of the New South Wales and Victorian branches, are invited. Among the subjects to be discussed are the necessity of defining the exact meaning of the geographical term Australasia, the compilation of a reliable work on the geography of Australia for Australian schools, the exploration of New Guinea, and the discovering and defining of the exact boundaries of what may now be termed British New Guinea.

ASTRONOMICAL PHENOMENA FOR THE WEEK

1885, FEBRUARY 1–7

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on February 1

Sun rises, 7h. 40m.; souths, 12h. 13m. 53·2s.; sets, 16h. 47m.; decl. on meridian, 16° 58′ S.: Sidereal Time at Sunset, 1h. 35m.

Moon (2 days past Full) rises, 18h. 22m.*; souths, 1h. 23m.; sets, 8h. 12m.; decl. on meridian, 8° 21′ N.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on Meridian ° ′
Mercury	6 31	10 33	14 35	22 3 S.
Venus	6 37	10 39	14 41	22 3 S.
Mars	7 52	12 24	16 56	17 21 S.
Jupiter	18 34*	1 37	8 40	11 28 N.
Saturn	12 14	20 17	4 20*	21 32 N.

* Indicates that the rising is that of the preceding, and the setting that of the following nominal day.

Occultations of Stars by the Moon

Feb.	Star	Mag.	Disap. h. m.	Reap. h. m.	Corresponding angles from vertex to left ° °
1	B.A.C. 3529	6	4 16	5 20	90 292
1	*d* Leonis	5	20 1	20 57	31 218
2	B.A.C. 3836	6	3 29	4 41	76 276
2	75 Leonis	5½	5 26	6 28	116 267
2	76 Leonis	6	6 29	7 25	81 312
5	B.A.C. 4591	6	3 13	4 11	95 199

Phenomena of Jupiter's Satellites

Feb.	h. m		Feb.	h. m.	
1	5 46	I. tr. ing.	3	23 41	I. occ. reap.
2	2 33	I. ecl. disap.	4	0 9	II. ecl. disap.
	5 15	I. occ. reap.		3 49	II. occ. reap.
	6 6	II. tr. ing.		18 38	I. tr. ing.
	22 8	IV. ecl. disap.		20 57	I. tr. egr.
3	0 12	I. tr. ing.	5	19 13	II. tr. ing.
	2 31	I. tr. egr.		22 8	II. tr. egr.
	6 25	IV. occ. reap.	6	2 37	III. tr. ing.
	21 1	I. ecl. disap.		6 13	III. tr. egr.

Saturn, February 1.—Outer major axis of outer ring = 44″·5; outer minor axis of outer ring = 20″·1; southern surface visible.

February 1, 7h.—Jupiter in conjunction with and 4° 9′ north of the Moon.

SCIENCE IN VICTORIA

THE President of the Royal Society of Victoria devoted a considerable portion of the presidential address contained in the last published volume of the Society's *Transactions* to a review of the progress of science in the colony. It might at first sight be supposed that, in young communities like those of the Western States of America or of our own Australasian colonies, the struggle to develop their resources to the utmost, which occupies every one, and the total absence of a leisured class, would be an insurmountable obstacle to scientific work, or indeed to work of any kind for its own sake. But the numerous and valuable publications which we constantly receive from scientific societies formed among young English-speaking communities all over the globe—in Japan, China, the Straits, Ceylon, Australia, Canada, the United States, the Cape, and many other places—show that this impression is wholly incorrect, and that the members carry with them into scientific work the energy and perseverance which they exercise in their ordinary avocations.

The first sign of progress which Mr. Ellery had to chronicle in his address was that the Royal Society had grown too large for its building, and consequently the more spacious rooms of the Melbourne Athenæum had to be selected for the annual address. The number of members has increased annually, and the financial condition of the Society is satisfactory. During the year under review there has been "a vigorous and healthy progress," but the young body, having outgrown its juvenile garments, must provide itself with more capacious ones in the shape of considerable additions to the Royal Society house. In the several national scientific and technical departments the year has been one of active labour, and their progress, in common with that of the Society, has been considerable. There is, the President reports, an undoubted and general increase in the desire for knowledge in the various pure and applied sciences, and especially as applied to technical training and to the daily requirements of life. New societies for the prosecution of study and research, more especially in the natural sciences, have come into existence in the provinces, and the older societies and schools are increasing in their influence and usefulness. The School of Technology and the technological museums at Melbourne are growing rapidly. An example of the great economic benefits of such institutions was afforded during the year under review by the opening of a new trade between Victoria and India wholly on account of the knowledge derived in Melbourne from the museum collection of Indian woods, and it is anticipated that a like result will accrue from a collection of colonial economic woods sent to Calcutta. In Ballarat and Sandhurst the schools of mines are important centres of teaching in the arts and in applied and natural sciences. In Melbourne itself the Medical and Pharmaceutical Societies, the Microscopical Society, and especially the Field Naturalists' Club, have partaken in the general progress.

The President then comes to the question of what has actually been done in Victoria during the year towards the advance of natural science. The first person referred to in this connection is Baron Mueller, to whose research is due a large proportion of what is known of Australian botany. He succeeded in getting the Colonial Government to purchase for the Botanical Museum the collection of Dr. Sanders of Hamburg, a leading authority on algæ, and on European and North African botany. Valuable additions, illustrative of the flora of the western coast districts of Australia, were made to the same museum, which has really been formed by Baron Mueller himself from his collections, extending over nearly forty-four years. Among new publications of the year were additions to the "Fragmenta Phytographia Australis," a continuation of the "Systematic Atlas of the Eucalypti," a new edition of a work on "Select Plants for Industrial Culture," and "A Systematic Census of Australian Plants." A second volume of the vegetable fossils of the auriferous drifts was completed, and in its pages are described and compared most of the fossil fruits of the Pliocene period. A vast field of investigation still remains in the fossil foliage of the Miocene deposits. With a reference to the work of the Melbourne Observatory during the year the president closes that portion of the address with which we are specially concerned here. At the end of the address he argues that the Royal Society is broad enough in its constitution to embrace all sciences, and that, therefore, various sections in connection with it should be formed rather than new societies for each science. The community is not, he thinks, yet large enough to maintain, in an effective state, a number of scientific societies; and if all in Victoria interested in the progress of science, or engaged in her various byways, were to unite together, not only would more useful work be done, but the work would be more valuable, on account of being subjected to a wider criticism. All the colonial scientific societies combined would form a strong body, capable of fostering and even subsidising scientific research. In one respect, perhaps, the wheels of the Society might run more smoothly. The volume (a rather small one) of the *Transactions* for 1883 was not issued till May 30, 1884, and was not delivered in London until more than six months later.

THE KILIMANJARO EXPEDITION

AT a meeting of the Royal Geographical Society held on Monday night, Mr. H. H. Johnston gave a description of his visit to Kilimanjaro, on the slopes of which he spent more than five months in the summer and autumn of last year.

Mr. Johnston began by explaining the circumstances in which, as appointed leader of the expedition projected by the joint Kili-

manjaro Committee of the British Association and the Royal Society, he found himself on arriving at Zanzibar without any trained collectors to assist him. Giving a lively and picturesque narrative of his adventures during his stay with Mandara, chief of Moshi, a person of remarkable character, who rules a small tract on the lower slopes of Kilimanjaro at an altitude of about 6000 feet, and is at war with all the surrounding potentates, Mr. Johnston told how, after some difficulties, he began the ascent of the mountain with forty carriers and some guides provided by another chief, Maranga. They crossed the cultivated zone, which ended at about 5500 feet in that part, entered a healthy district with pleasant grassy knolls and many streams of running water, and encamped beside a lovely fern-choked brook at 6500 feet, the whole ascent being very gradual. The following day they passed through stunted forest, not unlike an English woodland, where the trees, however, were hung with unfamiliar ferns and creepers, and where deliciously scented parasitic begonias trailed their pink flower-bells from branch to branch. The dracæna, which is cultivated by the Wa-Chagga to form hedges, here grew wild. Tree-ferns were abundant and handsome. Above 7000 feet the orchilla moss draped the forest trees in long gray festoons. Tracks of elephents were very numerous. The other noticeable inhabitants of the forest were dark blue touracoes and tree-hyraxes. Wart-hogs were occasionally met with up to 8000 feet. At 9000 feet they encamped for the night by a small spring of water in the midst of a grand bit of forest, not of that stunted character which marked the lower woods. He caught a chameleon and many beetles here, and also shot touracoes and pigeons. The next day they walked several miles eastward to find a good place for settlement close to water, and not too high up, so that his shivering followers might not suffer unreasonably from cold. He selected an admirable spot on a grassy knoll rising above the river of Kilema, which takes its source near the base of Kimawenzi. The altitude of this spot was nearly 10,000 feet. Having seen every one carefully installed and protected from the—to them—severe cold (for the thermometer descended every night to one or two degrees below freezing-point), he transferred his own quarters to a higher elevation, and began industriously to collect. His first excursion was to the base of Kimawenzi. The terrible hurricane of wind, however, that raged round this jagged series of lava peaks, prevented him from continuing the ascent, although he doubted if it were possible for any one to reach the summit, owing to the want of foothold. The snow varied very much in quantity on Kimawenzi. Sometimes the whole peak would be covered down to the parent ridge, with only the precipitous rocks peeping blackly through the mantle of white. At other periods the snow would be reduced to an insignificant patch, and the reddish sand which filled the crevices and glissades between the lava rocks would be left exposed to view. This change from an almost complete snow-cap to nearly no snow at all might be effected in twelve hours. His great object, however, was to reach the snows, and, if possible, the summit of Kibô. To do this it would be necessary to sleep on the way. He had therefore to induce a few followers to accompany him to carry impedimenta. Starting at 9, he walked upwards with few stoppages until 1.30. At first they crossed grassy undulating hillocks, the road being fairly easy. Then they entered a heathy tract, scorched and burnt with recent bush-fires; but higher up, where the blaze had not reached, the vegetation was fairly abundant and green. Small pink gladioli studded the ground in numbers. At an altitude of nearly 13,000 feet bees and wasps were still to be seen, and bright little sun-birds darted from bush to bush, gleaning their repast of honey. A little higher they found warm springs, the thermometer showing the temperature of the trickling mud to be 91° F. Mounting high above the rivulet the scenery became much harsher. Vegetation only grew in dwarfed patches as they passed the altitude of 13,000 feet, and the ground was covered with boulders, more or less big, apparently lying in utter confusion, and without any definite direction. They were not very difficult to climb over, and even seemed to act as irregular stone steps upwards. In their interstices heaths of the size of large shrubs grew with a certain luxuriance. About 13,700 feet he saw the last resident bird, a kind of stonechat apparently. It went in little cheery flocks, and showed such absence of fear that he had to walk away from it before shooting to avoid shattering his specimen. After this, with the exception of an occasional great high-soaring kite or great-billed raven, he saw no other bird. On reaching a height a little above 14,000 feet he stopped again to boil the thermometer and refresh himself with a little lunch. Throughout this ascent, which was easy to climb, he suffered absolutely nothing from want of breath or mountain sickness, although his three Zanzibari followers lagged behind, panting and exhausted, and complained much of their lungs and head. "Mounting up a few hundred feet higher than the last stopping-place," Mr. Johnston said, "and rounding an unsuspected and deep ravine, I arrived close to the base of a small peak which had been a continual and useful point to aim at during the whole journey from my station. I was now on the central connecting ridge of Kilimanjaro, and could see a little on both sides, though the misty state of the atmosphere prevented my getting any good view of the country. This ridge, which from below looks so simple and straight, is in reality dotted with several small monticules and cut up into many minor ridges, the general direction of which is, on the southern side, from north-east to south-west. To the eastward I could see the greater part of Kimawenzi rising grandly with its jagged peaks and smooth glissades of golden sand. Westward, I still looked vainly in the piled up clouds, for the monarch of the chain still remained obstinately hidden, and I was at a loss as how to best approach his awful crown of snow. At length, and it was so sudden and so fleeting that I had no time to fully take in the majesty of the snowy dome of Kibô, the clouds parted, and I looked on a blaze of snow so blinding white under the brief flicker of sunlight that I could see little detail. Since sunrise that morning I had caught no glimpse of Kibô, and now it was suddenly presented to me with unusual and startling nearness. But before I could get out my sketch-book and sharpen my chalk pencil, the clouds had once more hidden everything, indeed, had inclosed me in a kind of London fog, very depressing in character, for the decrease in light was rather alarming to one who felt himself alone and cut off at a point nearly as high as the summit of Mont Blanc. However, knowing now the direction of my goal, I rose from the clammy stones, and, clutching up my sketch-book with benumbed hands, began once more to ascend westwards. Seeing but a few yards in front of me, choked with mist, I made but slow progress; nevertheless, I continually mounted along a gently-sloping hummocky ridge, where the spaces in between the masses of rock were filled with fine yellowish sand. There were also fragments of stone strewn about, and some of these I put into my knapsack. The slabs of rock were so slippery with the drizzling mist that I very often nearly lost my footing, and I thought with a shudder what a sprained ankle would mean here. However, though reflection told me it would be better to return to my followers and recommence the climb to-morrow, I still struggled on with stupid persistency, and at length, after a rather steeper ascent than usual up the now smoother and sharper ridge, I suddenly encountered snow lying at my very feet, and nearly plunged headlong into a great rift filled with snow that here seemed to cut across the ridge and interrupt it. The dense mist cleared a little in a partial manner, and I then saw to my left the black rock sloping gently to an awful gulf of snow so vast and deep that its limits were concealed by fog. Above me a line of snow was just discernable, and altogether the prospect was such a gloomy one, with its all-surrounding curtain of sombre cloud and its uninhabited wastes of snow and rock, that my heart sank within me at my loneliness. Nevertheless, I thought, 'only a little further, and perhaps I may ascend above the clouds and stand gazing down into the crater of Kilimanjaro from its snowy rim.' So, turning momentarily northwards, I rounded the rift of snow, and once more dragged myself, now breathless and panting, and with aching limbs, along the slippery ridge of bare rock which went ever mounting upwards. I continued this for nearly an hour, and then dropped exhausted on the ground, overcome with what I suppose was an ordinary attack of mountain sickness. I was miserably cold, the driving mist having wetted me to the skin. Yet the temperature recorded here was above freezing-point, being 35° F. I boiled my thermometer, and the agreeable warmth of the spirit-lamp put life into my benumbed hands. The mercury rose to 183°·8. This observation when properly computed, and with the correction added for the temperature of the intermediate air, gives a height of 16,315 feet as the highest point I attained on Kilimanjaro. I thus came within a little more than 2000 feet of the summit, which is usually estimated to reach an altitude of 18,800 feet." He made other ascents during the month he was in high altitudes. The footprints and other traces of buffaloes were seen up to 14,000 feet, but he never caught sight of one of the creatures, nor did he see any of the big antelope,

who also wander up to the snow line. At a height of 13,000 feet he saw three elephants, and at night the shrill trumpeting of these animals could be heard round the station. On October 18 he found himself, most unwillingly, obliged to leave the elevated settlement and return to Taveita. The relatively great cold they had experienced had reacted very unfavourably on his men's health, and he feared that a longer delay might render them quite unfitted to carry burdens. He intended, however, to make his return journey entirely through a new and hitherto untraversed country, and this project somewhat consoled him for leaving the summit of Kilimanjaro still unconquered. Their downward journey, part of the way through trackless bush and dense dank forest, was not without adventure and some reward in scenery of great beauty. The average elevation of this country was between 8000 and 7000 feet, and the temperature consequently almost cool, ranging from 43° at night to 70° in the mid-day warmth. After some four hours' walking from their camp they crossed the long ridge that marked the southern flank of Kimawenzi, and began to descend the eastern slope of the mountain. Soon they emerged on a kind of heath-like country, and then looked forth on a splendid view stretching from Mwika to the mountains of Bura and Ukambani (the Kiulu range), with Jipe on one hand and the River Tzavo on the other. After some enjoyable excursions from his settlement at Taveita, finding that his funds would not support the expedition beyond the end of November, he made a rapid journey to the coast by way of Pare, Usambara, and the Rufu river to Pangani. At Zanzibar, finding there were no fresh funds to enable him to return to Kilimanjaro, he paid off the last of his faithful followers, many of whom had accompanied Thomson on his great journey, and took his passage on the British India steamer to Suez in quite a sulky frame of mind, as sorry to leave his beautiful mountain as many people are to quit England. Travelling overland from Suez, he arrived in London not much more than six weeks after he had caught his last glimpse of the snows of Kilimanjaro.

A SCANDINAVIAN LAND OF OPHIR

WE learn from *Naturen* that the little island in the Hardanger Fjord, known as Bömmelöen, which two years ago was an uninhabited and desolate spot, is now a busy scene of extensive gold-digging. Numerous English artizans and Norsk bricklayers and carpenters have for months been actively engaged in boring and sinking shafts into the rock, and in preparing houses and shelter for the men and machinery that have been drawn hither by the report of the discovery in 1882 of gold in the Storhangen mine. This discovery had been anticipated in 1862 by the find of a piece of pure gold, which was at once deposited in the mineralogical museum of Christiania, where it has since remained apparently unheeded, although the place and time at which it was found are duly marked on the corresponding label. After twenty years gold was again found in 1882, at the Storhangen mine, which was then being worked for copper ore. The result of this discovery was the purchase, in 1883, of the works by an English firm, trading under the title of the Oscar Gold Mining Company, which is worked under the scientific direction of Mr. Murchison. Considerable amusement seems so have been created among Norsemen by a somewhat ambiguous statement, set forth in the Company's circulars, which oracularly announces that "the gold finds at Bömmelöen are either Nature's greatest success or her greatest illusion"!

The geological formation of Bömmelöen is similar to that of other auriferous rocks, the gold being found in quartz, which occurs in strata never more than six feet thick, although of considerable extent, and generally underlying green (chloritic) schist. The greenstones of the island differ from those found in other parts of Norway, and contain glass and various typical vulcanic products.

The operations of the Oscar Mining Company have given a new stimulus to the search for gold in Norway, and we learn that Herr Bakke, Inspector of Mines at Trondhjem, has officially reported the discovery of virgin gold in a piece of chloritic slate from Stegen in Nordland, while it is authoritatively stated that gold has been found within the last year or two at Sveen in the Bergen-Amt, and also near Stavanger. In the latter case the discoverer, Nils Berg, an old experienced Australian gold-digger, washed the gold from the mud remaining at the bottom of a shaft that had been sunk in a copper mine.

SCIENTIFIC SERIALS

Wiedemann's Annalen, vol. xxiv. January 1885—O. Lehmann, on the melting-points of bodies in contact, and on the electrolysis of solid iodide of silver. A remarkable paper, accompanied with an elaborate plate describing phenomena of crystallisation observed chiefly with microscope at limiting edge of two crystallisable liquids or solutions. Iodide of silver presents certain closely-related phenomena under electrolysis, both in molten and in solid condition. Regular crystalline iodide of silver conducts an electric current, the silver being carried in the direction of the negative current through the crystal without its structure being disturbed. In its electrolysis, however, there appears a streaking in the direction of the flow of the current.—W. von Bezold, on a new kind of cohesion-figures. These experimental researches relate to the quasi-dendritic forms observed when one liquid descends through another.—L. Boltzmann, on the possibility of founding a kinetic theory of gases on attractive forces alone. This is an attempt to dispense with Maxwell's hypothesis that molecules repel one another in the inverse fifth power of the distance, which he framed to account for the apparent perfect elasticity exhibited by molecules of gases. Boltzmann proposes a new theory, based on attraction, very similar to that recently independently propounded by Sir W. Thomson (NATURE, August 28, 1884).—O. Chwolson, on the calibration of the plug-rheostats of Siemens and Halske. This discusses corrections for the resistance of connecting-pieces, &c.—F. Kohlrausch, the electric conductivity of water distilled *in vacuo*. A column of pure water 1 metre long and of 1 square millimetre section has a resistance of about 4×10^{10} ohms.—G. Kirchhoff, on the change of form which an elastic body experiences when it is magnetically or dielectrically polarised. This paper, originally published in the *Proceedings* of the Berlin Academy, deals analytically with the phenomenon of electrostriction investigated by Lorberg and others.—A. Schuster, on the discharge of electricity through gases. Treats of certain points in dispute between the author and Profs. Goldstein and E. Wiedemann. The author pronounces in favour of the view that all the phenomena of effect of magnetism, &c., upon the discharge of the negative electrode may be explained if it be admitted that the negatively-charged portions of the gaseous molecules are driven off from the kathode.—E. Goldstein, on electric conduction in the vacuum. Discusses some experiments in which a carbon filament lamp was employed; the filament forming one electrode, a platinum wire being inserted through the glass to serve as another electrode for the discharge, which was obtained, without an induction-coil, with electromotive forces of about 300–350 volts.—Werner Siemens, contributions to the theory of magnetism. Describes experiments on partially-closed magnetic circuits of iron, giving rise to the opinion, that the harder a specimen of iron is, the greater is the value of the magnetising force at which the maximum of permeability is observed. Also, the magnetic resistance of air is from 480 to 500 times as great as that of iron.—H. Hertz, on the dimensions of unit of magnetic pole strength in different systems of measurement.—E. Ketteler, the optical constants of magnetic media. Develops equations relating to Kundt's recent magneto-optic observations.—E. von Fleischl, the double refraction of light in fluids. Proves that in optically-active liquids the rotation is due to the existence of double refraction. Double-refracting liquids have no optic axis, and the wave-surface consists of two concentric spherical sheets.—W. von Voigt, on the measurement of the refractive indices of absorbing media. Recommends the prism method as more accurate than the total-reflection method.—W. von Voigt, on the theory of reflection and refraction at the boundary of crystalline media. New equations based on the author's theory of the reactions between matter and ether in transparent media, and leading to same conclusions as Kirchhoff's older theory.

Journal de Physique, November, 1884.—J. Jamin, on hygrometry. The author proposes to substitute for the "relative humidity" a new coefficient termed the "hygrometric richness," which is the ratio of the actual pressure of aqueous vapour of the air to the difference between the total atmospheric pressure and the actual vapour pressure. The substitution appears to be both rational and instructive.—Ch. Rivière, essay on cooling power of gases. Confirms formula of Dulong and Petit up to 400° C., but above that temperature the observed values are lower than the theoretical. Also appears to prove that at very low pressures cooling power is independent of the chemical composition