

Occultations of Stars by the Moon (visible at Greenwich).

August.	Star.	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image.
			h. m.	h. m.	° °
1 ... 21	Sagittarii ...	5 ...	0 23 ...	1 29 ...	99 32 ³
6 ... 70	Aquarii ...	6 ...	1 14 ...	1 38 ...	35 6

August 3.—Partial eclipse of the Moon. First contact with shadow 19h. 36m.; middle of eclipse 20h. 49m.; last contact with shadow 22h. 2m. Magnitude of eclipse = 0.419 of moon's diameter. The moon will rise at Greenwich at 19h. 35m.

GEOGRAPHICAL NOTES.

THE rumour as to the death of Mr. Stanley is universally discredited in geographical circles, and among those directly interested in the Emin Pasha Expedition. The rumour seems quite inconsistent with the news as to Mr. Stanley's having left the Aruwimi River on June 3 for Wadelai. Had he been shot, as reported, it must have been after this date, and during the land journey, whereas one version of the rumour gives out that he was killed on the Congo. He may meet with Emin Pasha sooner than he expected. Emin, it seems, is at present exploring on the south of the Albert Nyanza, endeavouring to find the connexions of the great affluent he discovered on the south side of the lake, and ascertain whether it may proceed from the Mwuta Nzige. So that he and Mr. Stanley may meet half way. Letters from Mr. Stanley are expected in this country early in August.

THE Report of Dr. Hans Schinz on his exploration of the German colony known as Luderitzland (South-West Africa) has just been published. Dr. Schinz made two journeys: the first, in 1884, from Angra Pequena to Am-Hub on the Xamob, a sub-affluent of the Orange; and the second, in 1885, across Namaqua-land and Damara-land, and the little-known region which separates Damara-land from the Cunene River. The Report contains much valuable information, especially on the flora and the people of the region visited. The region is quite as sterile and hopeless as it has been painted by previous visitors. It is only on the north of Etosha (18° S. lat.) that the flora and fauna become anything like abundant—bauhinia, palms, cassia, baobab. The population becomes more dense as we approach the Cunene. But three-fourths, if not four-fifths, of the new German colony is unworkable and uninhabitable.

IN the new number of *Timehri* the valuable serial published in British Guiana, will be found a condensed translation of Père de la Borde's "History of the Origin, Customs, Religion, Wars, and Towns of the Caribs of Antilles," the first of a series of reprints of the literature of West India and Guiana red men, which it is proposed to publish from time to time in the journal. A large part of the number is devoted to Mr. Im Thurn's notes on the plants observed during the Roraima expedition.

THE last Annual Report of the Russian Geographica Society for 1886, which has just reached us, contains a good deal of useful information. An account of several interesting journeys is given. The publications of the Society were numerous and valuable. Seven fascicules of the Memoirs appeared during the year, containing the work on the geology of Lake Baikal, by M. Tchersky; a hydrological inquiry into the Upper and Middle Amu-daria, by the late M. Zuboff; on the landlips at Odessa, by M. Jarintseff; on the exposure of thermometers, by M. Saveliëff; on a journey to North-West Persia and the Transcaspian region, by M. Nikolsky; on the province of Olonets, by M. Polyakoff; and on the Votyaks, by M. Sokolovsky. The Society published, moreover, a volume of the "Works of the Siberian Expedition," containing Fr. Schmidt's "Miocene Flora of Sakhalin," and three volumes of observations of the Polar stations on the Lena and on Novaya Zemlya. It is good news that the addenda to the capital "Geographical Dictionary of Russia," by P. Semenov, are being rapidly prepared for the press. The great gold medal of the Society has been awarded to M. Potanin for his twenty years' geographical work; and that of Count Lütke to M. Tchersky for his remarkable geological explorations around Lake Baikal and in East Siberia altogether. Other gold medals have been awarded to MM. Nalivkin for their work "On the Position of Woman amidst the Settled Population of Ferganah," published last year at Kazan; to M. Yastreboff for a work on Turkish

Servians; to M. Makaroff for his researches into the double currents in straits; to MM. Skassi and Bolsheff for cartographical work; and to M. Eigner for his work at the Lena Polar station. Many silver medals have been awarded for works of less importance. The Committee of the Russian Geographical Society for Pendulum Observations and the Meteorological Committee have done most useful work.

THE TECHNICAL EDUCATION BILL.

I.

THE following is the text of the Bill to facilitate the provision of technical instruction:—

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1. This Act may be cited as the Technical Instruction Act, 1887.
2. Any local authority as defined by this Act may pass a resolution that it is expedient to provide for supplementing by technical instruction the elementary education supplied in its district, and for that purpose to put in force the provisions of this Act.
3. (1) A local authority shall, before proceeding to carry into effect a resolution under this Act, cause the resolution to be published in the prescribed manner, and within the prescribed time, not being less than two months after the publication, fifty persons entitled to vote at the election of members of the local authority, or one-third of the total number of those persons, may, by a written requisition, require a poll of those persons to be taken as to carrying the resolution into effect, and thereupon the poll shall be taken in the prescribed manner, and in accordance with the prescribed regulations.

Provided that—

- (a) the poll shall, so far as circumstances admit, be conducted in like manner in which the poll at a contested municipal election is directed by the Ballot Act, 1872, to be conducted; and, subject to any exceptions or modifications contained in any order of the Department of Science and Art made in pursuance of this Act, the Ballot Act, 1872, shall apply accordingly; and
- (b) all persons entitled to vote at the election of members of the local authority shall be entitled to vote at the taking of the poll; and
- (c) each of those persons shall be entitled to one vote only.
- (2) If the resolution is negatived at the poll it shall not be carried into effect, and shall not be again proposed until the expiration of not less than twelve months after the taking of the poll.
- (3) This section shall not apply to the metropolis as defined in the Elementary Education Act, 1870.
4. (1) For the purpose of supplementing by technical instruction the elementary education supplied in its district, a local authority may in pursuance of a resolution under this Act—
 - (a) Provide technical schools for its district; or
 - (b) Combine with any other local authority for the purpose of providing technical schools common to the districts of both authorities; or
 - (c) Contribute towards the maintenance, or provision and maintenance, of any technical school; or
 - (d) Make such arrangements as to the local authority seem expedient for supplementing by technical instruction the instruction given in any public elementary school in its district.
- (2) The expenses incurred by a local authority for the purposes of this Act shall be defrayed out of the local rate.
- (3) Provided that no payment shall be made under this Act out of the local rate in respect of a scholar unless or until he has obtained a certificate from the Education Department that he has passed the examination in reading, writing, and arithmetic prescribed by the standard set forth in the schedule to this Act (being the Sixth Standard fixed by the minutes of the Education Department in force at the passing of this Act) or an examination equivalent thereto.
- (4) Two or more local authorities may, with the sanction of the Department of Science and Art, enter into any agreement which may be necessary for carrying into effect any resolution under this Act; and any such agreement may provide for the appointment of a joint body of managers, for the proportion of the contributions to be paid by the respective authorities, and

for any other matters which, in the opinion of the Department of Science and Art, are necessary for carrying out the agreement.

5. (1) Every school provided under this Act shall be conducted in accordance with the conditions specified in the minutes of the Department of Science and Art in force for the time being, and required to be fulfilled by such a school in order to obtain a grant from that Department.

(2) Those conditions shall, amongst other things, provide that a grant shall not be made by the Department of Science and Art in respect of a scholar admitted to the school unless or until he has obtained such a certificate from the Education Department as is herein-before mentioned.

(3) A minute of the Department of Science and Art not in force at the passing of this Act shall not be deemed to be in force for the purposes of this Act until it has lain for not less than one month on the table of both Houses of Parliament.

6. (1) Every local authority providing a school under this Act shall maintain and keep efficient the school so provided.

(2) For the purposes of providing and maintaining any such school a local authority shall have the same powers as a school board has for providing sufficient school accommodation for its district, but for the purposes of this Act the provisions of the Elementary Education Acts with respect to the exercise of those powers shall have effect as if the Department of Science and Art were substituted therein for the Education Department.

(3) Where a local authority has provided or maintains any such school, it may discontinue the school or change the site thereof, if it satisfies the Department of Science and Art that the school to be discontinued is unnecessary or that the change of site is expedient.

7. (1) The managers of any technical school in the district of a local authority may make an arrangement with the local authority for transferring their school to that authority, and the local authority may assent to any such arrangement.

(2) The provisions of section twenty-three of the Elementary Education Act, 1870, with respect to arrangements for the transfers of schools in pursuance of that section, shall apply in the case of arrangements for the transfers of schools in pursuance of this section, with this modification, that for the purposes of this section references to the school board shall be construed as references to the local authority, and references to the Education Department as references to the Department of Science and Art.

8. In this Act—

The expression "technical instruction" means instruction in the branches of science and art with respect to which grants are for the time being made by the Department of Science and Art, or in any other subject which may for the time being be sanctioned by that Department; and the expression "technical school" means a school or department of a school which is giving technical instruction to the satisfaction of the Department of Science and Art.

The expression "local authority" means a school board and the council of a borough for which there is no school board.

The expression "local rate" means—

(a) in a district for which there is a school board, the school fund;

(b) in a borough for which there is not a school board, the borough fund or borough rate.

The expression "the Education Department" means the Lords of the Committee of Her Majesty's Privy Council on Education.

The expression "prescribed" means prescribed by the Department of Science and Art.

9. In the application of this Act to Ireland the expression "borough" means a borough subject to the Act of the session of the third and fourth years of the reign of Her present Majesty, chapter one hundred and eight, intituled "An Act for the regulation of municipal corporations in Ireland," and the Acts amending the same.

SCHEDULE.

Standard VI.

Reading.—To read a passage from one of Shakspeare's historical plays, or from some other standard author, or from a history of England.

Writing.—A short theme or letter on an easy subject, spelling, handwriting, and composition to be considered. An

exercise in dictation may, at the discretion of the inspector, be substituted for composition.

Arithmetic.—Fractions, vulgar and decimal, simple proportion, and simple interest.

II.

WE reprint from the *Times* of July 21 the following article on the Bill:—

The measure introduced late on Tuesday night by Sir William Hart Dyke, the Vice-President of the Council, may prove to be of far greater practical importance than many a measure that may for the moment loom larger in the public eye. It is a Government Bill for organizing throughout England and Wales at least the beginnings of a system of technical education. The Scotch Office is meanwhile preparing an analogous Bill for Scotland, which it is hoped will proceed *pari passu* with the English Bill through the House; and the Government intends, if possible, to carry both measures this session. It is quite time. There has been plenty of talk about technical education; and we want action in the matter. The need is admitted on all hands. It is a crying need, as much recognized in such authoritative statements as the Report of the late Commission as in the reports of examiners appointed by the Technical Institute at South Kensington. The former admits the great superiority of foreign nations over ourselves in this matter, and shows how both France and Germany make much more serious and successful attempts than we to train their workmen in the theory as well as in the practice of their trades. One result is the increased severity of foreign competition, from which British industry is suffering in all directions. What we lately stated, on the authority of the Committee of the London Chamber of Commerce, with regard to the competition of German with English clerks in London and the north may be applied, with little change, to the foreign workmen. They are not above learning their trade. They know that their bread depends on their excelling, and they strive to excel, with their Governments behind them, showing them, by carefully organized instruction, what is the best way. As yet, in England, we have done little more, by way of meeting this activity of our competitors, than to build a fine Institute at South Kensington. Not that that Institute is not doing good. Its very existence is a protest against the inveterate English belief in rule of thumb. It has as yet only touched the fringe of the questions before it; but, while it has done something positive by such means as teaching teachers, it has also done not a little to test the actual state of technical knowledge in many trades. Two months ago we called attention to the reports of its examiners, and pointed out how unfavourable on the whole they were. In the bleaching, dyeing, cotton-spinning, paper-making, carriage-building, and other industries, very few candidates showed any theoretical knowledge to speak of; on the one hand they were ignorant of the rudiments of chemistry, on the other of the rudiments of drawing. In a word, they failed to link the primary education which they might be supposed to have received with the business of their handicrafts.

The Government Bill proposes to do much to render this state of things less common. So far as can be judged from the Vice-President's speech, the Bill being not yet printed, it is a Bill for enabling local authorities—generally School Boards—acting in concert with the Science and Art Department, to provide technical instruction for pupils who have left the elementary schools, and in certain cases for those who have not yet left them. What the mover calls the operative clause enables local authorities to provide technical schools, and at the same time to combine with other local authorities by way of saving expense. The power of rating is given, but at the same time the rate-payers are to have a veto on "any proposal under the Bill." The combination clause, which permits the joint action to which we have referred, is that on which Sir William Hart Dyke relies to convince the public that his Bill will be cheaply and easily worked. Another, with the same object, is the clause which enables the local authority to make any arrangements which it may deem expedient for supplementing the technical instruction at present given in the schools. As to the agricultural districts, and the teaching of agricultural subjects, the Vice-President admits that his Bill will not do very much, and, indeed, it would seem that the provision of that instruction, as was urged earlier in the evening, is beyond the power of the Science and Art Department. The question of London, and the London vote when debatable questions arise, is one which the Government have foreseen, but on which they can only

vouchsafe some rather mysterious information. It would be "very wrong," says the Vice-President of the Council, to bring into force the "enormous voting power" of London on the question of forbidding some scheme of the local authority; and consequently he has put himself into communication with the London School Board, or rather with Sir Richard Temple, its Vice-Chairman, to devise a way out of the difficulty. With the result he seems particularly pleased, but, as the proposal of Sir Richard Temple is not made public, it is lawful to reserve our opinion. Then there is the question of the directing authority. It is not to be the Education Office; it is to be the Science and Art Department. Whether this will create any possible conflict of authorities it is difficult to say; but as these two bodies have the same head—the President and the Vice President of the Council—it may be hoped that the conflicts will not be common or easy.

It is not to be supposed that such a Bill as this, which creates a new rating authority, and therefore threatens the pockets of the ratepayers, will pass into law without a good deal of criticism, or that it will be universally popular. Our correspondent, Mr. Daniel Watney, this morning gives utterance to a protest of which the language is strong, though the arguments are unconvincing. He admits that the old apprenticeship system has broken down, and that some substitute must be found; but anything like a general system of technical instruction, directed by the local authorities and the Science and Art Department, is condemned out of hand. Mr. Watney seems to think that the new proposal would give too much power to Professors, for whom he entertains the contempt of the "practical man." The practical man is commonly little more than an imperfect theorist; and just now, in England, his success in maintaining the commercial supremacy of the country is not such as to invest him with commanding authority. For our part we do not see where the Professors are to come in under Sir William Hart Dyke's Bill; but if they did come in, perhaps it might not be a bad thing for the improvement of our theoretical, and therefore our practical, knowledge. As to the immediate prospects of the Bill, it would seem from its reception on Tuesday night that the House is favourable to it. Mr. Mundella made two objections: one to the delegation of all power of initiation to the localities, and one to the exclusion of all pupils below the sixth standard. The objections stand on different grounds. The former is one of principle, the latter one of detail. It is not likely that the Government will venture, so late in the Session, and at a time when other difficulties have to be met and faced, to propose a sweeping measure for imposing technical instruction by the act of a central Department. The ratepayer must be humoured if his assent is to be won. As to the second objection, we think Mr. Mundella is probably right. The choice lies between retaining all children at school till they have passed the fifth standard, and admitting fifth-standard children to whatever technical classes may be available. It would be unjust to deprive them altogether, after they have left school, of the opportunity of learning whatever can be learnt about their trades.

SCIENTIFIC SERIALS.

Bulletin de la Société des Naturalistes de Moscou, 1887, No. 1.—The *Scaphirhynchus*, being an elaborate comparative anatomical description (in German) of the genus and its species, by N. Iwanow (with two plates).—On the great comet (43) of 1886, by Th. Bredichin (with a plate).—Enumeration of the vascular plants of the Caucasus, by M. Smirnof (in French). In this third paper the author discusses the relative moistness of the air in the Caucasus; he gives most valuable tables from twenty-three Caucasian stations, and shows the dependency of moisture upon the prevailing winds; he then gives tables as to the amount and frequency of rain in different parts of Caucasia, and discusses this climatic factor in comparison with the distribution of rains upon the Mediterranean region generally. This most valuable paper is to be continued.—On calorimetric methods for determining minimal quantities of iron in mineral waters, by E. Kislakovsky.—Comparative discussion of the data collected in Russia as to the epochs of the blooming of plants which are freely growing or cultivated between the 44th and 60th degrees of latitude, by A. Döengingk, being a most valuable paper (in German), containing a list of the times of blooming of 270 different species at Pyatigorsk, Kishineff, Sarepta, Orel,

Moscow, and St. Petersburg. This is followed by a note on the blooming of 225 plants at Pyatigorsk and Elizabethpol in the Caucasus, as also on trees and bushes, endemic and exotic, in the Caucasus, showing the origin of the exotic plants.—On the parasitical pteromalines of the Hessian fly, by Prof. Lindeman. Five parasites, all new species, are described (in German) and figured.—Entomological notes, by the same, on the *Haltica vittula* of Russia, the *Scotylus amygdali* of Transcaucasia, and the *Cleigastra flavipes* from Moscow.—On the tooth-plates of the *Gulnarina*, by Dr. W. Dybowski (in German).—On remains of the *Ursus spelæus* in Transcaucasia, by N. Anutschin (in German).—On the species of *Taraxacum* and *Glycerhiza*, and *Alhagi camelorum*, by A. Becker.

No. 2.—Comparative anatomical inquiry into the structure of the cord of fishes and its cuticular envelopes, by W. Lvoff (with three plates). A most elaborate inquiry into, preceded by an historical sketch of the literature of, the subject (summed up in German).—A study on the palæontological history of the Ungulata in America and Europe, by Mary Pavlow (in French). After having summed up the ideas developed on this subject by MM. Cope, Wortman, and Schlosser, the author studies the group of *Condylathra*, and shows that its separate members may have been predecessors of some orders of Mammalia; that it is a mixed group containing species which have the characters of Ungulatae as well as of Unguiculatae; and that it may be considered as standing at the head of the genetic tree of the Ungulatae and Carnivores. Madame Pavlow shows, moreover, that the *Condylathra* have also representatives in Europe.—Notes on the remains of man and *Ursus spelæus* in Transcaucasia, by N. Anutschin.—The Hessian fly (*Cecidomyia destructor*) in Russia, by Prof. Lindeman (in German), being an elaborate paper on the history of its spreading, its habits and devastations, and its development (to be continued).

SOCIETIES AND ACADEMIES.

LONDON.

Entomological Society, July 6.—Dr. D. Sharp, President, in the chair.—Mr. McLachlan remarked that at the meeting of the Society in October 1886 he exhibited a quantity of the so-called "jumping seeds" from Mexico, containing larvæ of *Carpocapsa saltitans*, Westw. The seeds had long ceased to "jump," which proved that the larvæ were either dead, had become quiescent, or had pupated; about a fortnight ago he opened one of the seeds, and found therein a living pupa. On the 4th inst. a moth (exhibited) was produced.—The President, on behalf of the Rev. H. S. Gorham, exhibited the following Coleoptera, lately taken in the New Forest: *Anoploclera sexguttata*, Fab., wholly black variety; *Grammoptera analis*, Fab.; *Colydium elongatum*, Fab.; and a specimen of *Tachinus elongatus*, Gyll., with brownish-red elytra.—Mr. S. Stevens exhibited a specimen of *Orsodaena humeralis*, Latr. (*lineola*, Panz., var.), taken by him at Norwood; he also exhibited a specimen of the same beetle taken by him fifty years ago in Coombe Wood; during the interval he had never seen it alive.—Mr. G. T. Porritt exhibited, on behalf of Mr. N. F. Dobrée, of Beverley, a series of about thirty specimens of a *Teniocampa* he had received from Hampshire, which had previously been referred to as a red form of *T. gracilis*. Mr. Dobrée was inclined to think they were not that species, but *T. stabilis*.—Mr. A. C. Horner exhibited the following species of Coleoptera from the neighbourhood of Tonbridge:—*Compsochilus palpatis*, Esp. (5); *Acrognathus mandibularis*, Gyll. (4); *Homalota atrata*, Mann., *H. vilis*, Er., and *H. difficilis*, Bris.; *Calodera rubens*, Er.; and *Oxytelus fulvipes*, Er. He also exhibited a *Rhizophagus* from Sherwood Forest, which appeared to belong to a new species; and several specimens of *Holopedina polyperi*, Först., also from Sherwood Forest, where he had found it in company with, and probably parasitic on, *Cis vestitus*.—Mr. Elisha exhibited two larvæ of *Zelleria hepariella*, Stn. Mr. Stainton remarked that as the greater part of the larvæ of *Zelleria* were attached to the Oleaceæ, it seemed strange that certain species had recently been found on Saxifrage.—Mr. Slater read a paper on the presence of tannin in certain insects, and its influence on their colours. He mentioned the fact that tannin was certainly present in the tissues of the leaf-wood- and bark-eating species, but not in the tissues of the carnivorous beetles, and that black colour on the elytra of certain beetles appeared to be produced by the action of iron on tannin. A