

THE TRANSIT OF VENUS.

It is not difficult to understand why astronomers attach so much importance to the transit of Venus, which took place between two and six o'clock this morning. The determination of the scale on which the solar system is constructed, although not in any sense affecting the astronomy of calculation and prediction, affects the very basis of the far more interesting astronomy of physical facts. Our ideas respecting the sun and planets depend greatly on the opinion we form of the dimensions of these bodies. For example, when we consider the wonders which have been revealed by modern researches into the structure of the sun; when we see his noble orb strewn at one time with enormous spots, and at another absolutely without spot or blemish; when we consider how all around his globe are flames of glowing hydrogen, leaping up in places to a height many times exceeding the diameter of this earth on which we live; we recognise the importance of determining the real scale on which these tremendous processes are taking place. It is because we already know the sun to be so far away, and therefore so large, that we find the phenomena of solar physics so impressive; for we know that the very least sign of change detected in the sun's orb from our distant standpoint implies processes so stupendous that the whole earth could not exist even where they were in progress, but would in a few moments be reconverted into the vaporous condition from which she passed millions of ages ago. Regarding the sun as the great storehouse whence the supplies of light and heat necessary for the wellbeing of our earth are lavishly distributed, we find it a matter of even greater interest to determine on what scale the mighty centre of our system has been framed. For on the size of the sun, and still more upon his distance, which implies the largeness of his domain, the duration of his life-giving power depends, and, therefore, the duration of life upon this earth. Nor do we find it possible to study attentively the planets over which he bears sway without perceiving that in their case also the question of size is of extreme importance. Our estimate of their magnitude manifestly depends on our estimate of the sun's distance. Any change in this fundamental element must change also our estimate of the dimensions of the whole solar system, and of every planet belonging to it except only our own earth and her companion planet, the moon.

Hence it may truly be said that the whole of that department of astronomy which is most interesting to us—all astronomy in fact—outside the columns of the Nautical Almanack, will be affected by the results obtained during the present transit of Venus. The slightest possible change in the adopted, though much doubted, estimate of the sun's distance will correspond to adding or taking away from our estimate of his mass, a quantity out of which thousands of such globes as our own earth could be framed. The last change of the kind diminished the sun's estimated mass by nearly forty thousand times the actual mass of the earth, and reduced the estimated pressure of every particle of matter of the sun's surface by almost exactly the weight which that matter would have under the action of gravity at our earth's surface. It diminished the estimated velocity with which meteoric matter drawn in from outer space approaches the sun by a velocity half as great again as that with which the giant Jupiter speeds upon his mighty orbit. And although it is not to be expected that anything like so great a change will be occasioned by the results of the present observations, yet there can be no doubt that the new estimate of the dimensions of the solar system will differ so much from that at present adopted as to involve changes as to size, mass, and velocity, compared with which all terrestrial relations of like kind sink into utter insignificance.

But apart from considerations such as these, the transit of Venus occupy an interesting position in the history of astronomy. Long before their value as means of determining the sun's distance had been recognised, they attracted the attention of thoughtful astronomers because of their bearing on the theory of planetary motion. Cassendi watched patiently to observe the transit of 1631, but in vain; because the transit had been miscalculated, and occurred in the night time for Europe. Horrocks was more fortunate in his attempt to observe the transit of 1639. He calculated the transit himself arriving at a result differing notably from that which the great Kepler had obtained (who, indeed, supposed there would be no transit), and also from the result of the more pretentious calculations of the Belgian astronomer Lansberg. Few episodes in the history of astronomy are more interesting than the observation of the transit by the young English clergyman and his friend Crabtree. Confident in his calculations, yet not willing "to be deceived by a vain exultation," Horrocks watched all through that Sunday, November 24th of the Old Style (December 6, N.S.), on the afternoon of which he had calculated that the transit would begin. A narrow limit, indeed, separated the time at which he judged that Venus would first appear from the hour of sunset. "My corrected computation," he says, "forbade me to expect anything before three o'clock in the afternoon," and the sun was to set at a quarter to four. The young astronomer waited, and watched at Hoole, divided between hopes and fears, while his friend Crabtree, stationed near Manchester, was disturbed near the moment when transit was to begin by finding the sun's face obscured with clouds. Nevertheless, fortune favoured both of them. Horrocks perceived Venus first at a quarter past three (having been called away by ministerial duties between one o'clock and that hour); and he found her occupying precisely the position he had expected. She had manifestly entered on the sun's face at three, and was now just fully upon it. Before the sun was lost to his view, Horrocks watched Venus as she advanced through twice her own breadth upon the solar disc. Crabtree's view of the sun was interfered with by clouds till twenty-five minutes to four, when, the sun bursting forth, he observed Venus already fully entered on the face of the sun. "Rapt in contemplation, he stood for some time motionless," writes Horrocks of his friend, "scarcely trusting his own senses through excess of joy; for we astronomers have, as it were, a womanish disposition, and are overjoyed with trifles and such small matters as scarcely make an impression upon others; a susceptibility which those who will may deride with impunity. . . . But let no severe Cato be seriously offended with our follies; for, to speak poetically, what young man on earth would not, like ourselves, fondly admire Venus in conjunction with the Sun, *pulchritudinem divitiis conjunctam*?

Nor were the transits of 1761 and 1769 without their historical interest. The misfortunes of Le Gentil remind us of the good fortune of science on the present occasion, in that no wars interfered to prevent astronomers occupying the most desirable stations. And yet, in passing, we may note that war has to some degree affected the dispositions made upon the present occasion, since it can scarcely be doubted that France, if not Germany, would have taken a larger share in the work but for the expenses entailed by the war of 1870. But in 1761 war had a much more serious effect for evil. Le Gentil, one of the most skilful of the French observers, was unable to occupy Pondicherry, the place selected by the Paris Academy, because, when his frigate reached the coast of Malabar, he learned that the English were masters of Mahe and Pondicherry. He sailed for the Isle of France, but the transit occurred while he was still at sea, and he observed it (quite uselessly, of course) from the deck of his ship. The English expedition to Bencoolen was fortunate rather than the reverse in being hindered by a similar cause, for that place had nothing whatever to recommend it, and was apparently selected only because Halley had named it in 1712, when he altogether miscalculated the nature of the transit, as the result proved. But the real conditions of the transit were known long before the expedition sailed, and it is difficult to understand how so ill-judged an arrangement came to be adopted. Possibly some official pique may have operated to prevent the change which should have been made. Fortunately, a Spanish war-ship stopped the expedition, which put in at the Cape, a station in all respects excellent, where very useful observations were made.

The transit of 1769 derives interest from the fact that the most important of the English expeditions sailed with Captain Cook on the first of his voyages round the world. Le Gentil experienced renewed ill-fortune. He had stayed eight years at Pondicherry (where he was enabled to go when peace was declared between France and England), but at the critical moment of the transit a cloud obscured the sun. Chappo d'Auteroche, though successful in his observations at St. Joseph, lost his life through his excess of zeal for astronomy. Three days after the transit had been observed he was attacked by an epidemic malady, and only twelve days later, when he was slowly recovering his strength, an eclipse of the moon occurred which he insisted on observing. The fatigue caused a relapse, and he died six weeks later, on August 1st, 1769. "Je suis bien qu'il faut finir," he said, shortly before his death. "at que je n'ai que peu de temps a

vivre, mais j'ai rempli ma mission et je meurs content;" and though his mission was one of peace, this sentiment is as worthy of respect as though he had fallen on the field of battle after fulfilling a mission of slaughter.

Doubtless the present transit and the transit to follow in 1882 will present successes and failures rendering their history not less interesting than the record of transits which are past. Ere long we shall know to which side the balance inclines in the case of the transit of 1874—whether science will have to regret mischances or to rejoice over good fortune. Whatever be the event, it cannot be doubted that excellent provision has been made to ensure success, so far as success can be ensured, in a matter depending so largely upon accidents of weather. At present we can but echo the devout aspiration of the Astronomer Royal—"Heav'n send good weather for observation."

DEAF AND DUMB.

TO THE EDITOR OF THE DAILY NEWS.

SIR,—As one who takes a deep interest in the spiritual and temporal welfare of the deaf and dumb, may I crave the space of a few lines in the *Daily News* to call attention to a subject in which I am sure the supporters of our charitable institutions for the deaf and dumb will be much concerned? The excellent education given at each of these institutions is well known, but it will surprise a great many to learn that in Old Kent-road the unfortunate mutes attend the ordinary services of the church without having any opportunity of understanding the services or the sermons. In fact, they might as well be away for any good purpose which is served by their attendance. At other places—such as St. Matthew's, Bothnal-green, and St. Saviour's, Oxford-street—the text and sermon are explained in the finger and sign language on one side of the church; and it seems to me that a similar arrangement might well be made at Old Kent-road. The principal of that establishment is a clergyman thoroughly competent to undertake the duty. It is painful to see the listless expression of the deaf and dumb during Divine service, and it is to be hoped that attention has only to be called to the matter to ensure a speedy remedy.—I am, Sir, your obedient servant, D. T. B., a Deaf Mute.

A CENTENARIAN.

TO THE EDITOR OF THE DAILY NEWS.

SIR,—For the information of Mr. Thoms and others I beg to send you the following particulars of the case of an undoubted centenarian. Edward Stone, son of Edward and Hannah Stone, of Crocombe, near Wells, was born on December 11th, 1774, and baptised on January 15, 1775, as attested by the parish register, and an old Bible in existence. He enlisted into the Marines in 1793, and served in various vessels chiefly on the French coast, until he was discharged in 1802. Having been "drawn" for the Militia in 1802, he volunteered into the 40th Regiment, and served in Ireland, the Peninsula, and in France. He was discharged from the army on the 17th of May, 1815, after a severe wound received at Vittoria. He is in excellent health, though very thin, and will walk some distance to be feted on his 100th birthday, on Friday next, December 11th.—Yours truly,

F. PORTER SMITH, M.B. Lon., F.R.G.S.
Shepton Mallet, Dec. 7.

CITY CHORAL SOCIETY.—The amateur choir under this name, conducted by Mr. Edwin Moss, gave a concert last night in the schoolroom of the City Temple, the pastor of which church, the Rev. Joseph Parker, D.D., occupying the position of president of the society. The choir consists of nearly equal proportions of ladies and male voices, and both have been brought to a degree of excellence that redounds much to the credit of themselves and their instructors. Last night's programme consisted of sacred selections in the first, and secular music in the second, part. The society had the professional assistance of Miss Lizzie Evans, an accomplished and very pleasing soprano, a pupil of the Royal Academy of Music, who gave with much effect "There is a green hill far away," and "Robin Adair." Solos and songs were also given by Miss E. Butterworth (contralto) and Miss C. Harper (soprano), members of the society, both of whom met with highly flattering receptions, and were recalled after each song. In the absence of Mr. Harper, who was suffering from cold, the songs in his name were effectively given by Mr. Moss, the conductor, who was ably supplemented by Mr. James. The choral selections, and indeed the whole programme, met with most favourable recognition by a very considerable audience.

A FAMILY POISONED.—During the past few days considerable excitement has been caused at Lindfield, near Hayward's Heath, in consequence of the report that a family had been poisoned through eating some jam pudding. Up to yesterday two deaths had occurred. The names of the deceased are Frederick Knight, aged 4 years; and a girl named Aimie Knight, aged 2 years. For the past two years an agricultural labourer, his wife, and family of four children, have been living in a cottage in the village of Soyves-hill, near Lindfield, and always enjoyed good health. On Thursday afternoon last the mother and her four children, after eating some currant and raspberry jam pudding for dinner, were all seized with illness, and were very sick. A medical man was sent for, and prescribed for them. The mother recovered, but two of the children died, and two others remain in a precarious condition. Yesterday a third child was expected to die. The inquest on the bodies of Aimie and Frederick Knight was opened by Mr. L. G. Fullagar, the coroner for East Sussex. Eliza Knight, the mother of the deceased, said that on Thursday the children returned from school about 12 o'clock. They sat down to dinner, after which they all ate some currant and raspberry jam pudding. The other children were aged respectively six and nine years. They all became ill after dinner, and some of them were very sick almost immediately afterwards. Thinking, however, they were suffering from cold, she sent them to school again at two o'clock, but the youngest child returned crying, was very sick, and continued asking for cold water, as he said his mouth was burning him. The child became insensible, and expired on the following evening. The second child also returned, apparently in great pain, had two fits, and expired on Saturday at six o'clock. Witness herself was very ill after dinner. Mr. William E. Porter, surgeon, of Lindfield, said that he was called to see the family, who had been seized with sickness and purging. Since the deaths he had made a post-mortem examination in each case, and found the intestines contained a small amount of dark brownish fluid. The intestines were most extensively inflamed. The cause of death in each case was convulsions produced by intestinal irritation. The appearances were all those of irritant poison. The coroner adjourned the inquiry for an analysis to be made of the contents of the stomachs.

FATAL COLLISION ON THE THAMES.—An inquest, which has been several times adjourned, was concluded at Plumstead yesterday, relative to a collision between the screw steamer *Thames*, of Glasgow, and three barges, by which two of the barges were sunk, in Erith Reach, and two persons, a bargeman and his wife, named John and Lucy Knight, were drowned. William M'Kee, master of the barge Robert, belonging to Messrs. Curtis and Harvey's powder magazine at Erith, said he saw the steamer coming down the river against the tide, and in her proper course on the south shore. Several barges were sailing up-close together, and the steamer kept on the port helm to avoid them. Suddenly, however, the foremost of them, a barge named the *Sisters*, starboarded her helm, and ran right under the steamer's bows. The steamer thereupon, to avoid running over the *Sisters*, starboarded also, which brought her down upon the two next barges, the *Adela* and the *Volunteer*. The men in charge of these, obeying the rule of the road at sea, to port helm in any difficulty, put their helms hard apart, hoping to run off to the north and get clear, but the south-west wind assisted to drive the steamer in the same direction, and before she could stop she cut clean through the *Adela* and sunk her, besides doing some damage to the *Sisters*, and inflicting such injury upon the *Volunteer* that she sank in ten minutes. Knight and his wife were not seen after the collision, but the only other person on board, the mate, saved himself by swimming. The evidence of this witness was confirmed by several other bargemen, who all concurred in ascribing the blame to the helmman of the *Sisters*, and exonerating the persons in charge of the steamer. William Griggs was then called, and said that he was a waterman and gained his living by piloting vessels up and down the river. He was in charge of the *Thames* when this accident occurred on October 15. He saw the barges, and was keeping well out of their way, until for no reason whatever the *Sisters* starboarded. Knowing that he must have cut that barge down if he had kept straight, and having several other craft on the port side, he decided that the best thing to do was to starboard, hoping that the other barges would starboard also, and follow the *Sisters*. He accordingly stopped, and reversed the engines and starboarded the helm, calling out to the bargemen to starboard likewise; but they, thinking no doubt that they were legally bound to do so, put their helms hard apart, and, as the speed of the vessel had little diminished, he could not avoid running over them. He then lowered a boat, and stopped the propeller, for fear of injuring any one who might be in the water, but saw no one. The coroner informed the jury that they were not to consider who was liable for the damage which had been done, but whether Griggs or any one was responsible in a criminal sense for the deaths of these two persons. The jury expressed an opinion that Griggs was driven to act as he did by the misconduct of the *Sisters*, and returned a verdict of "Accidental death."

THE ALLEGED CRUELTY TO HYENAS.—Yesterday, at the Leeds Borough Court, Mr. Bruce, the stipendiary magistrate, delivered judgment in the case of cruelty to several hyenas, in *Edmonds' menagerie*, when that exhibition was in Leeds, during the fair week, in November. Mr. Feens, for the prosecution, still contended that a hyena confined within a menagerie came within the definition of the statute which provides that no cruelty should be exercised towards any of the animals mentioned in the statute, and concludes with the words, "or any other domesticated animals." Mr. Bruce, in delivering judgment, said that in this case the two defendants were summoned for cruelty to animals, and he had no hesitation in stating that from the evidence before him there was a cruel ill-treatment of the animal. The first question was as to whether the law reached such a case. This case was laid under the Cruelty to Animals Act, 20th Vic., c. 92, s. 2, which enacts that if any person cruelly beating, ill-treating, or over-driving any animal shall be subject to a penalty of 5*l*. The word "animal" here used was very general, but it was, however, limited by an interpretation clause, which states that an animal shall mean "a horse, cow, bullock, heifer, ox, dog, cat, &c." The learned magistrate next pointed out that the provision of the statute also stated that if there was any baiting of a domestic or wild animal, such baiting was punishable. The idea of a hyena leaping through blazing hoops was not then thought of. No man, in the eye of the law, would ever think of classing a hyena kept in a menagerie as a domestic animal. He had expressed his opinion strongly about the cruelty, and if it were not discontinued it was to be hoped that the common sense of the people would discourage it, or that the Legislature would interfere in the matter. Judgment would be given for the defendants. Mr. Feens, for the prosecution, applied for a case, but it was refused by his worship.

The *Sussex Daily News* announces the death of Major Meek, of Balcumb, Sussex, high sheriff of that county. He had been ill but a short time of congestion of the lungs.

The grandest and most luxuriant hotel in the world, where all the real comforts of life can be enjoyed, is the Grand Hotel, Paris, which is particularly recommended to the nobility and gentry for its moderate rates. Particular attention is drawn to the quality of the table, and the selection of the best and choicest wines.—A. V. Lombard, Administrateur.—Advertisement.