character.

This disaster compelled the survey party to halt for some time to afford assistance to the wounded officer and to allow the military guard

under Lieut.-Col. Tulloch to come up and chastise the village of Pángti, which was effectually done on the following morning, the whole party remaining encamped there afterwards.

The precise cause for such an attack so near Golághát, is not yet known, but it would seem to indicate that the Nágás of the village of Nínú were not sufficiently punished for the terrible massacre committed there last season on Lt. Holcombe's party, or else that it is impossible to make these savages, inhabiting closely approximate villages, comprehend or realize the lessons which take place so close to them, so hostile are they even amongst themselves, one village with another in close proximity.

He expressed a strong hope that the services of that intrepid explorer and excellent officer, Capt. Butler, might not long be lost to the Government. It would be almost a national calamity, if such a valuable officer lost his life under such circumstances.

Capt. Butler was very ably supported by Lt. Woodthorpe, who had now obtained considerable experience amongst these hill-tribes, and it was to be hoped that this temporary disaster might not have the effect of preventing the present good policy of the Government of India from being carried out, until we had a thorough knowledge of the whole geographical situation round the British border of Asám, which has so long baffled all attempts at its investigation, but has now been declared so essentially necessary for all administrative purposes of that Province.

The completion of our geographical knowledge of the tracts held by these hill-tribes between the British territory of Asám and Burmah, is absolutely essential to the depiction of the entire line of the British Eastern Frontier.*

2. *On the influence of Eosin on the Photographic Action of the Solar Spectrum upon the Bromide and Bromoiodide of Silver.—By Capt.* J. WATERHOUSE, *Asst. Surveyor General of India.*

At the November meeting of the Society I exhibited some plates showing the action of the red rays of the spectrum on dry films of collodio-bromide of silver stained with a blue dye. I have since received from Berlin a sample of a new red dye called Eosin, and have obtained results on dry bromide plates stained with it, which are of particular interest from the fact that the photographic action of the spectrum on such plates is entirely different to its ordinary action on an unstained plate, *i. e.*, instead of the maximum of action being in the indigo and violet it is in the green and yellow, as will be seen in the accompanying photographs and in fig. 5 of Plate I.

* Since the meeting took place, the sad news of Capt. Butler's death on the 7th January has been received, and the Government Gazette of the 22nd instant contains a handsome tribute to his character and worth.

This effect is quite in accord with Dr. Vogel's theory, that the sensibility of dry collodio-bromide of silver films for any particular part of the spectrum may be heightened by staining them with a suitable dye which absorbs that part but not others; but so distinct a change of position of the maximum of action from the indigo to the green has not, so far as I am aware, been observed before on films of bromide of silver, though Dr. Vogel has noticed it on films of chloride of silver stained with roseine. [Ber. Deut. Chem. Ges. 1874, p. 546.]

The dye to which the name of *Eosin* has been given, from Ἠως, the red of the morning dawn, is, according to Hofmann,* the pthalein of dibromresorcin, or tetrabromofluorescin, and is soluble both in water and alcohol, the solution being of a bright rosy-orange colour with a strong greenish-yellow fluorescence, tending to green in the watery solution and to yellow in the alcoholic. Examined with the spectroscope, a weak watery solution shows a strong obscuration of the spectrum from below E to above F, with a strongly marked absorption band about E and *b*, and a second fainter band about and above F [Plate I, Fig. 2]. A weak alcoholic solution shows similar bands, but displaced more towards the red, the wide band beginning at *b* and extending to about one-third the distance between E and D, while the fainter band is below F (Fig. 3).

Dr. Vogel has laid it down as one of the conditions of success in such observations, that the dye employed shall combine chemically with free iodine or bromine, and I was led to specially select this dye for experiment from an anticipation that it might prove particularly suitable for the purpose on account of its being a compound of resorcin, a substance which readily combines with bromine and particularly with iodine.

The dry bromide plates experimented on were prepared in two ways—

1*st*.—By using bromised collodion coloured with the dye. This collodion showed no fluorescence and was of a bright golden colour inclining to orange, without any trace of the beautiful rosy tint peculiar to the dye. This, however, was probably caused by acidity of the collodion, induced by long keeping, as a more neutral and fresher sample shows a fine yellow fluorescence and rosy tint. Examined in the spectroscope the absorption bands were absent, or so faint as not to be distinguishable, an effect which is observed with an acid watery solution of the dye. The films given by this collodion were rather transparent and showed only a slight yellowish opalescence by direct transmitted light, but by reflected light, or laid on white paper they showed a distinct pink tint. Examined in the spectroscope, the peculiar absorption bands in the green were not perceptible.

2*nd*.—By applying a watery solution of the dye to plates prepared with unstained bromised collodion after the free nitrate of silver had been removed

* Ber. Deut. Chem. Ges. VIII. 62, 146, quoted in Am. Jour. Arts, Sc. May, 1875.

by thorough washing. These films were denser than the first and showed a deep orange colouration by transmitted and a strong pink by reflected light. Examined with the spectroscope no absorption bands were visible, and the spectrum was quite obscured above F.

As already stated, the absorption spectrum of the dye shows well marked bands in the green, and according to Dr. Vogel's theory, this part of the spectrum should act with increased intensity on the dry bromide plates stained with the dye; though the action on the plate may be expected to be nearer the red than the absorption band of the colour, in accordance with Kundt's law that when non-absorbent media are mixed with an absorbent substance, the absorption band has no constant position, but is displaced towards the red, in proportion as the dispersion of the added non-absorbent medium increases.

Dry plates prepared with the coloured bromised collodion and exposed for periods varying from 1 to 5 minutes, to the spectrum given by a miniature direct-vision spectroscope of about six inches focus, exhibit after development a much greater sensibility to the green rays than to the blue, indigo, or violet, the maximum of action being below E, extending to about half way to D, and then decreasing till all action ceases just about D. Above E the action gradually lessens nearly to F, beyond which is a wide band of decreased action extending more than half way to G, followed by faint but increased action extending for some distance beyond H into the ultra-violet. The increased action in the yellow and green is strongly marked by its contrast with the very weak action in the blue, indigo and violet.

On the dry plates prepared by immersion in a watery solution of the dye, the same general characteristics are observed, but the image is stronger and the band of maximum action somewhat more extended between E and D, towards D, at which point the action ends almost abruptly (Fig. 5). The band of decreased action in the blue just above F and extending about half way to G is very clearly marked. The same decreased action accompanying increased sensitiveness for less refrangible rays, has been observed on plates stained with various dyes, but the cause has not yet been explained and further observation is required to elucidate the law regulating its occurrence.

It is worthy of note that traces of action in the green and yellow were distinctly visible on the plate before development, though nothing could be seen in the indigo and violet, as is usually the case. This is the only instance in which I have observed this effect, though several colours tried have given increased sensibility for the less refrangible rays.

A reference to the diagrams in Plate I will show that these results are quite in accordance with Dr. Vogel's theory, and tend strongly to confirm it. As, however, Dr. Vogel has stated his rule in general terms as applica-

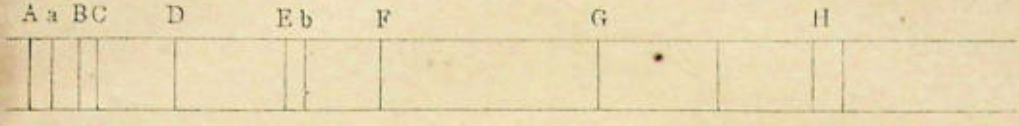


Fig. 1. Solar Spectrum.

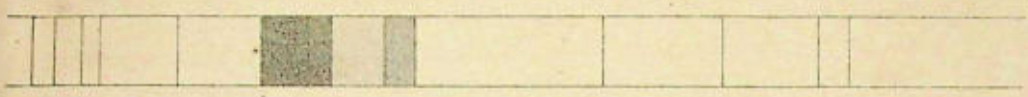


Fig. 2. Absorption Spectrum of Eosin in weak Watery solution.

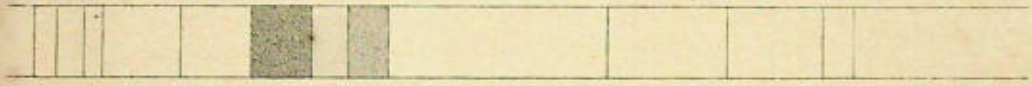


Fig. 3. Absorption Spectrum of Eosin in weak Alcoholic solution.

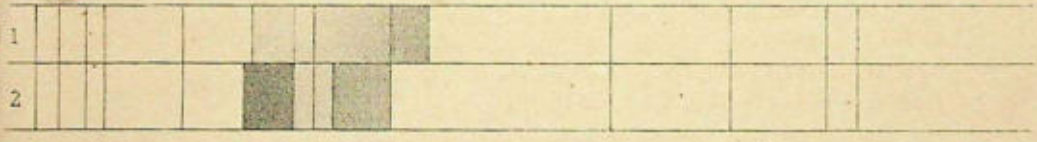


Fig. 4. Absorption Spectrum of stained Bromised Collodion.

(1. *Non-Fluorescent*.—2. *Fluorescent*.)

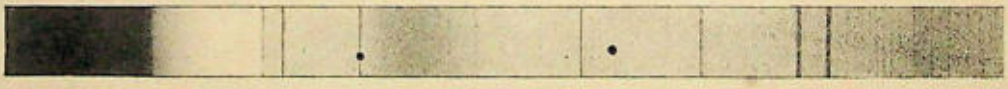


Fig. 5. Spectrum as photographed on stained dry bromide plate.

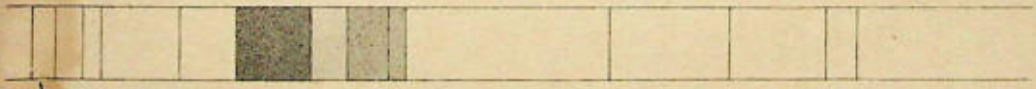


Fig. 6. Absorption Spectrum of stained bromo-iodised Collodion.



Fig. 7. Spectrum as photographed on stained wet bromo-iodide plate.



Fig. 8. Spectrum as photographed on unstained wet bromo-iodide plate.

ble to *any* colour,* experiments must be tried with various dyes before a conclusive decision can be come to. The results of such an examination I hope to lay before the Society on a future occasion.

A further peculiarity of this dye is that ordinary wet collodion plates prepared with bromo-iodised collodion containing it, exhibit a marked prolongation of the photographic action of the spectrum in the green and yellow, extending it beyond its usual limit of *b*, or at most E, nearly to D. The stained bromo-iodised collodion is strongly fluorescent and retains its rosy tinge. Examined with the spectroscope it shows two strong absorption bands in the green. (Fig. 6.)

The character of the photographic image of the spectrum, as obtained on the stained wet bromo-iodide plates, is entirely different from what it was in the dry bromide plates, and we have an image of fair density showing strong action extending from above H_2 to a little below G, where there is an abrupt and distinctly marked band of lessened action extending to about half way between F and E, from which point the action decreases to its minimum between *b* and E, and again rises at E with a marked increase of action extending half way to D, whence it gradually decreases till it disappears about D. (Fig. 7.) The increase in the extent of the photographic action towards D will be seen by comparing Figs. 7 and 8, the latter of which shows the spectrum as taken upon an unstained wet bromo-iodide plate.

It is noticeable that a band of decreased action is observed almost corresponding with the position of the space between the absorption bands of the dye, and further investigation may possibly show similar effects with other dyes.

From this marked sensibility to the green and yellow rays of the spectrum, it might have been anticipated that wet plates prepared with the eosin-stained collodion would have shown an increased sensitiveness for foliage and other coloured objects of a green or yellow tint, and might have proved of use in photographing coloured maps, paintings or other documents such as the Sanskrit MSS. written on yellow paper. On trying a landscape I found that the dye lessened the sensitiveness of the plate very considerably, and that the exposure had to be increased to about three times what was necessary for similar plates unstained. Even with this increase of exposure, there was little or no improvement in the detail of the foliage, but the image was much denser than usual and the shadows were particularly clean and well defined. I also tried photographing bouquets of flowers and a stained glass window comprising red, green, yellow and blue, both with dry bromide and wet bromoiodide plates, but found that little practical advantage was to

* See paper in Pogg. Annal. Vol. Cl. p. 453, translated in Phil. Mag. S. 4, Vol. 47, p. 273.

be gained by the use of the stained collodion, though the plates did show some slight increase of sensitiveness for yellow. Further trials in copying letterpress on yellow, green and red papers have given similar results, and the only well-marked advantage of the stained plates for such work is the great increase of density combined with clearness of the shadows, which might be turned to useful account in cases where the increased length of exposure is of no consequence.

From these results it will be evident that the photographic action of the spectrum is but a very slight index to the action of coloured objects, and that methods have yet to be found which will enable us to overcome many of the difficulties of colour still connected with the practice of photography. The observations, however, have their value in showing that the photographic action of the spectrum is more extended than has usually been stated and further investigation may lead to some useful practical application of the principle of staining the collodion film.

LIBRARY.

NOTE.—*It is proposed to adopt an entirely new and improved arrangement of the Library List, commencing with the present volume of the Proceedings, but owing to delay in carrying out the new arrangement for the list of additions received in December, it could not be included in the present number of the Proceedings. The February number will therefore contain the additions to the Library during December and January.*—J. W.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR FEBRUARY, 1876.

The Annual Meeting of the Society was held on Wednesday, the 2nd February, 1876, at 9 o'clock P. M.

T. Oldham, Esq., LL. D., President, in the chair.

According to the bye-laws of the Society, the President ordered the voting papers to be distributed for the election of Officers and Members of Council for 1876, and appointed Messrs. Pedler and Peterson, Scrutineers.

The President then called upon the Secretary to read the Annual Report.

ANNUAL REPORT FOR 1875.

In presenting their Annual Report for 1875, the Council have once more the satisfaction of congratulating the Members on the continued prosperity of the Society, as evinced by the increase in its funds, though the number of new members again shows a falling off.

The number of members elected during the year under review, has been 28, against 35 of the previous year.

During the year 1875, the Society sustained the loss of 25 ordinary members by withdrawal, 1 by removal and 3 by death, in all 29. The total number of ordinary Members was 346 at the end of the year 1874 and 345 at the close of 1875.

Of these 345 members, 65 are absent from India, of whom 50 are non-subscribing members, leaving a balance of 295 paying members, 113 of whom are Resident and 182 non-Resident Members.

The table below shows the fluctuation of members during the last ten years.

Year.	Paying.			Absent.	Total.
		Resident.	Non-Resident.	Non-Paying.	
1866, ...	293	124	169	94	387
1867, ...	307	154	153	109	416
1868, ...	294	159	135	133	427
1869, ...	304	162	142	138	442
1870, ...	266	134	132	148	414
1871, ...	286	112	174	160	446
1872, ...	279	105	172 + 2 L. M.	159	438
1873, ...	305	116	186 + 3 L. M.	53	358
1874, ...	312	127	184 + 3 L. M.	32	346
1875, ...	295	113	179 + 3 L. M.	50	345

Two Honorary Members were elected during the year. *viz.*: Prof. J. O. Westwood, of Oxford, and Dr. O. Böhtlingk, of Jena; also two Associate Members, *viz.*:—Rev. J. D. Bate, Allahabad, and Maulaví 'Abdul Hai, Calcutta.

Among those whose loss by death the Society have to regret, the Council have to record, of the ordinary members, the names of Lieut.-Col. T. C. Hamilton, Rangoon, J. H. Haworth, Esq., Calcutta, and Lieut. W. A. Holcombe, Assam, who was treacherously murdered by the Nágás, while on duty with the survey party in the Nágá Hills. Of the Honorary Members, Dr. Ewald, and the Right Hon'ble Sir E. Ryan, Kt.; an Associate Member, Sayyid Karámát 'Ali, and Dr. Wilson, of Bombay, Corresponding Member. The name of Munshi Niwal Kishwar has been removed from the list on account of non-payment of his subscriptions.

Among the contributors to the pages of the Journal, the Council regret to announce the death of Mr. Thomas W. Beal of Ágrah. He was for a long time employed as a clerk in the Sudder Board of Revenue at Allahábád and later at Ágrah. In 1849, he published at Ágrah his *Miftáh-uttawáríkh*, which is dedicated to Sir H. M. Elliot. A second edition (406 pages, folio) was lithographed at Lakhnau in 1867. The book is a charming collection of biographies of illustrious Moslems and Indian celebrities, and of choice chronograms, many of which were composed by the author himself. It contains, besides, numerous copies of Muhammadan inscriptions taken by the writer in his journeys in Upper India. The book is written in easy and elegant Persian, and shows that the author had a

profound knowledge of the MSS. sources of Indian history and the treasures of Persian poetry.

Mr. Beal for several years forwarded to the Society readings of Muhammadan inscriptions from the neighbourhood of Agrah, which were published in the Proceedings of the Society for 1873, 1874, and 1875, and also allowed the Society to take copies of several rare and unique historical MSS. He had just been proposed for election as an Associate Member, when he died at Agrah, on 9th June, 1875, at the advanced age of eighty-one years.

Though not members of the Society at the time of their death, the names of Col. S. R. Tickell, and Capt. T. Hutton, both of whom were formerly valued contributors to the Society's Journal, may be recorded among those of others who have passed away during the year. Col. Tickell was elected in November 1859, and remained a member of the Society till January 1865. During this period he contributed several valuable papers, chiefly on Indian ornithology and ethnology, among which may be mentioned "List of Birds collected in the jungles of Borabhum and Dholbum;"—"on the Oology of India, a description of the Eggs also Nests of several Birds of the plains of India;"—"Notes on the Henma or Shendoos, a tribe inhabiting the hills north of Aracan."

Capt. Hutton appears never to have been a member of the Society, but the general Index to the early volumes of the Journal shows a list of between twenty and thirty papers from his pen on various subjects connected with Natural History and Geology.

Indian Museum.

The Council continue to carry out the provisions of Act XVII, of 1866 and transfer all Natural History and Archæological specimens, received by them, to the Trustees of the Indian Museum.

The Trustees on the part of the Society were:—

Col. H. Hyde, R. E., Col. J. E. Gastrell, Dr. S. B. Partridge, and Dr. T. R Lewis.

Finance.

Notwithstanding the decrease in the number of paying members, the Council are happy to report, that the Financial position of the Society continues in a satisfactory state.

The actual total receipts by subscriptions from members during the year under review amounts to Rs. 9,760, exceeding the total receipts of the previous year, which were Rs. 8,729, by Rs. 1,031.

The amount due from members on account of arrears of subscriptions has been reduced this year by Rs. 448, leaving a balance of Rs. 6,561 still to be collected, against Rs. 7,009 in arrears in 1874.

The Council take this opportunity of again earnestly urging upon mem-

bers, the importance of punctual payment of their subscriptions, and the early paying up of all arrears. The outstandings of the Society have for many years amounted to a large sum, and though it is satisfactory to know that the loss under this head is not increasing, it still causes a serious deficit in the finances of the Society.

The assets consisting of—

Government Securities, ... Rs.	13,200	0	0
Cash in hand, ...	160	9	4
Balance in Bank of Bengal, ...	3,858	2	3
amount to Rs... :	17,218	11	7

It is satisfactory to observe that during the last year, an additional sum of Rs. 4000-0-0 has been invested in Government Securities, of which sum Rs. 1,182-0-0 is the amount collected from admission fees during 1874.

The following is a statement of the Receipts and Disbursements of the Society during the year—

Receipts.

	1874.			1875.		
Subscriptions, ... Rs.	8,729	3	0	9,760	15	0
Admission Fees, ...	1,182	0	0	930	0	0
Publications, ...	2,126	8	7	1,729	10	0
Library, ...	412	12	6	411	14	0
Secretary's Office, ...	23	12	9	24	15	6
Vested Funds, ...	449	0	0	449	0	0
Building, ...	4,800	0	0	4,800	0	0
Coin Fund, ...	0	0	0	0	0	0
Sundries, ...	2,861	4	2	3,657	0	1
Rs.	20,584	9	0	21,763	6	7
Balance in the Bank of Bengal, 1874, ...				6,856	12	2
Cash in hand, ...				161	9	1
Total, Rs.				28,781	11	10

Disbursements.

	1874.			1875.		
Publications, ... Rs.	7,440	11	8	7,373	2	1
Library, ...	2,732	2	9	4,475	6	6
Secretary's Office, ...	3,119	8	10	3,769	9	9

DISBURSEMENTS,—*continued.*

	1874.			1875.		
Vested Funds,	1,646	5	5	4,073	9	8
Building,	919	13	10	1,008	12	7
Coin Fund,	266	0	0	376	4	0
Sundries,	1,228	7	7	3,686	3	8
Rs.	17,353	2	1	24,763	0	3
Balance in the Bank of Bengal,	3,858	2	3			
Cash in hand,	160	9	4	4,018	11	7
Total, Rs.				28,781	11	10

With reference to the above statement the Council would draw the attention of members to the satisfactory increase in the income of the Society.

The estimated income was put down at Rs. 16,500 for the year 1875, The receipts realised, however, were Rs. 21,763, shewing an increase of Rs. 5,263, on the estimate. On the other hand, the Expenditure during the year has exceeded the amount (Rs. 16,500) allotted in the budget estimate by Rs. 8,263; but as this sum includes Rs. 4,000 expended in the purchase of Government Securities, the excess is in reality only Rs. 4,263, which was partly incurred on account of the Library, (the sum of Rs. 1,475, being spent in excess of the Budget estimate) and the increase of Establishment expenses of the Society on the appointment of a new Assistant Secretary. Notwithstanding this excess, however, the expenditure during 1875, has been less than the receipts by Rs. 1000.

The following is the Estimate of Income and Expenditure for 1876.—

INCOME.

Subscriptions, Rs.	9,000	0	0
Admission Fees,	900	0	0
Publications,	1,700	0	0
Library,	400	0	0
Vested Funds,	600	0	0
Building,	4,800	0	0
Sundries,	3,000	0	0
Rs.	20,400	0	0

EXPENDITURE.

Publications, ...	Rs. 8,000	0	0
Secretary's Office, Librarian, &c., ...	5,500	0	0
Building repairs, ...	500	0	0
Coin Fund, ...	500	0	0
Library, ...	2,000	0	0
Sundries, ...	3,000	0	0
Balance, ...	900	0	0
Rs.	20,400	0	0

Library.

During 1875, the Library received an addition of 927 volumes, or parts of volumes. Of these, 44 have been presented by Government, 39 presented by authors, 289 purchased and 555 by exchange with other Societies.

The Photographic Collection of the Society has received several valuable additions during the course of the year, among which may be noted a set of splendid photographs and lithographs illustrating the ruins of Bôrô Boudour in Java, received from the Batavian Society of Arts and Sciences, and for which a special vote of thanks was given; a set of 67 photographs of the ancient Architectural remains of Chota Nagpúr presented by the Government of India, Home Department; 49 photographs of the Ancient Temples at Barwa Sagar, Barauli, in the Jhánsi district, and of Muhammadan buildings at Badáon and Kol from the Government of the N. W. P., and a set of 5 photographs of copper Saśánas from Dr. G. Bühler.

Publications.

There were issued in 1875, 10 numbers of the Proceedings, containing, together with the Meteorological Observations, upwards of 325 pages of letter-press, illustrated by 5 plates. The Journal, Part I, of which 4 Nos. have been published, consists of 404 pages of letter-press, illustrated by 26 plates. Of Part II, 3 Nos. have also been published, containing upwards of 200 pages of letter-press, illustrated by 10 well executed plates. An extra number of Part II, in 167 pages, containing a Catalogue of Mammals and Birds of Burmah by the late Mr. E. Blyth, with a Memoir and Portrait of the author, and an introductory preface by Mr. A. Grote, has just been printed in England, under the general editorship of Mr. Grote, to whom the Society is greatly indebted for the care and attention he has bestowed upon the work. The special thanks of the Society are also due to Lord Walden, for the large amount of time and labour he has devoted to the Catalogue of Birds which, by the valuable and copious note and additions he has made to it, has become a complete list of the Burmese species, as ascertained to date; as also to Dr. J. Anderson, and Dr. Dobson, who have materially

assisted in perfecting the work, the former by revising the Catalogue of *Mammalia*, the latter by editing the Catalogue of the *Chiroptera*.

Coin Cabinet.

The additions to the Society's Coin Cabinet, made during 1875, consist of 32 silver, and 2 copper coins. Of these 25 silver and 2 copper coins were presented to the Society by Col. Stubbs, (17 silver, 1 copper); Mr. E. V. Westmacott, C. S., (4 rare silver coins struck by Mahmúd Sháh I. of Bengal); Capt. Williamson, Gáro Hills, (one unique silver Nara Náráyan of Kúch Bihár, and one Bengal Dáúd Sháhí); Bábu Mohini Mohun Rái, (2 Bengal Nuçrat Sháhís); and Mr. S. Kurz (one copper Lapeck). These coins were exhibited at the meetings held in March, June, and November, and several of them have since been published in the Journal.

Seven rare Bengal silver coins were purchased (Proceedings, June, 1875, p. 113).

Stoliczka Memorial.

The Council are happy to report that the subscriptions to the Stoliczka Memorial Fund amount to Rs. 2,872, of which Rs. 2,680 have already been realised, besides £76 collected in England by the London Committee. As the amount subscribed was sufficient to cover the cost, the Committee have considered it desirable to obtain both a portrait and a bust of their late esteemed Natural History Secretary and have solicited the co-operation of the London Committee in giving effect to this proposal. The London Committee have accordingly made arrangements with Mr. Dickinson of Langham Place for the painting of a kitcat portrait at a cost of 100 guineas, and they have commissioned Mr. Geflowski, a rising sculptor, to execute a bust, also at a cost of 100 guineas. It is expected that the model of the latter will be completed in March.

The Council would take this opportunity of thanking Mr. Grote, Dr. Day, and other members of the London Committee for the valuable co-operation and assistance they have rendered in furthering the objects of the Fund by the collection of subscriptions, the selection of artists, and the supervision of the work.

Zoological Garden.

From time to time during many years past the question of the establishment of a Zoological Garden in Calcutta has received the attention of the Society, but from various causes nothing could ever be done towards carrying out a project of which the great desirability and importance have always been fully recognised by the Council. It is, therefore, most gratifying to record that His Honor the Lieutenant-Governor of Bengal has taken the matter in hand, and has assigned a large plot of ground at

Alipore which has been cleared and planted as a site for the Garden. Several animals have already been transferred from the collections of Mr. Schwendler and others, and upwards of Rs. 200,000 have already been collected in subscriptions towards the establishment of the Garden. The Council therefore hope that its ultimate success may now be looked upon as secured.

Officers.

The Philological and Natural History Secretaries, Messrs. Blochmann and Wood-Mason, have retained charge throughout the year, of their respective parts of the Journal, and other duties of their Secretaryships. Capt. Waterhouse has continued to act as General Secretary during the year, with the exception of the months of March and April, when Dr. Lewis undertook the duties of General Secretary in Capt. Waterhouse's absence. The office of Financial Secretary and Treasurer was held by Col. J. E. Gastrell until the month of May, when Capt. Waterhouse took temporary charge during Col. Gastrell's absence.

Bábu Pratápachandra Ghosha, late Assistant Secretary, having resigned his appointment at the end of April last, Mr. G. S. Leonard was appointed Assistant Secretary in his place; and though the change involves some additional expense, the Council have every reason to believe that it is an improvement on the former state of things, and to be satisfied with the zeal and attention to his duties shewn by Mr. Leonard, who has commenced the preparation of an Index to vols. 24 to 43 of the Journal, and has also given attention to the preparation of the new catalogue of the Society's Library, though the progress of this most important work is greatly hindered by the crowded state of the rooms now occupied by the Society. It is, however, to be hoped that this cause of delay will soon disappear. Bábu Gopál Chunder Dutt, who was engaged in 1874 as an assistant in the Secretary's office, resigned his appointment at the same time as the late Assistant Secretary, and no other appointment has been made in his room.

Munilall Bysak, Assistant Librarian; Jado Bindo Bysak, Storekeeper; and Bábu Baddinath Bysak, have continued to do good service in their respective branches.

Bibliotheca Indica.

Arabic and Persian Series.

Maulawí 'Azíz urrahmán, of the Presidency College, Calcutta, has brought the edition of the Farhang i Rashídí to a close. This Persian Dictionary contains 703 pages quarto, in two volumes. The work was compiled towards the end of Sháhjahán's reign, in 1064 H., by Sayyid 'Abdurrashíd of Tattah, in Sindh, one of the best grammarians and lexicographers that India has produced. During the 17th and 18th century of our era, the study of Persian was zealously cultivated in India by both Muhammadans and Hin-

dús, and numerous critical works on Persian lexicography, grammar, and idiom, were written. Among them, the Farhang i Rashídí holds a prominent place. The numerous Persian dictionaries which had before been compiled and had more or less been eclipsed by Jamál uddín Injú's *Farhang i Jahángírí*, were now for the first time critically examined: Sayyid 'Abdurrashíd discovered in the older dictionaries a large number of words that never existed in the language and had found their way into the dictionaries through bad MSS. and careless copyists. Again, words had been entered into the older dictionaries with wrong meanings, because the passages in which they occurred had been wrongly explained. These and other defects were corrected by Sayyid 'Abdurrashíd. His work forms thus the basis of Persian lexicography, and has been used as such by later writers, such as Árzú, Wáris, and Tek Chand. The Society's edition of the Farhang will therefore be of the greatest use to European scholars. Maulawís Zulfaqár 'Alí and 'Azíz urrahmán, the editors, have not only carefully collated the several MSS. which the Society had placed at their disposal, but they have also added valuable notes from Surúrí, Jahángírí, and the Siráj. The numerous quotations from Persian poets have in all cases been compared with those in the Jahángírí (where they are generally quoted at full length), and the editors have seen that they are given metrically correct.

Of the Arabic biographical work, entitled 'the Içábah', no fasciculus was issued during last year; but Nawáb Muhammad Çiddíq Hasan Khán, Prime-Minister of Bhopál, has offered to the Society the loan of a complete copy of this rare work. On the receipt of the MS., the work will again be continued by Maulawí 'Abdul Hai, of the Calcutta Madrasah.

Major Raverty has issued two more fasciculi (Nos. V and VI,) of his annotated English translation of the *Ṭabaqát i Náçirí*, which brings the work down to the reigns of the first Muhammadan kings and governors of Bengal.

Of the *Akbarnámah*, Maulawí 'Abdurrahím, of the Calcutta Madrasah, has issued two quarto fasciculi (Nos. III andIV), and has thus nearly completed the portion which is often called the first volume of the Akbarnámah. The work in consequence of an unfavourable notice of it in the History of India by Elphinstone, had hitherto been looked upon by European historians as a mere panegyric of the emperor Akbar, and therefore of little historical value. Native historians, on the other hand, have always considered it as a truthful account of the events of Akbar's reign and as a model of historical style. This correcter estimate of Abul Fazl's work has also lately been adopted by Professor Dowson in his notes on the Akbarnámah (Elliot's History of India, Vol. VI).

Sanskrit Series.

Of the Sanskrit series fourteen fasciculi have been published during the year under report. These comprise portions of seven different works. The only work completed is a translation of the Sáhitya Darpaṇa, a treatise on rhetoric which is held in high esteem by the Paṇḍits of Bengal, and comprises a very full summary of all the leading works on the subject. It was originally undertaken by the late Dr. Ballantyne, and about one hundred and sixty pages were passed through the press by him. On his retirement to Europe the work was left in abeyance for some time. The Council has every reason to be satisfied with the manner in which the present editor, Bábu Pramadádása Mitra, has completed the work.

Reference was made in the last report to the materials collected by Bábu Rájendralála Mitra for an edition of the Aitareya Bráhmaṇa of the Rig Veda. The work has since been sent to press, and two fasciculi have already been published. The Bábu has also published two more fasciculi of his edition of the Agni Puráṇa, which, it is expected, will be completed in course of the current year.

The necessity of printing the text of the Sáma Veda Saṅhitá with all the prosodial and musical notes which occur in the different gánas, entails much tedious labour, both on the editor and the printer, and having due regard to accuracy of printing, the work cannot be pushed on as rapidly as could be wished; but the progress hitherto made has been steady and satisfactory. Four fasciculi were issued during the past year, and altogether one half of the work has been completed.

Among the many commentaries extant on Śaṅkara's exposition of the Vedánta Aphorisms of Vyása, the *Bhámati* of Váchaspati Miśra is held in great esteem by Indian scholars, and an edition of this work has been undertaken by Paṇḍit Bála Śástrí, Professor of Hindu Law at the Benares College, and the first fasciculus, comprising about one-fifth of the work, has lately been printed. The materials available for the work are ample, and under the able superintendence of the learned professor, they will be, the Council expect, most satisfactorily utilised.

Professor Eggeling's edition of the old Sanskrit Grammar, the Kátantra, the publication of the first two fasciculi of which was referred to in the last report, has advanced by two more fasciculi. It is expected the work will be completed in course of the current year.

MSS. of the first part Hemadri's digest of Hindu civil and canonical law not being at the time accessible, the Council sanctioned the publication of the second part, and on the completion of it the editor, Professor Bharatachandra Śiromaṇi has been engaged in carrying the third part through the press, and three fasciculi of it have already been issued.

The following is a detailed list of the works published in 1875—

Persian Series.

The Farhang-i-Rashídí, by Mullá 'Abdur Rashíd of Tattah. *Edited and annotated by Maulawí* 'Azíz-urrahmán, *Presidency College.* Nos. 317, 318, Fasc. XIII, XIV.

The Akbarnámah, by Abul Fazl i Mubárak i 'Allámí. *Edited by Maulawí* 'Abdur Rahím, *Calcutta Madrasah.* Nos. 319, 320, Vol. I, Fasc. III, IV.

The Tabaqát i Násirí of Minháj i Siráj. *Translated from the Persian by Major* H. G. Raverty. Nos. 310, 311, Fasc. V, VI.

Sanskrit Series.

The Agni Puráṇa, *a system of Hindu Mythology and Tradition. Edited by Bábu* Rájendralála Mitra. Nos. 313, 316, Fasc. VII, VIII.

The Mimámsá Darsana, *with the commentary of* Savara Swámin. *Edited by Paṇḍita* Maheśachandra Nyáyaratna. Nos. 209, 240, 315, Fasc. X, XI, XII.

The Sáma Veda Saṅhitá, *with the commentary of* Sáyana Áchárya. *Edited by Paṇḍita* Sátyavrata Samasramin. Nos. 321, 322, 323, 324, Fasc. II to V, Vol. II.

The Chaturvarga Chintámani *by* Hemádri. *Edited by Paṇḍita* Bharatachandra Siromaṇi. Nos. 326, 327, Vol. II, Fasc. I, II.

The Kátantra, *with the commentary of* Durgasiñha. *Edited, with Notes and Indexes, by* Julius Eggeling. Nos. 308, 309, Fasc. III, IV.

The Sáhitya Darpana *or* Mirror of Composition, *translated into English by Bábu* Pramadádása Mitra. No. 330, Fasc. IV.

The Aitareya Áraṇyaka of the Rig Veda, *with the commentary of* Sáyana Áchárya. *Edited by Bábu* Rájendralála Mitra. Nos. 325, 329, Fasc. I, II.

The Bhámati, *a Gloss on Saṅkara Áchárya's commentary on the Brahmasútras, by* Váchaspati Miśra. *Edited by Paṇḍita* Bála Śástrí, *Professor of Hindu Law, Banáras College.* No. 328, Fasc. I.

List of Societies, Institutions, &c., with which Exchanges of Publications have been made during 1875.

Batavia :—Batavian Society of Arts and Sciences.
Belgium :—Geological Society of Belgium.
Berlin :—Royal Academy of Arts and Sciences.
Birmingham :—Institution of Mechanical Engineers.
Bombay :—Royal Asiatic Society.
——— :—Editor, Indian Antiquary.
Boston :—Natural History Society.
Bordeaux :—Bordeaux Academy.

Buenos Ayres :—Public Museum.
Brussels :—Royal Academy of Sciences.
Cherbourg :—National Society of Natural Sciences.
Calcutta :—Agricultural and Horticultural Society of India.
——— :—Geological Survey of India.
Christiania :—University.
Copenhagen :—Royal Society of Northern Antiquaries.
Cambridge :—University.
Dacca :—Editor, Bengal Times.
Dehra Dún :—Great Trigonometrical Survey.
Dublin :—Royal Irish Academy.
——— :—Natural History Society.
Edinburgh :—Royal Society.
Geneva :—Physical and Natural History Society.
Königsberg :—Physical and Economical Institution.
Lahore :—Agricultural Society of the Panjáb.
Leipzig :—German Oriental Society.
Liége :—Royal Society of Sciences.
Leyden :—Royal Herbarium.
Liverpool :—Literary and Philosophical Society.
London :—Royal Society.
——— :—British Museum.
——— :—Royal Asiatic Society of Great Britain and Ireland.
——— :—Royal Institution.
——— :—London Institution of Civil Engineers.
——— :—Royal Geographical Society.
——— :—Museum of Practical Geology.
——— :—Zoological Society.
——— :—Statistical Society.
——— :—Geological Society.
——— :—Linnean Society.
——— :—Anthropological Institute.
——— :—Royal Astronomical Society.
——— :—Editor, Athenæum.
——— :—Editor, Nature.
——— :—Editor, Geographical Magazine.
Lyon :—Agricultural Society.
Moscow :—Society of Naturalists.
Madras :—Government Central Museum.
——— :—Literary Society.
Manchester :—Literary and Philosophical Society.
Munich :—Royal Academy.

Netherlands :—Royal Society.
New Haven :—Connecticut Academy of Arts and Sciences.
Oxford :—Bodleian Library.
Paris :—Imperial Library.
—— :—Anthropological Society.
—— :—Asiatic Society.
—— :—Geographical Society.
—— :—Ethnological Society.
Pisa :—Tuscan Society of Natural Sciences.
Stettin :—Entomological Society.
Stuttgardt :—Natural History Society of Würtemberg.
St. Petersburg :—Imperial Library.
———— :—Imperial Academy of Sciences.
Stockholm :—Royal Academy of Sciences.
Trieste :—Adriatic Society of Natural Science.
Turin :—Academy.
Vienna :—Imperial Geological Institute.
——— :—Anthropological Society.
——— :—Zoological and Botanical Society.
——— :—Imperial Academy of Sciences.
Washington :—Smithsonian Institution.
———— :—Commissioners of the Department of Agriculture.

The PRESIDENT said—He had now to ask the meeting to receive and approve the Report of the Council for the past year. In doing so, it seemed to him that there were just one or two points to which the attention of the meeting might more particularly be called. In the first place, it was satisfactory to see that the income of the Society had shewn a considerable increase during the year. But they must at the same time not conceal the painful fact that the amount of arrears due for unrealized subscriptions, &c., was by much too large. It was not due to any want of exertion on the part of the Treasurer of the Society. The accumulation has been one of long growth, and though the amount was reduced last year, still it is far too great to be satisfactory.

Then as their funds had increased, a considerably larger sum than originally contemplated was devoted to the improvement and extension of the Library. This is, at present by far the most valuable portion of the Society's property, and though rich in many ways, it still calls for much exertion to extend and improve the collections. Progress has, he was thankful to say, been made in this direction, although nothing really satisfactory could be done until the Society had obtained more room to put out their books, and admit of their classification and arrangement, in such a way as shall render them accessible.

The Publications of the Society had maintained their character during the year. Although occasionally arrears in the issue of the parts unavoidably occur, still they had on the whole been punctually given to the public. He considered this point of punctuality and regularity of issue one of the highest importance, and that much in other ways should be sacrificed to it. Much progress had been made, however, and the Journal and Proceedings of the Society were now worthy of the high position which the Asiatic Society of Bengal had always held, as the first of non-metropolitan Societies of Science. The publications were well and sufficiently illustrated, well printed, and altogether highly creditable to the Secretaries who edited them.

Another source of much gratification was that the Council, besides incurring this additional expenditure, had been able to invest for the Society a considerable sum. He thought the importance of this could not be overrated: the experience of every Association or Society, no matter what its object, shewed that times of depression or even difficulty will come; and that unless the Society has in itself some means of maintaining itself during these unfavourable periods, the result may be very serious. In this way the possession of a sufficient fund in vested securities, independent of such temporary changes, acts like the heavy fly-wheel of a large engine; by steadying the motion, and producing a continuity of the force, which produced that motion. He hoped this investment would be maintained until the Society had an income independent of the varying chance of subscriptions, sufficient to carry them over any such temporary difficulties as might occur.

The Philological Secretary had told them of the sound and valuable progress made in the Oriental publications of the Society, and they have been indebted to the several editors of the books for their exertions.

He would fail, however, in his duty did he not take this opportunity of saying how vastly indebted the Society were to their Honorary Secretaries and other officers. Though an officer of the Society himself, he was sorry to think that the very limited time at his disposal, from other more pressing occupations and also the state of his own health, had prevented his doing much for the Society. But this very fact enabled him to speak with greater force as to the untiring exertions of the Secretaries. At all times and on all subjects, they never ceased to work for the benefit of the Society. It would be in fact impossible for any but those who were, he might say, behind the scenes, to form an estimate of the amount of work which devolves on their officers, and of the readiness and earnestness with which it is not only undertaken, but carried through. And the Society certainly owes to their officers, the most grateful and hearty acknowledgments of their labours.

He would now put to the meeting—That the report of the Council as now read be received and approved.

The motion was carried unanimously.

The Scrutineers reported the election of Officers and Members of Council for 1876 as follows:—

T. Oldham, Esq. LL. D.	*President.*
The Hon. E. C. Bayley, C. S. I.	*Vice-Presidents.*
Bábu Rájendrálálá Mitra.	
Col. H. L. Thuillier, C. S. I.	
H. Blochmann, Esq., M. A.	*Secretaries & Treasurer.*
Capt. J. Waterhouse.	
J. Wood-Mason, Esq.	
Dr. T. R. Lewis.	
Col. J. E. Gastrell.	
T. Oldham, Esq., LL. D.	*Members of Council.*
The Hon. E. C. Bayley, C. S. I.	
Bábu Rájendralálá Mitra.	
Col. H. L. Thuillier, R. A., C. S. I.	
Col. J. E. Gastrell.	
L. Schwendler, Esq.	
H. Blochmann, Esq., M. A.	
Capt. J. Waterhouse.	
J. Wood-Mason, Esq.	
Dr. T. R. Lewis.	
J. O'Kinealy, Esq.	
Bábu Prannath Pandit.	
Dr. W. K. Waller.	
E. Gay, Esq.	
C. H. Tawney, Esq., M. A.	

Messrs. Gay and Waldie were elected to audit the Annual Accounts.

The Meeting was then resolved into an Ordinary Monthly General Meeting.

Dr. T. Oldham, President, in the chair.

The minutes of the last meeting were read and confirmed.

The following presentations were announced—

1. From the author, a copy of a paper "On the Age and Correlations of the Plant-Bearing Series of India, and the former existence of an Indo-Oceanic Continent," by H. F. Blanford, Esq.

From Prof. Tacchini, Memoirs of the Italian Spectroscopic Society, No. 10, October, 1875.

From M. Ph. Ed. Foucaux, a copy of "Le Religieux chassé de la communauté", a Buddhist tale, translated from the Tibetan.

From His Royal Highness the Prince of Wales, a copy of the photo-lithographed edition of the "Mahábháshya," in six volumes.

The following letter from Sir H. Bartle Frere, G. C. S. I., K. C. B., accompanying the donation, was read—

Government House, Calcutta.
3rd January, 1876.

Sir,—I am commanded by His Royal Highness the Prince of Wales to inform you that he has directed a copy of the "Mahábáshya" to be forwarded to you for presentation to the Society.

His Royal Highness hopes that the Asiatic Society will accept the book, as a *souvenir* of his visit, and as a mark of His Royal Highness' high estimation of the great work the Society has done and is doing in promoting the study of all the important subjects to which the labours of the Society and its members have been for so many years directed.

I am, Sir,
Your obedient Servant,
H. B. Frere.

To the Secretary Asiatic Society, Calcutta.

The President drew the attention of the meeting to the six fine volumes on the table, stating that they possessed special value from the fact that they were photolithographed facsimiles of original MSS., and he proposed that the special thanks of the meeting should be tendered to His Royal Highness for his considerate remembrance of the Society.

The proposition was carried unanimously.

From the author, a copy of a work entitled "Protection of Life and Property from Lightning", by W. McGregor.

The following gentlemen, duly proposed and seconded at the last meeting, were balloted for and elected ordinary members—

R. B. Shaw, Esq.
Col. J. F. Tennant (re-election).

The following is a candidate for ballot at the next meeting—

Jas. Crawfurd, Esq., B. A., Under-Secretary to the Government of Bengal; proposed by Dr. D. D. Cunningham, seconded by Capt. J. Waterhouse.

The following papers were read—

1. *An Account of the Maiwár Bhíls.—By* T. H. Hendley, *Surgeon, Jaipúr, Rájpútáná.*

(Abstract.)

Dr. Hendley gives in this paper an account of those members of the Bhíl race who reside in the 'Hilly Tracts' of Maiwár (Udaipúr), where they have perhaps best preserved their individualities. He has been able to col-

lect a good deal of information whilst residing among them as Surgeon of the Maiwár Bhíl corps. In the chapter on the religion of the Bhíls, Dr. Hendley notices the cairns and *sthâns*, which are erected on the summits of high hills, and the curious reverence of the people for the horse, which, as Sir J. Malcom says, the Bhíls worship and do not mount. Then follows a description of the customs observed at births, marriages and deaths, of the government and the agriculture of the tribe, and statistical tables containing race measurements. The Bhíl skull is but slightly dolicho-cephalic, and differs very much from the long thin-walled cranium of the pure Hindu. The chapter on Language contains an outline of Bhíl grammar, a vocabulary, and a list of proper nouns; and the paper ends with specimens of Bhíl songs.

A plate of Bhíl arms and ornaments will be published, with the essay, in No. IV. of Pt. I. of the Journal for 1875.

2. *Popular Songs of the Hamírpur District, Bundelkhand, North Western Provinces.—By* Vincent A. Smith, B. A., C. S.

(Abstract.)

Mr. Vincent Smith submits specimens of songs from Bundelkhand in honour of Hardaul, a son of the notorious Bir Sing Deo Bundelá, Rájá of Urcha, who was poisoned by his brother Jhajhár Sing. His ghost is worshipped in every village, and chiefly at weddings and in the month of Baisákh. Hardaul is also propitiated with songs when storms appear.

The Hindí of the songs is peculiar, and Mr. Vincent Smith has promised to favour the Society with other specimens.

The paper will appear in No. IV. Pt. I. of the Journal, for 1875.

Library.

The following additions have been made to the Library since the meeting held in December last.

1.—Transactions, Proceedings and Journals.

Presented by the respective Societies or Editors.

Berlin. Königliche Akademie der Wissenschaften,—Abhandlungen aus dem Jahre 1874.

———. ———, Monatsbericht, Juli und August, 1875.

Peters.—Über die Entwickelung der *Caecilien*. *G. Kirchhoff.*—Über die stationären elektrischen Strömungen in einer gekrümmten leitenden Fläche. *Peters.*—Über zwei Gattungen von Eidechsen, *Scincodypus* und *Sphenoscincus*.

Birmingham. Institute of Mechanical Engineers,—Proceedings, June, July, 1875.

Crossley. Dr. F. W.—On Otto and Langen's Atmospheric Gas Engine and some other Gas Engines. *G. H, Daglish.*—On direct-acting Winding Engines for Mines.

Bombay. The Indian Antiquary,—Vol. IV, Pt. 49.

Sri Krishna Sástri Talekar.—Legendary Account of old Newása. *Dr. A. B. Cohen Stuart.*—Sacred Footprints in Java. *J. G. Da Cunha.*—Words and places in and about Bombay. *Miss E. Lyall.*—Táránátha's account of the Magadha kings, translated from Vassilief. *H. Blochmann.*—Inscriptions from Ahmadábád.

Buenos Aires. Academia Nacional de Ciencias Exactas existente en la Universidad de Cordova,—Boletin, Entrega IV, 1875.

Calcutta. Christian Spectator.—Vol. V, No. 55, January, 1876.

Gravenhage. Bijdragen tot de Taal-land en Volkenkunde van Nederlandsch-Indië.—Deel, 8, Stukken 2, 3, 4. Deel 9, Stukken 1 to 4.

Deel 8. Stukken, 3, 4.—Cankara ácárya's Commentaar op de Aphorismen van den Vedánta, Vertaald door Dr. A. Bruining, met lene inleidung von Prof. H. Kern. (continued in Deel 9. Stukken 3-4.)

———. Babad Tanah Djawi, in Proza, Javansche Geschiedenis van J. J. Meinsma, Erste Stuk. (Tekst).

Leipzig. Deutsche Morgenländische Gesellschaft,—Zeitschrift, Vol. 29, Heft II.

O. Bohtlingk.—Kâtjâjana oder Patangalí im Mahâbhâshja. *F. Rückert.*—Aus Dschâmí's Liebesliedern. *A. D. Mordtmann.*—Sassanidische Gemmen. *S.*

Lefmann.—Zum Gâthâdialect. *Dr. H. Jacobi.*—Ueber tejás, vâyu, âkâça, speciell in der Vaiçeshika Philosophie. *A. von Krémer.*—Ein Freidenker des Islam.

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Pt. 25. *Pitta Boschii, Turdus Gouldi, Lophophorus l'Huysi, Chalcophasis Sclateri, Meropogon Forsteni, Garrulax chinensis, Trochalopteron Elliotii, Ianthocincla ocellata, I. lunulata, I. Artemisiæ, I. Austeni, Rhopophilus pekinensis, Phlogœnas tristigomata, Stachyris ruficeps, Orthotomus longicaudus.*

Pt. 26. *Palæornis Calthropæ, P. rosa, P. cyanocephala, Paradoxornis Austeni, P. Heudei, Ixus Sinensis, Calophasis Ellioti, Tetraophasis obscurus, Columba rupestris, C. leuconota, Ægithalus Consobrinus, Trochalopteron Blythii, Garrulax picticollis,; Pericrocotus cantonensis, Sylvia nana.*

Pt. 27. *Podoces Biddulphi, P. Hendersoni, P. Panderi, P. humilis, Lobiophasis Bulweri, Euplocamus lineatus, Pucrasia Darwini, Dicæum retrocinctum, Trochalopteron Cinereaceum, T. virgatum, Garrulax Galbanus, Actinodura Waldeni, Pyrrhula cineracea, Montifringilla ruficollis, Sitta nagœnsis.*

———. Society of Arts,—Journal Vol. XXIII, Nos. 1185 to 1199.

No. 1185.—Silk Supply. Metallurgy in Japan.

No. 1189.—Silk Culture in Australia.

No. 1190.—The Saltpetre Deposits of Peru. The Geographical Congress and Exhibition at Paris. Utilisation of the Products of Maize.

No. 1192.—Silk Culture in Australia. Indian Jute and Lac. Indian Glass. Japanese Damasked Metal Plates.

No. 1193.—Food Preservation. The Progress of India.
No. 1194.—Through Railway to India. Metal Work among the Hindus.
No. 1195.—Health and Civilisation. Coffee Disease in Dominica.
No. 1198.—Census of India.

London. The Ibis,—3rd Series, Vol. V, No. 19.

W. V. Legge.—On the Birds of the South-eastern Subdivision of Southern Ceylon. *R. W. Morgan.*—On the Nidification of certain South-Indian Birds. *H. E. Dresser.*—Notes on Severtzoff's "Fauna of Turkestan." *A. Newton.*—Note on *Palæornis exsul*. *P. L. Sclater.*—On *Turdus javanicus* of Horsfield, and its allied form *Turdus Schlegeli*. *R. W. Ramsay.*—Ornithological Notes from the District of Karennee, Burmah. *J. H. Gurney.*—Notes on a "Catalogue of the *Accipitres* in the British Museum" by R. B. Sharpe. *W. T. Blanford.*—A letter from, on *Hypocolius ampelinus*.

———. The Westminster Review,—No. 96, October, 1875.

The Baroda Blunder.

———. The Quarterly Review,—No. 278, October, 1875.

———. Edinburgh Review,—No. 290, October, 1875.

Forest Management.

———. The Academy,—Nos. 183 to 187, 1875.

New Haven. U. S. The American Journal of Science and Arts,—Vol. X, Nos. 56, 57, 58.

No. 56. *E. S. Holden.*—Historical Note on the Observation of the Corona and Red Prominences of the Sun. *B. G. Wilder.*—On a fœtal Manatee and Cetacean, with remarks upon the affinities and ancestry of the *Sirenia*.

No. 57. *S. Haughton.*—Mechanical Work done by a Muscle before exhaustion and on the "Law of Fatigue." *R. H. Chittenden.*—On some interesting Equine Calculi. *J. W. Mallet.*—Note on the Gases accompanying Meteorites. *A. E. Verrill.*—Notice of the occurrence of another Gigantic Cephalopod (*Architeuthis*) on the coast of Newfoundland, in December 1874.

Paris. Comptes Rendus,—Tome 71, Nos. 4—18, 1875.

No. 4. *M. J. Jamin.*—Sur la distribution du magnétisme dans les faisceaux composés de lames très-minces et de longueur finie. *M. G. Planté.*—Recherches sur les phénomènes produits par des courants électriques de haute tension, et sur leurs analogies avec les phénomènes naturels. *M. A. Renard.*—Action de l'oxygène électrolytique sur la glycerine.

No. 5. *M. J. Jamin.*—Sur les aimants formés pas des poudres comprimées. *M. J. Béchamp.*—Des microzymas et de leurs fonctions aux différents âges d'un même être. *M. Arm. Gautier.*—Sur la séparation complète de l'arsenic des matières animales et sur son dosage dans les divers tissus. *M. Oré.*—Observation d'un cas de névralgie épileptiforme de la face, traitée par la section des nerfs nasal interne et nasal externe, avec anesthésie produite par injection intra-veineuse de chloral.

No. 6. *M. Lorin.*—Faits relatifs á l'étude des alcools polyatomiques proprement dits. Application à un nouveau mode d'obtention de l'acide formique cristallisable. *M. Prosper Henry.*—Découverte de la planète 148 faite à

l'Observatoire de Paris. *M. Arm. Gautier.*—Conduite de l'appareil de Marsh; son application au dosage de l'arsenic contenu dans les matières organiques.

No. 7. *M. Th. du Moncel.*—Neuvième Note sur la conductibilité électrique des corps médiocrement conducteurs. Polarisation électrique des mineraux. *M. J. M. Gaugain.*—Quatrième Note sur les procédés d'aimantation.

No. 8. *M. Le Verrier.*—Comparaison de la théorie de Saturne avec les observations. Masse de Jupiter. Tables du movement de Saturne.

No. 9. *M. Faye.*—Sur la formation de la grêle. *M. Th. du Moncel.*—Dixième Note sur la conductibilité électrique des corps médiocrement conducteurs. *M. de Rostaing.*—Addresse la description d'une expérience constatant l'efficacité de la racine de garance pour la conservation des viandes non cuites.

No. 10. *MM. P. Desains et Aymonet.*—Etude des bandes froides des spectres obscurs. *M. Th. du Moncel.*—Onzième Note sur la conductibilité électrique des corps médiocrement conducteurs. *M. Brault.*—Nouvelles cartes de Météorologie nautique, donnant à la fois la direction et l'intensité probables des vents. *M. N. Severtzow.*—Note à propos d'une communication précédente de M. Faye, sur des observations faites pendant, un orage de grêle dans l'Asie centrale.

No. 11. *M. J. C. Watson.*—Mémoire sur les observations du passage de Vénus faites à Pekin. *M. S. Cloez.*—Note sur la matière grasse de la graine de l'arbre á huile de la Chine. *M. C. Husson.*—Sur quelques réactions de l'hemoglobine et de ses dérivés.

No. 12. *MM. P. et H. Gervais.*—Sur une particularité anatomique remarquable du Rhinoceros. *M. Lecoq de Boisbaudran.*—Caractères chimiques et spectroscopiques d'un nouveau métal le *Gallium*, découvert dans une blende de la mine de Pierrefitte, vallée d'Argelès (Pyrénées.) *M. J. Chatin.*—Sur le développement et la structure des glandes foliares interieures.

No. 13. *M. Th. du Moncel.*—Douzième Note sur la conductibilité électrique des corps médiocrement conducteurs. *M. G. le Bon.*—Transformation du sang en poudre soluble, propriétés chimiques, physiques, et alimentaires de cette poudre. *MM. L. Mathieu, et V. Urbain.*—Remarques concernant une Note de *M. F. Glenard*, sur la coagulation spontanée du sang en dehors de l'organisme. *M. Meusel.*—De la putrefaction produite par les bactéries en presence des nitrates alcalins.

No. 14. *M. A. Mouchot.*—Résultats obtenus dans les essais d'applications industrielles de la chaleur solaire. *M. G. Tissandier.*—Sur l'existence de corpuscules ferrugineux et magnetiques dans les poussières atmospheriques. *M. D'Arbaud-Blonzac.*—Les orages de 1875.

No. 15. *P. A. Secchi.*—Résultats des observations des protubérances et des taches solaires du 23 avril, au 28 juin 1875 (fin.) *M. Durin.*—De l'analyse commerciale des sucres, et de l'influence des sels et du glucose sur la cristallisation du sucre.

No. 16. *M. Th. du Moncel.*—Treizième Note sur la conductibilité électrique des corps médiocrement conducteurs.

No. 17. *M. de Magnac.*—Progrès réalisé dans la question des atterrissages par l'emploi de la méthode rationnelle dans la détermination des marches diurnes des chronomètres. *M. A. Cazin.*—Observations magnétiques faites à l'île Saint-Paul, en novembre et décembre 1874. *M. J. A. Broun.*—Note sur les relations observées à Trevandrum, entre les resultats des observations magnetiques et la période des taches solaires.

No. 18. *M. Th. du Moncel.*—Quatorzième Note sur la conductibilité électrique des corps médiocrement conducteurs. *M. Chauveau.*—De l'excitation électrique unipolaire des nerfs. Comparison de l'activité des deux pôles, pendant le passage des courants de pile. *MM. V. Feltz et E. Ritter.*—De l'apparition des sels biliaires dans le sang et les urines, déterminée par certaines formes d'empoisonnement.

Paris. Revue et Magasin de Zoologie,—3me Serie, Nos. 4—8, 1875.

———. Journal des Savants,—Juillet, Août, Septembre, Octobre, 1875.

Juillet. *Barthélemy Saint-Hilaire.*—La langue et la litterature hindoustanies de 1850 à 1869 et 1874.

Septembre.—*J Bertrand.*—Uranographie chinoise.

Octobre.—*M. M. Chevreul.*—E'tudes sur les quinquinas.

———. Revue Critique d'Histoire et de Litterature,—Nos. 31—44, Juillet—Octobre, 1875.

No. 31. *Leland.*—Découverte de l'Amérique par les Buddhistes.

No. 34 and 35. *Burnell.*—E'léments de Paléographie Indienne.

No. 36. *Beal.*—La Légende de Sâkya Buddha. *J. de Goeje.*—l'Ancien lit de l'Oxus.

No. 44. *Muir.*—Choix de sentences religieuses et morales, traduites du Sanskrit.

———. Revue Archéologique,—Nos. 7—10, Juillet—Octobre, 1875.

———. Revue des Deux Mondes,—Tomes 10, 11. 12, Août—Novembre, 1875.

Tome 10.—Les Progrès de la Russie dans l'Asie centrale et les ombrages de l'Angleterre.

5.—Books Purchased.

Beal, S. The Romantic Legend of Sákya Buddha, from the Chinese.

Childers, R. C. A Dictionary of the Pali Language, Pt. II.

Cowell, E. B. A short Introduction to the ordinary Prákrit of the Sanskrit Dramas.

Darwin, C. Insectivorous Plants.

Elliot, Sir H., K. C. B. The History of India as told by its own Historians, Vol. VI., ed. Prof. Dowson.

Grassmann, H. Wörterbuch zum Rig-Veda, 5 and 6 Liefrung.

Harbold, E. von. Morgenländische Forschungen. Coleopterologische Hefte XIII.

Jevons, W. Stanley. Money and the Mechanism of Exchange.

Neumayer, Dr. G. Anleitung zu wissenschaftlichen Beobachtungen auf Reisen.

Sims, R. Hand-book to the Library of the British Museum.

Whitney, W. W. The Life and Growth of Language.

Wright, T. The Celt, the Roman, and the Saxon; a History of the early inhabitants of Britain.

Vogel, Dr. H. The Chemistry of Light and Photography in its application to Art, Science, and Industry.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

For March, 1876.

The Monthly General Meeting of the Society was held on Wednesday, the 1st March, at 9 o'clock P. M.

T. Oldham, Esq., LL. D., President, in the chair.

The minutes of the last meeting were read and confirmed.

The following presentations were announced:—

1. From the Government of India, Foreign Department, a copy of a "Report of Mission to Yarkand, by Sir Douglas Forsyth."

2. From Dr. T. H. Hendley, a copy of his "Guide to Jeypore."

3. From the author, a copy of an "Address delivered to the Biological Section of the British Association," by P. L. Sclater.

4. From Rájá Harendra Krishna Bahádur, a copy of a work entitled "The Indian Press on the late Rájá Kali Krishna Bahádur, K. G. S."

5. From W. F. Blanford, Esq., a copy of the Atlas of Mining Industry accompanying Vol. III of the Records of the U. S. Geological Exploration of the Fortieth Parallel, by Clarence King.

6. From Nawáb Sayyid Siddíq Hasan Khán, Bahádur, of Bhopál, copies of the following works:—

Itháf-ulnubalá il-muttaqín bi-ihyái maásir ilfuqahá ilmuhaddisín; Alhitta fí zikr ilçihách il-Sittah; Táj uliqbál, Tárikh i riyásat i Bhopál (Persian); Ditto ditto, (Urdú); Luqtat ul'ajalán; Rihlat uççidíq ila-lbait il'atíq; Qitf ul-samar; Alintiqád ulrajíh fí sharh ili'tiqád ilçahíh; Huçúl ul mámúl min 'ilm il-uçúl; Iksír fí uçúl iltafsír.

7. From J. Wood-Mason, Esq., a collection of photographs found among the effects of the late Dr. Stoliczka.

The following gentleman, duly proposed and seconded at the last meeting, was elected an ordinary member.

J. Crawfurd, Esq., B. A., C. S.

The following are candidates for ballot at the next meeting:—

Mr. H. Wilson, Asst. Controller, P. W. Dept., proposed by Dr. E. W. Chambers, seconded by Mr. F. W. Peterson.

Kumár Kanti Chandra Sing, of Paikpárá, proposed by Maulavi Abdul Latif Khán, Bahádur, seconded by Bábu Bhuggobutty Charan Mullick.

T. E. Coxhead, Esq., proposed for re-election by Mr. H. Blochmann, seconded by Captain J. Waterhouse.

The following gentlemen have intimated their desire to withdraw from the Society—

R. Stewart, Esq., on leaving India, Capt. T. B. Mitchell, Rájá Harendra Krishna Bahádur.

The Council reported that Capt. J. Waterhouse, and Mr. H. Blochmann, had been nominated Trustees of the Indian Museum on behalf of the Society, in the place of Col. Hyde, and Dr. S. B. Partridge, who had left the Council.

The PRESIDENT announced that the Council recommend Dr. Werner Siemens, and Col. Henry Yule, R. E., C. B., as suitable persons for election as Honorary Members of the Society.

The following were the grounds on which this recommendation was made:

Dr. W. SIEMENS, the elder of two brothers both famous and distinguished as practical physicists, has been from the first the most eminent and most useful of the pioneers of telegraphy. He first successfully introduced the covering of telegraph wire with gutta-percha and Indian-rubber. He recommended the first submarine telegraph through the Red Sea, in order to establish direct communication with India from Europe. When this failed and telegraphing became so imperfect that letters often reached their destinations before messages, he promoted with immense zeal and energy the Indo-European line by land, which has since worked, and is working so well, that we have the London news of the evening before, in our morning papers. He has been more instrumental than any one else in making telegraphic communication with Europe perfect, and is acknowledged to have been by far the greatest improver and perfector of Telegraphy in general, thus becoming the general promotor of the most beneficial scientific improvement of modern times.

Colonel HENRY YULE, R. E., C. B. has, since the year 1842, been an occasional contributor to the Journal of the Society. He was elected a member in July, 1856, and up to 1861, when he retired from the service, valuable papers on the "Khási Hills, and their People," "On the ruins at Pagán on the Irrawaddi," and on the "Buddhistic remains in Java," evidenced the interest which he took in the labours of the Society. He accompanied Major,

(now Sir Arthur) Phayre, in his mission to the Court of Ava in 1855, and his preparation of the account of that mission, illustrated largely by his own artistic pencil, and accompanied by excellent maps of ancient Burmah, appears to have laid the foundation of his unceasing interest in the study of the Geography of Central Asia. The learned and valuable work on "Cathay and the Way thither," published by the Hakluyt Society, was followed by the masterly dissertation on one of the most puzzling questions of Central Asian geography, prefixed to the new edition of Wood's Journey to the Source of the Oxus. And his labours culminated in the scholarly and elaborate translation of Marco Polo's Travels, to the editing of which he brought a mass of widely extended and careful research, and an amount of erudition and knowledge perfectly unequalled in any other recent contribution to literature. A second edition, greatly extended, was published during the last year.

Other valuable papers by Col. H. Yule, have appeared in the pages of the Royal Geographical Society, London, Geographical Magazine, &c., and he now stands confessedly one of the foremost scientific Geographers of the day, particularly with reference to the earlier geographical history of China and Central Asia.

In accordance with the rules of the Society these names would be hung up in the Meeting-Room of the Society until the next ordinary meeting, when they would be balloted for.

The Council reported that the following gentlemen have been nominated by the Council to serve on the several Committees during the ensuing year.

1876.

Sub-Committee of Finance.

Bábu Rájendralála Mitra, LL. D.
E. Gay, Esq.
R. Taylor, Esq.
Colonel J. F. Tennant.

Library.

The Hon. E. C. Bayley, C. S. I.
Bábu Rájendralála Mitra, LL. D.
Colonel J. F. Tennant, R. E.
G. Nevill, Esq.
A. Pedler, Esq.
Dr. Mohendralal Sircar.
J. Geoghegan, Esq.
Dr. W. K. Waller.
C. H. Tawney, Esq., M. A.
Whitley Stokes, Esq.
W. T. Blanford, Esq.
C. H. Wood, Esq.
Dr. O. Feistmantel.
Dr. D. D. Cunningham.
Bábu Prannáth Pandit.
W. S. Brough, Esq.

Philology.

The Hon. E. C. Bayley, C. S. I.
Bábu Rájendralála Mitra, LL.D.
C. H. Tawney, Esq., M. A.
Major-Genl. A. Cunningham, C. S. I.
J. Beames, Esq.
F. S. Growse, Esq.
Rev. K. M. Banerjea, LL. D.
Bábu Gaur Dás Bysack.
Dr. Mohendralala Sirkar.
Maulavi Abdul Latif Khán Bahádur.
Maulavi Kabiruddin Ahmad Sahib.
Bábu Dijendra Nath Thákúr.
Whitley Stokes, Esq.
Bábu Prannáth Pandit.
Dr. G. Thibaut.

Natural History.

G. Nevill, Esq.
H. F. Blanford, Esq.
V. Ball, Esq.
H. B. Medlicott, Esq.
Dr. O. Feistmantel.
D. Waldie, Esq.
A. O. Hume, Esq., C. B.
Dr. D. D. Cunningham.
Dr. J. Armstrong.
S. Kurz, Esq.
Dr. G. King.
S. E. Peal, Esq.
W. E. Brooks, Esq., C. E.
Dr. J. Scully.
Dr. W. Schlich.
W. Theobald, Esq.
R. Lydekker, Esq.
W. T. Blanford, Esq.

Physical Science.

Col. H. L. Thuillier, C. S. I.
H. B. Medlicott, Esq.
H. F. Blanford, Esq.
D. Waldie, Esq.
A. Pedler, Esq.
R. S. Brough, Esq.
Dr. D. D. Cunningham.
The Hon. J. B. Phear.
A. Tween, Esq.
W. Theobald, Esq.
A. Cappel, Esq.
T. S. Isaac, Esq., C. E.
Colonel J. F. Tennant, R. E.
Commander A. D. Taylor.
V. Ball, Esq.
Col. D. G. Robinson., R. E.
Rev. F. Lafont.
J. O'Kinealy, Esq.
W. T. Blanford, Esq.
C. H. Wood, Esq.
Dr. J. Scully.

Coins.

The Hon. E. C. Bayley, C. S. I.
Colonel J. F. Tennant. R. E.
Bábu Rájendralála Mitra, LL. D.
Major-Genl. A. Cunningham, C. S. I.
Major F. W. Stubbs, R. A.
Rev. M. A. Sherring.

The Secretary laid before the meeting a letter from the President and Secretary of the Committee, forwarding the programme of the 3rd Congress of Orientalists, proposed to be held at St. Petersburgh in the month of

September next, and soliciting the support and presence of members of the Asiatic Society, and read the following extracts from the programme:

"The Russian Committee of organisation, acting in concert with the Permanent Committee of the 2nd Session in London have drawn up the following regulations for the ensuing Session.

"1. The International Congress of Orientalists will re-assemble for its 3rd meeting at St. Petersburgh on the 1st September, 1876. The meeting will last for 10 days.

"2. The meeting will be chiefly devoted to subjects relating to Asiatic Russia. The subjects will be discussed in four sittings, the first of which will be taken up by Siberia (eastern and western), the second by Central Asia within Russian boundaries (comprising also the independent principalities of Ouzbekistan); the third by the Caucasus (with the Crimea and other countries in European Russia inhabited by an Asiatic population); the fourth by Trans-Caucasia (formerly Georgia and Armenia).

"3. At the three following sittings the Congress will consider the rest of Asia, divided into three groups: 1, Eastern Turkistan, Tibet, Mongolia, with Mantchouria and the Corea, China Proper and Japan. 2. India, Cis- and Trans-Gangetic, Afghanistan, Persian and the Indo-Chinese Archipelago; 3. Turkey, including Arabia and Egypt.

"4. The subjects which will be considered in these seven sittings will comprise the Cartography, Ethnography, Language, History and Literature of the respective countries.

"5. The two last sittings will be devoted to questions relating 1, to the Archæology and Numismatics of the Eastern peoples generally, and 2, to their Religious and Philosophical Systems.

"16. A summary of all the papers and communications brought before the meeting in the Russian language, as well as of the discussions carried on in that language, will be published in the Report of the Congress, in French.

"17. The Committee will publish a list of the questions to be proposed for discussion at the Congress. Any person wishing to propose any special questions relating to the East are requested to submit them in writing to the managing Committee, or to one of its corresponding members, accompanied by an abstract stating their opinions on these questions. It is only on this condition that the latter can be admitted for discussion.

"18. The International Congress of Orientalists at its 3rd meeting will only consider subjects of purely scientific interest; consequently any communication or discussion on subjects bearing on the Christian religion or contemporaneous politics, administration, commerce and industry or which may not be included in the above mentioned programme of the meeting, will be considered as out of place and at once vetoed by the President of the sitting.

"19. Papers or communications intended to be read at the sittings of the Congress may be sent direct to the managing Committee at St. Petersburgh, or to its Corresponding Members, who have been directed to forward them to the Committee.

"20. The Committee will organise during the continuance of the Congress an Exhibition of objects relating to the antiquities, and actual condition of Eastern peoples. Foreign members of the Congress will be admitted as exhibitors. The cost of transit charges to and fro will be borne by exhibitors.

"21. Admission as a member of the Congress will be granted to any person of either sex, expressing a desire to take part in the labours of the Congress and paying the subscription of 10 shillings. On payment of the subscription a member's ticket will be given, which will give the possessor admission to all the sittings of the Congress and to the attached Exhibition, as well as a right to a copy of all the publications of the meeting of the Congress.

"22. Scientific Societies may also be inscribed as such on the list of members of the Congress, with the right of being represented by a special delegate.

"23. Persons not presenting their tickets of membership will not be admitted to the sittings of the Congress or to the Exhibition.

"24. Immediately on their arrival at St. Petersburgh, the members of the Congress are requested to be good enough to proceed to the office of the Managing Committee to signify their presence, enter their residence, and obtain the rules of the meeting.

"26. The liberality of the Russian Government renders it unnecessary for the Committee to admit a separate class of donor members. The subscriptions of members will be principally devoted to the publication of the proceedings of the meeting. But any donation of books, manuscripts, drawings, maps, objects of antiquity, art or curiosity, &c., will be gladly received.

"27. All scientific bodies and societies among whose members there may be some interested in Oriental studies, will be informed of the rules of the meeting and invited to take part in the proceedings of the Congress. No personal invitations will be issued.

"28. All foreign correspondence of the Committee of Management, excepting that relating to the Exhibition, will be conducted through the President of the Committee, M. W. W. Grigorief (St. Petersburgh, Vasilievski-Ostrov, Volkhovskoi-Péréovlok, No. 6,) or the Secretary for Foreign correspondence, M. le Baron Victor de Rosen, Asst. Professor of Arabic at the University of St. Petersburgh (Fourchatskaya, No. 25). For any business relating specially to the Exhibition, application should be made to M. Pierre Lerch, Secretary of the Imperial Archæological Commission at St. Peters-

burgh (Vassilievski-Ostrov, Grand Perspective No. 8), who is specially charged with the organisation and management of the Exhibition.

The following paper was read :—

1. *On Human Sacrifices in Ancient India.*—*By* Bábu Rájendralála Mitra, LL. D.

(Abstract.)

The author starts with the assumption that, however repulsive the idea of sacrificing human beings may be to modern civilization, it was not inconsistent with the different forms of religion which were current in primitive times. They all were founded on the belief of one or more supernatural beings of great power who were easily offended, but who, at the same time, were amenable to the seductive influences of coaxing and peace-offering ; and all mantras, charms, prayers and sacrifices originated from, and were various forms of, coaxing and peace-offering. Human sacrifice was, in short, the natural result of assigning human attributes to the Divinity, and it proceeded under different circumstances from anthropopathy, devotion, penance, joicings, vindictiveness, expediency, respect for the dead, necromancy, vows, and a desire to avert an evil or secure a coveted object by divine or supernatural intervention. To illustrate these points, the author quotes largely from different works showing that sacrifices of human beings were made by the Greeks, Romans, Egyptians, Assyrians, Chaldeans and almost all other ancient nations. He then discusses the true character of the story of Sunahśepha as given in the Vedas, and comes to the conclusion that the sacrifice there referred to was real and not typical, as supposed by Wilson, Rosen and other European orientalists. Extracts are then given from the White Yajur Veda, the Taitiriya Bráhmaṇa, the Srautra Sútras of Apastamba and Kátyáyana, and the Káliká Puráṇa to show the various phases through which the odious practice of sacrificing human beings had passed in India.

The Rev. Dr. K. M. Banerjea said :—The theory which Bábu Rájendralála has propounded on the origin of human sacrifices in the world would, if discussed at large, lead to a theological debate not suitable at a place like this. I will therefore content myself with saying that I cannot assent to such a dogma—certainly not in the sweeping manner in which it has been propounded. I do not deny that human sacrifices have prevailed among most nations of the world—but probably not in primitive times—nor among the Jews, *as Jews*, at any time. The offering of Isaac was a simple trial of faith, not followed by actual slaughter—nor was it indicative of an inhuman custom. The offerings to Moloch were professedly the consequences of *lapses to open idolatry*, and so far *unJewish*. But I

will confine myself to the proper subject of the paper as notified beforehand, *viz.*, "Human Sacrifices in Ancient India." I do not know in what sense the learned essayist has used the term "Ancient India." I do not deny that human sacrifices have prevailed in the country, but that was long after the *primitive* Vedic period. My friend has referred to the Rig Veda, but he has admitted that the verses to which he has called attention do not themselves conclusively prove the fact. But he seems to think that those verses, coupled with the comment of the Aitareya Bráhmaṇa, do prove his case. I beg to dissent from him. The case is that of Sunahśepha, but, like Isaac, he was let off. It was not *in effect* a case of human sacrifice. What it might have been *in the intention* is a question difficult of solution. The difficulty is raised in the Aitareya Bráhmaṇa itself, which my friend has adduced as his evidence. It speaks of *Purusha-medha*. Now "purusha" is not synonymous with *man*. It only means a *person*. We have in the Rig Veda the account of the sacrifice of primeval "purusha, begotten in the beginning," *(purusham játamagratah)*. We have also the Vedic dogma—"The Lord of the Creation offered himself as a sacrifice." I believe this dogma and the description of the sacrifice of the *Primeval purusha* proceeded from hazy recollections of the original revelation of "the Lamb slain from the foundation of the world." That is my belief but I will not discuss it here. So much for the word "purusha." Now as to the word *medha*, my friend's own witness, the Aitareya Bráhmaṇa itself, used it in the sense of that part or essence of an animal body, which alone can be acceptably offered as a sacrifice, *and it can be abstracted without loss of life to the animal*. The Aitareya Bráhmaṇa refers not only to the case of a *Purusha-medha*, in which the person was dismissed alive, after the *medha* had escaped from his body, but also to numerous cases of animals which were produced as victims, but released on the *medha* escaping from them. "Medha" is a peculiar sacrificial term. It seems to correspond to the Hebrew *meḥa* which, as an adjective, signifies *fat*, and is applied to sacrificial animals, such as sheep and lambs. The substantive form *moḥa* means *marrow*. That is also the sense in which, according to the Inscriptions, the word *mahe* was used by the Assyrians. But, as the *Aitareya Bráhmaṇa* itself shows, the *medha* can escape without the animal being slaughtered. What this means I cannot readily say. It is certain, however, that the use of the term "purusha-medha" is little or no proof of the actual sacrifice of a man, much less of the existence of an inhuman custom or institution among our primitive ancestors.

I do not deny that some time after the Vedic period such inhuman practices did prevail as offerings to Sakti in her blackest form. I acknowledge also that solitary instances, rare in themselves, of a sort of religious suicide, may likewise be found, apart from offerings to Káli, in the post-Vedic period, as in the case of Sarabhanga in the age of the Rámáyana.

The Hon. E. C. Bayley said that while he agreed with Dr. Banerjea that Bábu Rájendralála had gone a good deal beyond what he proposed as the subject matter of his paper, and had travelled on to ground which was possibly beyond the province of the Society, nevertheless Mr. Bayley thought that some at least of his propositions were not open to dispute.

It was no doubt true that human sacrifice was in many cases due to the desire of propitiating the Gods by the sacrifice of the sacrificer's dearest possessions, as for example was the case in the well known history, curiously brought into prominence by the recent discovery of the "Moabite Stone," of Mesha, king of Moab, who sacrificed his son on the walls of his beleaguered city to obtain relief from the danger which pressed upon him.

That this principle was carried also to the extent of inducing the sacrifice of a man's own life to propitiate the Deity, was a fact of which contemporary evidence might be had. Mr. Bayley had, on one occasion, official cognizance of a case in which an unfortunate Hindu, suffering terribly from leprosy, had caused himself to be buried alive, in the hope that by this act of self-immolation he might in a future state of existence escape his terrible disease, and in which case two men were punished for assisting him thus to commit suicide. On the other hand some of the instances to which Bábu Rájendralála had alluded, could hardly come under the head of sacrifice, such for example as the alleged destruction by the Emperor Napoleon the First, of the sick who embarrassed his army—there were many well known similar instances of wholesale and wanton destruction of human life, which certainly partook in no way of the character of sacrifice, as for example, the massacres of his prisoners by Timur, near Dehli and elsewhere; and, in very recent times, the story of the barbarous Turkoman who erected a pyramid of human skulls, and murdered the unfortunate Schlagintweit to obtain his head for the apex of it. It was not, however, Mr. Bayley's purpose to enter into the general questions raised, but rather to call the attention of the meeting to a fact which gave to the theories propounded a substantial existence and a local colouring, and which also would give a tolerably accurate and remote date for the practice of human sacrifice amongst a Hindu community.

Twelve years ago Mr. Bayley had the honor to furnish to the Society a number of drawings of sculptures brought from the ruins of Jamalgiri, near Peshawar, and which were of the class now known as Eusofzye sculptures. They were published, with a brief account of them, in the 21st Volume of the Society's Journal, and opposite p. 621 of that volume would be found a lithograph* of a sculpture which Mr. Bayley believed undoubtedly to represent a human sacrifice. The original† (which unfortunately perish-

* From a drawing by the late Sir Herbert Edwardes.

† It was cut in a coarse blue slatey limestone and was in imperfect preservation, four parts of the surface were scaled off as the drawing shows.

ed in the fire at the Indian Department of the Crystal Palace) was not indeed found at Jamalgiri but at Peshâwar, and was sent to him with most of the other sculptures by the late Lieutenant S. W. Stokes, of the Bengal Artillery. But though not actually coming from the same place as the other sculptures, it clearly was of the same class, both in general character, design, and in many of the details, though of less skilful work and probably therefore of rather later date.

The centre figure in the group (which contains four persons), is represented with a closely shaven head. This is a frequent characteristic of figures in the groups of Eusufzye sculptures and is supposed, with much probability, by General Cunningham to indicate that the person intended to be represented as a Buddhist monk. In this instance this person is the victim who is naked, and the others are represented in the act of binding him down to a kind of altar of open stone or brick work. Of the threefold cords, one is drawn across the victim's throat, another round his waist. The feet apparently are still free, but the sculpture was in this part imperfect. The victim is represented as struggling or remonstrating, and one of the other figures appears, while restraining his struggles with his left hand, to be in the act of striking with his right hand, in which apparently some weapon was figured.

The dress of the other figures is that ordinarily shown on the Eusofzye sculptures and was, no doubt, the local costume of that day in the neighbourhood of Peshâwar, as indeed in some respects it still is.

It would be safe, therefore, Mr. Bayley thought, to take this sculpture as representing the immolation of a captive Buddhist monk by his Hindu enemies.*

Probably from its general resemblance to other sculptures undoubtedly Buddhist, it was of Buddhist origin, and was intended to represent the death of some early martyr to that faith.

But at any rate there seemed no reason to doubt that it represented an human sacrifice in a Hindu country, and that it is of early date.

The only inscription yet found among the Eusofzye sculptures bears a date which both General Cunningham and Professor Dowson concur in attributing to the middle of the first century of the Christian era. And it is safe at least to assign the bulk of the Eusofzye sculptures to this date: from internal evidence, Mr. Bayley would have been himself disposed to consider them of somewhat earlier origin, but no doubt Mr. Fergusson on the

* An instance, that is to say, of the sacrifice of a human captive the firstfruits of a victory as Bâbu Râjendralâla suggests either as an indication of gratitude or perhaps rather in this instance as it seems to me, the immolations of one regarded by the gods as hostile or in order to please or appease them.

same evidence, had before the discovery of the inscription assigned them to the commencement of the Christian era.

The present sculpture might be two or three centuries later, or its inferior character might be partly due to its belonging to a minor class of building, as the inferior material used seemed to indicate. Still Mr. Bayley thought that it would not be safe to assign it to a later date than the 3rd or 4th century of the Christian era, and if his interpretation of it were correct, it would suffice to prove the existence of human sacrifice among a Hindu race at least as early as the epoch at which he presumed it to have been executed.

Bábu Rájendralála Mitra said, he was sorry that there should be a misunderstanding as to what he had meant by the word "ancient." He had used the word in the sense in which historians generally employ it, namely, to indicate all time anterior to the 6th century of the Christian era, taking the period from the 6th to the 14th century to be the middle ages, and all after the last date to be modern. He was perfectly well aware that the practice of casting infants into the waters of the Hughli near Ságar Island was most probably of mediæval origin, and in referring to it, his object was to point out, that what was common in the middle ages and modern days, was not *in se* improbable in earlier times, and not to adduce it as an instance of ancient usage; though he strongly suspected that the sacrifice of Sunahśepha was the type on which the modern rite was founded.

He was not, he admitted, sufficiently well up in Biblical learning to enter into a discussion as to the true meaning of Abraham's offer of Isaac as a sacrifice, nor was he disposed to raise a polemical controversy; but to his lay understanding, the offer, without any expression of compunction, was a remarkable fact, and certain it was that when the offer was made, there was no reservation, nor any prospect or hope of the offer not being accepted, and in so far, the case was a parallel one to that of Sunahśepha. In the case of Jephtha, the rash vow to make a "burnt offering" was brought to its tragic close by the immolation of his own daughter, "while the Spirit of Jehovah," we are told, was upon him, and that clearly showed that the Jews could, and did, sacrifice human beings in the name of religion. Doubtless there were many passages in the Old Testament which reprobated "the shedding of innocent blood," as in Deuteronomy xii, 31, and elsewhere, but they did not deter Jephtha. The legend of Jephtha is supposed by some to be an adaptation of that of Iphigenia, but it does not alter the charge against the Jews.

As regards the story of Sunahśepha, the Bábu would, for the credit of his ancestors, gladly accept the European theory on the subject, if he could, but he felt it impossible to reconcile the details of the story with its supposed symbolical character. A man has a hundred wives, but no children;

he prays the water-god Varuṇa for children, promising to give up the first-born to the god; a child is born, and Varuṇa claims it; the father evades fulfilling his promise under one pretext or another, until the child, grown up to man's estate, runs away from home to escape being sacrificed; the god, disappointed, afflicts the father with dropsy; the son, mindful of his filial duty, returns home to save his father, and, meeting a poor Bráhman in the way, buys one of his sons for a hundred head of cattle to offer him as a substitute; and the victim ultimately escapes through the intervention of certain gods. Now, eliminate the element of danger from this story, and the dramatic and sensational character of the whole would be at once destroyed. If the sacrifice were a symbolical one, why should the man fail to redeem his promise? There would have been no harm done to his son by repeating a few mantras over him. The son had no reason to run away from home, and to buy a substitute; and the substitute, a grown up man well versed in the details of sacrifice, had no business to bewail his lot, to forsake, in disgust, his father who had sold him, and to become the adopted son of a stranger and a man of a lower caste.

The Bábu could not also subscribe to the interpretation of the word *Purushamedha* suggested by the Rev. K. M. Banerjea, as the Satapatha Bráhmaṇa of the White Yajur Veda had defined it differently, and no one in the present century could consistently adopt a different interpretation. The enquiry was, as to what the Veda itself meant by the word, and not what could be made of it by the aid of philology.

The story in the Aitareya Bráhmaṇa, which referred to the passing of that part of a man which was fit for offering successively to a horse, to an ox, to a sheep, to a goat, and lastly to the earth, was purely allegorical, and intended to eulogise the value of rice offering, and did not set aside the animal sacrifices. The goat was never set aside, and yet it comes under the same category with the horse, which too, if the Vedas are to be at all believed, at one time formed an important subject of sacrifice.

The PRESIDENT, in closing the discussion, expressed the obligation of the Society to Bábú Rájendralála Mitra for his paper, as for the discussion it had elicited. Much had been said of the meaning of the word 'ancient,' and in every statement care was taken to give the date of the story or sculpture, referred to. To him, however, this seemed a matter of the most secondary importance. Human sacrifice had existed in this country and in others, from the earliest times, and were it not checked by the strong arm of the law, would exist to the present day largely and comparatively widely. In truth, he was not aware of the existence of any race of human beings, among whom human sacrifice had not existed at some period of their history. It had been said to-night that the Persians were an exception; he must doubt it, and if there were no evidence of it among that people, this

must, he thought, arise from the imperfection of the records, not from the absence of the custom. Our own ancestors, much as we were naturally disposed to plume ourselves on our humanity, unquestionably offered human sacrifices. And the natural conclusion, the inevitable conclusion, he thought, of the study of the history of the human race was, that this custom was not confined to any special times, was not a question of centuries, or of epochs but was in every case, a question of the state of co-ordinate civilization and thus might exist in one nation, or in one tribe or part of a nation, many centuries after it had disappeared from others.

The PRESIDENT said, before the meeting closed, he was anxious to say a few words on a matter of very considerable importance to the Society. The Members were fully aware of the arrangements which had been made with the Government of India, by which the Asiatic Society was to have provided for it in the new Indian Museum, apartments fitted for its accommodation and use: also of the strict supervision, which the Society, as Trustees for the public, had secured over the valuable collections, which they handed over to the safe keeping of the Trustees of the New Museum. Then recently, the Government of India had found that the demands for space in that building were more extended than had been supposed. And they have proposed that the Asiatic Society should give up their right to the rooms which had been appropriated for their use, and should accept in lieu thereof a sum of money supposed to represent the value of the house and premises now occupied by the Society, and which is their property. This house and premises would have been a certain source of steady income to the Society. A new Act of the Legislature was requisite for this purpose, and in the preparation of this Act some slight alterations had been introduced. The principal of them was, that the number of Trustees was increased, and the right of nomination of an additional Trustee was secured to the Society, making the number to be nominated by that body five; the President for the time being, and four other Members, instead of four as at present.

The same right of property in the collections handed over, and power of resuming these, in the event of the Museum not being maintained, were contained in the new Act, as in the former one. And practically the rights of the Society continue as they were.

This proposal on the part of the Government when submitted to the Council of the Society, received their unanimous assent, and they have expressed their willingness on behalf of the Society to accept the terms. A Bill has been introduced into the Legislative Council, to legalize the proceedings, and it is hoped, that before the close of the present month, it may be completed. The whole will then doubtless be formally laid before the Society.

The meeting then adjourned.

LIBRARY.

The following additions have been made to the Library since the meeting held in February last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS.

Presented by the respective Societies or Editors.

Berlin. Königliche Preussische Akademie der Wissenschaften,—Monatsbericht, September, October und November, 1875.

Sept. and Oct. *Pischel.*—Kâlidâsa's Vikramorvaciyam nach drâvidischen Handschriften.

Birmingham. Institution of Mechanical Engineers,—Proceedings, July, Pt. II, 1875.

T. N. Robinson.—On Wood-Working Machinery. *Sir J. Whitworth.*—On Fluid Compressed Steel and Guns.

Bombay. Bombay Branch of the Royal Asiatic Society,—Journal, Vol. XI, No. 31, 1875.

E. Pierce.—A Description of the Mekrance-Beloochee Dialect. *Hon. Rao Saheb V. N. Mandlik.*—Sangameśvara Máhâtmya and Linga-worship. *J. G. da Cunha.*—Memoir on the History of the Tooth-relic of Ceylon. *E. Rehatsek.*—The subjugation of Persia by the Moslems, and the Extinction of the Sásánian Dynasty. *J. F. Fleet.*—Old Canarese and Sanskrit Inscriptions relating to the Chieftains of the Sindavamsa.

Bombay. The Indian Antiquary,—Vol. V, Pts. 50, 51, 52.

Pt. 50. *Prof. C. H. Tawney.*—Metrical Translation of the Vairágya Sátakam, or hundred Stanzas on Asceticism by Bhartrihari. *W. F. Sinclair.*—Notes on some parts of the Ahmudnagar Collectorate. *J. F. Fleet.*—Sanskrit and old Canarese Inscriptions. *M. J. Walhouse.*—Archæological Notes.

Pt. 51. *J. T. Fleet.*—A Chronicle of Toragal. Sanskrit and old Canarese Inscriptions, continued, Nos. XI, XII. *M. J. Walhouse.*—Archæological Notes.

Pt. 52. *Prof. C. H. Tawney.*—Metrical Version of Bhartrihari's Vairágya Sátakam. *J. F. Fleet.*—Sanskrit and old Canarese Inscriptions. Nos. XIII, and XIV. *J. Burgess.*—The Dhârâsinva Rock Temples. *Sir W. Elliot.*—Notice of a Sculptured Cave at Undâpalli in the Gantúr District. *J. W. M'Crindle, M. A.*—Translation of the Indica of Arrian.

Calcutta. Christian Spectator,—Vol. V, Nos. 56, 57, February, March, 1876.

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Dr. Waagen.—The Cephalopoda (Ammonitidæ).

———. ———. Memoirs,—Vol. XI, Pt. 2.

Wynne.—Trans-Indus Salt Region, Kohat District.

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Dublin. Royal Geological Society of Ireland,—Journal, Vol. IV, Pt. 2, 1874-5.

Geneva. La Société de Physique et d'Histoire Naturelle.—Mémoires, Tome 24, Pt. I.

Liverpool. Literary and Philosophical Society,—Proceedings, No. 29, 1874-75.

J. A. Picton.—On the Origin and History of the Numerals. *Rev. W. Kennedy-Moore.*—Oriental Pantheism and Dualism. *R. Leigh.*—The Yang-Tse-Keang River of Asia.

London. Anthropological Institute,—Journal, Vol. V, No. 2, October, 1875.

———. The Athenæum,—Pts. 574, 575, 576, October, November, December 1875, and No. 2521, February 1876.

———. Geographical Magazine,—Vol. III, Nos. 1, 2, January, February 1876.

No 1. *Major H. Wood.*—On former Physical Aspects of the Caspian. *D. Ker.*—Is it possible to unite the Black Sea and the Caspian?

No. 2. Introduction of the Cultivation of Caoutchouc-yielding Trees into British India. *Prof. H. H. Giglioli.*—Dr. Beccari's Recent visit to New Guinea.

———. Geological Society,—Quarterly Journal, Vol. 31, Pt. 4, No. 124, November 1875.

H. F. Blanford.—On the Age and Correlations of the Plant-bearing Series of India, and the former Existence of an Indo-Oceanic Continent. *Prof. Owen.* On *Prorastomus sirenoides.*

———. ———, List of Members of the Society, 1875.

———. Royal Asiatic Society,—Journal, Vol. VIII, Part I.

E. B. Cowell, and J. Eggeling.—Catalogue of Buddhist Sanskrit Manuscripts in the Possession of the Royal Asiatic Society. *T. H. Blakesley.*—On the Ruins of Sigiri in Ceylon. *J. F. Dickson.*—The Pâtimokkha, being the Buddhist office of the Confession of Priests. *R. C. Childers.*—Notes on the Sinhalese Language. No. 2, Proofs of the Sanskritic Origin of Sinhalese.

———. Royal Astronomical Society.—Monthly Notices, Vol. 36, Nos. I, II.

No. 1. Spectroscopic Observations made at the Royal Observatory, Greenwich, by the Astronomer Royal. *Col. J. F. Tennant.*—Note on a Successful Attempt to support a Mercury Trough by a compact and easily removable arrangement. Note on Prof. Pritchard's Ephemeris of Circumpolar Stars.

No. 2. *Rev. S. J. Perry.*—Manila Photographs of Transit of *Venus. M. A. Martin.*—On the silvering of Glass by Inverted Sugar, for Optical Instruments and Experiments. *Prof. Zenger.*—On Celestial Photography. *Prof. Pritchard.*—Remarks upon two papers by Col. Tennant.

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Vol. 164, Pt. I. *L. Clark.*—On a Standard Voltaic Battery. *R. S. Ball.*—Researches in the Dynamics of a Rigid Body by the aid of the Theory of Screws.

H. N. Moseley.—On the Anatomy and Histology of the Land-Planarians of Ceylon, with some Account of their Habits, and a Description of two new Species, and with Notes on the Anatomy of some European Aquatic Species. *J. Tyndall.*—On the Atmosphere as a Vehicle of Sound. Pt. II. *F. A. Abel.*—Contributions to the History of Explosive Agents. *W. Roberts.*—Studies on Biogenesis. *J. Norman Lockyer.*—The Bakerian Lecture. Researches in Spectrum-Analysis in Connexion with the Spectrum of the Sun, Nos. III, IV. *J. N. Lockyer and W. C. Roberts.*—On the Quantitative Analysis of certain Alloys by means of the Spectroscope. *H. F. Blanford.*—The Winds of Northern India, in relation to the Temperature and Vapour-constituent of the Atmosphere. *H. E. Roscoe.*—On a Self-recording Method of Measuring the Intensity of the Chemical Action of Total Daylight. *W. C. Williamson.*—On the Organization of the Fossil Plants of the Coal measures.

Vol. 165, Part I. *E. R. Lankester.*—Contributions to the Developmental History of the Mollusca. *Captain Noble and F. A. Abel.*—Researches on Explosives. Fired Gunpowder. *J. B. N. Hennessey.*—On the Atmospheric Lines of the Solar Spectrum, illustrated by a Map drawn on the same scale as that adopted by Kirchhoff. *General Sir E. Sabine.*—Contributions to Terrestrial Magnetism. *Dr. E. Klein.*—Research on the Smallpox of Sheep. *Dr. H. Gunther.*—Description of the Living and Extinct Races of Gigantic Land-Tortoises. Pts. I and II, Introduction, and the Tortoises of the Galapagos Islands.

London. Royal Society,—Proceedings, Vol. 24, No. 164.

Prof. Wyville Thomson.—Report to the Hydrographer of the Admiralty on the Cruise of H. M. S., "Challenger," from June to August, 1875. *J. Priestley.* On the Physiological Action of Vanadium *F. W. Pavy.*—On the Production of Glycosuria by the Effect of Oxygenated Blood on the Liver.

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———. ———, The Anatomy of the Lymphatic System. By E. Klein, M. D.

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G. F. Deacon.—The Systems of Constant and Intermittent Water supply and the Prevention of Waste, with special reference to the restoration of Constant Service in Liverpool.

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Munich. K. B. Akademie der Wissenschaften,—Mathematisch-physikalische Classe—Sitzungsberichte, Heft. I, II, 1875.

Heft. I. *v. Pettenkofer*—Ueber ein Reagens zur Unterscheidung der freien Kohlensäure im Trinkwasser von der an Basen gebundenen.

Heft. II. *v. Jolly.*—Ueber die elektrische Influenz auf Flüssigkeiten von A. Wüllner. *Voit.* Ueber die Eiweisszersetzung im Thierkörper bei Transfusion von Blut und Eiweisslösungen von J. Forster. *Beetz*—Ueber das doppelte Maximum in der Haufigkeit der Gewitter während der Sommermonate von W. v. Bezold.

Munich. K. B. Akademie der Wissenschaften.—Philosophische, philologische und Historische Classe—Sitzungsberichte, Band I, Heft. 2, 3, Band II, Heft. 1.

Band I. Heft. 2. *Trumpp.*—Uber den Accent und die Aussprache des Persischen.

Band II, Heft. 1. *E. Schlagintweit.*—Die tibetischen Handschriften der Königl. Hof-und Staatsbibliothek zu München.

———. ———. Historische Classe,—Abhandlungen, Band 12, dritte Abth. Band 13, erste Abth.

———. ———, Almanach für das Jahr 1875.

——— ———, Ueber die Beziehungen der Chemie zur Rechtspflege, von Dr. L. A. Buchner.

Palermo. Società degli Spettroscopisti Italiani,—Memorie. Dispensa 10, 11, Novembre, Ottobre, 1875.

Disp. II. *T. Bredichin.*—Spectre des nébuleuses. Confronto fra il diametro solare meridiano e spettroscopico ricavato da osservazioni fatte dagli astronomi Secchi, Rayet, Dorna e Tacchini.

Paris. Journal Asiatique,—Septième Série, Tome VI, No. 6, 1875.

M. B. de Meynard.—Les Pensées de Zamakhschari, texte arabe, publié complet pour la première fois avec une traduction et des notes.

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Janvier. *V. A. Malte Brun.*—l'Expédition polaire anglaise en 1875. Carte du détroit de Smith pour suivre l'expédition polaire anglaise. *l'Abbé Armand David.*—Second voyage d'exploration dans l'ouest de la Chine 1868 à 1870.

Roorkee. Professional Papers on Indian Engineering,—2nd Series. Vol. V, No. 19.

P. Dejoux.—Artificial Puzzolana made of Burnt Clay. Indian Railway Traffic. *F. Cox.*—The use of Concrete in India. *W. Parker.*—Formation of a Harbour at Madras.

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Captain Descharmes.—Itinerary of Two Routes between Yedo and Niigata. *Capt. St. John.*—An Excursion into the Interior Parts of Yomato Province. *J. H. Gubbins.*—Notes of a Journey from Awamori to Niigata and of a visit to the Mines of Sada. *C. H. Dallas.*—The Yonezawa Dialect.

Books and Pamphlets.

Presented by the Authors.

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No. 97. *Major H. H. Godwin-Austen.*—Description of a supposed new *Suthora* from the Dafla Hills, and a *Minla* from the Nágá Hills, with remarks on *Pictorhis* (*Chrysomma*) *altirostre*, Jerdon. *J. Wood-Mason.*—On a gigantic Stridulating Spider.

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No. 334. *R. M. Bosanquet.*—On the Polarization of the Light of the Sky. *R. Bunsen.*—Spectral-Analytical Researches. *W. Weston.*—The Application of Phosphorus to the "Poling" of Copper.

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No. 1205. *J. L. W. Thudichum, M. D.*—On the Discoveries and Philosophy of Liebig, with special reference to their influence upon the advancement of Arts, Manufactures and Commerce. Pts. I, II, III.

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No 19. *M. A. Commaille.*—Note sur le dosage de la caféine et la solubilité de cette substance. *M. Oré.* De l'influence des acides sur la coagulation du sang.

No. 20. *M. Th. du Moncel.*—Quinzième Note sur la conductibilité électrique des corps médiocrement conducteurs. *M. E. Duchemin.*—Emploi du nickel déposé par voie électrique pour protéger contre l'oxydation les aimants servant à la construction des bousoles. *W. Fr. Glénard.*—Sur le rôle de l'acide carbonique dans le phénomène de la coagulation spontanée du sang.

No. 21. *M. Ch. Sainte-Claire Deville.*—Sur la periodicité des grandes mouvements de l'atmosphère. *M. P. Gervais.*—Remarques sur les Balénides des mers du Japon à propos du crâne d'un Cétacé de ce groupe, envoyé au Muséum par le gouvernement japonais sur la demande de M. Janssen. *M. Oré.* De l'action qu' exercent les acides phosphoriques monohydraté et trihydraté sur la coagulation du sang.

No. 22. *M. G. Lombroso.*—Du principe vénéneux que renferme le maïs avarié, et de son application à la pathologie et à la thérapeutique. *M. Edm. Perrier.* Sur les vers de terre des îles Philippines et de la Cochinchine.

No. 23. *M. D. Mendelief.*—Sur la température des couches élevées de l'atmosphère. *M. E. Allard.*—Sur la transparence des flammes et de l'atmosphère et sur la visibilité des feux scintillants. *M. P. Schutzenberger.*—Recherches sur la constitution des matières albuminoïdes. *M. Signol.*—Sur l'état virulent du sang des chevaux sains, morts par assommement ou asphyxie. *M. M. Trève et Durassier.*—Note sur la distribution du magnetisme à l'intérieur des aimants. *M. P. Carbonnier.*—Nidification du poisson arc-en-ciel, de l'Inde.

No. 24. *M. J. Jamin.*—Sur les lois de l'influence magnétique. *M. Janssen.*—Note accompagnant la présentation de plaques micrométriques destinées aux mesures d'images solaires. *M. Lortet.*—Sur un poisson du lac de Tibériade, le *Chromis paterfamilias*, qui incube ses œufs dans la cavité buccale. *M. Jobert.* Recherches sur l'appareil respiratoire et le mode de respiration de certains Crustacées brachyures. *M. A. Crova.*—Sur l'intensité calorifique de la radiation solaire et son absorption par l'atmosphère terrestre. *M. G. Tissandier.*—Observations météorologiques en ballon.

No. 25. *M. J. Jamin.* Formule de la quantité de magnétisme enlevée à un aimant par un contact de fer, et de la force portative. *M. Edm. Perrier.*—Sur la classification et la synonymie des Stellérides.

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PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR APRIL, 1876.

The monthly General Meeting of the Society was held on Wednesday the 5th April, 1876, at 9 o'clock P. M.

Col. H. L. Thuillier, C. S. I., Vice-President, in the Chair.

The minutes of the last meeting were read and confirmed.

The following presentations were announced—

1.—From Pandit Brahma-vatra Samadhyayí, a copy of Srimadvagatatam, with commentary, Sridharasvami, Nos. 1 to 3 and 5 to 8, and a copy of the "Sama Veda Sanhita (Chanda Archika)".

2.—From Dr. T. Oldham, several numbers of the Journal and Proceedings.

3.—From the Hon'ble E. C. Bayley, C. S. I., 9 volumes of the Journal, and 7 of the Proceedings.

4.—From the Marquis Doria, Genoa, Vols. 2 to 6 of the "Annali del Museo Civico di Storia Naturali di Genova.

5.—From Dr. T. Oldham, two gold coins, forwarded by Mr. W. Bourne, and two copper coins.

Mr. BLOCHMANN said—The two gold coins, presented to the Society by Mr. Bourne through Dr. Oldham, were a Dutch ducat of 1818, and an old Venetian sequin, a facsimile of which was published by Mr. Burgess in his "Indian Antiquary", Vol. II, 1873, p. 213. Mr. Bourne's specimen, however, was no forgery. These coins were of interest from the fact that they had been obtained in the Jain temple of Baidyanáth, near Deogarh, where they had been deposited as offerings by some pilgrims.

The other two coins presented by Dr. Oldham are two small Muhammadan copper coins. The legend is scarcely legible: on one of them he could make out the name Ibráhím. Mr. Wynne, who obtained them from Dadji, Thakur of Nurrha, Kachh, says they are pice of the coinage of the Rájá Vigo or Vigu, found 40 years ago at the ruins of Vigu Koṭ, half way between Ramáo ke Bázár and Sindrí, near the Allah Band, the embankment in the Ran of Kachh formed during the earthquake of 1819.

6.—From Bábu Rájendralála Mitra, LL. D., four leaves of an illuminated MS. of the Kalpa Sutra of the Jains, about 400 years old.

7.—From E. Gay, Esq. a copy of a work entitled "Purchas his Pilgrimage, or Relations of the World and the Religions observed in all Ages and Places."

Mr. BLOCHMANN said this appeared to be a copy of the original edition of 1614 and would be a great acquisition to the Library. The Society were much indebted to Mr. Gay for this and former presentations of valuable and scarce works.

The following gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected ordinary members—

Mr. A. Wilson.

Kumar Kanté Chunder Sing of Paikpara.

Mr. T. E. Coxhead.

Dr. Werner Siemens, Berlin, and Col. Henry Yule, R. E., C. B., proposed by the Council at the last Meeting as Honorary Members, were balloted for and duly elected.

Before the commencement of the ballot, the Chairman said that perhaps the meeting might expect a few words of explanation as to the proposition submitted that evening for filling up the vacancies in the list of honorary members of the Society. The Council had given this subject their very careful consideration, and had much confidence in submitting for election the names of Dr. Werner Siemens and Colonel Henry Yule, C. B., Member of the Indian Council in London. The grounds on which the Council founded their recommendation of these gentlemen had been duly placed before the Society, and as the nomination had been advisedly made after mature deliberation, the Council trusted that they would meet with the full support of the meeting and of the Society.

The following are candidates for ballot at the next meeting.—

Surgeon Major A. F. Bradshaw, Surgeon to H. E. the Commander-in-Chief, proposed by Col. C. Dickens, R. A., seconded by Col. H. Drummond, R. E.

Mr. John M. Lyall, proposed by Col. J. E. Gastrell, seconded by Capt. J. Waterhouse.

Mr. A. M. Nash, M. A., Professor, Presidency College, Calcutta, proposed by Mr. H. Blochmann, seconded by Col. J. E. Gastrell.

The following gentlemen have intimated their desire to withdraw from the Society—

Messrs. H. Williams, Chester Macnaghten, W. Theobald, Walter Bourne, A. Tweena (on leaving India), and Rájá Harendra Krishna Bahádur.

The CHAIRMAN said that he had to inform the meeting that in consequence of the departure from India of their esteemed and valued President, Dr. Thomas Oldham, the Council of the Society had considered it their duty to record their unfeigned regret at the great loss which the Society thus sustained by Dr. Oldham's departure on the severance of his connection with the Government service in this country. He was sure that the feelings and sentiments which unanimously actuated the Council would be shared in by the Meeting and the Society at large, and as this was the last occasion on which an opportunity would present itself of considering the late President's long and valuable services, he felt great pleasure in thus prominently bringing before them, the imperfect tribute to Dr. Oldham which the Resolution of the Council attempted to convey. The Resolution was as follows:

Resolved that the Council of the Asiatic Society record the feeling of unfeigned regret with which they accept Dr. Oldham's resignation of the post of President, a regret intensified by the disappointment of the earnest anticipations and hopes of the Council that Dr. Oldham's recent visit to Europe would have given him renewed strength and vigour, and have enabled him to pursue his eminently useful career in this country for some time longer.

The Council cannot permit Dr. Oldham to leave them without an expression of their grateful recognition of his unceasing exertions to forward the interests and promote the welfare of the Society throughout the 25 years of his Membership during which time he has been a Member of the Council for 14 years and four times President.

The Council have at least the one source of gratification that Dr. Oldham has remained with them long enough to see the accomplishment of one of the objects for which he has striven on behalf of the Society so long and so earnestly, and by which the financial condition of the Society is placed upon a permanently sound and prosperous basis and its power of usefulness vastly increased.

The Council trust that the change of climate Dr. Oldham is now compelled to seek will prove thoroughly beneficial and that, though from a distance, they may still have for many years to come the benefit of the counsels and assistance they have learned to appreciate so fully.

Colonel THUILLIER said, in recording these sentiments Dr. Oldham's old colleagues of the Council had only performed a grateful duty, which it was believed would meet with the most hearty response from the Society, on behalf of which he most cordially and sincerely bid Dr. Oldham farewell with every good wish for renewed health and continued usefulness and prosperity in his native country.

The motion of the Chairman that the resolution of the Council be accepted and confirmed by the Society was carried unanimously.

DR. DAVID B. SMITH said—*Mr. President*, when I came here this evening I had no intention of speaking; I find myself, however, strongly impelled to make a few remarks with reference to Dr. Oldham's retirement from India and from this Society. You have, Sir, this evening laid before us a Resolution of the Council of the Society, conveying an appropriate and graceful tribute to Dr. Oldham, yet I hope it may not be considered presumptuous in me to say that I think the Society would do itself honor by going a step further, so as to have a lasting Memorial of Dr. Oldham, in this room where we are now assembled. Nearly a quarter of a century ago, when I was a student of Medicine, and a pupil of that great Naturalist EDWARD FORBES (whose writings and memory are still valued and cherished by men of Science), I well remember his often alluding, in his Lectures, to Dr. Oldham as one of the then foremost leaders of Geological Science. A quarter of a century has, I am sure you will allow, not detracted from his fame in this respect; but I regret that I am altogether unable to dilate on this view of his character; indeed I am ashamed to think how meagrely I must at present allude to it. For a good many years I have been a Member of this Society and during some of these years I have had the honor of acting on the Council. I feel sure that any one who has had the opportunities that I have had of judging of Dr. Oldham's good services to this Society must place a high value on them. A good man of business, careful, exact, regardless of too adverse criticism or of party spirit, he has, as its often re-elected President, ever had the interests of this Society closely at heart; and I think that all of us who can appreciate his attainments, and who have observed his earnest interest in all Science, and his devotion to the good of this Society, must have felt that in him we have had a really strong and safe man at the wheel. I for one, Sir, should be very sorry to think that such a man should be allowed to pass away from our midst, without some permanent Memorial of him being in the possession of this Society. Whilst therefore I now speak un-preparedly and in a manner quite unworthy of my subject, I beg very strongly to suggest that it would well become the Asiatic Society of Bengal to have, in this room, some Memorial of Dr. Oldham; and I hope that the Council, on behalf of the Society, may be pleased to take the initiative, so that we may, ere long, have a picture or a bust of the distinguished man who (I much regret to think) is amongst us this evening for the last time.

The CHAIRMAN remarked that the proposals of the last speaker were most congenial to his own feelings, and he should hail with the utmost satisfaction any movement which would tend to give the Society a fitting Memorial of the late President who had done so much for the Society. As it

appeared to be the wish of the meeting that such a course should be pursued, he felt sure that the Council would take the necessary steps for raising by subscription among the members of the Society, a sufficient sum for a bust or portrait of Dr. Oldham to perpetuate his memory in the Society.

The vacancy thus caused, had had the anxious consideration of the Council, and as it was found difficult to find a suitable successor to Dr. Oldham, from amongst gentlemen, who were altogether permanent residents in Calcutta, it had been determined to elect as President for the current year, the Hon'ble E. C. Bayley, C. S. I., who had kindly consented to act and to watch over the interests of the Society, although he of necessity must be absent from Calcutta for several months.

The Council reported that in consequence of the approaching departure from India of Dr. Oldham, Colonel J. E. Gastrell, Messrs. L. Schwendler, E. Gay, and C. H. Tawney, they had nominated Col. J. F. Tennant, R. E., Dr. D. B. Smith, Messrs. H. B. Medlicott, T. S. Isaac, and W. T. Blanford as Members of the Council. Also they had appointed Mr. H. B. Medlicott, Treasurer of the Society, and Dr. T. R. Lewis as a Trustee of the Indian Museum on behalf of the Society in place of Col. J. E. Gastrell.

The CHAIRMAN said that it was a great matter of regret that the Society was losing this year so many of its valued working members in consequence of their departure from India. To Colonel Gastrell, who was on the point of departure, and to Dr. Partridge who had already gone, the thanks of the Society were eminently due for very long and most important services rendered as Office-bearers. Colonel Gastrell, whose period of Government service had expired, had been a member of Council for 11 years out of the 17 years of his membership, and during 8 of these 11 years he had acted as Treasurer of the Society, a most responsible office, and it would be difficult to find a successor on the Council who would devote himself more closely to the interests of the Society. Dr. Partridge also had been a valued member of the Council during 10 years of his membership, and had attended the meetings whenever the requirements of his professional duties would permit. Both these gentlemen, the Chairman was sure, left India with the best wishes and thanks of the Society, and he would therefore propose that the thanks of the Society should be tendered to Col. Gastrell and Dr. Partridge for their long and valuable services to the Society.

The motion was carried unanimously.

The CHAIRMAN then informed the meeting that the negociations with the Government of India on the subject of the future accommodation of the Society, had been actively pursued and completed since the last meeting, when a summary of the proposals of the Government was laid before the Society

by their late President. The Government had paid the sum of Rs. 1,50,000 as compensation to the Society for the abandonment of their claim to the accommodation in the New Museum Building, which was provided under Act XVII of 1866, and the Society would therefore continue to occupy their old premises. A formal Deed of Release had been drawn up by the Government Law Officers and had been signed on behalf of the Society by the whole of the Members of the Council present in Calcutta, in their collective capacity. A new Bill had also been drawn up and brought before the Legislative Council to meet the altered circumstances of the case. The Chairman thought the meeting would agree with him, in deeming these arrangements altogether satisfactory, and conducive to the real interests of the Society. The money had been invested to the best advantage in 5½ per cent. Government Securities,* and would form a capital yielding an income which would ensure the future prosperity of the Society and greatly facilitate the successful management and working of its affairs.

The Meeting were doubtless aware that the removal of the collections, and the long use the Trustees of the Museum had made of the present premises, had left the Society's property in a very deteriorated state, and

* Particulars of Government Securities purchased by the Asiatic Society of Bengal, deposited for safe custody in the Bank of Bengal, April 3rd, 1876.

Register No.	*Description.*				*Amount.*		
8268	5½ Per Ct.	No.	009505/7144	of 59/60	Rs. 500	0	0
8269	„	„	003890/002922	of „	„ 10,000	0	0
8270	„	„	/4523	of „	„ 800	0	0
8271	„	„	007396/6078	of „	„ 3,500	0	0
8272	„	„	043655	of „	„ 10,000	0	0
8273	„	„	043654	of „	„ 10,000	0	0
8274	„	„	043653	of „	„ 10,000	0	0
8275	„	„	043652	of „	„ 10,000	0	0
8276	„	„	043651	of „	„ 10,000	0	0
8277	„	„	043882/043538	of „	„ 1,000	0	0
8278	„	„	043881/043537	of „	„ 1,000	0	0
8279	„	„	043535/042783	of „	„ 1,000	0	0
8280	„	„	043534/ „	of „	„ 1,000	0	0
8281	„	„	043894/043518	of „	„ 5,000	0	0
8282	„	„	040385/007484	of „	„ 10,000	0	0
8283	„	„	040384/ „	of „	„ 10,000	0	0
8284	„	„	040377/ „	of „	„ 10,000	0	0
8285	„	„	040376/ „	of „	„ 10,000	0	0
8286	„	„	040375 „	of „	„ 10,000	0	0
8287	„	„	038223/035082	of „	„ 10,000	0	0
8288	„	„	029129/006278	of „	„ 10,000	0	0
				Total Rupees,....	1,43,800	0	0

it would now be absolutely essential to put the entire building into a state of thorough repair, and to effect such alterations and improvements, as were obviously necessary for furtherance of the objects of the Society and the increased comfort and advantage of its Members.

To this end it would be necessary to expend some small portion of the new capital, so as to render the Society's Premises really efficient, comfortable and appropriate. A Sub-Committee had been appointed by the Council to suggest and superintend the carrying out of the required changes, and it was hoped that whatever might be determined on, would be carried out before the next cold season.

The SECRETARY then read the Deed of Release, as below, and the motion of the Chairman that the Meeting should accept and confirm the action of the Council was carried unanimously.

DEED OF RELEASE.

Dated this 30th day of March, 1876.

THE COUNCIL *of the* ASIATIC SOCIETY OF BENGAL.

To the SECRETARY OF STATE *for* INDIA IN COUNCIL.

This Indenture, made the thirtieth day of March, one thousand eight hundred and seventy six, Between THOMAS OLDHAM, LL. D., President; BÁBU RÁJENDRALÁLA MITRA LL. D., THE HONORABLE EDWARD CLIVE BAYLEY, C. S. I., C. S., and COLONEL HENRY EDWARD LANDOR THUILLIER, R. A., C. S. I., (Vice-Presidents); COLONEL JAMES EARDLEY GASTRELL, B. S. C., LOUIS SCHWENDLER, Esquire, HENRY BLOCHMANN, Esquire, M. A., CAPTAIN JAMES WATERHOUSE, B. S. C., JAMES WOOD-MASON, Esquire, TIMOTHY RICHARDS LEWIS, Esquire, M. B., JAMES O'KINEALY, Esquire, C. S., BÁBU PRANNÁTH PANDIT, WALTER KERR WALLER, Esquire, M.D., CHARLES HENRY TAWNEY, Esquire, M.A., and EDWARD GAY, Esquire, M. A., Members of the COUNCIL of the ASIATIC SOCIETY OF BENGAL of the one part, and the SECRETARY OF STATE FOR INDIA IN COUNCIL of the other part, *Whereas* the said Asiatic Society of Bengal is a Voluntary Society the affairs financial and otherwise of which are regulated, administered and directed by a Council selected annually by the said Society. *And Whereas* upon the second day of February one thousand eight hundred and seventy-six, the said *Thomas Oldham, LL. D.* was duly elected President of the said Society and *Bábu Rájendralála Mitra, LL. D., The Honorable Edward Clive Bayley, C. S., C. S. I.*, and *Colonel Henry Edward Landor Thuillier, R. A., C. S. I.*, Vice-Presidents, and *Colonel James Eardley Gastrell, B. S. C., Louis Schwendler, Esquire, Henry Blochmann, Esquire, M. A., Captain James Waterhouse, B. S. C., James Wood-Mason, Esquire, Timothy Richards Lewis, Esquire, M. B., James O'Kinealy, Esquire, C. S., Bábu Prannáth*

Pandit, Walter Kerr Waller, Esquire, M. D., Charles Henry Tawney, Esquire, M. A., and *Edward Gay, Esquire, M. A.*, Council. *And Whereas* by Act XVII. of 1866, passed by the Governor General of India in Council it was amongst other things enacted that the Governor General in Council should cause to be erected at the expense of the Government of India a suitable building in Calcutta to be devoted in part to collections illustrative of Indian Archæology and of the several branches of Natural History, in part to the preservation and exhibition of other objects of interest, whether historical, physical, or economical, in part to the records and offices of the Geological Survey of India and in part to the fit accommodation of the Asiatic Society of Bengal, and to the reception of their Library, Manuscripts, Maps, Coins, Busts, Pictures, Engravings, and other property. And it was also enacted that the said Trustees should have the exclusive possession, occupation, and control for the purposes of such trusts of the said building, other than those portions thereof which upon its completion should be set apart by the said Trustees for the records and offices of the said Geological Survey and for the accommodation of the said Asiatic Society and the reception of their Library, Manuscripts, Maps, Coins, Busts, Pictures, Engravings, and other property; *And* it was also enacted that the Council of the said Asiatic Society should cause the collections belonging to such Society, and illustrative of Indian Archæology and the several branches of Natural History, and all additions that might be made thereto, to be removed to and deposited in the said building at the expense of the Government of India as soon as the same should be completed as far to be in condition to receive the said collections, and that the said Society should continue to have the same exclusive right, property in, and control over their Library, Manuscripts, Maps, Coins, Busts, Pictures, and Engravings which they then possessed, and that the Council of the said Society should have the exclusive possession, occupation, and control for the purposes of the said Society of those portions of the said building which should be set apart for the accommodation of the said Society and the reception of their Library and other property thereinbefore mentioned. *And whereas* in consideration of a sum of Rupees one hundred and fifty thousand to be paid to them by the Government of India the Council of the said Society has agreed on behalf of the said Society to relinquish and give up all right to the possession, occupation, and control secured to them by the said Act of the portions of the said building which under the said Act were to be set apart for the accommodation of the said Society and the reception of the said Library and other property. *Now this Indenture witnesseth* that in pursuance of the said Agreement and in consideration of the sum of Rupees one hundred and fifty thousand at or before the execution of these presents paid by the Secretary of State for India in Council to the parties

hereto of the first part (the receipt whereof they hereby acknowledge). They the said parties hereto of the first part for themselves and for the said Society do hereby release and for ever discharge the said Secretary of State for India in Council and his successors of, from and against all right, title and interest, claims and demands which the said Society has, or may have, to the possession, occupation and control secured to them under the provisions of Act XVII of 1866 of the Governor General of India in Council, or in any other manner of and over any portion or portions of the Indian Museum situate in Chowringhee Road, which under the said Act was or were to be set apart for the accommodation of the said Society and the reception of their Library, Manuscripts, Maps, Coins, Busts, Pictures and Engravings and other property. *In witness whereof* the said parties to these presents have hereunto set and subscribed their hands and seals the day and year first above written.

Signed, Sealed and Delivered by the above-named *Thomas Oldham, Rájendralála Mitra, Edward Clive Bayley, Henry Edward Landor Thuillier, James Eardley Gastrell, Louis Schwendler, Henry Blochmann, James Waterhouse, James Wood-Mason, James O'Kinealy, Prannath Pandit, Walter Kerr Waller, Charles Henry Tawney,* and *Edward Gay,* in the presence of	THOMAS OLDHAM, (Seal) RAJENDRALALA MITRA, (Seal) E. C. BAYLEY, (Seal) H.E.L. THUILLIER, COL., R.A. (Seal) JAMES E. GASTRELL, (Seal) LOUIS SCHWENDLER, (Seal) H. BLOCHMANN, (Seal) J. WATERHOUSE, (Seal) JAMES WOOD-MASON, (Seal) J. O'KINEALY, (Seal) PRANNATH PANDIT, (Seal) WALTER KERR WALLER, (Seal) CHARLES H. TAWNEY, (Seal) E. GAY, (Seal)
O. J. MELITUS, *Articled Clerk to Messrs. Berners and Co., Solicitors, Calcutta.*	

We do hereby certify that the above paper writing is a true copy of the Original Deed of Release of which it purports to be a Copy, the same having been examined by us herewith. Dated this 1st day of April, 1876.

O. J. MELITUS,
Art. Clerk to Messrs. Berners & Co., Sol., Calcutta.

WM. D'CRUZ,
Clerk to Messrs. Berners & Co.

The CHAIRMAN announced that Dr. S. B. Partridge and Col. Gastrell had become Life Members of the Society by paying the fee of Rs. 100 under the terms of Rule 14.

The SECRETARY read extracts from letters from Dr. Day, Mr. Grote, and Dr. Dobson relating to the Stoliczka Memorial, and submitted a statement of the account up to date.

From MR. F. DAY, *dated 14th January*, 1876.

Dear Sir,—A meeting of the Committee of the Stoliczka Memorial Fund was held in London on Wednesday last (January 12th) when your letters of December were laid before it.

It was announced that the sculptor Mr. Geflowski was still willing to undertake the bust at the terms formerly communicated by Mr. Grote.

It was unanimously resolved to place the execution of the bust in Mr. Geflowski's hands.

Should there be sufficient funds there will be no difficulty in obtaining a pedestal of the description desired by the Calcutta Committee.

From MR. GROTE, *dated January 14th.*

"Day and Duka met at my rooms here yesterday and we decided on giving Geflowski the commission for Stoliczka's bust. He undertakes it for 100 guineas of which I shall have to pay him a moiety on completion of his model. Geflowski's reputation is rising daily and he has been selected over the heads of Woolner and Noble to make the Fairbairn statue for Manchester. This is a job of 850 guineas. As Day is leaving London he has asked me to do his share of the Committee's work. He insists on making no charge on the fund for his printing and other charges. I shall have to discount your bill on the Oriental Bank should Geflowski complete his model before the 25th March. This he will probably do, though his work will have to wait till Dickinson can spare the photos."

"As regards the sums collected here, your memo. enclosed in said letter makes me out to have received £96, whereas I have only realised £76, apparently nothing more will be coming in here."

"As to the pedestal, there will be no difficulty in providing one here if you can afford the expense. Lately I paid £18 for a pedestal, the freight &c., would amount to perhaps £5 more. Oldham, I should think, would suggest to you some local material which would connect his friend's name and memory with his professional labours and which would be less costly than a pedestal dispatched from this country."

From DR. G. E. DOBSON, *dated 19th February.*

"As I came through London I saw Mr. Dickinson who is painting Stoliczka's portrait: it is nearly finished, so nearly that he had only to paint in some accessory things when I saw it.* I was much pleased with it, and I think the subscribers will also be well pleased. The bust I did not see, the model was not completed but soon will be, I will endeavour to go to town to see it. I would suggest that Woodbury or Carbon-type somewhat *enlarged* copies of the photograph from which the painting is being made, be

* In a letter just received from Mr. Grote, dated 30th March, he says that the picture is finished and is undergoing visits of criticism from members of the Committee and other friends of Stoliczka.

made and distributed one to every subscriber if the funds will admit. If they do not admit, then I propose that those who wish for an enlarged copy of that photograph printed in permanent pigments agree together to bear the expense of having it done. About 1200 copies Woodbury-type prints could be made for £5; certainly each copy would not cost threepence to each member."

Account Statement Stoliczka Memorial Fund.

Total subscription realized in India,... ...				.. Rs.	2,746	0	0
„ unrealized „				... „	126	0	0
				Rs.	2,872	0	0
Deduct Printing Expenses,... ...	Rs.	112	15	0			
„ Remitted to London by draft, £150	„	1,664	11	10	1,777	10	10
Balance remaining in India,				Rs.	1,094	5	2

English value of Balance available, at 1/9*d*, ...				...£	95	14	6
Total subscription in England, ...				... „	76	0	0
Remitted to England, ...				... „	150	0	0
				£	321	14	6

Estimated cost of Painting with frame, packing and freight, ...	£	140	0	0
Estimated cost of Bust, packing, and freight,	„	120	0	0
Balance available for cost of Pedestal (£23), and permanent photographs, as suggested by Dr. Dobson, ...	„	61	14	6
	£	321	14	6

The following papers were read:

1. *On the Ghalchah (Wakhí and Sarikolí) Languages.*—*By* R. B. Shaw, Esq., *Political Agent, late on special duty at Káshghar.*

(Abstract.)

The author in this paper gives an account of the Ghalchah dialects, *viz.*, those spoken by the tribes living in the valleys on the head-waters of the Oxus, north of the Hindu-Kush; dialects which belong to the Persic branch of the Arian family; and traces some radical affinities between them and the Dardu dialects spoken on the south of the Hindu-Kush Range, and which belong to the Indic branch. It is argued from these affinities that Ghalchahs and Dards must at one time have lived together not far from their present

habitations and have formed part of one people who must have at that early period spoken a tongue neither distinctly Persian nor distinctly Indian, but containing in itself germs of both forms.

As a chain of dialects connects on the one side the Dards with the Hindí speakers of the Panjáb, and on the other the Ghalchahs with the Iranian populations of Central Asia and Persia, the two lines culminating and meeting at the Hindu-Kush watershed; it is suggested that perhaps they mark the tracks by which Indians and Persians migrated to their present seats; and that Ghalchahs and Dards are perhaps the direct descendants of that portion of the Indo-Persic race which remained near its early home. Also that although the dialectic tendencies which resulted in the formation of the two distinct languages, Persian and Hindi, have operated on Ghalchah and Dardu respectively, yet the mutual resemblances still subsisting between them indicate that the ancestors of the tribes speaking those dialects must have remained together till a later period than the other members of the two great branches of the Arian family, the Persic and the Indic.

2. *Description of a new Rodent from Central Asia.*— *By* JAMES WOOD-MASON, ESQ.

NESOKIA SCULLYI.

Fur fine and silky; above pale fawn-coloured paling on the sides; below, on the insides of the limbs, on the throat, lips, and cheeks, whitish: the hairs of the back being very dark slaty tipped with very pale fawn, and those of the under parts much paler slaty tipped with whitish. Face brownish grey. On the back, especially on the sacral region, some hairs longer but hardly coarser than the rest represent the coarse, flattened, spindle-shaped, grooved, and projecting bristle-like ones observed in *Spalacomys (= Nesokia) Indicus* and some other species: these hairs have a dark brown or blackish ring intervening between the slaty basal and the pale fawn apical portion. One or two of the vibrissæ reach the bases of the ears, two or three of them are black to the tips, most of them are tipped with white, a fringe of short stiff silvery ones on the upper lips. Ears short, scarcely projecting beyond the fur, all but naked, being sparsely clothed with an inconspicuous lanugo. Hands and feet flesh coloured, with a scanty covering of short hairs. Tail without a single hair, shorter than the body, obscurely scaled, the scales arranged, as usual, in rings.

The Turki name for the animal is '*Mughi*.'

Length from tip of the snout to the base of tail,	168	millims.
Length of tail,	132	„
„ „ ears (at back),	12	„
Breadth „ „ (convex curvature),	11	„

Length of hand to tip of middle finger,	23	millims.
„ „ foot „ „ „ „ toe,	43	„
„ „ skull with incisors,	48	„
Interzygomatic breadth (at posterior root of zygoma),	28	„

The first two of the above measurements were taken by Dr. Scully on the dead body of the animal and have been converted by me from English inches into millimetres.

Hab. A single male specimen was captured on June 11th, 1875, at Sanju in Kashgharia, by Dr. J. Scully, the author of a valuable contribution to our knowledge of the avifauna of Central Asia, and has since been presented by him to the Indian Museum.

This species is at once distinguished from *Nesokia Huttoni* and *Spalacomys (= Nesokia) Indicus* of Peters* (which latter will in all probability turn out to be identical with one of the insufficiently described species of the genus) by the quality of the fur, by the totally naked condition and proportional length of the tail, by the greater length of the hands and feet, and by the greater size and breadth of the skull, mandible, and teeth.

P. S.—In *Nesokia Huttoni* the incisors are much broader and thicker in males than in females.

3. *The Prologue to the Rámáyana of Tulsi Dás.*—*By* F. S. Growse, M. A., B. C. S.

(Abstract.)

The author states in the preface that the Rám-charit-mánas, commonly called the Rámáyana, of Tulsi Dás of Soroṇ, was commenced in 1575 A. D. at Ayodhyá (Awadh). The work is not a Hindí translation of the ancient Sanskrit Rámáyana. The general plan and the management of the incidents are necessarily much the same, but there is a difference in the touch in every detail; and the two poems vary as widely as any two dramas on the same mythological subject by two different Greek tragedians.

The Prologue, of which Mr. Growse has given a translation, consists of 54 dohás, and is a valuable resumé of popular Hindu theology and metaphysics. Tulsi Dás's vindication of himself against his critics is a curious feature. They attacked him for lowering the dignity of the subject by clothing it in the vulgar vernacular; but though his defence did not please the professional Sanskrit Paṇḍits, the book is in every one's hands.

The translation of the Prologue is submitted as a specimen of Mr. Growse's translation of the whole work, which is now in progress.

* 'Ueber einige merkwürdige Nagethiere des Königl. Zoologischen Museums', Abhandl. der Königl. Akad. der Wissensch., Berlin, 1860, p. 139 *et seqq.*

Mr. Blochmann read several portions of Mr. Growse's paper. He said that the Prologue commenced, as usual, with an invocation of the Goddess of Speech, to which he might compare the custom of Muhammadan Masnawí writers to add to the preface of epics a chapter on the *ta'ríf i sukhan*, which custom had become *de rigueur* since the time of Nizámí. He was much struck with Mr. Growse's translation of the 17th dohá: it reminded him of the Bhagawat Gitá controversy, and was an additional proof that religious thought repeats itself, and that it was not difficult to cull passages from Hindu works that bear the most striking similarity to passages of the New Testament, though the authors could not be supposed to have been acquainted with Jewish or Christian writings. The passage he referred to was the following:

> There is one God, passionless, formless, uncreated, the universal soul, the supreme spirit, the all-pervading, whose shadow is the world; who has become incarnate and done many things, only for the love that he bears to his faithful people, &c., &c.

He hoped that Mr. Growse would have leisure and strength to complete the great—he might say, national—work which he had commenced. Mr. Growse was well known both for the extent of his researches in Hindí folklore and philology, and for the classical taste that pervades his translations; and there was no one better qualified to bring out a faithful and truly readable version of Tulsi Dás's Rámáyana than Mr. Growse.

The reading of the following paper was postponed—

On Ancient Asiatic Firearms. By Major General R. Maclagan, R. E.

LIBRARY.

The following additions have been made to the Library since the meeting held in March last.

TRANSACTIONS, PROCEEDINGS AND JOURNALS.

Presented by the respective Societies or Editors.

Berlin. Königliche Preussische Akademie der Wissenschaften.—Monatsbericht, December, 1875.

Siemens.—Messung der Fortpflanzungsgeschwindigkeit, der Electricität in suspendirten Drähten.

Birmingham. Institute of Mechanical Engineers.—Proceedings, November, 1875.

W. Daniel.—On Mechanical Ventilators for Mines. *C. Cochrane.*—On the Ultimate Capacity of Blast Furnaces.

Bordeaux. Société de Géographie Commerciale de Bordeaux.—Bulletin, No. I, 1874-75.

Boston. Society of Natural History.—Memoirs Vol. II, Pt. III, Nos. 4, 5, and Pt. IV, No. 1.

Pt. IV, No. 1. *C. R. O. Sacken.*—Prodrome of a Monograph of the *Tanbanidæ* of the United States.

——— ———. Proceedings, Vol. XVI, Pts. 3 and 4, Vol. XVII, Pts. 1 and 2.

Vol. XVI, Pt. 3. *L. F. Pourtales.*—Remarks on Crinoids. *J. A. Allen.*—Metamorphism produced by the burning of Lignite Beds. *T. M. Brewer.*—Hybridism among the Ducks. *T. S. Hunt.*—Deposition of Clays.

Pt. 4. *S. Kneeland, M. D.*—Evidence for and against the existence of the so called Sea-serpent. *Samuel Wells.*—A simple Heliostat.

Vol. XVII, Pt. 1. *A. Hyatt.*—Genetic Relations of the *Angulatidæ*. *J. G. Hunt, M. D.*—Contents of Mastodon's Stomach.

Pt. 2. *J. D. Dana.*—Metamorphism and Pseudomorphism. *A. Hyatt.*—Hollow-fibred Horny Sponges. *F. W. Putnam.*—Mammoth Cave Fishes. *A. Hyatt.*—Two new Genera of Ammonites. Biological Relations of Jurassic Ammonites. *R. Rathbun.*—Cretaceous Lamellibranchs from near Pernambuco, Brazil.

Bombay. The Indian Antiquary, Vol. V, Pt. 53.

J. W. M'Crindle.—Translation of the Indica of Arrian, (Continued). *Dr. G. Bühler.*—Inscriptions from Kâvi. *Dr. F. Kielhorn.*—The Nitimanjari of Dyâ Dviveda.

Calcutta. The Christian Spectator, Vol. V, No. 58, April 1876.

———. The Ramayanam, Pt. 5, No. 5.

———. Geological Survey of India.—Records, Vol. IX, Pt. 1, 1876.

Annual Report of the Geological Survey of India, and of the Geological Museum, Calcutta, for the year 1875. *W. T. Blanford.*—On the Geology of Sind.

Leipsic. Kunde des Morgenlandes. Abhandlungen, Band. V, No. 4.

Zur Sprache, Literatur, und Dogmatik der Samaritaner.

London. Chemical Society,—Journal, Ser. 2, Vol. XIII, November and December, 1875, Ser. 2, Vol. XIV, January, 1876.

Vol. XIII, Nov. *A. W. Hofmann.*—The Faraday Lecture: The Life-work of Liebig in Experimental and Philosophic Chemistry; with Allusions to his influence on the Development of the Collateral Sciences and of the Useful Arts.

December. *J. C. Brown.*—On the Agricultural Chemistry of the Tea Plantations of India.

———. The Geographical Magazine, Vol. III, No. 3, March, 1876.

E. G. Ravenstein.—Cameron's Route from Lake Tanganyika to the west coast of Africa. *C. R. Markham.*—The Irrigation of Firozpur. *D. Ker.*—The World's future Coal Depôt.

———. Nature,—Vol. 13. Nos. 328 to 332.

———. Royal Astronomical Society,—Monthly Notices, Vol. 36, No. 3.

On a new form of Solar Eyepiece by Mr. Christie.

———. Royal Geographical Society—Proceedings, Vol. XX, No. 1.

———. Royal Society,—Proceedings, Vol. XXIV, No. 165.

R. von Willemöes-Suhm, Ph. D.—On the development of *Lepus fasciellaris* and the *Archizoea* of Cirripedia.—Preliminary Remarks on the development of some Pelagic Decapods.

London. Statistical Society.—Journal, Vol. XXXVIII, Pt. 4, 1875.

Moscow. Société Impériale des Naturalistes de Moscou,—Bulletin No. 2, 1875.

R. Hermann.—Untersuchungen über die specifischen Gewichte fester Stoffe. *A. Becker.*—Reise nach dem Magi Dagh, Schalbus Dag und Basardjusi. *V. Motschoulsky.*—Enumération des nouvelles espèces de Coléoptères rapportés de ses voyages.

Palermo. Società degli Spettroscopisti Italiani,—Memorie, Dispensa, 12, Decembre, 1875, and Dispensa, I, Gennaio, 1876.

Dispensa 12, 1875. *P. A. Secchi.*—Recenti ricerche intorno alla distribuzione del calore sul disco Solare. Il nuovo Osservatorio di Calcutta. Bordi solari osservati da A. Secchi e P. Tacchini nel giugno e luglio, 1874. *J. A. C. Oudemans.*—Sur une meillure méthode pour faire les mesures héliométriques a l'occasion d'un passage de Vénus sur le soleil.

Dispensa 1, 1876. *P. Tacchini.*—Statistica delle eruzioni solari osservate a Palermo nel 1871.—Osservazioni Spettroscopiche del sole fatte nel 1875 dal, prof. *Bredichin*, direttore della Specola di Mosca.—Notizie di Calcutta.

Paris. Société de Géographie,—Bulletin, Fevrier, 1876.

l'Abbé Armand David.—Second voyage d'exploration dans l'ouest de la Ch[illegible] 1868, à 1870, (suite).

Pisa. Società Toscana di Scienze Naturali,—Atti, Vol. II, fasc. I.

Trieste. Società Adriatica di Scienze Naturali,—Bollettino, Nro. 7, Decembre, 1875.

Dr. B. Biasoletto.—L'acido rosolico come indicatore della quantità di acido carbonico nell' aria. *Dr. Stenta.*—Notizie risguardanti i bacini del Caspio e dell 'Aral.

BOOKS AND PAMPHLETS

Presented by the Authors.

ATKINSON, EDWIN T. Economic Products of the North-Western Provinces, Pt. I,—Gums and Gum-Resins.

BRAHAMABRATA SÁMADHYAYI. Samaveda Sañhita Kauthumi Sákha, Vol. I, Pts. 1 to 3.—Srimadbághavatam, with Commentary. Sridharasvámi, Pts. 1 to 3, and 5 to 8.

PICKERING, CHARLES, M. D. Chronological Observations on Introduced Animals and Plants, Pt. I.

THEOBALD, W. Descriptive Catalogue of the Reptiles of British India.

MISCELLANEOUS PRESENTATIONS.

Report on the Food-grain Supply and Statistical Review of the Relief Operations in the Distressed Districts of Behar and Bengal during the Famine of 1873-74.

Report on the Financial Results of the Excise Administration in the Lower Provinces for the year 1874-75.

Report on the Land Revenue Administration of the Lower Provinces for the year 1874-75.

GOVERNMENT OF BENGAL.

General Report on the Revenue Survey Operations of the Upper and Lower Circles for 1874-75, by Colonel J. E. Gastrell and Lieut.-Col. J. Macdonald.

SUPERINTENDENT REVENUE SURVEY.

Synopsis of the Results of the Operations of the Great Trigonometrical Survey of India, Vol. VI, (duplicate), by Col. J. T. Walker, R. E.

REVENUE DEPT. GOVT. OF INDIA.

Report on the Judicial Administration (Criminal) of the Central Provinces for 1875.

CHIEF COMMISSIONER, CENTRAL PROVINCES.

Tagore Law Lectures, 1874-75. The Law relating to the Land Tenures of Lower Bengal. By A. Phillips, M. A.

REGISTRAR, CALCUTTA UNIVERSITY.

Fifty-sixth Annual Report of the Board of Public Education for the year 1874.

Annual Report of the Board of Regents of the Smithsonian Institution for 1873.

Contributions to the Annals of Medical Progress and Medical Education in the United States before and during the War of Independence, by Joseph, M. Toner, M. D.

Report on the Chemistry of the Earth. By T. S. Hunt, LL. D. (4 copies).

Memoir of C. T. P. von Martius. By Charles Rau, (4 copies).

SMITHSONIAN INSTITUTE.

Monthly Reports of the Department of Agriculture for 1874.

DEPT. OF AGRICULTURE OF THE U. S. AMERICA.

Purchas his Pilgrimage or Relations of the World, and the Religions observed in all ages and places discovered from the Creation unto this present, 1614.

E. GAY, ESQ.

Ithâf-ulnubalá il-muttaqín bi-ihyái maásir ilfuqahá ilmuhaddisín. Alhitta fí zikr ilçihâh il-Sittah. Táj uliqbál Táríkh i riyásat i Bhopál (Persian). ditto ditto (Urdú). Luqtat ul'ajalán. Rihlat uççidíq ila-lbait il'atíq. Qitf ul-samar. Alintiqád ulrajíh fí sharh il-i'tíqád ilçahíh. Huçúl ul mámúl 'ilm il-uçúl. Iksír fí uçúl iltafsír.

NAWÁB SAYYID SIDDÍQ HASAN KHÁN BAHÁDUR, OF BHOPÁL.

PERIODICALS PURCHASED.

Berlin. Journal für die reine und angewandte Mathematik, Band 82, Heft II.

L. Fuchs.—Ueber die linearen Differentialgleichungen zweiter Ordnung welche algebraische Integrale besitzen, und eine neue Anwendung der Invariantentheorie. *T. Caspary.*—Die Krümmungsmittelpunktsfläche des elliptischen Paraboloids.

Bombay. Bombay Branch of the Royal Asiatic Society,—Vol. XI, No. 32, 1875.

Dr. J. G. Bühler.—Additional Remarks on the Age of the Naishadiya. *J. G. Da Cunha.*—An Historical and Archæological Sketch of the Island of Angediva. *Hon. Rão-Sáheb V. N. Mándlik.*—Three Walabhi Copper Plates with Remarks.

Calcutta. Calcutta Review,—No. 124, April, 1876.

———. The Indian Medical Gazette,—Vol. XI, No. 4.

———. Stray Feathers,—Vol. IV, Nos. I, II, and III.

J. Scully.—A Contribution to the Ornithology of Eastern Turkestan. *C. T. Bingham.*—*Anastomus Oscitans.*

Göttingen. Göttingische gelehrte Anzeigen, Nos. 3, 4. Nachrichten. No. 25 and No. 1, 1876.

No. I, *Nöldeke.*—Karkemisch, Circesium, und andre Euphrat-Ubergänge.

London. The Academy,—Nos. 198 to 202, 1876.

———. Annals and Magazine of Natural History,—Vol. 17, No. 98.

Prof. Allman.—Descriptions of some new Species of *Hydroida* from Kerguelen's Island. *J. Wood-Mason.*—A Conspectus of the Species of *Paratelphusa*, an Indo-Malayan Genus of Freshwater Crabs. *M. E. Bugnion.*—On the Verminous Pneumonia of Domestic Animals. *M. P. Carbonnier.*—Nidification of the Indian Rainbow Fish. *M. O. Grimm.*—On the Scientific Exploration of the Caspian Sea. Formation of Nitrites by *Bacteria.*

———. Conchologia Indica,—Pts. 7 and 8.

No. 7. Diplommatina. Paludomus. Helix. Megalomastoma. Raphaulus. Streptaulus, Helicina. Clostophis. Pterocyclos, including Spiraculum, &c. Craspedotropis. Jerdonia. Lagochęilus. Cyathopoma. Mychopoma and Ditropis. Navicella. Corbicula. Leptopoma. Pterocyclos.

No. 8. Cyclophorus. Alycæus. Omphalotropis. Cataulus. Cyathopoma. Cremnoconchus. Sophina. Hypsęlostoma. Bulimus. Helix. Planorbis. Amnicola. Bithinia. Vitrina. Melania. Unio. Corbicula, Cyclas. Pisidium. Tricula. Achatina. Coilostele. Pupa. Streptaxis. Navicella. Neritina. Camptoceras. Limnæa. Succinea. Helix. Clausilia.

———. The Edinburgh Review,—No. 291, January, 1876.

The Suez Canal.

———. The Ibis, 3rd Series, Vol. V, No. 20, October 1875 and Vol. VI, No. 21, January 1876.

Vol. V, No. 20. *W. V. Legge.*—On the Birds of the South-Eastern Subdivision of Southern Ceylon. *R. Swinhoe.*—On the contents of a second Box of

Birds from Hakodadi, in Northern Japan. *Arthur, Viscount Walden.*—Notes on Birds from Burma. *Dr. N. Severtzoff.*—Notes on some new Central Asiatic Birds.

Vol. VI. No. 21. *R. Bowdler Sharpe.*—Contributions to the Ornithology of Borneo. *H. E. Dresser.*—Notes on Severtzoff's "Fauna of Turkestan."

London. The London, Edinburgh and Dublin Philosophical Magazine, 5th Series, Vol. I, No. 2.

E. Edlund.—Experimental Proof that the Resistance to Galvanic Conduction is dependent on the Motion of the Conductor.

———. The Quarterly Review, No. 281, January 1876.

Modern Methods in Navigation and Nautical Astronomy.

———. Society of Arts,—Journal, Vol. 24, 1209 to 1212.

New Haven, U. S. The American Journal of Science and Arts, Vol. X, No. 60, Vol. XI, No. 61.

No. 60. *S. P. Langley.*—The Solar Atmosphere; an introduction to an account of researches made at the Allegheny Observatory. *P. H. Storer.*—Ammonia a constant contaminant of Sulphuric Acid.

No. 61. *E. Loomis,*—Contributions to Meteorology. *H. A. Rowland.*—Studies on Magnetic Distribution.

Paris. Annales de Chimie et de Physique, 5me Série, Vols. IV, V, VI.

Vol. V. *MM. P. Champion, H. Pellet, et M. Grenier.*—Application de l'électricité à l'inflammation des fourneaux de mine, torpilles &c., et à l'industrie minière. *M. Boussingault.*—'Etudes sur la transformation du fer en acier par la cémentation. *M. H. Müntz.*—Sur les ferments chimiques et physiologiques. *M. C. Dr. Jeannel.*—Note relative á l'influence des racines des végétaux vivants sur la putréfaction.

———. Comptes Rendus, Tome 82, Nos. 1 to 4, 1876.

No. 1. *M. J. Jamin.*—Sur la constitution intérieure des aimants. *M. Th. du Moncel.*—Seizième Note sur la conductibilité électrique des corps médiocrement conducteurs. *M. A. Crova.*—Recherches sur la loi de transmission par l'atmosphére terrestre des radiations calorifiques du Soleil.

No. 2. *M. J. M. Gaugain.*—Influence de la trempe sur l'aimantation. *M. Gaumet.*—Sur un télémètre de poche à double réflexion.

No. 3. *M. A. Müntz.*—Transformations du sucre de canne dans les sucres bruts et dans la canne à sucre. *MM. Aimé Girard et Laborde.*—Sur l'inactivité optique du sucre réducteur contenu dans les produits commerciaux.

Paris. Journal des Savants, December, 1875.

———. Mélanges d'Archéologie Egyptienne et Assyrienne, Tome II, 3e Fas.

———. Revue Archéologique, Janvier, 1876.

———. Revue Critique d'Histoire et de Litteráture.—Nos. 1 to 5, 1876.

No. 1. Cowell.—Introduction au Prâkrit des drames.

No. 5. Childers.—Dictionnaire de la langue Pâli.

———. Revue des Deux Mondes, Tome 13, Pts. 2 and 3.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR MAY, 1876.

The Monthly General Meeting of the Society was held on Wednesday the 3rd May, at 9 o'clock, P. M.

W. T. Blanford, Esq., Vice-President, in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Government of India, Home Department, a set of photographs of the paintings at the Adjanta Caves in the Bombay Presidency.

2. From the author, a copy of a work entitled—"The Travels of Guru Tegh Bahadur and Guru Gobind Sing. Translated from the original Gurumukki by Sirdar Attar Sing, Chief of Bhadaur.

3. From the author, a pamphlet entitled—"What is the correct term for God in Santhali?" By the Rev. L. O. Skrefsrud.

4. From the Manager, Basel Mission Book and Tract Depository Mangalore, a pamphlet entitled—"Ueber den Ursprung des Lingakultus". By F. Kittel.

5. From Dr. J. Scully, a copy of his paper entitled—"A Contribution to the Ornithology of Eastern Turkestan."

The following gentlemen, duly proposed and seconded at the last Meeting, were elected ordinary members—

Surgeon-Major A. F. Bradshaw, J. M. Lyall, Esq., A. M. Nash, Esq.

The following are candidates for ballot at the next meeting.—

Julius Behrendt, Esq., Professor, Dacca College, Dacca, proposed by Mr. H. Blochmann, seconded by Captain Waterhouse.

J. F. Baness, Esq., Chief Draftsman, Surveyor General's Office, proposed by Capt. Waterhouse, seconded by Mr. Blochmann.

R. Parry, Esq., Professor, Presidency College, Calcutta, proposed by Mr. Blochmann, seconded by Capt. J. Waterhouse.

The following coins were exhibited at the meeting by Mr. Blochmann.

(1) From Dr. J. Scully, 2 gold coins, 3 silver coins, 3 copper coins, from Káshghar, and six pierced Chinese copper and brass coins, one of them large, about 1½ inch in diameter.

Dr. Scully writes—'The gold coins are called *tilla* [طلا *ṭilá*, gold]; the Káshghar one is worth about Rs. 5, and the Khoqand tilla about Rs. 6-8-0.

'The small Káshghar silver coins are called 'tanga', and 25 of these equal in value one tilla; 5 tangas = 1 Rupee.

'The large copper coin (Chinese) is not now in circulation in Eastern Turkistán; it was said to equal four of the small Chinese copper coins.

'The pierced Chinese copper coins are called 'Dachin'; 25 of them = 1 tanga. They are the commonest kind of coin met with in Káshgharia. The brass coins are also called 'Dachin', but are not now in circulation. The small Muhammadan copper coins are new 'Dachin', intended to supersede the old Chinese pattern.'

Mr. BLOCHMANN said—

The Muhammadan gold, silver, and copper coins, presented by Dr. Scully, have the following legends:

The Khoqand Ṭilá— بهادر خان سيد سلطان محمد

Bahádur Khán Sayyid Sulṭán Muhammad.

ضرب دار السلطنة خوقند لطيف ١٢٨٠

Struck at the capital Khoqand, the pleasant.

The Káshghar Ṭilá—١٢٩١ سلطان عبد العزيز خان

Sulṭán 'Abdul 'Azíz Khán, A. H. 1291.

ضرب دار السلطنة كاشغر ١٢٩١

Struck at the capital Káshghar, A. H. 1291.

In both ṭilás, the legends are circular, and the margins have little crosses, dots, and arabesques.

The Káshghar Tanga. عبد العزيز خان

'Abdul 'Azíz Khán.

ضرب كاشغر لطيف ١٢٩١

Struck at Káshghar, the pleasant, A. H. 1291.

The new Káshghar Dachins. They have the same legend as the tanga but Kashghár has not the epithet of *laṭíf*, 'the pleasant'. The epithet is common on all Khoqand coins.

The name of 'Abdul 'Azíz Khán, Sulṭán of Turkey, is given on the coins, because the present Atáliq of Káshghar does not feel strong enough to strike coins in his own name.

There is also a modern Persian silver piece among Dr. Scully's coins, which bears the legend—

السلطان ناصر الدين شاه قاجار

Sulṭán Náçir-uddín Sháh, the Kájár.

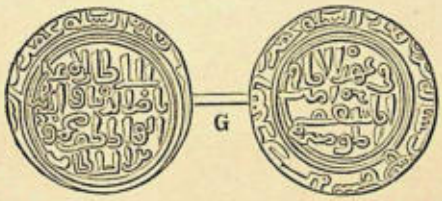
ضرب مشهد مقدس * ۱۲۷

Struck at Mashhad, the holy, A. H. 127*.

(2.) From the Rev. M. Carleton, American Mission, Karnál, for exhibition, a unique gold coin of Náçir-uddín Mahmúd Sháh (A. H. 644 to 664; A. D. 1246 to 1265).

Mr. Blochmann said—Mr. Thomas has remarked that the earlier kings of Dihlí do not seem to have issued many gold coins; but no gold coin struck by Mahmúd Sháh appears to exist in the best coin cabinets.

Mr. Carleton's coin has the same legend as the silver Mahmúd Sháhí in Thomas's chronicles, pl. II, 39, and p. 129.



The weight is 168·45 grains. Both obverse and reverse have the same legend.

Obverse—السلطان الاعظم ناصر الدنيا و الدين ابو المظفر محمود بن السلطان

Reverse—في عهد الامام المستعصم امير المومنين

Margin (on both faces)—ضرب هذه السكة بحضرت دهلي في سنه سبع خمسين و ستمايه

The great Sulṭán Náçir uddunyá waddín Abul Muzaffar Mahmúd, the son of the Sulṭán,

In the time of the Imám Al-Musta'çim, the Commander of the Faithful.

This coin (*sikkah*) was struck in the capital, Dihlí, in 657 A.H.

(3) The Society has also bought of Bábu Omesh Chunder Banerjea, Godda, a gold coin, struck by Muhammad-bin-Tughluq in the name of the Egyptian Khalif Al-Mustakfí Billah, Dihlí, 743, A. H. The coin weighs 168·05 grains.

The coin has been described by Mr. Thomas in Chronicles, p. 259.* Another specimen of the same year is in the cabinet of General Cunningham.

* Where the word في is left out before الدهلي.

Mr. BLOCHMANN exhibited a further batch of Muhammadan Inscriptions.

(1) From Mr. Delmerick's Dihlí rubbings, three inscriptions of A.H. 1012, 1063, 1068, of the reigns of Akbar, Sháhjahán and Aurangzíb. The first is taken from the tomb of Mírzá Muzaffar.

(2) From Mr. Delmerick's Hiçár Firúzah rubbings, four inscriptions, dated 892, 927, 931, 944, H.

(3) From Mr. F. L. Beaufort, C. S., a reading and translation of the inscription of a large cannon in the Jinsí-Topkhánah, Murshídábád. The gun was cast at Dháká in A. H. 1047, or A. D. 1632.

The text and translations of these inscriptions will be published next month.

Mr. WOOD-MASON read the following extract from a letter from Mr. S. E. Peal of Sibsagar, Assam,

"While out with an Assamese lately in the jungles, whistling for deer we came on a place all *swamp* and dug up by *Pigs* looking for *fish*."

"Did you know this as a custom? it seems (on enquiry) quite corre[illegible] Jackals also are destroying all the sugar-cane plantations about here. I [illegible] pestered for loan of guns or powder to shoot them. This is so bad *west*, *i. e.*, Golaghat and Gauhati, that high fences have to be made to save the canes," and stated that the wild pigs of the Andaman Island repaired daily at low water to the sea-shore in search of crustacea, fish, and other animals.

Mr. W. T. BLANFORD said that the carnivorous habits of wild pigs were well known. Mr. Peal has given us no details in this case, but he has doubtless satisfied himself that the ground he mentions was turned up by pigs in search of fish, and not of roots. The margins of tanks and of marshes are always found more or less dug up wherever wild pigs occur, but this is usually done in order to enable the animals to feed on the roots of water plants.

Jackals are largely frugivorous, and often feed entirely on the fruit of the ber *(Zizyphus)* and their partiality for sugarcane has been noticed before. In fact many animals are far less exclusively herbivorous or carnivorous in their habits than is generally supposed.

The Council reported that they had elected Mr. W. T. Blanford, a Vice-President of the Society in the place of the Hon'ble E. C. Bayley, C. S. I., who had been appointed President.

The CHAIRMAN announced that the Council had sanctioned the purchase of a selection from the Coins belonging to the late Colonel Guthrie, to the amount of Rs. 2000-0-0.

The CHAIRMAN also announced to the meeting that steps would be taken immediately for the thorough repair of the Society's premises. Some inconvenience would no doubt be felt, while the repairs were going on, but it was hoped that it would not be found necessary to interfere with the usual course of the meetings, or with the other business of the Society.

The following papers were read :

1.—*On Early Asiatic Fire Weapons.—By Major-General* R. MACLAGAN, R. E., *Secretary to the Government of the Panjáb, P. W. D.*

(Abstract.)

The introduction of this paper treats of the various kind of fire arrows used by the Greeks and the Romans. The author then collects numerous passages from the historians of Asia and Africa regarding the use of petroleum and naphtha for purposes of war. What we call 'Greek Fire' was nothing else but petroleum, and the Arabs have left us numerous recipes for warfire and fireworks, both liquid and dry, most of which contained petroleum, or one or all constituents of gunpowder. The preparation of Greek Fire has never been a secret, nor has the art ever been lost ; and only the difficulty of procuring it in Europe made its use a rare occurrence. It was extensively used by the Arabs in Sindh (690) ; at the sieges of Constantinople (717) and Thessalonica (904) ; in Egypt ; by Chingiz Khán, Timur, and even in England, where it was introduced by Edward I.

The noise accompanying the discharge of war-fire, consisting of petroleum, and the use of long tubes for throwing it, has inclined many writers to refer the invention and application of gunpowder to early times ; and the Chinese have specially been mentioned as having been acquainted with the use of gunpowder long before it became general in Europe. The ancient Hindus, too, are said to have been acquainted with it. General Maclagan shows that either assertion is utterly groundless. The extensive use of petroleum missiles was certainly due to the Arabs, and the introduction of gunpowder and artillery proceeded from Europe to the East.

The paper concludes with a sketch of the progress of artillery up to the end of the 16th century in India, Persia, Burmah and China.

The essay will appear in the first number of Pt. I of the Journal for 1876.

2.—*Were the Sundarbans inhabited in Ancient Times ?—By* H. BEVERIDGE, Esq., B.C.S.

(Abstract.)

This paper contains several interesting notices on the condition of the Sundarbans in the 16th century, and an account of the journey, in November and December, 1599, of the Portuguese missionary Fonseca from Dianga (south of Chittagong) over Baklá (Kochúá in Báqirganj) to 'Ciandecan',

the king of which received him kindly, and allowed him to build a church. The church built at Ciandecan, the author states, was the first ever erected in Bengal; that of Chittagong was the second, and then came the church at Bandel, which was erected by a Portuguese named Villalobos.*

Mr. Beveridge identifies 'Ciandecan' with Chánd Khán, or Dhúmghát, the seat of Rájá Pratápaditya, in the 24-Parganahs, near Káliganj. 'Chánd Khán' was the old name of the property in the Sundarban, which Vikramáditya, Pratápaditya's father, got from Dáúd Sháh of Bengal.

The description of the wood and rivers, the animals and scenery described by Fonseca, and the fact that he speaks of no towns, show that the Sundarban in 1599 was what it now is.

The paper will be printed in No. I, of Pt. I, of the Journal for 1876.

Mr. W. T. Blanford said—That any contribution to the history of the Sundarbans was of interest because of its bearing upon the theories of formation of river deltas. If Mr. Ferguson's views of the mode in which the delta of the Ganges has changed in late years be accepted, it is very improbable that the Sundarbans have, at any recent period, been higher above the water level, and consequently better suited for human habitation than they are at present.

Mr. H. F. Blanford said—That there was good Geological evidence of the Sundarbans having undergone depression: since excavations everywhere in and around Calcutta and also at Kulna in Jessore showed that an old forest, indicated by stumps of trees with their roots *in situ*, exists at a depth of from 20 to 30 ft.; at such a depth, that if the ground above were removed, the forest bed would be some feet below low water level. This forest is chiefly *Sundri*, a tree which now grows between tide marks, and the ground above is apparently a fresh water deposit. Nothing could be said as to the date of the submergence, whether it took place within what are usually regarded historic times or earlier.

Mr. H. Beverley enquired whether it was not the case that the cultivation of the Sundarbans was largely influenced by the action of the river-system of the lower Gangetic delta. Where there was a strong current of fresh water making its way to the sea, it was only reasonable to suppose that the salt water was thereby kept back somewhat and the land rendered fit for habitation and capable of being cultivated. Now Mr. Westland had shown in his work on Jessore that for many years past the river-system of the delta had been gradually shifting eastwards, and it was the fact that at the present day the great body of the waters of the Ganges and Brahmaputra rivers emptied itself by the Megna which flowed to the east of the Báqirganj

* But the keystone of the old Bandel church, said to have belonged to the original church that was destroyed by Sháhjahán's troops, bears the year 1599. The Editor.

district. It was also a fact that in that district the margin of cultivation lay nearer the sea than either in the 24-Parganahs or in Jessore. Starting from a point not many miles south of Calcutta, this margin extended almost in a straight line to within a few miles of the sea in the Báqirganj district. Wherever there was a large river, cultivation would be found to encroach somewhat south of the line, but as a general rule its direction was as stated. When reporting on the census of 1872, Mr. Beverley said, he had made special enquiries with reference to this subject, but he had failed to ascertain that in the districts of the 24-Parganahs and Jessore there had been any great increase of cultivation within recent years. At the same time if it could be shown (as indeed the numerous old river-beds found in the Húglí, Nadiá and Jessore districts seemed to indicate) that at some former time the main channel of the Ganges flowed through the Western Sundarbans, it was not impossible that the margin of cultivation, and consequently of population, may have lain further to the south in those parts than at present. Were we to suppose that by some change in the river-system, the Megna were now to lose half its volume of water, there could be no doubt that the salt water tides would gain a corresponding influence, and a certain quantity of land in the neighbourhood would again be thrown out of cultivation and be depopulated.

3.—*Description of a new Phasmideous Insect from the Andamans.*—*By* J. Wood-Mason, Esq.

The author describes, under the name of *L. verrucifer*, the two sexes of an insect belonging to the same little group as *Lonchodes amaurops, nodosus, brevipes, uniformis, Crawangensis, bifoliatus*, &c., all species, like it, with the first tarsal joint of the fore legs elevated into a sharp foliaceous crest; and states that *Lonchodes nematodes*, an insect with short filiform antennæ and long and simple first tarsal joint to fore legs, cannot be the male of *L. Crawangensis*, an insect with long setaceous antennæ and foliaceous first tarsal joints, but that it must be the male of *L. cunicularis*, or of some closely allied form.

This section of the genus *Lonchodes* is represented in India by one species only, the *L. brevipes*, which is said to be a native of the Malabar coast, the fauna of which was largely composed of representative Malayan forms.

Mr. W. T. Blanford called attention to the large field for exploration still offered by the hills of Southern India and the forests near the Malabar coast. The wonderful collections of reptiles and land mollusks made by Colonel Beddome served to shew how much in all probability remained to be learned in other branches of Zoology.

LIBRARY.

The following additions have been made to the Library since the meeting held in April last.

TRANSACTIONS, PROCEEDINGS, AND JOURNALS,

presented by the respective Societies or Editors.

Berlin. Königliche Preussische Akademie der Wissenschaften,—Monatsbericht, Januar, 1876.

Bombay. The Indian Antiquary,—Vol. 5, Pt. 54.

Rev. J. F. Kearns.—Âtma Bôdha Prakásika. *L. Rice.*—Two Kongu or Chera Grants of A. D. 454 and 513. *Dr. F. Kielhorn.*—Remarks on the Síkshâs. *Dr. H. Bühler.*—Inscriptions from Kavi, No. 2. *J. Muir.*—Maxims and Sentiments from the Mahábhárata. *J. F. Fleet.*—Sanskrit and old Canarese Inscriptions, No. XV. *Rev. G. U. Pope.*—Notes on the South-Indian or Drávidian family of Languages.

Calcutta. The Christian Spectator,—Vol. V, No. 59.

Edinburgh. Royal Society.—Transactions, Vol. 37, Pt. III, Session, 1874-75.

J. Lister.—A Contribution to the Germ Theory of Putrefaction and other Fermentative Changes, and to the Natural History of Torulae and Bacteria. *A. Buchan.*—On the Diurnal Oscillations of the Barometer.

———. ———. Proceedings, Session, 1874-75.

C. G. Knott and *A. Macfarlane.*—On the Application of Angström's Method to the Conductivity of Wood. *J. G. MacGregor.*—Note on the Electrical Conductivity of Saline Solutions, *R. Tennent.*—The Theory of the Causes by which Storms progress in an Easterly direction over the British Isles, and why the Barometer does not always indicate real Vertical Pressure.

Genoa. Museo Civico di Storia Naturale. Annali,—Vols. II, III, IV, V, VI, 1872—74.

London. The Athenæum,—Pts. 577 and 578, January and February, 1876.

———. Geological Society,—Quarterly Journal, Vol. 32, Pt. 1, No. 125.

Prof. Owen.—On a new Modification of Dinosaurian Vertebræ. *H. Woodward.*—On the Discovery of a Fossil Scorpion in the British Coal-measures. On a remarkable Fossil Orthopterous Insect from the Coal-measures of Scotland.

———. Nature, Vol. 13, Nos. 333 and 336.

———. The Royal Society,—Proceedings, Vol. XXIV, No. 166.

T. E. Thorpe and *A. W. Rücker.*—On the expansion of Sea-water by Heat. *Prof. W. G. Adams.*—On the Action of Light on Tellurium and Selenium. *Prof. O. Reynolds.*—On the Refraction of Sound by the Atmosphere. *J. Tyndall.*—On the Optical Deportment of the Atmosphere in reference to the Phenomena of Putrefaction and Infection. *Capt. J. Waterhouse.*—On Reversed Photographs of the Solar Spectrum beyond the Red, obtained on a Collodion Plate.

London. Royal Astronomical Society,—Memoirs, Vol. 42, 1873-75.

Lieut.-Col. J. F. Tennant, R. E.—Report on observations of the Total Eclipse of the Sun on December 11—12, 1871, made by order of the Govt. of India, at Dodabetta, near Ootacamund. *E. J. Stone.*—The Total Eclipse of the Sun April 16, 1874.

———. ———. Monthly Notices, Vol. 36, No. 4.

Report of the Council to the Fifty-sixth Annual General Meeting of the Society Notes on some Points connected with the Progress of Astronomy during the past Year.

———. Royal Geographical Society,—Proceedings, Vol. XX, No. II.

Livingstone East Coast Expedition. Lieut. Cameron's Arrival at the West Coast of Africa. *Cameron.*—Letters detailing the journey of the Livingstone East Coast Expedition from Lake Tanganyika to the West Coast of Africa.

Palermo. Società degli Spettroscopisti Italiani,—Memorie. Dispensa 2 e 3, Febbraio e Marzo, 1876.

Disp. 2. *P. Tacchini.*—Macchie e facole al bordo, Osservazioni dirette e spettroscopiche fatte all'osservatorio di Palermo nel 1874.—Magnesio al bordo osservato a Palermo nel 1874.

Disp. 3. *P. Tacchini.*—Magnesio al bordo osservato a Palermo nel 1874.—Osservazioni spettroscopiche solari fatte a Palermo nel primo trimestre 1876.—Statistica delle eruzioni solari osservate a Palermo nel 1874.—Macchie solari osservate all'Equatoriale di Merz della specola di Palermo nel primo trimestre 1876 da P. Tacchini, e tempo del passaggio del semidiametro solare determinato da *G. De Lisa.*

Paris. Journal Asiatique.—Septième Série, Tome VII, No. I, 1876.

M. J. Mohl.—Sentences, maximes, et proverbes mandchoux et mongols.—Archæological Survey of India.

———. Société de Géographie,—Bulletin, Mars, 1876.

L'abbé Armand David.—Second voyage d'exploration dans l'ouest de la Chine, 1868 á 1870 (suite et fin). *Romanet du Caillaud.*—Origine du nom de Tong-King.

Roorkee. Professional Papers on Indian Engineering,—2nd Series. Vol. V, No. 20.

Capt. A. Cunningham.—Continuous Uniform Beams. *J. C. Douglas.*—The Limit of Elasticity.

Toronto. The Canadian Journal of Science, Literature, and History. Vol. XIV, No. VI, December, 1875.

Books and Pamphlets,

presented by the Authors.

Sirdar Attar Sing. The Travels of Guru Tegh Bahádur and Guru Gobind Sing. Translated from the original Gurmukhí.

Burgess, J. Archæological Survey of Western India. No. 2—Memorandum on the Antiquities at Dathoi, Ahmedabad, Than, Junagadh, Girnar and Dhank. No. 3—Memorandum on the Remains at Gumli, Gop, and in Kachh, &c.

Scully, J. Dr. A Contribution to the Ornithology of Eastern Turkestan.

Senart, E'd. Essai sur la Légende du Buddha, son caractère et ses origines.

MISCELLANEOUS PRESENTATIONS.

A New Hindustani-English Dictionary. By S. W. Fallon, Ph. D. Pts. I, II.

The Indian Antiquary, Vol. V, Pt. 54.

The Jummoo and Kashmir Territories. A Geographical Account. By F. Drew. London, 1875.

GOVERNMENT OF INDIA, HOME DEPARTMENT.

General Report on the Topographical Surveys of India and of the Surveyor General's Department for 1874-75.

THE SURVEYOR GENERAL OF INDIA.

General Report on the Operations of the Great Trigonometrical Survey of India during 1874-75.

THE SUPERINTENDENT OF THE SURVEY.

Report on the Nágpur School of Medicine, Central Provinces for 1875.

CHIEF COMMISSIONER, CENTRAL PROVINCES.

Annual Report of the Three Lunatic Asylums, in the Madras Presidency during 1874-75, No. 49.

GOVERNMENT OF MADRAS.

Report of the United States, Geological Survey of the Territories. Vol. VI.

Annual Report of the United States, Geological and Geographical Survey of the Territories, embracing Colorado, being a Report of Progress of the Exploration for the year 1873.

List of Elevations principally in that portion of the United States west of the Mississippi River. By Henry Gannett.

Birds of the North-West: a Hand-book of the Ornithology of the Region drained by the Missourie River and its Tributaries. By Elliott Cones.

T. W. HAYDEN, U. S. GEOLOGIST.

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No. 1213. *S. Evans.*—Sole-leather Tanning, with some remarks on the Import of Hides and Cattle. Japanese Lacquer Ware.

No. 1214. *C. Magniac.*—On the Commercial Aspects of the Suez Canal.

„ 1215. Adjourned Discussion on Mr. C. Magniac's paper on the "Commercial Aspects of the Suez Canal." *W. Saville Kent.*—Aquaria, their Construction, Management, and Utility. Paper from Bamboo.

No. 1216. *E. Seyd.*—The fall in the Price of Silver; its Consequences and their possible Avoidance.

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No. 5. *M. Tresca.*—Compte rendu des expériences faites pour la détermination du travail dépensé par les machines magnéto-électriques de M. Gramme, employées pour produire de la lumière dans les ateliers de M.M. Sautter et Lemonnier. *M. R. Fr. Michel.*—Note sur la méthode à employer pour l'essai des conditions de conductibilité des paratonnerres.

No. 6. *M. J. Gayat.*—De la conjonctivite granuleuse. Résumé de deux missions ayant eu pour objet l' étude des maladies oculaires en Algérie.

No. 7. *MM. E. Mathieu et V. Urbain.*—Réponse à une Note précédente de *M. Arm. Gautier*, relative au rôle de l'acide carbonique dans la coagulation du sang. *M. Couté.*—Sur l' origine et la mode de génération des tourbillons atmosphériques, et sur l'unité de direction de leur mouvement gyratoire.

No. 8. *M. Faye.*—Remarques au sujet des lois des tempêtes.

No. 9. *M. Schnetzler.*—Sur les propriétés antiseptiques du borax. *MM. E. Mathieu et V. Urbain.* Réponse à la dernière Note de *M. F. Glénard*, relative au rôle de l'acide carbonique dans le phénomène de la coagulation spontanée du sang.

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PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR JUNE, 1876.

The monthly General Meeting of the Society was held on Wednesday, the 7th June, 1876, at 9 o'clock, P. M.

Bábu Rájendralála Mitra, LL. D., Vice-President, in the Chair.

The following gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected ordinary Members—

Julius Behrend, Esq.

J. F. Baness, Esq.

R. Parry, Esq.

The following are candidates for ballot at the next meeting.—

Lieut. F. W. Jarrad, R. N., Depy. Supt. India Coasts Survey, proposed by Mr. J. Wood-Mason, seconded by Dr. James Armstrong.

D. Scott, Esq., C. E., proposed by Mr. J. Wood-Mason, seconded by Mr. W. T. Blanford.

Ross Scott, Esq., C. S., of Muzaffanagur, proposed by Mr. F. S. Growse, seconded by Mr. Blochmann.

Dr. D. O'Connell Raye, General Hospital, Calcutta, proposed by Dr. G. King, seconded by Capt. J. Waterhouse.

Rev. Thos. Foulkes, Bangalore, proposed by Capt. J. Waterhouse, seconded by Mr. Blochmann.

The CHAIRMAN announced that Lord Lytton had been pleased to honor the Society by accepting the office of Patron of the Society, vacant by the resignation of Lord Northbrook.

The CHAIRMAN said: "By the last mail from Germany the Council have received the melancholy intelligence of the death of Professor Christian Lassen, one of the oldest honorary members of the Society, and an oriental scholar of the highest attainments. Born in 1800 at Bergen in Norway,

Lassen retired to Germany in early youth, and passed the best part of his life as Professor of Sanskrit in the University of Bonn. He attained distinction as a Sanskrit scholar more than half a century ago, and was elected an honorary member of this Society in 1831. With the characteristic leaning of the scholars of his adopted country, he first directed his attention to Hindu Philosophy, and, in 1832, published a Latin translation of the Sánkhya Káriká, which, though not so rigorously exact as the English version subsequently prepared by Colebrooke, was still a work of great merit, and it brought him to prominent notice as an able, clear-headed, and pains-taking student of the Sanskrit language. In 1835, he published a Latin translation of the renowned pastoral of Jayadeva, the Gítagovinda. He had, in this undertaking the advantage of Sir William Jones' English translation and the ductility of the Latin language—so much more allied in idiom to the Sanskrit than the English—in his favour; nevertheless high praise was due to him for the ability and scholarship with which he did such ample justice to the poetical imagery and richness of the original. The work is peculiarly oriental in its tone, feeling, form, and expression, and calculated to tax to the utmost the capacity of European translators. To English readers Dr. Arnold's new metrical version will convey an idea of what the true character is of this "Indian Song of Songs," and how widely it differs from Western imagery and thought. In 1836, Professor Lassen published two works, one on some Persepolitan inscriptions, and the other a commentary on the *Pentapotamia Indica;* both replete with the results of great learning and persevering research. The work on inscriptions entailed enormous labour, as it was one of the earliest attempts at deciphering Persian cuneiform writing, but it was eminently successful. These were followed, in 1837, by an essay on the Prakrit dialects, the *Institutiones Linguæ Prakriticæ*, which first afforded to European scholars a clear insight into the nature and character of those ancient vernaculars. Nothing has since been published to supersede that learned essay. His essay on the "Coins of the Indo-Scythian Kings," which brought together in a systematic form the numismatic researches of our James Prinsep, and enriched them with the results of his own enquiry and study, was a work of great interest, and the Society published an English translation of it by the late Dr. Röer, in our Journal for 1842-3. A Sanskrit Anthology for school use, an essay on the Vendidad, and a valuable dissertation on the island of Taprobane, were also among the several works which he published during the first half of this century, and which secured for him a high and honorable place among the labourers in the vast field of oriental research. He was also a frequent contributor to oriental periodicals, and editor of the *Zeitschrift für die Kunde des Morgenlandes* for several years. The most important work, however, which he published and which will make his name

to be honorably remembered for a long time, is his *Indische Alterthumskunde.* In it he brought the strictest rules of classical criticism and the Niebuhrian method of distinguishing the true from the false to bear on oriental learning, and for the first time set in order the *disjecta membra* of ancient Indian history which his predecessors and contemporaries had brought to light. We may not assent to all his conclusions, and the materials he had to work upon were certainly not always the safest and most accurate; but on the whole his work is a noble monument of his learning, and genius,—of his zeal, devotion, and unflagging industry. I am sure this meeting will, in common with Oriental antiquarians in every part of the civilized world, mourn the loss of so distinguished a scholar."

Read the following letter from Mr. H. W. I. Wood, Secretary of the Piddington Fund, forwarding Rs. 586/4 as a refund of a moiety of contributions to the Fund from the Asiatic Society.

Bengal Chamber of Commerce, Calcutta, 10th April, 1876.

The Secretary of the Asiatic Society.

DEAR SIR,—The Committee of the Chamber of Commerce desire me to inform you that as the object for which a fund was subscribed in 1870 for the benefit of the late Mrs. Piddington has been accomplished, they hold a surplus—as per memorandum at foot—which will admit of a refund of a moiety of contributions; and they direct me to hand you the sum of Rupees 586/4, your receipt for which in annexed form will oblige

Yours faithfully,
H. W. I. WOOD,
Secretary.

MEMORANDUM OF THE PIDDINGTON FUND ACCOUNT.

Subscription from Saigon Chamber of Commerce,	Rs.	100	0	0
„ Madras,		470	0	0
„ Colombo,		390	0	0
„ Shanghai,		677	2	5
„ Peninsular and Oriental Company,		100	0	0
„ Asiatic Society,		1,172	8	0
„ Calcutta Trades' Association,		500	0	0
		3,409	10	5
Local individual subscriptions,		7,269	0	0
		10,678	10	5
Interest on account with the Oriental Bank Corporation,		2,296	13	1
	Rs.	12,975	7	6

Paid Mrs. Piddington 100 Rs. a month from May 1870 to date of decease in Sept. 1875,	6,500	0	0	
„ for funeral expenses, &c.,	192	5	6	
„ for cost of a Monument,	537	8	0	
				7,229 13 6
Balance,				Rs. 5,745 10 0

H. W. I. WOOD,
Secretary.

The SECRETARY said that the money had been deposited in the Bank of Bengal and that Subscribers to the Fund could receive on application a refund of half their contributions. A list of the subscribers would be found on the fly leaf of the Proceedings for May 1870.

Mr. H. F. BLANFORD said that as a subscriber to the "Piddington Fund", he would propose for the consideration of other subscribers, that the residue of the Fund now in the hands of the Society should be made the nucleus of a permanent fund for pensioning old and deserving servants of the Society.

Mr. V. BALL seconded the proposal.

The CHAIRMAN having put Mr. Blanford's proposal before the meeting, it was agreed that it should be referred to the subscribers for consideration.

The SECRETARY laid before the Meeting a copy of a pamphlet by Mr. W. C. McGregor entitled "Protection of Life and Property from Lightning during Thunderstorms," and stated that Mr. McGregor, had very kindly offered to send 100 copies for distribution among members. The Secretary also read some extracts from a short paper by Mr. McGregor, on the same subject of which the following is an abstract:

On the Prevention of Accidents by Lightning.

The author commences by stating that although a century and a quarter has elapsed since Franklin proved by his kite experiment the similarity between atmospheric and frictional electricity, and showed that protection to life and property could be secured by artificial means, we still read announcements of churches and other public buildings, both in England and this country, being struck and injured by lightning, and two recent accidents of this kind are instanced, in one of which the steeple of the village church of Snettisham, near Sandringham, was destroyed, happily without loss of life; and in the other, the Himalaya Hotel, Masuri, was struck, two natives being killed on the spot by the electric fluid in its pas-

sage, and others wounded, considerable damage being also done to the Hotel and the property of the inmates.

From the fact of no mention having been made of lightning conductors being attached to these buildings, the author concludes that this means of artificial protection had not been adopted, and goes on to enquire how far are Churchwardens, Hotel Proprietors and persons in charge of other large or prominent buildings justified in endangering the lives of their fellow creatures by neglecting to adopt precautionary measures against accidents by lightning—a question which the author has fully treated in his pamphlet referred to above.

The author then gives a brief notice of what has been done in Europe with regard to the prevention of accidents from lightning and goes on to suggest that similar steps should be taken in India.

At the present time very nearly all vessels carry a fixed lightning conductor as part and parcel of the vessel, instead of its being stowed away to be run up to the masthead when required, as was done on the introduction of lightning conductors into the British Navy. The same principle should be carried out with reference to buildings. Dr. Mann, Mr. Preece, Captain Galton and others have pointed out that no building should be considered complete without the necessary protection against lightning and there should be no difficulty in providing this at the same time and in the same manner as the rainpipes or gutters forming part of a building.

In France, the Prefect of the Seine has appointed a Commission, comprising several members of the Academy, to inspect and report upon the lightning-rods connected with the buildings of the Municipality of Paris. Their inspection will be annual and particular study will be made of certain of the conductors with reference to the thunderstorms which pass over Paris.

In England, a Committee has been formed under the auspices of the Meteorological Society of London for the purpose of encouraging and introducing a proper system of protection against accidents by lightning and for supervising and reporting upon the means in existence.

As a member of the Asiatic Society, the author asks if it is not a matter of sufficient importance and within the scope of its action to warrant the Society in taking some such steps for carrying out investigations and practical suggestions, within the limits of its operations.

The author expresses his belief that the Government, through its Meteorological office, would assist greatly the exertions of the Society, by allowing it to be furnished with data and information regarding accidents to life and property already reported and on record; as also of the present means employed for guarding against such accidents. The Press and the public can also assist with important information and co-operation; and if

the matter can only be properly and practicably ventilated most useful results must follow.

The author concludes by referring to a reprint, in pamphlet form, from the Quarterly Journal of the Meteorological Society for October 1875, of a paper by Dr. R. J. Mann, F. R. A. S., entitled "Remarks on some practical points connected with the construction of Lightning Conductors", with the discussion thereon, as containing much interesting information on this subject.

The SECRETARY laid before the meeting a circular containing a list of the subjects for discussion, at the ensuing International Oriental Congress at St. Petersburg, as below.

Questions pour être discutées à la 3-e Session du Congrés international des Orientalistes, proposées par le Comité-organisateur de cette Session.

PREMIÈRE SÉRIE

1. Les monuments historiques nous apprennent que la Sibérie pendant plus de 2,000 ans envoyait peuple sur peuple dans l'Asie centrale: quelles étaient les circonstances qui y produisaient ce surcroît de population et pourquoi cet accroissement et ces émigrations ont-elles cessé avec la conquête de la Sibérie par les Russes?

2. Le Chamanisme qui jusqu'à nos jours predomine chez les indigènes païens de la Sibérie, est-il le même chez tous? ou bien nous présente-t-il des différences selon la famille ethnographique à laquelle appartiennent ses adhérents sibériens?

3. Nous voyons que presque tous les fondateurs de nouvelles monarchies nomades dans l'Asie centrale octroient à leurs sujets leurs codes de lois particuliers. Quels étaient les motifs et le but de ces codifications successives, étant donnée l'uniformité bien connue des coutumes et du genre de vie de ces peuples nomades?

4. Y avait-il avant Djenguis-Khan un peuple ou une tribu du nom de M o n g o l, ou bien le nom Mongol n'est-il qu'un nom dynastique adopté par Djenguis pour l'empire qu'il a fondé?

5. Quelles sont les preuves en faveur de l'opinion généralement admise que les manuscrits turcs en c a r a c t è r e s Ouigours qui se trouvent dans les différentes bibliothèques de l'Europe, soient écrits réellement dans la l a n g u e des Ouigours, ces caractères étant employés aussi par d'autres peuples turcs dans le temps auquel le manuscrits en question se rapportent?

6. Les renseignements sur les fêtes annuelles du Turkestan, oriental et occidental, que l'on trouve dans les annales officielles chinoises jusqu'au temps des Thans—jusqu'à quel point s'accordent-ils avec ceux d'el-Birouni

sur les calendriers des Kharizmiens, des Soghdiens (et en partie aussi des Tokhars) ? En quoi ces calendriers diffèrent-ils de celui de la Perse du temps des Achéménides, aussi bien que de celui des Sassanides ?

7. Que savons-nous de l'écriture soghdienne ? Quels sont les monuments, où elle s'est conservée ? Est-il possible de déterminer, ne serait-ce qu'approximativement, l'époque de son introduction dans la Transoxiane ?

8. Jusqu'à quel point peut-on suivre dans les documents historiques les noms ethnographiques de "Sarte" et de "Tadjik" ? Quelles conclusions en pourrait-on tirer concernant la signification primitive et les acceptions successives de ces noms ?

9. A quelles causes pourrait-on attribuer la stabilité de la langue néopersane qui du X^me^ siécle jusqu'à nos jours n'a presque pas subi de changement quelque peu remarquable dans ses formes grammaticales ?

10. Les nombreux noms propres élamites qui se sont conservés, nous permettent-ils d'en tirer des conclusions décisives quant à la nationalité des Elamites ?

11. Peut-on déterminer d'une manière exacte sous le point de vue ethnographique et géographique les noms "Rutenu" et "Cheta", qui dans les inscriptions égyptiennes de la XVIII^me^ et de la XIX^me^ dynastie sont mentionnés comme les ennemis séculaires de ces deux dynasties ?

12. Dans quel jour apparaît dans les inscriptions égyptiennes la population de la Palestine avant l'invasion des Hyksôs ?

13. Jusqu'à quel point les rapports mutuels des tribus arabes avant Mahomet peuvent-ils servir à éclaircir l'état politique des tribus israélites du temps des Juges ?

14. Les données chronologiques et topographiques fournies par les légendes des monnaies des dynasties musulmanes sont généralement considérées comme plus dignes de foi que celles des chroniques et des autres monuments non officiels : cette opinion est-elle parfaitement inattaquable ? et avons nous toujours le droit de corriger les données des chroniques à l'aide de celles des monnaies ?

15. Quelles étaient les raisons qui au commencement du XI^me^ siècle firent cesser subitement le commerce entre l'Orient musulman et l'Europe septentrionale, commerce qui florissait sans interruption du VII^me^ au X^me^ siécle ?

Dr. RÁJENDRALÁLA MITRA read the following extract from a letter of Dr. Burnell, on the invasion of Bengal, in the 11th century, by the Chola king Kulottunga :

Tanjore, 29th April, 1876.

"MY DEAR SIR,—I am just about to leave India for Java for two months, but I must tell you a discovery I have made which will I know

interest you, as you have taken much trouble about the Pála kings of Bengal.

"It is that in a Támil inscription here, I have found that Kulottunga Cola states that in his 29th year* he conquered (!) Bengal (Vengāla) and Mayipálaṉ (*i. e.* Tamil for Mahípála). This 29th year = 1093 A. D., as Kulottunga began his reign in 1064 A. D.

"The whole inscription is of immense importance for the chronology of the 11th century, as a vast number of countries (in India) are mentioned, and often the names of their kings.

"Kulottunga was the greatest of the last Cola dynasty, and it is quite possible that he may have attacked Bengal (already invaded by the Muhammadans) in order to revenge himself for a real attack on the South at the end (?) of the previous century as mentioned in the Buddal pillar inscription. Buddal is apparently mentioned in the inscription; at least I can make nothing else of the word v (b)oṭṭal which must be a proper name.

"Kulottunga *inherited* the kingdom of Kalinga, so was not far from Bengal.

"The whole inscription (which I hope to publish) throws great light on the sad state of S. India in the 11th century, owing to religious animosity; it is easy now to understand how the whole country fell a prey to the Muhammadans in 1311."

The CHAIRMAN remarked that in the Rájsháhi inscription, discovered by Mr. Metcalfe and published in the Society's Journal for 1867, mention was made of the founder of the Sena dynasty of Bengal having been a Dakshinátya, or a conqueror from the South who upset the Pála dynasty; and from calculations subsequently made, it appeared that this founder, Ádisura or Vira Sena, came to Bengal in the last decade of the tenth century. Now James Prinsep in his Chronological Tables had doubtingly assigned to Kulottunga an age between 800 and 1000 A. C., and if the later date could be accepted as the correct one, it would follow that the invasion referred to in the inscription was that which gave to Bengal the Sena dynasty, and that Vira Sena was a lieutenant of Kulottunga, who having conquered the country, held it, originally in the name of his master, but afterwards on his own account. This assumption, however, could not be defended, as the date of Kulottunga, according to Dr. Burnell's recent researches, was later by a century and a half, and it brought us to the time of Vijaya Sena. Curiously enough, the Rájsháhi inscription says that Vijaya invaded the Kalinga country; now that country at the time was a part of the Chola dominion, and we had thus two contemporary kings, each of whom claimed a victory over the other. On whose side the victory really lay, it was not easy now to determine, but the Rájsháhi inscription was highly eulogistic,

* This is the date of the *gift*, *i. e.* year of reign.

and in adverting to an invasion of the Western kings, the only fact on which it dwells is the stranding of a fleet of war boats on a sandbank, which it poetically describes as the "ashes on the forehead of Śiva changed to mud by contact with the water of the Ganges." This was done to give a happy turn to a sad failure, and the writer who could make so much of such an accident, would scarcely scruple much to change a defeat into a victory. Dr. Burnell thinks that the invasion mentioned in the Budál inscription might be the offence which Kulottunga retaliated; but it is not necessary to go so far for the first offence: both the inscriptions might be right, and it might be that one of them describes the invasion and the other the retaliation. What the case really was could not be decided until after the publication of the whole of Dr. Burnell's inscription. It was expected, however, that it would prove of much value in elucidating several doubtful points in the history of the two kings.

Dr. Rájendradála Mitra submitted translations of some Inscriptions from Rohtás.

No. 1.

On the jamb of a gate in the Citadel, Rohtás.

Transcript.

संवत् १३९४ समए(ये)
वैसाष(शाख)सुदी १४ रवी(वि)वा
सर वाए रोज। पदा सरो
य(?)मलीला। आगे मुलदलसीं (सिं)
ह पिछे मूलदलभीम

Translation.

"In the time of the Samvat year 1394, on Sunday the 14th of the waxing moon in the month of Vaisákha—on this day were born for a bright (?) career, first Muladala Siñha and afterwards Muladala Bhíma."

The inscription is in the Hindi language, but both its spelling and grammar are frightfully corrupt. The last letter of the 3rd line is clear enough, but the first letter of the 4th is doubtful. If we read the two letters together with what follows, we have *royasa lilá*, a word which I cannot explain: Omitting the first letter *yasa lilá* means 'career of renown'; the epithet, however, is not of much consequence. Who the worthies were, whose birth is here recorded I know not. To the right of the inscription there is a figure (in outline) of the renowned hero of the Rámáyana, Hanumán, armed with a club.

No. 2 is a duplicate of the last.

No. 3.

On the jamb of the north gate, Citadel, Rohtás.

Transcript.

थीर गलुनाथग(ट)च ।

Translation.

"The room of Thíra (the sage) Galunátha."

The only doubtful word in this record is the first. It looks very like an adjective for the name; if so in ordinary Hindi, it can mean quiet, peaceful, not given to much motion; but it is a very unlikely one to be used in such a place. In Páli *thera* means a sage, an expounder, a teacher, and I am disposed to accept it here in that sense. It may, however, be a part of the name.

No. 4, is a duplicate of the last.

No. 5.

Over the inner entrance to Palace, Rohtás.

Transcript.

संवत् १६५४.

श्रीगणेशाय नम(मः) अंभोधीषुरसेंदु
भिः परिमिते पुण्यायने ह्ययने चैत्रे
मासि वलचे पचे वलिते षष्ठां तिथौ श्री
तगेः । वारे सर्वगिरींद्रवंशतिलके श्रीरो
हितास्याचले श्रीमन्मानमहीमहेन्द्रसदने
द्वारं व्यगात्पूर्णतां ॥ १ ॥ श्रीमद्वाराजाधिरा-
जमद्वाराजश्रीमानसिंपुरोहितश्रीध
राधिकारे भ(?म)दवलभट्टेन कारितं समसरप

Translation.

"Salutation to Ganes'a. During the northern declension (of the sun), in the year of the sea, (4), the arrow, (5), the flavours, (6), and the moon (1), Samvat 1654, (The date is given on the top of the line as shown in the transcript) on Monday, the 6th of the waxing moon in the month of Chaitra, the palace of the auspicious Mána, the great lord of the earth, on the hill of Rohitásva, the noblest of the race of hills, was repaired, during the government of Sridhara, the purohita of the auspicious great king of kings (*Mahárájádhirája* the great king, Maharája Srí Mánsiñ. The work was done by Madabala Bhatta. Remember this."

The only doubtful letter is the first of the name of the architect; it is very like a bh, but as Bhadabala makes an unmeaning word, I prefer to take it for an m. The text is in Sanskrit, but the last sentence is in corrupt Hindi. I take it to be equivalent to *Smaran rakho.*

No. 6 is a duplicate of the last.

No. 7.

From a rock just outside of the right hand of Bagdad, west gate, Rohtás.

(१) ९ ॐ नवतिनवमुनीन्द्रैर्वासराणामधीशैः परिकलयति सङ्ख्यां वत्सरे साश्वशाके ।
मदनविजययात्रामंगले मासि चैत्रे प्रतिपदि सितकाव्ये चापगे भास्करेण ॥
(२) यवनदलन-लीलामांसलैः खेर्यशोभिर्धवलयति धरित्रीं श्रीप्रतापक्षितीन्द्रे ।
इदमुदकमुदारज्ञानभाजां स्वरूपं नमितमिह गिरीन्द्रे श्रीमता माधवेन ॥
(३) अनाविलमनल्पीयपापनिर्वाणकारणं ।
स्वयशःसोदरं वारि कारयामास माधवः ॥
निजं वच इव स्वादु सद्बोधस्यमिव निर्मलं ।
एतदत्र सुविस्तीर्णं कार-
(४) यामास माधवः ॥ अकाण्डे कुण्डिकाकाण्डनिधिर्निधिमपामिव ।
अकारि माधवेनेयं प्रपा वै पातकद्रुहि ॥

Translation.

"Om. In the Sah's Sáka year of ninety (90), and nine (9), and the sages, (7), and the Indras (14), and the lords of days (12), all added up, (132,) on the day of the festival of the conquest of Cupid (*Madana-vijaya*) in the auspicious month of Chaitra, the eleventh of the moon, when the sun, Venus and Jupiter were in Pisces. When Pratapa, the lord of the earth, had, by his glory, proficient in the recreation of trampling down the Yavanas, whitened the earth, this well (*lit.* piece of water) delightfully clear like (the intellect of) wise men, was excavated in this noble hill by the auspicious Mádhava.

"This water, without turbidity, the agent for the wiping out of no small amount of sin, was made, even as own brother to his renown, by Mádhava.

"Even he, Mádhava, made here this wide expanse (of water), sweet even as his own words, translucent like a great fountain.

"In this sin-destroying, waterless spot was made, by Mádhava, this well, a basin of invaluable water, even like the ocean, the great reservoir of the waters."

Mr. H. Beverley, C. S., made the following remarks regarding certain results of the recent Census of the Town of Calcutta.

Though the tabulation of the returns was not yet completed, *Mr. Beverley* thought that a brief summary of some of the results obtained might not be uninteresting to the members of the Society. It was well-known to those present that a census of the Town was taken in 1866, and again in 1872. The Census of 1872 showed a large increase in the population of

the Town as compared with that of 1866; but doubts had been cast upon its accuracy and unfortunately the papers had been destroyed. The recent census also showed a large increase over that of 1866, but not so large as that of 1872. Including Fort William and the Fort of Calcutta, the figures were for 1866,—377,924; for 1872,—447,601 and by the recent census 429,535. It should be mentioned that the first two censuses were taken in the month of January and the last in April.

Excluding Fort William and the Fort, the population of the Town proper was 409,036, and of this number 187,132, or 45·75 per cent., reside in pucka or brick-built houses. Unfortunately no information on this point was collected at either of the previous censuses, so that it is impossible with any accuracy to trace the progress of the town in this respect. Mr. Simms in his survey of 1850 estimated that no more than 31·6 per cent. of the population dwelt in pucka houses, and even had he adopted the high average of 11 souls to each house given by the recent census, the percentage would be raised to 40 only. Of course the high average referred to depended on the definition of a house, and even with regard to pucka houses, it was no easy matter to observe a uniform definition. The number of pucka houses would seem, however, to have increased of late years. In 1850 Simms counted 13,120; in 1866 there were 16,022; the present returns give 16,896. This increase moreover is altogether in houses of two or more stories, the one-storied houses actually showing a falling off, due no doubt to a difference in the method of counting rows of shops.

The average density of the population throughout the Town was 107 persons to the acre, but the density varied in different parts from 211 in the Kalútola Ward to 24 in Chowringhee.

One of the main objects for which the recent census was taken was to obtain a trustworthy basis for the calculation of a birth and death rate; and he *(Mr. Beverley)* was of opinion that that object would be to a very large extent attained. A common argument against the accuracy of former censuses of Calcutta was the disproportion* in the number of males and females in the Town. If this was a defect, it was one shared by the Census of 6th April last. Putting aside Fort William and the Port, the males on that date numbered 262,455 against 146,581 females only.

In 1866 the males composed 59 per cent, of the total population.*
1872 .....66 „ „
1876 .....64 „ „

But what seemed to him *(Mr. Beverley)* a most remarkable fact was that, although the totals of the three censuses varied so considerably, the number of females in the Town remained nearly constant. Thus in 1866 the females numbered 115,933; in 1872, 147,222; and in 1876, 146,581.

* In Bombay the percentage is 62 per cent.

This was a very striking result, and it was impossible to deny the conclusion that the variable element in the Calcutta population must be looked for among the males. This conclusion was borne out by the statistics in regard to age, which showed that the excess in the number of males over females was mainly to be found between the ages of 20 and 60. Up to ten years of age, the males and females were nearly equal, the males being 26,216 and the females 25,179; and over 60 years of age the males numbered 9,854 only, against females 10,774. But between the ages of 20 and 40, for instance, we found 134,820 males against 58,724 females. This clearly showed that the excess of males, so far from being a flaw in the census, was simply due to the immigration of adult males for the purposes of trade or service. It was a variable and inconstant element, and sufficed to explain both the uncertainty which hung about the population of Calcutta, and the absurdly low death-rate hitherto put forward. *Mr. Beverley* trusted that, with these figures before him, the Health Officer would be in a position to exhibit the vital statistics of this City in a new and striking light.

As so many other gentlemen had to address the meeting that evening, *Mr. Beverley* would not detain them longer than just to ask them to bear in mind two things in regard to the late census: first, that it was merely a census of the Town proper, exclusive of the Suburbs, and so did not show the entire population of the city as a whole; and secondly that it was an enumeration of the *sleeping* and not of the *day* population. If the Suburbs were taken into account, Calcutta had a population of at least 800,000 souls; while the numbers that frequented the Town for business purposes during the day would considerably augment that figure. Madras with an area of 27 square miles, had a population of less than 400,000 souls; Bombay, with 18½ square miles, 644,405. In point of mere numbers, therefore, Calcutta still deserved to be regarded as the capital of the Indian Empire.

The CHAIRMAN said that the thanks of the meeting were due to Mr. Beverley both for the very interesting remarks he had made, and for the ability, care and forethought with which he had conducted the last Census of Calcutta. It was expected that the result would be much more satisfactory than that of all former attempts of the kind had been. The problem of taking a census in India was an exceedingly difficult one. Subject races could not be expected to sympathise with their conquerors in the latter's attempt to collect statistical information about the domestic details of the conquered. There would invariably be apprehensions of fresh taxation, which the weak would always attempt to overcome by cunning. No amount of protestation on the part of the conquerors, who have to meet the exigencies of a progressing state by devising new sources of revenue, will convince the people of their good faith. Even if the people believed in the good faith

of their rulers for the time, they were intelligent enough to apprehend that exigencies might arise in future, which might make the facts collected bear heavily upon them. It was in the nature of weak, subject races to be shy and suspicious, and it was not easy to eradicate such feelings. Mistakes had also been made by the governors which were fatal to anything like accuracy in the different censuses which had been taken. In 1872, the strongest protestations were made by Government that the Census then about to be taken had none but scientific objects in view; but by an unfortunate coincidence a Bill was brought before the Bengal Council at the same time for legalising a Poll Tax in the towns and municipalities of Bengal; and it was easy to conceive how the one operated on the other. Nor did the effect of this mistake end with the Census of 1872; for the memory of such coincidences was not easily effaced. The Chairman hoped, however, that the ample precautions taken by Mr. Beverley had prevented any very gross errors creeping into his returns, and that those returns will be found, within a small margin, reliable for all practical purposes.

The Natural History Secretary (Mr. WOOD-MASON) exhibited a complete dried specimen of the well-known Glass-rope Sponge (*Hyalonema Sieboldii*), accompanied by its inseparable 'chum' the *Palythoa* and referred those interested to the excellent account of the history of the species given by Professor Wyville Thomson in his 'Depths of the Sea.' The specimen was presented to the Society by G. G. Apcar, Esq.

Mr. V. BALL exhibited a series of Khond weapons and musical instruments from the Tributary States of Sambalpúr, and said—

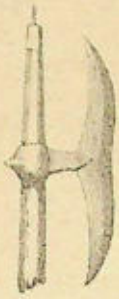
The series of battle axes on the table (see Plate) exhibits the principal varieties of form used by the Khonds of the Southern tributary states of Sambalpúr. They were selected by me from the residue of a collection made by Capt. Bowie for presentation to the Prince of Wales.

At the present time when the forms of weapons in use by different races in India and Africa are attracting much attention, the collection now exhibited is one of considerable interest.

Besides the battle axes there are also some musical instruments. To one of these I would especially direct the attention of the meeting. No English name is exactly suited to its description. It is neither a harp nor a lyre, but to those instruments it is most nearly allied. It is made up of a number of reeds lashed together in a raft-like form; of each reed, a portion of the cuticle is raised and upheld by slips of bamboo placed as bridges; and it would appear that the instrument is capable of being tuned. It is played with the tongue of a little iron implement which bears a close resemblance to a jews-harp. Even in inexperienced hands, the drawing



1



2



3



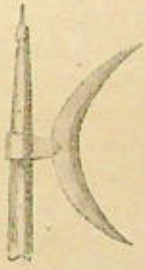
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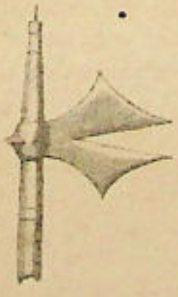
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8



9



10



11



12

KHOND WAR-AXES

one-tenth natural size.

of this tongue across the strings produces a pretty rippling sound. It is quite possible that in the hands of an accomplished performer a pleasing result might be produced.

Last year Mr. Wood-Mason exhibited a one-stringed banjo made of bamboo from the Naga Hills.

In it the principle of using for a string a small bundle of the fibres of the cuticle raised *in situ*, instead of any foreign material, was also employed.

Another instrument on the table is a sort of Banjo with one string of brass wire and a pumpkin attached as a sounding board. I have not met with the same form elsewhere.

Mr. H. B. Medlicott exhibited a Meteorite from Raipur, Central Provinces, and read the following note regarding it—

Record of the Sitathali Meteorite of 4th March, 1875.

In May 1875, Mr. H. Read, the Deputy Commissioner of Raipur, forwarded to the Indian Museum, Calcutta, a specimen of a meteorite that fell in Sitathali, of the Zamindari Narra, about 62 miles east of Raipur in the Central Provinces. This would be about long. 82° 35′ E., lat. 21° 15′ N. The fall is stated to have occurred at about 11 A. M. In the letter announcing the presentation it is stated that a similar meteorite was said to have fallen at the same moment three-quarters of a mile distant from the first fall. A portion of this was also procured by Mr. Read and, at the request of the Trustees, forwarded to the Museum. Both specimens were now exhibited to the Meeting.

The most noteworthy circumstance of this fall is, that, though found at such a distance apart, the two pairs most unmistakeably fit. They weigh respectively 2lbs. 0 oz. 430 grains, and 1lb. 10oz. 160gr. When united they form a lump of peculiar shape, resembling a quarter segment of an ovoid mass—a principal convex surface, two secondary surfaces meeting this and each other nearly at right angles, having a length of 5½ inches, and a fourth, or basal surface of quadrant shape with a radius of 3 inches. This last is unfortunately for the most part an artificial fracture; all the others having the usual black crust. There is a marked gradation of the glazing action: the main convex surface is the smoothest, though still betraying the granulation of the stone, and on it one can detect faintly, as it were the trail of the fused matter, as swept from the surface by the resisting medium. The two principal secondary surfaces are slightly concave, and dimpled: although the film is about as thick on these as on the main surface, the roughness of the stone's texture is much less disguised, while on the flat and dimpled surface of junction of the two pairs the glazing film, though quite distinct, does not completely cloak the texture and colour

of the stone. I think it is inferable that the aerolite was originally perhaps four times as large as these united pairs; and that other portions of it must have fallen. This might easily have occurred unnoticed, as the country is rather jungly.

The character of the stone is of a common type: of a pale gray colour; made up, in order of abundance, of steel-gray granules, those of clear yellow passing into ochrey granules, and of minute silvery specks, all in a whitish earthy matted matrix.

The account of the fall obtained by the native Police officer is as follows: it has the usual marks of fabrication—it is almost certain the aerolite must have fallen before the man could have heard the explosion.

Translation of a Report made by the Chief Constable, Narra, dated 6th March, being an extract from Roznamcha of that date.

Ghotan, Chamar of Mouza Singhampuri, made a report to the effect that at about 11 A. M. on Thursday the 4th March, 1875, a stone fell from the sky in Mouza Sitathali in Zamindari Narra, whereupon I despatched constable Kalamath to fetch the stone from that place, which is situated at a distance of 2 miles from Narra. The constable accordingly brought the stone together with one Shaikh Madar Baksh; from whose statement it appears that about the time above stated, a loud noise resembling the report of a cannon was heard, and on coming out of his house to see what was the matter, he observed an atmospheric disturbance in the southern direction of the village; and the stone produced fell immediately afterwards with such force that it was found buried 8 inches in the ground, at a distance of 100 paces from the village and 50 paces from the spectators themselves.

The stone smells like gunpowder, and the day in question was stormy and attended with thunder.

Narra is situated 62 miles to the east of Raipur.

Mr. W. T. BLANFORD exhibited some iron arrow-heads from Sind, and made the following remarks upon them:

I am indebted for the specimens exhibited to Mr. H. E. Watson of the Sind Commission. The arrow-heads were found by natives amongst the limestone hills which extend to the southward from the neighbourhood of Sehwán. No arrows are now used in any part of Sind nor have any of the Balúch tribes, who inhabit the country, any tradition of their former use. It may fairly be inferred that the heads now exhibited are of considerable age, perhaps some centuries old, for in so dry a climate as that of Sind, iron would rust very slowly.

The forms of some of the arrow-heads appear to me familiar and I think I have seen similar shapes used amongst some of the aboriginal tribes,

but I cannot recollect amongst which, nor have I succeeded in finding figures of similar forms. Two are square bird-bolts, the others are three-edged, three of them having a conical or conoidal and one an elliptical longitudinal section; in one the three sharpened longitudinal edges are concave; none are distinctly barbed. The heads are about 2 to 2½ inches long, (those of the bird-bolts being shorter) and are furnished with a slender basal termination for fitting into the shaft.

The CHAIRMAN announced that the Council proposed to register the Society under Act XXI of 1860.

The object of the Registration was to obtain for the Society a definite legal status as a corporate body, and they would at the same time secure the right of proceeding against defaulters in the Civil and Criminal courts. As the Society now possessed large vested funds, the Council considered it very desirable that this step should be taken. Under Section XVII of the Act it was laid down that no Society established previously to the passing of the Act, but not registered under Act XLIII, of 1850, should be registered under the Act unless an assent to its being so registered had been given by three-fifths of the members present personally or by proxy, at some General Meeting convened for that purpose by the governing body. The question would therefore be brought up for vote at the next meeting and in the meanwhile a copy of the Act would lie at the Society's Rooms for the inspection of members wishing to refer to it.

The Council reported that they have appointed Mr. John Elliott, M. A., and Mr. A. M. Nash, M. A., members of the Physical Science and Library Committees.

The following papers were read :—

1. *On certain protracted Irregularities of Atmospheric Pressure in the Indian Monsoon-region, and their relation to Variations of the Local Rainfall.—By* H. F. BLANFORD, ESQ., F. G. S.

(Abstract).

Mr. BLANFORD said that the subject of the paper which he had to bring before the Society was one of considerable interest, not only on account of its scientific bearings, but also, because in the validity of the views now put forward, lay our best hope of accomplishing the desired object of Meteorological Science, that of to some extent forecasting the conditions of a season's rainfall.

It discussed two theses. First, that amid all the changes to which atmospheric pressure is incessantly subject, including the redistribution of pressure over the whole country at the change of the monsoons, certain peculiar features tend to perpetuate or reproduce themselves; that, never-

theless, though of protracted duration, these peculiar features are not permanent. They characterise it may be a single season, or it may be two or more seasons in succession, and then disappear. Second, that these peculiarities in the distribution of barometric pressure exercise an important influence on the rainfall, by affecting the course and velocity of the winds which bring the rain. The laws of this interdependence require a prolonged study, but in certain cases in which the barometric anomaly has been of unusual intensity, it has appeared that the rainfall of a season has been deficient under the lee of a region in which the pressure has been higher than usual relatively to the surrounding regions; and that in the lee of a region of relatively abnormal barometric depression, the rainfall has been heavier than the average. This last relation, it was pointed out, coincides with the law of rainfall in Cyclones; the heaviest rain being in advance of the storm vortex.

The paper discusses the registers of pressure in Bengal, and the Bay, the Central and N. W. Provinces, for the seven years 1868-1874, the data being given in the form of Tables, shewing the total and relative barometric anomalies of a number of stations. The first of these tables shew how much the mean of the barometer readings of each month at each station ranged above or below the average of the seven years, for the same month and station. This difference is termed the total anomaly. In the second table, the total anomalies of certain pairs of stations are compared month by month, and it is found that as a general rule, the total anomaly of the one instead of oscillating sometimes above and sometimes below that of the other, remains higher or lower, as the case may be, for many months in succession; and sometimes through one or two years. This difference is termed the relative anomaly.

Some striking cases were described in which the relative anomaly has been of unusual intensity; more especially in 1868, when the North West corner of the Bay of Bengal was the seat of a persistent barometric depression; and in 1873, when there appeared to be an unusual depression in the neighbourhood of the Nicobars and another in Oudh and the N. W. Provinces.

A number of barometric charts were exhibited, most of which, however, had reference only to Bengal and the neighbouring Central and N. W. Provinces. Until last year it was impossible to obtain data from other parts of India to compare therewith. The charts for the first eight months of 1875, shew the distribution of pressure, wind direction and temperature over the whole of India and the Bay of Bengal; and it was pointed out that in the course of a few years such a series would afford the best possible material for the further study of the problems now put forward.

The paper will be published in full in the forthcoming number of the Journal, Part II.

2. *An account of Experiments made in* 1875 *and* 1876, *in various parts of India for the purpose of comparing the observed Temperature of the Dew-point with that computed from the Psychrometer by different methods of reduction.—By* H. F. Blanford, Esq., F. G. S.

(Abstract).

This paper described the results of a series of experiments made at various stations in Madras, the N. W. Provinces and the Punjab, during the dry season, for the purpose of comparing the observed hygrometric state of the atmosphere, as ascertained by the use of Regnault's hygrometer, with that computed from the readings of the dry and wet bulb thermometers. This comparison has long been a desideratum, since the formulæ by which the vapour tension, &c., are computed from the temperatures of the air and of an evaporating surface, make certain assumptions which have not been sufficiently verified; and although in the more humid atmosphere and low temperatures of Europe, the results of the formulæ are found to agree fairly well with the direct observation of the dew-point, it is by no means certain that such is also the case in the dry hot climate of India. The results of the comparison have shewn that the psychrometric method is liable to many disturbing influences, but that on the mean of a large number of observations, the dew-point computed by August's formula, with Regnault's constants, from the readings of the dry and wet bulb thermometers, exposed under an open shed, agree fairly well with the results of the direct dew-point determinations. Apjohn's formula gives a vapour-tension and humidity somewhat too high, and Glaisher's factors give too low a result in a damp atmosphere and too high in a dry one.

The paper will be published in full in the Journal Part II, No. 2.

3. *List of Birds collected on the expedition into the Dafla Hills, Assam, together with those obtained in the adjacent Durrang Terai.—By Major* H. H. Godwin-Austen, F. R. G. S., F. Z. S.

(Abstract).

The collection of which this paper is an account, was made by the author while in charge of the survey party attached to the force which, under Brigadier-General Stafford, C. B., penetrated during the winter of 1874—75 into the Dafla Hills.

The list shows that the author was tolerably successful, 29 birds (including two new forms) being added to those recorded in his previous papers on the avifauna of the N. E. Frontier, notwithstanding that he was only able to explore the small portion of the Eastern Himalaya extending from E. Long. 93° to Long. 94°, on Lat. 27°—a distance of about 60 miles, exclusive of the district of Durrang lying at the base of the hills. The hills of the Dafla country are described as clad from summit to base with dense

forest, the larger trees of which are covered with thick creepers; and the ravines as filled with a luxuriant growth of bamboos, canes, screw-pines, tree-ferns, plantains, etc. The author expresses his regret at not having been enabled to penetrate beyond this region of dense, sombre forest into the higher and unknown ranges beyond, where, he feels confident, his success in all branches of zoology would have been far greater. Finally, he expresses his indebtedness to the officers of the survey and of the force, especially, to General Stafford, for assistance rendered and for the lively interest taken by them in the work; and to Arthur Viscount Walden, for kind assistance in the identification and nomenclature of the species.

The paper will be published in the forthcoming number of the Journal, Part II, with coloured illustrations of the two new species, *Actinura Daflaensis* and *Suthora Daflaensis*.

Mr. W. T. BLANFORD said—

The paper by Major Godwin-Austen which has just been read is of great interest, as the author is the first naturalist who has had an opportunity of investigating the zoology of the Himalayas east of Bhutan. It is a subject for great regret that he was not permitted to penetrate further into the country. It is impossible for us to tell what reasons may have existed for the singularly small results in the way of exploration which have resulted from most expeditions of late years, doubtless there were reasons, but it is most unfortunate that in the Dafla expedition, as in that to Yárkand, so little was done with the admirable means which existed. At the close of the Dafla campaign, there was an overwhelming force in the country, there were ample means of carriage, and there were thoroughly competent officers, Major Godwin-Austen himself being an admirable example, who only asked to be allowed to go on, but nothing was done, and to this day peaks and mountain ranges within view of our own possessions are as thoroughly unexplored as if they were at the South Pole.

4. *On an Ancient Kitchen-Midden at Chaudwar, near Cuttack.*—*By* V. BALL, ESQ., M. A., F. G. S.

It is more with the object of putting on record a few facts in reference to a discovery recently made on the site of the old city of Chaudwar, and of thus anticipating the possible promulgation of an erroneous view which the discovery at first gave rise to, than because the facts are of themselves of much importance, that this note has been written.

On my arrival in Cuttack last November I was informed that a block of laterite, raised in the quarries at Chaudwar, had been forwarded to the irrigation works at Marsagai where it was observed to contain fragments of pottery and to be, as a building stone, unsuited for the purpose to which it had been destined. Subsequently it was removed by Mr. Macmillan, the

Executive Engineer to his own house in Cuttack where he kindly gave me an opportunity of examining it, afterwards forwarding it to our Geological Museum where it may now be seen by any one interested in the subject.

Although I could detect no very sharply marked line of demarcation between the portion of the block which contained the pottery and that which was free from any trace of it, still it was apparent that, in so far as this particular specimen was concerned, the layer of pottery was superficial in other words was *on* not *in* the laterite.

It was evident that to fully understand the relations, a visit to the quarries was necessary, as, without seeing the rock *in situ*, no certain conclusion could be drawn. On reaching Chaudwar, the site of old Cuttack, on the north bank of the Mahanadi, I found that throughout a considerable portion of the area occupied by the quarries, the cuttings, down to the surface of the laterite, disclosed sections of from one to three feet of a layer of broken pottery and bones, in fact, the remains of an ancient Kitchen-Midden.

The base of this layer, the portion in contact with the laterite is firmly cemented by ferruginous matter; but higher in the sections the deposit becomes looser and looser as it rises to the surface.

In some cases the pottery is so firmly attached to the laterite that it cannot be detached without fracture.

It is not, I think, necessary to suppose that the laterite was in a soft or only partially formed condition when the pottery was first thrown down upon it. The percolation of waters from above, more or less charged with organic matter, may have acted upon its upper surface in such a way as to cause the solution and subsequent deposition of the ferruginous matter which now includes and binds to the laterite the fragments of pottery.

Had this been a *bonâ-fide* case of the occurrence of pottery *in* laterite it would have had an interest very much greater than it can be now said to possess. Although evidence, that of stone implements, has been found of the existence of man while one of the forms of laterite was being deposited, it still remains to be proved that man, so far advanced in knowledge of the arts as to manufacture pottery, lived in India at so early a period.

As to the age of the deposit, the date of the founding of Chaudwar, the capital of Orissa, would only furnish a rough indication; but even it is not certainly known. Mr. Beames puts it at probably 350 A. D., other authorities so far back as 23 A. D.* Either probably sufficiently remote for the completion of the operations giving rise to the phenomena above described and which belong most distinctly to the, geologically speaking, present period.

* See on this subject Indian Antiquary, February 1876, p. 55.

5. *On Stone Implements found in the Tributary States of Orissa.*—*By* V. BALL, ESQ., M. A., F. G. S.

It seems to be not improbable that it will be possible, ere long, to trace with a considerable degree of accuracy, the geographical distribution in India of those early races who employed stone in the manufacture of implements and weapons. In the meantime, with this end in view, it is most important that all discoveries should be recorded. Since the year 1867, when a list by me was published in the *Proceedings*, of the then known localities where stone implements had been found in India, the number of such localities has been nearly doubled. As of many of these there is no printed record, I have collected the information as far as possible and hope to be able to present shortly before the Society a list revised up to date.

As an example of the interesting points which a comparison of the special character of these implements from different localities may sometimes produce, I need only refer to Genl. Sir Arthur Phayre's remarks* upon the implements of the Burmese type from Singhbhum, which I exhibited here last year. Sir A. Phayre shews that the part of Burma in which the stone implements occur—the valley and delta of the lower Eráwati—is inhabited by a race called *Mún* whose language presents affinities with that of the Múndás of Singhbhum. Hence the probability of an early intercourse having existed, and possibly of an identity of origin between these now widely separated peoples, becomes very great.

The implements which I now exhibit belong to quite a different type from those just mentioned. They are roughly chipped quartzite axes similar to those which have been found so abundantly in the Madras Presidency and in smaller numbers in the Central Provinces and other parts of India. Excluding one of doubtful artificial character there are only four specimens. These I picked up on the surface at different localities in Denkenal, Ungul, Talchir, and in Sambalpúr.

Denkenal. The specimen from this locality is very rudely formed and has the point broken off by a recent fracture. It was found together with the debris from a laterite conglomerate; and from the fragments of ferruginous matrix still attached to its surface there can, I think, be little doubt that it was at one time imbedded in the laterite. The material is an opaque, slightly granular quartzite.

Ungul. This specimen was found in the bed of a stream near the village of Kaliakota. Its shape, a broad oval, is unusual. The material is a vitreous quartzite.

* P. A. S. B., January 1876, p. 3.

Talchir. This specimen was found on the surface near Hurichandpur. It is the best formed of the series. The material is a vitreous quartzite not improbably derived from a vein.

Sambalpúr. This specimen was found near Bursapali to the north of the locality well known village of Kudderbuga. It has a pointed wedge-shape. The material is a vitreous quartzite.

6. *On the femoral Brushes of the* Mantidæ *and their Function.*—*By* J. Wood-Mason, Esq.

(Abstract).

The author states that, while recently examining a specimen of a species of *Hierodula* from the Nicobars, his attention was arrested by two brightish oblong spots, situated one near the distal end of each of the fore femora and nearer to the lower dentate than to the upper entire edge of the joint; and that on examining these spots more closely by the aid of a lens he had found that they were brushes of stiff hairs, all of which were directed away from the upper edge of the femur, some of which, namely, those forming the upper half of the brushes, were closely appressed to the surface and threw back the light strongly, and the rest of which projected almost straight out from it and were the stiffest of all. He had been unable to find any account of these structures in any entomological work to which he had access; and neither M. de Saussure, who had recently published an admirable account of the external anatomy and habits of the whole family, nor Dr. Fischer, the author of the learned Latin work on the Orthoptera of Europe, had made any mention of them. These brushes occurred in a large number of Asiatic, European, African, and Australian forms, and probably universally throughout the whole group, although he had examined none of the American species, which, however, were hardly likely to prove an exception to the rule.

He finally discusses the probable function of the brushes, and concludes that they are used for cleaning the parts of the mouth after feeding, just as the pollen-brushes of bees are used by them for freeing their bodies from the pollen grains with which they have been powdered during their quest after honey.

The paper will be published in the Journal, Part II.

7. *On the Geographical Distribution of* Schizocephala, *a Genus of* Mantidæ.—*By* J. Wood-Mason, Esq.

(Abstract).

The author states that so far from being a peculiarly African form, as it is considered to be by M. de Saussure in his recent monograph of the

family, the remarkable genus *Schizocephala* is one of the most widely distributed not only of *Mantidæ* but of insects in India; and, in support of his statement, gives a long list of localities from which he has received either perfect or immature examples of the (?) single species *S. bicornis*, *viz.*, the Karakpur hills in Behar, Devapur and Chánda in the Central Provinces, Kaladgi in the Bombay presidency, Kachh, Ceylon, Murshidabad and Calcutta in Bengal, Pegu, &c.; and quotes the old entomologist Stoll, who describes and figures examples from Tranquebar and China; and Professor Westwood's 'Arcana Entom,' in which it is referred to as an Asiatic form. Finally, he concludes either that the locality given by M. de Saussure is erroneous or that that author's specimens, if really from South Africa, represent a second species of the genus.

8. *Description of a new Cat* (Felis Shawiana) *from Eastern Turkistán.* —*By* W. T. BLANFORD, Esq., F. R. S.

Mr. BLANFORD said—The skin of a cat, which was amongst the collections made by Dr. Stoliczka in Eastern Turkestan, was too imperfect to be satisfactorily identified. A much better specimen has since been brought by Mr. Shaw from the same country, and of this the skeleton has been kept, as well as the skin. It proves to be a new species resembling *Felis (Chaus) caudata*, of Western Turkestan in colouration, but having a shorter tail and a differently formed skull. It is proposed to name this cat after Mr. Shaw, to whom we are so largely indebted for our knowledge of Yárkand and Káshghar.

The description will be published in the forthcoming number of the Journal Part II.

The reading of the following papers was postponed—

1. On the Physical Geography of the Great Indian Desert, with especial reference to the former presence of the Sea in the Indus Valley, and the Origin and Mode of Formation of the Sand-hills. By W. T. BLANFORD, Esq., F. R. S.

2. Notes on the Inhabitants of the Nicobars. By F. A. de ROEPSTORFF, Esq., Extra Assistant Superintendent Port Blair and Nicobars.

Library.

The following additions have been made to the Library since the Meeting held in May last.

Transactions, Proceedings, and Journals,

presented by the respective Societies or Editors.

Berlin. Königliche Preussische Akademie der Wissenschaften,—Monatsbericht, February, 1876.

Siemens.—Uber die Abhängigkeit der electrischen Leitungsfähigkeit des Selens von Wärme und Licht. *Peters.*—Uber die Grundlagen einer Ethnographie Deutschland's mit besonderer Berücksichtigung von Friesland. *Zincken gen. Sommer.*—Uber die genaue Darstellung der Brechung eines Strahls durch ein Linsensystem.

Bombay. The Indian Antiquary,—Vol. 5. Pt. 55.

C. Horne.—Notes on villages in the Himálayas, in Kamáon, Garhwál, and on the Satlej. *D. P. Khakhar.*—Castes and Tribes in Kachh. *J. F. Fleet.*—Sanskrit and old Canarese Inscriptions, continued. Nos. XVI, XVII, and XVIII. *Sir W. Elliot.*—On some remains of Antiquity at Hánagal. *Dr. G. Bühler.*—Two Inscriptions from Jhálrápáthan. *Rev. F. Kittel.*—The Washerman Virasena: a Liñgáyta Legend. *Rev. J. Cain.*—Legends and Notes on Customs.

Boston. American Academy of Arts and Sciences,—Proceedings. New Series, Vol. II, May 1874 to May 1875.

S. H. Scudder.—Historical Sketch of the Generic Names proposed for Butterflies: A Contribution to Systematic Nomenclature. *C. H. Williams.*—Intensity of Twilight. *W. O. Crosby.*—Light of the Sky. *E. C. Pickering and D. P. Strange.*—Light absorbed by the Atmosphere of the Sun.

Calcutta. The Christian Spectator, Vol. 5, No. 60.

———. The Indian Medical Gazette, Vol. XI, No. 6, June, 1876.

———. The Rámáyanam, Pt. 5, No. 6.

———. Geological Survey of India (Records.) Vol. IX, Pt. I, 1876.

W. T. Blanford.—On the Geology of Sind.

Cambridge, U. S. Illustrated Catalogue of the Museum of Comparative Zoology at Harvard College, No. VIII.

T. Lyman.—*Ophiuridae* and *Astrophytidae*, including those dredged by the late Dr. William Stimpson.

Genoa. Museo Civico di Storia Naturale, Annali, Vol. VII.

London. The Geographical Magazine,—Vol. III, Nos. 4 and 6, April and May, 1876.

No. 4. A. Vambery.—The Russian Campaign in Khokand.

No. 5. The Island of Sokotra. *R. Michell.*—Ferghana. *M. Venyukof.*—New Maps of Mongolia.

London. Nature, Vol. 13, Nos. 335, 337 to 340, 1876.

Palermo. Societá degli Spettroscopisti Italiani,—Memorie, Dispensa 4, Aprile, 1876.

Capt. J. Waterhouse.—On the influence of Eosin on the Photographic Action of the Solar Spectrum upon the Bromide and Bromoiodide of Silver. *P. Tacchini.*—Eruzioni solari osservate nel 1872. Osservazioni solari spettroscopiche e dirette fatte all' Osservatorio di Palermo nell' Aprile 1876. *A. Ricco.*—Sulla trasparenza dell' aria.

BOOKS AND PAMPHLETS

presented by the Authors.

MIANSAROF, M. Bibliographia Caucasica et Transcaucasica: Essai d'une bibliographie systématique relative au Caucase à la Transcaucasie et aux populations de ces contrées, Tome I and II, Royal 8vo., St. Pétersbourg, 1874-76.

SKREFSRUD, L. O. Rev. What is the correct term for God in Santhali? Pamphlet, Benares, 1876.

TARINI PROSAD SEN. History of Bijni Dynasty, 8vo., Assam, 1875, (3 *Copies.*)

MISCELLANEOUS PRESENTATIONS.

A new Hindustani-English Dictionary. By S. W. Fallon, Ph.D., Pt. III.

The Indian Antiquary, Vol. V, Pt. 55.

GOVERNMENT OF INDIA, HOME DEPARTMENT.

Further Notes on the Rungpore Records. By E. G. Glazier, C. S., Vol. II.

Annual Report on the Police Administration of the Town of Calcutta and its Suburbs for the year 1875. By Sir Stuart Hogg.

GOVERNMENT OF BENGAL.

Annual Report of the Civil Dispensaries for the Calendar year, 1873-74, No. 45.

GOVERNMENT OF MADRAS.

Report on the Police Administration of the Central Provinces for the year 1875.

CHIEF COMMISSIONER CENTRAL PROVINCES.

Annual Report of the Trustees of the Museum of comparative Zoology at Harvard College in Cambridge U. S., together with the Report of the Committee on the Museum for 1874.

TRUSTEES OF THE MUSEUM.

The complete Works of Count Rumford.

AMERICAN ACADEMY OF ARTS AND SCIENCES.

Annual Report of the Board of Regents of the Smithsonian Institute, showing the Operations, Expenditures and Condition of the Institution for the year 1874.

Report of Explorations in 1873 of the Colorado of the West and its Tributaries. By Professor J. W. Powell, (2 copies.)

Drilling in Stone without Metal. By Charles Rau.

The Scientific Education of Mechanics and Artizans. By Professor A. P. Peabody.

SMITHSONIAN INSTITUTE.

PERIODICALS PURCHASED.

London. The Academy. Nos. 206 to 211, 1876.

BOOKS PURCHASED.

FALLON, S. W., Dr. A new Hindustani-English Dictionary, with illustrations from Hindustani Literature and Folk-Lore. Pt. III.

FERGUSSON, J. History of Indian and Eastern Architecture: forming the third volume of the new Edition of the "History of Architecture." Royal 8vo., London, 1876.

MARKHAM, CLEMENTS R. Narratives of the Mission of George Bogle, to Tibet, and of the journey of Thomas Manning to Lhasa, 8vo., London, 1876.

MANUSCRIPTS PURCHASED.

Persian.

Kulliyát-i-Anwarí. Díwán of Rúh-ul-Amín. Díwán-i-Naçíbí. Kulliyát-i-Khwájah Salmán. Sháhansháhnámah, a History of Muhammad and the four Khalífahs. Zafarnámah-i-Timúrí, 1 Vol. Bahrám o Bihrúz. Jangnámah-i-Akbar Khán, or Akbarnámah. Táríkh-i-Amírnámah, by Munshí Bishn Lál. Táríkh-i-'Alam-árái 'Abbásí, by Sikandar Beg, Vols. I and II. Do. do., Vols. I and II. Iqbálnámah-i-Jahángírí. Muntakhab-ul-Tawáríkh, by 'Abdul Qádir Badáoní.. Táríkh-i-Firúz Sháhí, by Shamsuddín 'Afíf. Khuláçat-uttawáríkh, by Sujján Rái Khatrí. Táríkh Nawáb Sir John Malcolm, Vols. I and II. Farhang-i-Jahángírí, by Jamál-uddín Husain Injú.

Arabic.

Fath-ul-Bárí, Sharh-i-Bukhárí, 2 Vols.

Urdú Lithographs.

Mir-át-ul-Mulk, by Rahím Bakhsh. Bádsháhnámah, by Sadar.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR JULY, 1876.

The monthly General Meeting of the Society was held on Wednesday, the 5th instant, at 9 o'clock P. M.

Bábu Rájendralála Mitra, LL. D., Vice-President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

The following presentations were announced—

1. From the Hungarian Academy of Sciences, a bronze Medal struck by the Academy in commemoration of the completion of its great Hungarian Dictionary, edited by the late G. Czuczor and J. Fogarasi.

2. From Dr. Rájendralála Mitra, a copy of the "Atlas of Northern Antiquities."

3. From the Secretary of State for India, a copy of a work entitled, "Primitive Tribes of the Nilagiris," by the late J. W. Breeks, M. C. S.

4. From A. V. Nursingrow, Esq., a copy of the "Results of Meteorological Observations, 1875, taken at G. V. Juggarow's Observatory, Dabba Gardens, Vizagapatam."

5. From J. Calvert, Esq., a drawing of an Ancient Temple at Jugget Sookh, Kulu Valley, and some lithographs of sculptures in Kulu.

6. From Bábu Nílcomal Basák, through Dr. Rájendralála Mitra, 5 vols. of a MS. Sanskrit Dictionary, with 60 specimen pages, printed in Bengali, compiled by the late Bábu Káśínátha Basák.

The following letter from Dr. Rájendralála Mitra accompanied the donation—

"I send herewith, for presentation to the Society, in the name of Bábu Nílcomal Basák of Kálákar Street, Calcutta, five volumes of a MS. Dictionary of the Sanskrit language, and also sixty specimen pages of the same, printed in the Bengali character. The work was compiled by the late Bábu Káśínátha Basák who died about forty years ago. He was a distinguished Sanskrit and Persian scholar, and for his time a good English writer, having been in the habit of preparing briefs for barristers of the late Supreme Court of Calcutta. He was much re-

spected by his countrymen for his learning, wealth and social qualities. The Dictionary is remarkable for being the first of its kind prepared by a native without European assistance or superintendence. It is alphabetically arranged, fuller in vocables than the 'Śabdakalpadruma' of the late Sir Rájá Rádhákánta Deva, and gives the etymology of every word. In the last respect it is superior to both the 'Śabdakalpadruma' and the Dictionary compiled under the superintendence of the late Dr. Wilson. The work was completed in eight volumes, of which the 1st, 3rd, and 5th are lost. The second volume is devoted to the letter क, the 4th to ट to ष, the 6th to फ to र, the 7th to ल to ष and the 8th to स and ह. The codices seem to have been sadly neglected, and have suffered much from damp and the ravages of rats."

7. From F. S. Growse, Esq., through Dr. Rájendralála Mitra, a copper-plate grant of Govindachandra of Kanauj, dated A. D. 1111, with transcript and translation by Bábu Durgáráma Basu, B. A. and B. L.

Dr. Rájendralála Mitra writes regarding it:

"I send herewith a copper-plate grant, forwarded to me by J. Growse, Esq. of Mathurá, for presentation to the Society. I send also a transcript and a translation prepared by Bábu Durgáráma Basu, B. A. and B. L., Pleader of the High Court, who undertook the decipherment of the record at my request.

"The plate was accidentally turned up, in the year 1869, at a place called Ráhan in the Etáwa district, by a kachhi while digging in the fields. It is quadrangular in shape, measuring across the middle $19\frac{1}{2} \times 13$ inches, but the edges are slightly curvilinear. At the middle of the upper edge is rivetted a clasp holding a ring.

"The record comprises 29 lines, extending lengthwise over the whole surface of the plate, except the last line, which terminates at about the middle, the space after it being filled up by the figures of a conchshell and an arrow. The characters are of the Kuṭila type.

"In its preamble and the imprecatory verses, the record is a counterpart of the several inscriptions of Govindachandra of Kanauj, already published in the Journal—the last by me in 1873. The dynasty is the same, and described in identically the same words. The subject, the grant of a plot of land measuring four ploughs, in the district of Kamaitha, to one Bhaṭṭa Bráhmaṇa Gugáchandra of Bhaṭakábara, is also of little interest. But it bears the date, the 15th of the wane in the month of Pausha, Samvat 1166, equal to A. C. 1111, when his father, Madanapála, was still the reigning sovereign, which shows that he must have succeeded his father some time after A. C. 1111, and not between 1103 and 1117 of the Christian era, as conjectured by me in my paper of 1873 (*Journal* XLII, p. 316.)"

Transcript of a copper-plate Grant of Govindachandra of Kanauj.

1. ॐ परमात्मने नमः । अकुण्ठोत्कण्ठवैकुण्ठकण्ठपीठलुठत्करः । संरम्भः सुरतारम्भे स श्रियः श्रेयसेसु वः ॥ अभून्नृपो गाहड़वालवंसे(शे) महीतलो नाम जि—

2. तारिचक्रः । स्थिता धराभारमशेष एव शेषः सुखं यस्य सुजं (भुजं) निधाय ॥ प्रध्वसे सोमसूर्य्योद्भवविदितमहाक्षवंस(श)द्वयेष्विन्नृत्य(त्त्य)न्नप्रायवेदध्वनि जगदखिलं म—

3. न्यमानः स्वयम्भूः । क्षला देहपहाय प्रवणमिह मनः शुद्धबुद्धिर्धरित्र्यामुद्धर्तुं धर्म्म-मार्गं प्रष्टत(प्रथित)मथ तथा क्षवंशद्वयञ्च ॥ वंशे तच ततः स एष समभूद्भूपा—

4. लचूड़ामणिः प्रद्धलोद्धतवैरिवीरतिमिरः श्रीचन्द्रदेवो नृपः । येनी(नो)दारतरप्रताप-शमितामेष(शेष) प्रजोपद्रवं श्रीमद्वाधिपुराधिराड्डसमसमं(समं) दोर्व्विक्रमेणार्ज्जितं ॥

5. तीर्थानि कासि(शि) कुसिको(शिको)त्तरकोशलेन्द्रस्थानीयकानि परिपालयताभि-गम्य । क्षेमात्मतुल्यमनिशं ददता द्विजेभ्यो येनाङ्किता वशु(सु)मती शतस(श)स्फुला-भिः ॥ तस्मात्मजो—

6. मदनपाल इति क्षितीन्द्रचूड़ामणिर्विजयत निजगोचचन्द्रः । यस्याभिषेककलशोच्छ-सितैः पयोभिः प्रक्षालितं कलिरजःपटलं पृथिव्याः ॥ यस्यासीद्विजयप्रया—

7. णसमये तुङ्गाचलोद्वेल्लन्माद्यत्कुम्भिपदक्रमासमभरक्षस्यन्महीमण्डल(लः) । चूड़ारत्न-विभिन्नतालुगलितस्थानास्रगुद्गासितः शेष(षः)पेषवशादिर(व) क्षणमसौ क्रो—

8. ड़े सिलीनान(निलीनाननः) ॥ जातस्ततो रजनिजानिरिवाम्बुराशेर्गोविन्दचन्द्र इति कान्तिभराभिरामः । राजात्मजेन भवता समुपार्ज्जितानि रामेण दाशरथि-नेव यशांसि येन ॥ दुर्व्वारस्का—

9. रगैड़द्विरदवरघटाकुम्भनिर्भेदभीमं रक्तीरं न्यक्षवैरं मुजरसमरणक्रीड़या यो विध-त्ते । सक्षत्सञ्चारि(शत्यक्षार)वलगतुरगखुरपुटोल्लेखमुद्रासनाय क्षौ(क्षी)णीका—

10. रदलः स इह विजयते प्रार्थिनां कल्पवृक्षः ॥ परमभट्टारकमहाराजाधिराजपरमे-श्वरपरममाहेश्वरनिजभुजोपार्ज्जितश्रीकन्याकुब्जाधिपत्यश्रीचन्द्रदेव—

11. पादानुध्यातपरमभट्टारकमहाराजाधिराजपरमेश्वरपरममाहेश्वरश्रीमदनपालदेव-विजयराज्ये तस्यैवात्मजमहाराजपुत्रश्रीगोविन्दचन्द्रदेवः ॥

12. सिगुरोटपत्तनां रोमदृथग्रामे समस्तमहोत्तमजनपदनिवासिलोकान् प्रतिवासिलो-कांश्च राजराज्ञीमन्त्रि(त्री)पुरोहितामात्याक्ष(त्त)पटलिकभाण्डागारिकेभि—

13. षड्नैमित्तिकसेनापति अन्तपुरिक(पत्यन्तःपुरिक)समस्ताधिकारिपुरुषादीन् समाज्ञा-पयति सम्बोधयति च ॥ यथास्तु विदितेयमनित्यतायुर्गता युष्माभिः । वातातपव-सा(श्रा)क्षणाग्रलग्ना—

14. (सार)विन्दुरिव नश्वरपय(दं) बध्नाति जीवितं । नलिनीदलगतजलवच्चञ्चल-जलधरधाराजलजनितबुद्बुदवत् क्षणदृष्टा नष्टा सम्पत् ॥ क्षणिकानीन्द्रियसु—

15. खानि । सतंव(सतश्च) गत्वरं देहिनाम् आयुः ॥ तदिदं मयापि सकलफला प्रार्थी)?)-विसंवादिनीभिः श्रुतिस्मृतिभिरुपजातनिश्चयेन अनन्तफलभोगभाजनं भूमिदानं मत्वा । अस्मिन्

16. ग्रामे क्षेत्राणां चतुर्भिः प्रमाणैः ॥ सीमा १ सजलस्थलासोषरपाषाणगिरिनदीवन
वाटीकाक्षमधूकक्लीङ्कलवणाकरा । ऊर्द्धाधःसिद्धियुता सहशापराधदण्डा क्षेत्र—
17. पर्णाद्याकरादायसहिता । सं ११६६ पौषवदि १५ रवौ । अयोध्यासंतिकायां देव-
तामुरदक्षयघट्टे । यमुनायां यथाविधिना स्नात्वा देवमनुष्यपितृतर्पणाद्यनन्तरं
18. भगवन्तं सूर्य्यं उपस्थाय । तदनु चाभीष्टदेवतां सर्वेश्वरं पञ्चभिरुपचारैः समभ्यर्च्य
भगवते जातवेदसे पूर्णाहुतिं दत्वा राजपुत्रे सवितरि मातापित्रो—
19. रात्मनश्च पुण्ययशोविवृद्धये ॥ भट्टब्राह्मणाय गुणपवित्राय रौद्रक्षेत्रपाय । भतकवड़-
ग्रामविनिर्गताय साङ्कायनशाखिने गौतम इतश्च (श्रोत्रिय) आङ्गि—
20. रसविप्रवराय श्रुताध्ययनसम्पन्नब्राह्मणगुणचन्द्राय विशुद्धेन मनसा कुशपूतेन क्षेत्रो-
दकेन चित्युदधिपवनाम्बुराशि यावत् । राणक श्रीलव—
21. राप्रवाहेण(?) शासनत्वेन प्रदत्तः ॥ इति मत्वा सधा(यथा) दीयमानभागभोगकुटक-
विंशतिरूपया तुरस्कदण्ड । अत्रपटलादायबलदो कुमरगतिगदिद्याणकाक—
22. रक्षिरण्यवाच्याभ्यन्तरसिद्धि एतत्सर्व्वं । अन्यदपि भूम्या वा+णेत्यत्समानं सदाज्ञा-
पालनप्रवणैर्भूत्वा एतत्सर्व्वमस्मैरुप(उप)नेतव्यं एतत्सन्तत्यै अपि न केना—
23. प्यत्र बाधा कार्य्या । श्रुत्वा मुनीनां वचः । शतं भद्राशनं(सनं) रथं वराश्वा वरवारणाः।
भूदानद्रुमपुष्पाणि फलं स्वर्गः पुरन्दर । भूमिं यः प्रतिगृह्णाति यश्च भूमिं
24. प्रयच्छति । तावुभौ पुण्यकर्म्माणौ नियतं स्वर्गगामिनौ । बहुभिर्वसुधा भुक्ता राजभिः
सगरादिभिः । यस्य यस्य यदा भूमिस्तस्य तदा फलं । स्वदत्तां
25. परदत्तां वा यो हरेत वसुन्धरां । स विष्ठायां कृमिर्भूत्वा पितृभिः सह मज्जति ॥
षष्टिवर्षसहस्राणि स्वर्गे वसति भूमिदः । आच्छेत्ता चानुमन्ता च तावन्ति नरके
26. वसेत् । गामेकां स्वर्णमेकञ्च भूमेरप्येकमङ्गुलं । हरन्नरकमाप्नोति यावदाहूतसंप्लवं ॥
यानीह दत्तानि पुरा नरेन्द्रैर्दानानि धर्म्मार्थयस(श)स्कराणि । नि—
27. र्माल्यवान्तप्रतिमानि तानि को नाम साधुः पुनरादद्दीत ॥ ये पालयन्ति महीमिमां
मम कुले किंवा परस्मिन् महीं । तेषामेष मयाञ्जलिर्विरचितो नादेयम—
28. स्मात् कियत्। दूर्व्वाकाण्डमपि स्वधर्म्मनिरतैः दत्तं मया पाल्यतां ॥ वायुर्व्वास्यति
तप्स्यति प्रतपनः श्रुत्वा मुनीनां वचः । लिखिता(ते)यं महत्तकश्री—
29. गाङ्गेयानुज्ञया विभुवनपालेन ठक्कुरश्रीदेवाङ्गसुतेनेति ॥ सुनठक्कुरेण सातेश्वर-
सुतनेति ।

Translation of a copper-plate Grant of Govindachandra of Kanauj, dated A.D. 1111.

1. Om: salutation to the supreme Spirit. May that agitation at the commencement of his dalliance with Śrí, when her hands rolled about on the neck and shoulders of eager and lustful Vaikuṇṭha, be to your prosperity.

2. There was, in the dynasty of Gáharabála, a king named Mahítala, who had conquered all his enemies. Though he was not the Sesha, yet the serpent Sesha was gratified by placing into his hands the task of upholding the immense weight of this earth.

3. On the extinction of the two well known Khshatriya races descended from the sun and the moon, the Selfborn (Bramhá), perceiving that the chanting of the Veda was extinct in the whole universe, was inclined to incarnate himself on earth in order to reclaim the lost path of virtue as also the two celebrated Kshatriya races.

4. He was then born in that dynasty, as king, Srichandra Deva, the best of kings, the dispeller of the gloom of impatient heroic enemies; by whose glorious majesty was repressed the revolts of the subjects of the unrivalled great kingdom of auspicious Gádhipura, which had been earned by the valour of his arms.

5. Repairing, as a protector, to Káśí, Kusika, Uttara Kosála, Indrasthána and other places of pilgrimage, he marked the earth by the performance of a hundred *tulá* rites, in course of which he repeatedly gave to the twice-born his own weight in gold.

6. His son was Madanapála; that crest-jewel of the lords of the earth flourishes as the moon of his race. By the waters, which sparkled in jars at his coronation, the earth was washed clean of all the sinful dust of this iron age.

7. When he went forth to conquer on the earth, sinking under the overpowering weight of the footfalls of his maddened and careering elephants, high as lofty mountains, the serpent Sesha, crushed as it were by it, and having its crest-jewel fractured and thrust down into its bleeding mouth, for a time hid its face in its folds.

8. From him descended, even as the moon issued forth from the ocean, the charming and beautiful Govindachandra, who has acquired as much fame as Ráma, son of Daśaratha. He, by repeated battles, compelled Hammíra, who was much dreaded for having broken the heads of the huge, intractable elephants of Gaura, to sue for peace. He, who was well skilled in conquering the earth and was a Kalpa briksha to beggars, flourished here to efface from his kingdom the footprints of the constantly neighing and careering horses.

9. Srí Madanapála Deva, the highly revered, the great king over great kings, the chief lord, the devout worshipper of Siva, successor of the highly revered, the great king over great kings, the supreme lord, the devout worshipper of Siva, Srichandra Deva, the sovereign who by his arms carved the happy kingdom of Kánnyakubja reigned victoriously.

Govindachandra Deva, the son of this great king, commands and acquaints the inhabitants of the principal towns in the district or circle of

Romaitha, and of the neighbourhood, as also rájás, queens, priests, ministers, justiciaries, treasurers, physicians, astrologers, guardians of female apartments, and the owners of all sorts of properties. Knowing that all living beings are mortal and frail, and life, like a drop of water on a blade of grass subject to the influence of the wind and sun, is impermanent, and as unsteady as a drop of water on a lotus leaf, or like the bubble of water caused by rain drops, gone the moment after it is seen ; that the pleasures of the senses are transitory, and life is always passing ; being further assured by the otherwise conflicting Smritis and S'ruties that a gift of land secures eternal blessing, four ploughs of land in this village together with their soil and water, hills and rivers, orchards of mangoe, and madhuka trees, iron and salt mines, and with everything that is above and below that land, along with the power of inflicting punishment on the people according to the nature of their offences and of realizing the rents of grass, leaves and mines, I grant, for the increase of fame and virtue of myself and of my parents, unto Bhaṭṭa Brámhaṇa Gugáchandra, son of Rilhi, grandson of Gugá, inhabitant of Bhaṭakáhara, of the Sánkháyana Gotra, having Gautama, Abithatha and Angirasha for his threefold Pravara, and is well versed in S'ruti ; by this patent, with a pure heart, with hands consecrated by water and kusa grass ; for the period of the duration of air, water, earth and ocean, on this the 15th day of the wane in the month of Pausha, Samvat 1166, when the sun is under the influence of Ráhu, having bathed with due ceremonies in the Yamuná at the bathing place called after the god Muraitha in Bhasatika, having offered libations of water to gods, men and my ancestors, having worshipped the sun and then my god of special adoration, Maheśvara, with fivefold offerings, and having made full offerings to the fire.

Knowing this you must render unto him, according to my commands, the twentieth part of all usufructs and taxes for justice, fragrant grass, salt and diamond mines and other taxes, whatever have to be given. No body should in any way interfere with this.

1. O Purandara, heaven is the reward of those who give away a conchshell, a homestead, an umbrella, choice horses, excellent elephants, lands, trees, and flowers.

2. Both he who accepts lands and he who grants them are equally meritorious and dwell eternally in heaven.

3. The earth has been enjoyed by many kings, including Sagara and others. To whomsoever belongs the earth for the time being, he enjoys the fruit (of such gifts).

4. Whoever robs earth, whether given by himself or by others, becoming a maggot, sinks with his parents into ordure.

5. The donor of lands dwells in heaven for the space of sixty thousand years : the resumer and the abettor thereof are doomed to abide in hell for a like period.

6. He who robs a cow, a gold piece, or a finger's breadth of land, dwells in hell until the dissolution of the universe.

7. All the gifts of former kings are productive of virtue, wealth and fame—how can he, who claims the name of goodness resume them, which are to them but as emblems of vomited food?

8. With folded hands this is my prayer to all future sovereigns whether of my dynasty or of others, that they should never take any tribute from this village, not even a blade of durbá grass. Those who wish to do their duty should, obedient to the mandates of sages, preserve intact my gift, (as long as) the wind blows and the sun continues to shine.

Written by Tribhuvanapála, son of Ṭhakkura Devánga, under orders of Gángeya. (Engraved?) by Sunaṭhakkura, son of Sátchara.

The following gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected ordinary Members—

Lieut. F. W. Jarrad, R. N.
D. Scott, Esq., C. E.
Ross Scott, Esq., C. S.
Dr. D. O'C. Raye.
Rev. Thos. Foulkes.

The following are candidates for ballot at the next Meeting—

J. Hector, Esq., Bank of Bengal, proposed by Dr. T. Anderson, seconded by Mr. W. T. Blanford.

Major O. B. St. John, R. E., Superintendent Mayo College, Ajmere, proposed by Mr. W. T. Blanford, seconded by Mr. H. F. Blanford.

P. T. Carnegy, Esq., Political Agent, Naga Hills, proposed by Capt. J. Waterhouse, seconded by Mr. H. Blochmann.

Mr. C. T. Buckland has intimated his desire to withdraw from the Society.

The CHAIRMAN brought before the meeting the question of the Registration of the Society under Act XXI of 1860, announced at the last meeting; and on the proposal of the Council that the Society should be so registered being put to the vote it was carried unanimously.

Mr. BLOCHMANN laid before the Meeting the following prospectus of the proposed new Edition of Tabari, by Prof. M. J. de Goeje of Leyden.

THE PROJECTED EDITION OF TABARI.

The ancient Arabic chronicle has a very characteristic form. Each important fact is related, if possible, by an eye-witness or contemporary,

whose account came down through a series of narrators to the author. If he has obtained more than one account of a fact, with more or less important modifications, through several series of narrators, he communicates them all to the reader *in extenso*. Thus we are enabled to consider the facts from more than one point of view and to acquire a vivid and clear notion of them.

In this style a universal history, from the Creation down to A. D. 915 (302 of the Hidjra), was written by Tabari of Bagdad, an author whose veracity, accuracy and stupendous learning are justly eulogised by all, whether Moslems or Christians, who consulted his work. The original work was very extensive, so that the author, who was 78 years old on concluding it, resolved to devote the remaining years of his life to its abbreviation for general use. (He died in the beginning of 924.) Still his history remained a very bulky work. According to my calculation, it will fill in print twenty large volumes in 8vo. Its great extent rendered compendiums for private circulation necessary; they were generally employed and hence the original work became rare and only to be found in the great libraries. Of the best known abridgment made in 963 and written in Persian, Dr. H. Zotenberg gave a French translation, which has just been completed. The interest of this publication is incontestable, but it is far from indemnifying us for the want of the original work. For the Persian epitomator not only dropped a great many very interesting particulars, and modified here and there the facts, but what is most important is wanting: the different accounts of an event have been arbitrarily blended into one single narrative, or rather one, and not always the best series of traditions, has been followed, and the accurate statements regarding the transmission of the traditions from the first narrators down to the author have been altogether left out.

What the use of abridgments had begun, Timur and the decay of civilisation all but completed. It is even now doubtful if a single copy of this great work is still in existence out of Europe. Prof. Sprenger was told in 1848 that two complete copies were to be found at Medina. An Indian friend of his, who not long afterwards went on a pilgrimage to Arabia undertook to inquire about them. As the libraries are closed in the sacred month, he could not even get sight of the volumes, but was informed that the work really existed. M. Kunik of St. Petersburg tells in his interesting Appendix to Dorn's Caspia that Gottwaldt induced two hadjis of Kasan to make researches about the existence of a copy at Medina. They brought home the vague information that a copy had existed, but as they were told, the volumes had been transported to Constantinople. I think the latter information less trustworthy than the former. To resolve this very important question, M. A. von Kremer of Vienna wrote to Sheikh

Jusof Dhija al-Khalidi at Jerusalem, who promised to procure the requisite information, and Prof. Koch of Schaffhausen wrote to the Sherif of Mekka.

For the rest, parts of the work, mostly from different copies, are to be found in several libraries. Köprülü-library in Constantinople possesses 8 volumes, the British Museum 3, the Bodleian in Oxford 4, Berlin 6, Paris 4, Leiden and Algiers each 1. A provisional investigation afforded the satisfactory result, that it would be possible to restore a complete copy by help of all these dispersed volumes. From that moment, I firmly resolved to take the preliminary steps for preparing an edition of this most important work, and to see whether it would be possible, with the aid of others, to realise the plan.

The first decisive measure was brought about by the late Professor Stähelin of Basel, whose loss we had to deplore last summer. The 22nd December, 1872, I received a letter from Prof. Socin, in which in the name of Stähelin a certain sum was placed at my disposal, if I should feel inclined to take the lead in preparing an edition of Tabari. This contribution (5000 francs), together with a sum of 1500 guilders, placed at my disposal by the Minister of the Interior in the Netherlands, enabled me at once, with the assistance of Dr. Mordtmann, to get copied in Constantinople the first part of the first volume and the parts that contained the years 37—40, 51—64 and 158—302 of the Hidjra, and in London the second part of the first volume. Thus a beginning could be made with the preparation of the text. To Dr. Barth of Berlin was assigned the part of the first section containing the pre-islamitic history up to the Sassanides, to Prof. Nöldeke of Strassburg that containing the history of the Sassanides. Prof. Loth of Leipzig undertook the edition of the life of Muhammad and the four "righteous" Khalifas, the latter part of which has been published by Kosegarten from the Berlin manuscript (1831—53). Prof. Thorbecke of Heidelberg took upon himself the first, and Dr. Müller of Vienna the second part of the history of the Omayades, Dr. Grünert of Leipzig the first part of the history of the Abbasides, whilst the latter part remained for my own share. Perhaps it will be necessary to seek one or two more collaborators, some parts of the work being very extensive.

Thus the task is portioned out, and the study of the text has commenced. But before the whole can be fairly started, there is still a great deal to be done. The third part of the Constantinopolitan manuscripts has been copied, and one volume in London ; we have still to get copied the two thirds in Constantinople and the two remaining volumes in the British Museum. It will, too, be necessary to have the copies made in Constantinople once more collated with the originals in the Köprülü by a young Orientalist of capacity. If a copy of the work exists at Medina, we

neither can nor may do without it, but must have it copied. Then, though Messrs. Brill of Leiden proposed to publish the work at their costs, I think it very probable, that a contribution towards the expense of printing ought to be paid, especially as we must insist on two points, 1st, that the price of a volume of about 640 pages in 8vo. be not above S. 16; 2nd, that the printing be executed at the rate of 3 sheets of 16 pages per fortnight.

For these purposes a large sum of money is requisite. My learned friends, Prof. Dozy, in his letter to Mr. H. W. Freeland, of Chichester (printed in the Academy d. d. 27 Nov. 1875, p. 557), and Prof. Amari, in his letter to M. de Gubernatis (printed in the Rivista Europea), having invoked the assistance of all who understand the importance of this publication for the promotion of science, I feel myself justified in appealing to all who may deem the success of the enterprise an object worthy of their support. The work of Tabari is truly a mine of useful information for the historian. Even for pre-islamitic history it is not without value; Prof. Nöldeke calls its history of the Sassanides "a very precious source." How very highly Prof. Sprenger, the author of the Life and Doctrines of Muhammad, esteems the work, appears from a passage in one of his letters to me quoted by Prof. Dozy. Dr. Zotenberg says in his Preface, that especially for the history of the Omayades, the work of Tabari is the principal and richest source. The Russian historian M. Kunik deems the publication of this work of "the father of Muhammadan universal history" so important, that he calls it a duty for the empire, which possesses the Caucasus and reigns on the Shores of the Caspian, to provide for a complete edition of Tabari.

The work is to be published in three parallel series, the first comprising the pre-islamitic history, the life of Muhammad and the reign of the four "righteous" Khalifas; the second the history of the Omayades; the third that of the Abbasides. In order to bring the parts printed as soon as possible into the hands of the student, it will be issued in half volumes of about 320 pages. Every year one half-volume of each series will appear.

M. J. DE GOEJE,
Professor of Arabic, Leiden University.

LEIDEN, *March* 1876.

Mr. BLOCHMANN exhibited an ink impression of a silver coin of Sháhjahán II, received from General Cunningham, C. S. I. The legend is as follows—

OBVERSE— سکهٔ مبارک بادشاه غازی شاه جهان [ثانی] ۱۱۷۴

REVERSE— سنه احد جلوس میمنت‌مانوس ضرب احمدنگر فروغ‌آباد

Obverse.—The auspicious coinage of the victorious emperor Sháhjahán (II).
Reverse.—In the first year of the auspicious accession. Struck at Ahmadnagar-Farrukhábád.

Mr. Blochmann said—A few months ago, Mr. Delmerick forwarded to the Society a second list of unpublished coins, which will appear in No. III of this year's Journal. In it he gives a gold coin of Sháhjahán II, of 1173 H., together with some interesting particulars, to which I would refer the members.

The name of this puppet king of Dihlí is Muhiyy-ul-Millat ('reviver of the faith'). He is the son of Muhiyy-us-sunnat ('reviver of the law'), who was the son of Prince Kámbakhsh. The latter was the favorite son of the emperor Muhiyy-uddín 'Álamgír (Aurangzíb). In several histories and inferior MSS. Muhiyy-ul-Millat is confounded with his father. Thus Beale in his *Miftáh* says that the name of Sháhjahán II. was Muhiyy-us-sunnat; and Grant Duff (Histy. of the Mahrattas, Bomb. edit., p. 311) calls him "a son", instead of "a grandson" of Kámbakhsh.

But Muhiyy-us-sunnat could scarcely have been alive in 1173. He was born before or about 1100 A. H.; for we know from the *Maásir-i-'Álamgírí* that he received in 1107 a *yaumiyyah*, or daily stipend, from Aurangzíb, and that in 1114 he was made a Commander of 7000, with 2000 horse.

Muhiyy-ul-Millat was raised to the throne of Dihlí, under the title of Sháhjahán II.,* on the 8th Rabí' II, 1173, by Gházíuddín 'Imád-ul-Mulk (Mír Shihábuddín), who on the same day had murdered the emperor 'Azíz-uddín 'Álamgír II. This took place when Ahmad Sháh Abdálí invaded the Panjáb, and 'Imád-ul-Mulk had given out that the late emperor had carried on a secret correspondence with the Abdálí. 'Imád-ul-Mulk, after a short time, had to leave the newly made emperor in Dihlí, as Ahmad Sháh had advanced to the Ganges, and to seek a refuge with Súraj-Mall of Bhartpúr. Dihlí was then occupied by the Maráthas under Sadáshív Bháo, who for several months carried on negotiations with the Abdálí. It was with a view to detach Shujá'-uddaulah, the Nawáb-Vazír of Audh, from the invader, that the Bháo, on the 29th Çafar, 1174, deposed Sháhjahán II., appointing Mírzá Jawán-Bakht, son of Sháh 'Álam, regent for his father, and Shujá'-uddaulah Vazír of Hindústán.

On the 6th Jumáda II, 1174, Sadáshív Bháo was totally defeated by the Abdálí at Pánípat; and before the year was over, Ahmad Sháh had left India.

Muhiyy-ul-Millat, therefore, was titular king from 8th Rabí' II, 1173, to 29th Çafar, 1174. The histories do not say what became of him afterwards. In the list of Dihlí emperors he is generally left out, because he

* Rafí'-ud-daulah also had the title of Sháhjahán II.

was not recognized by Shâh 'Alam, the next emperor. 'Abdul-'Azíz 'Alamgír II had been killed on the 8th Rabí' II, 1173; and when the news reached his son Shâh 'Alam in Patna, he celebrated on the 4th Jumáda II. his *julús* in the neighbourhood of Patna. But Shâh 'Alam only received the insignia of royalty from Shujá'-uddaulah on the 16th Zil-Qa'dah at Sarái Rájí, on the left bank of the Karamnásá; and the coinage was only settled a few days after the 19th Zil-Hajj, 1174, at Jájmau, when the following legend was adopted—

سکه زد بر هفت کشور سایهٔ فضل اله حامي دین محمد شاه عالم پادشاه

The shadow of God's kindness issued his coinage over the seven realms, the protector of the religion of Muhammad, Shâh 'Alam, the Emperor.

This verse (metre, *long ramal*) appears also on the early coinage of the E. I. Company.

General Cunningham's coin of 1174 may have therefore been struck at any time during 1174, as the coinage was in all probability continued after the deposition of Shâhjahân II.*

[Maásir-i-'Alamgírí; Khizánah-i-'Amirah (under Alif); Maásir-ul-Umará (*sub* Ghází-uddín); Tabçirat-un-Názirín, by Sayyid Muhammad-ibn-'Abdul-Jalíl of Bilgrám (sub annis 1173 et 1174); Siyar-ul-Mutaakhkhirín; Táríkh-i-Muzaffarí; Miftáh-ut-Tawáríkh.]

I translate the following passage regarding Muhiyy-ul-Millat from the *Mukhtaçir-i-Sair-i-Hindústán* by Hakím Wahíd-ullah—

'Muhiyy-ul-Millat, Shâhjahân II., son of Prince Muhiyy-us-sunnat, son of Mírzá Kámbakhsh, son of the emperor 'Alamgír, sat on the throne of the kingdom in 1173 after the emperor 'Alamgír II, as given in the following chronogram of his accession (metre, *muzára'-i-akhrab*)—

مرزا محي الملة ابن محي السنة بنشست چون بعظمت بر تخت گورگاني

سال جلوس هاتف گفت از سر هدایت والا نسب محمد شاه جهان ثاني

1. When Mirzá Muhiyy-ul-Millat, son of Muhiyy-us-sunnat sat in grandeur on the throne of the Timurides,

2. A voice from heaven for the sake of guidance said, 'Muhammad Shâhjahân II, of noble origin.'†

'It is known that when this king sat on the throne, Ahmad Shâh Durráni marched with a large army on Dihlí, and encamped near the Ghát-Hazárí, where he fought with Jhankú Ráo, the Maratha. He killed many leaders of the Maraṭhas. 'Imád-ul-Mulk had fled to Fort Kumhír and

* For Ahmad Shâh Durráni's Indian coinage of 1173 and 1174, *vide* Proc. A. S., Bengal, for November, 1874, p. 208.

† The last *miçrá'* gives 1168; but the head *(sar)* of the word 'hidáyat', or h, *i. e.* 5, is to be added; hence we get 1173.

found an asylum with Mahárájá Súraj-Mall of Bhartpúr. Muhiyy-ul-Millat reigned for about a year. In 1174 H., he was deposed during the invasion of Ahmad Sháh Durráni.'

The following papers were read—

1.—*On the Physical Geography of the Great Indian Desert, with special reference to the former presence of the Sea in the Indus Valley, and the origin and mode of formation of the Sand-hills.—By* W. T. Blanford, Esq., F.R.S.

(Abstract.)

This paper commences with a notice of the wide geological distinctions which exist between the peninsula of India and the surrounding regions, and after pointing out how long these differences have prevailed, how important the zoological peculiarities of India are, and how far they justify the conclusion that India was for a long period part of an Indo-African continent or land area, to which Australia at one time must have been united, the author proceeds to call attention to the importance of investigating the border regions between the Indian peninsula and the surrounding countries. These border regions consist mainly of the Indo-Gangetic plain in which all older formations, and all traces of geological action are concealed beneath the deep alluvial deposit, and it is only in a few localities that portions of these regions are free from the alluvial covering. The Indian desert between the Indus valley and Rájpútana is such a tract.

A brief description is given of the physical character and zoology of the desert; it is shewn to consist of rather higher rocky ground about Jesalmír and Bálmír, and lower sandy tracts along the borders of Sind and towards Jodhpúr, especially in the Lúni valley. The northern portion of the desert has not been visited by the author, but it is said to be sandy throughout. A very large portion of the area consists of sand-hills, which, on the borders of the Indus valley, are arranged in long ridges running approximately from north-east to south-west, but elsewhere are less regular in form; they have, however, always a steep face towards the north-east, and a long slope toward the south-west. At first the desert might be taken for a plain of marine denudation, but the physical characters of the hills are opposed to this view; the scarps seen being of subaërial origin.

Between the sand-hills in eastern Sind are long pools of water known as 'dhandhs,' of considerable depth. Those to the westward, the water of which is supplied from the Indus valley, are fresh; to the eastward, where the water is supplied by percolation through the sand from the freshwater "dhandhs," it becomes salter and salter, until in some lakes salt and gypsum crystals are found. In some of the brackish water lakes a well known

mollusk *Potamides (Pirenella) Layardi*, H. Ad., was found living. This species is common in backwaters and salt lagoons on the Indian coast, and proves that the salt lakes in which it now lives were once in communication with the sea. It is probable that in geologically recent times a great inlet ran from what is now the Rann of Kachh up the Indus valley for a distance of certainly more than 100 miles, and probably much further. The occurrence of great quantities of salt in the Lúni valley south-west of Jodhpúr, and the low elevation of the region point to the probability of another arm of the sea having extended in that direction, whilst it is possible that either from the south or north-west an inlet may have extended to the Sámbhar Lake.

It is further shewn that the great accumulation of sand in two tracts, one along the edge of the Indus alluvium, the other in a belt running northward from the lower Lúni valley, also favoured the idea of former inlets of the sea in those directions, since the sand was originally in all probability derived from the sea coast, though a portion may have come from the Indus valley. The origin of the sand-hills is traced to the action of the south-west wind which blows with much force throughout the area in the hotter months of the year. The arrangement of the sand-hills in long ridges, *parallel* to the direction of the prevailing wind is shewn to be an anomaly difficult of explanation. Many of the sand-hills are of great antiquity and it appears possible that the long ridges may be due to a process of wind denudation, the intervening hollows having been swept clear of sand by the wind. The existence of sand-hills throughout the desert is simply the consequence of the want of any streams or rivers to wash the sand back again into the sea.

2. *Notes on the Inhabitants of the Nicobars.*—*By* F. A. DE ROEPSTORFF, *Candidate of Philosophy, Copenhagen, Extra Asst. Superintendent Port Blair and Nicobars.*

[Received May 12th. Read 5th July.]

It has for a long time been known that there existed in the interior of the island of Great Nicobar one or several inland tribes. They were constantly spoken of by the coast people and by the inhabitants of the other islands, but no European had ever seen them. Pastor Rosen, the Danish Resident at the Nicobars 1831-34, mentions them in his book on the Nicobars.*

Admiral Bille describes† how he, with some of the officers of the expedition in two boats, went up the Galathea river and came "to a place,

* Erindringer pamit Ophold pan de Nikobarske Oes, &c.; Kjöbenhavn (Copenhagen) 1839.

† Corvetten Galathea's Jordomseiling; Kjöbenhavn 1849, vol. I, p. 342).

where the river formed a right angle, and where a big jungle-covered hill overhangs steeply the river. Behind this hill the river forms a little bay and in this we found three or four canoes fastened near land. We landed and climbed the hill slope. We found the place carefully railed off from the river side, and inside this rail, which enclosed the whole hill, lay 7 or 8 huts, but all were left by the inhabitants. On the hill slope lay a fallen log with its crown resting on the other side of the valley, where the canoes were lying, like a bridge in the air. From the care with which the place had been railed off, one might think that these poor savages were afraid of being attacked and had kept this line of retreat open." (This alludes I believe to the fallen log.) "But of whom were they afraid? who were their enemies? Captain Aschland, who had visited the same spot the day before, had found, that it had been just evacuated, that fire was still burning on their cooking places; they could not possibly know of our approach—so that it could not be us they feared. It was hardly either against the coast people that they wanted to defend themselves, for it was quite apparent that these two peoples, although they live in the same island, which is only 28 miles long and 12 to 16 miles wide at its very broadest, were quite ignorant of each other, so that the coast people spoke of the inland tribe as very forest-demons, who lived in the trees, eat frogs and snakes, which they caught by supernatural means, and altogether resembled very much the animals whose name they gave them, namely Orang-utangs. They assured us that they had neither houses nor canoes and now the first things we met were canoes and houses. Against whom were they thus keeping on the defence? Was it possible that war with its wretchedness had found its way into the centre of the jungles of this little island, and that the couple of hundred people who live here, should try to destroy each other in this little place? All these questions and conjectures thereon forced themselves on our minds as we wandered about in this little deserted village, whose only inhabitant we found enclosed in a sort of prison formed of a couple of logs with sticks between. It was a pig who seemed famished, and to judge from this fact, the inhabitants had probably not been there for several days. That this establishment had recently been formed was evident from the fresh state of the palisading and the poles on which the huts rested. We all agreed that the inhabitants must be in a higher state of civilisation than our friends the coast Nicobarese would allow to the forest-people. It is true that the huts were the most wretched specimens we yet had seen, there was hardly space for two people to sit in them, much less to lie in them, but yet they were huts, and built on the same principle as those of the coast people, namely, raised from the ground on poles, which mode of construction is however always used by Malays when in swampy places. Several were merely small sleeping-platforms, with one side against the trunk of a

tree and over which for protection were spread dhunny and rattan leaves or sheets of bark for roofing. Such a sheet of bark also formed the substance of their cooking pot which stood on a stand formed of four little sticks with cross sticks, under which the fire was laid.... We found some wooden spears and some pieces of cloth pressed from the cettis bark, but they were very ragged. On the ground were thrown some used caldeira fruits and in one of the huts we found a piece of prepared pandanus bread. Finally we found in the forest, close to the railing, a big tree that had newly been felled, from which we concluded that their tools must be pretty good. Everything seemed to show that the inhabitants of this establishment were of the same kind of people as the coast Nicobarese."

I hope I may be excused this long citation, but in it is contained the only information that existed regarding these inland tribes. No one had ever seen these people; but of their existence there could be no doubt. The conclusion by Admiral Bille that these people were something like the coast people, was however not adopted. Wallace, in his exhaustive work on the Malay Archipelago, includes the Nicobars in the Archipelago and concludes that there are nigritos at Great Nicobar. Professor Owen, F. R. S., when addressing the ethnological section of the Congress of Orientalists in London, 1874, says that fragments of the dwarf Nigrito stratum may be picked up—at the Nicobar Isles. When such an authority in science as Prof. Owen, believes this, and Wallace, the great traveller of these parts, supposes that Nigritos are found here, it is time that this error should be corrected. Wallace meets Nigritos in the Malay Archipelago, Jagor describes them in the Philippines and further north are found the Andamanese, so it would form a link if they were also found in Great Nicobar. From an intimate knowledge with the Andaman islands I became quite convinced that no tribe of Nigritos in the same stage of existence (I dare not say civilisation) as the Andamanese could exist in the Andaman jungles. The Andamanese live quite close to the sea and wander along the shore getting their subsistence in shell fish from the coral reefs and in fish from the sea. Quite subsidiary is their hunting the pig. The *Sus And.* has increased in number since fields of sugarcane and grain have sprung up near the Settlement, but even now they are scarce at certain seasons and could never be relied on to supply a steady and regular subsistence; and beyond the wild hog there is very little else to feed on. A few sour berries and perhaps eatable roots, but this latter I do not believe. The state of the jungle being such, I was a couple of years ago astonished at hearing it proclaimed that there should be an *inland* tribe quite close to the Settlement at Port Blair. Thousands of runaway convicts have trodden all over the jungles, and there is not, I believe, a spot where these luckless travellers have not been. Starvation brings them back and of all those that have returned, not one

has brought a tale of such an inland tribe. This alone would make it very improbable that such a tribe did exist, but it appeared to me that there was also the objection to this tale, that they must necessarily live near the fresh water streams and every one of these have been visited by the coast people. They were called Jaruwallahs, which is a Hindustani word for sweeper. I never for a single moment believed in this tribe and it turned out to be a fable. In later reports the name was changed to Jarudawaddahs, this being simply an Andamanese dress for their old name.

The district in which it was supposed that this fabulous inland tribe lived was shifted constantly and I began to believe that the whole affair was an invention, until at last the matter was investigated by Mr. Tuson, who told me that there was a little tribe, not friendly to our Andamanese, which lived on the southern sea-border of S. Andaman. Thus the theory of an *inland* Andamanese tribe of Nigritos was exploded.

At Great Nicobar, on the other hand, it was quite certain that one or several inland tribes existed, and I became quite convinced from my experience at the Andamans that whatever sort of people they were, they must live in a different way from our Andamanese, who yet live on the Kjökkenmöddinge stage. Then, in 1872, I was visited at Nancowry by some men of the coast people from Great Nicobar. Among them was a youth who had been, so they assured me, one of the inland tribe and had as a little boy come to the coast, where he had remained. At times he still met his mother in the jungle but did not intend to return to his people.

This Shombong,* so these people are called, was fairer than the other men and had small Mongolian eyes. He had quite a different appearance from his friends and reminded me at once of the people of Schowra, a little island to the N. W. of Nancowry. The inhabitants of Schowra are also in a very peculiar isolated position, on which I will later on have more to say. This Shombong knew a little of the language of his tribe, and with a great amount of coaxing I got him to give me a few words. It was, however, getting dark and he was very frightened, so I had to let him go and thus I lost a chance of learning what I was so anxious to know. In a short vocabulary of mine of the dialects of these islands, I mentioned this strange visitor and what my conclusions were, but as the work was printed for official circulation the fact did not gain much publicity. It will be understood that I was anxious to visit the Great Nicobar and see these people myself. As there is the possibility of my not coming here again on duty, this one term was likely to be my last chance, and although I would not wish to visit these islands again, yet I should have left them with regret if I had not solved the mystery that was hanging about these inland tribes. I

* Shom means tribe, *e. g.*, Shom Pu = Car Nicobarian.

therefore early in April started southwards and arrived at Pulo Condul on the morning of the 5th. I was very well received and took the occasion to tell my wish to my hosts. Their lively faces changed at once, and they declared that it was quite impossible. I then told them, that if it could not be done of course I would have to give it up, but that I in no way intended to stir from the house until I had seen and talked to a Shombong. My people then agreed to try. It so happened that just at this time a father with his son were down at the coast to get some tobacco from the coast people, but these two lived six miles away in a lonely and out-of-the-way swamp. All declared that they would run away if I came unawares upon them, so two men were sent off with a present of tobacco to them and to prepare them for my coming. After allowing them a start of two hours we followed, and as it was a very hot and calm day, the six miles went very slowly, but amongst other things I tried to elicit from my guides something about these people. They told me that the Shombong ate monkeys, that they devoured the python snake, and in fact any animal food they could get. That they, some twenty years ago, before a great earthquake that took place about that time, had lived a few miles from the coast opposite to Condul on Great Nicobar, but they then got into some difficulties with the coast people, and moved away further inland to some far off hills. They showed me both places from the sea. That there were three tribes. One at this (the north) end, one on the west coast and one south, on the Galathea river. That the one tribe on the west coast was now very sociable, and that I could easily visit them, as they were not afraid of foreigners, but would even go on board the Malay ships for tobacco. That the men went quite naked when at home and the women wore a short skirt of a cloth pressed from cettis bark, which the Shombongs make. That the Shombongs have fine gardens in which they cultivate yams and other roots. That they had no cocoanuts because the monkeys destroyed them, and that they in fact had objections* to cocoanuts.

That they married one man one woman and that marriage was always for life. This is, however, not the case with the coast people where marriage is quite voluntary and can be broken off at any time. That none of the coast people had ever been to their place, and that in fact they would die if they did on account of the fever and evil spirits. That the Shombongs had great power over the elements, and had very powerful sorcerers among them. That they were very fond of glass beads, but would not have such big beads as the coast people wore, only small ones.

At last we arrived at the Ganges harbour where there were many traces of the earthquake they had spoken of, for a whole piece of land had sunk

* The expression used was tjuit (tjit), which means religious or superstitious objections.

into the sea. There were still some rotten logs standing out of the water, but these were nearly quite eaten through, and in another year I expect that this dead forest will be gone.

It was low water when we arrived, and we found the canoe of the men that had gone before us, hauled up on some rocks near the innermost part of Ganges harbour. There one man and I got out and waded along the swamp towards our Shombongs. At last we approached a little open hut where the people that had gone before us were sitting. When we came up to them, they said that the two Shombongs had just before run into the jungle and that they were quite close by. The Nicobarese had insisted on my wearing a red cloth over my coat, so as not to frighten them, but yet they had fled. My disappointment was very great, and my guide advanced into the jungle and called out to them. He turned to all sides calling and after a little while we heard a reply. A long parley followed and I sent one man more to try and persuade them to come in. After a little while my guide called out to me to come quickly and to bring the presents I had brought. I ran off as quickly as I could, with my presents in my hands, and very soon I met my man. He was on the other side of a little running stream and came over, but appeared very much frightened, so my guide gently led him off to his hut and very soon I joined them. He stood leaning against a tree and was watching every movement of mine, just like a wild beast, evidently afraid that I should throw myself upon him. My guide warned me to sit down and not to trouble him as he was afraid. So I sat down and began to write. He was a Mongolian, the small oblique eyes were quite a distinct feature in his face. His nose was bent, but flat below. His mouth was not so prominent as is found with the coast people. His teeth were small and well-formed, but black. He was 5′ 8½″ high. His hair and eyes were black. The hair was hanging wildly down his face, cut off just above the eyes, (the coast people have brown eyes). His forehead was high and well-formed, his ears not very big but bored. His legs were short and his feet and hands small. He was a good deal fairer than the three coast people present. He wore a string round his waist but badly tied, evidently put on for the occasion. After a little while we got into a conversation. He told me that his people did not eat either monkeys or the python, but lived on the produce of their gardens. That they had large plots under yams and Gunya. That they would also eat birds when they could get them. That they snared ducks and pigeons. That they did not use bow and arrows, but spears. That the men went naked but that their women had little skirts of the cettis-bark. I enquired what sort of cooking pots they had, and he declared that they had none, but boiled their food in vessels made of the areca-bark, and as a proof he showed me his last meal. He had been eating a couple of paddy birds (*Demiegretta sacra*).

I wanted him to take me to his place, but though he seemed half willing, my guides made him afraid, and he stoutly refused, but promised that he would go to his village and fetch me some spears, some cloth and also some of the produce of their gardens. He said he could not do it in less than four days; and so four knots were tied on two sticks, he got one and we one.

While we were talking, a pig walked up and he told me that this pig had followed him, like a dog would follow us, all the way from his home and went wherever he went. We then left, and in consequence of our arrangement I had to wait four days before I could commence my return journey. On the 4th day we started north for little Nicobar, but I called in at his place. It was highwater and the canoe went close up to his little hut. I saw his pig in the old place and he was there. He brought me a magnificent yam from his garden and some other vegetables, three spears, of which one was made wholly of the wood of the areca palm, and a piece of cloth. He told me that he had asked his people whether I could visit their place and that they were willing to allow me to come if I would bring my wife. I gave him some presents for his wife, himself and his brother, who had come down this time with him. His brother was a little half-grown lad, who had his hair in the same way falling down over his forehead. I could not do anything more in the matter, and after a little talk we parted.

The result of my visit, I think, will be found to be, that the tribes that live in the interior of Great Nicobar are Mongolians and not Nigritos, that they subsist by cultivating land, that they have wooden spears and use the cettis cloth. They have no cooking pots but boil their food in vessels made of bark.

This tallies in every detail with the description of the village seen by the members of the Galathea expedition. My information was got from the tribe in the northernmost part of Great Nicobar; the village they saw was right south, on the Galathea river, so that I do not think that there can be any doubt that these are the same people, although belonging to different tribes.

Before concluding, I would beg to call attention to another circumstance. The coast people and the Nancowry people are the same in appearance, language, customs and ways of living. These people are *par excellence* fishermen. They delight in fishing and all other work gives way to this passion. It is true that they cultivate land at Nancowry, though not at Great Nicobar, but that is quite a subsidiary means of support. When they make gardens, they only consist of little patches. Not so with people of Schowra. This little island is inhabited by a strong-built fair race of Mongolian origin. They live by cultivating the soil mainly, and by supplying the other islands with cooking pots. As fishermen they do not do much and their spears are only small imitations of those used by the Nancowry people. Their langua

is quite different in root and construction from the other dialects, and their women do not use cloth as the Nancowry tribe, but fringed belts made of cocoanut leaves. This tribe and the Shombongs are possibly the remains of a race of Mongolians, who were peaceably settled on the Nicobar Islands, cultivating the land and perhaps in a higher state of civilisation. They were perhaps attacked by the Malay race that is now living on the Nancowry group. They were driven away from the fertile alluvial soil which they cultivated and had to take refuge on the sterile Island of Schowra (there is no fresh water on Schowra) which they by care have made into a lovely garden. It resembles a park. Every available spot is cultivated and well kept. Some of this tribe were driven south, and took refuge in the interior of Great Nicobar where they, shut off from the outer world, lead a miserable existence, still tilling the soil as did their forefathers.

I have collected a great many words of the language of the Schowra people, but not very many of the inland race of Great Nicobar, not sufficient to ascertain by comparison, whether their languages might not be closely related.

But I think it will be found that the (Shom) Tatat of Schowra and the (Shom) Bong of Great Nicobar are the remains of what was once one people.

Mr. W. T. Blanford thought that Mr. de Roepstorff was misled by his experience of the Andamanese when he supposed that a Nigrito tribe would have any difficulty in supporting itself away from the coast. Possibly the Andaman islanders might starve under such circumstances, but it is certain that Nigrito tribes are found far from the sea in the interior of the great Malay islands. They unquestionably exist in New Guinea, and almost certainly in the interior of Borneo, and they are said to be found in the Phillipines and in the interior of the Malay Peninsula. It is very difficult for a civilized human being to understand how savages live, or even to conceive what a marvellous variety of animal and vegetable productions, on which savage man, at any rate, can subsist, are to be found in the forests of all tropical regions. Mr. Blanford believed that man could certainly find food wherever monkeys could exist.

The reading of the following papers was postponed—

1. On the physical explanation of the Inequality of the two semidiurnal Oscillations of Barometric Pressure. By Henry F. Blanford, Esq., *Meteorological Reporter to the Govt. of India.*

2. The *Cyclostomaceæ* of the Dafla Hills, Assam. By *Major* H. H. Godwin-Austen, F. R. G. S., F. Z. S., &c., *Depy. Supt. Topographical Survey of India.*

3. Description of *Botryodon*, a new Genus of *Muridæ* from Sind. By W. T. BLANFORD, Esq., F. R. S.

4. Description of Ancient Dwellings and Tombs at Sut Kagen Dor and Dhamba Koh, near Gwádar in Makrán, Balochistán. By Capt. E. Mockler, *Political Agent, Gwádar.*

LIBRARY.

The following additions have been made since the Meeting held in May last.

TRANSACTIONS, PROCEEDINGS, AND JOURNALS,

presented by the respective Societies or Editors.

Berlin. Konigliche Preussische Akademie der Wissenschaften,—Monatsberichte. Marz 1876.

Peters.—Uber ein neues Argali Schaf, *Ovis jubata*, aus dem östlichen Theile der Mongolei, im Norden von Peking. *Helmholtz*—Bericht betr. Versuche über die elektromagnetische Wirkung elektrischer Convection, ausgeführt von H. N. Rowland.

Birmingham. Institution of Mechanical Engineers,—Proceedings. January, 1876.

E. Hutchinson.—On the mode of Erection of the large Iron Girder Railway Bridge over the River Dal in Sweden.

Calcutta. Agricultural and Horticultural Society of India,—Journal, Vol. 5, Pt. II, N. S.

S. E. Peal.—Note on Dr. Aleyboom's paper on "Roest." Notes and Reports on a Wax-yielding insect from Chota Nagpore.

Haarlem. Musée Teyler,—Archives, Vol. I. Fasc. 1, 2, 3, and 4, Vol. II, Fasc. 1 to 4, Vol. III, Fasc. 1 to 4, Vol. IV, Fasc. 1.

Vol. I, Fasc. 1 and 2. 5. *S. M. von der Willigen.*—Mémoire sur la determination des longueurs d'onde du spectre solaire.

Vol. III, Fasc. 1, 5. *S. M. von der Willigen.*—Nouveau spectre de réfraction de la lumiére solaire. Fasc. 2, 5. *S. M. de von der Willigen.*—Sur les mesures naturelles.

Leipsic. Deutsche Morgenländische Gesellschaft,—Zeitschrift, Vol. 29, Heft. III und IV.

Heft. III und IV. *Dr. S. Landauer.*—Die Psychologie des Ibn Sinâ. *Th. Nöldeke.*—Zur Topographie und Geschichte des Damascenischen Gebietes und der Haurângegend. *O. Böhtlingk.*—Das Verhalten der drei kanonischen Grammatiker in Indien zu den im Wurzelverzeichnisse mit *sh* und *n* anlautenden Wurzeln. *S. Goldschmidt.*—Bildungen aus Passivstammen im Präkrit.

P. Zingerle.—Uber das syrische Buch des Paradieses von Ebedjesu, Metropolit von Nisibis. *R. Köhler.*—Die Pehlevi-Erzählung von Gôsht-i-Fryânô und der kergisische Büchergesang "die Lerche." *Dr. Ign. Goldziher.*—Abû-l-Alâ al-Ma'arrî als Freidenker. *C. Rice.*—An Besitzer der Bombayer Ausgabe des Mahâbhârata und der Calcuttaer Ausgabe der Siddhânta-Kaumudi.

London. The Athenæum. Pt. 579, March, 1876.

———. Geographical Magazine. Vol. III, No. 6, June, 1876.

Pundit Nain Sing. Geographical Discoveries in Tibet. The Abbé Armand David's Journey in Western China. *R. Mitchell.*—Ferghana.

———. Nature. Vol. 14, Nos. 341 to 344, 1876.

———. Royal Astronomical Society.—Monthly Notices, Vol. 36, No. 5.

Dr. Royston-Pigott.—Note on a Starlit Transit Eyepiece. *Mr. Pogson.*—Occultation of the *Pleiades* observed at Madras. Observations of the November Meteors made at the Royal Observatory, Greenwich. *Capt. Abney.*—Preliminary Note on photographing the least refracted portion of the Solar Spectrum.

———. Royal Geographical Society.—Proceedings, Vol. XX, No. 3, 1876.

Goldsmid.—Capt. the Hon'ble G. Napier's Journey on the Turcoman Frontier of Persia. *Margary.*—Extracts from the late Traveller's Diary: Hankow to Tali-fa. Extracts from his subsequent Letters. *Thomson.*—Marco Polo's Six Kingdoms or Cities in Java Minor identified in translations from the ancient Malay Annals.

———. Royal Society.—Proceedings, Vol. 24, No. 167, 1876,

Ch. S. Tomes.—On the Development and Succession of the Poison-fangs of Snakes. *Prof. J. Thomson.*—On an Integrating Machine having a new Kinematic Principle. *W. Crookes.*—On Repulsion resulting from Radiation. Pts. III and IV.

———. Zoological Society.—Proceedings, Pt. 4, November and December, 1875.

Signor. L. M. d'Albertis.—Letter from, giving some account of several excursions into Southern New Guinea. *P. Bleeker.*—Notice sur *l'Elopichthys dahuricus*. *W. T. Blanford.*—Notes on the figures of *Herpestes ferrugineus* and *Ovis polii*. On some Stags' Horns from the Thian-Shan Mountains in Central Asia. *M. H. Garrod.*—Report on the Indian Elephant which died in the Gardens on July 7th, 1875. Notice of a Memoir on the structure of the Manatee. *G. E. Dobson.*—A Monograph of the Genus *Taphozous*, Geoff. *Mr. Sclater.*—Exhibition of, and remarks on the upper horn of a two-horned Rhinoceros from the valley of the Brahmaputra. *Dr. A. Günther.*—Third Report on Collections of Indian Reptiles obtained by the British Museum. *W. Sclater.*—Exhibition of, and remarks on a skin of *Hypocolius ampelinus*. Bp. *S. Hanley.*—Description of new Land and Freshwater Shells from India. *Dr. J. S. Bowerbank.*—Further observations on *Alcyoncellum speciosum*, Quoy et Gaimard, and *Hyalonema mirabile*, Gray. *A. G. Butler.*—Descriptions of several new species of *Sphingidæ*. *Dr. O. Finsch.*—On a new Species of Crown-Pigeon. On *Pristorhamphus versteri*, a new Genus and Species of Bird

from the Arfak Mountains, New Guinea. *J. Caldwell.*—Notes on the Zoology of Rodriguez.

London. Zoological Society.—Transactions, Vol. IX, Pts. 5, 6 and 7.

Pt. 5. *W. K. Parker.*—On Ægithognathous Birds.

Pt. 6. *J. B. Perrin.*—On the Myology of *Opisthocomus cristatus.*

Pt. 7. *W. C. MIntosh.*—On British Annelida. On the Annelida of the "Porcupine" Expeditions of 1869 and 1870.

Munich. Königliche Bayerische Akademie der Wissenschaften.—Mathematisch-Physikalische Classe. Abhandlungen. Band XII, 1st Abth.

Band XII. *H. V. Schlagintweit-Sakünlünski.*—Die Pässe über die Kammlinien des Karakorúm und des Künlün in Bálti, in Ladák und im östlichen Turkistan. Nach unseren Beobachtungen von 1856 und 1857, und den neueren Expeditionen.

———. ———. Philosophisch-Philologische Classe. Abhandlungen. Band XIII, 3rd Abth.

———. ———. Verzeichniss der Orientalischen Handschriften der K. Hof- und Staatsbibliothek in München.

———. ———. Die Hebræischen Handschriften der K. Hof-und Staatsbibliothek in München, von M. Steinschneider.

Palermo. Societá degli Spettroscopisti Italiani.—Memorie, Dispensa 5, Maggio, 1876.

P. Tacchini.—Statistica delle eruzioni solari osservate a Palermo nel 1872. Magnesio al bordo osservato a Palermo nel 1875. Fotografie dello spettro solare fatte a Calcutta dal Cap. Waterhouse.

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Tome IX. *Hamy.*—Sur les races sauvages de la péninsule malaise et en particulier sur les Jakuns.

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No. 1220. *A. V. Harcourt.*—Some Methods of estimating the Illuminating Power and Purity of Coal Gas. *C. R. Markham.*—The Cultivation of Caoutchouc-yielding Trees in British India.

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No. 12. *M. Lockyer.*—Sur de nouvelles raies du calcium. *M. Rouyaux.*—Sur la conduite des chronomètres. *M. J. M. Gaugain.*—Influence de la temperature sur l' aimantation.

No. 13. *M. Y. Villarceau.*—Influence des variations de pression sur la marche des chronomètres. *M.M. Becquerel* et *Edm. Becquerel.*—Observations de température, faites au Muséum d'Histoire Naturelle pendant l'année météorologique 1875, avec les thermomètres electriques placés dans l'air ainsi que sous des sols gazonnés et dénudés. *M. Th. Schlœsing.*—Sur les échanges d'ammoniaque entre les eaux naturelles et l'atmosphère.

No. 14. *P. Secchi.*—Sur le déplacement des raies dans les spectres des étoiles produit par leur mouvement dans l'espace.

No. 15. *M. Cl. Bernard.*—Critique expérimentale sur la formation du sucre dans le sang ou sur la fonction de la glycémie physiologique. *M. Th. du Moncel.*—Dixseptième note sur la conductibilité électrique des corps médiocrement conducteurs. *P. Secchi.*—Sur le déplacement des raies dans les spectres des étoiles produit par leur movement dans l'espace. *M. G. Planté.*—Sur les taches solaires et sur la constitution physique du Soleil. *M. A. Sartiaux.*—Note sur l'emploi des machines magnéto-électriques de M. Gramme, pour l'éclairage des grandes salles de chemins de fer. *M. Th. Schlœsing.*—Sur les échanges d'ammoniaque entre les eaux naturelles et l'atmosphère.

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PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR AUGUST, 1876.

The monthly General Meeting of the Society was held on Wednesday, the 2nd August, 1876, at 9 o'clock, P. M.

Mr. W. T. Blanford, F. R. S., Vice-President, in the Chair.

The following presentations were announced—

1. From Mr. O. Semper of Hamburg, a copy of "Archiv des Vereins der Freunde der Naturgeschichte in Meklenburg."

The CHAIRMAN said that Mr. Semper, in sending this donation, had expressed his wish to receive papers relating to Shells, Mollusca and the geographical distribution of animals and plants.

From Capt. J. Waterhouse, a series of 14 photozincographed plates of Inscriptions from Gaur and Paṇḍuah.

Mr. BLOCHMANN said :—

The plates presented by Capt. Waterhouse to the Society are a set of photozincographs taken by him of inscriptions from Gaur and Paṇḍuah, the old Muhammadan capitals of Bengal. The originals of the plates were the rubbings which had been sent to the Society by General Cunningham, C. S. I., and Mr. E. V. Westmacott, C. S., and had been published with translations in the Journal for 1872, 1873 and 1874. The plates, it is hoped, will be published in the forthcoming work on Gaur by the late Mr. Ravenshaw.

The following is a list of the inscriptions—

Pl. I. Two Inscriptions from the Ádínah Mosque, Paṇḍuah, built by Sikandar Sháh, A. D. 1369. Published, Journal, 1873, p. 257.

The inscriptions are most artistically cut.

Pl. II. Inscription No. 4, from Hilál's Mosque near the Fort of Máldah. Mahmúd Sháh I., A. D. 1455. Journal, 1874, p. 294.

Inscription No. 5, from the Chhoṭá Dargáh at Paṇḍuah. Mahmúd Sháh I., A. D. 1459. Journal, 1873, p. 271.

Pl. III. Inscription No. 5, from a Mosque at Paṇḍuah. Yúsuf Sháh, A. D. 1479. Journal, 1873, p. 276.

Pl. IV. Inscription No. 6, from a Mosque at Gaur. Yúsuf Sháh, A. D. 1480. Journal, 1873, p. 277.

Inscription No. 7, from a Mosque at Gaur. Fírúz Sháh II., A. D. 1489. Journal, 1874, p. 299.

Pl. V. Inscription No. 8, from a Mosque near Máldah, Fírúz Sháh II. Journal, 1874, p. 299.

Inscription No. 8*a*., from a Mosque at Gaur. Mahmúd Sháh II. Journal, 1873, p. 289.

Inscription No. 9, from the Chhoṭá Dargáh at Paṇḍuah. Muzaffar Sháh, A. D. 1493. Journal, 1873, p. 290.

Pl. VI. Inscriptions Nos. 10 and 11, from Máldah. Husain Sháh, A. D. 1491 and 1495. Journal, 1874, p. 302.

Pl. VII. Inscription No. 12, from Husain Sháh's Madrasah at Gaur, A. D. 1502. Journal, 1874, p. 303.

Inscription No. 13, from a Gate at Gaur. Husain Sháh, A. H. 910. Journal, 1874, p. 304.

Pl. VIII. Inscription No. 14, from Husain Sháh's Mosque at Gaur, A. D. 1505. Journal, 1873, p. 294.

Inscription No. 15, Husain Sháh, A. D. 1505. Not published.

Pl. IX. Inscription No. 16, from Shaikh Akhí Siráj's tomb at Gaur. Husain Sháh, A. D. 1510. Journal, 1873, p. 294.

Pl. X. Inscriptions Nos. 17 and 18, from a Gate and a Mosque at Gaur. Husain Sháh, A. D. 1510 and 1512. Journal, 1873, p. 294, and 1874, p. 305.

Pl. XI. Inscriptions Nos. 19 and 20, from a Gate of the Fort of Gaur and Daulat Názir's Mosque near Máldah. Husain Sháh, A. D. 1512 and 1517. Journal, 1873, p. 295, and 1874, p. 305.

Pl. XII. Inscriptions Nos. 21 and 22, from Máldah. Nuçrat Sháh, A. D. 1524 and 1528-29. Journal, 1874, pp. 306, 307.

Pl. XIII. Inscription No. 23, from the Qadam Rasúl at Gaur. Nuçrat Sháh, A. D. 1530-31. Journal, 1872, p. 338.

Pl. XIV. Inscription No. 24, from a Mosque near Máldah. Nuçrat Sháh, A. D. 1531-32. Journal, 1874, p. 308.

Inscription No. 25, from a Mosque at Sa'dullahpúr, Gaur. Mahmúd Sháh III, A. D. 1534-35. Journal, 1872, p. 339.

The following gentlemen, duly proposed sad seconded at the last meeting, were balloted for and elected ordinary members—

J. Hector Esq.
Major O. B. St. John.
P. T. Carnegy, Esq.

The following are candidates for ballot at the next meeting :—

Dr. H. Cayley, proposed by H. F. Blanford, Esq., seconded by W. T. Blanford, Esq.

Major M. M. Bowie, Madras Staff Corps, Dy. Commr., Sambalpur, proposed by J. Wood-Mason, Esq., seconded by W. T. Blanford, Esq.

Mr. George A. Grierson, C. S., Rangpur, proposed by the Rev. Dr. K. M. Banerjea, seconded by H. Blochmann, Esq.

Mr. H. Beveridge, C. S., proposed by H. Blochmann, Esq., seconded by Capt. J. Waterhouse.

The CHAIRMAN, on behalf of the Council, made the following statement regarding the correspondence published in the Introductory Note to Mr. C. B. Clarke's "Compositæ Indicæ."

"With reference to the correspondence, and remarks thereon, published by Mr. C. B. Clarke as an Introductory Note to his recent work on 'Compositæ Indicæ,' the Council of the Asiatic Society deem it right to inform the Society, that Mr. Clarke's paper was declined on grounds which seemed to the Council least hurtful to Mr. Clarke's feelings, although, unfortunately, the opposite effect was produced. Mr. Clarke's statement as to the cost of the extra number of the Journal containing the Blyth Catalogues having been largely provided by Mr. Blyth's friends is entirely erroneous. The only portion of the expense which was not paid by the Society was the photographic portrait of Mr. Blyth, which was presented to the Society by Mr. Loder, a relative. With this explanation the Council express their deep regret at the misunderstanding between themselves and a valued member of the Society."

The CHAIRMAN laid before the Meeting the following Memorandum drawn up by the Council with reference to the arrangements they had finally made for the repairs and improvement of the Society's premises.

Memorandum on the Proposed Alterations and Repairs of the Society's Premises.

At the General Meeting of the Society in April, the Chairman announced that it was the intention of the Council to employ part of the money received from Government, in thoroughly repairing and improving the Society's premises.

There has been more delay than was anticipated in completing the arrangements; but the Council have decided that the following works are necessary; and as it was most desirable that they should be completed before the end of the recess, or as soon as possible after it, they have given orders for their being carried out, and they are now in course of execution by Messrs. Mackintosh, Burn and Co.

1. The house to be thoroughly repaired inside and out.

2. The rooms on the ground floor to be laid with asphalte. The passages about the entrance and staircase to be paved with Chunar stone.

3. Two rooms on the ground floor to be converted into a retiring room and lavatory for the convenience of Members.

4. The sky-light over the staircase to be enlarged and improved.

5. The meeting-room and the rooms round it to be coloured.

6. The floors of the three rooms, proposed to be devoted to the Library, to be propped up from below by iron pillars.

7. The staircase to be improved by the substitution of iron railings and a substantial mahogany hand-rail for the present ones.

8. The present portico, being very narrow and inconvenient, to be demolished, and a new enlarged portico to be built symmetrical with the entrance doorway, to which a new entrance door is to be put.

9. Gas to be laid on in the entrance and public rooms.

The cost of these repairs and alterations will be—

General repairs and alterations, including asphalte for lower floor, fitting up retiring room, enlarging sky-light, propping up Library rooms, colouring meeting-room, and other minor items,.....Rs.	8,980
Alterations to Staircase, ...	1,480
New Portico and Entrance-door, ...	3,150
	13,610
Gas and Fittings,.....	2,342
Total, Rs.	15,952

Messrs. Mackintosh, Burn have undertaken to execute the works included under the first three items for Rs. 13,000, so that the total cost will thus be reduced to Rs. 15,342.

Besides these repairs and alterations which are necessary and urgent, the Committee of Repairs have recommended that the present boundary wall and godowns in Park Street should be demolished, and replaced by a neat half-wall and iron railing with two gateways and a durwan's lodge, a new range of servants' houses and latrine being built at the back of the house from the old materials. The cost of these alterations and additions is estimated by Messrs. Mackintosh, Burn at Rs. 6,167.

There is no doubt that these proposed alterations of the boundary wall would be an immense improvement to the appearance of the Society's premises, and as the present boundary wall is in a very bad state, the godowns inconvenient and useless, and there would in any case be the expense of repairing them, which is estimated at Rs. 857, the Council consider that it

would be desirable to carry out the changes proposed by the Committee; but before deciding to spend so much money upon the mere improvement of the Society's premises, they feel themselves bound to refer the question for the vote of the general body of Members.

The Committee of Repairs have also recommended that one or two shops should be erected in the vacant corner of the compound, at the junctions of Park Street and Chowringhee. This could be done at a cost of about Rupees 12,000, and as the site is a most favourable one for such a purpose, there is little doubt that a regular income of between Rs. 200 and 300 a month would be realised, (an offer of Rs. 200 has already been received,) and that the erection of the shops would be a highly advantageous investment of part of the Society's capital.

If the shops were erected, there would be a reduction of about Rs. 1,000 from the cost of the boundary railing.

The ground on which it is proposed to build the shops is quite useless to the Society, except as a piece of garden, and it is so situated that it could be cut off without any inconvenience, nor would the presence of the shops interfere in any way with the perfect privacy of the Society's premises.

In this case also the Council feel that, although the proposed investment would no doubt be advantageous, they cannot act without the consent of the general body of Members, and they therefore propose to circulate this memorandum to all Members of the Society, for confirmation of their action with regard to the urgent repairs and alterations, and for their vote with regard—

I. To the erection of a dwarf wall and railings, and new servants' houses in place of the present boundary wall and godowns, at the estimated cost of Rs. 6,167.

II. To the investment of a portion of the Society's capital in the erection of a shop or shops, on a waste part of the Society's compound, at a cost of about Rs. 12,000.

These questions will be brought up for discussion at the November Meeting.

Should all these proposals be adopted, the total cost of the alterations and repairs will be about Rs. 33,000; but of this sum Rs. 12,000 must be looked upon in the light of a reproductive investment, so that the amount actually sunk in repairs will be Rs. 21,000, a sum well within that estimated and allowed for the purpose, when the question of the compensation to be given by Government to the Society for its rooms in the New Museum building, was considered.

Besides the above expense for repairs, there will be some further expenditure, estimated at between Rs. 5,000 and 6,000, for repairing the pic-

ture frames, new mats, punkahs, book-cases, furniture, &c., but the Council believe that this may be met in great part from income without trenching further on the vested capital of the Society.

It will thus be seen that the total expense of all the proposed repairs and alterations of the buildings and the further cost of furniture &c., is not likely to exceed Rs. 40,000. The amount of the Society's funded property at the present moment is Rs. 1,58,000, besides about Rs. 6,000 in floating account, so that should *all* the proposed improvements be adopted, there will remain to the Society at least Rs. 1,20,000 invested in 5½ % Government Securities and bringing in a regular income of nearly Rs. 550 a month, quite independently of subscriptions, besides 4 or 5,000 rupees available for the general purposes of the Society. Should the shops be built the income will be increased to at least Rs. 750, and if they are not built, to a little over Rs. 600.

The Council would take this opportunity of expressing their indebtedness to Mr. R. R. Bayne for the valuable professional assistance he has rendered to the Society, as a member of the Committee of Repairs, and particularly for the trouble he has taken in preparing detailed plans and estimates for the improvements proposed by the Committee, though the Council regret that they have been unable to carry out Mr. Bayne's beautiful designs, on account of the extra expense they would have involved.

The CHAIRMAN announced that as the stock of copies of the Rules of the Society was nearly exhausted, the Council proposed to publish a revised edition and had, with the assistance of a Committee, drawn up a circular showing the changes and additions it was thought desirable to make, with a statement of the reasons for the alterations proposed. The circular would be sent to the whole body of members, as provided under Rule 32 (*c*), and the question would come up for decision at the November meeting.

The following were the changes proposed—*

RULE 1. *Proposed Alteration.*

Name and Object.

The Society shall be called, as heretofore, the ASIATIC SOCIETY OF BENGAL *and its objects* shall be those described in the following language of the Founder, Sir William Jones:—"The bounds of its investigations will be the geographical limits of Asia, and within these limits enquiries will be extended to whatever is performed by man, or produced by nature."

* Additions and changes are shown in italics.

RULE 2. *Proposed Alterations.*

Constitution.

2. *The Society shall consist of Members of the three following classes :—*

(*a*) Ordinary Members, the number of whom shall be unlimited, and who shall be designated as *Resident Members*, if they permanently dwell in Calcutta, or within 30 miles thereof; as *Non-Resident Members*, if they permanently dwell *within the limits specified in Rule* 14 *D; and as Foreign Members, if they live permanently beyond those limits.*

(*b*) As at present.

(*c*) As at present.

Proviso.—As at present.

3. Persons of all nations shall be eligible as Members of the Society.

4. *The administration, direction and management of the affairs of the Society shall be entrusted to a Council composed of the Officers of the Society, namely: a President, three Vice-Presidents, and one or more Secretaries, including the Treasurer, with as many other ordinary Members as shall with these officers make up a total of fifteen.*

RULE 3. *Proposed additional Clause.*

Should there be no meeting during the recess months of September and October, the Council shall be empowered to elect candidates for ordinary Membership, who shall have been duly proposed and seconded at the Meeting of the Society in August, or whose names may be received as candidates during the recess. Such candidates shall be ballotted for at the Meeting of the Council next succeeding that at which their names and those of their proposers and seconders shall have been laid before the Council; and during the interval between the two meetings these names shall be suspended in the Society's meeting Room as provided in Rule 3; *and it shall be necessary for the due election of such candidates, that not less than two-thirds of the Members of Council present at the meeting shall vote in their favour. Such elections shall be reported and confirmed at the first general meeting of the Society after the Recess.*

RULE 5. A. B. C. *Proposed Alterations.*

5. A. As at present.

B. No person, although duly elected according to the foregoing Rules, shall be entitled to exercise the rights and privileges of Membership, nor shall his name be entered in the list of Members, until he has paid his admission fee *and first quarterly subscription.*

C. As at present.

The preceding three rules shall be written or printed on the letter of announcement of election sent to Members by the Secretary under Rule 4.

RULE 9. A. *Proposed Alteration.*

9. A. The subscription of Resident Ordinary Members shall be Rs. 9* per quarter.

PROPOSED RULES FOR COMPOUNDING,

to be added after Rule 9.

I. Any member of the Society may, after he shall have paid his entrance fee, compound for the payment of all future subscriptions as a non-resident member, by the payment in a single sum of Rs. 300.

II. Any member already belonging to the Society may at any time compound for his future subscriptions as a non-resident member by the payment of the above compounding fee, less Rs. 10 *for each full annual subscription, of not less than Rs.* 24, *he may already have paid, whether as a Resident or non-Resident member. Provided always that under no circumstances shall the composition be reduced below Rs.* 100.

III. Resident members who have already compounded for their non-resident subscriptions under the last rule, shall still be liable to pay a quarterly subscription equal to the difference between the Resident and non-Resident rates of Subscription, during such time as they shall remain resident. Such additional subscription to be chargeable under the provisions of Rule 9 *E.*

IV. Any member who compounds for his non-resident subscription, or who has already compounded for it, may also compound for all future additional subscriptions as a Resident member by payment of a sum equal to 10 *times the yearly difference between the non-resident and resident subscriptions.*

V. Any member who has compounded shall be entitled, while absent from India, to the privileges specified under Rule 14 C (as amended).

RULE 13. A. B. C. *Proposed Alterations.*

Cessation of Membership.

13. A. When any ordinary member shall have omitted to pay the subscriptions of six successive quarters, the Council shall cause a registered letter to be sent to him, directed to his last known address, informing him *of*

Striking off Member's name for non-payment of arrears.

* It is now Rs. 12.

the amount of the sums due by him and that unless they are paid within six months from the receipt of such letter, his name will be struck off the list of Members.

B. If he omit to pay the amount within the time so limited his name shall be suspended as a defaulter at any Ordinary General Meeting and, unless the amount be paid in the meantime, shall remain so suspended within the Society's building till the next Ordinary General Meeting when the Chairman shall declare such Member to be removed from the Society for nonpayment. This fact shall be notified in the Proceedings of the Society.

Clause C. will remain as it is.

RULE 14. A. B. *Proposed Rules.*

In the event of an Ordinary Member leaving India, and of his informing the Secretary by letter that he desires to retain his privilèges as an Ordinary Member under Rule 7 (b), his subscription shall be Rs. 16 per annum, or 32 shillings, whilst absent from India. On the return of such member to India he shall thereupon become liable to pay his original subscription as provided in Rule 10 B.

B. Any member leaving India may compound for all future subscriptions under the provisions of Rule II of the new rules for compounding.

Proviso.—These rules shall not apply to members who are now paying an annual subscription of Rs. 12 under Rule 14 A of the Rules of 1869, or who shall have compounded for their subscription under that rule.

C. Ordinary Members paying a subscription of Rs. 16 per annum under this rule shall not be competent to exercise the privileges specified in Rule 7 (e) and (g). Nor shall they have the right of voting under Rule 32.

D. For the purposes of this rule members in India shall be considered to include all those living in any part of India and its dependencies, including Aden, or in Ceylon and the Straits Settlements, or elsewhere between the parallels of 60° and 100° E. Longitude, and from the Equator to 40° North Latitude. Members beyond these limits shall be considered Foreign Members.

E. Same as present rule B.

RULE 15. *Proposed Rules.*

Any Member may withdraw from the Society by signifying his wish to do so by letter addressed to the Secretary.

Any member who shall cease to be a member of the Society either by

forfeiture of his claims under rules 13, 14 *B. and* 18, *or by voluntary withdrawal shall continue liable to the payment of the quarterly subscription until he shall have discharged all sums (if any) due by him to the Society and shall have returned all books or other property (if any) borrowed by him of the Society ; or shall have made full compensation for the same if lost, injured or not forthcoming.*

RULE 20 to be cancelled.

RULE 22. (*f*). *Proposed Alteration.*

(f) To prepare and submit to the Annual General Meeting a Report on the general concerns of the Society. Such report shall set forth the income and expenditure for the calendar year, the balance in hand, the debts and assets, the estimated income and expenditure of the succeeding year, prosperity, or otherwise, of the Society, and the progress of the Library *The Report shall also include an Abstract of theProceedings of the Council during the year.*

RULE 22. *Proposed Additional Clause (g).*

(g) In conformity with the provisions of the Registration Act, No. XXI of 1860, *(Sections* 9 *and* 10,*) under which the Society has been registered, the Council shall be empowered, subject to the sanction of an Ordinary General Meeting, to take legal proceedings under the Act for the recovery of any sums due by members who, after receiving due notice of their liabilities, shall refuse to discharge them.*

RULE 26. *Proposed Additional Clause.*

At the expiration of every Quarter the Treasurer shall prepare a list of the names of those members who may be in arrears of their subscriptions for that or previous quarters and shall submit it for the orders of the Council at the Council Meetings next before the General Meetings in February, May, August and November.

RULE 28. C. *Proposed Alteration.*

(c) The business of each Meeting shall be proceeded with in the order hereinafter prescribed in Rules 29 and 30, Clause *(c)* : provided always that, on *written notice being given to the President or one of the Secretaries not less than* 48 *hours before the hour of Meeting, a motion for the immediate transaction of urgent business may be made ; and if such motion be seconded and carried, this rule shall be suspended.*

RULE 28. *Proposed Additional Clause after (c).*

With the exception mentioned in the last Rule, notice of motion an any matter of importance shall be given at the General Meeting preceding that on which the subject is to be disposed of, in order that members who take an interest in the question may have an opportunity of informing themselves regarding it and expressing their assent or dissent; and no motion of which notice has not been given shall be carried at the meeting at which it is proposed if the President or Chairman of the Meeting rules that it should be postponed.

RULE 29. *Proposed Alteration.*

The Society shall meet on the first Wednesday in each month excepting in September and October *but the Council may, if they consider it desirable, appoint a meeting to be held as usual in one or both of those months.*

RULE 32 *(c).* *Proposed Alteration.*

(c) When any proposal is made respecting expenditure to a large amount, changes of organization, *disposal of securities forming part of the Permanent Reserve Fund*, amendment or alteration of the Rules, or generally when any question arises which, in the opinion of the Council, should be referred to the whole body of Ordinary Members.

RULE 33. *Proposed Alteration.*

Manner of taking the Votes.

33. Any question referred to the votes of the whole body of Ordinary Members, shall be brought up at the Ordinary Monthly Meeting next after the close of *one* month from the issue of the voting papers. Ordinary Members present at such Meeting, and who have not already sent in a voting paper, shall be permitted to fill in a voting paper at such Meeting. The Chairman shall appoint two Scrutineers, who shall proceed to examine the votes and report the result.

RULE 34. *Additional Rule proposed.*

Minutes of the Proceedings of every meeting of the Council shall be taken during their progress by one of the Secretaries, or, in the case of their absence, by some member present whom the Chairman shall appoint for the occasion. The minutes shall afterwards be circulated to the members present at the meeting for the purpose of ascertaining their correctness and then be copied fairly in a minute book and read and signed by the Chairman at the next meeting of the Council.

RULE 36 A to be cancelled.

RULE 38. *Proposed Rules.*

I. Of the Funds of the Society now invested in Govt. Securities, Rs. 1,20,000 *shall be considered as a* Permanent Reserve Fund *for the benefit of the Society and it shall not be competent to the Council, or to any of the Society's Officers, or to any Committee of the Society to sell or otherwise alienate the said fund or any portion of it without first recommending the sale or alienation in question to the Society and taking the votes of the general body of Members, as provided in Rules* 32 *and* 33, *and further such sale or alienation shall only be lawful if carried by a majority of not less than three-fourths of the members who have voted. And should any portion of the Permanent Fund be sold or alienated by authority of the members of the Society the remainder shall be preserved under this rule in the same manner as if the sum were intact. But this rule shall not apply to the temporary investments in Govt. Securities mentioned in the following rule.*

II. The remaining Funds of the Society shall be lodged in the Bank of Bengal in the name of the Society. Any surplus not required for immediate expenditure shall be invested from time to time by the Treasurer in the name of the Society as a Temporary Vested Fund ; *but no Government or other Securities forming part of this Fund shall be sold or otherwise disposed of by the Treasurer or any Officer or Committee of the Society except by special order of the Council.*

III. Whenever the Temporary Vested Fund shall exceed the sum of Rs. 10,000 *it shall be lawful to the Council, if they consider it desirable, to transfer such excess to the Permanent Reserve Fund, and the provisions of Rule I shall apply to these additions exactly as if they had formed part of the original sum.*

IV. All sums received from Members as Admission or Compounding fees shall be regularly invested by the Treasurer as soon as possible after the receipt thereof, and only the interest accruing thereform shall be considered available for the general expenditure of the Society. Such investments shall form, and be treated as, part of the Permanent Reserve Fund under Rule I.

V. All Securities and monies the property of the Society shall be lodged for safe custody in the Bank of Bengal.

VI. Cheques drawn on the Bank for sums in excess of Rs. 500, *shall be signed by the Treasurer and counter-signed by a Member of Council.*

PROPOSED NEW RULE (MISCELLANEOUS).

Alteration of the Bye-laws.

When the introduction of any new Bye-law, or the alteration or repeal of any existing Bye-law, is recommended by the Council, or proposed by ten or more ordinary Members, the Council shall cause to be sent to every member of the Society entitled to vote, a statement of the proposed changes and the reasons for them, with a view to the votes of the general body of Members being taken as directed in Rule 33. *Provided always that no change in the Bye-laws shall be valid unless a majority of three-fourths of the Members who have voted shall be in favour of the proposed changes.*

The COUNCIL reported that in conformity with the wish expressed at the last meeting Mr. H. F. Blanford's proposal, that the refund of subscription to the Piddington Fund should be devoted to form a nucleus of a fund for the pensioning of old and deserving servants of the Society, had been referred for the decision of the subscribers at present in India, and that of 17 members addressed eight had replied agreeing to the proposal. The Council would therefore recommend that it should be adopted but with the proviso, that any subscriber who wished to reclaim his share should be at liberty to do so.

The proposition was agreed to unanimously.

The COUNCIL reported that in accordance with the vote passed at the last meeting, the Society had been registered under Act XXI of 1860.

Also that they had elected Dr. J. Anderson and Lieut. F. W. Jarrad, R. N., members of the Natural History and Library Committees.

The REV. FATHER LAFONT, S. J., exhibited one of Crookes' Radiometers and said that he had made numerous experiments to ascertain 1st, whether the rotation was due to the impulse of the ether wave, and 2nd, whether they were due to the longer or to the shorter waves, to Heat rather than to Light. Having tried polarized heat and light, he thought the very slight acceleration produced, when the plane of the waves was directed normally against the vanes, could not warrant the conclusion that the waves were the propelling agent. In his opinion, the result of his experiments on the second point was more definite and pointed to Heat as the principal moving agent. He might venture to say that the radiometer never moved except a change occurred in its temperature: if that temperature was increased, the little mill moved white faces forward; if it was lowered, it moved black faces forward, or in the reverse direction.

Father Lafont concluded from this that the radiometer was completely useless as a photometer. As to the real cause or causes of its movements, he thought the subject required further study before a definite answer could be given.

Mr. R. LYDEKKER exhibited a portion of the lower jaw of *Tetraconodon magnum*, Falconer, from the Sewáliks, and said—

The specimen exhibited is a portion of the lower jaw of this Hippopotamoid: the animal was previously only known by two upper molars obtained by Falconer. The present specimen contains two tubercular molar teeth, and two large conical premolars, the latter far exceeding in size the former; a condition unknown in any other mammal with which I am acquainted.

The specimen was obtained by Mr. Theobald during the present year from the Sewáliks of the Panjáb; it will be found described in the forthcoming number of the 'Records of the Geological Survey of India.'

Mr. W. T. BLANFORD exhibited some drawings sent to him by Captain E. Mockler, Political Agent at Guádar, representing ancient dwellings and tombs discovered by Captain Mockler at Sutkagen Dor and Damba Koh near Guádar in Makrán (Balúchistán). The originals had been sent to the Royal Asiatic Society with a full account of Captain Mockler's discoveries, of which a short notice was given to the meeting by Mr. Blanford who said:

The two localities explored by Captain Mockler, are not far from the coast of Makrán. The first of these, Sutkagen Dor (the burnt-up torrent, a name derived from the charcoal and ashes found in the neighbourhood) lies about forty miles north-west of Guádar: there is a modern stone fort constructed by Balúchis, but remains of ancient works also occur, the principal being two dykes of large stones joining different hills together. Such works are found in other parts of Balúchistan and are known to the inhabitants as "Bahmani."

Excavations at this place beside an ancient brick wall laid bare the walls of a small house, built of bricks, some of them vitrified, and sparingly cemented together with mud, and also of a stone house enclosing platforms paved with stone. This, Captain Mockler thinks, may have been a temple. Pottery, charcoal, bones, chiefly of fish, and flint knives were found both in the houses and in the soil around. A number of oblong stone enclosures were also met with, one wall sometimes above another and running in a different direction. Fragments of pottery, stone knives, bones and pieces of copper are abundant in these enclosures and below the foundations, and in several of them, earthen pots were discovered, about 2½ feet high,

containing earth, stones, bones, (occasionally charred) teeth, charcoal, and in one case a small stone knife. The contents, with the possible exception of the bones, appear to have been washed in by water. Besides the earthen pots, pieces of shell bracelets, stone cubes like large dice, stone and pottery beads, fragments of copper bracelets, grinding stones, and round stones like cannon balls were found in the enclosures.

About 40 miles west of Sutkagen Dor is a place called Damba Koh or Dambani Koh (the hill of dambs, *i. e.*, cairns). A range of hills is covered with little square stone enclosures 8 or 9 feet square at the base, each having a single door which usually faces up the hill; a few, without apparent reason, have openings to the north, *i. e.* at right angles to the others. These enclosures were originally plastered over with mud and diminished in size above, but they are for the most part ruined and of many only a circle of stones remains. It is not clear whether these little enclosures were dwellings or tombs, but they were probably the latter. All contained earthen pots originally and much of the pottery is coated with a green glaze.

The country around the hills is a level of grey clay, and the hills consist of beds of similar clay tilted up and interstratified with limestone or calcareous sandstone, blocks of which are used for building. Two hills away from the main range are covered with ruins of stone houses built very close together. Most of these contained several rooms, each from 15 to 20 feet square. These ruins are probably the remains of the city, the inhabitants of which were buried in the "dambs." Details of the construction of these houses are given in the paper. Pottery, beads, &c., were found and a coin with some Greek letters still visible. The forms of the pottery discovered are different from those now used in Balúchistán.

In the neighbourhood of one of the hills remains of a furnace were found which had apparently been employed for burning vitrified bricks. None of these were found in the houses, but it is supposed that a fine red earth which abounds is due to their decomposition.

Remains of another city called Darmáni bán exist 5 miles south-east of Damba Koh and consist of a number of large houses packed closely together on a solitary hill, and of "dambs" on the hills around. The latter are not so well preserved as at Damba Koh. Here also the remains of a furnace were found. Forty miles south of Damba Koh at a place called Júní (or Júnrí) there are more "dambs", but they are, with rare exceptions, oval or circular, not square, and no door could be found, though one may have existed on the west side which is always more ruined than the others. These dambs are on level ground, not on hills. In one a pot with bones was found, and some fragments of iron, in others pottery, stones for sharpening knives, copper bracelets, and in one case a copper lamp, cornelian beads, ornaments, a lot of decomposed iron and bones.

Six "dambs" were also examined at a place called Jati, 6 miles from Guádar, three of these contained human bones alone, others contained besides bones, pottery, iron, &c.

Captain Mockler thinks that in all these dambs the bones were collected after the body had decomposed, and were placed either in an earthen pot or on the ground, and that an earthen water pot and sometimes other pots, perhaps containing food, were added, as well as ornaments and weapons. No signs of cremation appeared, except at Sutkagen Dor, and at that place there are no dambs and the houses were probably made by a different people. Captain Mockler concludes by saying that since his attention was first drawn to these antiquities, which have never before been noticed, he has heard of their occurrence in many parts of the country, and that he hopes to continue his researches into these and other remains.

Mr. BLANFORD added that the account appeared to indicate remains of two different ages, as in the sets of buildings at Sutkagen Dor flint knives were found and but little metal, whilst remains of iron implements and a Greek coin were found in those at Damba Koh. The remains of cyclopean masonry occur throughout Balúchistán, and the walls appear chiefly to have been built in order to form dams to reservoirs of water. The vitrified bricks mentioned are found at all old cities in Sind such as Arúr and Bráminabád.

Mr. WOOD-MASON exhibited specimens of a species of *Iapyx* which he had recently found amongst the decaying leaves and fungi at the foot of a bamboo-clump in his own garden at Calcutta, and said—

"This remarkable form of Arthropoda, which has not hitherto been met with in India or, indeed, in any part of Asia, is of the greatest interest as belonging to a group the members of which are considered by Sir John Lubbock to be the living representatives of a primæval form from which the great orders of insects have all originated. Discovered many years ago in Algeria by M. Lucas, the eminent French entomologist, *Iapyx solifugus*, the type of the group, was only made known to science in 1864, when Mr. Haliday described and figured it in the 'Transactions of the Linnean Society of London'; in the following year it was submitted to a more careful examination by Meinert, who detected a pair of rudimentary appendages on each of the seven anterior segments of the abdomen, just as in its allies, *Campodea* and *Nicoletia*, in which latter, however, all the abdominal segments appear to be thus furnished. Four species of the genus have already been described, viz., *Iapyx solifugus*, Haliday, from Algeria, Switzerland, and various parts of Italy; *I. Saussurii*, Humbert, from Mexico; *I. gigas*, Brauer, from Cyprus; and *I. Wollastoni*, Westwood, from Madeira and an adjacent island. A fifth has now been discovered thousands of miles from the nearest

of these localities, in association with a large bright crimson-coloured species of *Anoura*, two species of Spring-tails, two or three *Pselaphidæ*, five or six myriopods, amongst which a *Polyxenus* differing from the European *P. lagurus* in having one instead of two pencils of silvery hairs at the end of the body, and a species of the very remarkable genus *Scolopendrella* especially merit attention.

Mr. Wood-Mason next exhibited some remarkable species of *Mantidæ*, and said—

These insects belong to that division of the family in which either the legs or some part of the body is provided with appendages, and to that section of it in which in males as well as in females the antennæ are simple and setaceous and not pectinated, and I invite attention to some sexual differences presented by them which, I believe, have never before been noticed.

In *Hestias Brunneriana*, the head of the female is prolonged vertically in the form of a cone bilobed at its extremity, while in the opposite sex this great cone is represented by a mere tubercle, as in both sexes of the species belonging to the genus *Creobrota*; the fore-femora, which are wanting in the specimen from which the species was described by Saussure, are equally conspicuous in both sexes, being very broadly oval, with their upper margins very strongly crested.

In the next specimen to which I would draw attention, a small (22 mm. long) female insect brought from Pegu by Mr. Kurz and apparently allied to *Hestias* and *Oxypilus bicingulata*, DeHaan, the upper edges of the fore-femora are sharply crested, but not so greatly expanded; the cephalic cone is bicuspid at the extremity and armed with two pointed cusps on each side; the occiput presents behind each eye a pointed tubercle directed backwards; the face is carinate, the keel of the 'facial shield' terminating above in a stout conical tooth; the two upper ocelli are surmounted by a pair of long and slender conical spines; the organs of flight do not nearly reach to the extremity of the abdomen, and the disc of the prothorax is armed with four sharp erect spiniform tubercles. From the analogy of *Hestias*, I confidently expect that the male will prove to have its head similarly armed with a tubercle. I have named this curious insect *Ceratomantis Saussurii*.

I also exhibit the two sexes of an insect captured, the female by Mr. Peal in the Naga hills, and the male by Dr. Cameron in the Bhutan Doars; in the former the head is provided with a long and slightly tapering foliaceous frontal horn, truncated at the apex, longitudinally obtusely carinate in front and sharply crested behind, and nearly three times as long as the head is high; in the latter this great foliaceous horn is reduced to little more than a tubercle only about half as long as the head is high. I have named this

insect *Phyllocrania Westwoodi* notwithstanding that the prothorax has no foliaceous expansions.

Similar sexual differences may be looked for in *Phyllocrania*, *Parabl-pharis*, and *Sibylla*, the males of which are still unknown.

In the *Phasmidæ*, we meet with apparently similar sexual differences, but in these insects the great reduction in size and thickness of body that has taken place in the males may well have effaced the horns and foliaceous lobes which after all are generally relatively not very greatly developed in the females; we see the truth of this in the cases of the genus *Phyllium*, wherein the foliaceous lobes of the abdomen and legs of the female are relatively very large and those of the male are consequently by no means inappreciable, and in the case of *Lonchodes insignis*, in which in males more than ordinarily stout the cephalic horns reappear in rudiment though they have disappeared in slenderer individuals.

Mr. WOOD-MASON also announced that he had ascertained by actual observation of living specimens belonging to several species that the femoral brushes described at a recent meeting are used by the *Mantidæ* to keep their eyes in a functional condition; and that they are present in the young when they quit the egg.

The following papers were read:—

1. *On the physical explanation of the Inequality of the two semi-diurnal, Oscillations of Barometric Pressure.—By* H. F. BLANFORD, ESQ., F. G. S., *Meteorological Reporter to the Government of India.*

(Abstract.)

Mr. BLANFORD said that the paper he had to bring before the meeting dealt with a phenomenon which to observers in tropical countries is one of the most familiar and most regular in the whole range of Meteorological physics, but is, at the same time, one, on the explanation of which the greatest diversity of opinion prevails.

It needs but to observe the rise and fall of the barometer for a day or two, in about any part of India, to learn the fundamental fact, that the atmospheric pressure undergoes daily, a double oscillation which is so regular in its occurrence, that except during the passage of a cyclone it is scarcely ever masked by the irregular or not periodic variations. From between 3 and 4 in the morning the pressure begins to rise, slowly at first, afterwards more rapidly, and it attains its maximum generally between 9 and 10; the exact hour varying at different seasons of the year. It then falls with great rapidity during 3 or 4 hours after noon, and attains the lowest pressure of the 24 hours about 4 or 5 P. M. Again a

rise takes place till about 10 at night; but this second maximum is somewhat less than that of the morning. Finally it falls, but less than in the afternoon, and reaches a minimum between 3 and 4 A. M. Such is the phenomenon as usually observed in Bengal, but it is subject to some local variations, both as to the time of the extremes and the relative and absolute amplitude of the oscillations. On hill stations 6,000 or 7,000 feet above the sea, the afternoon minimum is generally not quite so low as the morning minimum, and the morning maximum occurs later. And, on the plains, the morning maximum occurs earlier and the afternoon minimum later in the dry hot weather than in the rains; at dry stations in the interior than at damper stations near the coast. It decreases in amplitude as we retreat from the tropics towards the poles, and in Europe it is always more or less masked by the greater irregular oscillations to which the atmospheric pressure is there subject. In the tropical Atlantic the rise and fall of both oscillations are nearly equal, and apparently less than on the land.

The phenomenon is generally spoken of as the barometric tides, but it is clearly not a phenomenon of the same order as the oceanic tides, since it is quite independent of the position of the moon, and has reference not so much to the position of the sun, as to the length of time he is above the horizon. Atmospheric tides there undoubtedly are, similar in general character and origin to those of the sea, but these are not to be detected in the oscillations of the barometer, except as small residual phenomena, when readings are taken at different elevations and afterwards compared and reduced.

The occurrence of the diurnal oscillations and their regularity was observed as long ago as the middle of the last century, and many hypotheses have been put forward to account for them.

One of the earlier explanations was that of Kaemtz who referred them to the action of the sun's heat, in expanding the air and causing an overflow to East and West; while the superincumbent mass of the atmosphere is reduced to a minimum where the sun's heat falls most directly. But this would fail to account for the double tide, and accordingly Sabine and Dove supposed that the whole phenomenon is composed of two distinct elements; viz., a single oscillation, which was explained on Kaemtz's hypothesis; the result of which, taken by itself would be to produce a minimum at the hottest time of day and a maximum at the coldest; and a double oscillation which they referred to the varying tension of water vapour which has (in dry countries at least) two maxima and two minima. This view was adopted by Herschell in his well known treatise, and also by Col. James in his Handbook of Instructions. But it was found when tested by observation, that it failed to explain the phenomenon. At Bombay, for instance, it was found that when the curve of vapour tension was subducted from the

curve of the barometric oscillation, instead of leaving a single curve of one oscillation, a very irregular curve resulted, in which the double oscillation was still a very prominent feature. This, it was suggested, was a local peculiarity owing to the alternation of the sea and land breezes; but it was speedily discovered that so far from being exceptional it was the general rule in all parts of India, and that the hypothesis of Dove and Sabine could in no way be made to suffice for the facts.

Another view had been put forward independently by Broun of Trevandrum and Lamont of Munich, and had received support from Mr. Hornstein of Vienna. This is that the element of the double oscillation is an effect of either the Solar magnetism or electricity, and Mr. Hornstein had demonstrated that, in certain respects, the phenomenon shews a periodicity corresponding to the frequency of sun-spots and auroras, and also of the period of the sun's rotation on his axis. Beyond, however, such coincidences, which seem to establish no more than that the phenomenon varies with certain solar phenomena and others which are known to vary with them, there appears to be little ground to assign the tides to magnetic rather than to thermal agency.

Meanwhile Espy, Davies and Kreil had, as it appears, independently of each other, drawn attention to one necessary consequence of the diurnal heating of the atmosphere, which had escaped the attention of Kaemtz, Dove and Sabine; and which, whether affording a complete or only a partial explanation of the oscillation, must cause a double diurnal oscillation such as is to be accounted for. This is the increase of atmospheric pressure produced by the expanding atmosphere in the forenoon, and that again produced by its contraction in the evening. It follows from elementary mechanical laws, that a mass of air resting on the ground and expanding, must exercise pressure in excess of that due to its weight; that this pressure will increase as the rate of expansion increases, will be constant when the rate of expansion is constant, and will fall as that rate decreases. Thus will arise an oscillation of pressure, similar to, and about coincident with the morning oscillation. As a partial verification of this coincidence, Mr. Blanford stated that he had found, on comparing the Calcutta diurnal curve of pressure with that of temperature, that the instant of the morning maximum of the former falls less than half an hour later than the instant of most rapid rise of the latter near the ground surface.

In the evening, the contraction of the atmosphere in consequence of its cooling, will necessarily produce an increase of pressure, arising from the subsidence of the contracting atmosphere, and this seems a not improbable explanation of the evening maximum. It appeared to be somewhat inexplicable that this suggested explanation has not received more attention at the hands of physicists. As put forward by Davies and Kreill it presents some weak points, but these are not essential.

On this hypothesis, since the two diurnal oscillations are due to different kinds of action, there would be nothing even apparently anomalous in the fact of their inequality. But, as a fact, the inequality of the two oscillations is greater on the land than on the sea, greater in dry than damp weather, and undergoes reversal between the plains and mountains. As a distinct feature of the whole phenomenon it deserves independent study.

Pointing out that the whole oscillation may be considered as compounded of a single and double oscillation, the former of which produces the inequality referred to, Mr. Blanford said that in discussing the diurnal variation of the winds at Calcutta he had found that there was a diurnal single oscillation of the wind-direction coinciding in the hours of change &c., with the barometric single oscillation in question, and also a double oscillation of the wind bearing the same relation to the double barometric oscillation. Of these the first is the most important. The tendency of the wind is to blow from the West (the direction of the ordinary land-wind) during the day, and the opposite during the night. It is difficult to escape the obvious inference that the coincidence of a westerly wind with falling pressure, and an easterly with rising pressure, both in the case of the single and double oscillation is not fortuitous.

If the diverse effects of the sun's heat when falling on land and water be investigated, it will be found that a greater pressure will be generated over the former than over the latter. A given quantity of heat used up in the one case in heating dry air, in the other in charging it with vapour without heating it, will raise the pressure of the dry air $7\frac{1}{3}$ times as much as that of the moist air. After allowing much for heat reflected, radiated &c., it still seems highly probable that a portion of this difference will remain outstanding, and thus will arise a diurnal inequality of pressure over land and sea, a pressure, however, due to the internal motion of the air and not to the quantity which exerts weight. The tendency of this will be to produce a transfer of air from the land to the sea in the day, and a compensating return current at night.

That the amplitude of the day oscillations does depend to a great extent on the kind of work done by the sun's heat is evidenced by the small amplitude of the barometric curves in the rains as compared with those of the dry weather, at sea as compared with land, and on cloudy days as compared with clear days, which last fact was established by Kreil and Lamont.

Within the last few months a very elaborate summary of the data recorded in different parts of the world, bearing on the subject of the barometric tides has been published by Mr. Alexander Buchan. In reviewing these data Mr. Buchan has drawn a conclusion as to the variation of the diurnal fall of pressure which at the first glance appears very paradoxical, but which falls in so admirably with the conclusions just described, that it

has been the immediate occasion of the present paper. Mr. Buchan has pointed out that the fall of pressure during the afternoon hours seems to depend much on the local distribution of land and water as well as on the position of the sun, the humidity of the air, and the direction of the wind, particularly considered as a land or sea wind; and that while numerous illustrations could be adduced shewing a larger oscillation over the same region with a high temperature and a dry atmosphere, than with a low temperature and a moist atmosphere there are some remarkable and striking exceptions. One of them is presented by the Mediterranean on the coasts of which sea, the amplitude of the oscillation is least, precisely at that season when the air is driest. Mr. Blanford remarked that this apparent anomaly is readily explained by the action already described. The inequality of the diurnal pressures generated over land and sea will be greatest when the sun's action is most direct; when the solar rays, unimpeded by cloud, fall on the land in the one case, on the water surface in the other, and under such circumstances the transfer of air from land to sea during the day will be a maximum, and the diurnal fall of pressure on the coast will be diminished by the local accumulation of air.

It appears then in a high degree probable that a great part of the diurnal irregularity of the barometric tides is due to the transfer of air from land to sea and *vice versâ*, and to a similar transfer which may be proved to take place between the plains and the mountains. But the phenomenon is very complex, and much study and labour are yet required to unravel its elements, consisting as they do, partly of elastic and reactionary pressure, partly of dynamic pressure, and partly of variations in the static pressure of the atmosphere. Till this shall have been done, and it shall be found, after all, that heat and its effects are insufficient to explain the phenomenon, it seems premature to resort to magnetic and electrical phenomena for the explanation of the barometric tides.

2. The *Cyclostomaceæ of the Dafla Hills, Assam.*—*By Major* H. H. GODWIN-AUSTEN, F. R. G. S., F. Z. S.

The present list is confined to the operculated land shells and includes 33 species, of which eleven are described and figured as new; five were previously known from Darjiling; thirteen are well-known Khási and Nága Hill forms, and three or four extend to the Shán States. The *Helicidæ* will form the subject of a second paper, in which the author hopes to be joined by Mr. G. Nevill. The most interesting species described appears to be *Megalomastoma tanycheilus.*

The paper, which is illustrated by one plate, will be published in the Journal Part II, No. 3, 1876.

3. *Description of* Pelomys Watsoni, *a new species of Mouse from Sind.*—*By* W. T. Blanford, F. R. S., &c.

Amongst some small mammals and reptiles in spirit received from Mr. H. E. Watson of the Sind Commission, are two specimens of a mouse from the southern extremity of the Khirthar range about 50 miles north-west of Kotri. At first from the very peculiar characters of the molar teeth, I was inclined to consider this animal a new genus, but, although the molars of adult *Pelomys* have not been described, those figured in Peters's 'Reise nach Mozambique' being apparently scarcely worn, it appears highly probable that in an older animal they would exhibit the peculiarities of the Sind rodent. In both species the upper incisors are grooved, and the hallux of the fore-foot has a small teguliform nail. I propose to name the new species after Mr. Watson, to whom we are indebted for several additions to the Sind fauna, both Dr. Day and Mr. Hume having been much aided by him when collecting in Sind.

Pelomys Watsoni, sp. nov.

The fur is harsh and consists of very flat hairs each with a broad groove down one side: the general colour is brown, approaching that of a hare, above, dirty white below. The hairs are dusky grey at the base, then darker, tawny towards the ends on the back and sides, numerous longer hairs, either entirely black or with a black tip, being scattered throughout the back. Average length of hair on the middle of the back half an inch.

Ears rounded, naked outside. Feet pale brown above, soles naked, toes 5—5, all with claws, the hallux of the fore foot rudimentary but furnished with a small flattened nail. Tail stout, rather shorter than the head and body, finely ringed, and thinly clad with short bristly hairs which are black above, tawny on the sides and below.

The skull is typically murine; the anterior palatine foramina *(foramina incisiva)* very long, extending fully two-thirds the distance from the incisors to the molars. The incisors in both jaws are deep orange in front, the upper pair grooved, the lower smooth. The molars are three in number, on each side of each jaw, with deep folds of enamel arranged in semicircular lobes having their convex edges in front; these lobes in the upper teeth are arranged in 3 longitudinal rows, in the lower teeth in two. The anterior upper molar contains 7 lobes, the second 6, the hindmost 4, the anterior lower molar has 7 lobes, the second 5, the third 4, the posterior lobe in each of the lower molars being small and central.

The following are the dimensions taken from a specimen in spirit.

Total length of animal (an adult female) from nose to end of tail,	8·65 in.	·219 met.
Length from nose to anus,	4.55 „	·116 „
Do. of tail,	4·1 „	·105 „
Do. of ear,	0·57 „	·014 „
Do. of skull,	1·22 „	·0305 „
Breadth of do.,	0·62 „	·015 „

A fuller description with figures of the skull, &c., will be given in the Journal of the Society.

The occurrence of this African form in Sind in quite in accordance with other peculiarities of the fauna. The only other known species of the genus is *P. fallax*, Peters, from Mozambique.

4. Amphistoma hominis: n. sp. *A New Parasite affecting Man.*—*By* T. R. LEWIS, M. B., *and* J. F. P. MCCONNELL, M. B.

The parasite forming the subject of this paper has not, so far as we have been able to ascertain, been previously described; nor indeed have any species of the genus to which it belongs been, heretofore, found to affect man.

The anatomical and other details here recorded are based on two distinct series of dissections and observations: the earlier series of observations were conducted in June 1871 in connection with specimens of the entozoon obtained from Dr. Joseph O'Brien of Gowhatty; and the second series during the present year, on specimens which had remained undescribed for several years in the Pathological Museum of the Calcutta Medical College.

Regarding the former specimens Dr. O'Brien in writing to one of the authors of this paper (T. R. Lewis,) says:—"I send to-day—28th May, 1871—a small bottle containing some curious looking parasites found by Curran [Dr. R. H. Curran, since deceased] and I, in the intestines of an Assamese man who died of cholera.....We found them certainly, by hundreds; they lay chiefly in the vicinity of the Ileo-colic valve, and numbers were turned out of the vermiform appendix. I have sent the vermiform appendix; in it you will find two or three of the 'beasts' *in situ*. When the intestine was freshly opened they exactly resembled miniature snails and they appeared to stick on to the mucous membrane

of the gut by means of the pale sucker-like surface on the inferior portion of the body." On adding a solution of chloride of zinc to the specimens, "it had" the writer continues, "the effect of bleaching their coats and destroying the moist glistening appearance in which they formerly rejoiced." The coats of specimens thus treated, it may be remarked, became eventually grayish black.

The specimens which had been preserved in the Medical College Museum, and which formed the basis of the other series of observations (by J. F. P. McConnell), were, strange to say, obtained from the intestines of a man who was also stated to have died of cholera. This of course, might have been a coincidence merely, or it might be that owing to the irritation set up on the mucous surface of the intestinal canal by the parasite cholera-like symptoms may have become developed in addition, possibly, to some other fatal form of disease in both cases. With regard to the first case it may be mentioned that cholera was very prevalent at the time at Gowhatty, but that no such parasites were found in other cases.

The history of the specimens forming the second series of observations, and which were lodged in the Museum, is thus briefly recorded in the Catalogue of the Medical College Museum :—

"The cæcum of a native prisoner who died from cholera in the Tirhoot gaol hospital, with a number of peculiar and, probably, hitherto unrecognized parasites, found alive in that part of the intestinal canal." "(*Presented by Dr. Simpson through Professor E. Goodeve*)."

With reference to this preparation, the following very interesting particulars from the Annual Jail Report of Tirhoot for 1857 have been very kindly placed at our disposal by the Surgeon-General, Indian Medical Department. The prisoner, Singhesur Doradh, aged 30, was attacked with cholera on the 13th and died on the 14th July 1857. "Had not been in hospital previously, and was employed in cleaning the jail."

The *post-mortem* examination was made three hours after death :— "Colon externally livid, contracted ; contains a little serous fluid with flakes of mucus. Mucous membrane healthy except venous injection. In the cæcum and ascending colon numerous parasites like tadpoles, alive, adhering to the mucous membrane by their mouths. The mucous membrane marked with numerous red spots like leech-bites from these parasites. The parasites found only in the cæcum and ascending colon, none in the small intestines." This description is by Dr. Simpson, who adds, "I have never seen such parasites, and apparently they are unknown to the natives. They are of a red colour, size of a tadpole, some young, others apparently full grown, alive, adhering to mucous membrane,—head round, with circular open mouth which they had the power of dilating and contracting. Body short and tapering to a blunt point."

The lithograph (Plate III) which accompanies this preparation gives a very correct representation of the cæcum with portion of the adjacent ileum from the above case. It has been drawn to the exact size of the specimen as it now exists in the Medical College Museum. Several of the parasites have also been delineated. The majority were found free, *i. e.* detached from the surface of the bowel, but others are seen to be still slightly adherent or entangled in the folds of the mucous membrane. The solitary glands are seen to be throughout prominent and hypertrophied, a condition which although very common in cholera, appears in this instance to have existed (and still persists) in a very remarkable degree,—probably on account of the great follicular irritation which these parasites by their presence, are likely to have excited.

Amphistoma hominis, sp. nov.

The parasite belongs to the *Trematode* or Fluke order of Helminths and to the genus *Amphistoma*. We have endeavoured to refer it to one or other of the tolerably numerous species belonging to this genus but have not been able to find that it belongs to any hitherto described species, so have decided on naming it *Amphistoma hominis*.

The specimens in our possession vary slightly in size, possibly owing to to the different mode of preservation—those which were obtained from the Assamese having first been treated with chloride of zinc and subsequently preserved in glycerine, whereas the other samples appear to have been preserved in spirit throughout. Those of the former kind are of a grayish dark colour owing, as already stated, to the action of the zinc solution, whereas those of the latter are of a grayish yellow tint. Their greatest length varies from the $\frac{1}{3}$ to $\frac{1}{2}$ of an inch (5 to 8 millimeters) and the greatest width, across the caudal sucker, from $\frac{1}{8}''$ to $\frac{1}{6}''$ (3 to 4 millimeters). Its form is somewhat difficult to describe: Fig. 2 *a* in the Plate represents a ventral view of it; fig. 2 *b* a dorsal, and figs. *c* and *d* lateral and semidorsal views—all sketched double their natural size. It may be roughly divided into an anterior and a posterior half, the length of the former being about half the transverse measurement of the latter. At the anterior extremity (slightly on its ventral aspect) the oral sucker is readily detected, and about $\frac{1}{12}$ of an inch below this sucker is the genital pore. The posterior half of the *Amphistoma* is composed of a somewhat flattened, circular bursa, within which is placed the caudal sucker proper. The *bursa* may be observed in different states of contraction in different specimens; when flattened out, (as in figs. *a* and *b*, Fig. 2, Plate III) it measures about $\frac{1}{6}$ of an inch transversely. In some specimens this pouch is seen to have become folded laterally, leaving merely a slit in the long direction of the parasite an' almost hiding the sucker itself from view.

The *Caudal sucker* is a firm cup-shaped organ composed of circular and

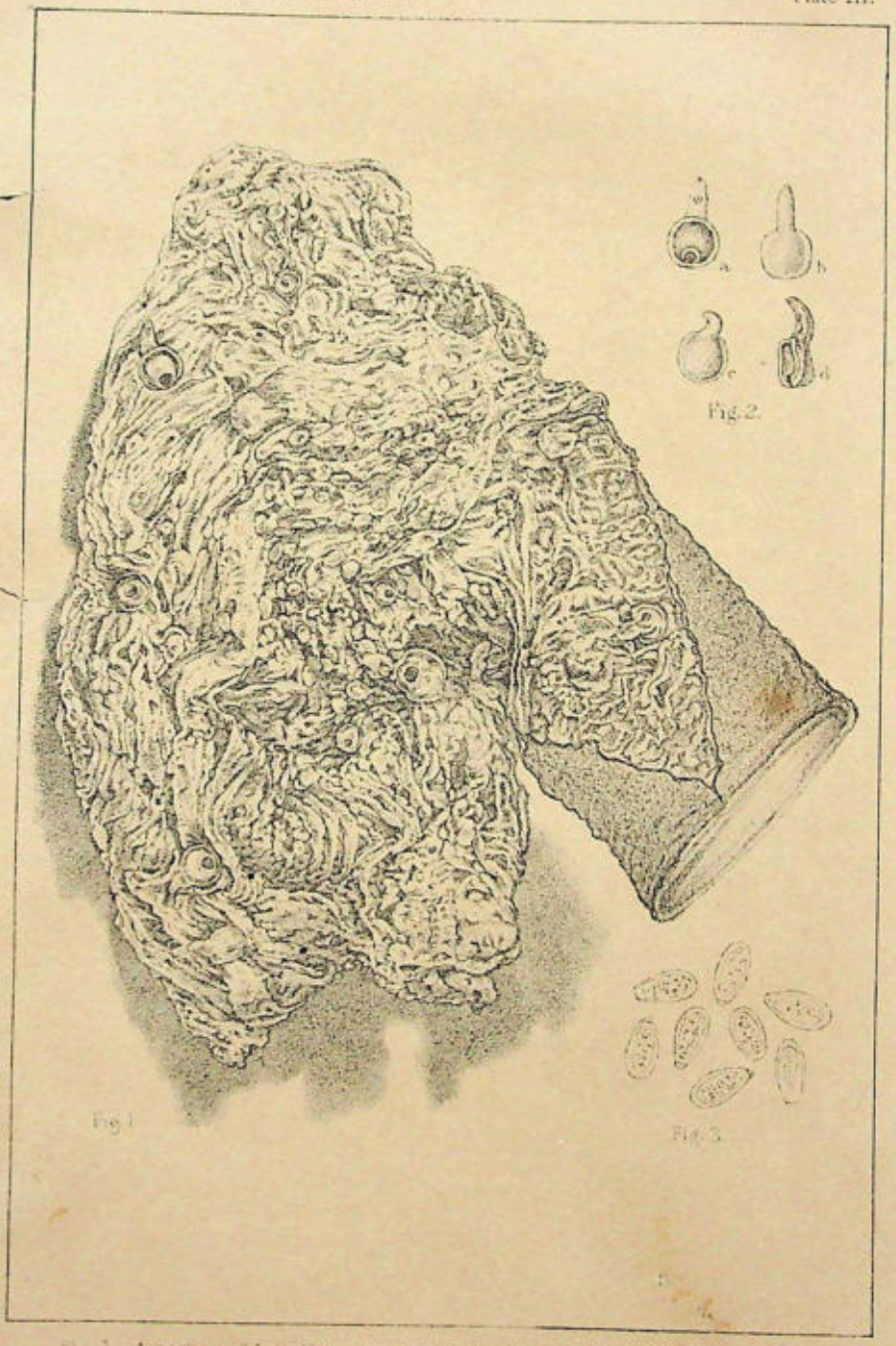


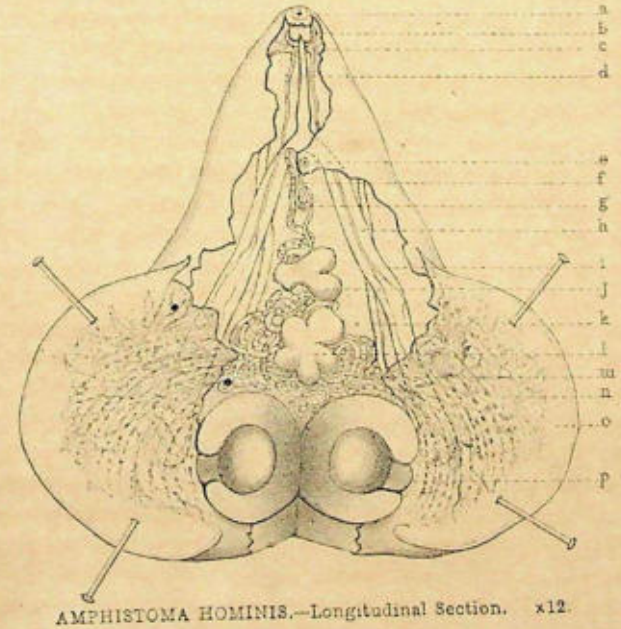
Fig. 1. A portion of Intestine slit open, with specimens of AMPHISTOMA HOMINIS adherent,—natural size.

Fig. 2. a.-d. AMPHISTOMA HOMINIS in various positions × 2.

Fig. 3. Ova of Patto × 65.

radiating muscular fibres. Its orifice is about $\frac{1}{25}$th of an inch in transverse diameter, but $\frac{1}{12}$" when the measurement is taken from the outer margin of the rim forming the sucker. In the adjoining figure a vertical section of this sucker may be observed.

In this drawing the anatomy of the entozoon may also be studied as viewed from the ventral surface. The parasite is represented as magnified 12 diameters. Commencing with the oral sucker (*a*) we find it to consist of a transversely placed oval orifice, surrounded by a ring of muscular tissue and presenting in many specimens a slight, papilla-like prominence. The orifice leads to a bulbous heart-shaped pharynx—with the apex directed anteriorly (*b*). At the lower margin the *Nervous ganglia* (*c*) may be recognised—the ganglia of one side communicating with those of the other by means of a comparatively strong cord passing transversely behind the œsophagus. Nervous filaments are given off which spread in all directions, of which the largest are the cords (*h*) which may be traced along the ventral surface of the two intestinal canals.



AMPHISTOMA HOMINIS.—Longitudinal Section. ×12.

The *Œsophagus* (*d*) is $\frac{1}{12}$" or $\frac{1}{16}$" in length, bifurcates behind the genital pore—generally a little above the level of this aperture, but sometimes

below. As indicated in the figure (*i*), the two canals thus formed terminate cæcally about opposite the middle-half of the caudal sucker.

Closely attached to the canal on either side, and easiest seen when the dissection is conducted from the dorsal surface of the *Amphistoma*, are the main branches of the water-vascular system (*k*), with which numerous fine *Canaliculæ* may, in suitable specimens, be seen connected along the entire course of the main trunks.

The *Genital pore* (*e*), as before stated, is situated about $\frac{1}{12}''$ below the oral sucker. The orifice is surrounded by muscular fibres arranged in a circular and radiating direction. Into it open the two channels of the sexual apparatus of this hermaphrodite entozoon. The *vagina* (*f*) is, in mature specimens, filled with ova, and it measures near its exit-termination about $\frac{1}{25}''$ transversely. The convolution of the vagina and uterus occupy a great portion of the interior of the worm, to such an extent indeed is this the case that it is difficult to prick the skin of the dorsal surface without witnessing the escape of ova by the rupture of some of the uterine convolutions. In front of these convolutions, as seen from the ventral aspect, is the ovarian portion of the reproductive apparatus (*l*) and closely adjoining are the lobulated *testes* (*j*) from which the *vas deferens* with its continuation the *ductus ejaculatorius* (*g*) may be traced. A double twist may generally be perceived to have formed along the course of this duct; its width between this spot and the genital pore is about $\frac{1}{250}''$ or about half that of the vagina at the same part.

The *ova* Fig. 3, Plate III, have firm capsules, and are provided with the operculum common to the ova of flukes. The average measurements proved to be $\frac{1}{170}''$ in length by $\frac{1}{350}''$ in diameter.

The ramifications of the *vitellogene ducts* with the glandules may be perceived through the cutaneous covering of the parasite, presenting a dendriform arrangement (*n*), especially distinct all over the surface of the *bursa*; and their main ducts (*m*) may be seen in some specimens directed towards the ovarian body. In addition to these glands the cutaneous envelope of the entire entozoon is seen to be plentifully supplied with glandulæ, of varying size, but averaging about $\frac{1}{180}''$; interspersed amongst which are numerous minute cells averaging $\frac{1}{2000}''$ to $\frac{1}{3000}''$ in diameter, generally of hyaline appearance and not unlike the calcareous particles common to entozoa. They withstand the action of dilute hydrochloric acid.

With these remarks we conclude our description of the leading features in the anatomy of this new parasite and we trust it is sufficiently explicit to enable future observers to experience but little difficulty in identifying it.

5. *Popular Songs of Hamirpur District in Bundelkhand.* (Second Paper).—*By* Vincent A. Smith, B. A., C. S.

(Abstract.)

This paper is in continuation of the paper on Hardaul songs published in the Journal, Part I, No. IV, for 1875, and comprises the text and translation, with a commentary, of twelve songs.

These are all Caste Songs, that is to say, songs which describe or specially refer to the occupations and characteristics of the caste of the singer. The castes, specimens of whose songs are given, are (1) Sunár, (2) Luhár, (3) Barhái, (4) Kahár, (5) Náí, (6) Kol, (7) Nat, (8) Khangár, (9) Dumár, (10) Lodhí and (11) Telí, (two songs). The songs are various in character, some being little more than catalogues of goods made by or wares sold by the singer's caste-fellows, while others are satirical.

The dialect of eleven of the songs is that of Maudhá, the eastern parganah of the Hamírpur district; one song, No. X, is a specimen of the Hindí spoken by the Lodhís of Parganah Panwárí in the south-west of the district.

It is believed that the verbal forms of these compositions are deserving of attention, and that the songs will be of interest as pictures of native society.

6. *Note on the use of the Radiometer as a Photometer.—By* A. Pedler, Esq., F. C. S., *Lond. and Berlin.*

The discovery by Mr. Crookes of the so-called mechanical action of light has naturally attracted considerable attention, and has led to numerous experiments in this direction. The instruments which are employed to shew this action of light may be conveniently divided into two classes. In the first class, a light beam, generally of straw with pith ends, is suspended in a vacuum tube by an exceedingly fine glass thread, and the effect of the heat and the light rays falling on either end is measured by the torsion of the thread. In the second class of instruments, which are called "Radiometers or Light Mills," a vane with four arms of some light material is suspended on a fine steel point, such as a needle, resting in a cup of glass, so that the arms are able to revolve horizontally upon the centre point, in the same manner as the arms of an ordinary anemometer revolve. To the extremity of each arm is fastened a thin disc of light material, such as mica, which is silvered on the one side and blackened on the other, all the black surfaces facing the same way. The whole is enclosed in a thin glass globe which is exhausted to the utmost limit which can be produced by a Sprengel mercurial pump. On exposing the instrument to light the vane revolves with a velocity proportional to the strength of the light. The former class of instruments is not so well suited for travelling as the latter,

and the experiments which are here described were performed with one of the second class of radiometers, which had been forwarded to me from England. In a paper "on the Mechanical Action of Light" by Mr. Crookes,* a few photometrical experiments with this instrument are given, and from them it is concluded that the radiometer is a perfect photometer. The author says "By this means Photometry becomes much simplified, flames the most diverse may readily be compared between themselves or with other sources of light; a standard candle can now be defined as one which at x inches off causes the radiometer to perform y revolutions per minute, the values of x and y having previously been determined by comparison with some ascertained standard; and the statement that a gas flame is equal to so many candles may with more accuracy be replaced by saying that it produces so many revolutions." This conclusion being of great practical importance, and as the experiments on which it was based were very few in number, it appeared to be advisable that they should be, if possible, confirmed by a more extended series of observations. For this purpose during the past six weeks, I have made a continuous series of measurements with this instrument, which do not however enable me to speak with great confidence in the radiometer as a photometer.

The mechanical effect produced in a radiometer is admittedly the product of the two forces, light and heat, and as it is well known that the illuminating power of a gas jet or candle flame depends very essentially upon its temperature, I thought at first that it would be better when testing the radiometer photometrically to employ the total radiation from the flames.

My first experiments consisted in observing the radiometer, which was placed at a fixed distance from a gas flame, at the same time that I was testing the gas flame by the old photometrical method of Bunsen. For this purpose the radiometer was placed inside the photometer, in which it has been kept during the whole of the experiments; this photometer is entirely lined with black velvet, so that we have only to deal with the radiation from the light itself, and the phenomena are not complicated by any radiation from extraneous sources, as would be the case if the experiments were performed in an open room. The distance of the radiometer from the gas jet in these preliminary experiments was 27·2 inches; the gas-jet a standard argand one, burning 5 feet of gas per hour, and the observations of the radiometer are here given in quarter revolutions, that is to say, the number of arms of the vane which pass a given spot in a given time.

* Quarterly Journal of Science, July, 1875.

	Illuminating power of Gas-jet, in standard sperm candles burning 120 grains per hour.	*Number of quarter-revolutions of Radiometer per minute (at 27·2 inches distance).*
1.	12·34	35·7
2.	12·04	40·0
3.	10·10	29·0
4.	11·48	38·0
5.	12·42	35·0

It will be seen that there is here a general sort of agreement between the number of revolutions and the illuminating power, but that in one or two instances discrepancies occur. I therefore thought it better to extend the observations of the radiometer by altering the distances from the source of light. By doing this, it would also prove whether the mechanical effect produced could be brought under any definite law. I therefore arranged that the radiometer could be placed at the distances 10, 15, 20, 25 and 30 inches respectively from the gas-jet, and made a series of observations of the rapidity of revolution, two and, in many cases, three measurements at each distance being taken. The results are given in the table below, and it will be again seen, that there are discrepancies between the illuminating power and the observed revolutions, and that also these discrepancies extend throughout the observations at the varying distances.

	Illuminating power of gas-jet.	Distance of radiometer from gas jet.				
		10 inches	15 inches.	20 inches.	25 inches.	30 inches.
	12·42	135	79·3	44·25	26·67	19·67
	10·58	162	108·5	66	45·5	27
	13·12	162	121·5	75	43·5	29
	9·53	152	97	60	38	25
	13·42	154·67	104·5	64·5	45·5	29
	13·06	170·5	109·5	66	43·5	31·5
	11·86	163	112	67	46	34
Average, ...	12·00	157·02	104·57	63·25	41·25	26·45
Practical result, calculated to the rate of 10 per minute at 30 inches distance		59·36	39·53	23·91	15·59	10·0
Theoretical result, calculated according to law of inverse squares, ...		90	40·0	22·5	14·4	10·0

At the bottom of the table I have calculated the observed rate of revolution, starting with a supposed unit of 10 quarter-revolutions, at the distance of 30 inches; and it will be seen that these results agree very closely with those calculated according to the law of inverse squares; that is to say, the number of revolutions of the radiometer will be inversely

proportional to the square of the distance from the source of light. But it will also be noticed that there is one marked exception to the rule, and this is at a distance of 10 inches from the gas flame where the rapidity of revolution is great. Here the actual number of quarter-revolutions amounted to 59·36 per minute, whilst theoretically they should have been 90. Evidently when the radiometer is rotating rapidly, there must be an immense increase in the friction so as to reduce the rotation by one-third of the whole amount. There are also indications in the above table that when the radiometer is rotating very slowly, there is a considerable disturbance from the theoretical rate of revolution, probably showing that friction has much influence both when the rotation is slow and rapid.

As the result of these observations was not very satisfactory in so far as the applicability of the radiometer to photometry is concerned, I abandoned my former idea, that both the light and heat rays should be allowed to act upon the radiometer; and a second series of observations was commenced, in which the dark heat rays from the gas-jet were filtered off by passing the light through a glass cell one inch in thickness with parallel sides, which was filled with a saturated solution of alum. The method of observation was similar to that before described, and under these circumstances it was found that the rapidity of the revolution of the vane fell very considerably; this will be seen from a comparison of the following table with the preceding one.

Dark Heat rays cut off by Alum solution.

	Illuminating power of gas-jet.	Radiometer in quarter-revolutions per minute.				
		10 in.	15 in.	20 in.	25 in.	30 in.
	14·30	42·5	24	14·5	8·5	5·0
	13·30	40	22·5	12·5	8·0	4·5
	15·52	48	26	16	11·5	6
	13·10	39·5	23·5	14·5	9·5	6
	13·76	44·5	81	17	9·5	5·75
	12·79	42	24·5	14	8·5	5·0
Average, ...	13·8	42·75	25·25	14·42	8·92	5·37
Calculated to 10 per min. at 30 inches distance, ..	..	79·6	47·0	26·8	16·6	10
Theoretical, ...	..	90	40	22·5	14·4	10
	11·5	25	13·5	8·5	5	
	9·1	20·5	11·0	6		
	9·56	18·5	13·0	7·5		

The velocity of rotation has, it will be seen, fallen to about one-fourth of what it was previously, and this is due almost entirely to the absorption

of the dark heat rays by the cell of alum solution; there is, of course, a certain loss of light by the use of the cell of liquid, and, in order to ascertain the amount of this, some experiments were made with the Bunsen photometer, which gave as an average of several determinations, that a total loss of 8·6 per cent. of light occurred in the passage through the alum cell. This shews then that from two-thirds to three-fourths of the mechanical effect in the radiometer, is, in the case of a coal-gas jet, due to dark heat rays, and not to light rays at all.

In this series of observations we again see a general agreement of the average of the results at the varying distances, with the law of inverse squares; but when the experiments are examined in detail, it will be found that there are somewhat serious divergences from the theory, and that the discrepancies are still greater when the rapidity of the rotation is compared with the illuminating power of the gas-jet on the separate occasions. The differences between the illuminating powers and the velocity of revolution are more marked in this table than in the last, and I cannot help thinking that the value of the radiometer as a photometer has been much overestimated.

Apparently from these experiments, which, however, are fewer in number than I should have wished, we must either believe that the old process of photometry cannot be thoroughly depended upon, or that the radiometer does not yield absolutely constant results. During the experiments I have made, there have been some instances in which I obtained some very curious alterations in the rapidity of rotation of the radiometer with scarcely any apparent alteration in the external circumstances, these, however, I cannot at present satisfactorily explain. Since making the above experiments I have received a paper by Mr. Crookes (published in the Proceedings of the Royal Society, vol. XXIV, p. 276) in which he proves, that different parts of the spectrum have very different actions on the rotation of the radiometer; and as the light of coal gas varies from white to yellow, it is possible that the origin of the discrepancies between the radiometer and photometer may be due to the differences in colour of the light. There are, however, other photometrical instruments such as, "the Sugg Jet Photometer," and it is my intention to compare this instrument with the radiometer. During these experiments, I have of course not neglected to test the radiometer, with the standard sperm candles, and even here I obtained somewhat discordant results. As an average of my determinations, I found that my radiometer, when placed at a distance of 10 inches from a candle burning 120 grains of sperm per hour, made 18·2 quarter rotations per minute. The average of the radiometer under the same circumstances with a gas flame of 12-candle power was 157·02 quarter-revolution; according to the radiometer, therefore, *under these conditions*, the

illuminating power of that gas flame would be only 8·6 candles, or about two-thirds of the illuminating power as measured by the old process.

It is, I think, evident from these experiments that it would be impossible to say that because a Radiometer rotated sixteen times as rapidly with one flame as it did with another, that the former flame possessed sixteen times the illuminating power of the latter; for it must be seen that in working with either a very high or very low rate of revolution, there appears to be considerable disturbance due to the friction of the instrument. It is I believe possible, and even probable, that much better results will be obtained, by working the radiometer always to a fixed number of revolutions (say about 30 or 40 quarter-revolutions per minute); and by altering the distance of the flame until such rapidity is obtained; in this way the friction of the instrument would be reduced to a constant quantity, and the comparative luminosities could be judged by the squares of the distances. These observations to be conclusive will take a considerable time to carry through, but I hope at some future period to lay them before the Society.

Through the courtesy of the Rev. Father Lafont I have been able to test a second radiometer of a similar construction, having blackened discs of an equal size, which are suspended in the same way on a glass pivot.

I have found that it is a much more sensitive instrument than my own, but that the relative sensitiveness varies according to the velocity of rotation. Some of the comparisons are instructive, and are given in the table below; No. 1, Radiometer being the one used in the former experiments, and No. 2, the instrument belonging to Father Lafont.

Source of Light.	Radiometer, No. 1, Quarter-revolutions per min.	Radiometer, No. 2, Quarter-revolutions per min.
Standard Sperm Candle, burning 126 grains per hour, ..	19	34
Gas Jet 13·76 candle power at 10 inches distance, ...	169	221
" " " " 20 " "	74	119
" " " " 30 " "	35·5	62
" " " " 10 " with alum cell interposed, ...	44·5	73
" " " " 20 " "	17	35
" 9·56 " " 10 " "	18·5	32·5
" " " " 20 " "	7	9

It will be seen that these comparative experiments confirm what has been said before that radiometers at high and at low velocity of rotation give somewhat uncertain indications; for instance at a high rate of revolution No. 1 radiometer is about one-third less sensitive than No. 2; at a

medium speed it is about one-half as sensitive, whilst at a very low speed of rotation the two become almost equally sensitive. So far as can be judged, the only difference between the two instruments must be in the amount of exhaustion; but whether a more perfect vacuum will produce a more sensitive instrument or the contrary, I cannot pretend to say. The results here described, are of course, only applicable to the "Light Mill;" but I should imagine that the other kind of radiometer, where the effect is measured by torsion, would probably give more constant results. I do not even now despair of the Radiometer being of some use in Photometry, although I very much doubt if it will ever supersede the old Bunsen method with the standard candles.

7. *A Sketch of the Vegetation of the Nicobar Islands.*

By S. Kurz, Esq.

(Abstract.)

The Nicobar Islands are geologically divisible into two groups, the the Southern, which belongs to the brown-coal formation, and the Northern, where alluvial deposits are pierced by plutonic rocks. This geological division coincides with the botanical one, at least in its broad features; the islands of the northern group being characterized by extensive grass-heaths, while those of the southern group are forest-clad to the very summit. The vegetation divides into the following five groups:—

1. The mangrove-forests, which grow on the swampy alluvium at the debouchure of the rivers.

2. The beach forests, which occupy the calcareous sand of the beaches and are the chief zone in which not only the cocoa-nut palm grows but on which the Nicobarese build their huts.

3. The tropical forests, growing on different strata. Of these, two varieties are for the present separated:

a. The coral-reef-forests, which grow on the upraised coral-lands;

And

b. The true tropical forests, growing on plutonic rocks and polycistina-clay. Those growing on polycistina clay are alone fully treated, while those on plutonic rocks and on calcareous strata had to be omitted for several reasons.

4. The grass-heaths. These occupy the hillocky plateaux of the islands of the Northern group and offer many peculiarities.

5. The marine vegetation, which is restricted to a few phanerogamic plants, while seaweeds and other algæ are abundantly represented.

Cultivation is little represented on these islands and, therefore, not separately treated, but the botanical constituents of the forests are given

in full, a list of the plants of these islands being appended, which contains more than 600 species of phanerogams and ferns.

Finally, the author expresses his thanks to Prof. Dr. Pelzeln, Director of the Vienna Museum, for forwarding to Calcutta for his examination the botanical collections made during the visit of the Austrian frigate 'Novara' to these islands.

The paper will be published in full in the Journal, Part II, No. 3, 1876, with illustrations.

Mr. W. T. BLANFORD said that the circumstance of the Nicobar collections of plants made during the Novara Expedition having been entrusted to Mr. Kurz for determination and description shewed the appreciation felt in Germany for Mr. Kurz's botanical labours, and that the Society were indebted to Mr. Kurz for his having presented to them the first results of his study of the collections in question.

Report of the second Sub-Committee appointed by the Council to consider the question of the introduction of a Compounding Fee for Members of the Asiatic Society of Bengal.

The Sub-Committee having carefully considered the earlier papers on the subject, as well as the Report of the Sub-Committee appointed in 1875, with the remarks of the Council thereon; is of opinion

I. With reference to the *Amount* of the Compounding Fee—

That it should be calculated on the basis of the subscriptions paid by *Non-resident* Members, and should be such a sum as will, with the interest accruing from it annually at 4 %, be sufficient to meet the expense incurred by the Society during the average lifetime of a member compounding on entering the Society between 25 and 30, the expectation of life being about 29 years.

The Sub-Committee believe that the sum of Rs. 300 is the lowest that will fulfil these conditions, and they would therefore recommend that this sum be fixed as the compounding fee for a non-resident member.

II. With reference to the Compounding Fee for Resident Members—

The opinion of members of Council and others who have considered the question before has been generally in favour of one single compounding fee for resident and non-resident members, but the only reason given has been the inconvenience and complication that would arise by having two compounding fees, one for resident and another for non-resident members.

As the Society is at present constituted the Sub-Committee consider that some difference must be made between the rates of compounding for resident and non-resident members, and that the best way of avoiding the difficulty of two fees will be to provide that Resident Members who may

have already compounded or wish to compound, shall, in addition to the compounding fee they would pay as non-resident members, pay the difference between the non-resident and resident subscriptions; and it may be remarked that the first rules for compounding passed by the Council in 1872 were based on this principle.

One of the chief inducements for a member to compound is that he may be free from the necessity of remitting his periodical subscriptions when away from the head-quarters of the Society. The proposed rule would meet this completely for all non-resident members, whether in this country or in Europe, while the trouble to Resident Members of paying the extra subscription when in Calcutta would be very slight indeed.

The Sub-Committee would further observe that by calculating the compounding fee on the non-resident rate, it can be fixed at a much lower sum than if it covered resident as well as non-resident subscriptions; and they believe that the rules they now propose will thus be much fairer for all classes of members and also make the compounding fee independent of any future reduction in the resident rate of subscription.

The Sub-Committee have the less hesitation in making this proposal in opposition to the general opinion previously expressed, because they believe that a similar principle obtains in other scientific societies where the members are classed as resident and non-resident, as well as in some clubs.

III. With reference to the Reduction of the Compounding Fee by Length of Membership—

The Sub-Committee are of opinion that some such provision would be desirable, and indeed only equitable to those members who having already subscribed to the Society for many years, might be desirous of compounding for future subscriptions. And it appears also desirable that members who join the Society at an early age, and therefore are likely to find the full amount of the compounding fee more than they can afford to pay, may have an opportunity of compounding at a reduced rate when they can better afford to do so.

The Sub-Committee believe that this object can most conveniently be gained by making a reduction in the compounding fee in proportion to the number of annual subscriptions already paid; and they would therefore recommend that the compounding fee to be paid by members already belonging to the Society should be a reduction, from the full compounding fee, of Rs. 10 for each full annual subscription of 24 Rs. already paid, exclusive of the extra contribution paid by Resident members.

IV. With regard to the alteration of Rule 14 A., so far as it relates to the commutation of subscriptions by members leaving India—

The Sub-Committee believe that the rules they now propose for reducing the compounding fee in proportion to the length of membership in the

Society will amply meet the requirements of members leaving the country for good, and they would therefore propose that the provisions of Rule 14, A. laying down a composition of Rs. 100 be rescinded.

V. With reference to the Investment of the Capital acquired by Compounding Fees—

The Sub-Committee quite agree with the general opinion expressed upon this point by the Council and the former Sub-Committee and would recommend that the capital realised from Compounding Fees shall in each instance be regularly invested by the Treasurer as soon as possible after receipt, and shall not be available towards the current expenses of the Society; but that the interest may be applied to the general purposes of the Society.

On these grounds the Sub-Committee would recommend the introduction of the following rules:*

I. Any member of the Society may, after he has paid his entrance fee, compound for the payment of all future subscriptions as a *Non-resident* Member by the payment in a single sum of Rs. 300.

II. Any member already belonging to the Society may at any time compound for his future subscriptions as a non-resident member by the payment of the above compounding fee, less Rs. 10 for each full annual subscription of Rs. 24 he may have already paid, exclusive of the extra contribution of a resident member.

III. Resident members wishing to compound shall, in addition to the compounding fees calculated as above, be liable *in all cases* to pay a quarterly subscription equal to the difference between the Resident and Non-Resident rates of subscription, during such time as they shall remain resident. Such additional subscription to be chargeable under the provisions of Rule 9 E.

IV. The amounts realised by Compounding Fees shall in all cases be regularly invested by the Treasurer as soon as possible after receipt thereof; and only the interest accruing therefrom shall be considered available for the general expenditure of the Society.

V. In Rule 14 A. instead of the words "commutable into a single payment of Rs. 100" the following should be substituted "commutable into a single payment under the provisions of rule II (of these rules)."

Sd. R. TAYLOR.
J. O'KINEALY.
J. WATERHOUSE.

* These rules though adopted in principle have been modified by the Rule Committee, as will be seen at p. 166. ED.

Library.

The following additions have been made to the Library since the Meeting held in July last.

Transactions, Proceedings, and Journals,

presented by the respective Societies or Editors.

Berlin. Königliche Preussische Akademie der Wissenschaften.—Monatsberichte. April, 1876.

Papadopulos.—Beiträge zur inschriftlichen Topographie von Klein-Asein.

Bombay. The Indian Antiquary. Vol. V, Pt. 56, July, 1876.

Dr. F. Kielhorn.—Remarks on the Sikshâs. *Prof. M. Williams.*—Sraddha Ceremonies at Gayâ. *Dr. G. Bühler.*—Grants from Valabhi. *F. S. Growse.*—Translation of an Episode in the 1st. Book of the Râmâyana of Tulsi Dâs. *Rev. F. T. Cole.*—The Râjmahâl Hillman's Songs.

Brussels. L'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique.—Mémoires couronnés et autres mémoires, Tomes 24, 25 26, 1875.

Tome 24. *M. Melsens.*—Note historique sur J. B. van Helmont à propos de la définition et de la théorie de la flamme. Opinions des anciens chimistes et physiciens sur la chaleur, le feu, la lumière et la flamme dans leurs rapports avec les idées et les travaux de van Helmont. *A. Perrey.*—Note sur les tremblements de terre en 1870, avec supplément pour 1869. Note sur les tremblements de terre en 1871, avec suppléments pour les années antérieures de 1843 à 1870.

Tome 25. *M. P. Mansion.*—Théorie des équations aux dérivées partielles du premier ordre. *J. C. Houzeau.*—Résumé de quelques observations astronomiques et météorologiques faites dans la zone surtempéreé et entre les tropiques.

Tome 26. *A. Gilkinet.*—Mémoire sur le polymorphisme des champignons.

———. ———. Mémoires couronnés et Mémoires des savants étrangers. Tome 38, 1874. Tome 39, 1876.

Tome 38. *Dr. J. P. Nuel.*—Recherches sur l'innervation du coeur par le nerf vague, faites au laboratoire physiologique d'Utrecht.

———. ———. Mémoires. Tome 41, Pts. I, II, 1875.

Pt. I. *F. Plateau.*—Recherches sur les phénomènes de la digestion chez les insectes.

———. ———. Bulletins, 2nd Série, Tomes 37, 38, 39, 40; 1874, 1875.

———. ———. Annuaire pour les années 1875 et 1876.

———. ———. Notices Biographiques et Bibliographiques, 1874.

Calcutta. Geological Survey of India. Records, Vol. IX, Pt. 2, 1876.

Dr. O. Feistmantel. Notes on the Age of some Fossil Flora in India. *R. Lydekker.*—Description of a Cranium of *Stegodon Ganesa*, with notes on the sub-genus and allied forms. *H. B. Medlicott.*—Note upon the Sub-Himalayan Series in the Jamu Hills.

Leipsic. Der Deutsche Morgenländische Gesellschaft,—Abhandlungen, Band VI, No. 1.

M. l'Abbé P. Martin.—Chronique de Josué le Stylite, écrite vers l'an 515.

London. The Athenæum,—Pt. 580, April, 1876.

———. Nature,—Vol. 14, Nos. 345, 346, 347, 1876.

———. Geological Society,—Qt. Journal, Vol. 32, No. 126, May, 1876.

———. The Royal Society,—Proceedings, Vol. 24, No. 168.

Dr. U. Pritchard.—The Organ of Corti in Mammals. *C. S. Bate.*—On the Development of the Crustacean Embryo, and the Variations of form exhibited in the Larvæ of 38 Genera of *Podophthalmia*. *C. Meldrum.*—On a Secular Variation in the Rainfall in connection with the Secular Variation in amount of Sun-spots.

———. The Royal Astronomical Society,—Monthly Notices, Vol. 36. No. 6, August 1876.

———. The Statistical Society.—Journal, Vol. 39, Pt. I, March 1876.

J. Dun.—The Banking Institutions, Bullion Reserves, and Non-Legal-Tender Note Circulation of the United Kingdom Statistically investigated. *M. E. Grant-Duff.*—Opening Address of the President of the Department IV, "Economy and Trade," of the National Association for the Promotion of Social Science at the 19th Annual Congress held at Brighton in October, 1875.

Pisa. Società Toscana di Scienze Naturali. Atti. Vol. I, fas. 3.

Rurki. Professional Papers on Indian Engineering,—Vol. 5, No. 21, 2nd Series, July 1876.

Experiments on Strength of Indian Cements. Drainage of Madras.

Vienna. Der Anthropologische Gesellschaft,—Mittheilungen. Band V. Nr. 10.

Miscellaneous Presentations.

CALDWELL, REV. ROBERT. A Comparative Grammar of the Dravidian or South Indian Family of Languages.

HOME DEPARTMENT, GOVERNMENT OF INDIA.

PILCHER, SURGEON-MAJOR J. G. Report of the Sanitary Commission for Bengal, for 1875.

BEATSON, DR. J. FULLARTON. Report on the Calcutta Medical Institutions, for 1875.

Report of the Calcutta Court of Small Causes, for 1875-76.

GOVERNMENT OF BENGAL.

Report on the Administration of the Madras Presidency during the year 1874-75.

GOVERNMENT OF MADRAS.

BÜHLER DR. G. Report on Sanskrit MSS. 1874-75.

GOVERNMENT OF BOMBAY.

ATKINSON, EDWIN, T. Statistical Description, and Historical Account of the North-Western Provinces of India, Pt. I,—Agra Division.

GOVERNMENT OF THE N. W. PROVINCES.

Report on the working of the Government Charitable Dispensaries in the Central Provinces for the year 1875.

Report on the working of the Registration Department in the Central Provinces for the year 1875-76.

Report, with the Chief Commissioner's Review, on the Stamp Revenue of the Central Provinces for the year 1875-76.

CHIEF COMMISSIONER, CENTRAL PROVINCES.

Report of the Operations for 1875 of the British Indian Association.

THE HONY. SECY., BRITISH INDIAN ASSOCIATION.

PERIODICALS PURCHASED.

Göttingen. Gottingische Gelehrte Anzeigen, Nos. 15 to 18: Nachrichten No. 9, 1876.

Die Aechtheit der moabitischen Alterthümer geprüft von Prof. E. Kautzsch und Prof. A. Socin in Basel.

London. The Academy, Nos. 215 to 219, 1876.

———. The Annals and Magazine of Natural History, Vol. 17, No. 101, May 1876.

Dr. A. Günther.—Notes on the Mode of Propagation of some Ceylonese Tree-Frogs, with Description of two new Species. Description of a new Frog from North-eastern Asia.

———. The London, Edinburgh, and Dublin Philosophical Magazine, Fifth Series, Vol. 1, No. 5.

R. Sabine.—On a Method of Measuring very small Intervals of Time. *O. J. Lodge.*—On some Problems connected with the flow of Electricity in a Plane. *J. M. Gaugain.*—The Influence of Temperature on Magnetization.

———. The Messenger of Mathematics, No. 60, New Series, April, 1876.

W. M. Hicks.—Practical Method of modelling the Wave Surface.

———. The Numismatic Society's Journal, Pt. I, New Series, No. 61, 1876.

———. The Journal of the Society of Arts. Nos. 1223 to 1226, 1876.

No. 1223, *Capt. D. Galton.*—On Sanitary Progress in India.

No. 1224, Health and Sewage of Towns.

No. 1225, *W. T. Thornton.*—Irrigation works in India with special reference to their Remunerativeness.

New Haven. The American Journal of Science and Arts, Vol. XI, No. 64, April, 1876.

N. W. Wright.—On the Gases contained in Meteorites. *S. Newcomb.*—Review of Croll's Climate and Time with especial reference to the Physical Theories of Climate maintained therein.

Paris. Annales de Chimie et de Physique, 5th Series, Tome VII, Avril, 1876.

M. Eug. Tisserand.—De l'action du froid sur le lait et les produits qu'on en tire.

Paris. Comptes Rendus, Tome 82, Nos. 16—19, 1876.

No. 16. *M. Faye.*—Sur l'orientation des arbres renversés par les tornados ou les trombes. *M. Marié-Davy.*—Note sur l'ozone de l'air atmosphérique.

No. 17. *M. Boussingault.*—Sur la végétation des plantes depourvues de chlorophylle. *M. Daubreé.*—Expériences faites pour expliquer les alvéoles de forme arrondie que présente trés-frequemment la surface des météorites. *M. L. Larbé.*—Note relative à un fait de gastrotomie pratiquée pour extraire un corps étranger (fourchette) de l'estomac. *M. Th. Schloesing.*—Sur les échanges d' ammoniaque entre les eaux naturelles et l'atmosphére. *M. Marey.*—Des variations électriques des muscles et du cœur en particulier, étudiées au moyen de l'electromètre de M. Lippmann. *M. Ch. Brame.*—Sur la recherche chimicolégale de l'arsenic. *M. Bertot.*—Procédé pour prendre l'empreinte des plantes.

No. 18. *M. L. Smith.*—Recherches sur les composés du carbone pur dans les météorites. *M. Bouchotte.*—Sur la transmission des courants électriques par dérivation au travers d'une riviére.

No. 19. *M. L. Pasteur.*—Note sur la fermentation à propos des critiques soulevées par les *Drs. Brefeld* et *Traube*. *M. Th. Schloesing.*—Sur les échanges d'ammoniaque entre l'atmosphere et la terre végétale. *M. J. Dogiel.* Anatomie du cœur des Crustacés.

———. Journal des Savants, Avril, 1876.

Paret de Courteille.—Dictionnaire arabe-français.

———. Mélanges d'Archéologie Egyptienne et Assyrienne. Tome III, Fas. I.

———. Revue Archéologique, Avril, 1876.

———. Revue Critique, Nos. 17, 18, 19, 1876.

No. 19. *J. Budst.* Tálubs Kitâh al Fasîh.

———. Revue des Deux Mondes, Tome 15, Pts. I, II, 1876.

Pt. I. *M. L. Simonin.*—Les applications industrielles de la chaleur solaire: la machine de Tours. *M. E. Blanchard.*—La voix chez l'homme et chez les animaux.

Pt. II. *M. R. Radau.*—La constitution physique du Soleil d'après de récentes recherches.

———. Revue et Magasin de Zoologie, 3me Serie, Tome 4, No. 2, 1876.

Books Purchased.

Anderson, John, Dr. Mandalay to Momien: A Narrative of the two Expeditions to Western China of 1868 and 1875 under Colonel Edward B. Sladen, and Colonel H. Brown. Royal 8vo. London, 1876.

Böhtlingk, O. Dr. Zur Kritik und Erklärung verschiedener indischer Werke. 8vo. St. Petersburg.

Hooker, J. D. Dr. The Flora of British India, Vol. I. Royal 8vo. London, 1875.

Schutzenberger, P. On Fermentation. 8vo. London, 1876.

The Oriental Sporting Magazine, from June, 1828 to June, 1833, Vols. I and II. Royal 8vo. London, 1873.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR NOVEMBER, 1876.

The Monthly General Meeting of the Society was held on Wednesday, the 15th November, at 9 o'clock P. M.

H. BLOCHMANN, ESQ., M. A., in the Chair.

The minutes of the last Meeting were read and confirmed.

The following presentations were announced :—

1. From the Government of India, Foreign Dept.—

(1.) Memorandum descriptive of the route between Sohar and El Bereymee in Oman, with route map. By Lieut.-Colonel S. B. Miles, Political Agent, Muscat.

(2.) Report by Surgeon C. T. Peters on the Hot Springs of Bosher, a town about 18 miles from Muscat.

2. From the Government of Bengal, a copy of Dr. W. W. Hunter's Statistical Account of Bengal, in 5 volumes.

3. From the Right Hon'ble the Secretary of State for India, a copy of "The Commentaries of the great Afonso d'Alboquerqas, second Viceroy of India," by W. de Gray Birch, published by the Hakluyt Society.

4. From the author, a copy of a work entitled "Notes on the History and Antiquities of Chaul and Bassein," by J. Gerson da Cunha.

5. From the author, a work entitled, "The District of Bákarganj its History and Statistics," by H. Beveridge, C. S.

6. From the author, a work entitled, "The Geographical Distribution of Animals and Plants. Pt. II, Plants in their wild state," by Dr. C. Pickering.

7. From M. Garcin de Tassy, a copy of his work entitled "Allegories, réeits poetiques et chants populaires traduits de l'Arabe, du Persan, de l'Hindoustani, et du Turc."

8. From Nawab Nizám-ud-Daulah, former Díwán of Jodhpur Ráj, a opy of a work entitled "Gulistán-i-Lughát wa Shabistán-i-Nukát."

9. From Prof. P. Tacchini, a copy of his Report on the Observation of the Transit of Venus at Muddapur in Lower Bengal.

The following gentlemen, duly proposed and seconded at the last Meeting, were balloted for and elected ordinary members—

Dr. H. Cayley.
Major M. M. Bowie.
Mr. George, A. Grierson.
Mr. H. Beveridge.

The following are candidates for ballot at the next Meeting—

1. Mr. J. C. Macdonald, Superintendent of Terai Perganahs, N. W. P., proposed by Mr. S. White, seconded by Capt. J. Waterhouse.

2. Captain E. Mockler, Political Agent, Gwádar, proposed by Mr. W. T. Blanford, seconded by Mr. H. Blochmann.

3. Lieut. G. S. Rodon, Royal Scots, Ránikhet, N. W. P., proposed by Capt. J. Waterhouse, seconded by Mr. H. Blochmann.

4. Colonel G. B. Malleson, C. S. I., proposed by Dr. D. B. Smith, seconded by Mr. R. H. Wilson, C. S.

5. W. T. Webb, Esq., proposed by Mr. A. M. Nash, seconded by Mr. H. Blochmann.

The following gentlemen have intimated their desire to withdraw from the Society :—

Mr. R. A. Carrington.
Capt. E. W. D. La Touche.
Mr. J. Hector.

The CHAIRMAN announced that the Council had appointed Dr. J. Anderson a Member of the Council in the place of Col. J. F. Tennant resigned.

The CHAIRMAN laid before the Meeting the memorandum of the Council with reference to the repairs of the Society's building and the erection of shops, published in the August Proceedings, (p. 163,) which had been circulated to all the members of the Society for their votes on the two following propositions :

I. The erection of a dwarf wall and railings, and new servants' houses in place of the present boundary wall and godowns, at the estimated cost of Rs. 6,167.

II. The investment of a portion of the Society's capital in the erection of a shop or shops, on a waste part of the Society's compound at a cost of Rs. 12,000.

And said that the votes of the meeting would now be taken, and it would be necessary to appoint two Scrutineers to examine the votes.

Messrs. Gribble and Waldie kindly undertook the office of Scrutineers and, after examination of the votes, reported that, of 76 voters, all were in favour of Proposition I; and that there were 58 in favour of Proposition II and 18 against it.

The CHAIRMAN drew attention to rule 33 of the Society's Bye-laws, and said that as the proposition was not one of alteration of the rules both propositions were carried.

Before and after the voting there was considerable discussion as to the propriety and desirability of erecting shops, and also on the desirability of giving an opportunity for the discussion, at a general meeting of the Society, of such questions as were then before the meeting, before circulating them to the general body of members. It was felt that under the present rules the Resident Members of the Society had no opportunity of discussing proposals emanating from the Council, and the votes of the non-resident members decided all such questions. It seemed therefore useless bringing them before a meeting at all.

In the course of the discussion, Mr. H. F. BLANFORD proposed the following resolution:

"That this meeting do not approve of the erection of shops on a portion of the Society's compound, and recommend the Council not to act on the power now vested in them by the general votes of the members."

Mr. R. H. WILSON seconded the resolution.

The CHAIRMAN explained that the proposal for erecting the shops had not originated with the Council, but as it was for the advantage of the Society the Council had thought it desirable to place it before the general body of members. It would not, however, be obligatory on the Council to erect the shops in consequence of the vote.

Dr. D. B. SMITH then proposed the following amendment:

"That the Council shall act in conformity with the powers vested in them by the general vote of the Society if they consider it necessary."

After some further discussion, Mr. Blanford withdrew his motion on the understanding that the question of the erection of the shops would receive further consideration by the Council, and that they would not be erected unless it was really necessary to increase the income of the Society by that means.

Dr. Smith thereupon withdrew his amendment.

The CHAIRMAN then laid before the meeting the proposed alterations in the Rules and commenced taking them one, by one with the object of making a few verbal alterations that had been suggested by absent members or might be suggested at the meeting.

Some of the members present objected to this method on the ground that a large majority having already sent in their votes in favour of the rules as proposed by the Council, it would only be a useless waste of time going through them seriatim, as no alteration made by the meeting would be valid. It was therefore decided that the votes of members present should be taken for the rules as they stood.

Messrs. Gribble and Waldie again undertook the office of Scrutineers and reported the result as follows:

	For.	Against.	No Vote.	Total.
Rule 1, ...	73	0	3	76
Rule 2, *(a.)*	71	1	4	76
„ *(b.)*	72	0	4	76
„ *(c.)*	72	0	4	76
Rule 3, (addl. clause), ...	65	6	5	76
Rule 5, A.	71	0	5	76
„ B.	71	0	5	76
„ C.	70	1	5	76
Rule 9, A.	62	10	4	76
Compounding Rules, Clause 1, ...	70	2	4	76
„ „ 2, ...	71	1	4	76
„ „ 3, ...	71	1	4	76
„ „ 4, ...	70	2	4	76
„ „ 5, ...	71	1	4	76
Rule 13, A.	67	5	4	76
„ B.	66	6	4	76
„ C.	68	4	4	76
Rule 14, A.	70	2	4	76
„ B.	70	2	4	76
„ C.	71	1	4	76
„ D.	70	2	4	76
„ E.	71	1	4	76
Rule 15, ...	69	4	3	76
Rule 20, ...	67	3	6	76
Rule 22, *(f.)*	70	3	3	76
Rule 22, (addl. clause *g.*)	63	7	6	76
Rule 26, (addl. clause), ...	67	4	5	76
Rule 28, (*e.*)	65	5	6	76
Rule 28, (addl. clause after *e.*)	65	5	6	76
Rule 29, ...	70	1	5	76
Rule 32, (*e.*)	69	0	7	76
Rule 33, ...	69	2	5	76
Rule 34, ...	67	3	6	76
Rule 36, A....	69	0	7	76
Rule 38, Clause 1, ...	71	1	4	76
„ „ „ 2, ...	71	1	4	76
„ „ „ 3, ...	71	1	4	76
„ „ „ 4, ...	70	2	4	76
„ „ „ 5, ...	71	1	4	76
„ „ „ 6, ...	72	0	4	76
New Rule, (Miscellaneous,)	66	2	8	76

The CHAIRMAN announced that all the proposed changes in the Society's Bye-laws had been carried.

Mr. H. F. BLANFORD gave notice that in accordance with Rule 29, Clause (*d*) he would move at the next meeting the following addition to the present rule 33:

"If the question to be submitted to a general vote be one falling under Section *c* of Rule 32, it shall, in the first instance, be submitted for discussion at an ordinary monthly meeting, and the votes of the members present shall be taken whether the proposal shall be recommended or otherwise. A full report of the discussion shall be circulated with the voting papers."

The following communications have been received:—

1. Fifth List of Birds from the N. E. Frontier of India. By Major H. H. Godwin-Austen.

2. Descriptions of new Species of *Blattidæ* belonging to the Genus *Panosthia*. By J. Wood-Mason.

LIBRARY.

The following additions have been made to the Library since the Meeting held in August last.

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Bombay. The Vedárthâyatna, or an attempt to interpret the Vedas, Nos. 4, 5.

———. The Indian Antiquary. Vol. V., Pts. 57 and 58. August and September, 1876.

Pt. 57. *E. Rehatsek.*—The twelve Emáms. *Rev. J. F. Kearns.*—Silpa Sástra. *M. J. Walhouse.*—Archæological Notes. *Dr. F. Kielhorn.*—On the Mahábhâshya. *Sir W. Elliot.*—On the Noubat. *G. H. Johns.*—Notes on some little-known Baudha excavations in the Puná Collectorate.

Pt. 58. Prof. Kearn's versions of some of the Asoka Inscriptions. *G. Bühler.*—A Grant of Chittarajadeva Mahámandalésvara of the Konkana.

———. Bombay Branch of the Royal Asiatic Society.—Journal, Vol. XII., No. 33., 1876.

J. F. Fleet.—Sanskrit and old Canarese Inscriptions relating to the Yádava Kings of Dévágiri, edited from the originals, with translations. *Bhau Dáji.*—Report on some Hindu Coins. *Dr. C. Marcheselti.*—On a pre-historic Monument of the Western Coast of India.

Berlin. Königliche Preussische Akademie der Wissenschaften—Monatsbericht. Mai 1876.

Schott.—Über gewisse Thiernamen mit besonderer Rücksicht auf das sogenannte tatarische Sprachengebiet.

Cherbourg. Société Nationale des Sciences Naturelles de Cherbourg,—Memoires. Tome XIX.

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A. W. Franks.—On stone Implements from Honduras. *H. H. Howorth.*—The Arian Nomades. *E. B. Tylor.*—Remarks on Japanese Mythology.

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No. 7. *Fr. Ad. de Röepstorff.*—The Andaman Islands.

No. 8. The Basin of the Ob and Yenisei Rivers. *Prof. H. H. Giglioli.*—Dr. Beccari's third visit to New Guinea.

———. Nature, Vol. 14, Nos. 348 to 354, 1876.

———. Royal Astronomical Society,—Monthly Notices, Vol. 36, Nos. 7 and 8, 1876.

No. 7. *Major Palmer.*—On recent American Determinations of Geographical Positions in the West Indies and Central America. *Mr. Dunkin.*—Note on the discovery of four Minor Planets, (160) *Una*, (161), (162), and (163).

———. Royal Geographical Society,—Journal, Vol. 45, 1875.

E. L. Oxenham.—On the Inundations of the Yang-tse-kiang. *C. R. Markham.*—Travels in Great Tibet, and trade between Tibet and Bengal. *Major H. Wood.*—Notes on the Lower Amú-darya, Syr-darya and Lake Aral, in 1874.

———. ———. Proceedings, Vol. XX, No. 4, 1876.

Elias.—Visit to the Valley of the Shuelí, Western Yunnan. *Markham.*—Afghan Geography. *Stone.*—Recent explorations in the interior of New Guinea from Port Moresby. Description of the Country and Natives of Port Moresby and neighbourhood, New Guinea. *D'Albertis.*—Remarks on the Natives and Products of the Fly River, New Guinea.

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M. C. SCHEFER, PARIS.

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abhängegen Veränderlichen. *M. R. Lepschitz.*—Généralisation de la théorie du rayon osculateur d'une surface. *Max Simon.* Ganzzahlige Multiplication der elliptischen Functionen in Verbindung mit dem Schliessungs problem.

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No. 6. *P. Silow.*—Ueber die Dielektricitatsconstante der Flüssigkeiten.

No. 7. *F. Kohlrausch.*—Experimental-Untersuchung uber die elastische Nachwirkung bei der Torsion, Ausdehnung, und Biegung. *G. Berthold.*—Notizen zur Geschichte des Radiometers. *H. Helmholtz.*—Bericht betreffend Versuche über die elektromagnetische Wirkung elektrischer Convection.

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No. 102. *W. B. Carpenter.*—Notes on Otto Hahn's "Microgeological Investigation of *Eozoon canadense*." *A. G. Butler.*—Preliminary Notice of new species of *Arachnida* and *Myriopoda* from Rodriguez, collected by Messrs. G. Gulliver and H. H. Slater. *Prof. C. Semper.*—On the Identity in Type of the Annelids and Vertebrates. *M. A. Giard.*—Note on the Embryogeny of the *Tunicata* of the Group *Luciæ*. *A. Agassiz.*—On Hackel's Theory (Allæogenensis) of the Genetic Connexion between the *Geryonidæ* and *Æginidæ*. *M. N. Joly.*—On the Embryogeny of the *Ephemeræ*, especially that of *Palingenia virgo*. Oliv. *M. J. B. Schnetzler.*—Protection of Herbaria and Entomological Collections from Insects by means of Sulphide of Carbon. *Prof. P. B. Wilson.*—Silica of Grasses and other Plants carried up as Diatoms or other Siliceous Grains and not in Solution or as Soluble Silicates.

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No. 1232. Indian and Colonial Museum.

No. 1233. Lightning Conductors.

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No. 66. *C. A. Young.*—Note on the Duplicity of the "1474" line in the Solar Spectrum. *J. L. Smith.*—Researches on the solid Carbon Compounds in Meteorites. *L. Trouvelot.*—Physical Observations on Saturn. *R. W. McFarland.*—Curve of Eccentricity of the Earth's Orbit. *M. C. Lea.*—Notes on the Sensitiveness of Silver Bromide to the Green Rays as modified by the Presence of other Substances.

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No. 21. *M. A. Angot.*—Sur les images photographiques obtenues au foyer des lunettes astronomiques. *M. A. Girardin.*—Note sur quelques propriétés physiques des eaux communes. *M. S. de Luca.*—Sur le plomb contenu dans certaines pointes de platine employées dans les paratonnerres. *M. Onimus.*—Modifications dans les piles électriques rendant leur construction plus facile et plus économique. *M. Th. Schloesing.*—Sur la fixation de l'azote atmosphérique par la terre végétale. *M. G. Carlet.*—Sur l'anatomie de l'appareil musical de la Cigale.

No. 22. *M. A. Ledieu.*—Examen de l'action mécanique possible de la lumière. E'tude du radioscope de *M. Crookes. M. W. de Fonvielle.*—Sur le radiomètre de *M. Crookes. M. Ch. Lamey.*—Sur la théorie de la periodicité undécennale des taches du Soleil.—*M. Oré.*—Anesthésie par la méthode des injections intra-veineuses de chloral. Amputation de la cuisse; insensibilité absolue; sommeil consecutif pendant six heures; guérison sans aucun accident.

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Books Purchased.

Hooker, J. D. Dr. Himalayan Journals : or Notes of a Naturalist in Bengal, the Sikkim, and Nepal Himalayas, the Khasia Mountains, &c. Vols. I and II. 8vo. London, 1854.

Thomas, E. Records of the Gupta Dynasty. Illustrated by Inscriptions, Written History, Local Tradition, and Coins. Royal 4to. London, 1876.

List of Sanskrit and other Manuscripts and Lithographed works purchased for the Society.

	Sanskrit MSS. on Paper Pothies.	*Subjects.*
1617.	Dharmádhyávabodha. By Nimbáditya,	Smṛiti.
1618.	Śilpa Śástra. By Sutra-maṇḍana,	Art.
1619.	Práyaśchitta-viveka,	Smṛiti.
1620.	Ch'hándogya-bháshya,	Veda.
1621.	Vrihad-dharma-puráṇa,	Puráṇa.
1622.	Anumána-dídhiti,	Nyáya.
1623.	Amṛita-vindúpanishad,	Vedánta.
1624.	Náráyanopanishad,	„

1625. Shaṭ-prasní,.....Vedánta.
1626. Nṛisiñha-tápaní-upanishad, Purvárddha, ... „
1627. Nṛisiñha-tápani-upanishad, Uttarárddha,..... „
1628. Átharvana Tápanyupanishad-bháshya, ... „
1629. Átharvana-purva-tápanyupanishad, ... „
1630. Nṛisiñha-tápanyupanishad-bháshya, ... „
1631. Taittiríya Sañhitá,.....Veda.
1632. Sámagri-pratibandha-vichára, ...Smṛiti.
1633. Bhaṭṭi Kávya, in Bengali Character, ...Poem.
1634. Nyáya-pakshatá, ...Nyáya.
1635. Máthurí Chintámani,..... „
1636. Anumána Chintámaṇi, ... „
1637. Chintámani-rahasya, ... „
1638. Kevalánvayí-rahasya,..... „
1639. Śabda-prámáṇya, ... „
1640. Prámáṇyaváda-ṭíká, ... „
1641. Anumána-dídhiti, ... „
1642. Nyáya-tattva-bháshya, ... „
1643. Pramáṇa Khaṇḍa, ... „
1644. A Nyáya work. (Unnamed). .....

Lithographs received on 10th March, 1875.

1645. Laghu-śabdendu-śekhara, ...Grammar.
1646. Praudha-manoramá, ... „
1647. Jágadíśi Pancha-lakshaṇa, Tippaṇí,.....Nyáya.
1648. Máthurí Pancha-laxaṇa, Tippaṇí, ... „
1649. Viśva-guṇa-darśana, ...Poem.
1650. Yavana-játaka, ...Astronomy.

Sanskrit MSS. on Palm-leaved Pothies.

1651. Kátantra Parisishṭa Ṭíká, ...Grammar.
1652. Tithi Tattva, ...Smṛiti.
1653. Dáya Tattva, ... „
1654. Śráddha Tattva,..... „
1655. Pratishṭhá Tattva,..... „
1656. Aśaucha-nirṇaya, ... „
1657. „ „ (duplicate,) ..... „
1658. Karma-vipáka, ... „
1659. Smṛiti-tattva, ... „
1660. Daśamaskandha Ṭíká, ...Puráṇa.
—61. Vishṇu Puráṇa, ... „
—62. Áyurveda, ...Medicine.
—63. Chaitanya-chandrodaya, ...Drama.

1864. Rághava-pandavíya and Kirátarjuníya, ...Poem.
—65. Vidvan-moda-taranginí, ...Philosophy.
—66. Kshudra Kávyáni,.....Poems.
—67. Dhátu-rúpa, ...Etymology.
—68. A Work on Nyáya, ...
—69. A Work in a ruined state,.....
—70. A Telugu work,.....

Sanskrit MSS. on Palm leaves.

—71. Sánti-śataka Ṭiká,.....Poems.
—72. Súrya Śataka Ṭiká, ... „
—73. Śaṅkara's Átma-tattva-viveka,.....Vedánta.
—74. Dhananjaya-vijaya Ṭiká, ...Poem.
—75. Pingala Ch'handa,.....Versification.
—76. Nitya Durgápuja, on the daily worship of Durgá, Smṛiti.
—77. Práyaschitta-nirṇaya, ... „
—78. Kautuká-sarvasva Náṭaka, ...Drama.
—79. Trikánḍa-kosha Ṭiká, ...Lexicon.
—80. Ayodhyá-máhátma, Puráṇa. By Umápati Sarmá, (on paper.)
—81. Śabdárṇava. By Raghumani. Sanskrit Dictionary in 5 Vols. Much decayed.
—82. Aitareya Áraṇyaka, ...Veda in 5 Parts.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR DECEMBER, 1876.

The Monthly General Meeting of the Society was held on Wednesday, the 6th instant, at 9 o'clock P. M.

The Hon. E. C. BAYLEY, C. S. I., President, in the Chair.

The minutes of the last meeting were read and confirmed.

The following presentations were announced—

1. From Prince Rama Varna, First Prince of Travankor, a copy of the Report on the Census of Travankor for 1874-75.

2. From Professor C. Schefer, of the Ecole des langues Orientales vivantes, Paris, a valuable collection of Oriental Works, partly published by the professors of the Ecole, the particulars of which will be found in the Library List.

The following gentlemen, duly proposed and seconded at the last meeting, were balloted for and elected ordinary members—

J. C. Macdonald, Esq.

Capt. E. Mockler.

Colonel G. B. Malleson, C. S. I.

W. T. Webb, Esq.

Lieut. G. S. Rodon.

The following is a candidate for ballot at the next meeting—

Kumara Radha Kishore Deb, Juvráj of Hill Tiperah, proposed by Mr. T. E. Coxhead, seconded by Capt. J. Waterhouse.

In pursuance with the notice given at the last meeting, Mr. H. F. BLANFORD proposed that the following addition be made to Rule 33.

"If the question to be submitted to a general vote be one falling under Section (*c*) of Rule 32, it shall in the first instance be submitted for discussion at an ordinary monthly meeting, and the votes of the members present shall be taken whether the proposal shall be recommended or

otherwise. A full report of the discussion shall be circulated with the voting papers."

In the absence of Mr. R. H. Wilson, Dr. Waldie seconded the proposal.

Mr. BLANFORD said that the object of the addition he proposed was to ensure the discussion of important questions at a general meeting of the Society before they were circulated for the votes of the general body of members. He understood that there was an impression that he intended to stop the reference of such questions to the whole body of members in the case of the vote of the meeting being against it—but such was not his intention, and in such a case it would still be open for the Council to circulate the question for the votes of non-resident members, but accompanied by a report of the discussion at the meeting.

CAPT. WATERHOUSE said—that while quite agreeing with the principle of Mr. Blanford's proposal, he thought that the addition to the rule might be worded differently, so as to indicate definitely the procedure to be adopted in order to ensure the discussion at a general meeting before the circulation of the voting papers, because at present all such questions were brought before a general meeting before being circulated. With reference to the proviso that a full report of the discussion should be circulated with the voting papers—he thought it was impracticable, unless the services of a short-hand writer were engaged for the purpose, and even then it might involve a great deal of useless printing. A short statement of the objections, would, he thought, be better. He would therefore propose the following amendment:

"If the question to be submitted to a general vote be one falling under Clause *(c)* of Rule 32, the Council shall cause to be sent to every Resident Member, at least 48 hours before a general meeting, a printed circular, setting forth the nature of the proposal to be brought forward and the reasons for it, in order that it may be duly discussed at the meeting; and should the general sense of the meeting be opposed to such proposal, a statement of the objections raised against it shall also be circulated with the voting papers."

Mr. BLOCHMANN seconded the amendment.

Mr. BLANFORD objected to the amendment on the ground that it did not provide for the discussion of the question before the issue of the voting papers.

After some further discussion the PRESIDENT observed that the object of the original motion and of the amendment seemed to be much the same, and that perhaps before the next meeting Mr. Blanford and Capt. Waterhouse could arrange between themselves as to the form the additional rule should take, and the Council would then circulate it to the Society in the usual way.

The PRESIDENT announced, on the part of the Council, that with reference to what passed at the last meeting regarding the erection of shops on a waste portion of the Society's compound, the Council had resolved that in any case the shops should not be built on the site proposed, at the corner of Park Street and Chowringhee, though they reserved the power of building them at the other corner in Park Street if the interests of the Society should require it.

COLONEL THUILLIER said—With reference to what had just been announced by the President, as to the intention of the Council in regard to the proposed erection of shops on a portion of the Society's ground in the south-east corner of the compound in Park Street, he desired to bring to the notice of the present meeting his very emphatic protest against the disposal of any of the ground belonging to the premises of the Society for the erection of shops with a street frontage, as a financial speculation.

He considered the question of shops in such a desirable situation, and in close contact with the Society's house, altogether prohibitory on many accounts, entailing, as such erections undoubtedly would, an unending source of inconvenience and difficulty in harbouring natives of inferior description about the premises, and in entirely spoiling the fine frontage towards the Maidan and Park Street, which, when properly opened out by the contemplated improvements, would necessarily afford to the house they were so fortunately situated in, the superiority of aspect and prominence which it required and deserved.

The erection of shops as a speculation on the part of the Society, he deemed utterly foreign to the position, character, and objects of the Society; and their erection in such close vicinity to the house, in such a confined compound, would obstruct light and ventilation, and be a terrible eyesore and annoyance when built.

Understanding that the sense of the previous meeting was entirely in accordance with his views on this very important question, he entreated the Council to weigh it well before acceding to it their support—he had therefore entered his protest on the minutes of Proceedings of the last Council meeting, against the measure, and he earnestly trusted nothing of the sort would be actually undertaken to the detriment of the real interests of the Society.

The PRESIDENT announced that subscriptions to the amount of Rs. 910 had been received for the proposed Memorial Bust of Dr. Oldham, a further sum of about Rs. 600 was still required, and it was hoped that subscriptions to this amount would be received.

The PRESIDENT laid before the meeting a copy of the revised Rules and stated that a few alterations had been made in the wording of some

of the rules as passed at the last meeting, in accordance with the suggestions made by members when the proposed changes in the rules were circulated; but as these alterations in no way affected the spirit or substance of any of the rules, the Council thought it was unnecessary to again circulate them for the approval of the Society, and they would therefore be printed off and issued immediately.

The PRESIDENT also announced that as the first Wednesday in January would fall on the 3rd during the holidays, when probably many members would be out of Calcutta, it was proposed that the meeting of the Society should be postponed till the 10th instant.

COL. THUILLIER suggested that the 17th would be a better day, and it was therefore agreed that the meeting should be postponed till that date.

The PRESIDENT announced that the Council recommend the election of Dr. J. Muir, as an Honorary Member of the Society in the room of the late Prof. C. Lassen.

The following were the grounds upon which this recommendation was made:

Mr. John Muir, D. C. L., LL. D., Ph. D. was elected a member of this Society in July 1837, and up to 1854, when he retired from the country, took a deep interest in the labours of the Society. He was an occasional contributor to the Journal of the Society, and attracted considerable attention by his contributions on Sanskrit Literature and Philosophy to the pages of the *Benares Magazine*. His life of Jesus Christ, in Sanskrit verse, established his reputation as a profound Sanskrit scholar. Since his retirement from India, he has been most assiduously engaged in oriental researches, and his essays in the Journal of the Royal Asiatic Society of Great Britain attest the success with which he has prosecuted them. His great work, however, is his "Sanskrit Texts," in the five volumes of which he has brought together the matured fruits of a long life of patient reading and research, and an amount of learning and critical acumen which place him in the foremost rank among the oriental scholars of the day. His generous gift towards the founding of a Sanskrit chair in the University of Edinburgh and the prizes given by him for essays on Indian Philosophy, and a translation of the Vedanta Sutras also deserve honourable mention.

Mr. H. F. BLANFORD exhibited two series of synoptical weather charts of India, illustrating the atmospheric conditions which preceded and led up to the remarkably heavy rainfall at Allahabad on the 30th and 31st July, 1875, and that at Delhi, Rohtak, Gurgaon, &c., on the 8th and 9th September in the same year.

The charts exhibited were the first of the kind which had ever been constructed for India, or indeed which it had ever been possible to construct. They showed the distribution of pressure, and the direction of the wind over the whole of India at 10 o'clock in the morning of each day; the pressure being shown by isobars, or lines of equal pressure at the sea level, for each twentieth of an inch of the barometer, and the winds by arrows, certain marks on which indicated the approximate mean velocity of the wind on the day in question. The first series of charts extended over twelve days, *viz.* from the 20th July to the 1st August; and the second over eight days, from the 2nd to the 9th September. The general character of the phenomena illustrated was similar in the two cases. A barometeric depression was apparently generated in Orissa or possibly in the North-West corner of the Bay: (there was no direct evidence pointing to a marine origin, and although, in the absence of any observations at sea, it could not be positively affirmed that the formation took place over the land, such was at least the more probable view). Around this depression, the winds blew spirally inwards, forming what may be termed a land cyclone. The velocity was in no case very high, and the barometric gradients were in general moderate, but in other respects the conditions were similar to those of a cyclone. From Orissa, the depression moved westwards towards Nagpore, and then somewhat northward. That which was formed in Orissa on the 25th July, entered the Gangetic valley, and coalesced with the depression which had its seat in that region throughout the rainy season; and on the 30th and 31st the depression became very intense over Allahabad, and apparently lasted for at least a day after the heavy fall of rain, which was registered at 13 inches.

The depression in the early part of September moved rather to the North-West, and on the 8th and 9th was very intense on the plateau between the Narbadá and the Ganges, and in the upper part of the latter valley, especially over Ságar and in the neighbourhood of Delhi.

Mr. Blanford thought it probable that these land cyclones were not exceptional features of the meteorology of the rainy season, but were only somewhat exaggerated instances of the state of things that accompanies every general burst of rainfall at that season. If so their further study would certainly throw much light on the conditions that determine the distribution of the rainfall.

The Hon'ble E. C. Bayley exhibited the following silver coins:

No. 1. A coin of the city of Tarsus in Cilicia, struck under the Dynasty of the Seleucidan kings: according to the Duc de Luynes, a coin of the birthplace of St. Paul. In bad preservation, but rare.

Obverse. A seated figure of the god "Baal-Tars", with a defaced

monogram in front, and faint traces of Phœnician letters behind the head.

Reverse. Lion "passant" to the left, over it the Greek letter Γ.

Sassanian Coins.

No. 2. A coin of Khusrau Parwíz of Persia. Struck in his seventeenth year (?)

Mint very doubtful, coin imperfect.

No. 3. A do. struck at "Saham" in the thirty-sixth year (?); better preservation.

No. 4. According to Thomas, a coin of Varahran (Bahrám), the fourth king of Persia, but in bad preservation and of rude execution.

Parthian.

No. 6. Apparently a coin (according to Mianut) of Arsaces the seventh.

No. 7. As above—Arsaces the ninth.

Nos. 8 to 17. There are local Parthian or sub-Parthian types, examples of which are given in Wilson's 'Ariana Antiqua.' These legends are only in Arsacidan Pehlvi, but very little progress has been made in their decipherment and their precise attribution is yet undetermined. There will probably be some information regarding them in the new work on Parthian coins now about to issue in the revised Marsden series. I should like to see them again when that appears, but have no leisure to work at them now.

There are two types, one with a head on either side, the reverse of the other bears a fine altar with a single 'mobid', or priest.

Also the following gold coins belonging to J. R. Reid, Esq., C. S., Jaunpur.

No. I. *Kanishka* or *Kanerke.*

Obv. King sacrificing, with right hand at an altar; spear in left hand.

Legend—

PAONANOPAO

KANHPKI KOPANO

Rev. Figure four-armed of Ugra = Siva, and fawn. Legend—OKPO = Ugra (ΟΡΚΟΣ orcus).

No. II. *Obverse* as in No. 1. *Reverse*—female figure with a peculiar pronged instrument in right hand.

Legend NANA.

("Nana" or "Nanaca" is a Sythian goddess and a very old deity. Nana = Anaitis = Anáhíd = Diana (Cunningham).

No. III. *Obverse* as in No. 1. *Reverse*—Figure as in No. II, but with sword in girdle and a half moon on the head.

Legend NANAPAO.

(Rao, honorific title.) A fine coin.

No. IV. *Obverse* as in No. I, king (?) helmeted, with nimbus and spear in right hand. Sword in girdle.

Legend ΟΡΑΑΓΝΟ "Orlagno"; meaning not yet known.

The Secretary exhibited some specimens of Meteorites recently fallen in India and read some remarks upon them by Mr. H. B. Medlicott.

Record of the Judesegeri Meteorite of 16th February, 1876.

The meteorite was sent to the Indian Museum by the Chief Commissioner of Mysore. It fell in the bed of the tank of Judesegeri village in the Chittanhalli hobli of the Kadaba Taluk, on the evening of the 16th February, 1876. The position is about Lat. 12° 51′ N., Lon. 76° 48′ E.

The pieces sent weigh in the aggregate 1 lb. 9 oz. 136 grains. They are all more or less broken, forming probably a small portion of the total fall. There is nothing remarkable in their appearance: they contain nodules of triolite; but for the rest they have the pale grey colour and granular texture of the most common variety of meteoric stone. The specific gravity is 3·63.

The circumstances of the fall are related as follows:—

Judesegeri stone—Report of the Deputy Commissioner of Túmkúr.

"The find is entirely due to Mr. Assistant Commissioner Woodcock, who, having received reports from all his Police stations in the Kadaba Taluk of the meteor being seen, and the general impression that it had fallen close to each, instituted a vigorous search, and it then transpired, that a Tigalar, who was that night sleeping in a hut in his garden, heard, after seeing the meteor, a thud in the earth, not far distant, as of a heavy body falling. In the morning he discovered the stone buried several inches deep in the bed of the adjoining tank; but under the impression that it contained gold it had unfortunately been smashed and changed hands before the fragments now sent were eventually recovered. It is "alleged to have smelt strongly of sulphur when found."

"I observe from the local papers that the meteor was seen at Bangalore, and supposed to fall in the Roman Catholic Cathedral compound. I myself saw it at this station (Túmkúr), it was observed at Kallambelle and Sira; at the former place it is reported to have been accompanied by a slight shock of an earthquake, and a great noise, which latter was also distinctly heard at Túmkúr almost immediately following the fall of the meteor, and apparently being a direction from north to south; and I have also learned from Major Armstrong that the meteor was observed by him at Chitaldroog nearly at the same time as visible in this District and at Bangalore; the whizzing sound of the falling meteor was, however, apparently only heard in the western Taluks of this District."

Record of the Nageriá Meteorite, of 22nd April, 1876.

Nageriá is in the Fathábád parganah of the Ágrah district, Lat. 27° 3′ N., Lon. 78° 21′ E. The fall occurred about an hour and a half after sunrise on the 22nd Oct. 1876. The specimen was sent by the Archæological Society of Ágrah to the Asiatic Society of Bengal and forwarded to the Indian Museum. An account of the circumstances of the fall, drawn up by the Tahsíldár, was also received. This is appended as a sample of a respectable native official's thoughts on the subject.

Considering that a mass estimated as weighing 26 lbs., is stated to have fallen, it is very unsatisfactory that so small a portion should have been secured for museums where these objects can be appreciated.

The total quantity received weighs only about 300 grains. It is a very friable stone; of an unusual whiteness, greenish gray granules in an abundant, white, almost powdery matrix. The film of fusion is thicker than is generally the case, it has a brilliant black surface. The sp. gr. is 3·12.

Nageriá stone—Tahsíldár's Report.

"About an hour and a half after daybreak there was a great whizzing noise, as if a great bird rose: then a ball fell and immediately broke; the sound of its fall reached a great distance. From the inspection of the place it appeared that this ball fell in the middle of field No. 253. A large hole 2 feet in circumference and diameter 8 inches and depth 8½ inches, was made. The land on the spot is very hard. From the inspection of the spot it further appears, that when it fell, it was broken into many fragments, which flew to a great distance. Arguing from the weight of the fragments and the depth and circumference and diameter of the hole it seems, that the ball must have weighed nearly 13 seers; and considering the hardness of the ground it would appear that it fell straight on the ground from a great distance, and with great force. From the shape of the hole, it seems, that the ball fell perpendicularly from above. And as the ball was of very hard substance, and crumbled away, it must have fallen from a very great distance."

"Sometimes a substance in the bright phosphorus, which we in India call broken stars, takes fire and falls. But as this ball fell in the day, it cannot be discovered whether it was bright or not. Sometimes European people seat themselves in balloons and ascend, and put stones, &c., in the balloon; and when the balloon grows heavy, throw out the stones, &c., to lighten it, and it then ascends further. It is just imaginable that some aeronaut may have flung out the stone. But I never saw a stone like this. In short, there are many doubts in the matter, but there is no doubt on this point that the ball fell from above on to the ground, and that the peo-

ple who remained on earth had nothing to do with it. The fragments of the ball are white and dark inside, like the dregs after sifting lime and plaster, and outside it is black, like a lacquer; and it is not clear what it is. There are no trees, &c. where the ball fell."

The following papers were read:

1. *Fifth list of Birds from the Hill Ranges of the N. E. Frontier of India. By Major* H. H. Godwin-Austen, F. R. G. S., F. G. S., &c.

The present list, which adds 36 species, bringing up the record of birds from the Eastern districts and hill-frontier to a total of 528 species, includes birds, principally from the Munipur Hills, obtained by Messrs. Ogle and Robert in the field-season of 1873-74, in the Eastern Naga Hills, by Mr. A. W. Chennell, and in the Khasi Hills, by the author himself in 1875. All the new forms except two, which are here for the first time made known, were described in a joint paper by Viscount Walden (now Marquess of Tweeddale) and the author, in 'the Ibis' for 1875; these descriptions are repeated in full.

The paper concludes with some short additional notes on the birds of the lists previously communicated by the author to the Society's Journal.

The paper will appear in Journal Part II, No. 4, for the current year, and will be illustrated by three coloured plates, two of which are by the author's own hand.

2. *Contributions towards the knowledge of the Indian Fossil Flora. On some Fossil Plants from the Damuda Series in the Raniganj Coal-field, collected by Mr. J. Wood-Mason. By* Dr. O. Feistmantel.

Mr. Wood-Mason has lately brought a very fine collection of fossil plants from the Raniganj coal-field, and at his request I have undertaken the examination and description of these interesting remains.

Although the Geological Museum possesses large collections from the same coal-field, as well as from all other localities, Mr. Wood-Mason's collection is yet very valuable, containing as it does not only several perfectly new, but also better specimens of the known forms.

The Raniganj coal measures belong to the great series of rocks which are classed as the Damuda Series, and they are the top group of this series. These Damudas, together with the Panchet group, form the lower portion of the whole plant-bearing system, for which it is now better to adopt the name Gondwana System, as there occur in it not only plants, but animals also.

Mr. Wood-Mason's collection is especially of value for estimating the age of this series, which from a stratigraphical point of view may well be divided into three or four groups, but which from a palæontological point of

view constitutes a single formation, to which besides the whole Panchet group is in the closest relation.

In some preliminary notes on the Indian fossil flora published in a recent number of the Records of the Geological Survey of India,* I have attempted to show that all the plant-bearing beds from the Kach-Jabalpur group down to the Talchir group are the representatives of the European Jura-Triassic systems, merely on palæontological grounds, such as the best known palæontologists, from Brongniart, Sternberg, Lindley, and Hutton, down to those of the present day, have established them; and these observations on the Indian flora are already partly approved at home.

From the occurrence of the genus *Glossopteris* (which is so very frequent here in India in the Damudas and in the upper portion of the Australian coal-measures, but which occurs also rarely in the lower coal-measures of the same country), our Damudas were for some time compared with these Australian lower coal-measures, which contain scarcely anything but the remains of animals of lower carboniferous age; and the two were therefore considered to be of the same age. But while our Damuda Series contains in no part the least trace of a marine animal, or even of a Fauna, which permits of any comparison with the Australian coal-strata, it contains on the other hand a very numerous Flora which has all its connections in Europe, and this in the mezozoic strata in general and in the Trias in particular.

The same age must be assigned also to the upper Australian coal-measures (Wianamatta, Hawkesberry, Victoria, Queensland, Tasmania, &c., Upper Newcastle Coal-beds), and with these only can our Damuda flora be compared. *Glossopteris* makes its appearance as a genus rarely in Australia at a time when carboniferous animals lived in the sea, but it survived and became more abundant after these carboniferous strata had been deposited, *i. e.*, when the carboniferous animals were extinct, *i. e.*, when another period of life had begun.

I have shown these relations in the last number of the Records (IX. 4).

Mr. Wood-Mason's fossils exhibit again throughout the most unmistakeable characteristics of a mesozoic flora.

a. Ferns with net-venation, of which *Sagenopteris* and *Glossopteris* are examples.

b. Ferns with parallel venation, passing out from the midrib at right or slightly acute angles, and forked—*Taeniopteris* (and I am sure the present paper will not fail to make the mesozoic and triassic age of the Damudas still more evident, as in the whole flora there is not a single form which could justify a view of an age lower than Triassic; this of course can be only stated as regards the homotaxis.) I cannot here discuss all the previous literature of the subject. This will be done in detail in my

* Vol. IX, 2, 3.

paper in the Journal, and it may be sufficient to point out here only the most important facts.

I have determined altogether 14 species of fossil plants in Mr. Wood-Mason's collection; amongst these are 7 new species and amongst these again 2 new genera.

Represented are the orders of *Equisetaceæ* and *Filices*.

Amongst the *Equisetaceæ*, which on the whole are very frequent in the Damuda Series, were especially represented: *Sphenophyllum Trizygia*, Ung. This was formerly named *Trizygia speciosa* by Royle, later mentioned as *Sphenophyllum speciosum* by McClelland, and finally established as *Sphenoph. Trizygia* by Unger. It is distinctly characterized by the number and position of the leaflets in the articulations. There are invariably 6 leaflets only, which, considered according to their size, form three pairs, (therefore *Trizygia*) and are placed on one side of the articulation. Figures of this interesting fossil have been published altogether twice only by Royle and McClelland, but as the work of this latter author is very little known, I give two more figures with my paper. The same species occurs also in the Barakur group.

The second fossil I describe from the *Equisetaceæ* is the famous *Vertebraria*, which to date is not yet quite satisfactorily explained. The first reasonable explanation was given by Sir Ch. Bunbury, who considered it to be the rhizome or roots of an equisetaceous plant, as he supposed of *Phyllotheca*, which means, in another sense, of *Schizoneura*, most of the so-called *Phyllotheca* being states of this genus. Since that time nothing positive has been pronounced about this fossil. Mr. Wood-Mason's collection contains several nice specimens, amongst which one which shows quite certainly the equisetaceous nature of this fossil, exhibiting perfectly distinctly 2 or 3 articulations with ribs not alternating in the articulation, but quite opposite, as is generally the case in the Triassic *Equisetaceæ* of Europe. The Australian *Vertebraria* is, as far as it is described, different from ours.

Besides these equisetaceous plants the most frequent in the Damudas is a representative of the well-known Triassic genus *Schizoneura* which I have called *S. Gondwanensis*, and which is very near to *Schizoneura paradoxa*, Sch., of Europe. A good many of the stalks generally called *Phyllotheca* belong to this genus, although a true *Phyllotheca*, in Zigno's sense, occurred too. *Phyllotheca* is a mesozoic genus. In Australia it is frequent in the Upper Newcastle Beds, and I have lately discovered a form almost identical with *Phylloth. equistiformis*, Zign.

But amongst the Ferns are the most interesting forms.

Of the *Sphenopterides* I have described a *Sphenopteris polymorpha*, so-called from the variations of form which it exhibits according to the size or

age of the specimens. I think Mr. McClelland's *Pecopt. affinis* is to be placed here. The same form occurs also in the Barakur group near Cuttack.

Of the *Pecopterides* there occurred two pinnae representing two species, which, however, belong to the same group of mesozoic ferns, *viz.* to the group of the *Alethopteris Whitbyensis*, Gopp, which Schimper first indicated, but for which Saporta more recently advocates the genus *Cladophlebis*, Bgt. These two species are :—

Alethopteris Lindleyana, found in fructification, is closely analogous to the *Alethopt. indica* from Rajmahal and to the true *Alethopt. Whithyensis* known as yet only from L. Oolite and Lias. This species we have also in the Kach and Jabalpur groups.

Besides these two species, there occurred a perfectly new type of *Pecopterids* which is very closely connected with the living *Phegopteris;* in the fossil flora it belongs to the genus *Alethopteris*, so that I describe this very fine form as *Alethopt. phegopteridoides.*

The *Taeniopterides* are of especial interest, as being represented by just such forms as exhibit very well the mesozoic character of the flora, and as establishing the connection between the Lower and Upper Gondwanas.

The *Taeniopteris danaeoides*, of which McClelland figured two specimens, is the same as that which Royle called *Glossopt. danaeoides*, but which has not been mentioned since the publication of McClelland's paper, although it has occurred. Mr. Wood-Mason collected many specimens of this species, and assures me that it is very frequent at Raniganj. According to the new classification of the *Taeniopterides*, these forms from Raniganj belong to Schimper's subgenus *Macrotaeniopteris.* Another big *Taeniopteris* was also met with, but the specimens of it are in so fragmentary a condition that I cannot describe it.

Amongst the *Taeniopterides*, I place the new genus *Palaeovittaria:* a splendid specimen contains about ten leaves of a fern, the shape of which resembles that of *Sagenopteris;* the midrib vanishes towards the apex; and the veins are not areolated, but pass out at a very acute angle from the midrib towards the margin and are forked. In these respects the fossil fern agrees, according to Mr. Kurz, only with the living *Vittaria*, so that I establish it as new genus *Palaeovittaria* calling the species *Palaeov. Kurzi.* Nowhere in the whole coal-measures has anything like it yet been met with.

The order *Dictyopterides*, including all ferns with net-venation, is also richly represented. The most interesting is a new genus which I call *Belemnopteris:* the shape of the leaf is arrow-like, there are three chief veins, and the other veins form areoles. This fossil fern has a very close resemblance to *Pteris sagittaefolia* and to *Hemionitis cordata*, Roxb., but

to which of them it should more correctly be brought nearest, cannot be well decided, as our fern exhibits no fructification. *Hemionitis* has a fructification along the secondary veins, while *Pte. sagittaefolia* has of course a marginal fructification. It is a very remarkable fossil, and I call the species after Mr. Wood-Mason.

Another very marked fossil is a species of the genus *Gangamopteris*, a form intermediate between *Glossopteris* and *Cyclopteris*, that is to say, it has no midrib; and the veins radiate towards the margins, and are not forked, as in *Cyclopteris*, but form areoles. Formerly, some forms of this genus with narrow net-venation were described as *Cyclopteris*, but only lately have their true relations been determined and explained by Mr. McCoy in his Prodrome. From the Damudas I have already described 2 species; this from the Raniganj field is a third, and I name it *Gangamopt. Whittiana*, after Mr. Whitty of Kurhurbali. It has very wide hexagonal and polygonal areoles. Amongst living forms, *Antrophyum* comes nearest to it, and of this the varieties without midrib. *Ganganopteris* is a mesozoic genus.

Of the genus *Glossopteris*, I have first to mention *Glossopteris angustifolia*, a species which was first described by Brongniart but has since not been recognized; Mr. Wood-Mason has brought several specimens of it which are more complete than those Brongniart had: they show the apex, show well that the venation was incorrectly drawn by Brongniart, and show besides this a marginated margin, which perhaps indicates the fructification—which would therefore be fructification *Pteridis*. This is the most important point in this *Glossopteris*, and we have thus three different fructificating states of *Glossopteris*: Kamthi, Australia, Raniganj.

Besides this *Gl. angustifolia*, there occurs very commonly at Raniganj a form which is equally frequent throughout the whole Damudas. I name it *Glossopt. communis*. It is of various dimensions, sometimes very large, with the midrib distinct, and the secondary venation very narrowly arculated. The thorough examination of the *Glossopterides* should yield altogether a great many species.

That this genus occurs in Australia in the lower portion of the coal-strata also, does not affect the question of the age of our Damudas; if such considerations were allowed weight, we would be obliged, for instance, to consider the Salt Range Trias as carboniferous, merely on account of the presence of the genus *Bellerophon*, or *vice versâ*.

I have now only to mention a *Sagenopteris* from the Raniganj field, which is described as *Sagenopt. polyphylla*: it is again a fern with net-venation, and it belongs to a genus which in Europe is mesozoic and Rhætic.

Besides these plants brought by Mr. Wood-Mason there are not many more species known from this coal-field altogether.

The following conclusions can be drawn :—

1. Mr. Wood-Mason's collection proves again that the Raniganj group contains a Flora only.

2. A comparison of this Series can be made only with corresponding Series and not with strata in which marine animals are predominant.

3. All the plants brought by Mr. Wood-Mason show excellently the mesozoic *habitus* of the fossil flora as the illustrious Brongniart has established it in his excellent paper, and especially in his '*Tableau des genres des végétaux foss.*

The paper, which is illustrated by eight plates, will be published in the Journal Part II, No. 4, for the current year.

3. *On the* Helicidæ *collected during the Expedition into the Dafla-Hills, Assam. By Major* H. H. Godwin-Austen.

The present list contains nearly all the species of *Helicidæ* that were obtained by the author during the expedition of 1874-75, a few species only still remaining undetermined; these will be worked out, and the novelties amongst them described by Mr. G. Nevill from the series presented by the author to the Indian Museum.

The paper, which will appear in the forthcoming number of the Journal, Part II, is illustrated by a coloured plate of the animals and their shells from the author's own pencil.

4. *On the Development of the Antennæ in the Pectinicorn* Mantidæ. *By* J. Wood-Mason, Esq.

(Abstract.)

The author shows that, down to the last change of skin but one, no difference is to be detected between the two sexes of *Gongylus gongylodes* either in the form or in the proportionate length of the antennæ, which in both male and female are identically the same simple and setaceous structures, consisting of two distinct basilar segments followed by a multitude of very short and ill-defined flagellar ones; but that shortly after this event these appendages in the male commence to thicken throughout that portion of their length which in the perfect insect is bipectinated, so as eventually to acquire a compressed spindle-shaped form; that this thickening is the outward manifestation of the growth going on beneath the outermost layer of chitinous membrane *(last skin)*, which, at an early date, *pari passu* with the formation of the new antenna, tends to separate off from the rest, and thereafter serves as a capsule or sheath wherein the two series of pectinations are developed by a process of budding from the antennal segments between the basal 5 and the apical 12—15; that as the pectinations grow they press upon so as to distend the walls of the sheath,

completely obliterating all traces of its previous segmentation; and that if the sheath be carefully dissected away when distention of its walls has proceeded almost to the bursting point *(last moult)*, the completely bipectinated antenna of the adult male is disclosed, but with the teeth of each comb all glued and compressed together and with the two striated plates thus formed apposed to one another at their free ends, so as to enclose a compressed spindle-shaped cavity.

The reading of the following papers was postponed—

1. On an Imperial Assemblage at Delhi 3000 years ago. By Dr. Rájendralála Mitra.
2. On Himalayan Glaciation. By J. F. Campbell, Esq.

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The following additions have been made to the Library since the Meeting held in November last.

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Pt. 59. *Prof. C. H. Tawney.*—Metrical Translations of the Vairágya Satakam. *Káshináth Trimbak Telang.*—The Sankaravijaya of Anandagiri. *Rev. J. F. Kearns.*—Silpa Sástra. *Rev. G. U. Pope.*—Notes on the South-Indian or Drávidian Family of Languages. *C. Horne.*—Notes on a Tibet Teapot and on the Tea used therein. *Rev. J. Cain.*—The Bhadráchallam and Rékapalli Talukas, Godávarí District, South India.

Pt. 60. *Prof. C. H. Tawney.*—Metrical Translation of Bhartrihari's Vairágya Satakam. *W. F. Sinclair.*—Notes on some Caves in the Karjah Taluka of the Thaná Collectorate. *Dr. J. Muir.*—Krishna's opinion of unfair fighting. Maxims and Sentiments from the Mahábhárata.

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Pt. 3. *Dr. O. Feistmantel.*—Notes on the age of some Fossil Floras in India. *W. T. Blanford.*—Note on the Geological age of certain groups comprised in the Gondwâna Series of India, and of the evidence they afford of distinct Zoological and Botanical Terrestrial Regions in Ancient Epochs. *Th. W. H. Hughes.*—On the relations of the Fossiliferous Strata at Maléri and Kotá near Sironcha, Central Provinces. *R. Lydekker.*—Notes on the Fossil Mammalian Faunæ of India and Burma.

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Heft IV. *C. Sandreczki.*—Ein Beitrag zur Kenntniss der Arabischen Sprache in ihrer gegenwärtigen Fortbildung. *A. Bochtlingk.*—Einige Bemerkungen zu den von Th. Aufrecht veröffentlichen Sprüchen aus Çârúgadhara's Paddhati. *F. Spiegel.*—Zur Erklärung des Avesta. *H. Schanz.*—Indischer Regentenspiegel.

Band 29, Heft I. *A. Bastian.*—Die Verkettungstheorie der Buddhisten. *Th. Nöldeke.*—Zur Geschichte der Araber im 1. Jahrh. d. H. aus syrischen Quellen. *M. l'Abbé Martin.*—Discours de Jacques de Saroug sur la chute des idols.

Band 30, Heft I. *Jul. Oppert.*—Ueber die Sprache der alten Meder. *A. F. Pott.*—Chemie oder Chymie. *A. von Kremer.*—Philosophische Gedichte des Abûl-l-'Alâ' Ma'arrî. *H. Hubschmann.*—Ueber Aussprache und Umschreibung des Altarmenischen. *V. Garathausen.*—Ueber der griechischen Ursprung der Armenischen Schrift. *W. Bacher.*—Sa'dî-Studien. *H. Hubschmann.*—Iranisch-Armenische Namen auf *karta, kert, gird.*

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No. 10. *David Ker.*—A Peep into Kokan: or from Djizak to Tashkent, viâ Khodjent.

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Pt. III. *J. Leidy.*—*Quercus heterophylla*. *T. Meehan.*—Natural Hybrids: *Quercus heterophylla*. Hybrid Juglans; Hybrids of *Pyrus Sinensis*. *Quercus heterophylla*. *H. C. Chapman.*—On *Trichocephalus affinis*, Dies. On the Castor Glands of the Bever. Observations on the Structure of the Manatee. *E. D. Cope.*—On the supposed Carnivora of the Eocene of the Rocky Mountains. *J. Willcox.*—On Mineral Localities in N. Carolina.

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INDEX

TO

PROCEEDINGS, ASIATIC SOCIETY OF BENGAL,

FOR 1876.

	Page
Abdul Latíf Khán Bahádur, Maulawí, Member of Phil. Committee,	50
Aborigines. The Angámi Nágás, 11; Maiwár Bhíls, ...	32
Accommodation of the Society under New Museum Act, ...	59, 73
Account, abstracts of, ...	xiii.
Agni Purána, ...	27
Aitareya Arányaka, ...	*ib.*
Akbarnámah, ...	*ib.*
Alethopteris Lindleyana, Indica, Whitbyensis, and *phegopteroides,*...	226
Amphistoma hominis, ...	182
Anderson, (J. Dr.), elected Member of Committees and Council,	171, 202
Angámi Nágás and their language, on the, ...	11
Annual Meeting, 1876, and Report of the Council, ...	17
Anoura, ...	175
Antenna, Development of the, in Pectinicorn *Mantidæ,* ...	228
Apcar, (G. G. Mr.), presentation by, of a *Hyalonema Sieboldii,* ...	114
Armstrong, (J. Dr.), Member, Natural History Committee, ...	50
Arthropoda, new to India, ...	174
Arrow heads, iron, from Sind, ...	116
Asiatic Fire Weapons, on early, ...	93
Astacidæ, from New Zealand, On the systematic position of the, ...	4
Astacoides tridentatus, ...	*ib.*
Atmospheric Pressure, Irregularities of, in the Indian Monsoon region,	117
Ball, (V. Mr.), Member of Committees, ...	50
„ exhibits Khond weapons, and musical instruments from Sambalpúr, ...	114
„ On an Ancient Kitchen-midden at Chandwár, ...	120
„ On Stone Implements found in Orissa, ...	122

	Page
Banerjea, (K. M. Rev.,) Member of Philological Committee, ...	50
„ „ on Human Sacrifices in Ancient India, ...	53
Baness, (J. F. Mr.), election of, ...	101
Bayley, (The Hon'ble E. C.), Member of Committees, ...	49, 50
„ „ on Human Sacrifices in Ancient India,	55
„ „ elected President, ...	73
„ „ exhibits Cilician, Sassanian, Parthian, and Scythian coins, ...	219
Beames, (J. Mr.), Member of Philological Committee, ...	50
Behrendt, (J. Mr.), election of, ...	101
Belemnopteris, ...	226
Bengal, Invasion of, by the Chola King Kulottunga, ...	107
Beveridge, (H. Mr.), elected an ordinary Member, ...	202
„ Were the Sundarbans inhabited in Ancient Times? ...	93
Beverley, (H. Mr.), on the Sundarbans, ...	94
„ „ on the Census of Calcutta, ...	111
Bhámati, ...	27
Bhíls of Maiwár, ...	32
Bibliotheca Indica, Report on, ...	24
Birds, from Dafla Hills and Darrang Terai, List of,	119, 223
Blanford, (H. F. Mr.), on the Sundarbans, ...	94
„ „ on the residue of the Piddington Fund, ...	104
„ „ On certain protracted Irregularities of Atmospheric Pressure in the Indian Monsoon Region, and their relation to variations of the Local Rainfall, ...	117
„ „ An account of Experiments made in 1875 and 1876 in various parts of India for the purpose of comparing the observed Temperature of the Dew-point with that computed from the Psychrometer by different methods of reduction, ...	119
„ „ On the physical explanation of the inequality of the two semi-diurnal Oscillations of Barometric Pressure,... ...	176
„ „ on synoptical weather charts, ...	218
Blanford, (W. T. Mr.), Member of Committees and Council, ...	49, 73
„ „ remarks on the habits of Wild Pigs, ...	92
„ „ election of, as Vice-President, ...	*ib.*
„ „ on the Sundarbans, ...	94
„ „ exhibits some iron arrow-heads from Sind,	116

		Page
Blanford, (W. T. Mr.)	Description of a new cat *(Felis Shawiana)* from Eastern Turkistan, ...	124
„ „	on the Physical Geography of the Great Indian Desert with special reference to the former presence of the Sea in the Indus Valley and the origin and mode of formation of the Sand-hills,...	141
„ „	on the Inhabitants of the Nicobars, ...	149
„ „	exhibits drawings by Capt. E. Mockler, Guádar, of Ancient Dwellings and Tombs near Guádar in Balúchistán, ...	172
„ „	description of *Pelomys Watsoni*, a new species of mouse from Sind, ...	181
Blochmann, (H. Mr.),	nominated Trustee of the Indian Museum,...	48
„ „	readings of Arabic and Persian Inscriptions from Dihlí, Rohtás, and Sahasrám, ...	4
„ „	remarks on a silver coin of Sháhjahán II, ...	139
„ „	on Dr. Scully's coins from Káshghar, ...	90
„ „	on coins presented by Dr. Oldham, ...	69
Bourne, (Walter Mr.),	withdrawal of, ...	70
Bowie, (M. M. Major),	election of, ...	202
Bradshaw, (A. F. Surgeon-Major),	election of, ...	89
Brooks, (W. E. Mr.),	Member, Natural History Committee, ...	50
Brough, (R. S. Mr.),	Member of Committees, ...	49, 50
Buckland, (C. T. Mr.),	withdrawal of, ...	135
Burnell, (Dr.),	on the Invasion of Bengal by Kulottunga, ...	107
Butler, (J. Capt.),	on the Angámi Nágás and their language, ...	11
„ „	death of, ...	12
Bye-laws,	proposed alterations of the, ...	164, 203, 205
Bysack, (Gaur Dás, Bábu),	Member of Philological Committee, ...	50
Cappel, (A. Mr.),	Member of Physical Science Committee, ...	*ib.*
Carnegy, (P. T. Mr.),	election of, ...	160
Carrington, (R. A. Mr.),	withdrawal of, ...	202
Cat, new, from Eastern Turkistán,	... ...	124
Cayley, (H. Dr.),	election of, ...	202
Census of the Town of Calcutta,	results of, ...	111
Ceratomantis Saussurii,	... ...	175
Chaturvarga Chintamani,	... ...	27
Coin Cabinet,	Report on, and Committee, ...	23, 50
Coins, Chinese and Muhammadan, from Káshghar,	...	90
„ copper from Vigu Koṭ, Kachh,	... ...	69

	Page
Coins, gold, old Dutch and Venetian, from Baidyanáth Temple, ...	69
„ gold, struck by Muhammad-bin-Tughluq, ...	91
„ gold, unique of Náçir-uddín Mahmúd Sháh, ...	*ib.*
„ silver, of Sháhjahán II, ...	139
„ Sassanian, Parthian, Cilician, and of Kanishka,	219, 220
Committees, nomination of, ...	49
Compositæ Indicæ, Statement by the Council with reference to Mr. C. B. Clarke's Introductory Note to his, ...	161
Compounding Fee, Report on introduction of, ...	194
Congress of Orientalists, programme of 3rd, ...	50
Council, election of, ...	31
„ Memorandum on the Repairs of the Society's premises, ...	161
„ resolution on Dr. Oldham's resignation of the Presidentship,	71
„ on Mr. C. B. Clarke's "*Compositæ Indicæ*", ...	161
„ on the rejection of a Honorary Member,... ...	3
Coxhead, (T. E. Mr.), election of, ...	70
Crawfurd, (J. Mr.), election of, ...	47
Creobrota, ...	175
Cunningham, (A. Major-General), Member of Committees, ...	50
„ „ exhibits a coin of Sháhjahán II.,	138
„ „ Inscriptions from Sahasrám, &c.	10
Cunningham, (D. D. Dr.), Member of Committees, ...	49
Cyclostomacea of the Dafla Hills, Assam, ...	180
Dall, (C. H. Rev.), on Measurement of Mt. St. Elias, Alaska, ...	1
Damba Koh, Makrán, ancient dwellings and tombs at, ...	173
Darmáni bán, near Damba Koh, ...	*ib.*
Day, (F. Dr.), letter relating to the Stoliczka Memorial, ...	78
Deed of Release by the Council on receipt of Rs. 150,000 from Government, ...	75
Denkenal, Stone implement from, ...	122
Desert, Physical Geography of the Great Indian,... ...	141
Dijendra Nath Thákur, (Bábu) Member of Philological Committee,	50
Dobson, (Dr.), letter relating to the Stoliczka Memorial, ...	78
Durgáráma Basu, (Bábu) translation of a copper-plate grant of Govindachandra of Kanauj by, ...	130
Elliott, (J. Mr.), Member of Committees, ...	117
Eosin, influence of, on the Photographic Action of the Solar Spectrum upon the Bromide and Bromoiodide of Silver, ...	12
Farhang-i-Rashídí, completed, ...	24
Feistmantel, (Dr. O.), election of, ...	2
„ „ Member of Committees, ...	49

Page

Feistmantel, (Dr. O.), on Fossil Plants from the Damúdar Series in the Ráníganj coal-fields, ... 223
Felis (Chaus) caudata and *Shawiana*, ... 124
Finance, Report on, and nomination of Committee, ... 19, 49
Foulkes, (Thos. Rev.), election of, ... 135
Gangamopteris Whittiana, ... 226
Gastrell, (J. E. Col.), Life Member of the Society, ... 77
„ „ vote of thanks to, for long services rendered to the Society, ... *ib.*
Gay, (E. Mr.), Member of Finance Committee, ... 49
„ „ resignation of membership of Council, ... 73
Geoghegan, (J. Mr.), Member of Library Committee, ... 49
Ghalchah (Wakhí and Sariḳolí) Languages on the, .. 79
Glossopteris communis, ... 224, 227
„ *angustifolia*, ... *ib.*
Grierson, (G. A. Mr.), election of, ... 202
Godwin-Austen, (H. H. Major), List of Birds collected during the expedition into the Dafla Hills, Asám, together with those obtained in the adjacent Durrang Terai, ... 119
„ „ On the *Cyclostomacea* of the Dafla Hills, Asám, ... 180
„ „ Fifth list of Birds from the N. E. Frontier, ... 223
„ „ On the *Helicidæ* collected during the Dafla Expedition, 228
Gongylus gongylodes, ... *ib.*
Govindachandra of Kanauj, copper-plate grant of, ... 130
Grote, (A. Mr.), letter relating to the Stoliczka Memorial, ... 78
Growse, (F. S. Mr.), Member of Philological Committee, ... 50
„ „ the Prologue to the Rámáyana of Tulsi Dás,... 81
„ „ presentation by, of a copper-plate grant of Govindachandra of Kanauj, ... 130
Guádar in Balúchistán, ancient dwellings and tombs near, ... 172
Hamírpur District in Bundelkhand, Popular Songs, 33, 187
Hector, (J. Mr.), election of, ... 160
„ „ withdrawal of,... 202
Helicidæ, from the Dafla Hills, ... 228
Hemionitis cordata, ... 226
Hestias Brunneriana, ... 175

	Page
Heterorrhina annectans, ...	4
„ *Roepstorffii*, ...	*ib.*
Hierodula, ...	123
Human Sacrifices in Ancient India, ...	53
Hume, (A. O. Mr.), Member, Natural History Committee, ...	50
Hyalonema Sieboldii, ...	114
Iapyx gigas, Saussurii, solifugus, and *Wollastoni*, ...	174
Içábah, ...	25
Indian Museum Act, on proposed changes in the, ...	59
„ negociations with Government of India for abandonment by the Society of accommodation in the, ...	73
International Oriental Congress at St. Petersburg, List of Questions to be discussed, ... 50,	106
Isaac (T. S. Mr.), Member of Council and Committees, ... 73,	50
Inscriptions from the Rauzah Mírzá Muqím, Dihlí, ...	4
„ from Nizám-uddín, Dihlí, ...	5
„ from a tomb in a *gambaz* near the Ḳadam Sharíf, Dihlí,	*ib.*
„ from the courtyard of Amír Khusrau's Dargáh, ... 5,	6
„ from an old Masjid near the Dihlí Jail, ...	*ib.*
„ from a Mosque at Sarái Dáúd, near Chirágh-i-Dihlí, ...	7
„ from Rohṭás, ... 7, 8, 9,	109
„ from Chandan Pír Hill, Sahasrám, ...	10
„ from Mr. Delmerick's Dihlí rubbings, ...	92
„ from Mr. Delmerick's Hiçár Firúzah rubbings, ...	*ib.*
„ from F. L. Beaufort, C. S., inscription on a Cannon in the Jinsí-Topkhánah, Murshidábád, ...	*ib.*
„ from Gaur and Paṇḍuah, photozincographs of, ...	159
Jarrad, (F. W. Lieut. R. N.), election of, ...	135
„ „ Member of Committees, ...	171
Kabíruddín Ahmad, Maulawí, Member of Phil. Committee, ...	50
Kátantra, ...	27
Khond weapons and Musical instruments from Sambalpúr, ...	114
King, (G. Dr.), Member of Natural History Committee, ...	50
Kitchen-midden, On an ancient, at Chandwar, near Cuttack, ...	120
Knox, (G. E. Mr.), withdrawal of, ...	3
Kumar Kanté Chunder Sing, of Paikpárá, election of, ...	70
Kulottunga, Chola King, invasion of Bengal by, ...	166
Kurz, (S. Mr.), Member of Natural History Committee, ...	50
„ Sketch of the Vegetation of the Nicobar Islands by,	193
Lafont, (F. Rev.), Member of Physical Science Committee, ...	50

	Page
Lafont, (F. Rev.), exhibits a Crookes' Radiometer, ...	171
Lassen, Professor C. death of, ...	101
La Touche (E. W. D. Capt.), withdrawal of, ...	202
Lewis, (T. R. Dr.), Trustee of the Indian Museum, ...	73
„ and McConnell, (J. F. P. Dr.), On *Amphistoma hominis*, a new Parasite affecting Man, ...	182
Library, additions to, ... 34, 82, 96, 125, 150, 197, 205,	229
„ Report on, and Committee, nomination of, ...	22, 49
Lightning, prevention of accidents from, ...	104
List of Societies, &c., exchanging publications, ...	27
Lonchodes amaurops, Austeni, bifoliatus, brevipes, Crawangensis, cuniculuris, insignis, nematodes, nodosus, uniformis, and *verrucifer*, ...	3, 95
Lopaphus Iolas, ...	3
Lyall (J. W. Mr.) election of, ...	89
Lydekker (R. Mr.) exhibits jaw of *Tetraconodon magnum*, ...	172
„ „ member of Natural History Committee, ...	50
Lytton, Lord, accepts the office of Patron of the Society, ...	101
Macdonald (J. C. Mr.) election of, ...	215
Maclagan (R. Major-General), on Early Asiatic Fire Weapons, ...	93
Macnaghten (Cherter Mr.) withdrawal of, ...	70
Macrotæniopteris, ...	226
Mahábáshya, copy of, presented by Prince of Wales, ...	32
Malleson, (G. B. Col.), election of, ...	215
Mallock (H. H. Major), withdrawal of, ...	3
Mantidæ, On the femoral brushes of, and their Use,	123, 176
„ Remarkable, ...	175
„ Development of Antennæ in Pectinicorn, ...	228
McConnell (J. F. P. Dr.), *see* Lewis and McConnell.	
McGregor, (W. Mr.), election of, ...	2
„ on the Prevention of Accidents from Lightning,	104
Medlicott, (H. B. Mr.), exhibits Meteorites from Raipur, &c.,	115, 221
„ „ Member of Council, ...	73
„ „ appointed Treasurer of the Society, ...	*ib.*
„ „ Member of Committees, ...	50
Megalomastoma tanycheilus, ...	180
Members, list of, during 1875, Appendix II., ...	xii.
Meteorites, ...	115, 221
Mimánsá Darśana, ...	27
Mitchell (T. B. Capt.), withdrawal of, ...	48
Mockler (E. Capt.), election of, ...	215

	Page
Mahendralal Sircar, (Dr.), Member of Committees,	49, 50
Muhammad-bin-Tughluq, coin of,	91
Muhiyy-ul-Millat, prince of Dihlí,	139
Muir, (Dr. J.), proposed Honorary Member,	218
Náçir-uddín Mahmúd Sháh, unique gold coin of,	91
Nash, (A. M. Mr.), election of,	89
„ „ Member of Committees,	117
Natural History Committee, Nomination of,	50
Nephrops,	4
Nesokia Huttoni and *Scullyi*,	80, 81
Nevill, (G. Mr.), Member of Committees,	49
Nicobar Islands, A sketch of the vegetation of the,	193
Nicobars, Notes on the Inhabitants of the,	142
Officers, report on, and election of,	24, 31
O'Kinealy, (J. Mr.), Member of Physical Science Committee,	50
Oldham, (T. Dr.), Memorial to,	72, 217
Oxypilus bicingulata,	175
Palæovittaria Kurzi,	228
Palythoa,	114
Parablepharis,	176
Paranephrops,	4
Parasite, On a new, affecting Man,	182
Parry, (R. Mr.), election of,	101
Partridge, (S. B. Dr.), Life Member of the Society,	77
„ „ vote of thanks to,	73
Peal, (S. E. Mr.), letter on Wild Pigs eating fish,	92
„ „ Member of Natural History Committee,	50
Pedler, (A. Mr.), Member of Committees,	49
„ „ „ on the Radiometer as a Photometer,	187
Pelomys fallax and *Watsoni*,	181, 182
Phasmideous Insects, New or little-known,	3
Phayre, (Maj.-Genl. Sir A.), on Stone Implements from Burma,	95
Phear, (The Hon. J. B.), Member of Physical Science Committee,	50
Phibalosoma Westwoodii,	3
Philological Committee, nomination of,	50
Phyllium Celebicum, siccifolium, and *Westwoodi*,	3, 176
Phyllocrania Westwoodi,	*ib.*
Phyllotheca,	225
Physical Science Committee, nomination of,	50
Piddington Fund,	103 104, 171
Plants, Fossil,	223

	Page
Polyxenus lagurus, ...	175
Prannáth Pandit, (Bábu), Member of Committees, ...	49
Pteris sagittæfolia, ...	226
Prelaphidæ, ...	175
Publications by the Society, Report on, ...	22
Radiometer, note on the use of the, as a Photometer, ...	187
„ remarks on, by the Rev. Fr. Lafont, ...	171
Rájá Harendra Krishna Bahádur, withdrawal of, ...	48, 70
Rájendralála Mitra, (Dr.), Member of Committees, ...	49
„ on Human Sacrifices in Ancient India, ...	53
„ on the Invasion of Bengal by the Chola King Kulottunga, ...	107
„ on Inscriptions from Rohtás, ...	109
„ on a Kanauj copper-plate grant, ...	130
Rám-charit Mánas, the Hindí Rámáyana, ...	81
Rámáyana of Tulsí Dás, Prologue to the, ...	*ib.*
Rániganj, Fossil plants from, ...	223
Raye, (D. O'C. Dr.), election of, ...	135
Read, (H. Mr.), report on the Raipur meteorite, ...	115
Registration of the Society under Act XXI of 1860, 117, 135,	171
Reid, (J. R. Mr.), gold coins from, ...	220
Repairs to the Society's Premises, ... 93, 161,	202
Robinson, (D. G. Col.), Member of Physical Science Committee, ...	50
Rodent, new, from Central Asia,...	80
Rodon, (G. S. Lieut.), election of, ...	202
Roepstorff, (F. A. de, Mr.), Notes on the Inhabitants of the Nicobars,	142
Rules, alterations in the, ... 164, 203, 215,	217
Sagenopteris polyphylla, ... 224,	227
Sáhitya Darpana, ...	27
Sáma Veda Sañhita, ...	*ib.*
St. John, (D. B. Major), election of, ...	160
Sambalpúr, stone implement from, ...	123
Schizocephala bicornis, Geographical distribution of, ...	*ib.*
Schizoneura Gondwanensis, ...	225
„ *paradoxa*, ...	225
Schlich, (W. Dr.), Member of Natural History Committee, ...	50
Schwendler, (L. Mr.), resignation of membership of Council, ...	73
Scully, (J. Dr.), Member of Committees, ...	50
„ „ presents Coins from Káshghar, ...	90
Scolopendrella, ...	175
Scott, (Ross., Mr.), election of, ...	135

	Page
Scott, (D. Mr.), election of, ...	135
Sháhjahán II., silver coin of, ...	139
Shaw, (R. B. Mr.), election of, ...	32
„ on the Ghalchah Languages,... ...	79
Sherring, (M. A. Rev.), Member of Coin Committee, ...	50
Shombongs, aboriginal tribe of Nicobars, ...	145
Shops, erection of, in the Society's Compound, ...	217
Siemens, (Werner Dr.), proposed as an Honorary Member, ...	48
„ „ elected an Honorary Member, ...	70
Sitathali, near Raipur, C. P., meteorite from, ...	115
Smith, (D. B. Dr.), elected Member of Council, ...	73
„ (V. A. Mr.), Popular Songs of Hamírpur District,	33, 187
Spalacomys Indicus, ...	80
Sphenophyllum Trizygia, ...	225
Sphenopteris polymorpha, ...	*ib.*
Stewart, (R. Mr.), withdrawal of, ...	48
Stokes, (W. Mr.), Member of Committees, ...	49
Stone Implements found in the Tributary States of Orissa, ...	122
„ from Burma, Note on, by Sir A. Phayre, ...	3
Stoliczka Memorial, ...	... 23, 77
Stubbs, (F. W. Col.), Member of Coin Committee, ...	50
Sundarbans, whether inhabited in Ancient Times,... ...	93
Sutkagen Dor, Makrán, ancient tombs and dwellings at, ...	172
Ṭabaqát-i-Náçirí, ...	25
Tabarí, projected new edition of, ...	135
Tæniopteris Danæoides, ...	226
Talchir, Stone implement from, ...	123
Tawney, (H. Mr.), Member of Committees, ...	49
„ „ resignation of membership of Council, ...	73
Taylor, (A. D. Commander), Member of Physical Committee, ...	50
„ (R. Mr.), Member of Finance Committee, ...	46
Tennant, (J. F. Col.), Member of Committees, ...	49
„ „ „ re-election of, ...	32
„ „ „ of Council, ...	73
„ „ resignation of Membership of Council, ...	202
Tetraconodon magnum, ...	172
Theobald, (W. Mr.), Member of Committees, ...	50
„ „ withdrawal of, ...	70
Thibaut, (G. Dr.), Member, Philological Committee, ...	50
Thuillier, (H. L. Col.), on Capt. Butler, ...	11
Trizygia speciosa, ...	225

	Page
Tulsí Dás, Rámáyana of, ...	81
Tween, (A. Mr.), Member of Physical Science Committee, ...	50
„ „ withdrawal of, ...	70
Ungul, stone implement from, ...	122
Urmston, (H. B. Lieut.), withdrawal of, ...	3
Vertebraria, ...	225
Waldie, (D. Mr.), Member of Committees, ...	50
Wales (H. R. H. Prince of), presents copy of Mahábáshya, ...	32
Waller, (W. K. Dr.), Member of Library Committee, ...	49
Waterhouse, (Capt. J.), on the influence of Eosin on the Photographic Action of the Solar Spectrum upon the Bromide and Bromoiodide of Silver, ...	12
„ „ Trustee of the Indian Museum, ...	48
Webb (W. T. Mr.), election of, ...	251
Wild Pigs eating Fish, note on, by Mr. S. E. Peal, ...	92
Williams, (H. Mr.), withdrawal of, ...	70
Wilson, (A. Mr.), election of, ...	*ib.*
Wood-Mason, (J. Mr.), New Phasmideous Insects, and new *Cetoniidæ*, exhibited by, ...	3, 4
„ „ A new species of *Astacoides*, exhibited, with remarks on the systematic position of the New-Zealand *Astacidæ*, by, ...	4
„ „ Description of a new Rodent from Central Asia, by, ...	80
„ „ Species of *Iapyx*, *Scolopendrella*, etc. exhibited by, ...	174
„ „ On the femoral Brushes of the *Mantidæ* and their use, ... 123,	176
„ „ On some Remarkable *Mantidæ*, ...	175
„ „ Description of a new phasmideous insect, ...	95
„ „ Fossil Plants from Ráníganj, ...	223
„ „ On the Development of the Antennæ in the Pectinicorn *Mantidæ*, ...	228
Wood, (C. H. Mr.), Member of Committees, ...	49
Wood, (H. W. J. Mr.), letter regarding Piddington Fund, ...	103
Yule, (Henry Col.), proposed as an Honorary Member, ...	48
„ election of, as Honorary Member, ...	70
Zoological Garden, Calcutta, ...	23

LIST OF MEMBERS

OF THE

ASIATIC SOCIETY OF BENGAL,

ON THE 31ST DECEMBER, 1875.

LIST OF ORDINARY MEMBERS.

The * distinguishes Non-Subscribing, the † Non-Resident Members, and the ‡ Life-Members.

N. B.—Gentlemen who may have changed their residence, since this list was drawn up, are requested to give intimation of such a change to the *Secretaries*, in order that the necessary alterations may be made in the subsequent edition. Errors or omissions in the following list should also be communicated to the Secretaries.

Gentlemen who are proceeding to Europe, with the intention of not returning to India are particularly requested to notify to the *Secretaries*, whether it be their desire to continue as members of the Society, otherwise, in accordance with Rule 14 B. of the Bye-laws, their names will be removed from the list at the expiration of three years from the time of their leaving India.

Date of Election.		
1860 Dec. 5.	Abdullatíf Khán Bahádur, Maulaví.	Calcutta
1868 Sept. 2.	†Adam, R. M., Esq.	Agra
1860 July 4.	†Ahmad Khan, Bahádur, Sayyid, C. S. I.	Benares
1872 April 3.	†Ahsanullah, Khwájah.	Dacca
1860 April 4.	†Aitchison, J. E. T., Esq., M. D.	Mari, Panjáb
1866 Jan. 17.	*Allan, Lieut.-Col. A. S.	Europe
1871 June 7.	†Alexander, J. W., Esq.	Darbhanga
1860 Oct. 3.	Amír Alí Khán Bahádur, Nawáb.	Calcutta
1874 June 3.	Amír Alí, Sayyid, Esq.	Calcutta
1865 Jan. 11.	*Anderson, Dr. J., F. L. S.	Europe
1872 June 5.	†Anderson, A., Esq.	Fattehghur
1875 June 2.	Apcar, J. G., Esq.	Calcutta
1875 Feb. 3.	Armstrong, J., Surg., B. Army.	Calcutta
1871 Sept. 6.	†Atkinson, E. T., Esq., C. S.	Allahabad
1855 July 4.	*Atkinson, W. S., Esq., M. A., F. L. S.	Europe
1869 Feb. 3.	†Attar Singh Bahádur, Sirdár.	Bhadour, Ludiana
1870 Feb. 2.	*Baden-Powell, H., Esq., C. S.	Europe
1873 Aug. 6.	†Badgley, Capt., W. F.	Shillong
1859 Aug. 3.	Balaichánd Sinha, Bábu.	Calcutta
1865 Nov. 7.	†Ball, V., Esq., Geol. Survey.	Geol. S. Office
1860 Nov. 1.	Banerjea, Rev. K. M.	Calcutta
1869 Dec. 1.	*Barker, R. A., Esq., M. D.	Europe
1873 March 5.	Barclay, G. W. W., Esq., M. A.	Calcutta
1860 July 4.	†Batten, G. H. M., Esq., C. S.	Agra
1859 May 4.	Bayley, E. C., The Hon'ble., B.C.S., C.S.I.	Calcutta
1873 Feb. 5.	Bayne, R. R., Esq., B. A.	Calcutta
1864 Sept. 7.	†Beames, J., Esq., B. C. S.	Cuttak
1841 April 7.	Beaufort, F. L., The Hon., B. C. S.	Calcutta

Date of Election.			
1867	July	3.	Belletty, N. A., Esq.	Calcutta
1862	Oct.	8.	*Bernard, C. E., Esq., B. C. S.	Europe
1872	Aug.	7.	†Beverly, H., Esq., C. S.	Krishnagur
1864	Nov.	2.	Bhudeva Mukerjea, Bábu.	Chinsurah
1874	Nov.	4.	Bhagabati Charn Mallik, Bábu.	Calcutta
1875	July	7.	†Black, F. C., Esq.	Hamirpur
1873	Dec.	3.	Blackburn, J., Esq.	Calcutta
1857	Mar.	4.	Blanford, H. F., Esq., A. R. S. M., F. G. S.	Calcutta
1859	Aug.	3.	†Blanford, W. T., A. R. S. M., F. R. S., F. G. S.	Geol. S. Office
1873	Aug.	6.	†Bligh, W. G., Esq.	Muttra
1873	April	2.	†Blissett, T., Esq.	Dacca
1864	April	6.	Blochmann, H., Esq., M. A.	Calcutta
1871	April	5.	Bourne, Walter, Esq., C. E.	Calcutta
1868	Jan.	15.	†Boxwell, J., Esq., C. S.	Dumka
1872	June	5.	†Brooks, W. E., Esq., C. E.	Khagoul
1860	March	7.	†Brandis, Dr. D.	Simla
1871	Jan.	4.	*Brough, R. S., Esq.	Europe
1874	March	4.	†Brown, R. Esq., M. D.	Manipur
1866	Nov.	7.	*Browne, Col. Horace A.	Europe
1874	April	1.	*Bruce, W. D. Esq., C. E.	Europe
1871	July	5.	Buckland, C. T. Esq., C. S.	Hooghly
1871	Sept.	6.	†Buckle, H., Esq.	N. Arracan
1872	Jan.	3.	*Butcher, W. D., Esq., M. R. C. S.	Europe
1873	Aug.	6.	†Butler, Capt. J., B. S. C.	Samaguting
1869	Jan.	20.	†Cadell, A., Esq., B. A., C. S.	Banda
1863	June	3.	*Campbell, The Hon'ble Sir G., K. C. S. I.	Europe
1873	Mar.	5.	Cappel, A., Esq.,	Calcutta
1875	May	6.	Carrington, R. C., Esq.,	Calcutta
1860	Jan.	3.	†Carnac, J. H. Rivett, Esq., B. C. S.	Ghazipur
1875	April	4.	Chambers, Dr. E. W.	Calcutta
1868	Aug.	5.	†Chandramohan Gosvámi, Pandit.	Gauhátí
1872	Dec.	4.	†Chard, Rev. C. H.	Thayetmyo
1874	Aug.	5.	†Chennell, A. W., Esq.	Shillong
1875	June	2.	†Chennell, T., Esq.	Dibrúghar
1871	Sept.	6.	*Chisholm, R. F., Esq.	Europe
1868	Feb.	5.	†Clark, Lieut.-Col. E. G. Bengal Staff Corps.	Kheri, Oudh
1872	Aug.	7.	†Clutterbuck, Capt. F. St. Quintin.	Peshawar
1874	Nov.	4.	†Constable, A. Esq.	Lucknow
1871	Oct.	4.	*Cooke, H. G., Esq., C. S.	Europe
1868	Dec.	2.	†Cooke, J. E., Esq.	Madras
1872	June	5.	*Court, Major M. H.	Europe
1874	March	4.	†Crombie, A., Esq., M. D.	Rangoon
1873	Aug.	6.	Cunningham, D. D., Esq., M. B.	Calcutta
1874	July	1.	†Cowan, Capt. S. H.	Masúri
1847	June	2.	*Dalton, Col. E. T., C. S. I., Staff Corps.	Europe
1870	May	4.	†Damant, G. H., Esq., C. S.	Cachar
1873	Dec.	3.	†Dames, M. L., Esq., C. S.	Dera Ghazi Khan

Date of Election.			
1871	Jan.	4.	Daukes, F. C., Esq., C. S.	Calcutta
1861	Nov.	6.	†Davies, The Hon'ble R. H., C. S. I., B. C. S.	Lahore
1869	April	7.	*Day, Dr. F., F. L. S., F. Z. S.	Europe
1856	June	4.	†DeBourbel, Major R., Royal Engrs.	Lucknow
1874	July	1.	Deane, Capt. T.	Calcutta
1870	Feb.	2.	†DeFabeck, F. W. A., Esq., I. M. Service.	Deoli
1872	Aug.	7.	Dejoux, P., Esq.	Calcutta
1869	Oct.	6.	†Delmerick, J. G., Esq.	Delhi
1873	Jan.	8.	†Dennys, H. L., Esq.	Sambalpur
1864	July	6.	Devendra Mallik, Bábu.	Calcutta
1862	May	7.	†Dhanapati Singh Dughar, Rái Bahádur.	Azimganj
1853	Sept.	7.	Dickens, Col. C. H., C. S. I.	Calcutta
1870	May	4.	†Dobson, G. E., Esq., B. A., M. B., F. L. S.	Europe
1875	March	3.	Dodgson, Walter, Esq.	Calcutta
1859	Sept.	7.	*Douglas, Col. C.	Europe
1875	March	3.	Douglas, J., Esq., Govt. Telg. Dept.	Calcutta
1869	Feb.	3.	*Drew, F., Esq.	Europe
1874	July	1.	Drummond, Col. H., R. E.	Calcutta
1870	March	8.	‡Duke of Edinburgh, His Royal Highness.	Europe
1867	June	5.	†Duthoit, W., Esq., C. S.	Mirzapur
1871	March	1.	Dvijendranath Thakur, Bábu.	Calcutta
1863	May	6.	†Edgar, J. W., Esq., C. S. I., B. C. S.	Darjíling
1874	Dec.	2.	†Egerton, R. E., Esq., C. S.	Lahore
1871	Dec.	2.	†Elliot, J., Esq., M. A.	Allahabad
1846	Jan.	7.	*Elliot, Sir Walter, late M. C. S.	Europe
1859	Nov.	2.	*Elliot, C. A., Esq., B. C. S.	Europe
1871	Oct.	4.	†Evezard, Col. G. E.	Púna
1863	Oct.	7.	Ewart, J., Esq., M. D.	Calcutta
1859	Dec.	7.	Fath Alí, Maulaví.	Calcutta
1851	May	7.	*Fayrer, Dr. J., C. S. I.	Europe
1863	Jan.	15.	†Fedden, Francis, Esq., Geol. Survey.	Karáchi
1868	May	6.	*Field, C. D., Esq., M. A., C. S.	Europe
1869	Sept.	1.	*Fisher, J. H., Esq., C. S.	Europe
1872	Dec.	4.	*Forbes, Major J. G., R. E.	Europe
1875	Jan.	6.	*Forbes, Capt. C. J. F. S., Depy. Comr.	Shwegyeen, B.
1861	Feb.	6.	†Forest, R., Esq., Civil Engineer.	Dehra [Burmah
1869	Oct.	12.	*Forlong, Lieut.-Col. J. G. R., M. S. C.	Europe
1863	June	3.	Forsyth, The Hon. Sir T. D., K. C. S. I., C. B.	Calcutta
1871	Nov.	1.	†Foster, J. M., Esq., M. R. C. P.	Nazira, Assam
1873	July	2.	†Fraser, Capt. E.	Bushire
1869	Sept.	1.	*Fryer, Major G. E., Dy. Commissioner.	Europe
1867	Sept.	4.	Fyfe, The Rev. W. C.	Calcutta
1873	Dec.	3.	†Gamble, J. S., Esq.	Pankabari, Darjíling
1871	Aug.	2.	†Gangaprasad, Munshi.	Moradabad
1874	July	1.	*Gardner, D. M., Esq.	Europe

Date of Election.			
1859	Aug.	3.	Gastrell, Col. J. E., Supdt. Rev. Survey.	Calcutta
1862	Feb.	5.	†Gauradás Baisák, Bábu.	Birbhum
1867	Sept.	4.	†Gauvain, Capt. V.	
1867	Dec.	4.	Gay, E., Esq., M. A.	Calcutta
1859	Sept.	7.	Geoghegan, J., Esq., B. C. S.	Calcutta
1875	July	7.	†Girdlestone, C. E. R., Esq., C. S.	Nepal
1869	Feb.	3.	†Giriprasád Singh, Thákur.	Allighar
1861	Feb.	6.	*Godwin-Austen, Major H. H., Topographical Survey.	Europe
1872	Nov.	6.	*Gordon, C. B. P., Esq.	Calcutta
1862	July	2.	*Gordon, Robert, Esq., C. E.	Europe
1869	July	7.	*Gordon, J. D., Esq., C. S. I., C. S.	Europe
1875	July	7.	†Gouldsbury, J. R. E., Esq.	Montgomery
1863	Nov.	4.	†Gowan, Lieut.-Col. J. Y.	Europe
1866	June	6.	Gribble, T. W., Esq., B. C. S.	Calcutta.
1861	Sept.	4.	†Griffin, L. H., Esq., B. C. S.	Kapúrthala, Panjab
1873	Aug.	6.	Girischandra Sinha, Kumara.	Calcutta
1861	Feb.	6.	†Growse, F. S., Esq., M. A., B. C. S.	Mathurá
1871	Jan.	4.	Gunendranath Thákur, Bábu.	Calcutta
	Jan.	6.	†Gunn, S., Esq., M. B., Surg., Bengal Army.	Masúri
1864	Dec.	5.	†Gurucharan Dás, Bábu.	Krishnagur
1871	June	7.	Habíburrahmán, Maulaví.	Calcutta
1867	July	3.	†Hacket, C. A., Esq., Geol. Survey.	Geol. S. Office
1869	April	3.	*Hæberlin, The Rev. C.	Europe
1855	March	7.	†Hamilton, R., Esq.	Wardah
1861	March	1.	†Harachandra Chaudhuri, Bábu.	Sherepur
1866	Nov.	1.	Harendra Krishna Bahádur, Rájá.	Calcutta
1861	Feb.	2.	†Harrison, A. S., Esq., B. A.	Allahabad
1859	Oct.	6.	*Haughton, Col. J. C., C. S. I.	Europe
1862	Aug.	6.	*Heeley, W. L., Esq., B., A. C. S.	Europe
1874	Jan.	7.	Heintze, C., Esq.	Calcutta
1875	March	3.	†Hendley, Dr. T. H.	Jaipur
1875	Aug.	4.	†Hewitt, J. F. H., Esq., C. S.	Mutihari,
1868	Aug.	5.	†Hobart, R. T., Esq., C. S.	Allahabad
1872	Dec.	4.	*Hoernle, Rev. A. F. R., Ph. D.	Europe
1868	Nov.	4.	†Holroyd, Major W. R. M.	Lahore
1873	Jan.	8.	‡Houstoun, G. L., Esq.	Europe
1863	Jan.	15.	†Howell, M. S., Esq., C. S.	Benares
1866	Feb.	7.	Hoyle, G. W., Esq.	Calcutta
1867	Aug.	7.	†Hughes, T. H., Esq., A. R. S. M., F. G. S.	Geol. S. Office
1873	March	5.	†Hughes, A. J., Esq., C. E.	Byturm
1866	Jan.	17.	*Hughes, Captain W. G., M. S. C.	Europe
1870	Jan.	5.	Hume, Allan O., Esq., C. B., C. S.	Calcutta
1870	June	1.	*Hunter, W. W., Esq., LL.D., C. S.	Europe
1868	April	1.	Hyde, Col. H., R. E.	Calcutta

Date of Election.		
1872 Dec. 4.	†Ibbetson, D. C. J., Esq., C. S.	Karnál, Panjáb
1866 March 7.	†Irvine, W., Esq., C. S.	Fatehgarh,
1871 March 8.	Isaac, T. S., Esq., C. E.	Calcutta
1853 Dec. 7.	†Isvaríprasád Singh Bahádur, Raja.	Benares
1874 Feb. 4.	†Jackson, Dr. C. J.	Puri
1865 June 7.	†Jaykissen Dás Bahádur, Rájá, C. S. I.	Cawnpore
1873 Aug. 6.	Jogeshachandra Datta, Bábu.	Calcutta
1866 Feb. 7.	†Johnson, W. H., Esq.	Patna
1862 March 5.	*Johnstone, Major J. W. H.	Europe
1867 Dec. 4.	*Johnstone, Capt. J.	Europe
1873 Dec. 3.	†Johore, H. H., Maharaja of, K. C. S. I.,	New Johore, Singapore
1873 April 2.	†Jones, F., Esq.	Europe
1875 Nov. 3.	†Jones, S. S., Esq., B. A., C. S.	Sasseram
1869 April 7.	Kabíruddín Ahmad, Maulaví.	Calcutta
1871 May 3.	Káliprasanna Ghosh, Bábu.	Calcutta
1861 Dec. 4.	†Kempson, M., Esq., M. A.	Allahabad
1875 April 7.	†Kerr, Ralph, Major, Lord.	Mathura
1874 Dec. 2.	†Khudábaksh Khán, Maulaví.	Patna.
1867 Dec. 4.	King, G., Esq., M. B.	Calcutta
1867 March 6.	†King, Capt. H. W.	P. & O Co.'s Office
1862 Jan. 15.	King, W., Jr., Esq., Geol. Survey of India.	Geol. Surv. Office
1875 Dec. 1.	Knight, J. B., Esq.	Calcutta
1867 March 6.	†Knox, G. E., Esq., C. S.	Kirwi (Banda)
1860 May 5.	Kurz, S., Esq.	Calcutta
1859 Dec. 7.	*Leonard, H., Esq., M. A., C. E.	Europe
1870 July 6.	†Lethbridge, E., Esq., M. A.	Krishnagur
1869 June 2.	*Leupolt, J. C., Esq., C. S.	Europe
1873 Feb. 5.	Lewis, T. R., Esq., M. B.	Calcutta
1864 Nov. 2.	Locke, H. H., Esq.	Calcutta
1866 Jan. 17.	†Low, J., Esq., G. T. Survey.	Dehra Dun
1869 July 7.	Lyall, C. J., Esq., B. A., C. S.	Calcutta
1875 Jan. 6.	Lydekker, R., Geog. Survey of India.	Calcutta
1870 April 6.	‡Lyman, B. Smith, Esq.	Japan
1866 June 6.	Macdonald, Lieut.-Col. J., Staff Corps.	Calcutta
1873 May 7.	*Mackay, W., Esq., C. S.	Europe
1873 Dec. 3.	McLeod, K., Esq., M. D.	Calcutta
1848 April 5.	†Maclagan, Major-General R., R. E., F. R. S. E., F. R. G. S.	Lahore
1867 July 3.	*Macnamara, Dr. C.	Europe
1868 Dec. 2.	†Macauliffe, M., Esq.	Jhelum
1874 Jan. 7.	†Magrath, C. F., Esq., C. S.	Bogra
1870 May 4.	†Macnaghten, C., Esq.	Rájkot College, Kattywar

Date of Election.		
1874 July	1.	Mallock, Major H. A. — Calcutta
1867 April	3.	Mahendralál Sircár, Dr. — Calcutta
1867 April	3.	Mainwaring, Lieut.-Col. G. B. — Calcutta
1852 Nov.	3.	Manickjee Rustamjee, Esq. — Calcutta
1872 Nov.	6.	†Man, E. H., Esq. — Port Blair
1869 July	7.	†Markham, A. M., Esq., C. S. — Allahabád
1874 Aug.	5.	†Marsh, Capt. H. C. — Allahabad
1873 July	2.	*Marshall, C. W., Esq. — Europe
1873 Aug.	6.	†Marshall, Lieut.-Col. W. E. — Simla
1875 April	4.	McConnell, Dr. J. F. P., Prof. Med. Coll. — Calcutta
1860 March	7.	†Medlicott, H. B., Esq., F. G. S. — Geol. Survey
1874 July	5.	†Michell, Capt. T. B. — Gauhátí
1871 Sept.	6.	†Miles, Major S. B. — Muskat
1870 July	6.	Miller, A. B., Esq. — Europe
1867 June	5.	Milman, R., D. D., The Right Rev., Lord Bishop of Calcutta. — Calcutta
1874 May	6.	†Minchin, F. J. V., Esq. — Madras
1875 Aug.	4.	†Minchin, Lieut.-Col. C. C. — Bahawalpur
1874 July	1.	Molesworth, W. G., Esq., C. E. — Calcutta
1867 March	6.	*Montgomerie, Major T. G., R. E. — Europe
1854 Dec.	6.	Morris, The Hon'ble, G. G., B. C. S. — Calcutta
1854 Oct.	11.	Muir, The Hon'ble Sir W., K. C. S. I., B. C. S. — Calcutta
1862 July	2.	†Napier of Magdala, H. E. Lord R., General G. C. S. I., G. C. B. — Simla
1865 Feb.	1.	Nevill, G., Esq., C. M. Z. S. — Calcutta
1871 Jan.	4.	*Newton, Isaac, Esq. — Europe
1872 May	1.	†Niranjan Mukerji, Bábu. — Benaras
1869 July	7.	†Nursing Rao, A. V., Esq. — Vizagapatam
1871 July	5.	†Oates, E. W., Esq., C. E. — Pegu
1874 Oct.	4.	O'Kinealy, J., Esq., C. S. — Calcutta
1851 June	4.	Oldham, T., Esq., LL. D., F. R. S. — Calcutta
1873 Aug.	6.	Olpherts, W. J., Esq. — Calcutta
1864 Mar.	2.	Palmer, Dr. W. J. — Calcutta
1873 Aug.	6.	Parker, J. C., Esq. — Calcutta
1862 May	7.	Partridge, S. B., Esq., M. D. — Calcutta
1871 Dec.	6.	†Peal, S. E., Esq. — Sibsagar, Assam
1867 March	6.	Pearimohan Mukerji, M. A., Bábu. — Uttarpara
1860 Feb.	1.	*Pearse, Lieut.-Col. G. G. — Europe
1868 Nov.	4.	*Pearson, C. E., Esq., M. A. — Europe
1873 Aug.	6.	Pedler, A., Esq. — Calcutta
1869 July	7.	†Pell, S., Esq. — Ranigunge
1864 Mar.	2.	*Pellew, F. H., Esq. — Europe

Date of Election.			
1865	Sept.	6.	†Peppé, T. F., Esq.	Ranchi
1868	May	6.	Peterson, F. W., Esq.	Calcutta
1835	July	1.	*Phayre, Major-G., Sir A. P., K. C. S. I., C. B.	Mauritius
1864	Nov.	2.	Phear, The Hon'ble J. B.	Calcutta
1869	Feb.	3.	†Pickford, J., Esq., M. A.	Madras
1875	Feb.	3.	†Porter, W. J., Esq.	Shwegyeen, B. Burmah
1868	April	1.	†Pramathanáth Ráy, Raja.	Digapati
1872	Dec.	4.	Prananath Sarasvati Pandit, B. L.	Bhawánipur
1869	Feb.	3.	Pratápachandra Ghosha, B. A.	Calcutta
1871	June	7.	*Pratt, Capt. C. S., Staff Corps.	Europe
1874	Dec.	2.	†Protheroe, Capt. M.	Port Blair
1856	Mar.	5.	Rájendralála Mitra, Bábu.	Calcutta
1871	June	7.	Rámakrishna Dás, Bábu.	Calcutta
1837	Feb.	1.	Rámanáth Tagor, The Hon. Rájá, C. S. I.	Calcutta
1874	Dec.	2.	†Rám Dás Sen, Bábu.	Berhampur
1860	Mar.	7.	†Reid, H. S., Esq., C. S.	Allahabad
1871	July	5.	†Reid, J. R., Esq., C. S.	Azimghar
1872	April	3.	Richards, Dr. V.	Goalundo
1868	April	1.	Robb, G., Esq.	Calcutta
1863	April	1.	*Robertson, C., Esq., C. S.	Europe
1874	May	6.	*Robinson, Col. D. G., R. E.	Europe
1865	Feb.	1.	Robinson, S. H., Esq.	Calcutta
1870	Jan.	5.	*Ross, Alexander G., Capt., Staff Corps.	Europe
1871	Dec.	6.	†Samuells, Capt. W. L.	Tipperah
1872	Feb.	7.	†Sashagiri Sastri, M. B. A.	Madras
1870	May	4.	Satyánand Ghoshál, Rája.	Calcutta
1873	Jan.	8.	Schlegel, F., Esq.	Calcutta
1870	May	4.	†Schlich, Dr. W.	Darjíling
1869	Feb.	3.	Schwendler, L., Esq.	Calcutta
1874	July	1.	Scully, Dr. J.	Calcutta
1860	July	4.	†Shelverton, G., Esq.	Waltair, near Vizagapatam
1863	April	1.	†Showers, Lieut.-Col. C. L.	Amballa
1872	Aug.	7.	†Skrefsrud, Rev. L. O.	Santhal Mission Rampur Haut
1864	Sept.	7.	†Sladen, Lieut.-Col. E. B.	Amherst
1875	Feb.	3.	*Smidt, J., Esq.	Europe
1865	July	5.	†Smith, D. Boyes, Esq., M. D.	Dacca
1874	June	3.	†Smith, V. A., Esq., C. S.	Hamirpur
1864	Mar.	2.	*Spearman, Capt. H. R.	Europe
1872	July	3.	†Stephen, Carr, Esq.	Ludianah
1863	Sept.	2.	†Stewart, R. D., Esq.	Raniganj
1870	April	6.	Stewart, R., Esq.	Calcutta
1875	July	7.	Stewart, M. G., Esq.	Calcutta
1861	Sept.	4.	Stokes, Whitley, Esq.	Calcutta
1869	Feb.	3.	†Strachey, The Hon'ble Sir J., K. C. S. I.	Allahabad

Date of Election.			
1859	Mar.	2.	†Stubbs, Lieut.-Col. F. W., Royal Artillery.	Dalhousie, Panjab
1858	July	7.	†Sutherland, H. C., Esq., B. C. S.	Backergunge
1864	Aug.	11.	Swinhoe, W., Esq.	Calcutta
1865	Sept.	6.	Tawney, C. H., Esq., M. A.	Calcutta
1865	April	5.	Taylor, R., Esq.	Calcutta
1874	Mar.	4.	Taylor, Commander A. D., late Indian Navy.	Calcutta
1860	May	2.	Temple, The Hon'ble Sir R., K. C. S. I., B. C. S.	Calcutta
1859	Mar.	2.	†Theobald, W., Esq., Geological Survey.	
1875	June	2.	†Thibaut, Dr. G.	Benares
1869	Oct.	6.	†Thomson, A., Esq.	Faizabad
1875	Nov.	3.	†Thomson, R. G., Esq., C. S.	Sirsa
1847	June	2.	Thuillier, Col. H. L., R. A., C. S. I., F. R. S.	Calcutta
1865	July	5.	†Tolbort, T. W. H., Esq., C. S.	Jhang, Panjab
1875	April	7.	†Touche La, Capt. E. N. D.	Sámagúting, Assam
1871	April	5.	*Trefftz, Oscar, Esq.	Europe
1861	June	5.	†Tremlett, J. D., Esq., M. A., C. S.	Muzaffargarh
1872	July	3.	†Trevor, W. S., Lieut.-Col. R. E.	Indor
1873	April	2.	Turnbull, R., Esq.	Calcutta
1861	Sept.	4.	Tween, A., Esq., Geological Survey.	Calcutta
1863	May	6.	*Tyler, Dr. J.	Europe
1869	June	2.	Udaychánd Datt, Bábu.	Calcutta
1873	April	2.	Umesh Chunder Dutt, Bábu.	Calcutta
1873	May	7.	†Urmston, H. B., Lieut.	Dehra Ismail Khan
1860	May	2.	*Vanrenen, Major A. D., Bengal Staff Corps.	Europe
1864	Feb.	3.	†Verchère, A. M., Esq., M. D.	Benares
1864	April	6.	†Vijayaráma Gujapati Raj Munniá Sultán Bahádur, Mahárájah Mirza Vijayanagaram.	Benares
1870	June	1.	†Vrindávanachandra Mandala, Bábu.	Balasor
1871	Feb.	1.	*Waagen, Dr. W., Geological Survey.	Europe
1869	Aug.	4.	Wáhid Alí, Prince Jahán Qadr Muhammad Bahádur.	Garden Reach
1865	Nov.	1.	Waldie, D., Esq., F. G. S.	Calcutta
1861	May	1.	†Walker, Col. J. T., R. E., F. R. S.	Dehra Doon
1875	April	7.	Wall, Dr. A. J., B. Medical Service.	Calcutta
1863	Oct.	7.	Waller, W. K., Esq., M. B.	Calcutta
1865	May	3.	Waterhouse, Capt. J., B. S. C.	Calcutta
1874	July	1.	Watt, Dr. George.	Hughli
1869	Sept.	1.	†Westland, J., Esq., C. S.	Nagpur
1867	Feb.	6.	†Westmacott, E. V., Esq., B. A., C. S.	Dinajpur
1862	Oct.	8.	*Wheeler, J. T., Esq.	Europe
1873	April	2.	†White, E., Esq., C. S.	Bijnour

Date of Election.		
1875 Feb. 3.	†Whiteway, R. S., Esq., C. S.	Muttra
1867 Aug. 7.	†Wilcox, F., Esq.	Purulia
1873 Jan. 8.	†Williams, H. C., Esq., C. S.	Wardha
1873 May 7.	†Williams, G. R. C., Esq., C. S.	Banda
1867 Jan. 16.	†Williamson, Capt. W. J.	Garo Hills
1867 Mar. 6.	Willson, W. G., Esq., B. A.	Calcutta
1871 Mar. 1.	†Willson, James, Esq.	Bankipur
1870 Aug. 3.	Wilson, R. H., Esq., C. S.	Calcutta
1866 Mar. 7.	*Wise, Dr. J. F. N.	Europe
1867 July 3.	†Wood, Dr. J. J.	Ránchi
1874 Mar. 4.	Wood, C. H., Esq.	Calcutta
1870 Jan. 5.	Wood-Mason, J., Indian Museum.	Calcutta
1873 Aug. 6.	†Woodthorpe, Lieut. R. G., R. E.	Nága Hills
1869 Sept. 1.	Yadulál Mallik, Bábu.	Calcutta
1868 June 3.	Yatindramohan Tagore, Rájah Bahádur.	Calcutta.
1867 Mar. 6.	†Yogendranáth Mallik, Bábu.	Andul
1862	*Yule, Col. H., R. E.	London

HONORARY MEMBERS.

1825 Mar. 9.	M. Garcin de Tassy, Memb. de l'Institut.	Paris
1821 „ 6.	Sir John Phillippart.	London
1826 July 1.	Count de Noe.	Paris
1831 „ 7.	Prof. C. Lassen.	Bonn
1835 May 6.	Prof. Lea.	Philadelphia
1843 Mar. 30.	Prof. Jules Mohl, Memb. de l'Institut.	Paris
1847 Sept. 1.	Col. W. Munro.	London
1847 Nov. 3.	His Highness the Nawab Nazim of Bengal.	Murshidabad
1848 Feb. 2.	Dr. J. D. Hooker.	Kew
1848 Mar. 8.	Prof. Henry.	Princeton U. S.
1853 April 6.	Major-Gen. Sir H. C. Rawlinson, K. C. B.	London
1858 July 6.	B. H. Hodgson, Esq.	Europe
1859 Mar. 2.	The Hon'ble Sir J. W. Colvile, Kt.	Europe
1860 „ 7.	Prof. Max Müller.	Oxford
1860 Nov. 7.	Mons. Stanislas Julien.	Paris
1860 „ 7.	Dr. Robert Wight.	London
1860 „ 7.	Edward Thomas, Esq.	London
1860 „ 7.	Dr. Aloys Sprenger.	Bern
1860 „ 7.	Dr. Albrecht Weber.	Berlin
1868 Feb. 5.	Genl. A. Cunningham, C. S. I.	India
1868 „ 5.	Prof. Bápu Déva Sástri.	Benares
1868 „ 5.	Dr. T. Thomson.	London
1868 „ 2.	A. Grote, Esq.	London
1871 „ 7.	Charles Darwin, Esq.	London
1872 „ 1.	Sir G. B. Airy.	London
1872 June 5.	Prof. T. H. Huxley.	London
1875 Nov. 3.	Dr. O. Böhtlingk.	Jena
1875 „ 3.	Prof. J. O. Westwood.	Oxford

CORRESPONDING MEMBERS.

Date of Election.		
1844 Oct. 2.	Macgowan, Dr. J.	Europe
1856 June 4.	Krämer, Herr A. von.	Alexandria
1856 „ 3.	Porter, Rev. J.	Damascus
1856 „ 4.	Schlagintweit, Herr H. von.	Munich
1856 „ 4.	Smith, Dr. E.	Beyrout
1859 „ 4.	Tailor, J., Esq.	Bussorah
1857 Mar. 4.	Neitner, J., Esq.	Ceylon
1858 „ 3.	Schlagintweit, Herr R. von.	Giessen
1859 Nov. 2.	Frederick, Dr. H.	Batavia
1859 May 4.	Blecker, Dr. H.	Europe
1860 Feb. 1.	Baker, The Rev. H.	E. Malabar
1860 „ 1.	Swinhoe, R., Esq., H. M.'s Consul.	Amoy
1860 April 4.	Haug, Dr. M.	Munich
1861 July 3.	Göschc, Dr. R.	
1862 Mar. 5.	Murray, A., Esq.	London
1863 July 4.	Barnes, R. H., Esq.	Ceylon
1866 May 7.	Schlagintweit, Prof. E. von.	Munich
1866 „ 7.	Sherring, Rev. M. A.	Benares
1868 Feb. 5.	Foucaux, M. F. H.	Paris
1868 „ 5.	Holmböe, Prof.	Christiania

ASSOCIATE MEMBERS.

1865 May 3.	Dall, Rev. C. H.	Calcutta
1874 Feb. 4.	Schaumburgh, J., Esq.	Calcutta
1874 April 1.	Lafont, Rev. F. E., S. J.	Calcutta
1875 Dec. 1.	Bate, Rev. J. D.	Allahabad
1875 „ 1.	Moulvie Abdul Hai.	Calcutta

LIST OF MEMBERS WHO HAVE BEEN ABSENT FROM INDIA THREE YEARS AND UPWARDS.*

Rule 14, A.—In the event of an ordinary Member leaving India, and in the further event of his informing the Secretary by letter that he has no intention of returning, but desires to retain his privileges as an Ordinary Member, his subscription shall be 12 Rupees per annum, commutable into a single payment of Rs. 100, provided that if any such Member shall hereafter return to India, he shall thereupon become liable to pay his original subscription, subject to the operation of rule 10 B.

Rule 14, B.—After the lapse of three years from the date of a Member leaving India, if no intimation of his wishes shall, in the interval, have been received by the Society, his name shall be removed from the list of Members.

	Date of leaving India.
Butcher, W. D., Esq.	1872.
Cooke, H. G., Esq., C. S.	
Court, Major, M. H.	
Drew, F., Esq.	
Hamilton, R., Esq.	

* These names will be removed from the next list of Members unless intimation is meanwhile received from the member of his desire to retain the privileges of an ordinary member under the operation of Rule 14, A.

LOSS OF MEMBERS DURING 1875.

By Retirement.

E. D. Lockwood, Esq.	Monghyr.
R. T. St. John, Esq.	Bassein.
Sir W. J. Herschel.	Cooch Behar.
Lieut. W. S. S. Bisset.	Calcutta.
Col. O. Hamilton.	Calcutta.
S. C. Bayley, Esq., C. S.	Patna.
W. Heilgers, Esq.	Calcutta.
H. M. Durand, Esq.	Bhagulpur.
T. F. Harkness, Esq.	Etah.
A. P. Howell, Esq., C. S.	Calcutta.
J. Kimber, Esq.	Calcutta.
J. Sime, Esq.	Delhi.
A. C. Lyall, Esq.	Calcutta.
Babu Gangapersad Sing.	Calcutta.
The Rev. J. Hector.	Calcutta.
E. Benedict, Esq.	Calcutta.
Dr. P. F. Bellew.	Bombay.
Capt. J. C. Ross, R. E.	Cawnpore.
G. T. Peppe, Esq.	Pachamba.
Babu Govindo Coomar Chaudri.	Sherpur.
T. W. Bourne, Esq.	Calcutta.
A. D. B. Gomes, Esq.	Calcutta.
C. B. Clarke, Esq.	Darjiling.
Raja Chundranath Roy.	Natore.
R. Knight, Esq.	Calcutta.

By Death.

Ordinary Members.

Lieut. W. A. Holcombe.	Assam.
J. H. Haworth, Esq.	Calcutta.
Lieut.-Col. T. C. Hamilton.	Rangoon.

Honorary Members.

Dr. Ewald.	Europe.
The Right Hon'ble Sir E. Ryan, Kt.	Europe.

Associate Member.

Sayyid Karámat Ali.	Hughli.

Corresponding Member.

Dr. Wilson.	Bombay.

ELECTION CANCELLED.*

Amír Husain Khán Bahádur.
C. F. Bligh, Esq.
G. C. Farr, Esq.
J. W. Johnstone, Esq., M. D.
Babu Mohima Chundra Chackarvatty.
E. O'Brien, Esq.
Bábu Satyadyal Banerjea.
Bábu Vepena Vehary Mukerji.
B. O'Brien, Esq.

* These names should have been included in the list for 1874. Ed.

[APPENDIX.]

ABSTRACT STATEMENT

OF

RECEIPTS AND DISBURSEMENTS

OF THE

ASIATIC SOCIETY OF BENGAL

FOR

THE YEAR 1875.

STATEMENT,

Abstract of the Cash Account

RECEIPTS.

					1875.			1874.		
Balance of 1874.										
In the Bank of Bengal, viz.										
Account of Stoliczka Memorial Fund, ..	Rs.	1,201	3	6						
Account of Asiatic Society, ..		5,655	8	8						
					6,856	12	2			
Cash in hand, ...					161	9	1			
								7,018	5	3
Admission Fees.										
Received from Members, ...					930	0	0			
								930	0	0
								1,182	0	0
Subscriptions.										
Received from Members, ...					9,760	15	0			
								9,760	15	0
								8,729	3	0
Publications.										
Sale proceeds of Journal and Proceedings, ..					676	2	6			
Subscriptions to ditto, ...					1,025	4	0			
Refund of Postage Stamps, ...					22	3	6			
Ditto of Freight, ...					4	0	0			
Ditto of the price of 70 Copies of Slates, ..					2	0	0			
								1,729	10	0
								2,126	8	7
Library.										
Sale proceeds of Books, ...					375	12	0			
Refund of Freight, ...					33	9	0			
Ditto of Postage, ...					2	9	0			
								411	14	0
								412	12	6
Secretary's Office.										
Saving of Salary, ...					19	0	9			
Received fine, &c., ...					1	0	0			
Ditto Commission on Purchase of Postage Stamps, ...					4	14	9			
								24	15	6
								22	12	9
Vested Fund.										
Interest on the Government Securities from the Bank of Bengal, ...					449	0	0			
								449	0	0
								449	0	0
Building.										
Received from the Right Hon'ble the Secretary of State for India, being the Special House allowance granted by the Government from 1st December, 1874 to 30th November, 1875, at 400 Rs. per month, ..					4,800	0	0			
								4,800	0	0
								4,800	0	0
Dr. Stoliczka Memorial Fund.										
Received Subscriptions to the Fund, ..					1,350	0	0			
								1,350	0	0
								1,240	0	0
Carried over, Rs.								26,474	11	9

No. 1.
of the Asiatic Society for 1875.

DISBURSEMENTS.

				1875.			1874		
Publications.									
Paid—Freight for sending Journal and Proceedings, .. Rs.		78	11	0					
Ditto Lithographing and Engraving charges, &c., ...		2,683	15	1					
Ditto Printing charges, ...		3,967	6	9					
Ditto Commission sale of Books, &c., ..		54	6	6					
Ditto Purchase of Postage Stamps, ..		302	12	6					
Ditto Packing charges, ...		18	6	6					
Ditto Purchase of Journal, ...		10	0	0					
Ditto Paper for Plates, ...		211	15	0					
Ditto Journal binding, ...		7	8	0					
Ditto Telegram to A. Grote, Esq... ..		31	14	0					
Ditto Petty charges, ...		6	2	9					
					7,373	2	1	7,440	11 8
Library.									
Paid Salary of Librarian, ...		1,400	0	0					
Ditto Establishment, ...		120	0	0					
Ditto Commission on sale of Books, ..		32	5	3					
Ditto Landing charges, ...		9	15	3					
Ditto Book Binding, ...		270	0	0					
Ditto Salary of Punkhaman, ...		38	13	3					
Ditto Insufficient and Bearing Postage, ..		2	0	0					
Ditto Subscription to the Calcutta Review, ..		32	0	0					
Ditto Ditto to the Stray Feathers, ..		11	0	0					
Ditto Ditto for two Copies of the Rev. J. D. Bate's Hindi Dictionary, ...		30	0	0					
Ditto Extra attendance in the Library in the morning, ...		60	0	0					
Ditto Binding two Copies of Blank Books, ..		4	0	0					
Ditto Advertising charges, ...		1	4	0					
Ditto Purchase of Books, through Messrs. Trübner and Co. ..	1,679 4 9								
Ditto Ditto of ditto in Calcutta,	213 0 5								
		1,892	5	2					
Ditto for Preparing an English Catalogue of the Library Books, ...		387	0	0					
Ditto Printing charges, ...		59	12	0					
Ditto Purchase of two glass-door Almirah, ..		74	7	0					
Ditto Freight, ...		25	9	1					
Ditto Petty charges, ...		24	15	6					
					4,475	6	6	2,732	2 9
Secretary's Office.									
Paid General Establishment, ...		390	0	0					
Ditto Secretary's Establishment, ...		2,119	0	0					
Ditto Purchase of Postage Stamps, ..		96	4	6					
Ditto Insufficient and Bearing Postage, ..		2	9	6					
Ditto Meeting charges, ...		136	1	6					
Ditto Commission on Subscription Collected, ..		43	13	0					
Ditto Subscription to the Army List, ..		16	0	0					
		2,803	12	6					
				Carried over, Rs.	11,848	8	7		

RECEIPTS.			1875.			1874.		
Brought over, Rs.						26,474	11	9
MISCELLANEOUS.								
Fund account,	..	..	1,018	7	4			
O. P. Fund,	..	..	477	5	6			
The Government North-Western Provinces,		..	15	3	0			
H. F. Blanford, Esq.	..	..	12	6	0			
B. Quaritch, Esq.	..	..	5	1	0			
S. Kurz, Esq.	..	..	4	0	0			
W. Stokes, Esq.	..	..	0	9	0			
L. Schwendler, Esq.	..	..	9	7	0			
H. Blochmann, Esq.	..	..	9	0	0			
F. S. Growse, Esq.	..	..	6	5	0			
Major R. DeBourbel,	..	..	0	8	0			
The Rev. J. D. Bate,	..	..	0	9	0			
W. Theobald, Esq.	..	..	29	0	0			
Money Lal Bysack,	..	..	472	9	6			
W. J. Porter, Esq.	..	..	1	13	0			
Major G. E. Fryer,	..	..	11	6	0			
S. E. Peal, Esq.	..	..	18	0	0			
J. Sime, Esq.	..	..	0	8	0			
Capt. J. Butler,	..	..	1	6	0			
W. Irvine, Esq.	..	..	11	14	6			
A. Anderson, Esq.	..	..	9	7	0			
Dr. D. Waldie,	..	..	3	6	0			
D. C. J. Ibbetson, Esq.	..	..	19	2	0			
J. Wood-Mason, Esq.	..	..	8	8	0			
Col. E. T. Dalton,	..	..	9	9	3			
C. W. Marshall, Esq.	..	..	3	13	0			
The Rev. S. B. Fairbank,	..	..	19	8	0			
M. Macauliffe, Esq.	..	..	8	8	0			
Carr. Stephen, Esq.	..	..	0	14	0			
Yusuf Ali Munshi,	..	..	25	0	0			
G. H. F. Jameson, Esq.	..	..	2	4	0			
Lt.-Col. James Burn,	..	..	50	0	0			
Col. W. E. Marshall,	..	..	26	0	0			
A. M. Markham, Esq.	..	..	15	11	0			
						2,307	0	1
						1,621	4	2
Carried over, Rs.						28,781	11	10

DISBURSEMENTS.				1875.			1874.		
Brought over, Rs.				2,803	12	6	11,848	8	7
Paid Salary of Mali,				57	9	6			
Ditto Subscription to the Calcutta Directory,				14	0	0			
Ditto Printing charges,				47	0	0			
Ditto Pension to Islam Khan,				36	0	0			
Ditto for two Osler's patent double-light plated Reading Lamps,				112	0	0			
Ditto Fee to the Bank of Bengal for Stamping Cheques,				1	9	0			
Ditto Two Copies of Almanac,				2	0	0			
Ditto Stationery,				16	14	6			
Ditto Binding Blank Books,				17	0	0			
Ditto ditto Letter-Files,				8	0	0			
Ditto the Rev. F. C. Lafont being the amount voted by the Society towards the erection of a Spectroscopic Observatory,				500	0	0			
Ditto Repairing and cleaning a French Eight-day Clock,				18	12	0			
Ditto Mustard Oil, Chirags for Illumination of the Society's Premises,				50	15	9			
Ditto Advertising charges,				42	8	0			
Ditto Petty charges,				41	8	6			
							3,769	9	9
								3,119	8 10
VESTED FUND.									
Purchase of 4 per cent. Government Paper,				3,000	0	0			
Paid Premium on ditto,				63	12	0			
Ditto Commission ditto,				7	9	10			
				3,071	5	10			
Less Interest on 3,000 Rs. at 4 per cent.				17	5	4			
							3,054	0	6
Purchase of 4 per cent. Government Paper,				1,000	0	0			
Paid Premium on ditto,				21	4	0			
Ditto Commission on ditto,				2	8	8			
				1,023	12	8			
Less Interest on 1,000 Rs. at 4 per cent.				5	5	4			
							1,018	7	4
Ditto Commission on collecting Interest on Government Securities,							1	1	10
							4,073	9	8
								1,646	5 5
BUILDING,									
Paid House rate,							402	0	0
Ditto Police and Lighting rate,							234	0	0
Ditto Water rate,							235	3	1
Ditto Repairing charges,							137	9	6
							1,008	12	7
								919	13 10
COIN FUND.									
Purchase of Yarkand Coins,							350	0	0
Ditto of a Gold Coin,							25	0	0
Ditto Postage Expenses for returning Coins,							1	4	0
							376	4	0
								266	0 0
Carried over, Rs.							21,076	12	7

RECEIPTS.	1875.	1874.
Brought over, Rs.	28,781 11 10	

Carried over, Rs.	28,781 11 10	

DISBURSEMENTS.				1875.			1874.		
			Brought over, Rs.	21,076	12	7			
Dr. Stoliczka Memorial Fund.									
Paid Printing charges of Circulars,	..		32	14	0				
Ditto ditto of List of Subscribers,	..		12	0	0				
Ditto Telegram to A. Grote, Esq.,	..		23	6	0				
Ditto Postage for sending Letters and Circulars, &c.,	..	..	5	14	6				
Ditto Messrs. Prescott, Grote, Cave and Co., by a Bill of Exchange on the Oriental Bank Corporation, London, £150 at 1/9/$\frac{8}{9}$ per rupee,	..	..	1,664	11	10				
						1,738	14	4	38 12 0
Miscellaneous.									
Fund Account,	..	..	1,182	0	0				
O. P. Fund,	..	..	116	10	5				
The Government North-Western Provinces,	..		13	8	0				
Money Lal Bysack,	..	..	434	9	6				
Capt. E. Fraser,	..	..	0	4	10				
Major F. W. Stubbs,	..	..	0	4	0				
James Beames, Esq.	..	..	21	8	0				
Lieut. W. A. Holcombe,	..	..	1	0	0				
W. J. Porter, Esq.	..	..	2	2	7				
F. S. Growse, Esq.	..	..	6	5	0				
Major L. R. Kerr,	..	..	0	8	0				
R. Brown, Esq.	..	..	1	7	0				
T. W. H. Tolbort, Esq.	..	..	2	6	0				
L. Schwendler, Esq.	..	..	9	7	0				
H. Blochmann, Esq.	..	..	18	0	0				
D. C. J. Ibbetson, Esq.	..	..	5	0	0				
Capt. C. J. F. S. Forbes,	..	..	0	13	0				
Capt. W. L. Samuells,	..	..	3	11	0				
T. W. Bourne, Esq.	..	..	0	9	6				
W. Theobald, Esq.	..	..	29	6	0				
W. Irvine, Esq.	..	..	7	0	0				
Lt.-Col. W. E. Marshall,	..	..	31	9	0				
Major R. DeBourbel,	..	..	0	14	6				
J. R. Reid, Esq.	..	..	0	9	0				
S. E. Peal, Esq.	..	..	0	5	0				
M. Macauliff, Esq.	..	..	6	10	0				
E. Lethbridge, Esq.	..	..	1	5	3				
E. T. Atkinson, Esq.	..	..	0	14	0				
V. A. S. Smith, Esq.	..	..	1	0	0				
Major G. E. Fryer,	..	..	20	8	0				
J. Sime, Esq.	..	..	0	7	9				
S. Kurz, Esq.	..	..	4	0	0				
E. V. Westmacott, Esq.	..	..	1	2	0				
W. T. Blanford, Esq.	..	..	0	4	0				
Dr. G. Thibaut,	..	..	1	4	0				
W. Stokes, Esq.	..	..	0	7	0				
T. Chennell, Esq.	..	..	0	8	0				
James Low, Esq.	..	..	0	6	0				
W. W. Hunter, Esq.	..	..	1	8	0				
H. F. Blanford, Esq.	..	..	12	6	0				
Lieut.-Col. James Burn,	..	..	2	0	0				
Capt. F. J. Graham,	..	..	2	14	0				
						1,947	5	4	1,189 11 1
			Carried over, Rs.	24,763	0	3			

RECEIPTS.	1875.	1874.
Brought over,	Rs. 28,781 11 10	
	Rs. 28,781 11 10	

Examined and found correct,
DAVID WALDIE,
E. GAY.

ASIATIC SOCIETY'S ROOMS,
Calcutta, Jan. 1*st* 1876.

DISBURSEMENTS.				1875.			1874.
			Brought over, Rs.	24,763	0	3	
BALANCE.							
In the Bank of Bengal, viz.							
Account of Stoliczka Memorial Fund, ...	812	5	2				
Account of Asiatic Society of Bengal, ...	3,045	13	1				
				3,858	2	3	
Cash in hand, ...				160	9	4	
						4,018	11 7
			Rs.	28,781	11	10	

Examined and found correct.

DAVID WALDIE,
E. GAY.

ASIATIC SOCIETY'S ROOMS,
Calcutta, Jan. 1st. 1876.

STATEMENT,

Abstract of the Cash Account,

RECEIPTS.						1875.			1874.		
BALANCE OF 1874.											
In the Bank of Bengal, viz.											
Conservation of Sanskrit MSS.,			4,832	8	8						
Dr. J. Muir,	..	..	898	10	0						
O. P. Fund,	..	..	261	6	0						
						5,992	8	8			
Cash in hand,	..	..			..	125	3	11			
									6,117	12	7
ORIENTAL PUBLICATIONS.											
Received by sale of Bibliotheca Indica and by Subscription to ditto,		..			..	2,829	10	3			
Ditto Refund of Postage,		..			..	33	9	0			
Ditto Refund of Freight,		..			..	9	3	0			
									2,872	6	3
											2,271 1 6
GOVERNMENT ALLOWANCE.											
Received from the General Treasury at 500 Rs. per month,		..			..	6,000	0	0			
Ditto ditto Additional grant for the publication of Sanskrit Works at 250 per month,						3,000	0	0			
									9,000	0	0
											9,000 0 0
CUSTODY OF ORIENTAL WORKS.											
Received by transfer to the Asiatic Society of Banghy expenses for returning a package of MSS to Munshi Ramnarain, Bareily College on the 17th August, 1875,		..				0	6	0			
Saving of Salary,		..			..	1	12	9			
									2	2	9
Asiatic Society of Bengal,		..			..	116	10	5			
Hitalal Missiri,		..			..	1	1	0			
Braj Bhushan Das,		..			..	108	10	0			
Buddinath Chowdhury,		..			..	2	12	0			
Harendra Coomar Chowdhury,		..			..	0	12	0			
Kedarnath Banerjee,		..			..	30	0	0			
F. S. Growse, Esq.		..			..	2	0	0			
Kassinath Trambuck Telany,		..			..	19	11	0			
Major G. E. Fryer,		..			..	3	2	0			
Juggomohun Tarkaratna,		..			..	8	0	0			
Col. E. T. Dalton,		..			..	0	11	0			
									293	5	5
											394 8 4
CONSERVATION OF SANSKRIT MSS.											
Received from the Government of Bengal, the Amount sanctioned towards the Conservation of Sanskrit MSS. being 2nd Half of 1874-75,						1,600	0	0			
Ditto ditto being 1st Half of 1875-76,		..				1,600	0	0			
Sale proceeds of 20 Copies Notices of Sanskrit MSS.,		..			..	20	0	0			
Refund of the amount from Babu Rajendralala Mitra, paid on the 8th October, 1874, as an advance for Purchase of Sanskrit MSS.,		..				1,200	0	0			
						4,420	0	0			
Carried over, Rs.									18,285	11	0

No. 2.

Oriental Publication Fund, 1875.

DISBURSEMENTS.			1875.			1874.		
Oriental Publications.								
Paid Commission on Sale of Books, &c., ..	175	7 3						
Ditto Packing charges, ...	3	6 0						
Ditto Postage Stamps, ...	55	7 0						
Ditto Freight, ...	71	8 0						
Ditto advertising charges, ...	462	3 9						
Ditto Banghee Expenses, ...	2	10 0						
Ditto Petty charges, ...	3	7 0						
			774	1	0	687	3	1
Custody of Oriental Works.								
Paid Salary of the Librarian, ...	500	0 0						
Ditto Establishment, ...	724	0 0						
Ditto Fee for Stamping cheques, ...	3	2 0						
Ditto Book-binding, ...	55	4 0						
Ditto Insufficient Postage, ...	0	8 0						
Ditto Banghee Expenses, ...	0	14 0						
Ditto Petty charges, ...	7	6 0						
			1,291	2	0	1,273	5	9
Library.								
Paid Purchase of MSS.	6	6 6						
			6	6	6	494	11	0
Catalogue of Sanskrit MSS.								
Paid Salary for Cataloguing Sanskrit MSS., ..	360	0 0						
			360	0	0	358	0	0
Copying Charges.								
Paid Copying MSS., ...	157	0 3						
			157	0	3	19	4	0
Áín í Akbarí.								
Paid Editing charges, ...	96	0 0						
			96	0	0	1,011	12	0
Agni-Purána.								
Paid Editing and Printing charges, ..	658	0 0						
			658	0	0	976	10	6
Gobhiliya Grihya Sútra.								
Paid Editing charges, ...	140	0 0						
Ditto Postage, ...	0	5 0						
			140	5	0	224	0	0
Mímámsá Darsána.								
Paid Editing and Printing charges, ..	305	0 0						
			305	0	0	147	6	0
Sáhitya Darpana.								
Paid postage, ...	0	6 0						
			0	6	0			
Akbarnámah.								
Paid Editing and Printing charges, ..	688	0 0						
			688	0	0			
Farhangi Rashídí.								
Paid Editing and Printing charges, ..	929	8 0						
Ditto Banghee, expenses, ...	6	4 0						
			935	12	0	779	0	0
Carried over, Rs.			5,412	0	9			

RECEIPTS.				1875.			1874.		
Brought over, Rs.	4,420	0	0	18,285	11	0			
Refund of the amount from Ramdas Chuckerbutty paid for purchase of Sanskrit MSS., ..	35	0	0						
Ditto ditto from the Travelling Pandit, paid as an advance on account of his travelling expenses to proceed to Burdwan, ..	20	0	0						
				4,475	0	0	4,711	0	0
Carried over, Rs.				22,760	11	0			

DISBURSEMENTS.			1875.			1874.		
Brought over, Rs.			5,412	0	9			
Sáma Veda.								
Paid Editing and Printing charges,	..	1,220 0 0						
Ditto Postage, ..	..	0 10 0						
			1,220	10	0	608	7	0
Alamgír-námah.								
Paid Editing charges for an Index of names of persons, ..	..	47 8 0						
			47	8	0	241	2	0
Biographical Dictionary of persons who knew Mohammed.								
Paid Editing charges, ..	..	25 0 0						
			25	0	0			
Aitareya Áranyaka.								
Paid Editing and Printing charges,	..	353 0 0						
			353	0	0			
Pingála Chhanda Sutra.								
Paid Printing charges, ..	..	125 12 0						
			125	12	0	149	0	0
Haft Ásmán.								
Paid Printing charges, ..	..	316 11 0						
			316	11	0	128	4	0
Kâtantra.								
Paid Printing charges, ..	..	316 14 2						
			316	14	2	1,440	9	0
Chaturvarga Chintámani,								
Paid Editing and Printing charges,	..	610 0 0						
			610	0	0	344	11	0
Tabakat i Násirí.								
Paid Freight and Cooley hire to Messrs. Sykes and Co. ..	..	2 12 0						
			2	12	0			
Asiatic Society of Bengal,	..	477 5 6						
Buddinath Chaudhury,	..	3 0 0						
Kassinath Trambuck Telany,	..	19 11 0						
F. Keilhorn, Esq.	..	3 0 0						
T. W. H. Tolbort, Esq.	..	5 14 0						
Braj Bhushan Das,	..	104 6 0						
F. S. Growse, Esq.	..	2 0 0						
			615	4	6	666	1	4
Conservation of Sanskrit MSS.								
Paid Salary for preparing Catalogue of Sanskrit MSS. ..	..	360 0 0						
Ditto ditto for translating the Sanskrit Catalogue,	..	240 0 0						
Ditto ditto for Travelling Pandit,	..	650 0 0						
Ditto Copying MSS. ..	..	95 10 0						
Ditto Banghy expenses, ..	..	1 4 0						
Ditto Printing charges of Notices Sanskrit MSS., Vol. III., Part II. ..	..	398 4 0						
Ditto, Contingent charges for Travelling Pandit,		59 9 3						
Do., for Purchase of Sanskrit MSS. Rs. 1,121-2-0 Travelling, Brokerage, Packing, &c. 460-9-0		1,581 11 0						
Ditto, Postage for sending Notices of Sanskrit MSS. ..	..	15 4 0						
Ditto, Purchase of 3 Glass cases, ..	..	103 7 0						
Ditto, Salary for Bearer, ..	..	70 0 0						
			3,575	1	3			
Carried over, Rs.			9,045	8	5			

RECEIPTS.	1875.	1874.
Brought over, Rs.	22,760 11 0	

Rs. 22,760 11 0

Examined and found correct.
DAVID WALDIE,
E. GAY.

ASIATIC SOCIETY'S ROOMS,
Calcutta, 1st Jan. 1876.

DISBURSEMENTS.				1875.			1874.
Brought over, Rs.	3,575	1	3	9,045	8	5	
Ditto Repairing Oriental writing in chalk Lithographing 100 copies in Tint Black on paper, ...	86	0	0				
Ditto Freight for sending Notices of Sanskrit MSS.	14	14	0				
Ditto Advertising charges, ...	12	0	0				
Ditto Transfer of 5 copies of Notices of Sanskrit MSS. in exchange of Kâtantara, ..	5	0	0				
Ditto advanced to Travelling Pandit on account of his expenses to proceed to Burdwan,	20	0	0				
Ditto Babu Rajendralala Mitra, as advance of his travelling expenses and for purchase of Sanskrit MSS.	1,200	0	0				
Ditto Petty charges, ...	24	8	6				
				4,937	7	9	
				13,983	0	2	
BALANCE.							
In the Bank of Bengal, viz.							
Conservation of Sanskrit MSS.	4,370	0	11				
Dr. J. Muir, ...	898	10	0				
O. P. Fund, ...	3,364	8	6				
	8,633	3	5				
Cash in hand, ...	144	7	5				
				8,777	10	10	
			Rs.	22,760	11	0	

Examined and found correct.

DAVID WALDIE,
E. GAY.

ASIATIC SOCIETY'S ROOMS.
Calcutta, 1st Jan., 1875.

STATEMENT NO. 3.

Shewing the Assets and Liabilities of the Asiatic Society of Bengal on the 1st Jan. 1876.

ASSETS.	1875.	1874.
In the Bank of Bengal, ... Rs.	3,858 2 3	6,856 12 2
Cash in hand, ...	160 9 4	161 9 1
Government Securities, ...	13,200 0 0	9,200 0 0
	17,218 11 7	16,218 5 3
OUTSTANDING.		
Admission fees, ...	32 0 0	34 0 0
Subscriptions, ...	6,561 0 0	7,009 5 0
Sale of Journal, ...	358 7 9	812 7 3
Subscription do., ...	607 9 9	634 15 9
Sale of Library Books, ...	152 9 0	236 11 0
	7,711 10 6	8,727 7 0
Due by the Bank of Bengal Fund Account, ...	275 5 1	111 12 5
Rs.	7,986 15 7	8,839 3 5

LIABILITIES.		1875.	1874.
Salary and Establishment for December, 1875, ... Rs.		348 10 8	324 10 8
Dr. Stoliczka Memorial Fund, ...		812 5 2	1,201 3 6
Collector of Assessment, House rate for October, Novr. and Decr., 1875, ...		102 0 0	96 0 0
Police and Lighting rate, do. do.		60 0 0	54 0 0
The Great Eastern Hotel for Tea and Coffee, ...		8 4 0	8 4 0
Sydney Sedgefield for lithographing and Printing charges, Plates Nos. 14 and 15,		125 0 0	0 0 0
Baptist Mission Press, Printing charges, Journal, Part II. No. II. 1875, ..	334 0 0		
Ditto Part I. No. 3, ...	560 0 0		
Ditto Extra form of Part I. No. 3, 1875, ...	44 10 0		
Proceedings No. 8 of 1875,	197 0 0		
Ditto No. 9 of 1875, ...	93 12 0		
Royal printing paper, ...	15 6 0		
		1,244 12 0	2,238 2 6
Rs.		2,700 15 10	3,922 4 8

We have examined this Statement and see no reason to doubt its correctness.

ASIATIC SOCIETY'S ROOMS,
Calcutta, Jan. 1st, 1876.

DAVID WALDIE.
E. GAY.

STATEMENT NO. 4.

Shewing the Assets and Liabilities of the Asiatic Society of Bengal, O. P. Fund, on the 1st January, 1876.

ASSETS.				1875.			1874.		
In the Bank of Bengal, viz.									
Conservation of Sanskrit MSS.	Rs.	4,370	0 11						
Dr. J. Muir,		898	10 0						
O. P. Fund,		3,364	8 6						
				8,633	3 5		5,992	8 8	
Cash in hand,				144	7 5		125	3 11	
Government Allowance for Decr., 1875,				750	0 0		750	0 0	
Bibliotheca Sale and Subscription,				1,510	14 5		2,067	11 2	
			Rs.	11,038	9 3		8,935	7 9	

LIABILITIES.		1875.			1874.		
Salary and Establishment for December, 1875,	Rs.	110	5 4		90	5 4	
Ganesa Press, Printing charges, Aitareya Aranyaka, Fasc. II.		209	0 0		125	12 0	
Rajendralála Mitrá, editing charges, Aitareya Aranyaka, Fasc. II.		144	0 0		0	0 0	
Conservation of Sanskrit MSS.		4,370	0 11		4,832	8 8	
Dr. J. Muir,		898	10 0		898	10 0	
	Rs.	5,732	0 3		5,947	4 0	

We have examined this Statement and see no reason to doubt its correctness.

ASIATIC SOCIETY'S ROOMS,
Calcutta, Jan. 1st, 1876.

DAVID WALDIE.
E. GAY.

STATEMENT NO. 5.

Conservation of Sanskrit MSS. in Account Current with the Asiatic Society of Bengal.

Cr.

				1875	0	0
Balance of 1874, ...			Rs.	4,832	8	8
Received from the Government of Bengal, the amount sanctioned towards the Conservation of Sanskrit MSS. being 2nd Half of 1874-75, ...	1,600	0	0			
Ditto ditto being 1st Half of 1875-76, ..	1,600	0	0			
Sale proceeds of 20 copies Notices of Sanskrit MSS.	20	0	0			
Refund of the amount from Bábu Rajendralála Mitrá, paid on the 8th October, 1874 for purchase of Sanskrit MSS.....	1,200	0	0			
Ditto ditto from Ramdas Chuckerbutty paid for purchase of Sanskrit MSS. ..	35	0	0			
Ditto ditto from the Travelling Pandit paid as an advance on account of his expenses to proceed to Burdwan, ...	20	0	0			
				4,475	0	0
			Rs.	9,307	8	8

Dr.

				1875	0	0
Amount spent in 1875, ...		Rs.	4,937	7	9	
Balance, ...			4,370	0	11	
				9,307	8	8
		Rs.	9,307	8	8	

We have examined this Statement and see no reason to doubt its correctness.

Asiatic Society's Rooms,
Calcutta, Jan. 1st, 1876.

David Waldie,
E. Gay.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	30.016	30.094	29.957	0.137	67.4	76.5	59.6	16.9
2	.018	.094	.969	.125	66.9	77.3	58.3	19.0
3	.014	.106	.965	.141	67.0	77.5	57.6	19.9
4	29.999	.065	.943	.122	68.7	76.3	63.8	12.5
5	.995	.072	.934	.138	66.1	74.9	59.5	15.4
6	30.018	.095	.962	.133	66.7	76.4	58.4	18.0
7	.017	.103	.955	.148	67.9	76.6	60.0	16.6
8	29.969	.053	.886	.167	68.9	78.4	59.8	18.6
9	30.004	.088	.941	.147	70.2	80.2	64.0	16.2
10	.065	.147	30.014	.133	68.1	78.4	60.0	18.4
11	.062	.144	.005	.139	66.0	76.6	58.5	18.1
12	.028	.114	29.961	.153	64.0	74.4	56.0	18.4
13	.018	.097	.963	.134	63.5	75.5	54.8	20.7
14	.055	.124	.998	.126	64.9	76.7	54.5	22.2
15	.086	.174	30.035	.139	65.5	76.5	56.0	20.5
16	.045	.136	29.974	.162	65.2	76.6	55.8	20.8
17	.009	.090	.947	.143	67.7	79.5	57.0	22.5
18	29.975	.046	.920	.126	70.4	82.0	62.0	20.0
19	.948	.020	.885	.135	71.4	82.0	62.6	19.4
20	.937	.024	.856	.168	71.5	81.0	64.5	16.5
21	.965	.053	.906	.147	69.4	77.8	63.0	14.8
22	.908	29.998	.838	.160	67.3	78.3	57.2	21.1
23	.841	.920	.763	.157	69.9	80.4	62.4	18.0
24	.837	.920	.779	.141	71.3	82.3	62.5	19.8
25	.847	.933	.780	.153	71.4	80.5	64.0	16.5
26	.841	.914	.771	.143	67.4	74.3	62.8	11.5
27	.844	.920	.788	.132	64.7	73.5	56.3	17.2
28	.868	.934	.818	.116	65.9	76.3	57.5	18.8
29	.879	.958	.816	.142	68.5	80.0	58.0	22.0
30	.895	.972	.842	.130	69.3	80.5	60.0	20.5
31	.903	.971	.850	.121	70.2	82.0	59.7	22.3

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	62.0	5.4	57.7	9.7	0.485	5.35	2.04	0.72
2	59.9	7.0	54.3	12.6	.432	4.78	.50	.66
3	60.9	6.1	56.0	11.0	.458	5.07	.23	.70
4	62.1	6.6	56.8	11.9	.470	.18	.51	.67
5	60.0	6.1	55.1	11.0	.444	4.93	.17	.69
6	61.1	5.6	56.6	10.1	.467	5.17	.06	.72
7	62.3	5.6	57.8	10.1	.486	.37	.14	.72
8	63.6	5.3	59.4	9.5	.513	.64	.10	.73
9	64.5	5.7	59.9	10.3	.521	.73	.32	.71
10	61.2	6.9	55.7	12.4	.453	.01	.54	.66
11	58.8	7.2	53.0	13.0	.414	4.59	.49	.65
12	55.8	8.2	48.4	15.6	.354	3.93	.72	.59
13	55.3	8.2	47.9	15.6	.348	.87	.68	.59
14	57.8	7.1	52.1	12.8	.401	4.46	.39	.65
15	58.0	7.5	52.0	13.5	.400	.43	.55	.64
16	58.1	7.1	52.4	12.8	.405	.50	.41	.65
17	62.9	4.8	59.1	8.6	.508	5.61	1.85	.75
18	61.1	6.3	59.1	11.3	.508	.58	2.52	.69
19	63.6	7.8	57.4	14.0	.480	.26	3.09	.63
20	63.2	8.3	56.6	14.9	.467	.12	.26	.61
21	60.3	9.1	53.0	16.4	.414	4.56	.30	.58
22	59.1	8.2	52.5	14.8	.407	.50	2.87	.61
23	62.6	7.3	56.8	13.1	.470	5.17	.81	.65
24	63.4	7.9	57.1	14.2	.475	.21	3.12	.63
25	63.0	8.4	56.3	15.1	.462	.07	.28	.61
26	56.5	10.9	47.8	19.6	.346	3.82	.57	.52
27	55.1	9.6	47.4	17.3	.342	.80	.00	.50
28	58.6	7.3	52.8	13.1	.411	4.56	2.50	.65
29	61.5	7.0	55.9	12.6	.456	5.03	.62	.66
30	60.7	8.6	53.8	15.5	.425	4.68	3.15	.60
31	62.9	7.3	57.1	13.1	.475	5.22	2.83	.65

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid-night.	29.972	30.082	29.836	0.246	63.7	68.4	58.2	10.2
1	.964	.071	.832	.239	63.1	68.7	57.3	11.4
2	.955	.069	.822	.247	62.4	68.4	56.5	11.9
3	.945	.061	.810	.251	61.8	67.5	56.0	11.5
4	.941	.058	.802	.256	61.2	67.0	55.5	11.5
5	.952	.071	.816	.255	60.6	66.8	55.2	11.6
6	.966	.064	.833	.231	60.0	66.0	55.0	11.0
7	.988	.101	.858	.243	59.7	65.0	54.5	10.5
8	30.015	.133	.887	.246	61.3	66.7	56.6	10.1
9	.039	.172	.914	.258	65.7	71.0	61.4	9.6
10	.044	.174	.914	.260	69.9	74.0	65.0	9.0
11	.024	.156	.891	.265	73.1	77.0	68.5	8.5
Noon.	29.993	.122	.865	.257	75.1	79.0	70.5	8.5
1	.958	.087	.814	.273	76.6	81.0	72.3	8.7
2	.931	.066	.781	.285	77.5	82.0	73.5	8.5
3	.914	.046	.765	.281	78.0	82.3	73.5	8.8
4	.907	.039	.764	.275	76.8	81.0	73.0	8.0
5	.909	.043	.763	.280	75.3	79.6	71.5	8.1
6	.920	.036	.771	.265	71.9	75.5	67.6	7.9
7	.939	.058	.793	.265	69.6	73.3	65.1	8.2
8	.957	.077	.808	.269	68.0	71.5	63.0	8.5
9	.970	.093	.822	.271	66.8	70.4	61.8	8.6
10	.977	.093	.832	.261	65.5	70.0	60.5	9.5
11	.975	.082	.839	.243	64.7	69.0	59.0	10.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
Mid-night	60.0	3.7	56.7	7.0	0.469	5.22	1.37	0.79
1	59.6	3.5	56.4	6.7	.464	.17	.30	.80
2	59.1	3.3	56.1	6.3	.459	.14	.19	.81
3	58.7	3.1	55.9	5.9	.456	.10	.11	.82
4	58.2	3.0	55.5	5.7	.450	.04	.06	.83
5	57.6	3.0	54.9	5.7	.441	4.94	.04	.83
6	57.0	3.0	54.3	5.7	.432	.85	.02	.83
7	56.6	3.1	53.8	5.9	.425	.77	.05	.82
8	57.6	3.7	54.3	7.0	.432	.84	.28	.79
9	59.5	6.2	54.5	11.2	.435	.83	2.19	.69
10	61.4	8.5	54.6	15.3	.437	.81	3.17	.60
11	61.6	11.5	52.4	20.7	.405	.43	4.36	.50
Noon.	62.0	13.1	52.8	22.3	.411	.47	.87	.48
1	62.5	14.1	52.6	24.0	.408	.43	5.34	.45
2	62.6	14.9	52.2	25.3	.402	.37	.67	.44
3	62.9	15.1	52.3	25.7	.404	.37	.82	.43
4	62.4	14.4	52.3	24.5	.404	.38	.45	.45
5	63.2	12.1	54.7	20.6	.438	.76	4.64	.51
6	63.7	8.2	57.1	14.8	.475	5.20	3.28	.61
7	63.0	6.6	57.7	11.9	.485	.33	2.57	.68
8	62.4	5.6	57.9	10.1	.488	.38	.15	.71
9	61.7	5.1	57.6	9.2	.483	.31	1.92	.74
10	60.9	4.6	57.2	8.3	.476	.28	.70	.76
11	60.5	4.2	57.1	7.6	.475	.27	.53	.78

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 11 ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
1	130.4	...	S S W & S W	...	47.6	B to 4, ⟍i to 7, A. M. B to 11 P. M. Slightly foggy from Midnight to 2 A. M.
2	125.0	...	E N E & N by W [& S by W	...	76.1	B to 7 A. M., ⟍i to 2, B to 11 P. M. Slightly foggy at 8 & 9 P. M.
3	132.0	...	E S E, W by N	...	81.1	B. Slightly foggy at Midnight & 1 A. M.
4	142.5	...	N W & N N W [& S W	...	115.2	⟍i to 2, O to 5, ⟍i to 7 A. M., B to 2, ⟍i to 4, B to 11 P. M.
5	126.4	...	N N W, N by E	...	128.7	B. Slightly foggy from 7 to 10 P. M.
6	128.0	...	S E, N E & W S W	...	64.3	B to 1, ⟍i to 4, B to 11 P. M. Slightly foggy from 7 to 9 P. M.
7	130.0	...	N E, S W & W N W	...	77.6	B to 5 A. M., ⟍i to 6, B to 11 P. M. Foggy from 7 to 10 P. M.
8	131.0	...	S S E & S S W	...	77.6	B to 12, ⟍i to 4, B to 11 P. M.
9	133.4	...	S S W, N & N N E	...	104.6	B to 2, ⟍i to 6, B to 11 P. M. Foggy from 5 to 8 A. M. & 9 to 11 P. M.
10	135.0	...	N N E & N N W	...	100.8	B to 6 A. M., ⟍i to 6, S to 9, B to 11 P. M. Slightly foggy at Midnight, 1 & 8 A. M. & from 8 to 11 P. M.
11	131.9	...	N N W & W N W	...	95.1	⟍i to 4, B to 11 P. M. Foggy at Midnight.
12	132.0	...	N by E & W N W	...	107.3	B to 1, ⟍i to 7, B to 11 P. M. Foggy from 8 to 10 P. M.
13	132.0	...	S S W & N by W	...	95.1	B. Slightly foggy from 4 to 8 A. M. & at 8 & 9 P. M.
14	132.0	...	S W, S E & W S W	...	63.4	B.
15	130.0	...	S S W, N & W by S	...	79.1	B. Foggy from 7 to 11 P. M.
16	131.0	...	S W, W & S S W	...	39.8	B. Slightly foggy from Midnight to 4 A. M. & 9 to 11 P. M.
17	136.0	...	S S W & S W	...	45.2	B to 10 A. M., ⟍i to 4, B to 11 P. M. Foggy at Midnight & from 4 to 8 A. M.

⟍iCirri, —i Strati, ⌒i Cumuli, ⟍_i Cirro-strati, ⌒~i Cumulo-strati, ⟍_i Nimbi, ⟍~i Cirro,—cumuli-B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D, drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
18	135.7	...	S W & W	...	87.2	B. Foggy from 3 to 8 A. M.
19	134.0	...	W S W & W	...	100.2	B.
20	136.0	...	S W	...	118.5	B to 3, \i to 6, B to 11 P. M.
21	132.0	...	N N E & W by N	...	121.7	B. Slightly foggy from 8 to 10 P. M.
22	132.0	...	W S W & S S W	...	56.3	B.
23	133.8	...	SSW, WSW&W [S by W	...	111.0	B. Foggy from Midnight to 8 A. M.
24	136.0	...	S W, W S W &	...	103.0	B.
25	136.0	...	W & S by W [W N W	0.2	118.6	B. Slightly foggy from 1 to 4 A. M.
26	120.0	...	N N E, N W &	...	160.6	B to 5, \i to 7 A. M., Misty to 2, B to 11 P. M.
27	125.0	...	W & W N W	...	153.8	B. Slightly foggy from 8 to 11 P. M.
28	122.5	...	N N W & S S W	...	66.0	B. Slightly foggy at 6 & 7 A. M., & 7 & 8 P. M.
29	134.8	...	S by E & S S W [W by N	...	66.2	B to 11, ⌒i to 6, B to 11 P. M.
30	136.0	...	S S W, W S W &	...	54.2	B.
31	137.0	...	S, S W & S S W	...	82.5	B.

\i Cirri,—i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒i Cumulo-strati, ⌒_i Nimbi, \⌒i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January 1876.

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	29.965
Max. height of the Barometer occurred at 10 A.M. on the 15th ...	30.174
Min. height of the Barometer occurred at 5 P. M. on the 23rd ...	29.763
Extreme range of the Barometer during the month	0.411
Mean of the daily Max. Pressures	30.044
Ditto ditto Min. ditto	29.904
Mean daily range of the Barometer during the month	0.140

	°
Mean Dry Bulb Thermometer for the month	67.8
Max. Temperature occurred at 3 P. M. on the 24th	82.3
Min. Temperature occurred at 7 A. M. on the 14th	54.5
Extreme range of the Temperature during the month	27.8
Mean of the daily Max. Temperature	78.0
Ditto ditto Min. ditto, ...	59.6
Mean daily range of the Temperature during the month	18.4

Mean Wet Bulb Thermometer for the month	60.6
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	7.2
Computed Mean Dew-point for the month	54.8
Mean Dry Bulb Thermometer above computed mean Dew-point ...	13.0

	Inches.
Mean Elastic force of Vapour for the month	0.440

	Troy grain.
Mean Weight of Vapour for the month	4.85
Additional Weight of Vapour required for complete saturation ...	2.63
Mean degree of humidity for the month, complete saturation being unity	0.65

	°
Mean Max. Solar radiation Thermometer for the month	131.9

	Inches.
Rained no days,—Max. fall of rain during 24 hours	Nil
Total amount of rain during the month	Nil
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	Nil
Prevailing direction of the Wind ... S. S. W. & S. W.	

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of Jany. 1876.

MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. by E.	Rain on.	N. N. E.	Rain on.	N. E.	Rain on.	E. N. E.	Rain on.	E. by N.	Rain on.	E.	Rain on.	E. by S.	Rain on.	E. S. E.	Rain on.	S. E.	Rain on.	S. S. E.	Rain on.	S. by E.	Rain on.	S.	Rain on.	S. by W.	Rain on.	S. S. W.	Rain on.	S. W.	Rain on.	W. S. W.	Rain on.	W. by S.	Rain on.	W.	Rain on.	W. by N.	Rain on.	W. N. W.	Rain on.	N. W.	Rain on.	N. N. W.	Rain on.	N. by W.	Rain on.
	No. of days.																																														
Midnight	1				1		1		1								1		2				1		2		9		4										1				33		1	
1			1		2		1		2								1		2				1		1		8		5																	
2			1		2				1						1		2		1				1				7		1																	
3			1		2				1								2		1				1				7		1										1		1					
4			1		2				1								1				1		1				5		4																	
5			1		2				1								1				1		1				5		4																	
6			1		2				1								1				1		1				5		3																	
7			1		2				1										1		1		1				5		4						1											
8		1	1		2				1										1		1		1				5		3																	
9			1		2				1										1				1				5		3																	
10			1		2				1		1								1				1				5		3																	
11		1			3				2		1				1		1						1				4		3																	
Noon.		1		1					2						1								1		1		3		6		1															
1		3				1									1												1		6		3															
2		1				1																					1		6		3															
3		3			1																				1				6		4															
4																													6		4															
5					1																								6		4															
6					1																						1		6		4															
7					1																						1		6		4															
8					1																						1		6		4															
9		1																									1		6		4															
10		1				1		1										1							3		3		6		4															
11		1			1	1		1										1		1		1			4		9		6		4															

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
1	29.915	29.992	29.869	0.123	72.8	82.8	66.4	16.4
2	.918	.994	.854	.140	74.2	84.5	67.5	17.0
3	.928	30.008	.880	.128	75.4	84.3	69.9	14.4
4	.968	.063	.914	.149	69.5	77.5	63.5	14.0
5	.991	.084	.921	.163	65.5	75.0	58.4	16.6
6	30.007	.093	.947	.146	64.7	75.0	55.3	19.7
7	29.997	.070	.950	.120	64.2	76.0	54.4	21.6
8	30.014	.110	.989	.121	66.8	79.0	57.0	22.0
9	.060	.143	.996	.147	67.5	79.9	56.5	23.4
10	29.970	.051	.894	.157	68.5	80.8	57.6	23.2
11	.901	29.971	.848	.123	72.4	86.5	60.9	25.6
12	.947	30.008	.894	.114	74.8	88.4	63.5	24.9
13	.966	.012	.913	.129	75.3	88.0	66.2	21.8
14	.902	29.978	.821	.157	75.6	88.5	63.5	25.0
15	.817	.892	.751	.141	77.6	90.0	68.5	21.5
16	.828	.917	.772	.145	78.7	89.2	72.0	17.2
17	.794	.867	.737	.130	77.3	87.5	69.0	18.5
18	.827	.887	.778	.109	75.5	87.0	69.5	17.5
19	.935	30.026	.838	.188	71.8	79.4	66.5	12.9
20	.980	.062	.920	.142	70.2	81.0	62.0	19.0
21	.912	.000	.847	.153	71.2	82.5	62.0	20.5
22	.871	29.951	.804	.147	72.8	83.5	63.0	20.5
23	.789	.870	.710	.160	77.1	86.5	70.5	16.0
24	.772	.842	.707	.135	78.4	87.5	72.5	15.0
25	.878	.963	.821	.142	73.9	82.5	66.5	16.0
26	.941	30.019	.892	.127	73.8	85.0	63.2	21.8
27	.929	29.999	.863	.136	75.7	86.5	68.5	18.0
28	.842	.917	.781	.136	78.0	87.5	71.0	16.5
29	.810	.885	.751	.134	80.2	90.0	74.0	16.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	66.8	6.0	62.0	10.8	0.559	6.11	2.60	0.70
2	68.8	5.4	65.0	9.2	.617	.75	.34	.74
3	68.5	6.9	63.7	11.7	.591	.43	3.00	.68
4	58.6	10.9	49.9	19.6	.372	4.10	.78	.52
5	54.5	11.0	45.7	19.8	.322	3.57	.41	.51
6	54.2	10.5	45.8	18.9	.323	.60	.20	.53
7	54.7	9.5	46.1	18.1	.327	.63	.06	.54
8	57.5	9.3	50.1	16.7	.375	4.14	.12	.57
9	57.8	9.7	50.0	17.5	.373	.13	.29	.56
10	59.7	8.8	52.7	15.8	.409	.52	.13	.59
11	63.1	9.3	55.7	16.7	.453	.96	.64	.58
12	65.1	9.7	58.3	16.5	.494	5.37	.89	.58
13	65.7	9.6	59.0	16.3	.506	.51	.89	.59
14	65.9	9.7	59.1	16.5	.508	.52	.96	.58
15	69.2	8.4	63.3	14.3	.584	6.33	.74	.63
16	71.2	7.5	65.9	12.8	.636	.88	.53	.66
17	67.9	9.4	61.3	16.0	.546	5.92	4.06	.59
18	70.5	5.0	67.0	8.5	.659	7.17	2.29	.76
19	63.1	8.7	56.1	15.7	.459	5.03	3.42	.60
20	59.7	10.5	51.3	18.9	.390	4.29	.76	.53
21	60.5	10.7	51.9	19.3	.398	.38	.92	.53
22	64.3	8.5	57.5	15.3	.481	5.27	.44	.61
23	71.5	5.6	67.6	9.5	.672	7.29	2.63	.74
24	71.9	6.5	67.3	11.1	.666	.21	3.10	.70
25	60.6	13.3	51.3	22.6	.390	4.25	4.76	.47
26	65.0	8.8	58.8	15.0	.503	5.48	3.50	.61
27	70.1	5.6	66.2	9.5	.642	6.98	2.53	.73
28	73.0	5.0	69.5	8.5	.715	7.74	.45	.76
29	72.4	7.8	66.9	13.3	.657	.09	3.79	.65

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Midnight.	29.916	30.086	29.735	0.351	68.5	75.0	59.2	15.8
1	.907	.072	.730	.342	67.9	75.0	58.0	17.0
2	.895	.064	.717	.347	67.3	74.8	57.5	17.3
3	.885	.057	.707	.350	66.8	74.5	56.8	17.7
4	.881	.046	.714	.332	66.3	74.4	56.0	18.4
5	.894	.063	.725	.338	65.8	74.3	55.5	18.8
6	.911	.076	.747	.329	65.4	74.2	55.0	19.2
7	.931	.095	.771	.324	65·2	74.0	54.4	19.6
8	.957	.120	.807	.313	66.8	75.4	57.5	17.9
9	.979	.141	.824	.317	70.8	77.9	63.0	14.9
10	.990	.143	.842	.301	74.5	80.5	66.0	14.5
11	.978	.128	.830	.298	77.9	84.3	69.0	15.3
Noon.	.951	.091	.813	.278	80.1	86.6	70.5	16.1
1	.918	.060	.780	.280	81.9	88.0	73.0	15.0
2	.887	.027	.739	.288	83.1	89.4	74.0	15.4
3	.867	.007	.728	.279	83.8	90.0	75.0	15.0
4	.860	29.996	.713	.283	83.4	90.0	74.4	15.6
5	.860	30.005	.710	.295	81.9	89.0	73.0	16.0
6	.868	.018	.714	.304	78.1	85.4	69.5	15.9
7	.882	.044	.726	.318	74.9	82.0	67.0	15.0
8	.901	.066	.748	.318	72.8	79.5	64.2	15.3
9	.915	.080	.757	.323	71.3	78.5	62.5	16.0
10	.925	.092	.774	.318	70.2	77.0	61.0	16.0
11	.922	.096	.754	.342	69.3	77.3	60.4	16.9

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb. Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
Mid-night.	64.6	3.9	61.5	7.0	0.550	6.07	1.58	0.79
1	64.2	3.7	61.2	6.7	.541	.01	.50	.80
2	63.8	3.5	61.0	6.3	.541	5.99	.38	.81
3	63.4	3.4	60.7	6.1	.536	.93	.33	.82
4	63.0	3.3	60.4	5.9	.530	.88	.27	.82
5	62.6	3.2	60.0	5.8	.523	.80	.24	.82
6	62.2	3.2	59.6	5.8	.516	.73	.22	.82
7	61.8	3.4	59.1	6.1	.508	.64	.27	.82
8	62.5	4.3	59.1	7.7	.508	.62	.64	.77
9	63.8	7.0	58.2	12.6	.493	.41	2.79	.66
10	64.6	9.9	57.7	16.8	.485	.27	3.91	.57
11	65.1	12.8	56.1	21.8	.459	4.97	5.19	.49
Noon.	64.9	15.2	54.3	25.8	.432	.66	6.18	.43
1	65.3	16.6	53.7	28.2	.423	.55	.89	.40
2	65.7	17.4	53.5	29.6	.421	.51	7.35	.38
3	65.7	18.1	53.0	30.8	.414	.42	.68	.37
4	65.2	18.2	52.5	30.9	.407	.36	.66	.37
5	65.8	16.1	54.5	27.4	.435	.68	6.76	.41
6	67.1	11.0	59.4	18.7	.513	5.54	4.68	.54
7	66.4	8.5	60.4	14.5	.530	.77	3.51	.62
8	65.7	7.1	60.0	12.8	.523	.72	2.99	.66
9	65.3	6.0	60.5	10.8	.532	.84	.49	.70
10	65.2	5.0	61.2	9.0	.541	.99	.06	.74
11	65.0	4.3	61.6	7.7	.552	6.07	1.76	.78

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches	[by S	lb	Mile.	
1	136.5	...	S W, S S W & W	...	79.6	B to 4, Scuds to 8, \i to 10 A. M., B to 12, _i to 1, B to 11 P. M. Foggy from Midnight to 4 A. M. at 7, 8 & 11 P. M.
2	138.0	...	S W & S by W	...	95.1	O to 10 A. M., B to 11 P. M. Foggy from Midnight to 4 A. M.
3	135.0	...	S S W & N by E	...	148.6	S to 2, O to 8 A. M., B to 11 P. M. Foggy from 7 to 11 P. M.
4	132.0	...	N N E, N & N W	...	121.8	B.
5	136.0	...	N N W, N W & S W	0.2	166.4	B. Slightly foggy at 8 & 9 P. M.
6	132.4	...	S W, N E & W S W	...	105.0	B. to 1, \i to 5, B to 11 P. M. Slightly foggy from 8 to 11 P. M.
7	130.4	...	S W & S S W	...	84.3	B. Foggy from Midnight to 6 A. M. & 8 to 10 P. M.
8	132.2	...	S W & Variable	...	84.0	B. Slightly foggy from 9 to 11 P. M.
9	134.2	...	W & S W	...	75.7	B to 4, \i to 6, B to 11 P. M. Slightly foggy from Midnight to 6 A. M. & at 9 & 10 P. M.
10	135.8	...	S W & S by W	...	61.1	B to 11 A. M., \i to 11 P. M. Slightly foggy at 6 & 7 A. M.
			S by W & S S W	...	108.1	B to 11 A. M., \i to 1, B to 5, \i to 8, B to 11 P. M. Slightly foggy at 1 & 2 & from 5 to 7 A. M.
11	138.5	...				
12	137.8	...	S S W & S W	...	134.7	Chiefly B.
13	138.0	...	S S W & W by S	...	89.7	B. Foggy from 4 to 7 A. M. & at 10 & 11 P. M.
14	137.0	...	S W & S by W [& S W	...	72.0	B to 2, \i & _i to 8 A. M., B to 12, \i to 4, B to 11 P. M.
15	135.5	...	S by W, S S W	...	150 7	B.
16	137.5	...	Variable	...	107.0	B to 1, S to 8 A. M., B to 11 P. M.
17	134.0	...	S S W & Variable	...	113.6	B.
18	133.5	1.58	Variable	6.5	94.1	B to 1, \i to 3 A. M., ~i to 3, O to 11 P. M. T from 3¾ to 6 & at 10 P. M. L at 5½, 10 & 11 P. M. R from 3½ to 7 & 9½ to 10½ P. M.

\iCirri, —i Strati, ~i Cumuli, _i Cirro-strati, ~ i Cumulo-strati, ~i Nimbi, \~i Cirro,—cumuli-B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D, drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February 1876.

Solar Radiation. Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles	
19	127.0	1.35	N E, N & N N W	0.2	145.2	O to 9 A. M., ⌒i to 2, B to 11 P. M. Foggy from 8 to 11 P. M. R from 2½ to 3½ A. M.
20	134.8	...	S W & W S W	...	115.6	B. Slightly foggy from 7 to 9 P. M.
21	136.0	...	S W & N W	0.2	109.2	B to 3, ⌒i to 6, B to 11 P. M.
22	134.0	...	S W & S by W	...	118.6	B.
23	133.7	...	S by W & S S W	0.3	160.4	B to 2, O to 10 A. M., ⌒i to 4, ⌒i to 7, S to 11 P. M. Foggy from 3 to 5 A. M. Sheet L on N E at 11½ P. M.
24	136.8	...	S by W & S W	...	231.9	B to 4 A. M., ⌒i to 6, B to 11 P. M.
25	136.0	...	N N W, W & S	0.2	161.2	B to 7, ⌒i to 9 A. M., B to 5, ⌒i to 7, B to 11 P. M.
26	132.6	...	W by S & W	...	98.0	B.
27	135.3	...	S W & S by W	...	68.5	Chiefly B. Foggy from 2 to 8 A. M.
28	138.0	...	S by W, S S W & S	0.2	169.5	Chiefly B.
29	135.2	...	S S W & S W	0.2	238.5	⌒i to 7 A. M., B to 11 P. M.

⌒i Cirri,—i Strati, ⌒i Cumuli, ⌒i Cirro-strati, ⌒i Cumulo-strati, ⌒i Nimbi, ⌒i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of February 1876.

Monthly Results.

	Inches.
Mean height of the Barometer for the month	29.912
Max. height of the Barometer occurred at 10 A. M. on the 9th ...	30.143
Min. height of the Barometer occurred at 3 A. M. on the 24th ...	29.707
Extreme range of the Barometer during the month	0.436
Mean of the daily Max. Pressures	29.990
Ditto ditto Min. ditto	29.850
Mean daily range of the Barometer during the month	0.140

	°
Mean Dry Bulb Thermometer for the month	73.1
Max. Temperature occurred at 3 & 4 P. M. on the 15th & 29th ...	90.0
Min. Temperature occurred at 7 A. M. on the 7th	54.4
Extreme range of the Temperature during the month	35.6
Mean of the daily Max. Temperature	83.9
Ditto ditto Min. ditto, ...	64.8
Mean daily range of the Temperature during the month	19.1

Mean Wet Bulb Thermometer for the month	64.5
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	8.6
Computed Mean Dew-point for the month	57.6
Mean Dry Bulb Thermometer above computed mean Dew-point ...	15.5

	Inches.
Mean Elastic force of Vapour for the month	0.483

	Troy grain.
Mean Weight of Vapour for the month	5.27
Additional Weight of Vapour required for complete saturation ...	3.52
Mean degree of humidity for the month, complete saturation being unity	0.60

	°
Mean Max. Solar radiation Thermometer for the month	135.0

	Inches.
Rained 2 days.—Max. fall of rain during 24 hours	1.58
Total amount of rain during the month	2.93
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	2.45
Prevailing direction of the Wind ... S. W. & S. S. W.	

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of Feb. 1876.

MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. by E.	Rain on.	N. N. E.	Rain on.	N. E.	Rain on.	E. N. E.	Rain on.	E. by N.	Rain on.	E.	Rain on.	E. by S.	Rain on.	E. S. E.	Rain on.	S. E.	Rain on.	S. S. E.	Rain on.	S. by E.	Rain on.	S.	Rain on.	S. by W.	Rain on.	S. S. W.	Rain on.	S. W.	Rain on.	W. S. W.	Rain on.	W. by S.	Rain on.	W.	Rain on.	W. by N.	Rain on.	W. N. W.	Rain on.	N. W.	Rain on.	N. N. W.	Rain on.	N. by W.	Rain on.
	No. of days.																																														
Midnight					1														1						1		13		4				1										1					
1	1								1																1		12		6														1					
2	1				1																						12		6										1								
3			1		1		1	1					1	1			1										12		7				1								1							
4			1		1		1		1																		12		7												1							
5			1		12		1																				12		7				1								1							
6	1		1		1		1		1										1						1		12		10												1							
7	1						1																				12		8												1							
8	1				1		1		1										1						1		12		8												1							
9											1														1		12		8												1							
10	3	12			1								1		1				1		1						12		10												1							
11					12				12					1		1			1		1						12		8				2								1							
Noon.	1			12					1				1												1		12		4												1							
1	1		1		1										1												12		5				2								1							
2		12			1								1						1		1		3		1		12		1				1								1							
3					1																						12		5		1																	
4			1		1														1						1		12		5												1							
5			1		1		1																				12		5												1							
6			1		1		1																				12		5												1							
7			1		1		1																				12		5												1							
8																											12		5												1							
9																					1		1				12		5												1							
10																							1				12		5												1							
11															1		1										12		5												1							

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 31″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fait.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.839	29.918	29.761	0.157	78.2	85.2	71.5	13.7
2	.835	.902	.776	.126	76.7	83.2	69.0	14.2
3	.838	.962	.782	.120	72.7	79.7	67.5	12.2
4	.851	.907	.801	.106	76.8	86.0	69.0	17.0
5	.881	.966	.820	.146	79.0	86.5	74.0	12.5
6	.842	.910	.762	.148	78.7	85.5	73.6	11.9
7	.831	.899	.780	.119	79.3	86.6	73.7	12.9
8	.896	.970	.827	.143	77.9	86.0	70.5	15.5
9	.925	30.016	.856	.160	78.2	87.5	71.5	16.0
10	.917	.020	.855	.165	78.3	86.3	73.5	12.8
11	.901	29.965	.819	.146	77.8	87.5	71.5	16.0
12	.929	30.005	.880	.125	77.2	85.6	70.5	15.1
13	.952	.033	.904	.129	79.5	87.6	73.0	14.6
14	.873	29.961	.789	.172	81.2	89.7	74.5	15.2
15	.813	.891	.746	.145	81.3	89.5	74.0	15.5
16	.776	.812	.637	.175	81.2	92.0	73.0	19.0
17	.833	.907	.787	.120	82.8	91.3	77.0	14.3
18	.883	.967	.832	.135	82.2	90.2	75.5	14.7
19	.889	.944	.795	.149	82.5	91.3	75.5	15.8
20	.962	.973	.844	.129	83.0	92.5	75.7	16.8
21	.890	.972	.808	.164	83.3	92.5	76.5	16.0
22	.807	.876	.724	.152	83.9	92.2	77.8	14.4
23	.703	.789	.577	.212	85.1	93.0	79.5	13.5
24	.660	.738	.592	.146	85.5	95.0	79.2	15.8
25	.698	.777	.626	.151	84.2	95.0	75.0	20.0
26	.741	.806	.678	.128	84.3	94.2	77.0	17.2
27	.778	.851	.722	.129	84.3	92.4	80.0	12.4
28	.773	.836	.697	.139	83.5	92.0	77.6	14.4
29	.754	.807	.681	.126	84.9	93.5	78.5	15.0
30	.712	.778	.638	.140	85.5	95.5	76.7	18.8
31	.676	.732	.604	.128	84.9	93.5	78.5	15.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	74.8	3.4	72.4	5.8	0.785	8.50	1.75	0.83
2	73.0	3.7	70.4	6.3	.736	.00	.80	.82
3	69.9	2.8	67.7	5.0	.674	7.39	.29	.85
4	72.0	4.8	68.6	8.2	.695	.55	2.28	.77
5	74.8	4.2	71.9	7.1	.773	8.36	.14	.80
6	75.1	3.6	72.6	6.1	.790	.56	1.85	.82
7	71.8	7.5	66.5	12.8	.618	7.00	3.59	.66
8	68.3	9.6	61.6	16.3	.552	5.97	4.19	.59
9	71.7	6.5	67.1	11.1	.661	7.16	3.09	.70
10	73.3	5.0	69.8	8.5	.722	.81	2.47	.76
11	73.7	4.1	70.8	7.0	.746	8.09	.01	.80
12	72.9	4.3	69.9	7.3	.725	7.87	.08	.79
13	71.5	8.0	65.9	13.6	.636	6.86	3.80	.64
14	75.3	5.9	71.2	10.0	.756	8.13	.08	.73
15	70.8	10.5	63.4	17.9	.586	6.29	4.95	.56
16	76.7	4.5	73.5	7.7	.814	8.76	2.45	.78
17	74.9	7.9	69.4	13.4	.713	7.66	4.09	.65
18	72.4	9.8	65.5	16.7	.628	6.74	.80	.58
19	73.4	9.1	67.0	15.5	.659	7.07	.57	.61
20	74.1	8.9	67.9	15.1	.679	.28	.54	.62
21	77.4	5.9	73.3	10.0	.809	8.66	3.27	.73
22	78.9	5.0	75.4	8.5	.865	9.26	2.87	.76
23	78.7	6.4	74.2	10.9	.832	8.89	3.68	.71
24	74.8	10.7	67.3	18.2	.666	7.10	5.62	.56
25	73.3	10.9	65.7	18.5	.632	6.75	.49	.55
26	77.2	7.1	72.2	12.1	.781	8.34	3.94	.68
27	78.7	5.6	74.8	9.5	.849	9.07	.21	.74
28	78.5	5.0	75.0	8.5	.854	.14	2.86	.76
29	78.6	6.3	74.2	10.7	.832	8.89	3.60	.72
30	76.2	9.3	69.7	15.8	.720	7.68	5.04	.60
31	79.0	5.9	74.9	10.0	.851	9.09	3.40	.73

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid-night.	29.834	29.941	29.670	0.271	77.2	81.3	69.0	12.3
1	.823	.930	.655	.275	76.9	81.0	68.6	12.4
2	.812	.913	.644	.269	76.6	81.0	68.2	12.8
3	.802	.914	.637	.277	76.3	80.5	68.0	12.5
4	.803	.926	.637	.289	75.9	80.5	67.8	12.7
5	.814	.948	.648	.300	75.6	80.0	67.5	12.5
6	.833	.967	.655	.312	75.2	80.0	67.5	12.5
7	.857	.988	.684	.304	75.2	80.0	67.8	12.2
8	.878	30.002	.712	.290	76.7	81.4	68.4	13.0
9	.893	.025	.728	.297	79.7	84.5	71.7	12.8
10	.897	.033	.732	.301	82.4	87.5	73.7	13.8
11	.888	.022	.721	.301	84.7	91.0	76.0	15.0
Noon.	.862	29.999	.696	.303	86.6	93.5	78.0	15.5
1	.835	.988	.662	.326	88.0	94.4	78.8	15.6
2	.803	.950	.625	.325	88.8	95.0	79.1	15.9
3	.779	.928	.602	.326	89.3	95.3	79.7	15.6
4	.764	.913	.592	.321	89.0	95.5	79.5	16.0
5	.761	.913	.588	.325	87.9	93.8	78.5	15.3
6	.770	.910	.577	.333	85.3	91.3	73.0	18.3
7	.784	.917	.602	.315	82.5	87.5	74.6	12.9
8	.806	.941	.626	.315	80.7	86.0	73.0	13.0
9	.827	.946	.645	.301	79.5	84.5	71.5	13.0
10	.837	.948	.681	.267	78.3	83.5	70.0	13.5
11	.839	.959	.681	.278	77.6	83.0	69.0	14.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	°	°	°	°	Inches.	T. gr.	T. gr.	
Mid-night.	74.6	2.6	72.8	4.4	0.795	8.64	1.31	0.87
1	74.5	2.4	72.8	4.1	.795	.64	.22	.88
2	74.3	2.3	72.7	3.9	.792	.61	.16	.88
3	74.2	2.1	72.7	3.6	.792	.61	.08	.89
4	74.0	1.9	72.7	3.2	.792	.63	0.94	.90
5	73.9	1.7	72.7	2.9	.792	.63	.85	.91
6	73.4	1.8	72.1	3.1	.778	.48	.89	.91
7	73.2	2.0	71.8	3.4	.771	.40	.97	.90
8	74.0	2.7	72.1	4.6	.778	.44	1.36	.86
9	74.7	5.0	71.2	8.5	.756	.15	2.57	.76
10	74.9	7.5	69.6	12.8	.717	7.69	3.92	.66
11	74.7	10.0	67.7	17.0	.674	.21	5.21	.58
Noon	74.4	12.2	67.1	19.5	.661	.03	6.11	.54
1	74.9	13.1	67.0	21.0	.659	6.99	.69	.51
2	75.3	13.5	67.2	21.6	.664	7.03	.97	.50
3	75.5	13.8	67.2	22.1	.664	.03	7.18	.50
4	75.1	13.9	66.8	22.2	.655	6.94	.14	.49
5	75.5	12.4	68.1	19.8	.684	7.25	6.39	.53
6	75.6	9.7	68.8	16.5	.699	.45	5.19	.59
7	75.0	7.5	69.7	12.8	.720	.72	3.92	.66
8	74.7	6.0	70.5	10.2	.739	.97	.7	.72
9	74.4	5.1	70.8	8.7	.746	8.05	2.61	.76
10	74.3	4.0	71.5	6.8	.763	.26	.02	.80
11	74.4	3.2	72.2	5.4	.781	.46	1.61	.84

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	°	Inches.		lb.	Mile.	
1	132.0	1.53	S W & S	8.0	165.3	O to 7 A. M., ⌒i to 6, B to 11 P. M. T, L & R from 5 to 7 A. M., D at 10¾ A. M.
2	125.0	0.16	S & S W	2.0	139.1	S to 1, _i to 6, \i to 10 A. M., ⌒i to 3, O to 6, _i to 8, O to 11 P. M. T, L & R after intervals from 3 to 11 P. M.
3	131.0	0.69	S E & S S E	2.2	203.8	O to 5, ⌒i to 8, O to 11 A. M., ⌒i to 5, ⌒i to 8, B to 11 P. M. L from Midnight to 2 A. M. at 7 & 8 P. M. T & R from Midnight to 2 at 10 A. M., 5 & 6 P. M.
4	137.5	...	S & S W [S S W	...	118.4	B to 9 A. M., ⌒i to 4, \i to 6, B to 11 P. M.
5	141.0	...	S by W, S W &	...	101.6	B to 4, S to 8 A. M., ⌒i & \i to 5, B to 11 P. M. Foggy from 5 to 8 A. M.
6	136.4	...	S S W & S	...	98.5	B to 3 A. M., ⌒i & \i to 4, _i to 8, \i to 11 P. M. T & L at 11½ P. M.
7	135.0	0.16	S E & E N E	0.2	110.3	O to 7 A. M., B to 11 P. M. T at Midnight & 1 A. M., L from Midnight to 5 A. M., R at Midnight & 4 A. M.
8	135.0	...	Variable	...	121.5	B.
9	137.5	...	S & W	...	85.8	B to 5, ⌒i to 10 A. M., B to 12, _i to 3, B to 11 P. M.
10	134.0	...	S by W & S S W	...	88.5	B to 5, ⌒i to 11 A. M., \i to 8, B to 11 P. M.
11	141.0	1.06	S by W	1.8	85.7	B to 5, \i to 9 A. M., ⌒i to 4, O to 8, \i to 11 P. M. T, L & R from 5½ to 8 P. M.
12	135.0	0.04	S W & S S W	...	117.0	\i to 6 A. M., ⌒i to 3, \i to 5, B to 8, \i to 11 P. M. Light R at 2 A. M.
13	135.5	...	S S W, N E & S E	...	86.3	B to 4, \i to 6, B to 11 P. M.
14	139.2	...	S W & W S W	...	109.2	B to 5, _i to 11 A. M., ⌒i to 7, B to 11 P. M. Sheet L on S E at 7 P. M.

\i Cirri, —i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒i Cumulo-strati, ⌒i Nimbi, \i Cirro,—cumuli-B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D, drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
15	142.0	...	S W & N N W	...	105.4	Scuds to 3, _i to 6 A. M., B to 11 P. M.
16	141.4	0.54	S S W	20.0	109.5	S to 1, B to 5, Scuds to 8, B to 11 A. M., ⌒i to 8. B to 11 P. M. High wind at 6 P. M. Hails at 5¾ P. M. L at 7 & 8 P. M. T & R from 4 to 6 P. M.
17	140.0	...	S by W & S	...	112.1	S to 3, _i to 5, \i to 8 A. M., B to 11 P. M.
18	138.0	...	S by W	...	86.6	B to 3, _i to 6 A. M., \i to 7, B to 11 P. M.
19	141.0	...	S W	...	83.9	B to 3, \i to 6, B to 11 P. M.
20	141.2	...	S W & S S W	0.2	97.5	B to 7 A. M., \i to 7, B to 11 P. M. Slightly foggy at 6 A. M.
21	141.0	...	S W	0.2	130.7	B to 11 A. M., _i to 2, \i to 7, B to 11 P. M.
22	140.0	...	S W & S	...	137.3	B to 4, \i to 6, B to 8, ⌒i to 10 A. M., _i to 1, \i to 6, ⌒i to 8, B to 11 P. M. Sheet L on E from 6¾ to 8 P. M.
23	142.0	...	S S W & S W	...	129.5	B to 6, \i to 8, ⌒i to 4, \i to 6, B to 11 P. M.
24	143.0	...	S, N W & W by S	...	105.8	Scuds to 3. B to 11 A. M., \i to 7, B to 11 P. M. Slightly foggy at 6 & 7 A. M.
25	143.0	...	W S W & S S W	...	108.0	B to 2 A. M., \i to 1, B to 11 P. M.
26	142.0	...	S by W & S	...	106.0	B to 3, S to 8 A. M., \i to 7, B to 11 P. M.
27	140.0	...	S by W & S	...	109.3	B to 1, S to 7, ⌒i to 11 A. M. \i to 11 P. M. Sheet L on N E, from 6½ to 8 P. M.
28	140.8	...	S by W & S	0.8	161.9	\i to 10 A. M., ⌒i to 2, S to 6, \i to 9, B to 11 P. M. T at 5 P. M. Sheet L from 7 to 11 P. M. D at 5½ P. M.

\i Cirri,—i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒ i Cumulo-strati, _i Nimbi, \i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1876.

Solar Radiation, Weather, &c.,

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches.		lb	Miles.	
29	144.0	0.01	S & S S W	...	167.8	O to 1, B to 6 A. M., ⌒i to 12, ⌒i to 4, ⌒i to 7, B to 11 P. M. T at 1¼ A. M Sheet L from 2 to 4 A. M., Light R at 1¾ A. M.
30	141.0	0.17	S S W & S	1.2	170.0	⌒i to 5, ⌒i to 10 A. M., B to 3, ⌒i to 8, O to 11 P. M. L from 7 to 11 P. M. T between 8 & 9 P. M. R at 9¼ P. M.
31	141.0	...	S by E, S& S S W	...	141.5	B to 5 A. M., ⌒i to 4, B to 11 P. M.

⌒i Cirri —i Strati, ⌒i Cumuli, ⌒i Cirro-strati, ⌒i Cumulo-strati ⌒i Nimb, ⌒i Cirro-Cumuli, B clear, S stratoni, O overcast, T thunder, L lightining R rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1876.

Monthly Results.

	Inches.
Mean height of the Barometer for the month	29.825
Max. height of the Barometer occurred at 10 A. M. on the 13th ...	30.033
Min. height of the Barometer occurred at 6 P. M. on the 23rd ...	29.577
Extreme range of the Barometer during the month	0.456
Mean of the daily Max. Pressures	29.899
Ditto ditto Min. ditto	29.756
Mean daily range of the Barometer during the month	0.143

	°
Mean Dry Bulb Thermometer for the month	81.1
Max. Temperature occurred at 4 P. M. on the 30th...	95.5
Min. Temperature occurred at 5 & 6 A. M. on the 3rd	67.5
Extreme range of the Temperature during the month	28.0
Mean of the daily Max. Temperature	89.6
Ditto ditto Min. ditto, ...	74.5
Mean daily range of the Temperature during the month	15.1

Mean Wet Bulb Thermometer for the month	74.6
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	6.5
Computed Mean Dew-point for the month	70.0
Mean Dry Bulb Thermometer above computed mean Dew-point ...	11.1

	Inches.
Mean Elastic force of Vapour for the month	0.727

	Troy grain.
Mean Weight of Vapour for the month	7.82
Additional Weight of Vapour required for complete saturation ...	3.35
Mean degree of humidity for the month, complete saturation being unity	0.70

	°
Mean Max. Solar radiation Thermometer for the month	138.6

	Inches.
Rained 10 days.—Max. fall of rain during 24 hours	1.53
Total amount of rain during the month	4.36
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	3.74
Prevailing direction of the Wind ... S. S. W. & S. W.	

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the **S. G. O. Calcutta, in the month of** *May*, 1876.

MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. by E.	Rain on.	N. N. E.	Rain on.	N. E.	Rain on.	E. N. E.	Rain on.	E. by N.	Rain on.	E.	Rain on.	E. by S.	Rain on.	E. S. E.	Rain on.	S. E.	Rain on.	S. S. E.	Rain on.	S. by E.	Rain on.	S.	Rain on.	S. by W.	Rain on.	S. S. W.	Rain on.	S. W.	Rain on.	W. S. W.	Rain on.	W. by S.	Rain on.	W.	Rain on.	W. by N.	Rain on.	W. N. W.	Rain on.	N. W.	Rain on.	N. N. W.	Rain on.	N. by W.	Rain on.
	No. of days.																																														
Midnight																			2	1	1		2		7		7	1	7		3		1															
1																			1	1	3		1				2		9		9	1	4		1											
2																					1	1	12		3	12	7		8	8	12	7														
3																					1		12		4		8		6	6		5														
4																							1		4		9	1	6	6		5		1							1		1		
5																							1		12		11		6	6		5		1							1		1		
6																									1		9		5	7	1	3		1							1		12		
7		2						1				1				1									1		5		4	7		4					1						1		1	
8				1		1		1						1		1		1									4		4			7							1						
9						1																			1		4		6	6		8													
10						3		1		1										12		1			1		4		12	12		8													
11		2				1		3												12	1	1			3		1		12	12		10				1									
Noon.				1		1		1		1		1						12							5		1		5	5		5		2		2		1							
1						1		12				1						12									1		5	5		2		1				1							
2								1		1						1									2	2			5	5		4		1				1							
3								12										1					12		3	12	7		6	6		7		12		12		4							
4														1									1		5		5	12	5	5		6		1				1							
5																		1							5	12	4		5	5	1	8		1				1							
6														1	1					4	1		1		3	12	6		7	7		8	12	1				1							
7														1	1					3					2		6		2	2		1		1				1							
8																	1	1		4		1	1		7		10		6	6		1		1										
9										1				1						3			1		8		8		5	5		1												
10								1									1	1		12			1		7		7		8	8		2	1											
11																				1			1		9		7		7			1		1										

Meteorological Observations.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.705	29.769	29.638	0.131	85.1	94.4	78.5	15.9
2	.761	.832	.698	.134	84.2	93.5	79.2	14.3
3	.834	.921	.769	.152	84.8	93.2	77.5	15.7
4	.799	.877	.725	.152	85.3	93.4	79.5	13.9
5	.779	.844	.723	.121	85.3	93.7	79.5	14.2
6	.797	.866	.727	.139	86.1	94.7	79.0	15.7
7	.803	.874	.729	.145	85.8	96.0	78.5	17.5
8	.770	.853	.696	.157	86.1	97.8	78.3	19.5
9	.710	.787	.619	.168	87.2	99.5	79.5	20.0
10	.684	.756	.601	.155	87.2	97.8	81.2	16.6
11	.684	.747	.595	.152	86.1	94.6	80.0	14.6
12	.706	.786	.614	.172	83.6	91.8	74.0	17.8
13	.708	.749	.644	.105	80.5	91.2	73.5	17.7
14	.674	.733	.611	.122	85.8	93.4	80.5	12.9
15	.673	.740	.608	.132	86.6	94.5	80.0	14.5
16	.718	.784	.662	.122	88.0	96.0	82.5	13.5
17	.671	.756	.576	.174	87.2	97.5	80.4	17.1
18	.612	.675	.538	.137	86.6	94.0	80.0	14.0
19	.708	.778	.639	.139	86.8	94.5	80.6	13.9
20	.731	.805	.651	.154	86.3	94.4	80.0	14.4
21	.707	.780	.639	.141	86.4	96.3	79.0	17.3
22	.645	.709	.548	.161	87.0	96.3	79.7	16.6
23	.610	.682	.556	.126	87.5	95.1	82.0	13.1
24	.638	.692	.586	.106	87.5	95.6	82.0	13.6
25	.684	.755	.627	.128	87.0	94.0	81.5	12.5
26	.666	.726	.589	.137	88.0	96.5	82.0	14.5
27	.664	.733	.612	.121	87.6	96.4	81.3	15.1
28	.720	.793	.664	.129	87.4	96.0	81.5	14.5
29	.764	.842	.708	.134	86.6	94.5	80.0	14.5
30	.747	.824	.669	.155	85.9	94.8	77.8	17.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	79.0	6.1	74.7	10.4	0.846	9.05	3 52	0.72
2	79.5	4.7	76.2	8.0	.887	.51	2.73	.78
3	76.8	8.0	71.2	13.6	.756	8.07	4.39	.65
4	74.9	10.4	67.6	17.7	.672	7.17	5.47	.57
5	76.9	8.4	71.0	14.3	.751	8.02	4.62	.63
6	76.9	9.2	70.5	15.6	.739	7.87	5.08	.61
7	75.6	10.2	68.5	17.3	.692	.39	.44	.58
8	77.5	8.6	71.5	14.6	.763	8.13	4.82	.63
9	79.3	7.9	74.6	12.6	.843	.96	.41	.67
10	79.7	7.5	75.2	12.0	.860	9.15	.22	.68
11	79.8	6.3	75.4	10.7	.865	.22	3.73	.71
12	77.4	6.2	73.1	10.5	.803	8.60	.43	.72
13	75.8	4.7	72.5	8.0	.787	.49	2 49	.77
14	78.6	7.2	73.6	12.2	.817	.72	4.11	.68
15	80.9	5.7	77.5	9.1	.925	9.86	3.28	.75
16	77.2	10.8	70.7	17.3	.744	7.90	5.78	.58
17	79.6	7.6	75.0	12.2	.854	9.09	4.28	.68
18	80.0	6.6	76.0	10.6	.882	.39	3.75	.72
19	79.6	7.2	75.3	11.5	.862	.17	4.04	.69
20	78.8	7.5	73.5	12 8	.814	8.67	.35	.67
21	78.7	7.7	73.3	13.1	.809	.61	.45	.66
22	80.2	6.8	76.1	10.9	.885	9.42	3.87	.71
23	80.5	7.0	76.3	11.2	.890	.48	4.01	.70
24	81.2	6.3	77.1	10.1	.922	.81	3.68	.73
25	80.6	6.4	76.8	10.2	.905	.63	.66	.73
26	81.0	7.0	76.8	11.2	.905	.61	4.07	.70
27	80.6	7.0	76.4	11.2	.893	.51	.01	.70
28	80.4	7.0	76 2	11.2	.887	.45	.00	[illegible]
29	79.1	7.5	74.6	12.0	.843	8.98	.16	.68
30	78.2	7.7	72.8	13.1	.795	.48	.39	.66

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid-night.	29.720	29.819	29.609	0.210	82.0	84.0	74.5	9.5
1	.710	.810	.601	.209	81.6	83.8	74.1	9.7
2	.700	.806	.596	.210	81.2	83.6	73.9	9.7
3	.691	.805	.574	.231	80.8	83.5	73.7	9.8
4	.690	.811	.572	.239	80.5	83.2	73.7	9.5
5	.706	.830	.585	.245	80.0	83.0	73.5	9.5
6	.724	.845	.608	.237	79.8	82.5	73.5	9.0
7	.746	.872	.641	.231	80.7	84.0	74.8	9.2
8	.766	.900	.656	.244	83.2	86.0	79.5	6.5
9	.778	.919	.671	.248	86.1	88.5	82.8	5.7
10	.778	.921	.661	.260	88.9	91.6	85.5	6.1
11	.767	.907	.647	.260	91.1	94.0	87.4	6.6
Noon.	.748	.884	.626	.258	92.7	96.0	87.3	8.7
1	.723	.860	.602	.258	93.9	98.0	90.5	7.5
2	.691	.827	.573	.254	94.6	99.5	89.0	10.5
3	.671	.793	.563	.230	94.6	98.5	86.0	12.5
4	.653	.780	.544	.236	93.9	97.8	79.0	18.8
5	.645	.769	.538	.231	92.3	96.0	77.7	18.3
6	.652	.771	.548	.223	90.0	92.5	81.4	11.1
7	.673	.788	.573	.215	86.6	89.0	81.8	7.2
8	.691	.816	.580	.236	84.9	86.7	82.0	4.7
9	.716	.829	.599	.230	83.8	85.5	82.0	3.5
10	.728	.844	.616	.228	82.9	85.0	77.5	7.5
11	.727	.829	.613	.216	82.2	84.5	74.0	10.5

The Mean Height of the Barometer as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
Mid-night.	78.7	3.3	76.4	5.6	0.893	9.60	1.87	0.84
1	78.5	3.1	76.3	5.3	.890	.59	.75	.85
2	78.2	3.0	76.1	5.1	.885	.53	.68	.85
3	78.0	2.8	76.0	4.8	.882	.50	.57	.86
4	77.8	2.7	75.9	4.6	.879	.47	.51	.86
5	77.6	2.4	75.9	4.1	.879	.49	.32	.88
6	77.5	2.3	75.9	3.9	.879	.49	.26	.88
7	78.1	2.6	76.3	4.4	.890	.61	.43	.87
8	79.0	4.2	76.1	7.1	.885	.50	2.39	.80
9	79.7	6.4	75.2	10.9	.860	.16	3.79	.71
10	79.7	9.2	74.2	14.7	.832	8.82	5.22	.63
11	79.5	11.6	72.5	18.6	.787	.30	6.67	.56
Noon.	79.5	13.2	71.6	21.1	.766	.05	7.58	.51
1	79.5	14.4	70.9	23.0	.748	7.85	8.37	.48
2	79.3	15.3	70.1	24.5	.729	.64	.91	.46
3	79.2	15.4	70.0	24.6	.727	.61	.94	.46
4	78.7	15.2	69.6	24.3	.717	.52	.70	.46
5	79.3	13.0	71.5	20.8	.763	8.03	7.47	.52
6	79.6	10.4	73.4	16.6	.811	.57	5.93	.59
7	78.8	7.8	74.1	12.5	.830	.83	4.31	.67
8	78.6	6.3	74.2	10.7	.832	.89	3.60	.71
9	79.0	4.8	75.6	8.2	.871	9.33	2.77	.77
10	78.9	4.0	76.1	6.8	.885	.50	.29	.81
11	78.7	3.5	76.2	6.0	.887	.54	.00	.83

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind.			General aspect of the Sky.
			Prevailing direction.	Max. Pressure	Daily Velocity.	
	o	Inches		lb	Miles.	
1	143.2	...	S	...	138.5	\i to 1, B to 10 A. M., _i to 4, S to 11 P. M. L from 5½ to 8 P. M. T & D between 5 & 6 P. M.
2	141.0	0.13	S & S S W	1.0	151.0	S to 6 A. M., ~i to 5, \i & _i to 8, B to 11 P. M. L from 6½ to 8 P. M. T & R between 4 & 5 P. M.
3	139.7	...	S S W	...	115.3	\i to 1, B to 6, \i to 8 A. M., B to 1, \~i to 3, \i to 6, B to 11 P. M.
4	141.0	...	S W & Variable	...	123.6	B to 5, \i to 9 A. M., B to 11 P. M.
5	139.0	...	S S W, W by S & S	...	80.8	B to 1, Scuds to 6 A. M., B to 9, \i to 11 P. M.
6	141.5	...	S S W	...	110.0	B.
7	144.0	...	Variable	...	75.7	B.
8	144.0	...	S S W & S W	...	105.5	B.
9	147.0	...	S W & S	0.8	225.8	Scuds to 4 A. M., B to 8, ~i to 11 P. M.
10	144.0	...	S S W & S	...	219.2	~i to 4, \i to 6 A. M., B to 11 P. M.
11	143 8	...	S S W & S	...	193.2	Scuds to 4, \i to 7, ~i to 10 A. M., _i to 3, \i to 11 P. M. Sheet L from 7 to 9 P. M.
12	136.7	0.01	S	2.0	263.4	B to 4, \~i to 8 A. M., ~i to 5, O to 11 P. M. T at 9¼ P. M. L from 8 to 10 P. M. Light R between 9 & 10 P. M.
13	141.0	0.03	S S E & S	2.0	305.7	\i to 2 A. M., ~i to 1, O to 11 P. M. T from 2 to 5 P. M. L from 3¼ to 9 P. M. Light R between 3 & 4 P. M.
14	140.0	...	S by W & N	0.4	157.1	Scuds to 4, \~i to 8, A. M. ~i to 12, B to 11 P. M.
15	144.2	...	S by W & S S W	...	158.1	B to 5 A. M., ~i to 11 P. M. T at 7 P. M. L at 7 & 8 P. M.

\i Cirri, —i Strati, ~i Cumuli, _i Cirro-strati, ~ i Cumulo-strati, \~i Nimbi, \~i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
16	144.0	...	S S W & Variable	...	151.1	O to 4, ⌒i to 9 A. M., B to 11 P. M.
17	145.0	...	S S W & S W	...	133.3	B to 11 A. M., ⌒i to 5, B to 9, Scuds to 11 P. M.
18	143.0	...	S S W	2.1	259.6	Scuds to 7 A. M., B to 5, ⌒i to 7, Scuds to 11 P. M. Sheet L from 7 to 10 P. M.
19	143.0	...	S & S W	0.8	262.8	⌒i to 2, B to 7 A. M., ⌒i to 4, _i to 6, B to 11 P. M.
20	143.0	...	S & S W	1.0	369.3	B to 3, S to 8, B to 11 P. M. Sheet L on N at 7 P. M. D at 6¼ P. M.
21	143.0	...	S, S S W & S W	0.8	153.4	B to 3, \i & _i to 11 P. M.
22	145.0	...	S by W & S S W	0.8	222.9	B to 6, \i to 10 A. M., B to 2, ⌒i to 4, \i to 8, O to 11 P. M. Sheet L on N at 8 P. M.
23	142.5	...	S S W & S W	1.2	320.7	S to 3, _i to 7, Scuds to 10 A. M., B to 11 P. M.
24	143.0	...	S S W & S W	1.2	358.2	B to 4, Scuds to 11 A. M., B to 9, Scuds to 11 P. M.
25	142.0	...	S S W	1.9	311.1	Scuds to 10 A. M., ⌒i to 2, B to 9, S to 11 P. M.
26	145.5	...	S S W	0.6	288.8	S to 1, B to 4, Scuds to 10 A. M., _i to 2, B to 8, Scuds to 11 P. M.
27	147.0	...	S S W	0.4	295.9	Chiefly B.
28	146.0	...	S W & S S W	1.2	214.9	Chiefly B.
29	144.5	...	S S W	1.6	289.3	B.
30	144.5	...	S S W & S W	1.8	255.7	B.

\i Cirri,—i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒ i Cumulo-strati, _i Nimbi, \i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April 1876.

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	29.712
Max. height of the Barometer occurred at 10 A. M. on the 3rd... ...	29.921
Min. height of the Barometer occurred at 5 P. M. on the 18th ...	29.538
Extreme range of the Barometer during the month	0.383
Mean of the daily Max. Pressures	29.782
Ditto ditto Min. ditto	29.642
Mean daily range of the Barometer during the month	0.140

	°
Mean Dry Bulb Thermometer for the month	86.2
Max. Temperature occurred at 2 P. M. on the 9th	99.5
Min. Temperature occurred at 5 & 6 A. M. on the 13th	73.5
Extreme range of the Temperature during the month	26.0
Mean of the daily Max. Temperature	95.0
Ditto ditto Min. ditto, ...	79.6
Mean daily range of the Temperature during the month	15.4

Mean Wet Bulb Thermometer for the month	78.8
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	7.4
Computed Mean Dew-point for the month	73.6
Mean Dry Bulb Thermometer above computed mean Dew-point ...	12.6

	Inches.
Mean Elastic force of Vapour for the month	0.817

	Troy grain.
Mean Weight of Vapour for the month	8.70
Additional Weight of Vapour required for complete saturation ...	4.29
Mean degree of humidity for the month, complete saturation being unity	0.67

	°
Mean Max. Solar radiation Thermometer for the month	143.0

	Inches.
Rained 5 days.—Max. fall of rain during 24 hours	0.13
Total amount of rain during the month	0.20
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	0.14
Prevailing direction of the Wind ... S. S. W., S. & S. W.	

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of April 1876.

MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. by E.	Rain on.	N. N. E.	Rain on.	N. E.	Rain on.	E. N. E.	Rain on.	E. by N.	Rain on.	E.	Rain on.	E. by S.	Rain on.	E. S. E.	Rain on.	S. E.	Rain on.	S. S. E.	Rain on.	S. by E.	Rain on.	S.	Rain on.	S. by W.	Rain on.	S. S. W.	Rain on.	S. W.	Rain on.	W. S. W.	Rain on.	W. by S.	Rain on.	W.	Rain on.	W. by N.	Rain on.	W. N. W.	Rain on.	N. W.	Rain on.	N. N. W.	Rain on.	N. by W.	Rain on.
	No. of days.																																														
Midnight													1				1						12		4		6		16																			
1																	1		1		1				5		8		11		3																	
2		1															1						12		3		6		14																	
3																	1				1				6		4		13		3				1											
4																	1		1				12		4		4		11		5		1										1			
5					1																		12		4		4		11		4		1						1					
6							1												1		1		12		1		5		11						1									
7									1										1				12				6		12										1					
8																			1				12				2		12						1				1					
9		1											1										12		1		1		10		11		1											
10											•		1										12		3		1		10		10		2		1									
11		1			1												1								2		1		10		9		3				1				1			1
Noon.		2		1									1		•				1						3		2		8		8		1				2		1					
1		1			1		1						1		•				1						1		1		9		10		3				1							
2		12			1								1						1				2				1		14		6		1				1							
3		1		2									1						1				1		4		1		10		7		12				1							
4		1																	1		1		3		8		1		9		5										1			
5					1																				5		1		14		7		1		1		•				1			1
6												1													6	1	3		17		12										1			
7													1												2		3		16	1	1										1			
8																					2				8		5		15															
9																							1		12		5		12															
10						1	1										1		1						7		9		11		•													
11								1					1						1				2		3		11		11															

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.669	29.744	29.578	0.166	86.9	97.0	80.4	16.6
2	.607	.663	.526	.137	87.4	94.4	82.0	12.4
3	.650	.705	.596	.109	88.9	96.9	83.7	13.2
4	.648	.696	.563	.133	85.6	89.5	82.3	7.2
5	.628	.707	.564	.143	87.3	94.3	82.0	12.3
6	.594	.673	.511	.162	88.2	96.0	82.9	13.1
7	.604	.664	.549	.115	88.2	96.0	82.4	13.6
8	.636	.690	.565	.125	89.1	96.5	83.0	13.5
9	.670	.727	.602	.125	89.1	96.6	84.2	12.4
10	.663	.716	.587	.129	89.1	96.9	82.5	14.4
11	.644	.726	.563	.163	88.9	98.5	81.9	16.6
12	.613	.704	.525	.179	88.9	97.5	82.6	14.9
13	.660	.713	.588	.125	86.9	96.7	79.5	17.2
14	.680	.758	.585	.173	87.2	97.5	76.5	21.0
15	.629	.698	.527	.171	84.1	94.9	75.5	19.4
16	.614	.676	.591	.125	83.1	94.5	77.0	17.5
17	.681	.752	.593	.159	84.5	94.5	76.5	18.0
18	.724	.800	.652	.148	85.1	94.4	76.7	17.7
19	.690	.763	.612	.151	87.9	94.8	82.5	12.3
20	.678	.742	.621	.121	84.1	88.0	81.0	7.0
21	.723	.786	.661	.125	88.8	98.5	80.4	18.1
22	.733	.795	.661	.134	88.3	96.0	82.5	13.5
23	.683	.749	.602	.147	88.1	95.4	82.5	12.9
24	.659	.726	.611	.115	83.8	92.9	78.0	14.9
25	.675	.739	.612	.127	84.7	92.7	78.0	14.7
26	.688	.731	.645	.086	83.3	91.6	78.0	13.6
27	.683	.726	.612	.114	82.4	90.6	77.0	13.6
28	.649	.698	.568	.130	83.6	91.4	78.5	12.9
29	.598	.647	.520	.127	85.3	94.0	79.8	14.2
30	.587	.641	.509	.132	87.1	95.8	80.0	15.8
31	.593	.642	.517	.125	87.3	96.8	82.3	14.5

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	79.1	7.8	74.4	12.5	0.838	8.91	4.34	0.67
2	80.9	6.5	77.0	10.4	.910	9.69	3.76	.72
3	81.1	7.8	76.4	12.5	.893	.47	4.57	.68
4	79.4	6.2	75.1	10.5	.857	.13	3.63	.72
5	79.8	7.5	75.3	12.0	.862	.17	4.24	.68
6	81.0	7.2	76.7	11.5	.902	.56	.20	.70
7	81.2	7.0	77.0	11.2	.910	.67	.09	.70
8	81.4	7.7	76.8	12.3	.905	.59	.53	.68
9	81.5	7.6	76.9	12.2	.908	.62	.50	.68
10	81.3	7.8	76.6	12.5	.899	.52	.60	.67
11	81.0	7.9	76.3	12.6	.890	.44	.60	.67
12	80.4	8.5	75.3	13.6	.862	.14	.90	.65
13	79.6	7.3	75.2	11.7	.860	.15	.10	.69
14	80.5	6.7	76.5	10.7	.896	.54	3.83	.71
15	78.1	6.0	73.9	10.2	.824	8.83	.38	.72
16	78.6	4.5	75.4	7.7	.865	9.28	2.58	.78
17	79.5	5.0	76.0	8.5	.882	.43	.92	.76
18	80.0	5.1	76.4	8.7	.893	.55	3.02	.76
19	82.3	5.6	78.9	9.0	.967	10.28	.36	.75
20	79.9	4.2	77.0	7.1	.910	9.75	2.46	.80
21	79.5	9.3	73.9	14.9	.824	8.74	5.26	.62
22	82.1	6.2	78.4	9.9	.952	10.10	3.70	.73
23	82.7	5.4	79.5	8.6	.986	.47	.25	.76
24	80.2	3.6	77.7	6.1	.931	9.98	2.12	.83
25	79.7	5.0	76.2	8.5	.887	.49	.93	.76
26	79.2	4.1	76.3	7.0	.890	.55	.38	.80
27	78.1	4.3	75.1	7.3	.857	.21	.40	.78
28	79.5	4.1	76.6	7.0	.899	.63	.40	.80
29	80.7	4.6	77.5	7.8	.925	.88	.76	.78
30	82.0	5.1	78.9	8.2	.967	10.30	3.03	.77
31	82.2	5.1	79.1	8.2	.973	.36	.05	.77

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid-night	29.662	29.757	29.569	0.188	82.5	85.8	76.7	9.1
1	.654	.747	.579	.168	82.2	85.5	77.0	8.5
2	.646	.739	.574	.165	82.0	85.2	77.0	8.2
3	.639	.732	.563	.169	81.7	85.0	77.0	8.0
4	.638	.722	.572	.150	81.4	84.8	77.0	7.8
5	.652	.739	.586	.153	81.2	84.5	77.0	7.5
6	.666	.745	.602	.143	81.3	84.5	76.6	7.9
7	.688	.772	.626	.146	82.6	85.5	77.6	7.9
8	.703	.782	.640	.142	85.0	88.5	79.8	8.7
9	.709	.800	.641	.159	87.7	91.0	82.0	9.0
10	.707	.797	.635	.162	89.9	93.4	83.0	10.4
11	.693	.790	.626	.164	91.6	95.7	84.4	11.3
Noon	.680	.782	.598	.184	92.8	97.2	85.5	11.7
1	.659	.765	.579	.186	93.6	98.0	83.0	15.0
2	.632	.729	.551	.178	94.1	98.5	86.6	11.9
3	.610	.700	.524	.176	94.0	98.5	84.0	14.5
4	.591	.676	.513	.163	92.9	98.5	78.8	19.7
5	.584	.670	.509	.161	91.1	98.2	78.0	20.2
6	.601	.675	.511	.164	88.6	95.5	78.5	17.0
7	.622	.716	.529	.187	85.9	91.3	76.5	14.8
8	.642	.755	.538	.217	84.8	88.4	76.5	11.9
9	.661	.752	.572	.180	83.9	87.0	76.0	11.0
10	.673	.763	.601	.162	83.3	86.0	75.5	10.5
11	.668	.762	.592	.170	82.9	85.8	76.5	9.3

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
Mid-night.	79.0	3.5	76.5	6.0	0.896	9.63	2.01	0.83
1	79.0	3.2	76.8	5.4	.905	.73	1.81	.84
2	79.0	3.0	76.9	5.1	.908	.76	.71	.85
3	78.9	2.8	76.9	4.8	.908	.76	.61	.86
4	78.8	2.6	77.0	4.4	.910	.81	.46	.87
5	78.8	2.4	77.1	4.1	.913	.84	.37	.88
6	79.0	2.3	77.4	3.9	.922	.93	.31	.88
7	79.8	2.8	77.8	4.8	.934	10.03	.65	.86
8	80.7	4.3	77.7	7.3	.931	9.96	2.57	.80
9	81.2	6.5	77.3	10.4	.919	.78	3.78	.72
10	81.8	8.1	76.9	13.0	.908	.60	4.86	.66
11	82.4	9.2	76.9	14.7	.908	.56	5.53	.63
Noon.	82.7	10.1	76.6	16.2	.899	.46	6.26	.60
1	72.7	10.9	76.2	17.4	.887	.33	.75	.58
2	82.7	11.4	75.9	18.2	.879	.23	7.09	.57
3	82.6	11.4	75.8	18.2	.876	.20	.07	.57
4	82.4	10.5	76.1	16.8	.885	.30	6.47	.59
5	81.5	9.6	75.7	15.4	.873	.22	5.75	.62
6	80.2	8.4	75.2	13.4	.860	.13	4.79	.66
7	79.4	6.5	74.8	11.1	.849	.06	3.81	.70
8	79.4	5.4	75.6	9.2	.871	.31	.15	.75
9	79.2	4.7	75.9	8.0	.879	.42	2.71	.78
10	79.3	4.0	76.5	6.8	.896	.61	.32	.81
11	79.1	3.8	76.4	6.5	.893	.58	.21	.81

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	°	Inches		lb	Miles.	
1	141.0	...	S S W & S	1.8	337.8	B.
2	141.0	...	S S W & S S E	3.9	426.2	B to 5, _i to 11 A. M, Scuds to 3, _i to 11 P. M.
3	145.0	...	S & S S W	2.0	399.6	_i to 6, B to 11 A. M., _i to 11 P. M.
4	110.0	0.12	S S W	7.3	396.7	_i to 6 A. M., O to 12, _i to 5, S to 9, O to 11 P. M., T at 11 A. M. Sheet L on N W from 7 to 9 P. M. Slight R at 11, 12 & 1 P. M.
5	142.4	0.08	S & S S E	5.2	382.8	O to 5 A. M., ⌒i to 12, _i to 2, \i to 9, ~i to 11 P. M. T, L & R at 3 & 4 A. M.
6	148.0	...	S & S S E	1.0	219.9	~i to 6 A. M., \i to 11 P. M.
7	143.0	...	S S E & S	1.2	440.0	Scuds to 3, \i to 7, Scuds to 10 A. M, ⌒i to 5, \i to 9, Scuds to 11 P. M.
8	147.0	...	S S E & S S W	1.0	294.1	Clouds of different kinds. Sheet L on N E at 7 & 8 P. M.
9	142.0	...	S, E & S S W	...	257.6	S to 5 A. M., ~i to 4, \i to 9, S to 11 P. M. L on N at 7 P. M.
10	142.5	...	S by E & S	0.7	230.3	S to 4, \i to 10 A. M., ⌒i to 4, \i to 11 P. M. Sheet L on N E from 7 to 9 P. M.
11	149.0	...	S & S S W	0.8	219.6	\i to 7, ~i to 10 A. M., _i to 5, S to 9, \i to 11 P. M.
12	148.0	...	S S W & S	4.2	276.9	B to 1, _i to 11 A. M., B to 1, \i to 3, B to 6, O to 11 P. M. T at 7 P. M. L from 6¾ to 10 P. M.
13	141.5	...	S S E & S S W	3.2	326.0	\i to 7 A. M., ⌒i to 5, S to 11 P. M.
14	147.0	0.38	S & S W	5.0	214.4	B to 6 A. M., ⌒i to 5, O to 11 P. M., T, L & R from 6 to 10¾ P. M.

\i Cirri, —i Strati, ⌒i Cumuli, _i Cirro-strati, ~i Cumulo-strati, _i Nimbi, _i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches.		lb	Miles.	
15	143.0	1.05	S S W & Variable	9.8	266.6	O to 3, S to 5, _i to 10 A. M., ⌒i to 8, O to 11 P. M. T & L from 7 to 10 P. M. R from 9 to 11 P. M.
16	141.0	0.17	Variable	0.5	230.8	O to 6, \i to 11 A. M., ⌒i to 3, O to 11 P. M. T at 1 & 2 A. M. L from Midnight to 3 A. M. & at 7 & 8 P. M. R at 2 A. M. & between 6 & 7 P. M.
17	138.3	0.56	S S W & S	4.1	206.9	S to 5 A. M., \i & ⌒i to 6, O to 11 P. M. T, L & R from 6½ to 9 P. M.
18	143.0	...	S S W & S	...	184.1	O to 2, \i to 10 A. M., ⌒i to 4, \i to 7, B to 11 P. M. Sheet L on N from 8 to 10 P. M.
19	142.2	...	S S E & S S W	...	214.8	B to 7 A. M., ⌒i to 3, B to 7, S to 11 P. M. Sheet L on W at 8 & 9 P. M.
20	124.0	0.05	S E & S	...	244.4	\i to 7, O to 11 A. M., S to 11 P. M. L on E at 4 A. M. Light R at 2½ & 3¾ A. M.
21	146.0	...	S & S W	...	169.4	Chiefly B.
22	141.0	...	S & S S W	...	176.7	\i to 7, ⌒i to 10 A. M., \i to 1, ⌒i to 7, B to 11 P. M.
23	144.5	...	S & S S W	1.4	275.5	Clouds of different kinds. Sheet L on N at 7 P. M.
24	131.5	0.13	S & E by S	0.5	295.0	Scuds to 7 A. M., ⌒i to 12, O to 11 P. M. T from 12 to 4 & at 6½ P. M. L from 3½ to 10 P. M. Slight R at 12, 1, 3 & 4 P. M.
25	138.8	...	E by S & Variable	...	110.1	O to 8 A. M., \i to 6, S to 11 P. M. Sheet L from 8 to 11 P. M.
26	141.0	0.33	S S E & E	1.9	110.2	S to 3, _i to 9 A. M., ⌒i to 4, _i to 9, O to 11 P. M. T at 3 P. M. L on S at 10 & 11 P. M. R at 1¾ & 3 P. M.

\i Cirri,—i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒i Cumulo-strati, _i Nimbi, \i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1876.

Solar Radiation, Weather, &c.,

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	°	Inches.		lb	Miles.	
27	141.0	...	E N E & S E	...	174.0	O to 3, ⌒i to 8 A. M., ⌒i to 11 P. M.
28	142.5	...	S E, E & S	...	133.7	S to 6, O to 9 A. M., ⌒i to 6, ⌒i to 9, B to 11 P. M. T at 9½, 10 A. M. & 1 P. M.
29	147.2	0.06	E S E & S E	...	102.5	B to 7 A. M., ⌒i to 7, B to 11 P. M. T & R between 5 & 6 P. M.
30	148.0	...	S & S E	...	88.1	B to 4 A. M., ⌒i to 5, ⌒i to 8, B to 11 P. M.
31	152.0	...	S & S by W	1.3	102.1	B to 4, ⌒i to 7 A. M., ⌒i to 8, B to 11 P. M. T at 4 P. M.

⌒i Cirri —i Strati, ⌒i Cumuli, ⌒i Cirro-strati, ⌒i Cumulo-strati, ⌒i Nimbi, ⌒i Cirro-Cumuli. B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1876.

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	... 29.653
Max. height of the Barometer occurred at 9 A. M. on the 18th...	... 29.800
Min. height of the Barometer occurred at 5 P. M. on the 30th*	... 29.509
Extreme range of the Barometer during the month ...	... 0.291
Mean of the daily Max. Pressures	... 29.716
Ditto ditto Min. ditto	... 29.580
Mean daily range of the Barometer during the month ...	... 0.136

	o
Mean Dry Bulb Thermometer for the month	... 86.5
Max. Temperature occurred at 2, 3 & 4 P. M. on the 11th & 21st	... 98.5
Min. Temperature occurred at 10 P. M. on the 15th ...	... 75.5
Extreme range of the Temperature during the month ...	... 23.0
Mean of the daily Max. Temperature	... 94.8
Ditto ditto Min. ditto, ...	... 80.4
Mean daily range of the Temperature during the month ...	... 14.4

Mean Wet Bulb Thermometer for the month	... 80.4
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	6.1
Computed Mean Dew-point for the month	... 76.7
Mean Dry Bulb Thermometer above computed mean Dew-point	... 9.8

	Inches.
Mean Elastic force of Vapour for the month	... 0.902

	Troy grain.
Mean Weight of Vapour for the month	... 9.60
Additional Weight of Vapour required for complete saturation	... 3.50
Mean degree of humidity for the month, complete saturation being unity	0.73

	o
Mean Max. Solar radiation Thermometer for the month ...	... 142.0

	Inches.
Rained 10 days,—Max. fall of rain during 24 hours ...	... 1.05
Total amount of rain during the month	... 2.93
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	... 2.14
Prevailing direction of the Wind ... S. & S. S. W.,	

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of May 1876.

MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. by E.	Rain on.	N. N. E.	Rain on.	N. E.	Rain on.	E. N. E.	Rain on.	E. by N.	Rain on.	E.	Rain on.	E. by S.	Rain on.	E. S. E.	Rain on.	S. E.	Rain on.	S. S. E.	Rain on.	S. by E.	Rain on.	S.	Rain on.	S. by W.	Rain on.	S. S. W.	Rain on.	S. W.	Rain on.	W. S. W.	Rain on.	W. by S.	Rain on.	W.	Rain on.	W. by N.	Rain on.	W. N. W.	Rain on.	N. W.	Rain on.	N. N. W.	Rain on.	N. by W.	Rain on.
	No. of days.																																														
Midnight											1				2		2		1		4		1		14		2		4																		
1											1		1		1				2		6		2		9		3		5		1																
2											1		1		1				2		3		2		9		4		6		1	1															
3		1							1				1		1		1		2		2		2		10	1	3	1	5																		
4							1						1		1		1		2		5	1	3		9	1	3		3						1												
5		1							1						1		2		2		5		2		7		1		7																		
6							1		1						2		2		3		4		3		10				5																		
7							1		1						2		2		3		4				9		1		5																		
8							1				1		2		1				2		5				8		3		6		1																
9							1						3				1		2		2		1		7		1		11		1										1						
10		1					1		2										1		1		1		8		2		13		1																
11					1				1				1						1		2				9	1	2		12		1				1												
Noon.													1						2		1	1	1		5		6		9	1	3						1				1						1
1		1											1		2		1	1	1	1	2				7		1		10		3				1		1								
2							1	1											1		3				8		1		12		2				1						1				
3		1	1				1	1					1		1				1		1		1		8		1		13		3														
4															1		2				3				11	1	3		9		2										1				
5															1		1		1		1		1		13		1		10		2														
6													2	1	1		1				3		1		8				14	1															
7		1	1												2					2	6				9		6		2		1														
8													1		1				2		7		1		12		1		3		1						1	1			1	1			
9		1	1										1		3	1			1		5	1	4		8		3		4								1								
10													3	1	1		1		4		6	1	3		7		2		3												1				
11													2		2		1		3		5		3		11	1	2		1		1														

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.632	29.691	29.562	0.129	87.5	97.5	81.5	16.0
2	.648	.715	.576	.139	87.1	95.4	82.1	13.3
3	.637	.696	.554	.142	88.4	97.0	82.0	15.0
4	.614	.677	.517	.160	89.7	98.2	82.5	15.7
5	.594	.693	.492	.201	89.0	97.6	80.0	17.6
6	.604	.664	.544	.120	84.9	92.0	78.5	13.5
7	.588	.643	.533	.110	86.6	91.7	80.6	11.1
8	.583	.630	.492	.138	81.2	90.0	75.5	14.5
9	.565	.601	.522	.079	84.7	92.5	76.0	16.5
10	.575	.616	.535	.081	86.7	92.5	82.0	10.5
11	.588	.656	.533	.123	86.3	93.0	80.2	12.8
12	.597	.696	.531	.165	86.8	93.4	79.0	14.4
13	.633	.679	.573	.106	86.7	93.3	80.5	12.8
14	.595	.650	.524	.126	87.5	93.4	81.2	12.2
15	.553	.612	.498	.114	87.3	92.5	82.5	10.0
16	.544	.584	.477	.107	88.5	94.8	84.0	10.8
17	.571	.626	.518	.108	83.3	93.7	77.1	16.6
18	.581	.637	.500	.137	83.0	89.6	77.9	11.7
19	.520	.586	.427	.159	84.4	94.2	78.3	15.9
20	.469	.534	.401	.133	81.7	88.4	78.0	10.4
21	.471	.554	.418	.136	81.3	88.0	78.8	9.2
22	.455	.493	.403	.090	81.8	86.0	79.0	7.0
23	.501	.576	.439	.137	83.8	88.8	78.5	10.3
24	.560	.650	.513	.137	84.1	93.3	77.8	15.5
25	.603	.654	.540	.114	85.3	93.0	79.4	13.6
26	.609	.650	.553	.097	84.3	89.8	79.5	10.3
27	.627	.675	.572	.103	85.3	91.0	82.0	9.0
28	.553	.613	.469	.144	86.1	93.0	80.8	12.2
29	.466	.512	.389	.123	87.4	94.7	82.8	11.9
30	.440	.482	.375	.107	88.2	96.5	83.5	13.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	82.2	5.3	79.0	8.5	0.970	10.31	3.18	0.76
2	81.9	5.2	78.8	8.3	.964	.27	.06	.77
3	82.4	6.0	78.8	9.6	.964	.23	.61	.74
4	85.1	4.6	82.3	7.4	1.077	11.42	2.95	.80
5	82.1	6.9	78.0	11.0	0.940	9.97	4.11	.71
6	79.4	5.5	75.5	9.4	.868	.29	3.20	.74
7	81.3	5.3	78.1	8.5	.943	10.04	.10	.76
8	78.7	2.5	76.9	4.3	.908	9.78	1.43	.87
9	81.7	3.0	79.6	5.1	.989	10.58	.84	.85
10	82.3	4.4	79.7	7.0	.992	.57	2.61	.80
11	81.3	5.0	77.8	8.5	.934	9.95	3.07	.76
12	82.0	4.8	79.1	7.7	.973	10.36	2.85	.78
13	81.0	5.7	77.6	9.1	.928	9.89	3.29	.75
14	81.9	5.6	78.5	9.0	.955	10.16	.33	.75
15	83.4	3.9	81.1	6.2	1.037	11.04	2.37	.82
16	83.3	5.2	80.2	8.3	.008	10.71	3.17	.77
17	80.8	2.5	79.0	4.3	0.970	.42	1.51	.87
18	80.4	2.6	78.6	4.4	.958	.30	.52	.87
19	81.1	3.3	78.8	5.6	.964	.31	2.00	.84
20	80.1	1.6	79.0	2.7	.970	.44	0.93	.92
21	79.7	1.6	78.6	2.7	.958	.32	.92	.92
22	79.9	1.9	78.6	3.2	.958	.32	1.08	.91
23	80.5	3.3	78.2	5.6	.946	.13	.97	.84
24	80.3	3.8	77.6	6.5	.928	9.93	2.28	.81
25	80.3	5.0	76.8	8.5	.905	.65	.99	.76
26	80.7	3.6	78.2	6.1	.946	10.13	.15	.82
27	81.6	3.7	79.0	6.3	.970	.37	.27	.82
28	82.2	3.9	79.5	6.6	.986	.51	.44	.81
29	83.9	3.5	81.8	5.6	1.060	11.26	.19	.84
30	84.2	4.0	81.8	6.4	.060	.26	.50	.82

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid-night.	29.584	29.679	29.467	0.212	82.2	86.0	76.0	10.0
1	.572	.660	.462	.198	82.0	85.6	76.0	9.6
2	.560	.646	.434	.212	81.9	85.4	76.5	8.9
3	.551	.642	.414	.228	81.7	85.2	77.0	8.2
4	.549	.635	.428	.207	81.6	85.0	77.0	8.0
5	.558	.645	.447	.198	81.5	84.8	77.5	7.3
6	.572	.659	.455	.204	81.7	85.3	78.0	7.3
7	.587	.685	.458	.227	82.7	86.5	78.8	7.7
8	.600	.708	.473	.235	84.7	88.5	79.0	9.5
9	.607	.715	.467	.248	86.7	90.5	79.6	10.9
10	.605	.700	.479	.221	88.1	93.0	79.7	13.3
11	.599	.689	.465	.224	89.5	95.5	80.5	15.0
Noon.	.585	.666	.439	.227	90.9	96.3	80.5	15.8
1	.567	.643	.421	.222	91.1	97.7	79.8	17.9
2	.546	.639	.404	.235	91.3	97.8	78.5	19.3
3	.526	.616	.387	.229	91.1	98.2	77.5	20.7
4	.511	.597	.375	.222	90.1	98.0	78.0	20.0
5	.507	.577	.375	.202	88.7	96.5	78.0	18.5
6	.518	.595	.390	.205	87.5	93.5	78.0	15.5
7	.540	.615	.412	.203	85.7	91.5	77.4	14.1
8	.564	.641	.433	.208	84.8	89.6	76.5	13.1
9	.583	.669	.466	.203	84.0	88.0	76.5	11.5
10	.596	.693	.466	.227	83.2	87.0	76.2	10.8
11	.596	.696	.468	.228	82.5	86.4	75.5	10.9

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
Mid-night.	79.6	2.6	77.8	4.4	0.934	10.05	1.49	0.87
1	79.6	2.4	77.9	4.1	.937	.08	.39	.88
2	79.7	2.2	78.2	3.7	.946	.17	.27	.89
3	79.7	2.0	78.3	3.4	.949	.22	.15	.90
4	79.8	1.8	78.5	3.1	.955	.29	.05	.91
5	79.8	1.7	78.6	2.9	.958	.32	0.99	.91
6	80.0	1.7	78.8	2.9	.964	.38	.99	.91
7	80.6	2.1	79.1	3.6	.973	.45	1.27	.89
8	81.4	3.3	79.1	5.6	.973	.40	2.02	.84
9	82.2	4.5	79.5	7.2	.986	.51	.67	.80
10	82.7	5.4	79.5	8.6	.986	.47	3.25	.76
11	83.3	6.2	79.6	9.9	.989	.48	.81	.73
Noon.	83.8	7.1	79.5	11.4	.986	.43	4.46	.70
1	84.2	6.9	80.1	11.0	1.005	.60	.37	.71
2	84.2	7.1	79.9	11.4	0.998	.54	.52	.70
3	84.2	6.9	80.1	11.0	1.005	.60	.37	.71
4	83.6	6.5	79.7	10.4	0.992	.51	.03	.72
5	83.0	5.7	79.6	9.1	.989	.50	3.46	.75
6	82.4	5.1	79.3	8.2	.979	.42	.07	.77
7	81.4	4.3	78.4	7.3	.952	.17	2.63	.80
8	81.0	3.8	78.3	6.5	.949	.14	.32	.81
9	80.6	3.4	78.2	5.8	.946	.13	.04	.83
10	80.0	3.2	77.8	5.4	.964	.03	1.86	.84
11	79.7	2.8	77.7	4.8	.931	.00	.64	.86

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
1	150.0	...	S	...	116.5	\i to 2, _i to 5, \i to 7 A. M. ⌒i to 7, \i to 9, B to 11 P. M. T at 4 P. M., D at 5 & 7 P. M.
2	152.0	...	S & S E	...	117.5	B to 6 A. M., ⌒i to 3, O to 5, ⌒i to 9, \i to 11 P. M. T at 3 P. M.
3	149.0	...	S S E & S	1.2	120.4	\i to 2, B to 5, \i to 7 A. M., ⌒i to 3, \i to 8, S to 11 P. M. T at 2 P. M. D at 9¾ A. M.
4	148.5	...	S & S S W	...	162.9	\i to 7 A. M., ⌒i to 4, \i to 11 P. M.
5	145.0	0.03	S & S S W	1.4	196.4	\i to 5, _i to 8, O to 11 P. M. T at 9 & 10 P. M. L from 6¾ to 10 P. M. Light R at 8¾, 10¾ & 11¼ P. M.
6	142.0	...	S S W & S	...	175.9	O to 7 A. M., \i to 1, S to 7, O to 9, _i to 11 P. M. Sheet L on W at 10 & 11 P. M.
7	142.0	0·02	S S E & S	0.8	185.0	\i to 3 A. M., O to 9, _i to 11 P. M. L at 8, 10 & 11 P. M. Light R at 9 & 10 A. M. & 9¾ P. M,
8	135.0	1.36	S by W & S S E	8.1	177.7	O to 6, _i to 10 A. M., O to 11 P. M. T at 11 & 12 & from 7 to 9 P. M. L from 7 to 9 P. M. R after intervals.
9	146.0	0.02	S S W & S	1.7	197.7	O to 9 A. M., ⌒i to 2, S to 4, O to 11 P. M. Sheet L on W at 8 P. M. Light R at Midnight & 5½ A. M.
10	141.0	0.03	S & S S W	7.2	302.3	O to 6, _i to 8 A. M., \i to 5, S to 7, O to 11 P. M. T between 8 & 9 P. M. L from 8 to 10 P. M. Light R at 7¾ P. M.
11	141.0	...	E by S, S S W & S	2.8	285.7	S to 4, _i to 10 A. M., ⌒i to 6, B to 8, O to 11 P. M. Sheet L on W at 8 P. M. D at 11¼ P. M.

\i Cirri, —i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒-i Cumulo-strati, _i Nimbi, _i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
12	139.5	0.10	S by W, S & S S E	2.0	297.8	B to 7 A. M., ⌒i to 3, \i to 7, B to 9, O to 11 P. M. T at 11 P. M. L from 8½ to 11 P. M. R between 10 & 11 P. M.
13	140.0	0.02	S & S S W	1.4	304.1	O to 4, \i to 8 A. M., \i to 7, S to 11 P. M. T at Midnight, L at Midnight, 1 A. M. & from 8 to 10 P. M. Light R at Midnight, 1 & 2 P. M.
14	142.5	...	S S W	2.3	341.6	O to 9 A. M., \i to 6, _i to 8, O to 11 P. M. L from 7¼ to 11 P. M. D at 8¾, 9½, 10¼ & 11 P. M.
15	135.0	0.03	S S W & S	7.2	332.3	O to 12, S to 11 P. M. Sheet L from 7¼ to 10 P. M. Light R at Midnight, 2 & 6¾ A. M.
16	112.0	...	S by W & S	0.2	239.5	S to 1, O to 6 A. M., S to 11 P. M.
17	141.0	1.03	S	2.0	221.0	O to 4, \i to 11 A. M., O to 11 P. M. T from 11 A. M. to 4 P. M. L at 1 P. M. R from 12¾ to 7¾ P. M.
18	125.0	0.20	S	...	128.2	S to 4 A. M., \i to 12, O to 8, B to 11 P. M. Sheet L on S at 11 P. M. Slight R from 12¾ to 2½ & at 5 P. M.
19	148.7	2.01	S, E by N & N N W	...	93.8	S to 3, \i to 6, \i to 8 A. M., ⌒i to 3, O to 11 P. M. T between 4 & 5 P. M. Sheet L at Midnight, 1 A. M., 10 & 11 P. M. R at 4 & from 6½ to 10 P. M.
20	136.0	0.27	S W & Variable	...	133.2	\i & _i to 4 A. M., O to 12, ⌒i to 4, O to 11 P. M. Slight R from 6¾ to 11 A. M.
21	126.8	2.43	S S W & S	1.9	149.8	Chiefly O. T from 3 to 9 P. M. L from 6 to 8 P. M. R nearly the whole day.

\i Cirri,—i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒ i Cumulo-strati, ⌒_i Nimbi, \i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1876.

Solar Radiation, Weather, &c.,

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches.		lb	Miles.	
22	...	1.13	S S W & S W	0.5	180.1	O. Sheet L at 8 & 11 P. M. R at 1, 6, 8 & 9 A. M. & 7½ & 11 P. M.
23	135.7	0.16	S W & W	1.3	190.3	O to 11 A. M., S to 6, O to 11 P. M. T & L at Midnight & from 6½ to 11 P. M. Slight R at Midnight, 6 A. M. & from 8½ to 10 P. M.
24	145.0	...	S S W & S W	...	165.6	O to 4, \i to 7, B to 10 A. M., ⌒i to 4, O to 6, S to 11 P. M. L from Midnight to 3 A. M. & 8 to 10 P. M. D at Midnight, 1 & 3 A. M.
25	145.0	...	S E & S by E	...	100.1	S to 4 A. M., \i to 2, O to 7, _i to 9, S to 11 P. M. L between 10 & 11 P. M. D at 3½, 4 & 11 P. M.
26	145.6	0.06	S W & S	...	86.3	_i to 4, \i to 8, O to 10 A. M., ⌒i to 7, ⌒i to 11 P. M. T & L at Midnight & 6 P. M. Light R at 6 P. M.
27	146.0	0.04	S & S S W	...	84.3	S to 1, O to 4, _i to 9 A. M., ⌒i to 6, _i to 11 P. M. Light R at 2 P. M.
28	141.5	...	S & S S E	...	153.7	B to 7 A. M., ⌒i to 11 P. M. T & L at 6½ P. M. D at 6½ & 8½ P. M.
29	146.0	...	S & S by W	...	120.7	B to 5 A. M., ⌒i to 4, S to 7, _i to 11 P. M. T at 4 P. M. L on W at 8 P. M., D at 4 & 6 P. M.
30	141.5	0.38	S by E	...	133.5	S to 4, \i to 7 A. M., ⌒i to 5, \i to 8, S to 11 P. M. R from 4¼ to 5¼ P. M.

\i Cirri —i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒~i Cumulo-strati, _i Nimbi, \i Cirro-Cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1876.

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	29.566
Max. height of the Barometer occurred at 9 A. M. on the 2nd ...	29.715
Min. height of the Barometer occurred at 4 & 5 P. M. on the 30th ...	29.375
Extreme range of the Barometer during the month	0.340
Mean of the daily Max. Pressures	29.625
Ditto ditto Min. ditto	29.499
Mean daily range of the Barometer during the month	0.126

	°
Mean Dry Bulb Thermometer for the month	85.6
Max. Temperature occurred at 3 P. M. on the 4th...	98.2
Min. Temperature occurred at 11 P. M. on the 8th	75.5
Extreme range of the Temperature during the month	22.7
Mean of the daily Max. Temperature	92.8
Ditto ditto Min. ditto, ...	80.1
Mean daily range of the Temperature during the month	12.7

Mean Wet Bulb Thermometer for the month	81.5
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	4.1
Computed Mean Dew-point for the month	78.6
Mean Dry Bulb Thermometer above computed mean Dew-point ...	7.0

	Inches.
Mean Elastic force of Vapour for the month	0.958

	Troy grain.
Mean Weight of Vapour for the month	10.23
Additional Weight of Vapour required for complete saturation ...	2.53
Mean degree of humidity for the month, complete saturation being unity	0.80

	°
Mean Max. Solar radiation Thermometer for the month	141.0

	Inches.
Rained 26 days,—Max. fall of rain during 24 hours	2.43
Total amount of rain during the month	9.32
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	under repair.
Prevailing direction of the Wind ... ... S. & S. W.,	

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of June 1876.

Monthly Results.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. by E.	Rain on.	N. N. E.	Rain on.	N. E.	Rain on.	E. N. E.	Rain on.	E. by N.	Rain on.	E.	Rain on.	E. by S.	Rain on.	E. S. E.	Rain on.	S. E.	Rain on.	S. S. E.	Rain on.	S. by E.	Rain on.	S.	Rain on.	S. by W.	Rain on.	S. S. W.	Rain on.	S. W.	Rain on.	W. S. W.	Rain on.	W. by S.	Rain on.	W.	Rain on.	W. by N.	Rain on.	W. N. W.	Rain on.	N. W.	Rain on.	N. N. W.	Rain on.	N. by W.	Rain on.
	No. of days.																																														
Midnight	1																								12		4	1	10		12		5	3	4	12												
1																																										12	1				
2															1		1		1						12			1	12				6	1	4								12					
3															1		1	1	1		12				12				11				5	1	4	1									1	
4			1												1		1		1		12				12				9				6		3											
5			1												1		1		12		1				12				11				6		3											
6									1						1				1		4		1		12				8				4		1	1										
7							1	1											1		4				12				8	1			12		1											
8																			1		3				12				12				4		1	1										
9													1				1				3		1		12				6	1			12													
10															2		1				3	1	1		12				12				12													
11									1		1		1				1		2		1				3				7	1			12				1									
Noon.									1		1				1				1		2				4				8				13	1				1								
1							1	1			1		12	1					2		1				4		3		3				12	1					1							
2											1		12	1					1		1				8		3		3				5										1			
3									1			12	1					1	1		1				7		3		3				8						1							
4															1	1	1		1		1				8	1	12		12				10													
5																			1		3	1	1		8		12	1	12				8													
6									1	1									1	1	3		1		11		12		12				7		1											
7															1				1		5	1	1		9	1	12		12				7		1											
8													1						1		3		1		12		12		12				12													
9																	1		1		4		1		14		12		3	1			3													
10									1										1		5		1		12		12		3	1			3	1												
11					1																4				8		3		4				3													

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.448	29.515	29.377	0.138	88.7	95.5	83.5	12.0
2	.452	.516	.384	.132	83.8	87.5	80.2	7.3
3	.476	.533	.438	.095	81.6	84.5	78.6	5.9
4	.496	.542	.441	.101	82.3	85.6	79.2	6.4
5	.482	.533	.417	.116	84.3	88.0	81.5	6.5
6	.521	.585	.476	.109	85.1	89.7	82.0	7.7
7	.541	.574	.483	.091	84.7	86.5	83.0	3.5
8	.514	.559	.452	.107	81.0	82.6	78.5	4.1
9	.441	.493	.374	.119	81.6	86.0	79.0	7.0
10	.489	.582	.423	.159	83.3	89.0	80.0	9.0
11	.551	.599	.511	.088	82.5	86.2	80.5	5.7
12	.524	.584	.467	.117	83.4	87.8	80.0	7.8
13	.513	.556	.456	.100	84.3	90.6	80.3	10.3
14	.529	.568	.483	.085	83.2	87.4	80.5	6.9
15	.517	.563	.454	.109	81.7	86.8	79.0	7.8
16	.474	.537	.398	.139	81.3	85.5	79.5	6.0
17	.440	.481	.394	.087	80.0	81.8	79.0	2.8
18	.429	.495	.377	.118	78.2	80.4	77.0	3.4
19	.534	.639	.452	.187	78.9	80.8	77.0	3.8
20	.622	.666	.573	.093	82.8	87.6	78.0	9.6
21	.585	.640	.507	.133	83.4	88.9	79.5	9.4
22	.532	.584	.456	.128	83.5	88.4	79.3	9.1
23	.457	.514	.392	.122	84.3	89.8	81.5	8.3
24	.461	.515	.408	.107	83.6	89.0	80.4	8.6
25	.496	.533	.458	.075	83.9	88.5	80.0	8.5
26	.482	.527	.414	.113	83.3	87.5	79.5	8.0
27	.468	.530	.416	.114	83.0	88.5	81.2	7.3
28	.451	.506	.377	.129	81.1	83.6	78.8	4.8
29	.480	.551	.438	.113	80.3	84.2	76.4	7.8
30	.534	.579	.487	.092	82.6	86.0	80.0	6.0
31	.571	.616	.517	.099	82.3	85.6	79.8	5.8

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Gr.	Gr.	
1	83.9	4.8	81.0	7.7	1.034	10.96	3.00	0.79
2	81.6	2.2	80.1	3.7	.005	.75	1.35	.89
3	80.3	1.3	79.4	2.2	0.983	.58	0.76	.93
4	80.4	1.9	79.1	3.2	.973	.47	1.11	.90
5	81.6	2.7	79.7	4.6	.992	.61	.67	.86
6	82.3	2.8	80.3	4.8	1.011	.80	.77	.86
7	81:4	3.3	79.1	5.6	0.973	.40	2.02	.84
8	79.7	1.3	78.8	2.2	.961	.40	0.74	.93
9	79.8	1.8	78.5	3.1	.955	.29	1.05	.91
10	80.4	2.9	78.4	4.9	.952	.21	.72	.86
11	80.5	2.0	79.1	3.4	.973	.47	.17	.90
12	80.8	2.6	79.0	4.4	.970	.42	.54	.87
13	80.7	3.6	78.2	6.1	.946	.13	2.15	.83
14	80.7	2.5	78.9	4.3	.968	.39	1.50	.87
15	79.9	1.8	78.6	3.1	.958	.32	.05	.91
16	79.6	1.7	78.4	2.9	.952	.25	0.99	.91
17	78.6	1.4	77.6	2.4	.928	.03	.78	.93
18	76.9	1.3	76.0	2.2	.882	9.56	.69	.93
19	77.5	1.4	76.5	2.4	.896	.71	.76	.93
20	79.6	3.2	77.4	5.4	.922	.91	1.84	.84
21	80.2	3.2	78.0	5.4	.940	10.09	.87	.84
22	80.3	3.2	78.1	5.4	.943	.12	.88	.84
23	81.7	2.6	79.9	4.4	.998	.69	.59	.87
24	80.5	3.1	78.3	5.3	.949	.18	.85	.85
25	80.8	3.1	78.6	5.3	.958	.28	.85	.85
26	80.5	2.8	78.5	4.8	.955	.25	.68	.86
27	81.0	2.0	79.6	3.4	.989	.63	.19	.90
28	80.0	1.1	79.2	1.9	.976	.52	0.65	.94
29	78.7	1.6	77.6	2.7	.928	.01	.90	.92
30	79.7	2.9	77.7	4.9	.931	.00	1.68	.86
31	79.6	2.7	77.7	4.6	.931	.00	.58	.86

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid-night	29.523	29.633	29.440	0.193	81.4	86.0	78.2	7.8
1	.510	.620	.433	.187	81.2	85.5	78.0	7.5
2	.497	.612	.417	.195	80.9	85.1	77.2	7.9
3	.485	.604	.388	.216	80.7	84.6	76.8	7.8
4	.476	.600	.395	.205	80.5	84.2	76.4	7.8
5	.484	.613	.408	.205	80.3	84.0	76.4	7.6
6	.497	.629	.419	.210	80.3	83.8	77.0	6.8
7	.512	.618	.431	.217	80.9	84.5	77.0	7.5
8	.525	.654	.439	.215	81.9	86.5	77.4	9.1
9	.533	.664	.449	.215	83.0	89.0	77.5	11.5
10	.531	.666	.454	.212	84.1	91.0	78.0	13.0
11	.524	.661	.449	.212	85.3	92.8	78.5	14.3
Noon	.513	.652	.435	.217	85.6	93.8	78.5	15.3
1	.499	.629	.414	.215	85.4	93.8	78.0	15.8
2	.482	.615	.397	.218	85.2	95.0	80.4	14.6
3	.466	.603	.383	.220	85.1	95.5	79.4	16.1
4	.454	.584	.374	.210	84.9	95.5	79.0	16.5
5	.450	.579	.377	.202	84.4	95.0	78.8	16.2
6	.462	.573	.391	.182	83.7	90.6	77.5	13.1
7	.483	.589	.403	.186	82.7	88.5	77.5	11.0
8	.503	.609	.420	.189	82.2	86.8	77.0	9.8
9	.523	.627	.442	.185	81.9	86.8	77.3	9.5
10	.539	.639	.455	.184	81.7	86.5	78.0	8.5
11	.538	.636	.449	.187	81.5	86.5	78.0	8.5

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Gr.	Gr.	
Mid-night.	79.9	1.5	78.8	2.6	0.964	10.38	0.89	0.92
1	79.7	1.5	78.6	2.6	.958	.32	.89	.92
2	79.6	1.3	78.7	2.2	.961	.39	.73	.93
3	79.4	1.3	78.5	2.2	.955	.31	.73	.93
4	79.3	1.2	78.5	2.0	.955	.31	.67	.94
5	79.3	1.0	78.6	1.7	.958	.34	.57	.95
6	79.3	1.0	78.6	1.7	.958	.34	.57	.95
7	79.6	1.3	78.7	2.2	.961	.37	.73	.93
8	80.1	1.8	78.8	3.1	.964	.38	1.06	.91
9	80.5	2.5	78.7	4.3	.961	.33	.49	.87
10	80.9	3.2	78.7	5.4	.961	.31	.90	.84
11	81.3	4.0	78.5	6.8	.955	.21	2.43	.81
Noon.	81.4	4.2	78.5	7.1	.955	.21	.55	.80
1	81.3	4.1	78.4	7.0	.952	.17	.51	.80
2	81.3	3.9	78.6	6.6	.958	.23	.38	.81
3	81.3	3.8	78.6	6.5	.958	.23	.34	.81
4	81.1	3.8	78.4	6.5	.952	.17	.32	.81
5	80.9	3.5	78.4	6.0	.952	.19	.12	.83
6	80.5	3.2	78.3	5.4	.949	.18	1.89	.84
7	80.1	2.6	78.3	4.4	.949	.20	.52	.87
8	79.9	2.3	78.3	3.9	.949	.20	.34	.88
9	80.0	1.9	78.7	3.2	.961	.35	.09	.91
10	79.9	1.8	78.6	3.1	.958	.32	.05	.91
11	80.0	1.5	78.9	2.6	.967	.41	0.90	.92

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
1	153.0	...	S & S E	...	139.0	S to 4, ⟍i to 11 A. M., ⌒i to 4, ⟍i to 9, ⌒i to 11 P. M.
2	...	5.41	E N E, N E & S W	...	162.2	Chiefly O. T & L from 1½ to 8 P. M. R at 1¾ & from 7 A. M. to 10 P. M.
3	...	1·25	S S W & S	1.0	201.6	O to 7, S to 11 P. M. T at 3 P. M. R from 1 to 9½ A. M. & at 3 P. M.
4	127.5	0.06	S & S by W	...	181.5	S to 3, O to 7 A. M., S to 11 P. M. Light R from 5¾ to 7¾ A. M.
5	141.0	...	S by W & S	...	215.8	S to 5, ⟍i to 8 A. M., ⌒i to 12, S to 2, O to 7, S to 11 P. M.
6	135.0	...	S & S S W	...	207.8	S to 4, ⟍i to 6, ⟍i to 8 A. M., S to 1, O to 9, S to 11 P. M. T at 3¾ & 4 P. M. L on S at 7¾ P. M.
7	130.0	...	S W & S by W	...	132.3	S to 2, O to 6, ⟍i to 9 A. M., O to 2, S to 5, O to 11 P. M. D at 5 A. M. & 1 P. M.
8	...	0.40	S by W, W & S W [& S W	...	89.4	S to 5 A. M., O to 11 P. M. T at 8 A. M. Slight R after intervals from 6 A. M. to 11 P. M.
9	...	0.40	E & Variable	...	89.1	O to 2, ⌒i to 6, S to 11 P. M. Slight R after intervals.
10	135.0	0.10	S by E & S [by E	0.3	155.1	S to 6, O to 8 A. M., ⌒i to 7, B to 11 P. M. Slight R from 7 to 8¼ & at 11¾ A. M.
11	142.2	0.07	S, S by W & S	...	202.4	O to 2, ⌒i to 5, ⟍i to 9, ⌒i to 11 A. M., O to 5, S to 11 P. M. Light R at Midnight, 5¾ A. M., 12, 2, & 3 P. M.
12	140.0	0.76	S by E & S	...	116.1	S to 6, O to 8 A. M., ⌒i to 7, B to 11 P. M. T at 12¼ P. M. R at 7 A. M. & 8¼ P. M.

⟍i Cirri. —i Strati. ⌒i Cumuli. ⌒i Cirro-strati, ⌒i Cumulo-strati, ⟍i Nimbi, ⟍i Cirro-cumuli. B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	°	Inches		lb	Miles.	
13	141.0	...	S by E & S	...	113.3	\~i to 3, Scuds to 6, \~i to 8 A. M., ⌒i to 6, S to 11 P. M. Sheet L on N from 7½ to 9 P. M. D at 3 & 4½ P. M.
14	127.5	...	S S E & S	...	140.2	S to 7 A. M., ⌒i to 12, O to 4, S to 7, _i to 11 P. M. Sheet L on N at 2 A. M. D at 12¾ P. M.
15	130.6	1.14	S S W & S W	...	129.6	_i to 4, O to 10 A. M., ⌒i to 12, S to 11 P. M. Sheet L on S at 11 P. M. R from 6 to 8¼ A. M. & 1 to 4½ P. M.
16	130.0	0.22	S S W & S W	...	71.2	O to 11 A. M., ⌒i to 6, O to 11 P. M. Sheet L on N at Midnight. Slight R after intervals.
17	...	0.20	S S W & S W	...	153.1	S to 3 A. M., O to 7, _i to 9, O to 11 P. M. Slight R after intervals from 4 A. M. to 4½ P. M.
18	...	0.48	S S W & S W	...	161.0	O. Slight R after intervals.
19	...	2.11	S S W & S	6.0	191.7	O to 1, S to 6 A. M., O to 11 P. M. T at 1 P. M. R from 7 A. M. to 9 P. M.
20	140.0	...	S by W & S S W	...	198.0	O to 5 A. M., S to 12, \i & _i to 7, B to 11 P. M. Sheet L on S W at 11 P. M.
21	140.0	1.04	S S W	...	191.0	\i to 6, Scuds to 9 A. M., ⌒i to 5, O to 11 P. M. T at 9 P. M. L at Midnight & 9 P. M. R after intervals from 2 to 8 P. M.
22	139.5	...	S S W & S	...	112.7	O to 2, _i to 5, \i to 9 A. M., ⌒i to 7, B to 11 P. M.
23	140.0	0.49	S by E & S	...	64.3	\i to 6 A. M., ⌒i to 7, B to 11 P. M. T between 2 & 3 P. M. R after intervals from 12 to 6 P. M.
24	140.0	0.11	E & S E	1.6	178.4	B to 3, \i to 6, Scuds to 9 A. M., ⌒i to 5, \i to 8, S to 11 P. M. R at 11¼ A. M. & 12½ P. M.

\i Cirri, —i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒ i Cumulo-strati, \~i Nimbi, \~i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1876.

Solar Radiation, Weather, &c.,

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches.		lb	Miles.	
25	139.5	0.22	E by S & S	0.8	234.0	S to 1. O to 6 A. M., ⌒i to 11 P. M. Slight R at 2½, 6 A. M., 12½ & 1½ P. M.
26	141.0	0.37	S S E, S & S by W	...	145.3	O to 1, \i to 7, O to 10 A. M., ⌒i to 7, \i to 11 P. M. R at Midnight, 5, 8 A. M., 1 & 3 P. M.
27	139.0	0.27	S by W, S & S E	...	116.5	S to 8 A. M., ⌒i to 12, O to 5, S to 11 P. M. T from 1½ to 3 P. M. L at 9 P. M. R from 1 to 4 P. M.
28	...	1.17	S E & S by W	1.7	61.4	S to 6 A. M., O to 11 P. M. Sheet L on W at Midnight. R from 7½ A. M. to 5 & at 8½ P. M.
29	...	1.78	S by E & S S W	2.2	89.2	O. R after intervals from Midnight to 6 P. M.
30	126.5	1.06	S W & S S W	0.5	250.5	O to 8 A. M., S to 4, O to 11 P. M. R from Midnight to 3, at 7, 8 A. M. & 2½ P. M.
31	...	0.28	S W & S by W	1.2	171.3	O. Slight R after intervals.

\i Cirri —i Strati, ⌒i Cumuli, ⌣i Cirro-strati, ⌒ i Cumulo-strati, \⌣i Nimbi, \⌒i Cirro-cumuli. B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1876.

Monthly Results.

	Inches.
Mean height of the Barometer for the month	29.500
Max. height of the Barometer occurred at 10 A. M. on the 20th ...	29.666
Min. height of the Barometer occurred at 4 P. M. on the 9th ...	29.374
Extreme range of the Barometer during the month	0.292
Mean of the daily Max. Pressures	29.555
Ditto ditto Min. ditto	29.442
Mean daily range of the Barometer during the month	0.113

	°
Mean Dry Bulb Thermometer for the month	82.7
Max. Temperature occurred at 3 & 4 P. M. on the 1st	95.5
Min. Temperature occurred at 4 & 5 A. M. on the 29th	76.4
Extreme range of the Temperature during the month	19.1
Mean of the daily Max. Temperature	86.8
Ditto ditto Min. ditto, ...	79.8
Mean daily range of the Temperature during the month	7·0

Mean Wet Bulb Thermometer for the month	80.3
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	2.4
Computed Mean Dew-point for the month	78.6
Mean Dry Bulb Thermometer above computed mean Dew-point ...	4.1

	Inches.
Mean Elastic force of Vapour for the month	0.958

	Grain.
Mean Weight of Vapour for the month	10.30
Additional Weight of Vapour required for complete saturation ...	1.42
Mean degree of humidity for the month, complete saturation being unity	0.88

	°
Mean Max. Solar radiation Thermometer for the month	137.1

	Inches.
Rained 26 days,—Max. fall of rain during 24 hours	5.41
Total amount of rain during the month	19.39
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	under repair.
Prevailing direction of the Wind	S, S S W. & S. W.

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of July 1876.

Monthly Results.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. by E.	Rain on.	N. N. E.	Rain on.	N. E.	Rain on.	E. N. E.	Rain on.	E. by N.	Rain on.	E.	Rain on.	E. by S.	Rain on.	E. S. E.	Rain on.	S. E.	Rain on.	S. S. E.	Rain on.	S. by E.	Rain on.	S.	Rain on.	S. by W.	Rain on.	S. S. W.	Rain on.	S. W.	Rain on.	W. S. W.	Rain on.	W. by S.	Rain on.	W.	Rain on.	W. by N.	Rain on.	W. N. W.	Rain on.	N. W.	Rain on.	N. N. W.	Rain on.	N. by W.	Rain on.
	No. of days.																																														
Midnight															1		1		3		1		12		11	12	3	1	5	1	3						1										
1												1	1	12	12				1		2		3	1	8		5		6	1	12	12	1	1													
2											1	1	12	1		12			1		2		4	1	7		6		6	1	12	1															
3											1	12	1	1		1	1		1				6	1	4		5		7	3	3	1															
4								1			1	1	1										5	1	3		6		8	3	2															
5						1						1	1				1				1	1	5	1	3		7		5	1	4	12														
6						1					1	1	1				1	12	1	1	1		6	1	3		4	1	8	3	3	12														
7						1	1	1				12	1	1			1		1		2	1	3		5	12	4	1	7	3	3	3													
8								1	12	2		1	3				2	12	1	1	1		3		3	12	6	1	6	3	4	12	1												
9						1		1	1	1			1		1		2	12	1		1		3		1		3		9	3	6	12									12	1	1			
10								2	1	1			4				1						1				5	1	11	4				1											
11						1	1	1				1	3				2			1			12				8	1	2	4																
Noon.			1	1		1	1	2	1			1					2		2	1	1			4	1	1	8	3	7	1	1		1											
1						1	1	1				1	1			12	1	1	1	2	1	5	1	4		3	1	7	3	2	1	1													
2						1	1					1	1			12	1	1				6	12		1	4	1	7		4	12	1	1												
3												1				12	3	1	1	1	1	7	1	4	12	3	1	6	4		12	1												
4												1				12		1	1	1	1	7		4	12	6	1	7	2	3	12	1												
5												1				12		1	1			10	2	1		6	1	4	3															
6																	2		1			7	1	6		5	1	8	2															
7																12			1			9		2		5	1	4	12															
8																	1	1	1		1	11	1	7	1	4		5	12	1														
9													1				1					14	12	4	2	4		4	3	1														
10													1				1		1		1	12		1		4		4	2	3	12														
11													1		1				1		1	12				4		6	1																

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.605	29.680	29.549	0.131	83.0	88.5	80.0	8.5
2	.638	.682	.575	.107	82.7	90.3	77.7	12.6
3	.653	.708	.586	.122	82.9	89.8	77.5	12.3
4	.666	.716	.625	.091	80.6	87.0	78.0	9.0
5	.666	.715	.596	.119	83.1	87.3	80.2	7.1
6	.609	.678	.534	.144	83.2	89.0	78.5	10.5
7	.586	.625	.539	.086	81.4	84.4	79.3	5.1
8	.612	.671	.565	.106	82.1	87.5	78.5	9.0
9	.671	.733	.623	.110	84.9	90.7	81.0	9.7
10	.688	.752	.613	.139	84.4	88.8	81.2	7.6
11	.614	.674	.541	.133	84.3	88.7	80.5	8.2
12	.542	.596	.473	.123	83.2	88.8	78.8	10.0
13	.522	.563	.479	.084	81.4	83.5	78.6	4.9
14	.572	.632	.525	.107	80.2	83.2	78.0	5.2
15	.589	.657	.502	.155	81.5	86.5	77.5	9.0
16	.526	.579	.446	.133	81.6	85.0	80.0	5.0
17	.479	.521	.422	.099	81.9	87.0	79.5	7.5
18	.468	.520	.396	.124	82.5	86.5	80.3	6.2
19	.506	.595	.460	.135	82.2	87.2	80.0	7.2
20	.591	.673	.535	.138	82.0	88.0	80.6	7.4
21	.634	.690	.579	.111	82.6	86.5	79.0	7.5
22	.664	.707	.599	.108	82.5	87.1	80.5	6.6
23	.661	.709	.598	.111	83.2	89.5	80.0	8.5
24	.676	.729	.628	.101	82.5	87.4	79.6	7.8
25	.672	.718	.600	.118	83.2	90.7	78.5	12.2
26	.690	.748	.630	.118	83.6	89.8	80.2	9.6
27	.716	.773	.645	.128	84.0	90.5	80.5	10.0
28	.718	.784	.628	.156	85.3	91.5	80.5	11.0
29	.674	.738	.578	.160	85.8	92.0	81.8	10.2
30	.591	.652	.505	.147	85.5	90.6	82.5	8.1
31	.501	.560	.417	.143	84.9	90.5	81.5	9.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Gr.	Gr.	
1	79.5	3.5	77.0	6.0	0.910	9.77	2.05	0.83
2	79.4	3.3	77.1	5.6	.913	.80	1.92	.84
3	80.3	2.6	78.5	4.4	.955	10.27	.52	.87
4	79.1	1.5	78.0	2.6	.940	.13	0.88	.92
5	79.9	3.2	77.7	5.4	.931	.00	1.86	.84
6	80.2	3.0	78.1	5.1	.943	.12	.77	.85
7	79.6	1.8	78.3	3.1	.949	.22	.05	.91
8	80.1	2.0	78.7	3.4	.961	.35	.16	.90
9	81.5	3.4	79.1	5.8	.973	.40	2.09	.83
10	80.9	3.5	78.4	6.0	.952	.19	.12	.83
11	80.9	3.4	78.5	5.8	.955	.23	.05	.83
12	80.8	2.4	79.1	4.1	.973	.45	1.44	.88
13	79.9	1.5	78.8	2.6	.964	.38	0.89	.92
14	78.5	1.7	77.3	2.9	.919	9.92	.96	.91
15	79.1	2.4	77.4	4.1	.922	.93	1.38	.88
16	80.3	1.3	79.4	2.2	.983	10.58	0.76	.93
17	80.6	1.3	79.7	2.2	.992	.68	.76	.93
18	80.9	1.6	79.8	2.7	.995	.69	.95	.92
19	80.4	1.8	79.1	3.1	.973	.47	1.07	.91
20	80.3	1.7	79.1	2.9	.973	.47	.00	.91
21	80.1	2.5	78.3	4.3	.949	.20	.48	.87
22	80.7	1.8	79.4	3.1	.983	.56	.08	.91
23	81.0	2.2	79.5	3.7	.986	.57	.32	.89
24	80.2	2.3	78.6	3.9	.958	.30	.34	.89
25	80.3	2.9	78.3	4.9	.949	.18	.71	.86
26	80.5	3.1	78.3	5.3	.949	.18	.85	.85
27	80.6	3.4	78.2	5.8	.946	.13	2.04	.83
28	81.2	4.1	78.3	7.0	.949	.14	.50	.80
29	81.3	4.5	78.1	7.7	.943	.06	.77	.78
30	81.3	4.2	78.4	7.1	.952	.17	.55	.80
31	80.9	4.0	78.1	6.8	.943	.08	.41	.81

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid-night.	29.637	29.735	29.503	0.232	81.3	83.7	78.5	5.2
1	.626	.727	.494	.233	81.1	83.3	78.5	4.8
2	.612	.719	.472	.247	80.9	83.0	78.3	4.7
3	.601	.720	.461	.259	80.7	82.6	78.3	4.3
4	.596	.730	.451	.279	80.4	82.5	78.0	4.5
5	.606	.740	.460	.280	80.2	82.5	77.5	5.0
6	.620	.750	.474	.276	80.2	82.5	77.7	4.8
7	.632	.758	.490	.268	80.6	83.0	78.2	4.8
8	.646	.779	.495	.284	81.7	84.2	78.0	6.2
9	.656	.784	.497	.287	83.0	86.0	78.0	8.0
10	.655	.781	.506	.275	84.1	87.7	79.2	8.5
11	.647	.768	.494	.274	85.3	89.3	80.0	9.3
Noon.	.632	.742	.496	.246	85.9	90.0	81.0	9.0
1	.609	.719	.461	.258	86.4	90.5	80.4	10.1
2	.588	.691	.440	.251	87.0	91.5	80.5	11.0
3	.568	.654	.405	.249	86.6	92.0	79.3	12.7
4	.556	.650	.400	.250	85.7	91.5	78.5	13.0
5	.553	.645	.396	.249	84.9	89.2	78.5	10.7
6	.563	.663	.407	.256	84.2	88.0	80.2	7.8
7	.582	.687	.429	.258	83.2	86.0	78.8	7.2
8	.607	.709	.461	.248	82.5	85.5	78.8	6.7
9	.627	.735	.481	.254	82.2	85.0	79.4	5.6
10	.645	.748	.493	.255	81.7	84.3	77.5	6.8
11	.639	.752	.484	.268	81.4	84.0	78.0	6.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Gr.	Gr.	
Mid-night.	79.8	1.5	78.7	2.6	0.961	10.35	0.89	0.92
1	79.7	1.4	78.7	2.4	.961	.37	.80	.93
2	79.5	1.4	78.5	2.4	.955	.31	.79	.93
3	79.3	1.4	78.3	2.4	.949	.24	.80	.93
4	79.2	1.2	78.4	2.0	.952	.27	.67	.94
5	79.1	1.1	78.3	1.9	.949	.24	.64	.94
6	79.1	1.1	78.3	1.9	.949	.24	.64	.94
7	79.4	1.2	78.6	2.0	.958	.34	.47	.94
8	79.7	2.0	78.3	3.4	.949	.22	1.15	.90
9	80.3	2.7	78.4	4.6	.952	.21	.61	.86
10	80.6	3.5	78.1	6.0	.943	.10	2.11	.83
11	81.3	4.0	78.5	6.8	.955	.21	.43	.81
Noon.	81.3	4.6	78.1	7.8	.943	.06	.81	.78
1	81.6	4.8	78.2	8.2	.946	.09	.97	.77
2	81.8	5.2	78.7	8.3	.961	.24	3.05	.77
3	81.7	4.9	78.8	7.8	.964	.27	2.87	.78
4	81.1	4.6	77.9	7.8	.937	.00	.80	.78
5	81.1	3.0	78.4	6.5	.952	.17	.32	.81
6	80.9	3.3	78.6	5.6	.958	.26	1.98	.84
7	80.6	2.6	78.8	4.4	.964	.36	.53	.87
8	80.2	2.3	78.6	3.9	.958	.30	.34	.89
9	80.3	1.9	79.0	3.2	.970	.41	.10	.91
10	80.0	1.7	78.8	2.9	.964	.38	0.99	.91
11	79.9	1.5	78.8	2.6	.964	.38	.89	.92

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
1	140.0	0.06	S S W & S W	...	99.6	O to 11 A. M., S to 11 P. M. Light R at Midnight, 1, 2, 6 A. M., 4½ & 10 P. M.
2	148.0	0.40	S W & S S W	3.9	104.4	O to 9, _i to 11 A. M., \i to 1, ⌒i to 4, O to 11 P. M. T & L from 5½ to 11 P. M. R from 3 to 8 A. M., 6½ to 7½ & at 11 P. M.
3	140.0	2.15	S S W & S by W	1.4	93.3	O to 8, \i to 11 A. M., ⌒i to 5, S to 7, O to 11 P. M. T & L from 7½ to 11 P. M. R from Midnight to 5 A. M. & 9½ to 11 P. M.
4	135.0	2.21	S by W & S S W	1.8	121.2	O to 10 A. M., S to 1, ⌒i to 3, O to 11 P. M. T at Midnight, 1 A. M. & from 3½ to 5 P. M. L at Midnight, 1 A. M. & from 8 to 11 P. M. R from Midnight to 5 at 8 A. M. & from 3½ to 7 P. M.
5	140.0	...	S S W & W S W	...	72.6	O to 4, _i to 9 A. M., ⌒i to 6, O to 11 P. M. T at 7½ P. M. L at Midnight, 7½ & 8 P. M. D at 1 A. M. & 9 P. M.
6	139.8	0.09	S W & W S W	...	68.8	O to 8 A. M., _i to 12, ⌒i to 9, O to 11 P. M. T at 11¾ P. M. L at 7, 9 & 11¾ P. M. R at 3, 4½, 6½ A. M. & from 9½ to 11 P. M.
7	110.0	1.92	W S W & S S W	1.2	65.5	O to 1, _i to 7 A. M., O to 4, S to 6, \i to 8, S to 11 P. M. T & L at Midnight, R at Midnight & 1 & from 9 A. M. to 3 P. M.
8	136.3	...	S & S by W	...	57.7	O to 2, ⌒i & _i to 11 P. M. D at 1 & 9 A. M.
9	141.5	...	S & S by W	...	31.7	_i to 2, \i to 6 A. M., ⌒i to 5, _i to 11 P. M.
10	136.0	0.01	S & S E	...	56.6	_i to 7 A. M., ⌒i to 7, S to 11 P. M. T at 1½ P. M. Light R at 8 P. M.

_i Cirri, —i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒ i Cumulo-strati, _i Nimbi, \i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
11	142.0	0.32	S E & S by E	...	97.3	⌒i to 2, _i to 5 A. M., ⌒i to 7, S to 11 P. M. R from 7¾ to 9¼ P. M.
12	135.6	1.59	S S W	0.8	79.7	\i to 1, \i to 7 A. M., ⌒i to 5, O to 11 P. M. T at 5 P. M. R at 12½ & from 4 to 10 P. M.
13	...	0.75	S S W & S W	0.2	130.3	O to 3, \i to 5 A. M., O to 11 P. M. R after intervals.
14	111.5	0.34	S W & W by S	...	170.3	O to 11 A. M., S to 5, O to 11 P. M. T & L from Midnight to 2 A. M. R from 2½ to 10 A. M. & 7 to 8 P. M.
15	136.0	2.16	S W & W by N	...	139.4	O to 11 A. M., ⌒i to 7, O to 11 P. M. R from 1½ to 5, at 10½ A. M. & from 8 to 10¾ P. M.
16	...	4.75	W S W	...	71.5	Chiefly O. R from 5¾ to 8, 11 A. M. to 1 & 7½ to 11 P. M.
17	130.8	1.88	S & variable	...	67.6	O to 10 A. M., S to 2, O to 5. \i to 8, S to 11 P. M. T at Midnight & 1 A. M. L from Midnight to 2 at 5 A. M. & from 6½ to 11 P. M. R after intervals from Midnight to 4 P. M.
18	...	0.78	E & E S E	1.0	119.1	O to 2, S to 7, \i to 11 P. M. T at 11¼ A. M. & 12 P. M. R from 5½ A. M. to 12 & at 10 P. M.
19	135.8	0.34	S E & S by E	...	149.6	O to 8, ⌒i to 10 A. M., S to 4, \i to 7, S to 11 P. M. T at 2½ & 3¼ P. M. Slight R after intervals.
20	136.4	0.12	S, & S S E	0.2	93.2	\i & _i to 3. O to 7 A. M., \i & ⌒i to 12, O to 3, S to 6, \i to 9, O to 11 P. M. T at 12½ P. M. L on N at 10 P. M. R from 1 to 3 P. M.
21	136.3	0.21	S E, S & S by E	...	88.6	O to 8, ⌒i to 10 A. M., O to 2, ⌒i to 7, B to 11 P. M. R at 6, 11¼ A. M. & 2 P. M.

\i Cirri, —i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒ i Cumulo-strati, _ i Nimbi, \i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1876.

Solar Radiation, Weather, &c.,

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches.		lb	Miles.	
22	140.9	1.60	S S E & S	0.3	80.0	B to 5, ⌒i to 8, O to 10 A. M., ⌒i to 1, O to 4, ⌒i to 11 P. M. T after intervals from 9¾ A. M. to 7 P. M. L at 7 P. M. R after intervals from 8 A. M. to 8½ P. M.
23	138.8	0.94	S S E & S E	...	39.0	_i to 2 A. M., ⌒i to 1, O to 7, _i to 11 P. M. T & L at 3½ P. M. R from 2½ to 6½ P. M.
24	143.0	0.32	S E & S by E	...	89.8	O to 9 A. M., ⌒i to 5, S to 11 P. M. T at 12½ P. M. Slight R after intervals from 5 to 9 A. M. at 12½ & 6¾ P. M.
25	140.0	1.42	S by E, SE & E by N	0.7	68.9	B to 2, \i to 4, _i to 7 A. M., ⌒i to 2, O to 5, S to 11 P. M. T, L & R from 2¾ to 5½ P. M.
26	145.0	0.18	S E & S by E	4.0	90.3	\i to 8 A. M., ⌒i to 2, O to 7, \i to 11 P. M. T from 2½ to 4½ P. M. R at 1½ & 3¾ P. M.
27	142.5	0.26	S by E, E, & S	1.8	73.3	\i to 3, B to 7 A. M., ⌒i to 8, _i to 11 P. M. T at 5 & 6 P. M. R at 12½ & 4 P. M.
28	141.0	...	S & S W	...	62.9	B to 7 A. M., ⌒i to 7, _i & \i to 11 P. M. T at 5 P. M. Sheet L on E from 7½ to 11 P. M. D at 1¼ P. M.
29	142.0	...	SW, ESE & S by W	...	40.2	⌒i to 2, \i & _i to 7 A. M., ⌒i to 11 P. M.
30	143.0	...	S by W	0.5	69.1	\i to 7 A. M., ⌒i & \i to 8, _i to 11 P. M. T at 6¾ P. M. L at 4 A. M., 6¾ & 11 P. M.
31	142.0	0.02	S by W, N E & S E	...	62.5	⌒i to 6, _i to 10 A. M., ⌒i to 3, O to 7, S to 11 P. M. T at 3 & 11 P. M. L from Midnight to 4 A. M. & 6¾ to 11 P. M. R at 3, 7 & 11 P. M.

\i Cirri —i Strati, ⌒i Cumuli, _i Cirro-strati, ~i Cumulo-strati, _i Nimbi, _i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1876.

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	29.613
Max. height of the Barometer occurred at 9 A. M. on the 28th ...	29.784
Min. height of the Barometer occurred at 5 P. M. on the 18th ...	29.396
Extreme range of the Barometer during the month	0.388
Mean of the daily Max. Pressures	29.670
Ditto ditto Min. ditto	29.548
Mean daily range of the Barometer during the month	0.122

	°
Mean Dry Bulb Thermometer for the month	83.0
Max. Temperature occurred at 3 P. M. on the 29th	92.0
Min. Temperature occurred at 5 A. M. & 10 P. M. on the 3rd & 15th ...	77.5
Extreme range of the Temperature during the month	14.5
Mean of the daily Max. Temperature	88.2
Ditto ditto Min. ditto, ...	79.7
Mean daily range of the Temperature during the month	8.5

Mean Wet Bulb Thermometer for the month	80.3
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	2.7
Computed Mean Dew-point for the month	78.4
Mean Dry Bulb Thermometer above computed mean Dew-point ...	4.6

	Inches.
Mean Elastic force of Vapour for the month	0.952

	Grain.
Mean Weight of Vapour for the month	10.21
Additional Weight of Vapour required for complete saturation ...	1.61
Mean degree of humidity for the month, complete saturation being unity	0.86

	°
Mean Max. Solar radiation Thermometer for the month	137.5

	Inches.
Rained 28 days,—Max. fall of rain during 24 hours	4.75
Total amount of rain during the month	24.85
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	22.52
Prevailing direction of the Wind	S—S E & S S W

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of Aug. 1876.

Monthly Results.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. by E.	Rain on.	N. N. E.	Rain on.	N. E.	Rain on.	E. N. E.	Rain on.	E. by N.	Rain on.	E.	Rain on.	E. by S.	Rain on.	E. S. E.	Rain on.	S. E.	Rain on.	S. S. E.	Rain on.	S. by E.	Rain on.	S.	Rain on.	S. by W.	Rain on.	S. S. W.	Rain on.	S. W.	Rain on.	W. S. W.	Rain on.	W. by S.	Rain on.	W.	Rain on.	W. by N.	Rain on.	W. N. W.	Rain on.	N. W.	Rain on.	N. N. W.	Rain on.	N. by W.	Rain on.
	No. of days.																																														
Midnight														1	1	1			4		12		3		4		5	1	4	12	4	1	12	1	1												
1																1		1	3				3	1	6		3	1	4	3	4		3	1	12						1	1				
2				1	1											1			4				3		5		4		3	3	3		3	1	12			1	1						
3				1										1					4		1		3		5		3	12	4	4	3		3	1	12										
4							1		1										6		12		3		5		2	1	4	4	4		12	12	12	1	1								
5						1								1					6		1		12		5		12	1	4	4	4		12	12	12						1	1			
6		1												1	1				5				3	1	5		12	1	5	1	5		12	12	12	1	1				1		1		
7		1												1					3				12	1	3		4		4		1		12	12	12	1	1				1		1		
8														12	1	1		4	5	1			12	1	3		2	12	3		1		12	12	12										
9								12	12					12		1		4	3	1			12	1	3		2	12	3				12	12	12	1	1								
10														1		1		12	5				1		4	12	3		1				12	12	12	1	1								
11										2				12		1		12	4				3	1	4	1	3		1				12	12	12										
Noon.												1		12		12		1	5			5	1	1	1	12		4		3		12			12	1		1							
1										1		1		12		12		12	3			12	1	4	1	3	1		4		12		1												
2											1			12		12		12	3			12	1	3	1				3		12														
3										1	1			12		12		1	3			12	1	4	1				4		12														
4														12		12		12	3			12	1	4	1	3			4		12														
5								1	1	1				1				1	3			12	1	5	1	3			6		12		1												
6		1																1	4		1		1	4	1	4			5		12														
7																		1	5			12	1	5	1	4			4		12														
8		1	1											1	1				5			1	1	4		5			4		12														
9				1	1									1					4			1		3		3			5		12														
10														1					4	1				3		4			5		12														
11														1		1	1	1	3					3		4		1	5		12														

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.456	29.550	29.389	0.161	80.2	82.5	78.0	4.5
2	.587	.682	.508	.174	78.8	80.5	77.0	3.5
3	.675	.722	.631	.091	80.5	87.0	77.5	9.5
4	.675	.724	.618	.106	82.7	86.0	80.0	6.0
5	.690	.748	.622	.126	83.2	86.7	80.5	6.2
6	.719	.767	.657	.110	85.0	90.5	81.2	9.3
7	.720	.780	.663	.117	84.1	88.8	82.3	6.5
8	.676	.729	.617	.112	82.5	89.0	81.0	8.0
9	.656	.712	.586	.126	83.0	88.0	80.6	7.4
10	.652	.713	.578	.135	84.2	90.0	80.0	10.0
11	.644	.697	.561	.136	84.0	90.0	81.0	9.0
12	.611	.666	.533	.133	82.9	87.0	80.5	6.5
13	.609	.662	.540	.122	83.1	88.3	80.2	8.1
14	.653	.706	.587	.119	85.0	92.0	79.5	12.5
15	.685	.721	.634	.087	84.0	90.5	80.5	10.0
16	.715	.768	.671	.097	82.3	85.5	79.5	6.0
17	.723	.783	.645	.138	84.1	89.2	80.0	9.2
18	.726	.782	.671	.111	83.7	89.4	80.5	8.9
19	.764	.827	.707	.120	83.4	89.4	80.5	8.9
20	.773	.819	.700	.119	82.5	88.6	80.5	8.1
21	.704	.768	.626	.142	84.0	90.2	80.0	10.2
22	.663	.710	.613	.097	83.4	88.4	80.8	7.6
23	.702	.761	.652	.109	82.5	86.5	80.0	6.5
24	.753	.822	.701	.121	82.5	88.0	78.0	10.0
25	.775	.829	.712	.117	82.9	89.0	78.5	10.5
26	.777	.827	.709	.118	83.1	88.4	79.2	9.2
27	.814	.873	.773	.100	82.1	88.4	79.0	9.4
28	.859	.916	.796	.120	82.2	88.8	78.9	9.9
29	.881	.949	.792	.157	83.1	88.0	78.5	9.5
30	.826	.898	.744	.154	83.2	88.7	78.8	9.9

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Gr.	Gr.	
1	78.6	1.6	77.5	2.7	0.925	9.98	0.90	0.92
2	77.9	0.9	77.3	1.5	.919	.94	.50	.95
3	79.0	1.5	77.9	2.6	.937	10.10	.88	.92
4	80.6	2.1	79.1	3.6	.973	.45	1.27	.89
5	80.6	2.6	78.8	4.4	.964	.36	.53	.87
6	81.3	3.7	78.7	6.3	.961	.29	2.24	.82
7	81.4	2.7	79.5	4.6	.986	.55	1.66	.86
8	80.7	1.8	79.4	3.1	.983	.56	.08	.91
9	80.8	2.2	79.3	3.7	.979	.51	.31	.89
10	80.9	3.3	78.6	5.6	.958	.26	.98	.84
11	80.8	3.2	78.6	5.4	.958	.28	.89	.85
12	80.3	2.6	78.5	4.4	.955	.27	.52	.87
13	80.4	2.7	78.5	4.6	.955	.25	.61	.86
14	80.3	4.7	77.0	8.0	.910	9.73	2.80	.78
15	80.5	3.5	78.0	6.0	.940	10.07	.10	.83
16	79.9	2.4	78.2	4.1	.946	.17	1.41	.88
17	81.0	3.1	78.8	5.3	.964	.34	.87	.85
18	80.9	2.8	78.9	4.8	.967	.37	.70	.86
19	80.7	2.7	78.8	4.6	.964	.34	.62	.87
20	80.3	2.2	78.8	3.7	.964	.36	.28	.89
21	80.9	3.1	78.7	5.3	.961	.31	.86	.85
22	80.7	2.7	78.8	4.6	.964	.34	.62	.87
23	80.3	2.2	78.8	3.7	.964	.36	.28	.89
24	79.9	2.6	78.1	4.4	.943	.14	.50	.87
25	79.5	3.4	77.1	5.8	.913	9.80	.99	.83
26	80.0	3.1	77.8	5.3	.934	10.03	.83	.85
27	79.3	2.8	77.3	4.8	.919	9.88	.63	.86
28	79.2	3.0	77.1	5.1	.913	.82	.72	.85
29	79.4	3.7	76.8	6.3	.905	.71	2.15	.82
30	78.6	4.6	75.4	7.8	.863	.28	.61	.78

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid-night.	29.718	29.895	29.491	0.404	81.1	83.0	78.0	5.0
1	.707	.885	.465	.420	80.9	82.8	78.1	4.7
2	.695	.880	.458	.422	80.6	82.8	77.7	5.1
3	.686	.879	.450	.429	80.4	82.6	77.5	5.1
4	.680	.878	.442	.436	80.2	82.5	77.5	5.0
5	.693	.888	.446	.442	80.1	82.5	77.5	5.0
6	.707	.905	.453	.452	80.0	82.3	77.0	5.3
7	.726	.921	.453	.468	80.6	82.8	77.8	5.0
8	.745	.940	.454	.486	82.3	84.7	78.4	6.3
9	.754	.949	.462	.487	84.0	86.2	79.5	6.7
10	.754	.949	.488	.461	85.7	88.0	80.5	7.5
11	.743	.933	.464	.469	86.4	89.4	79.2	10.2
Noon.	.725	.911	.457	.454	86.7	90.7	80.5	10.2
1	.698	.873	.444	.429	86.8	91.5	79.8	11.7
2	.673	.843	.423	.420	86.4	92.0	77.5	14.5
3	.654	.820	.400	.420	85.7	91.6	78.2	13.4
4	.646	.802	.393	.409	85.4	92.0	79.0	13.0
5	.651	.809	.389	.420	84.2	87.8	79.5	8.3
6	.664	.826	.399	.427	83.4	86.5	79.5	7.0
7	.687	.865	.440	.425	82.8	85.4	79.5	5.9
8	.712	.881	.484	.397	82.3	84.7	78.5	6.2
9	.733	.898	.509	.389	81.9	84.0	78.5	5.5
10	.742	.909	.532	.377	81.6	83.5	78.5	5.0
11	.738	.900	.550	.350	81.3	83.5	78.0	5.5

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Gr.	Gr.	
Mid-night.	79.6	1.5	78.5	2.6	0.955	10.29	0 88	0.92
1	79.5	1.4	78.5	2.4	.955	.31	.79	.93
2	79.3	1.3	78.4	2.2	.952	.27	.74	.93
3	79.2	1.2	78.4	2.0	.952	.27	.67	.94
4	79.1	1.1	78.3	1.9	.949	.24	.64	.94
5	79.0	1.1	78.2	1.9	.946	.21	.63	.94
6	79.0	1·0	78.3	1.7	.949	.24	.57	.95
7	79.6	1.0	78.9	1.7	.967	.43	.58	.95
8	80.3	2.0	78.9	3.4	.967	.41	1.17	.90
9	80 9	3.1	78.7	5·3	.961	.31	.86	.85
10	81.3	4.4	78.2	7 5	.946	.09	2.71	.79
11	81.3	5.1	77.7	8.7	.931	•9.92	3.14	.76
Noon.	81.2	5.5	77.9	8.8	.937	.98	.20	.76
1	81.3	5.5	78.0	8.8	.940	10.01	.20	.76
2	81.1	5.3	77.4	9.0	.922	9.83	.23	.75
3	80.7	5.0	77.2	8.5	.916	.77	.03	.76
4	80.6	4.8	77.2	8.2	.916	.79	2.89	.77
5	80.5	3.7	77.9	6.3	.937	10.04	.20	.82
6	80.3	3.1	78.1	5.3	.943	.12	1.84	.85
7	80.4	2.4	78.7	4.1	.961	.33	.42	.88
8	80.1	2.2	78.6	3.7	.958	.30	.28	.89
9	79.9	2 0	78.5	3.4	.955	.29	.15	.90
10	79.7	1.9	78.4	3 2	.952	.25	.09	.90
11	79.6	1.7	78.4	2.9	.952	.25	0.99	.90

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
1	...	1.83	E & S E	1.7	157.0	O to 3, ⌒i to 6, O to 11 P. M. T at Midnight. L at Midnight & 1 A. M. R nearly the whole day.
2	...	1.18	S E & S S E	0.2	217.8	O. T at 4¾ A. M. R after intervals.
3	138.2	1.16	S by E & S	1.3	124.0	O to 9 A. M., ⌒i to 12, O to 11 P. M. T & L at 2 & 3 A. M. R from Midnight to 7 A. M., 12½ to 3 & 5 to 7½ P. M.
4	125.0	...	S by E & S S W [& S S E	...	95.0	⌒i & ⌒i to 7, O to 9 A. M., S to 9, ⌒i to 11 P. M.
5	139.2	...	S by E, S S W	...	59.8	⌒i to 8 A. M., ⌒i to 1, S to 9, ⌒i to 11 P. M. T at 3¾ & 4 P. M.
6	142.0	...	S S E & S	...	44.1	⌒i to 8 A. M., ⌒i to 6, O to 8, ⌒i to 11 P. M. T & L at 6 & 7 P. M. D at 7 P. M.
7	139.0	0.64	S S E & S by W	...	23.6	S to 4, ⌒i to 7 A. M., ⌒i to 4, O to 7, ⌒i to 11 P. M. T at 3¾, 6 & 7 P. M. L from 6½ to 8 P. M. Rain from 10½ A. M. to 12 & 2½ to 7 P. M.
8	136.2	2.01	S by W & S	...	30.4	⌒i to 8, ⌒i to 11 A. M., O to 1, ⌒i to 3, O to 5, ⌒i to 11 P. M. T from 11¼ A. M. to 1 & at 3¼ P. M.
9	136.5	0.94	S W & Variable [by W	...	34.0	⌒i to 1, ⌒i to 6, ⌒i & ⌒i to 11 A. M., ⌒i to 3, O to 6, ⌒i to 11 P. M. T at 3¼ & 4¼ P. M. R at 4 P. M.
10	142.0	...	S W, E by S & S	...	32.0	⌒i to 7 A. M., ⌒i to 4, S to 11 P. M. T at 3¾ P. M. Sheet L from 7 to 9 P. M.
11	146.0	...	E & S	1.2	59.8	⌒i & ⌒i to 6, ⌒i to 9 A. M., ⌒i to 2, S to 6, ⌒i to 11 P. M. L at 7, 8 & 11 P. M. D at 3 & 4 P. M.

⌒i Cirri, —i Strati, ⌒i Cumuli, ⌒i Cirro-strati, ⌒i Cumulo-strati, ⌒i Nimbi, ⌒i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches.		lb	Miles.	
12	136.0	0.04	E & S E	0.8	136.6	B to 5, Scuds to 9 A. M., ⌒i to 6, B to 11 P. M., T at 11½ A. M., 12 & 3 P. M. Sheet L on W at 8 & 9 P. M. Light R at 10½ A. M. & 3 P. M.
13	148.0	0.21	E S E, E & S E	0.4	108.1	B to 3, S to 10 A. M., \i to 12, ⌒i to 7, B to 11 P. M. T at 3¾, 4½ & 5½ P. M. Sheet L on N W from 7 to 10 P. M. R from 4 to 5¾ P. M.
14	141.0	...	E & S E	1.2	102.7	\i & _i to 9 A. M., _i to 12, ⌒i to 7, B to 11 P. M. Sheet L on N W at 11 P. M.
15	...	0.16	E by S & S E	2.0	108.4	B to 4, \⌒i to 8, _i to 10 A. M., ⌒i to 4, \⌒i to 6, \i to 8, B to 11 P. M. T at 2 P. M. R at 2½ P. M.
16	...	0.86	E S E & S E	1.0	145.8	B to 1, S to 8, ⌒i to 11 A. M., O to 3, S to 7, B to 11 P. M. T at 3¼ P. M. R at 3½, 4½ A. M., 12 & 3 P. M.
17	Out of order.	0.10	E by S & S	...	105.1	B to 4, \i to 8 A. M., ⌒i to 7, B to 11 P. M. T at 1½ P. M. Slight R after intervals from 9½ A. M. to 4½ P. M.
18		0.07	SbyE,SE&SSE	...	102.0	B to 1, \i to 7 A. M., ⌒i to 4, _i to 7, B to 11 P. M. T at 2 P. M. Sheet L at Midnight & 1 A. M. Slight R after intervals from 12¾ to 4½ P. M.
19		0.31	S & S S E	0.4	58.0	B to 6 A. M., ⌒i to 11 P. M. T from 12½ to 3 P. M. L at 9 & 10 P. M. R from 1¾ to 3¾ & at 7½ P. M.
20		0.05	S & S by W	1.6	87.0	S to 5 A. M., \i & ⌒i to 12, O to 6, Scuds to 9, B to 11 P. M. T from 11¾ A. M. to 1 P. M., Sheet L on W at 5 A. M., Light R at 12½ P. M.

\i Cirri, —i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒i Cumulo-strati, _i Nimbi, \⌒i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September 1876.

Solar Radiation, Weather, &c.,

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches.		lb	Miles.	
21		...	S by W & S	...	60.9	B to 5, \i to 8 A. M., ⌒i to 3, \i to 9, B to 11 P. M.
22		...	S & S by E	...	91.8	B to 5, \i to 8 A. M., ⌒i to 3, O to 6, ⌒i to 8, B to 11 P. M. Sheet L at 7 & 11 P. M. D at 11 A. M.
23		0.06	SSE,SE&SbyE	...	139.1	\i to 1, O to 5, \i to 9, ⌒i to 11 A. M., S to 7, \i to 9, B to 11 P. M. Light R at 12 P. M.
24		0.42	S & W S W	...	107.1	O to 5, \i to 9 A. M., ⌒i to 1, S to 8, O to 11 P. M. T at 10 P. M. L from 6½ to 10 P. M. R at 1, 3½ A. M., 9¾, 10½ & 11 P. M.
25		0.04	SSE,W by S&SW	...	62.1	O to 1, S to 6 A. M., ⌒i to 9, \i & _i to 11 P. M. Sheet L on W at 2 A. M. Light R at Midnight & 9 P. M.
26	Out of order.	...	W S W & S	...	45.5	_i to 2, \i to 7, O to 10 A. M., ⌒i to 4, S to 11 P. M. Sheet L from 6 to 11 P. M. D at 7 P. M.
27		0.16	NNW,S&ESE	...	80.4	B to 5, \i to 10 A. M., ⌒i to 1, O to 3, ⌒i to 9, B to 11 P. M. T at 1 & 3 P. M. Sheet L at 1½ A. M. & from 7 to 9 P. M. Slight R at 1 A. M., 2, 5, 7½ & 8 P. M.
28		0.02	E S E & S	1.3	77.9	B to 3, \i to 9 A. M., ⌒i to 5, _i to 7, B to 11 P. M. Light R at 5 P. M.
29		...	S & S by W	...	98.9	B to 7 A. M., ⌒i to 4, \i to 11 P. M. T at 12¾ P. M. D at 12 P. M.
30		...	S by W & S	0.2	97.2	\i & _i to 2, B to 7 A. M., ⌒i to 4, _i to 6, \i to 8, _i to 11 P. M. D at 11½ P. M.

\i Cirri —i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒i Cumulo-strati, _i Nimbi, _i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September 1876.

Monthly Results.

	Inches.
Mean height of the Barometer for the month	29.705
Max. height of the Barometer occurred at 9 & 10 A. M. on the 29th ...	29.949
Min. height of the Barometer occurred at 5 P. M. on the 1st ...	29.389
Extreme range of the Barometer during the month	0.560
Mean of the daily Max. Pressures	29.764
Ditto ditto Min. ditto	29.641
Mean daily range of the Barometer during the month	0.123

	°
Mean Dry Bulb Thermometer for the month	82.9
Max. Temperature occurred at 2 & 4 P. M. on the 14th	92.0
Min. Temperature occurred at 6 A. M. on the 2nd	77.0
Extreme range of the Temperature during the month	15.0
Mean of the daily Max. Temperature	88.1
Ditto ditto Min. ditto, ...	79.8
Mean daily range of the Temperature during the month	8.3

Mean Wet Bulb Thermometer for the month	80.1
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	2.8
Computed Mean Dew-point for the month	78.1
Mean Dry Bulb Thermometer above computed mean Dew-point ...	4.8

	Inches.
Mean Elastic force of Vapour for the month	0.943

	Grain.
Mean Weight of Vapour for the month	10.12
Additional Weight of Vapour required for complete saturation ...	1.67
Mean degree of humidity for the month, complete saturation being unity	0.86

	°
Mean Max. Solar radiation Thermometer for the month	139.1

	Inches.
Rained 25 days,—Max. fall of rain during 24 hours	2.01
Total amount of rain during the month	10.26
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	8.91
Prevailing direction of the Wind	S, S by E & S S E

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month Sept. of 1876.

Monthly Results.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. by E.	Rain on.	N. N. E.	Rain on.	N. E.	Rain on.	E. N. E.	Rain on.	E. by N.	Rain on.	E.	Rain on.	E. by S.	Rain on.	E. S. E.	Rain on.	S. E.	Rain on.	S. S. E.	Rain on.	S. by E.	Rain on.	S.	Rain on.	S. by W.	Rain on.	S. S. W.	Rain on.	S. W.	Rain on.	W. S. W.	Rain on.	W. by S.	Rain on.	W.	Rain on.	W. by N.	Rain on.	W. N. W.	Rain on.	N. W.	Rain on.	N. N. W.	Rain on.	N. by W.	Rain on.
	No. of days.																																														
Midnight														1	1		12		4		5		6	12	7		3			12	1						1										
1												1	1						4	1	4		4	1	6	1	5			1							1										
2								1	1					1									4	1	6	1			1					1								1	1		
3							1	1						1								1	1	1	7				1					1											
4							1	1						1							12		1	1	6	1								1											
5							1			1				1				1		1		1	1	1	7	1								1											
6									1	1				1								1	1	1	5	1								1											
7												1		1											4	1																			
8						12			1	1				1											4							1													
9						1			12					1											4							1													
10						1					1			1							1		3	1	9							1													
11									12						12						1		4				1			1															
Noon.									12														4	3	6	1	5		1		1		3											
1						1	1				1		1							1	1	1	1		7	1									1										
2																	1			1				1																					
3											1	1			12								1																					
4																																													
5							1							1									4																					
6							1				1				1		1		1																									
7												1																																	
8														1																														
9														1																														
10																																												
11																																												

Meteorological Observations.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.751	29.807	29.686	0.121	82.7	87.7	79.3	8.4
2	.803	.849	.753	.096	82.8	88.0	80.0	8.0
3	.852	.911	.815	.096	82.1	85.7	80.7	5.0
4	.850	.904	.785	.119	83.3	88.5	79.4	9.1
5	.857	.919	.797	.122	84.3	89.8	79.7	10.1
6	.858	.941	.819	.122	80.7	83.5	77.0	6.5
7	.810	.866	.743	.123	78.4	79.8	76.8	3.0
8	.726	.786	.666	.120	79.9	84.0	75.8	8.2
9	.665	.728	.595	.133	81.7	87.5	77.0	10.5
10	.702	.821	.601	.220	79.3	82.0	77.4	4.6
11	.866	.933	.786	.147	78.5	83.2	74.5	8.7
12	.906	.960	.853	.107	80.1	84.8	76.2	8.6
13	.901	.957	.845	.112	79.8	84.5	77.0	7.5
14	.913	.970	.869	.101	79.7	84.5	74.5	10.0
15	.942	.998	.881	.117	81.2	87.5	75.8	11.7
16	.975	30.039	.924	.115	81.1	86.6	76.0	10.6
17	.992	.062	.935	.127	80.9	87.0	75.5	11.5
18	.979	.051	.931	.120	81.3	87.0	76.5	10.5
19	.964	.032	.905	.127	81.4	87.5	77.0	10.5
20	.970	.037	.917	.120	79.5	86.2	74.5	11.7
21	.975	.030	.931	.099	78.5	84.0	74.0	10.0
22	.967	.027	.923	.104	78.0	84.4	72.0	12.4
23	.966	.032	.907	.125	77.8	84.3	72.5	11.8
24	.970	.031	.921	.110	77.4	83.5	72.7	10.8
25	.962	.023	.908	.115	77.5	84.6	70.5	14.1
26	.952	.020	.882	.138	77.8	84.5	72.0	12.5
27	.920	29.988	.861	.127	77.8	84.2	72.5	11.7
28	.901	.952	.854	.098	77.7	84.8	71.5	13.3
29	.902	.969	.834	.135	78.5	86.0	72.0	14.0
30	.862	.914	.806	.108	77.9	81.5	75.3	6.2
31	.703	.820	.558	.262	73.8	76.5	70.5	6.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Gr.	Gr.	
1	79.3	3.4	76.9	5.8	0.908	9.74	1.98	0.83
2	79.1	3.7	76.5	6.3	.896	.63	2.12	.82
3	79.2	2.9	77.2	4.9	.916	.85	1.66	.86
4	80.1	3.2	77.9	5.4	.937	10.06	.87	.84
5	80.2	4.1	77.3	7.0	.919	9.84	2.44	.80
6	78.4	2.3	76.8	3.9	.905	.75	1.29	.88
7	77.3	1.1	76.5	1.9	.896	.71	0.60	.94
8	78.2	1.7	77.0	2.9	.910	.83	.95	.91
9	77.9	3.8	75.2	6.5	.860	.24	2.13	.81
10	76.9	2.4	75.2	4.1	.860	.30	1.29	.88
11	75.9	2.6	74.1	4.4	.830	.00	.35	.87
12	77.0	3.1	74.8	5.3	.849	.17	.67	.85
13	76.8	3.0	74.7	5.1	.846	.14	.61	.85
14	75.5	4.2	72.6	7.1	.790	8.53	2.19	.80
15	76.5	4.7	73.2	8.0	.806	.68	.53	.77
16	76.3	4.8	72.9	8.2	.797	.59	.58	.77
17	75.8	5.1	72.2	8.7	.781	.40	.70	.76
18	76.4	4.9	73.0	8.3	.801	.62	.62	.77
19	76.1	5.3	72.4	9.0	.785	.45	.82	.75
20	74.2	5.3	70.5	9.0	.739	7.98	.68	.75
21	71.8	6.7	67.1	11.4	.661	.16	3.19	.69
22	71.2	6.8	66.4	11.6	.646	.00	.19	.69
23	71.4	6.4	66.9	10.9	.657	.12	.01	.70
24	71.4	6.0	67.2	10.2	.664	.20	2.81	.72
25	70.6	6.9	65.8	11.7	.634	6.87	3.17	.68
26	71.4	6.4	66.9	10.9	.657	7.12	.01	.70
27	71.9	5.9	67.8	10.0	.677	.33	2.80	.72
28	71.8	5.9	67.7	10.0	.674	.31	.79	.72
29	72.5	6.0	68.3	10.2	.688	.45	.90	.72
30	74.1	3.8	71.4	6.5	.761	8.23	1.93	.81
31	71.2	2.6	69.4	4.4	.713	7.80	.18	.87

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Midnight.	29.895	29.995	29.659	0.336	77.7	83.0	74.0	9.0
1	.882	.988	.622	.366	77.3	82.5	73.5	9.0
2	.870	.979	.610	.369	77.0	82.0	73.0	9.0
3	.859	.968	.608	.360	76.6	81.5	72.5	9.0
4	.858	.965	.601	.364	76.2	81.2	72.0	9.2
5	.872	.989	.622	.367	75.9	81.0	71.0	10.0
6	.890	30.002	.651	.351	75.7	81.0	70.5	10.5
7	.908	.027	.681	.346	76.2	81.9	71.5	10.4
8	.928	.052	.708	.344	78.2	83.3	74.5	8.8
9	.939	.062	.715	.347	80.2	85.5	75.2	10.3
10	.938	.060	.705	.355	81.9	87.7	76.0	11.7
11	.924	.043	.688	.355	82.7	88.2	76.5	11.7
Noon.	.900	.021	.658	.363	83.0	89.8	75.5	14.3
1	.872	29.998	.633	.365	83.8	88.8	74.6	14.2
2	.849	.967	.607	.360	84.2	89.6	74.0	15.6
3	.837	.955	.595	.360	84.2	88.6	72.5	16.1
4	.831	.935	.598	.337	83.7	88.5	71.6	16.9
5	.839	.937	.611	.326	82.9	88.5	71.5	17.0
6	.848	.955	.610	.345	81.2	85.5	71.0	14.5
7	.867	.965	.615	.350	80.3	84.8	71.0	13.8
8	.884	30.000	.580	.420	79.4	84.3	70.5	13.8
9	.896	.019	.558	.461	78.8	84.0	70.5	13.5
10	.900	.000	.570	.430	78.3	83.5	70.8	12.7
11	.897	.001	.561	.440	77.9	83.0	71.0	12.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Gr.	Gr.	
Mid-night.	75.3	2.4	73.6	4.1	0.817	8.86	1.24	0.88
1	75.0	2.3	73.4	3.9	.811	.80	.18	.88
2	74.8	2.2	73.3	3.7	.809	.77	.12	.89
3	74.6	2.0	73.2	3.4	.806	.77	.00	.91
4	74.3	1.9	73.0	3.2	.801	.71	0.95	.90
5	74.1	1.8	72.8	3.1	.795	.66	.91	.91
6	74.0	1.7	72.8	2.9	.795	.66	.85	.91
7	74.4	1.8	73.1	3.1	.803	.74	.92	.91
8	75.3	2.9	73.3	4.9	.809	.75	1.50	.85
9	75.8	4.4	72.7	7.5	.792	.54	2.34	.79
10	76.1	5.8	72.0	9.9	.776	.33	3.11	.73
11	76.2	6.5	71.6	11.1	.766	.22	.50	.70
Noon.	75.7	7.3	70.6	12.4	.741	7.95	.87	.67
1	75.9	7.9	70.4	13.4	.736	.89	4.21	.65
2	75.9	8.3	70.1	14.1	.729	.81	.43	.64
3	75.5	8.7	69.4	14.8	.713	.62	.62	.62
4	75.6	8.1	69.9	13.8	.725	.76	.31	.64
5	75.7	7.2	70.7	12.2	.744	.98	3.81	.68
6	76.1	5.1	72.5	8.7	.787	8.47	2.74	.76
7	76.3	4.0	73.5	6.8	.814	.78	.13	.81
8	75.9	3.5	73.4	6.0	.811	.76	1.86	.83
9	75.5	3.3	73.2	5.6	.806	.71	.73	.83
10	75.4	2.9	73.4	4.9	.811	.78	.50	.85
11	75.3	2.6	73.5	4.4	.814	.83	.33	.87

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
1	...	...	S by W & S S W	...	182.9	⌒i & ⌣i to 10 A. M., ⌢i to 11 P. M. T from 8 to 10½ P. M. L from 6½ to 9 P. M. D at 9 P. M.
2	...	...	[& E by N S S E, W N W	...	83.9	⌒i to 3, O to 6, ⌒i to 10 A.M. ⌢i to 4, ⌒i to 7, ⌒i to 11 P. M.
3	...	0.03	E by N, N & N W	...	88.5	⌒i to 8 A. M., ⌢i to 1, O to 4, S to 6, ⌒i to 11 P.M. T at 2 P.M. Light R at 10¾ A. M. & 2½ P. M.
4	...	0.71	N W & N N E	...	66.3	⌒i to 8, ⌢i to 11 A. M. O to 1, ⌒i to 6, B to 8, ⌒i to 11 P. M. T at 12½ P. M. R at 12 & 1 P. M.
5	...	...	N N E & E	...	69.0	⌒i to 9 A. M., ⌢i to 5, ⌣i to 7, S to 11. P. M. Sheet L on E from 6¼ to 9 P. M. D at 3½ P. M.
6	...	0.35	E & S	1.2	82.6	⌒i to 8, S to 10 A. M. O to 11 P. M. R between 11 A. M. & 12, & from 4 to 9 ¾ P. M.
7	Out of order.	1.59	E N E & E	...	63.8	Chiefly O. T at 10¼ A. M. R nearly the whole day.
8		1.10	E by N & E	C.4	155.4	O to 5, ⌒i to 10 A.M. S to 12, ⌢i to 6, O to 11 P. M. T at 4 & 10¾ A. M. L on W at 8 P. M. R after intervals.
9	...	...	E S E & S E	1.0	143.4	⌒i to 1, ⌒i to 5, O to 11 P.M. Sheet L between 7 & 8 P. M. R at 11 P. M.
10	...	0.62	S S E & S	2.2	306.2	O to 6, ⌒i to 9 A. M. S to 5, O to 11 P. M. T between Midnight & 1 A. M. L at 1½ A. M. R at Midnight 2, 3, 5½ & 10 A. M.
11	...	0.42	S E & Variable	...	147.6	O to 10 A.M., ⌢i to 1, ⌒i to 6, B to 11 P.M. R from 2 to 7¾ A. M.
12	...	0.10	S E & S S W	...	41.7	B to 2, ⌒i to 10 A.M., ⌢i to 7, B to 11 P. M. R at 11 A. M.
13	...	...	S S W & S by W	...	37.1	B to 2, ⌒i to 7, S to 10 A. M., ⌒i to 6, ⌒i to 11 P.M. D at 12¼ P. M.

⌒i Cirri, —i Strati, ⌢i Cumuli, ⌣i Cirro-strati, ⌢ i Cumulo-strati, ⌒i Nimbi, ⌒i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
14	...	0.44	W by S & S W	...	70.2	B to 1, ⌒i to 4, _i to 11 A. M., B to 11 P. M. R between 3 & 4 A.M.
15	...	...	S W & S S W	...	54.2	B to 8 A.M., _i to 1, ⌒i to 4, B to 11 P. M.
16	...	...	S S W & S W	...	47.8	B to 10 A. M., ⌒i to 4, B to 11 P. M.
17	...	...	S W & S S W	...	40.5	B to 8, \i to 11 A. M., B to 4, _i to 7, B to 11 P. M. Sheet L on W at 7 P. M.
18	...	...	S S W & W	...	36.5	B to 7, \i to 10 A. M., ⌒i to 4, B to 11 P. M. Slightly foggy at 9 P. M.
19	...	0.04	W & S W	...	44.4	B to 9 A. M., ⌒i to 6, S to 11 P. M. Light R between 7 & 8 P. M.
20	...	...	N by E & N by W	...	68.3	B to 10 A. M., ⌒i to 4, B to 11 P. M.
21	Out of order.	...	N by W & N N W	...	91.3	B to 10 A. M., ⌒i to 5, B to 11 P. M.
22		...	N N W & N by E	...	101.1	B to 10 A. M., ⌒i to 4, \i to 6 B to 11 P. M.
23		...	N N W & N by W	...	120.2	B to 10 A. M., ⌒i to 4, B to 11 P. M.
24	...	...	N by W & W N W	...	63.2	B to 4, \i to 6 A. M., ⌒i to 3, B to 11 P. M.
25	...	...	W N W & N N W	...	72.1	B to 10 A. M., ⌒i & _i to 4, B to 11 P. M. Slightly foggy at 6 & 7 A. M.
26	...	...	N W & W by N	...	45.4	B to 10 A. M., ⌒i to 5, B to 11 P. M. Slightly foggy from 8 to 11 P. M.
27	...	...	W by N & W N W	...	34.7	B to 9 A. M., ⌒i to 5, B to 11 P. M. Slightly foggy from 8 to 10 P. M.
28	...	...	W N W & N N W	...	26.3	B to 5, \i to 11 A. M., ⌒i to 4, \i to 6, B to 9, \i to 11 P. M. Slightly foggy from 9 to 11 P. M.

\i Cirri, —i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒ i Cumulo-strati, _i Nimbi, _i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1876.

Solar Radiation, Weather, &c.,

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	°	Inches.		lb	Miles.	
29	Out of order.	...	N N W & N by W [E by N	...	24.0	\i to 2, S to 6 A. M., \i to 11 P. M.
30		...	N by W, S S E &	...	42.7	⌒i to 1, S to 7, O to 11 A. M., \i to 4, O to 11 P. M. D at 11½ A. M.
31		0.40	N E	12.0	215.7	O. High wind from 11½ A. M. to 11 P. M. Slight R from 4 A. M. to 11 P. M.

\i Cirri —i Strati, ⌒i Cumuli, _i Cirro-strati, ⌒ i Cumulo-strati, _i Nimbi, \i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1876.

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	29.883
Max. height of the Barometer occurred at 9 A. M. on the 17th...	30.062
Min. height of the Barometer occurred at 9 P. M. on the 31st ...	29.558
Extreme range of the Barometer during the month	0.504
Mean of the daily Max. Pressures	29.948
Ditto ditto Min. ditto	29.822
Mean daily range of the Barometer during the month	0.126

	°
Mean Dry Bulb Thermometer for the month	79.7
Max. Temperature occurred at Noon on the 5th	89.8
Min. Temperature occurred at 6 A. M. 8 & 9 P. M. on the 25th & 31st ...	70.5
Extreme range of the Temperature during the month	19.3
Mean of the daily Max. Temperature	85.0
Ditto ditto Min. ditto, ...	75.4
Mean daily range of the Temperature during the month	9.6

Mean Wet Bulb Thermometer for the month	75.4
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	4.3
Computed Mean Dew-point for the month	72.4
Mean Dry Bulb Thermometer above computed mean Dew-point ...	7.3

	Inches.
Mean Elastic force of Vapour for the month	0.785

	Grain.
Mean Weight of Vapour for the month	8.48
Additional Weight of Vapour required for complete saturation ...	2.24
Mean degree of humidity for the month, complete saturation being unity	0.79

	°
Mean Max. Solar radiation Thermometer for the month ...	...Out of order

	Inches.
Rained 16 days,—Max. fall of rain during 24 hours	1.59
Total amount of rain during the month	5.80
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	5.09
Prevailing direction of the Wind ...	... S S W, S W & N N W

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month Oct. of 1876.

MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.		N. by E.		N. N. E.		N. E.		E. N. E.		E. by N.		E.		E. by S.		E. S. E.		S. E.		S. S. E.		S. by E.		S.		S. by W.		S. S. W.		S. W.		W. S. W.		W.		W. by N.		W. N. W.		N. W.		N. N. W.		N. by W.	
		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.		Rain on.
	No. of days.																																												
Midnight			1		1						12	1	12	•	1					12		1	1	1			12		3					1		1				1		4		4	
1			1		1		1		1		3		•		1					12		1		1			12	12	3					1		1				1		3		3	
2			1		1				3		1				1					12		1	1				12	12	3					1		1				1		3		3	
3			1		1				3		1				1		1			12		3					12		3					1		1				1		3		3	
4	1		1		1		1		1		1				1		1			12		1					12		3					1		1				1		3		3	
5			1		1			1	1		1				1		1			12		1					12		3					1		1				1		3		3	
6			1		1			1	1		1				1		1			12		1					12		3				1		1				1		3		3	
7			1		1			1	1		1				1		1			12		1					12		3				1		1				1		3		3	
8	4		1		1			4	1		1				1		1			12		1					12		3				1		1				1		3		3	
9	1		12		4			12	1							12	1			12		1					12		3				1		1				1		3		3	
10	1		1		4			3	1						1		1			12		1	1				12		3				1		1				1		3		3	
11	12	1	1					3	1		1		12		1		1			12		1	1	1			12		3				1		1				1		3		3	
Noon.	1		2		3	1	1		1	4	1					1		1			1	1				12	1	1		3			1		1				1		3		3	
1	1							12		1		1	1			1			1							12		1			1		2							1		3		3	
2	4				1			12		1					1			1	12				1			12		1							1		1				1		3		3	
3	12		1					12							1											12		1							1		1				1		3		3	
4	3				1	1	2	1		1			1					1			12		1					12		1							1		1				1		3		3	
5								1		1					1											12		1							1		1				1		3		3	
6					1			1		1					1											12		1							1		1				1		4		4	
7					1			1		1						1										12		1							1		1				1		4		4	
8					1			1		1																12		1							1		1				1		4		4	
9					1	1																				12		1							1		1				1		4		4	
10			1		1					1	1							1								12		1							1		1				1		4		4	
11					1	1				1				1								2	1				1								1		1				1		4		4	

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.722	29.853	29.514	0.339	75.9	82.4	72.0	10.4
2	.896	.961	.840	.121	77.1	84.0	71.0	13.0
3	.937	30.005	.894	.111	77.1	83.4	72.0	11.4
4	.946	.006	.900	.106	76.4	83.6	71.0	12.6
5	.956	.025	.904	.121	74.8	82.7	68.0	14.7
6	.929	29.987	.876	.111	74.5	81.7	68.0	13.7
7	.952	30.003	.902	.101	74.5	83.0	66.7	16.3
8	.977	.048	.934	.114	74.8	82.0	67.2	14.8
9	.957	.025	.897	.128	75.2	82.7	68.5	14.2
10	.903	29.960	.820	.140	75.6	82.0	70.5	11.5
11	.909	.978	.858	.120	75.4	83.7	69.5	14.2
12	.936	.991	.891	.100	74.8	83.8	67.9	15.9
13	.932	30.001	.872	.129	73.5	82.0	66.7	15.3
14	.855	29.926	.783	.143	73.2	80.8	68.0	12.8
15	.852	.918	.797	.121	72.5	80.3	66.0	14.3
16	.939	30.010	.888	.122	71.4	79.5	64.0	15.5
17	.967	.031	.900	.131	71.7	80.5	63.9	16.6
18	.967	.047	.902	.145	72.6	81.5	65.0	16.5
19	.959	.034	.889	.145	73.2	82.8	65.5	17.3
20	.978	.042	.920	.116	73.0	81.0	66.0	15.0
21	30.014	.098	.938	.160	73.0	81.0	66.5	14.5
22	29.972	.040	.906	.134	73.2	81.2	65.0	16.2
23	.845	29.927	.779	.148	71.9	74.5	69.5	5.0
24	.830	.920	.768	.152	70.3	73.5	66.7	6.8
25	.952	30.034	.856	.178	71.9	75.2	69.8	5.4
26	30.008	.080	.946	.134	72.8	80.5	68.0	12.5
27	.005	.081	.959	.122	74.0	81.7	69.2	12.5
28	.028	.093	.969	.124	71.0	79.5	65.5	14.0
29	.023	.096	.957	.139	68.3	77.0	61.5	15.5
30	.009	.081	.931	.150	67.1	76.5	59.8	16.7

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Gr.	Gr.	
1	71.3	4.6	68.1	7.8	0.684	7.43	2.14	0.78
2	72.0	5.1	68.4	8.7	.690	.48	.44	.75
3	71.9	5.2	68.3	8.8	.688	.46	.46	.75
4	70.7	5.7	66.7	9.7	.653	.09	.63	.73
5	67.9	6.9	63.1	11.7	.580	6.31	.95	.68
6	67.0	7.5	61.7	12.8	.554	.03	3.15	.66
7	67.6	6.9	62.8	11.7	.574	.26	2.92	.68
8	67.9	6.9	63.1	11.7	.580	.31	.95	.68
9	68.6	6.6	64.0	11.2	.597	.50	.87	.69
10	69.8	5.8	65.7	9.9	.632	.88	.60	.73
11	68.1	7.3	63.0	12.4	.578	.30	3.13	.67
12	67.4	7.4	62.2	12.6	.563	.13	.13	.66
13	66.1	7.4	60.9	12.6	.539	5.88	.02	.66
14	66.9	6.3	61.9	11.3	.557	6.09	2.73	.69
15	65.4	7.1	59.7	12.8	.518	5.67	.96	.66
16	64.2	7.2	58.4	13.0	.496	.43	.92	.65
17	65.1	6.6	59.8	11.9	.520	.69	.74	.68
18	66.3	6.3	61.3	11.3	.546	.99	.67	.69
19	66.2	7.0	60.6	12.6	.534	.83	.99	.66
20	65.3	7.7	59.1	13.9	.508	.55	3.21	.63
21	65.0	8.0	58.6	14.4	.499	.46	.30	.62
22	66.1	7.1	60.4	12.8	.530	.80	.02	.66
23	69.5	2.4	67.6	4.3	.672	7.38	1.10	.87
24	68.6	1.7	67.2	3.1	.664	.31	0.77	.91
25	70.1	1.8	68.7	3.2	.697	.64	.84	.90
26	70.0	2.8	67.8	5.0	.677	.41	1.30	.85
27	68.6	5.4	64.8	9.2	.613	6.71	2.33	.74
28	63.5	7.5	57.5	13.5	.481	5.28	.97	.64
29	60.3	8.0	53.9	14.4	.426	4.71	.89	.62
30	60.9	7.1	54.3	12.8	.432	.78	.54	.65

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Midnight.	29.937	30.053	29.528	0.525	70.3	74.4	63.6	10.8
1	.927	.030	.514	.516	69.7	74.0	63.2	10.8
2	.918	.024	.523	.501	69.2	73.1	63.0	10.1
3	.909	.009	.553	.456	68.7	72.9	62.0	10.9
4	.910	.007	.597	.410	68.2	72.6	60.5	12.1
5	.925	.020	.640	.380	67.7	72.5	60.0	12.5
6	.943	.035	.682	.353	67.4	72.5	60.0	12.5
7	.963	.060	.712	.348	67.6	72.5	59.8	12.7
8	.985	.085	.748	.337	70.3	76.1	61.0	15.1
9	30.003	.098	.782	.316	73.3	77.5	64.8	12.7
10	.001	.093	.791	.302	75.7	80.0	68.2	11.8
11	29.981	.076	.797	.279	77.5	82.0	70.0	12.0
Noon.	.953	.050	.776	.274	78.9	83.0	71.5	11.5
1	.921	.008	.753	.255	80.0	84.0	72.8	11.2
2	.900	29.981	.742	.239	80.6	84.0	73.3	10.7
3	.889	.971	.738	.233	80.6	84.0	73.5	10.5
4	.887	.969	.746	.223	79.4	83.3	73.4	9.9
5	.897	.980	.751	.229	78.0	82.5	72.6	9.9
6	.912	30.000	.777	.223	75.8	79.5	70.0	9.5
7	.929	.018	.792	.226	74.3	78.5	68.4	10.1
8	.947	.035	.806	.229	73.1	77.0	67.0	10.0
9	.959	.050	.814	.236	72.3	76.2	66.2	10.0
10	.967	.062	.826	.236	71.4	75.5	65.0	10.5
11	.961	.065	.818	.247	70.7	75.0	64.0	11.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Gr.	Gr.	
Mid-night.	67.0	3.3	64.4	5.9	0.605	6.66	1.42	0.82
1	66.3	3.1	64.1	5.6	.599	.59	.34	.83
2	66.2	3.0	63.8	5.4	.593	.54	.27	.84
3	65.8	2.9	63.5	5.2	.588	.48	.21	.84
4	65.3	2.9	63.0	5.2	.578	.39	.19	.84
5	64.9	2.8	62.7	5.0	.572	.33	.13	.85
6	64.6	2.8	62.4	5.0	.567	.27	.12	.85
7	65.0	2.6	62.9	4.7	.576	.37	.07	.86
8	66.4	3.9	63.3	7.0	.584	.42	.66	.80
9	67.2	6.1	62.3	11.0	.565	.17	2.67	.70
10	68.0	7.7	62.6	13.1	.570	.20	3.31	.65
11	68.3	9.2	61.9	15.6	.557	.03	4.01	.60
Noon.	68.3	10.6	60.9	18.0	.539	5.82	.65	.56
1	68.4	11.6	60.3	19.7	.528	.69	5.12	.53
2	68.7	11.9	60.4	20.2	.530	.71	.30	.52
3	68.4	12.2	59.9	20.7	.521	.60	.41	.51
4	68.0	11.4	60.0	19.4	.523	.65	4.97	.53
5	68.5	9.5	61.8	16.2	.555	6.01	.18	.59
6	68.9	6.9	64.1	11.7	.599	.51	3.03	.68
7	68.7	5.6	64.8	9.5	.613	.69	2.43	.73
8	68.4	4.7	64.6	8.5	.609	.66	.13	.76
9	67.9	4.4	64.4	7.9	.605	.63	1.95	.77
10	67.4	4.0	64.2	7.2	.601	.60	.75	.79
11	67.0	3.7	64.0	6.7	.597	.56	.62	.80

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
1	...	...	W N W & W	14.0	434.1	O to 9, \i to 11 A. M. ⌣i to 2, B to 11 P. M. Slightly foggy at 8 & 9 P. M. D at Midnight & 1 A. M.
2	...	...	W by S & W	...	88.9	B to 4, \i to 10 A. M., ⌒i to 3, \i to 9, B to 11 P. M.
3	...	...	N E, W & W by S	...	76.6	B to 5, \i to 7, \i to 10 A. M. ⌒i to 4, ⌣i to 6, B to 9, \i to 11 P. M. Slightly foggy from 8 to 11 P. M.
4	...	...	[& N N W W by S, W S W,	...	33.0	\i to 1, B to 10 A. M., ⌒i to 2, \i to 6, B to 11 P. M. Slightly foggy from 5 to 7 A. M.
5	...	...	N N W & N W	...	80.2	B to 10 A. M., ⌒i to 1, \i to 6, B to 11 P. M.
6	...	...	N W & W N W	...	99.3	B.
7	...	...	W N W & N by W	...	90.3	B.
8	...	...	N N W & W by N	...	77.2	B to 4, \i to 6, B to 11 P. M. Slightly foggy from 8 to 11 P. M.
9	...	...	W by N & N N W	...	60.2	B to 4, \i to 8 A. M., B to 2, \i to 6, B to 11 P. M. Slightly foggy from Midnight to 2 A. M. & at 10 & 11 P. M.
10	137.7	...	N N W & W N W	...	79.8	B to 6 A. M., \i to 1, \i to 8, \i to 11 P. M.
11	135.0	...	W N W & N	...	63.7	\i to 2, \i to 5, \i to 7, B to 11 A. M., \i to 5, B to 11 P. M.
12	132.5	...	N	...	89.3	B to 6 A. M., \i to 6, B to 11 P. M.
13	132.5	...	N & N by W	...	134.3	B to 3 A. M., \i to 6, B to 11 P. M.
14	128.0	...	[& N N by W, N by E	...	179.0	\i to 3, S to 8 A. M., \i to 5, B to 11 P. M.
15	130.5	...	N & W	...	186.8	B.
16	137.8	...	W & W S W	...	87.4	B.
17	136.0	...	W S W & N	...	60.5	B. Slightly foggy at 6 & 7 A. M. & from 7 to 10 P. M.

\i Cirri, —i Strati, ⌒i Cumuli, ⌣i Cirro-strati, ⌒ i Cumulo-strati, \⌣i Nimbi, \⌣i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	°	Inches.		lb	Miles.	
18	134.0	...	N, N by E & W S W	...	54.1	B to 11 A. M., ⌒i to 5, B to 11 P. M. Slightly foggy at 8 & 9 P. M.
19	135.0	...	S W & N by E	...	79.9	B.
20	134.0	...	E by N & N by W	1.6	91.0	B to 10 A. M., ⌒i to 12, B to 11 P. M. Slightly foggy from 5 to 7 A. M.
21	130.0	...	N by W & N	...	206.7	B.
22	135.0	...	N by W & N N E	...	150.1	B to 4 A. M., ⌒i to 2, —i to 7, O to 11 P. M. D at 11½ P. M.
23	...	0.17	N E & N N E	0.3	159.0	O to 4, S to 9, ⌒i to 11 P. M. Light R from 8¼ to 11 A. M. & at 3 & 4 P. M.
24	...	...	N & N N E	1.2	290.8	⌒i to 7 A. M., O to 7, S to 9, —i to 11 P. M. D at 7½, 9 A. M. & 3 P. M.
25	95.0	0.02	[& N by W N N E, W N W	...	191.4	B to 3, O to 9 A. M., ⌒i to 12, O to 7, B to 11 P. M. Slightly foggy from 5 to 7 A. M. & at 10 & 11 P. M. Light R at 5, 6, 7 & 9 A. M.
26	126.4	...	[W N W N by W, N W &	...	100.8	B to 3, O to 10 A. M., ⌒i to 5, B to 11 P. M. Slightly foggy at Midnight, 1 & from 6 to 8 A. M. & 7 to 9 P. M.
27	124.0	...	W & N N E	...	92.2	B to 5, ⌒i to 8, B to 11 A. M., —i to 3, B to 9, ⌒i to 11 P. M. Foggy from 7 to 10 P. M.
28	125.0	...	N by W & N N W	0.8	111.0	⌒i to 2 A. M., B to 11 P. M. Slightly foggy at 9 & 10 P. M.
29	130.0	...	N N W	...	153.3	B. Foggy from 8 to 10 P. M.
30	127.5	...	N N W & N	...	130.7	B. Foggy at 7 P. M.

⌒i Cirri, —i Strati, ⌒i Cumuli, —i Cirro-strati, ⌒i Cumulo-strati, ⌒i Nimbi, ⌒i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of November 1876.

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	29.938
Max. height of the Barometer occurred at 9 A. M. on the 21st ...	30.008
Min. height of the Barometer occurred at 1 A. M. on the 1st ...	29.514
Extreme range of the Barometer during the month	0.584
Mean of the daily Max. Pressures	30.010
Ditto ditto Min. ditto	29.873
Mean daily range of the Barometer during the month	0.137

	°
Mean Dry Bulb Thermometer for the month	73.3
Max. Temperature occurred at 1, 2 & 3 P. M. on the 2nd	84.0
Min. Temperature occurred at 7 A. M. on the 30th	59.8
Extreme range of the Temperature during the month	24.2
Mean of the daily Max. Temperature	80.8
Ditto ditto Min. ditto, ...	67.3
Mean daily range of the Temperature during the month	13.5

Mean Wet Bulb Thermometer for the month	67.2
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	6.1
Computed Mean Dew-point for the month	62.3
Mean Dry Bulb Thermometer above computed mean Dew-point ...	11.0

	Inches.
Mean Elastic force of Vapour for the month	0.565

	Grain.
Mean Weight of Vapour for the month	6.17
Additional Weight of Vapour required for complete saturation ...	2.67
Mean degree of humidity for the month, complete saturation being unity	0.70

	°
Mean Max. Solar radiation Thermometer for the month	129.8

	Inches.
Rained 5 days.—Max. fall of rain during 24 hours	0.17
Total amount of rain during the month	0.19
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	0.11
Prevailing direction of the Wind	N & N N N

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of Nov. 1876

Monthly Results.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. by E.	Rain on.	N. N. E.	Rain on.	N. E.	Rain on.	E. N. E.	Rain on.	E. by N.	Rain on.	E.	Rain on.	E. by S.	Rain on.	E. S. E.	Rain on.	S. E.	Rain on.	S. S. E.	Rain on.	S. by E.	Rain on.	S.	Rain on.	S. by W.	Rain on.	S. S. W.	Rain on.	S. W.	Rain on.	W. S. W.	Rain on.	W. by S.	Rain on.	W.	Rain on.	W. by N.	Rain on.	W. N. W.	Rain on.	N. W.	Rain on.	N. N. W.	Rain on.	N. by W.	Rain on.
	No. of days.																																														
Midnight	7		1	1	1		12				1																				1		1		3		1		5		4	
1	6	1	1		1		1				1						1																													
2	6		1				1				1						1																													
3	5				1		1		1		1																																			
4	5		1		1		1		1		1																																			
5	4		12		1	1	1		1		1																																			
6	4		4	1			1				1														1																				
7	1		3	1			1				1																																			
8	2	1	3		1		1				1														1																				
9	3	1	12		3		1	1																																					
10	4		12		5		12	1			1																																			
11	4		12		4		4	1																																					
Noon.	7		1		1		12				1																				3		3		3		1		3		1		2	
1	5				3		3																								3		3		3		12		3		1		2	
2	1		12		3		1		1								1														3		3		12		12		3		1		3	
3	5		1		2	1	1		1	1																					4		4		12		12		4		4			
4	3				3		1	1																							5		5		12		12		4		4			
5	8		1		1		1																								4		4		12		12		4		4		6	
6	7		1		4																										1		1		12		12		4		4		3	
7	7		1		4																										1		1		12		12		4		4		4	
8	7		1		4																										1		1		12		12		4		4		4	
9	6		1		3																										1		1		12		12		4		4		4	
10	6		12		3		12																								1		1		12		12		4		5		3	
11	7				3		1				1																				1		1		12		12		3		5		4	

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December 1876.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Temperature during the day		
		Max.	Min.	Diff.		Max.	Min.	Diff
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
1	30.012	30.094	29.940	0.154	66.4	74.9	58.7	16.2
2	29.992	.074	.928	.146	64.2	72.4	57.5	14.9
3	30.021	.106	.970	.136	64.1	74.0	55.5	18.5
4	.019	.104	.960	.144	65.0	75.5	56.5	19.0
5	.044	.097	.985	.112	66.4	76.5	57.5	19.0
6	.123	.191	30.057	.134	67.8	77.5	60.3	17.2
7	.148	.231	.086	.145	66.9	77.0	59.0	18.0
8	.066	.150	29.983	.167	67.2	76.5	59.5	17.0
9	.041	.118	.981	.137	67.0	76.0	58.8	17.2
10	.078	.167	30.025	.142	67.9	77.5	60.5	17.0
11	.063	.128	.092	.126	67.8	77.5	60.6	16.9
12	.058	.142	29.980	.162	68.0	77.2	60.0	17.2
13	.031	.105	.978	.127	68.1	77.9	60.5	17.4
14	.025	.101	.971	.130	67.2	77.0	58.8	18.2
15	.057	.166	30.000	.166	65.8	75.5	58.0	17.5
16	.035	.111	29.975	.136	65.3	75.0	57.5	17.5
17	.008	.067	.946	.121	66.0	75.5	57.7	17.8
18	.027	.099	.974	.125	66.6	75.5	58.5	17.0
19	29.996	.061	.935	.126	68.4	76.6	62.0	14.6
20	30.024	.100	.966	.135	67.4	75.0	60.8	14.2
21	.081	.151	30.033	.118	65.8	74.8	58.0	16.8
22	.084	.156	.044	.112	65.6	74.5	58.0	16.5
23	.099	.166	.052	.114	66.3	75.5	59.0	16.5
24	.104	.166	.049	.117	67.1	76.0	59.7	16.3
25	.103	.168	.040	.128	67.7	76.8	61.0	15.8
26	.097	.171	.032	.139	68.3	78.0	60.0	18.0
27	.102	.187	.041	.146	68.7	78.0	60.5	17.5
28	.081	.151	.024	.127	68.9	78.0	61.3	16.7
29	.084	.153	.031	.122	68.7	78.0	61.0	17.0
30	.118	.195	.067	.128	67.6	76.4	61.3	15.1
31	.097	.177	.025	.152	65.2	73.8	57.5	16.3

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December 1876.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued.)*

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	°	°	°	°	Inches.	Gr.	Gr.	
1	59.5	6.9	51.0	12.4	0.428	4.74	2.43	.66
2	56.6	7.6	49.8	14.4	.371	.13	.56	.62
3	57.7	6.4	51.9	12.2	.398	.41	.23	.67
4	58.6	6.4	53.5	11.5	.421	.68	.19	.68
5	60.0	6.4	54.9	11.5	.441	.88	.29	.68
6	60.6	7.2	54.8	13.0	.440	.85	.63	.65
7	60.7	6.2	55.7	11.2	.453	5.02	.26	.69
8	61.4	5.8	56.8	10.4	.470	.20	.15	.71
9	61.4	5.6	56.9	10.1	.472	.21	.09	.71
10	61.5	6.4	56.4	11.5	.464	.11	.40	.68
11	61.8	6.0	57.0	10.8	.473	.22	.26	.70
12	61.2	6.8	55.8	12.2	.455	.03	.50	.67
13	61.0	7.1	55.3	12.8	.447	4.94	.61	.65
14	60.6	6.6	55.3	11.9	.447	.95	.40	.67
15	58.5	7.3	52.7	13.1	.409	.55	.49	.65
16	57.4	7.9	51.1	14.2	.388	.31	.62	.62
17	59.3	6.7	53.9	12.1	.426	.73	.35	.67
18	61.2	5.4	56.9	9.7	.472	5.21	.00	.72
19	62.7	5.7	58.1	10.3	.491	.42	.20	.71
20	61.0	6.4	55.9	11.5	.456	.04	.35	.68
21	59.5	6.3	54.5	11.3	.435	4.83	.21	.69
22	58.9	6.7	53.5	12.1	.421	.68	.32	.67
23	60.1	6.2	55.1	11.2	.444	.93	.22	.69
24	60.7	6.4	55.6	11.5	.452	5.00	.32	.68
25	61.6	6.1	56.7	11.0	.469	.17	.29	.69
26	62.2	6.1	57.3	11.0	.478	.27	.33	.69
27	62.6	6.1	57.7	11.0	.485	.34	.35	.69
28	63.1	5.8	58.5	10.4	.498	.49	.25	.71
29	63.0	5.7	58.4	10.3	.496	.47	.22	.71
30	60.5	7.1	54.8	12.8	.440	4.85	.59	.65
31	58.2	7.0	52.6	12.6	.408	.53	.38	.66

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid-night.	30.065	30.161	29.993	0.168	63.1	65.0	59.4	5.6
1	.055	.148	.981	.167	62.4	64.5	58.8	5.7
2	.046	.136	.971	.165	61.8	64.0	58.0	6.0
3	.036	.123	.963	.160	61.2	63.5	57.3	6.2
4	.033	.113	.973	.140	60.6	63.0	56.7	6.3
5	.048	.141	.982	.159	60.0	62.5	56.0	6.5
6	.066	.157	.991	.166	59.5	62.2	55.5	6.7
7	.086	.181	30.008	.173	59.3	62.0	55.5	6.5
8	.112	.208	.026	.182	61.9	64.7	59.8	4.9
9	.135	.230	.061	.169	66.2	69.0	63.4	5.6
10	.136	.231	.057	.174	69.6	72.5	66.5	6.0
11	.116	.211	.034	.177	72.4	74.8	68.7	6.1
Noon.	.085	.177	.013	.164	74.2	76.8	70.0	6.8
1	.046	.125	29.967	.158	75.2	77.0	71.0	6.0
2	.024	.108	.940	.168	76.0	77.8	72.0	5.8
3	.008	.090	.928	.162	75.9	78.0	72.4	5.6
4	.006	.093	.928	.165	74.6	76.7	71.5	5.2
5	.013	.103	.940	.163	73.0	75.5	69.7	5.8
6	.030	.119	.962	.157	69.8	72.4	66.0	6.4
7	.046	.139	.973	.166	68.1	70.2	64.5	5.7
8	.063	.158	.989	.169	66.8	69.5	63.5	6.0
9	.076	.170	30.008	.162	65.5	68.0	62.5	5.5
10	.080	.181	.013	.168	64.5	67.0	61.5	5.5
11	.076	.173	.005	.170	63.7	66.0	59.9	6.1

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December 1876.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—*(Continued).*

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	o	o	o	o	Inches.	Gr.	Gr.	
Mid-night	59.7	3.4	56.6	6.5	0.467	5.21	1.26	0.81
1	59.1	3.3	56.1	6.3	.459	.14	.19	.81
2	58.5	3.3	55.5	6.3	.450	.04	.17	.81
3	58.0	3.2	55.1	6.1	.444	4.98	.12	.82
4	57.5	3.1	54.7	5.9	.438	.91	.07	.82
5	57.0	3.0	54.3	5.7	.432	.85	.02	.83
6	56.6	2·9	54.0	5.5	.428	.80	0.98	.83
7	56.6	2.7	54.2	5.1	.431	.84	.90	.84
8	58.1	3.8	54.7	7.2	.438	.90	1.33	.79
9	60.0	6.2	55.0	11.2	.442	.91	2.21	.69
10	61.6	8.0	55.2	14.4	.445	.91	.99	.62
11	62.4	10.0	54.4	18.0	.434	.74	3.86	.55
Noon.	62.7	11.5	54.6	19.6	.437	.76	4.33	.52
1	62.7	12.5	53.9	21.3	.426	.65	.72	.50
2	62.9	13.1	53.7	22.3	.423	.61	.99	.48
3	62.9	13.0	53.8	22.1	.425	.62	.95	.48
4	62.3	12.3	53.7	20.9	.423	.62	.58	.50
5	62.7	10.3	54.5	18.5	.435	.75	.01	.54
6	62.8	7.0	57.2	12.6	.476	5.23	2.72	.66
7	62.4	5.7	57.8	10.3	.486	.37	.18	.71
8	61.8	5.0	57.8	9.0	.486	.38	1.88	.74
9	61.3	4.2	57.9	7.6	.488	.40	.58	.77
10	60.6	3.9	57.5	7.0	.481	.35	.41	.79
11	60.1	3.6	56.9	6.8	.472	.25	.31	.80

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Guage 1 ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
1	127.0	...	N & N W	...	141.8	B. Slightly foggy from 8 to 10 P. M.
2	125.8	...	N W	...	110.1	B. Foggy from 8 to 11 P. M.
3	126.0	...	N W & W N W	...	80.4	B. Slightly foggy from Midnight to 4 A. M & 7 to 11 P. M.
4	124.0	...	W N W	...	59.3	B. Slightly foggy from 7 to 10 P. M.
5	127.5	...	[W S W W by N, W &	...	65.3	B. Slightly foggy from 5 to 8 A. M. & at 7 & 8 P. M.
6	121.0	...	W S W & N N W	...	74.9	B. Slightly foggy at 7 & 8 A. M.
7	126.8	...	N N W, N N E	...	137.3	B.
8	125.0	...	N N W & W N W	...	131.0	B to 11 A. M., _i to 1, \i to 5, B to 11 P. M.
9	121.0	...	W N W & W by N	...	75.4	B to 11 A. M., _i to 3, \i to 5, B to 11 P. M. Slightly foggy from 5 to 7 A. M. & 8 to 11 P. M.
10	125.8	...	W by N & N N E	...	68.1	B. Slightly foggy from Midnight to 2 A. M. & 7 to 11 P. M.
11	126.0	...	N N E, N & N by E	...	99.8	B to 5 A. M., \i to 4, B to 11 P. M. Slightly foggy at Midnight & 1 A. M. & from 8 to 11 P. M.
12	127.2	...	[N N W N by E, N W &	...	103.4	B to 5 A. M., \i to 6, B to 11 P. M. Slightly foggy at Midnight & 1 A. M. & from 8 to 11 P. M.
13	129.5	...	W & N N W	...	82.8	B to 4, \i to 6, B to 9 A. M., \i to 5, B to 11 P. M. Slightly foggy at Midnight, 1, 5 & 6 A. M. & from 8 to 11 P. M.
14	128.0	...	N N W & N by E	0.4	88.0	B to 5, \i to 7, B to 11 P. M. Slightly foggy at Midnight & 1 A. M. & from 8 to 11 P. M.
15	127.0	...	N by E & N by W	...	114.5	B. Slightly foggy from Midnight to 2 A. M.
16	123.0	...	N N W	1.0	187.8	B.

\i Cirri, —i Strati, ^i Cumuli, _i Cirro-strati, ^ i Cumulo-strati, ≻ i Nimbi, \≻i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December 1876.

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 1½ ft. above Ground.	Wind. Prevailing direction.	Wind. Max. Pressure	Wind. Daily Velocity.	General aspect of the Sky.
	o	Inches		lb	Miles.	
17	122.5	...	N & N N E	...	181.1	B. Slightly foggy from 7 to 10 P. M.
18	118.5	...	N N E & S S W	...	67.6	B to 11 A. M., ⌣i to 6, B to 11 P. M.
19	129.0	...	SSE, SE & NNW	...	59.3	B to 1 A. M., ⌢i to 7, B to 11 P. M.
20	125.2	...	N by W	...	87.9	⌣i to 1, ⌢i to 10 A.M. ⌣i to 5, B to 11 P. M. Slightly foggy from 8 to 11 P. M.
21	124.9	...	N by W & N by E	...	87.8	B to 2 A. M., ⌢i to 6, B to 11 P. M. Slightly foggy from Midnight to 2 A. M. & 7 to 9 P.M.
22	123.0	...	N by E	...	96.8	B to 12, ⌣i to 5, B to 11 P. M.
23	124.0	...	N & N N E	...	147.8	B to 6 A. M., ⌢i to 12, ⌣i to 5, B to 11 P. M.
24	123.4	...	N N E & N by W	...	138.0	B to 11 A. M, ⌒i to 4, B to 11 P. M.
25	124.0	...	N by W	...	124.9	Chiefly B.
26	126.7	...	N by W & N N E	...	108.9	B to 1, ⌢i to 7, B to 11 P. M.
27	125.0	...	N by W & N	...	97.1	B to 12, ⌣i to 3, B to 5, ⌢i to 8, B to 11 P. M.
28	128.0	...	N & N N W	...	67.6	B to 8 A. M., ⌢i to 2, B to 11 P. M.
29	127.0	...	N N W & N by W	...	64.4	B.
30	126.5	...	N by W & N W	...	104.5	B.
31	121.0	...	N & N N W	...	98.5	B.

⌢i Cirri, —i Strati, ⌒i Cumuli, ⌣i Cirro-strati, ⌒ i Cumulo-strati, ⌢i Nimbi, ⌢i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R. rain, D. drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of December 1876.

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	30.062
Max. height of the Barometer occurred at 10 A. M. on the 7th ...	30.231
Min. height of the Barometer occurred at 3 & 4 P. M. on the 2nd ...	29.928
Extreme range of the Barometer during the month	0.303
Mean of the daily Max. Pressures	30.137
Ditto ditto Min. ditto	30.002
Mean daily range of the Barometer during the month	0.135

	°
Mean Dry Bulb Thermometer for the month	66.9
Max. Temperature occurred at 3 P. M. on the 26th, 27th, 28th & 29th	78.0
Min. Temperature occurred at 6 & 7 A. M. on the 3rd	55.5
Extreme range of the Temperature during the month	22.5
Mean of the daily Max. Temperature	76.1
Ditto ditto Min. ditto, ...	59.2
Mean daily range of the Temperature during the month	16.9

Mean Wet Bulb Thermometer for the month	60.4
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	6.5
Computed Mean Dew-point for the month	53.2
Mean Dry Bulb Thermometer above computed mean Dew-point ...	11.7

	Inches.
Mean Elastic force of Vapour for the month	0.445

	Grain.
Mean Weight of Vapour for the month	4.93
Additional Weight of Vapour required for complete saturation ...	2.35
Mean degree of humidity for the month, complete saturation being unity	0.68

	°
Mean Max. Solar radiation Thermometer for the month	125.1

	Inches.
Rained no days.—Max. fall of rain during 24 hours	Nil
Total amount of rain during the month	Nil
Total amount of rain indicated by the Gauge* attached to the anemometer during the month	Nil
Prevailing direction of the Wind	N N W, N by W & N

* Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of Dec. 1876

MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on.	N. by E.	Rain on.	N. N. E.	Rain on.	N. E.	Rain on.	E. N. E.	Rain on.	E. by N.	Rain on.	E.	Rain on.	E. by S.	Rain on.	E. S. E.	Rain on.	S. E.	Rain on.	S. S. E.	Rain on.	S. by E.	Rain on.	S.	Rain on.	S. by W.	Rain on.	S. S. W.	Rain on.	S. W.	Rain on.	W. S. W.	Rain on.	W. by S.	Rain on.	W.	Rain on.	W. by N.	Rain on.	W. N. W.	Rain on.	N. W.	Rain on.	N. N. W.	Rain on.	N. by W.	Rain on.
	No. of days.																																														
Midnight	2		4		3																1										1										3		6		7	
1	4	2	4		3																1										1										3	2	6	3	7	2
2	5	4	4		3																1										1										2	2	4	2	7	2
3	5	4	3		3																1										1										2	2	4	2	7	2
4	5	5	1		4																1										1										2	2	3	2	6	2
5	6	5	1		3				1												1										1										2	2	3	2	6	2
6	7	6	1		2				1										1												1										2	2	3	2	6	2
7	6	6	2		2										1				1												1										2	2	3	2	6	2
8	7	7	1		3										1				1												1										2	2	3	2	6	2
9	4	4	1		4		2	2											1												1										2	2	3	2	6	2
10	3	3	2		7		3	2	1										1												1										2	2	3	2	6	2
11	4	1	1		6		4						1																		1										1		3		6	
Noon.	7	1	1		6		3								1																1				1		1				4		1		3	
1	9				12				12						1																1				1						7		3		3	
2	8		1		12		1																																		7		3		3	
3	5		1		1		1																														1				7		3		4	
4	11		1																										1								1				4		3		3	
5	3		4		3														1										1								1				3		3		5	
6	1		4		3														1										1								1				3		3		5	
7	1		4		3																								1								1				3		3		5	
8	1		4		3																								1								1				3		3		5	
9	1		4		4																								1								1				3		3		5	
10	1		4		4																								1								1				3		3		5	
11	2		4		3																1								1								1				3		3		6	