

At Carlton College, Northfield, Minn., it was estimated that four observers might have counted about 1600 meteors per hour. There was a marked falling off in numbers on the morning of November 16. Yet at two stations, according to newspaper reports, the shower was quite striking on the latter morning, for at Los Angeles one observer is said to have counted 385 meteors in the hour between 4h. and 5h. a.m., while at Phoenix 200 were seen in half an hour. It is highly probable, however, judging from the character of the shower as recorded at other stations, that in the two latter cases the observations were really made on the morning of the 15th and not on the 16th as stated in the newspaper accounts, which are often erroneous in such matters.

The maximum of the display must have occurred at about 11h. 30m. a.m. G.M.T. November 15, according to some of the best American descriptions. Possibly it may have been attained even later than this, for the morning twilight must have affected the observations to some extent. If the time of greatest frequency was after that stated, the phenomenon at its best could only have been observed from the Pacific Ocean, and it is not probable that we shall get any satisfactory reports from this region.

Though the shower was pretty active, it does not appear that photography has afforded any material assistance in recording its features. Plates were exposed at many observatories, but trails were absent upon them except in one or two isolated instances.

In England a number of meteors were doubly observed during the Leonid epoch, and their real paths have been calculated. In the following table are given the heights, &c., of 8 Leonids, of 1 Leo Minorid, of 1  $\delta$  Leonid, and of a remarkably slow-moving meteor from Cetus:—

Date.	G.M.T.	Mag.	Height at beginning.	Height at ending.	Path.	Velocity per second.	Radiant point.
1901.			Miles.	Miles.	Miles.	Miles.	$\alpha$ $\delta$
Nov. 14	13 32	1	85	52	66	Rapid	156+32
	13 37½	2	77	57	38	Rapid	152+30
	13 42	2½	81	67	67	55	174+20
	14 24	4	82	57	44	Rapid	152+25
	14 38	2	62	54	22	37	152+23
	15 7	3	95	55	60	Rapid	152+23
	15 23	>1	74	47	36	72	151+25
	16 0	1	91	61	41	54	149+20
	16 7	1	86	60	35	Rapid	151+23
Nov. 15	13 8	1½	43	37	28½	7½	38-21
	13 48	2	76	59	37	37	151+21

The mean height of 8 true Leonids was 81 to 56 miles and the mean radiant-position  $151^{\circ}2 + 23^{\circ}7$ .

The place of the radiant found by Mr. Winslow Upton at the Ladd Observatory, Providence, was on November 15 a.m.  $150\frac{3}{4}^{\circ} + 21\frac{1}{2}^{\circ}$ , and on November 16 a.m.  $151^{\circ} + 21\frac{1}{2}^{\circ}$ .

The next return of the Leonids will be regarded in an interesting light, for 1902 will afford the 1000th anniversary of the first record of the shower (902). The moon will be full at the middle of November, but as the meteors of this swarm are often brilliant, some of them are likely to be distinguished in spite of the illuminated sky. There were showers of Leonids in 902, 1002, 1202 and 1602, and the revival of the display in 1901 encourages the hope that something may be seen of it in 1902, though the parent comet will be about three and a half years past its perihelion.

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UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The 231st meeting of the Junior Scientific Club was held on January 31. Two papers were read, one by Prof. H. A. Miers, F.R.S., Magdalen, on gold-mining in Klondike, and the other, by Mr. H. L. Tidy, New College, on some curious sounds. The officers of the Club for this term are:—President, Mr. H. H. Cooke, New College; biological secretary, Mr. E. Burstal, Trinity; chemical secretary, Mr. S. P. Grundy, Balliol; treasurer, Mr. E. L. Kennaway, New College; editor, Mr. H. D. Davis, Balliol.

In reply to a question in the House of Commons on Monday as to the approximate date of the introduction of the Education Bill promised in the King's Speech, Mr. Balfour said he was unable to give a date, but he hoped the Bill would be introduced before Whitsuntide.

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CORRESPONDENCE classes in various branches of engineering have been successfully carried on in the United States for several years. Prof. Andrew Jamieson, late professor of electrical engineering at the Glasgow Technical College, has now established similar classes in Glasgow for students of electrical and mechanical engineering. We are glad to notice that all students are advised to take a course of practical mathematics before devoting themselves to other subjects.

THE annual general meeting of the Association of Technical Institutions was held on Friday last in London. Lord Avebury, the president for the ensuing year, delivered an address in which he showed that the system of technical and higher education in Germany had been to the industrial advantage of the nation. If Britannia is to rule the waves she must be able to rule the steam engine and dynamo as well. Resolutions were adopted to the following effect:—(a) That this Association strongly approves the general principles on which the Government Education Bill of 1901 was based, and trusts that the Government will carry a Bill embodying these principles, with such amendments as may prove necessary, in the next session of Parliament. (b) That the Bill should prescribe that the residue under section 1 of the Local Taxation Account (Customs and Excise) Act, 1890, including any balance thereof which may remain unexpended at the end of the financial year, shall be applied for the purposes of education, and shall be administered by the education authority. (c) That an extension of the rating power by only 1d. in the pound, as was proposed in the Bill of 1901, would be wholly inadequate—especially in the case of the county boroughs—to defray the necessary additional charges in respect of secondary education which would fall upon the local authorities. (d) That it should be made a condition of the application of the residue under section 1 of the Local Taxation (Customs and Excise) Act, 1890, to the purposes of secondary education in general, that adequate provision shall first have been made for technical instruction, as was done in clauses one (1) and two (1) of the Duke of Devonshire's Education Bill of 1900. (e) That the Government should at once introduce and pass a Bill placing primary, secondary and technological education under the supervision of one local authority appointed as a rule for an area not less than that of a county or a county borough.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 23.—“On the Causation of the so-called ‘Peripheral Reflex Secretion’ of the Pancreas. (Preliminary Communication.)” By W. M. Bayliss, D.Sc. and Ernest H. Starling, M.D., F.R.S.

Introduction.—It has long been known that the introduction of acid into the duodenum causes a flow of pancreatic juice, and it has been shown recently by Popielski, and by Wertheimer and Le Page, that this flow still occurs after nervous isolation of duodenum and pancreas. Wertheimer also mentions that the flow can be excited by injection of acid into the jejunum, but not by introduction of acid into the lower part of the ileum. These authors conclude that the secretion is a local reflex, the centres being situated in the scattered ganglia of the pancreas, or, in the case of the jejunum, in the ganglia of the solar plexus (Wertheimer).

Results.—The secretion excited by introduction of acid into the jejunum cannot be reflex, since it occurs after extirpation of the solar plexus and destruction of all the nervous filaments passing to the isolated loop of jejunum. It also occurs after intravenous injection of 0.01 gramme atropin sulphate. It must therefore be due to direct excitation of the gland cells by a substance or substances conveyed to the gland from the bowel by the blood stream.

The exciting substance is not acid. Wertheimer has shown that injection of 0.4 per cent. HCl into the blood stream has no excitatory influence on the pancreas.

The secretion must therefore be due to some substance produced in the intestinal mucous membrane under the influence of the acid, and carried thence by the blood stream to the gland. This conclusion was at once confirmed by experiment.

When the mucous membrane of the jejunum or duodenum is exposed to the action of 0.4 per cent. HCl a body is produced which, when injected in minimal doses into the blood stream,