

Dr. Parkinson for a short time acted as President of his college. He examined for the Mathematical Tripos in 1849 and 1852, and was on the Council of the Senate more than once. He was a Fellow of the Royal Society, and was elected a Fellow of this Society March 11, 1853.

STEPHEN JOSEPH PERRY was born in London on August 26, 1833, and was the son of Mr. Stephen Perry, a member of a well-known firm in Red Lion Square. He received his early education at Gifford Hall School, and then went to France to study at the college at Douay, where he was so successful in his mathematical work as to carry off the first prize. From Douay he proceeded to the English College at Rome for theological training, as he was destined for the priesthood, and in 1853 he entered the Society of Jesus.

It was in 1856 that Father Perry first came to Stonyhurst to go through the usual course of mental philosophy and physical science. His special aptitude for mathematics was soon perceived, and in the same year he was appointed to assist the Rev. A. Weld, who was then Director of the Observatory.

In 1858, on matriculating at the London University, he went up for mathematical honours, taking the sixth place. After this he was sent to London for a year to study under Professor De Morgan, and then for another year to Paris, where he attended the mathematical lectures of Liouville, Delaunay, Serrat, Cauchy, and Bertrand.

In the autumn of 1860 he returned to Stonyhurst, being appointed Professor of Mathematics and Director of the Observatory, as successor to Father Weld, who had held that position for many years. In the autumn of 1863 he left to complete his theological course at St. Beuno's College, in North Wales, where he was ordained priest in 1866; and when all his studies were completed he came back finally to Stonyhurst in 1868 to resume charge of the observatory, which he continued to direct until the day of his death.

The first important scientific work Father Perry undertook, was in the autumn of 1868, when he spent the vacation in making a magnetic survey of the west of France, in which he was assisted by the Rev. W. Sidgreaves, S.J. The instruments employed were those in constant use for the monthly observations of the magnetic elements at Stonyhurst. Complete sets of observations of dip, declination, and horizontal force were taken at fifteen different stations, and the elements reduced to January 1, 1869, the secular variations being obtained by comparison with Lamont's observations made ten years previously.

In the following year this survey was continued and extended to the eastern part of France, the months of August and September being devoted to it. Complete sets of observations were made at twenty-one stations, and the elements reduced to the same epoch. In both series two sets of observations were made

at Paris. Thus the magnetic elements of thirty-five different stations, well distributed over France, were determined by the same observers with the same instruments.

Father Perry's attention had been directed to the unsatisfactory character of the magnetic elements in Belgium, and he considered that a new series of determinations was rendered necessary in consequence of previous observers having chosen very few stations in that country, and especially as the curvature of the isodynamics and isoclinals in Lamont's maps indicated some very considerable disturbing cause. In 1871, therefore, he, assisted by Mr. W. Carlisle, undertook a new magnetic survey, when complete sets of observations were made at twenty different stations.

The result was to indicate that the coal measures, which stretch completely across the south-eastern portion of the country, exercise a strong disturbing influence, so much so as to completely mask the normal direction of the lines.

The results of these magnetic surveys were all published in the *Philosophical Transactions*.

In 1870 Father Perry was chosen as chief of the expedition to Cadiz to observe the total eclipse of the Sun, the results of which he communicated in a paper published in the *Monthly Notices*.

In 1872 he commenced regular observations of the phenomena of *Jupiter's* satellites, employing the 8-inch Troughton and Simms Equatoreal. These have been continued to the present date, and, with the exception of the period 1875-1877, when there existed unavoidable hindrances to the prosecution of the observations, they form a fairly connected series, which have been published in the *Monthly Notices*.

In 1874 Father Perry was appointed to the command of the important expedition to Kerguelen Island to observe the transit of *Venus*. It is unnecessary to refer particularly to the observations made on that occasion, which have all been published in the official account, and fully discussed in the *Monthly Notices*. But he has recounted his experiences of the whole expedition in some graphic and delightful "Notes of a Voyage to Kerguelen Island to Observe the Transit of *Venus*, December 8, 1874," published in the *Month and Catholic Review* in 1876.

He, with the Rev. W. Sidgreaves, his companion in the French magnetic work, left England in the latter part of June 1874 and arrived at the Cape of Good Hope July 20, where all the members of the party were assembled. Various accidents and hindrances occurred which prevented the expedition leaving Cape Town till September 18. The voyage to Kerguelen, or Desolation Island, in H.M.S. "Volage" was an eventful one from the heavy weather and exceedingly rough sea that were experienced. Father Perry was throughout life a martyr to seasickness, which never left him so long as he was on board ship, but his narrative contains no word of his own sufferings in a

voyage which must have been full of pain and discomfort, and, indeed, not without peril.

Few persons have probably realised what was involved by going to this island to observe the planet *Venus* pass across the Sun's disc. The desolate situation, almost 3,000 miles away from any habitable spot; the dreary aspect of an island of rock and lake and bog, without man, or beast, or tree to break the monotony of its loneliness; and, most of all, the fearful approach through mist and storm, with waves the greatest in the world, and winds blowing a gale for five days out of every seven: and yet it was this cheerless island that Father Perry and his companions inhabited from October 8 to the 26th of the following February, with weather in which, he says, they were never free from the danger of a heavy fall of snow, even at midsummer, and with a wind which seldom failed to blow fully half a gale in the course of forty-eight hours. On the eventful December 8 the sky was very hazy and Father Perry's observations of the ingress of *Venus* were in consequence very imperfect; but as egress approached the Sun cleared a little, without, however, being brilliant, and he was able to secure both contacts. His work, however, was not over. Sir George Airy had pointed out to him, as he did to the meeting of this Society in November 1874, the necessity for an absolute determination of longitude at Kerguelen. This meant one hundred double observations of lunar altitude, or azimuth, and thirty transits of the Moon over the meridian. When we learn from Father Perry's "Notes" that up to December 8 only five transits and a proportionate number of azimuths had been secured, we may well admire the enthusiasm and the high sense of duty that impelled him and his party to settle down for a further twelve weeks' work in this inhospitable clime; that being the utmost time it was calculated to be prudent to stay, on account of the stock of provisions; and even that accompanied with the prospect of a home journey of many thousand miles upon half rations. As he modestly puts it, "We must not deny that there was a little grumbling, but the work was done, and, we hope, thoroughly." On the homeward voyage a cyclone, which flooded everywhere, with wind blowing a hurricane and the ship rolling at times more than 45° , was one of the most perilous trials he experienced.

But these discomforts and hardships seem only to have inspirited Father Perry to devote himself in the future to like expeditions, for in 1882 he again took charge of an expedition to the south-west coast of Madagascar to observe the transit of *Venus*. On this occasion he was accompanied by Father Sidgreaves, who had been his companion at Kerguelen, and by Mr. Carlisle, an assistant at the Stonyhurst Observatory. The party left England on August 29 and arrived at Madagascar October 22 in H.M.S. "Fawn." The insecurity on the main island made Father Perry select the small island of Nos Vey for his observing station. Nos Vey is a heap of sand, three-quarters of

a mile in length by one-quarter in breadth, surrounded by a coral reef, and inhabited by French and English traders, with about sixty native families from the mainland. On the south point of this sandbank he erected his instruments. On the day of the transit, notwithstanding a high wind and showers of fine sand, which fell over the instruments, satisfactory observations of internal contact at ingress were secured by all the observers. The particulars of these observations have been published in Mr. Stone's official report.

In 1886 Father Perry went out to the West Indies with the British expedition to observe the total solar eclipse of August 29 in that year. His station was at Hermitage, on the island of Carriacou. For the observation of this eclipse he took out the 5½-inch equatoreal by Alvan Clarke, which had formerly belonged to the Rev. T. W. Webb. He devoted himself to spectroscopic observations, the report of which has been published in the *Philosophical Transactions*.

In 1887 he was nominated by the Council as a representative of this Society, to observe the solar eclipse of August 19. For this purpose he accepted the hospitable invitation of Professor Bredichin, and proceeded to the town of Pogost, on the Volga, but on account of the bad weather he was unable to secure any important observations.

Soon after his return from Kerguelen in 1875 Father Perry had turned his attention to solar physics, and had inaugurated a series of solar drawings and measurements of the chromosphere, in which he was materially assisted by the special aptitude for drawing such objects displayed by one of his assistants, Mr. McKeon. This work has been continued uninterruptedly since 1879, and includes a careful drawing of the solar surface on every available occasion (made by projecting the image on a screen), and also a complete measure of the Sun's chromosphere, to which, in 1882, a spectroscopic examination of Sun-spots was added. Many of the results have been published in the *Monthly Notices*, in astronomical journals, and in the published annual volumes of the Stonyhurst meteorological and magnetical observations.

In an interesting paper contributed to vol. xlix. of the *Memoirs* of this Society, Father Perry has discussed the correctness that can be attained by solar drawings, from an examination of Greenwich photographs and Stonyhurst drawings made on the same days. In this paper he calls attention to the curious fact that whereas the mean daily spot area in the photographs is in excess of that in the drawings, the reverse is the case with the faculæ, which in the drawings are largely in excess. An account of the Stonyhurst solar work formed the subject of Father Perry's lecture to the Royal Institution last May.

Up to the time of his leaving England on his last fatal expedition, it was his full intention, at the earliest possible time, to prepare a work embodying a complete discussion of the results derivable from the solar and magnetic observations he had

carried out at Stonyhurst. This work had been planned out with the object of throwing light upon theories of Sun-spot formation, and on solar physics generally, and also to find, if possible, a clue to the nature of the connection between Sun-spots and terrestrial magnetism. Before leaving Stonyhurst last November he instructed his assistant to prepare the materials and be ready when he came back to commence a systematic study of the life history of each group of spots recorded in the Stonyhurst drawings, and also to investigate all the spots for each year studied collectively on a chart. This work was intended to be exhaustive of the material he had accumulated, which he considered might be sufficient to throw important light on the subject of the proper motions in spots, on the connection between spots and faculæ, the recurrence of spots in the same heliocentric position, and many other questions of solar physics. The remarkable observations of veiled spots which Father Perry brought before the Society in January 1888 indicate that the method of projection adopted is capable of furnishing results of considerable interest and value. It is a serious loss to astronomy that his untimely end has prevented so hopeful an investigation from being conducted under the auspices of the author and originator of the work.

In the early part of 1889 the Council invited Father Perry to take charge of the Royal Astronomical Society's expedition to French Guiana to observe the total solar eclipse of December 21-22, 1889. He at once, with the enthusiasm that was characteristic of his nature, accepted the confidence that was placed in him, and from that time till he left England in November spared no effort in his preparations to fulfil his mission in the most satisfactory manner to astronomy and to the Society.

The programme of the operations for observing the eclipse has already been published in the present volume, and we need not here make further reference to it; but the story of his last fatal expedition is too romantic not to be recorded in some detail.

Father Perry, accompanied by Mr. Rooney, one of his colleagues at Stonyhurst, left Southampton on November 14, in the Royal Mail s.s. "Tagus," and arrived at Barbados on November 26. On December 2 he left Barbados in H.M.S. "Comus," Captain Atkinson, and arrived at the Isles du Salut, near Cayenne, on December 7, anchoring at "Royal Island." During the voyage the weather was very rough, and he suffered severely from sea-sickness. Notwithstanding the resulting prostration, he insisted upon landing the evening of his arrival, in order to examine the site for the observatory, and to introduce himself to the French authorities, from whom he received the greatest courtesy and assistance.

He took up his quarters at the military hospital, where two very good rooms were placed at his disposal by the Commandant. It was soon discovered that the sanitary arrangements of the

whole island were very bad, and, notwithstanding the urgent and repeated request of Captain Atkinson that he would sleep each night on board the "Comus," he insisted upon passing the night at his quarters. Had he acceded to that request, it is probable his life would have been spared; but his fear of giving trouble to others, his high sense of duty, and his conscientious desire to accomplish his work in the most successful manner, were with him paramount considerations over any personal discomfort or danger. On December 20 it was discovered that he was in seriously bad health; indeed, his companions considered him in feeble health all the time he was on the island. At last this forced itself upon him so much, that he acknowledged to Captain Atkinson that he felt himself to be unfit for the work.

The rain, which had set in on the 18th, caused the weather to be very unhealthy. A large number of convicts on the island were ill with dysentery, and deaths were occurring at the rate of four or five a day. On the 20th he complained of being very ill, but the night clearing up after the heavy rain, he rashly determined to remain at the observatory all night to secure some trial photographs. He worked on till 3 A.M., and when his men retired on board the "Comus," he merely lay down in a hammock in the tent, so as to be ready to take the position of the Sun at rising just before 6. Doubtless the fatal chill was here received, for the same night, December 21, he was very ill with cramp and diarrhoea; so ill, indeed, that it was feared he could take no part in the observation of the eclipse; but the enthusiasm and self-denying spirit that had carried him through so many previous difficulties, were not yet to be quelled by bodily ailment, and on the morning of the eclipse he managed, with the assistance of a seaman, to walk the rough and difficult half-mile from his quarters to the observatory, and declined to allow himself to be carried on a stretcher. He at once took his place at Mr. Common's large photographic instrument, and conducted the whole proceedings.

Up till about twenty-five minutes before totality a heavy black cloud had completely obscured the Sun, but this cleared off at the critical moment, and allowed him to make, in the most satisfactory manner, all the observations which he had travelled so far to accomplish. The success of the observations seemed to give him new life; he was alert and self-possessed, and was really much better. He stated that he had never conducted so successful an observation of the Sun's eclipse before. He then asked Captain Atkinson to call for three cheers for the successful observation: "I cannot cheer," he said, but he waved his helmet. After uttering these words, which convey so much that is touching and pathetic, the effort of strength he had called up to nerve him to the fulfilment of his mission was soon dissipated, and he rapidly became dangerously ill. Of the last moments of his life there is little to tell. On the afternoon of the eclipse he was taken on board the "Comus," and put to bed

P

in the captain's cabin, suffering from the most virulent form of dysentery. On the 26th he was better, and the "Comus" at once proceeded with all despatch for Demerara, but on that night gangrene of the lower bowel showed itself, and Father Perry died at 4.20 P.M. on the 27th. When told he was dying, he calmly sent for Mr. Rooney, and gave him full directions about everything connected with the eclipse, told him where his notes were, and left nothing undone. He was enthusiastic to the last, and in his wanderings just before death he rehearsed the operations which took place at the observation station during the eclipse. His body was landed at Demerara on December 28, where it was at once interred in the old Catholic cemetery.

Thus died Father Perry, through a devotion to duty which will always ennoble his name, and rank him in the long list of those who have made allegiance to the call of duty their supreme guide: "Not only religion and war, but even astronomy has its heroes."

At their meeting on January 10, 1890, the Council of this Society recorded in their minutes the following resolution, which was passed unanimously: "The Council, having heard with the deepest regret of the death of the Rev. S. J. Perry while on the Society's expedition to observe the total eclipse at the Salut Isles, desire to put on record their sense of the great loss which astronomy has suffered by the death of so enthusiastic and capable an observer, and to offer to his relations and to his colleagues at Stonyhurst the expression of their sincere sympathy and condolence on this sad event."

As a professor, Father Perry's chief characteristics were the extreme care he took in the preparation of his lectures, and the earnestness he threw into his work. What he undertook, that he did as thoroughly as lay in his power, whether it were astronomical observations, or teaching mathematics, or playing games with the boys at Stonyhurst. In this respect his characteristic was concentrativeness, coupled with a charming, simple earnestness that captivated respect and esteem. Loyalty to science and to his college were part of his nature, and a word at the expense of either roused him at once. As a public lecturer on astronomical subjects he was very effective and popular. He delivered lectures at the Royal Institution, in many places in the north of England, and on one occasion, in 1887, he lectured in French at Brussels. His last lecture was to the crew on board the "Comus," and his last sermons were preached in French on December 8 and 15 to the convicts at the Salut Isles. Thus his life passed simply and laboriously, without pretence or affectation, and, great as was his devotion to science, his desire was still greater to do his duty in the state of life he had chosen, in whatever direction that duty might be appointed for him.

Father Perry was elected a Fellow of the Royal Society in 1874, and was made a member of its Council last November. In 1886 he received the honorary degree of D.Sc. from the

Royal University of Ireland. He was a member of the Royal Meteorological, the Physical, and the Liverpool Astronomical Societies, of which last he was President. He was also a member of the Accademia dei Nuovi Lincei, of the Société Scientifique de Bruxelles, and of the Société Géographique d'Anvers. For several years he served on the Solar Physics Committee and on the British Association Committee for comparing and reducing magnetic observations.

He was elected a Fellow of this Society April 9, 1869, and served on the Council for several years, and in December last he was proposed by the Council as one of the Vice-Presidents for the ensuing year.

E. B. K.

GEORGE ELLIOT RANKEN was born in the year 1828, and was educated at Eton and Oxford. His career at Eton was brilliant and exceptionally successful, and at the age of eighteen he entered University College, Oxford, on the foundation, having won the scholarship the previous year. His tutor at Oxford was the late Dean Stanley, who often prophesied great things of his future. Soon after taking his degree he became a student at the Inner Temple, and then entered the War Office as private secretary to Sir Edward Lugard. On resigning this position Mr. Ranken settled in Rome, where for some years he was attached to the Papal Court, having been appointed a Privy Chamberlain by Pope Pius IX. In the year 1871 he returned to England and became editor of the *Tablet*, a position which he held until about five years ago, when ill-health compelled him to resign it.

In the year 1859 Mr. Ranken married Georgina Elizabeth, daughter of the Rev. H. W. Buckley, Rector of Hartshorne, Derbyshire, by whom he leaves two children, a son and a daughter.

Mr. Ranken was a man of more than ordinary accomplishment. His early training and the reading of his lifetime had left him with a memory singularly well stored, and with the more important results of an habitual retentiveness. His love for literature was liberal and most intelligent, and he fed it on the works of many languages, his linguistic talent being remarkable. To his familiarity with the modern literature of Europe he added a ripe and an accurate scholarship, which made his opinion upon any question connected with the classics specially valuable. In the problems of astronomy he found a resource and a pleasure which even his failing health never seemed to impair. But it was only those who knew Mr. Ranken well—perhaps only those who lived in habitual and professional intercourse with him—who ever fully realised how gifted he was and in how many ways.

He was elected a Fellow of this Society January 13, 1882.

GEORGE FRANCIS RIDDIFORD, who died at Barnwood Lodge, near Gloucester, on December 6, 1889, was born at Gloucester in

P 2