30°, its logarithmic sweep being lost behind the intervening mountains. The almost triangular notch in the snow-cap may possibly represent the scarp that is supposed to have been formed by the great earthquake of 1891, causing a strip of ground in unstable equilibrium to slip downwards." The reader should compare this view with that given in Plate IX., which shows the lake, with the reflection of the mountains behind, and the snow-covered Fuji rising in the background. This plate, and the view, Lake Kawaguchi, given on Plate V., are so delicate and faithful in their portrayal of water and atmospheric effects as to defy reproduction.

No attempt has been made by the authors to produce a scientific treatise, the information contained in the text being of a popular character, and the reader is referred to the Transactions of the Seismological Society of Japan for more detailed information on the subjects treated of. It is nevertheless true that the text published with these plates contains, as the authors claim for it, information not readily obtainable from other sources. The introduction gives a sketch of the volcanic phenomena of the Japan and Kurile Islands, in which we are informed that the number of volcanoes still preserving their form, and with distinct craters, is one hundred, distributed as follows:—In the Kuriles 23, in Yezo 28, in Honshiu 36, and in Kiushiu and the Southern Islands 13. Of these no less than 50 emit steam, while 39 are distinguished by their beautiful and graceful outlines. The number of great eruptions of which there is any published record is 233, the greater frequency, as with earthquakes, having been during the colder months of the year. One line of vents, which is more than 2000 miles long, begins in Kamsatka, passes through the Kuriles, Yezo, and down by Honshiu to the ever-smoking Asama. Here it is joined by a line branching away to the south-west, which runs through the great Fujisan and Oshima, till it reaches the Ladrões, a distance of 1200 miles. The last line begins at, or near, the gigantic crater of Mount Aso, and extends 1300 miles through Formosa to the Philippines. Extremely basic rocks are rare, but so far as observations have gone, it may be said that the lava poured out from the northern vents is more acid in composition than the southern. All are magnetic, and lavas that will turn a compass-needle through 180° are not rare. By their decomposition, the soil of the country is in many places so filled with grains of magnetite, that a magnetized knife passed over the gravel of a garden path will be covered with a brush of this unoxidizable material.

The twelve pages devoted to the description of Fujisan are replete with interesting information. The word Fuji is said (on the authority of the Rev. John Batchelor, of Sapporo) to be a corruption of the Ainu word *Huchi*, which is the name of the "Goddess of Fire." Professor Milne ascended the mountain in 1880, and found that it was not quite extinct, as is usually supposed, for small quantities of steam were detected by him issuing through the ashes on the eastern side of the mountain just outside the lip of the crater. Von Fritsch and Ludecke have shown the lavas composing Fuji to be dolerites, and analyses by several chemists are given in this work. The beautiful and symmetrical outlines of the mountain are well known, but on the south side of the mountain there is an excrescence, at a height of 9000 feet, which was produced by the last great eruption in 1707. The recorded eruptions of the mountain are as follows:—B.C. 301, 294, or 286, and A.D. 799, 802, 864, 937, 1021, 1082, 1329, 1560, 1627, 1649, 1700, and 1707. Professor Milne records the interesting observations made by him with a trometer or tremor-measure during a stay of five days on the top of Fuji. These observations tend to prove that the great mass of the mountain actually yields to force of wind playing around its summit. The height of Fujisan is proved by various observations to lie between 12,400 and 12,450 feet.

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The authors are to be congratulated on the excellence of this first instalment of a work which promises to be one of great scientific value.
J. W. J.

THE GALILEO CELEBRATION AT PADUA.

THE celebration of the three hundredth anniversary of the day on which Galileo began his labours as a Professor at the University of Padua was even more successful than had been anticipated. Its success was in every way worthy of the large number of scientific men who assembled to do honour to Galileo's memory, and of the great institution with which, as it remembers with veneration and pride, he was so intimately associated.

On December 6 the Rector, Prof. C. J. Ferraris, received in one of the courts of the old University, adorned everywhere with portraits of the most illustrious professors, delegates from the Universities, the polytechnic schools, and Italian and foreign Academies, amounting to nearly a hundred, and amongst them many of those who shed most lustre on contemporary science. The University of Cambridge was represented by Prof. George Howard Darwin, F.R.S., who also represented the Royal Society as Mr. Norman Lockyer, its delegate, had been prevented from attending. The University of Oxford by Prof. E. J. Stone; the Royal College of Physicians, London, by Sir Joseph Fayrer, F.R.S.; the Chemical Society and British Association by Prof. Ludwig Mond, F.R.S.; the Harvard University, Cambridge, U.S.A., by Prof. William James, and the Princeton University by Prof. Allan Marquand; the University of Lund by Prof. R. A. V. Holmgren; the Astronomical Observatory of Paris by its Director, Prof. F. Tisserand; that of Berlin by Prof. W. Foerster; the Polytechnic Schools of Berlin, Karlsruhe, Monaco, Brunswick, Stuttgart, by Profs. Lampe, Keller, Sohncke, Blasing, Lemcke; the University of Göttingen by Prof. Voigt; that of Budapest by Prof. Lanczy; that of Dorpat by Prof. Schmourlo; that of Lausanne by its Rector, Prof. Favay; the Academy of Paris by Prof. Gariel; the Faculty of Letters at Grenoble by Prof. de Croyals; the General Council of the Faculty at Nancy by Prof. Molk, &c., &c. There were also delegates from the towns of Florence, Pisa, Venice, and representatives from the foremost Italian Universities, Academies, and Technical Schools.

The great academical celebration took place on December 7 in the large hall of the University, in the presence of the Hon. Ferdinando Martini, Minister of Public Instruction, who represented the King of Italy. The ceremony was begun with a discourse prepared for the occasion by the Rector Magnifico, and devoted principally to a cordial expression of thanks to the King and to the Minister who represented him; to the foreign and Italian delegates; and to the ladies of Padua, who had given the University a most beautiful banner, on which were various emblems indicating the history of the University, the genealogical tree of the Galileo family, and the ancient inscription above the door of the University—*Gymnasium omnium disciplinarum*.

Next came the commemoration of Galileo by Prof. Antonio Favaro, who has for nearly fifteen years devoted himself almost exclusively to the study of the life and works of Galileo, and to whom was confided by the Government the care of the national edition of the philosopher's works, under the auspices of the King of Italy. The orator kept his discourse within the limits marked out for him, speaking chiefly of Galileo at Padua. Constrained to leave the University of Pisa, Galileo had been welcomed in that of Padua, where he found the "natural home of his mind," a "theatre worthy of his talents." The conditions at Padua at that time were eminently favourable to Galileo's work, for the Venetian

Senate granted the lecturers the utmost liberty, and experimental methods, which could not be learned from books, had been practised at the University for more than a century. Galileo had many opportunities for the development of his genius, both in the lecture-room and in the home, in the preparation of scientific publications, and in the workshops of scientific instrument-makers both in Padua and Venice. To Venice he frequently went, attracted thither by the means it afforded him for study; by that grand arsenal which had already been sung by Dante, and which in his reputed Dialogues is spoken of by Galileo with admiration; but above all by the advantages he derived from scientific intercourse with eminent men who resided in the dominion. The culminating point of the discourse was naturally reached when the orator had to deal with the invention of the telescope, and with the astronomical discoveries made by means of it, the immediate result of which was the recall of Galileo to Tuscany. This did not aid Galileo in his glorious career, or help to protect him from the attacks which were for a long time made on him by invidious adversaries. Even some of his own servants changed at once to implacable and dangerous enemies, and at last he was involved in all the miseries which sprang from the memorable lawsuit. This led the orator to recall the fact that when the clouds assumed their most threatening aspect, the Venetian Republic, forgetting with real magnanimity whatever resentment it might have felt at Galileo's abandonment of his chair at Padua, offered to re-appoint him, and to print at Venice the work which had brought upon him so much trouble. He said also that a pleasant memory of Padua must have passed through the mind of the prisoner of the Holy Office, when there came to him his only comfort, the message from the favourite of his childhood, the nun who in Padua had tenderly cared for him during the first ten years of his youth.

After Prof. Favaro's oration discourses were delivered by the foreign delegates, Holmgren, Fayrer, Darwin, Tisserand, Lampe, Keller, Foerster, Sohncke, Blasing, Lemcke, Farey, Lanczy, Schmourolo, and by Italian delegates, Nardi-Dei, Mantovani-Orsetti, and Del Lungo. Then followed the conferring of University honours, of which seven had been set apart by the Council for seven men of science, one for each nation, all distinguished for their devotion to the studies in which Galileo excelled, viz. Schiaparelli, Helmholtz, Thomson, Newcomb, Tisserand, Bredichir, and Gylden. The degree of philosophy and letters was given to the Minister Martini; of natural philosophy, and philosophy and letters, to the leading delegates. The ceremony was closed by the inauguration of a commemorative tablet in the large hall.

Of the other festivals connected with the celebration it would be out of place to speak here, and it will be better to add a list of the publications which have been issued on the occasion. The oration read in the Great Hall by Prof. Favaro has been published, with the addition of twenty-five facsimiles of documents containing the various decrees of the Senate concerning Galileo, the date of the early prelections given by him at regular intervals, several autographic records of Galileo, chosen in order to give a more exact idea of what are the most precious materials for his biography, the frontispieces of the various publications issued by Galileo, or relating to the time of his sojourn in Padua, the geometric and military compass, the writing presenting the telescope to the Doge, and the first observations of the satellites of Jupiter. A portrait of the great philosopher, from a painting which represents him at the age of forty, taken in 1604, is prefixed.

By favour of the University there have also been published two other works, one containing all the notices of the studies at Padua in 1592, the other proving which

was the house inhabited by Galileo and the place in which he made his astronomical observations. The ancient Academy of Padua, among whose founders Galileo is numbered, has issued a publication in which are collected several works dedicated to his memory; and the students of the University have sought to perpetuate the remembrance of this festival by the publication of a "unique number," bringing together all the documents relating to the sojourn of Galileo in Padua, collected from all quarters. These publications will serve as suitable memorials of a great and most interesting celebration.

ANTONIO FAVARO.

SIR RICHARD OWEN.

IT is with great regret that we record the death of Sir Richard Owen. He died on Sunday, after a lingering illness, at Sheen Lodge, Richmond Park, in his eighty-ninth year. In publishing his portrait in the series of "Scientific Worthies" (*NATURE*, vol. xxii. p. 577) we have already presented an estimate of his work and of his place in the history of science. It is only necessary now, therefore, to recall some of the leading facts of his career.

He was born at Lancaster on July 20, 1804, and received his early education at the grammar school of his native place. Afterwards he matriculated at the University of Edinburgh as a medical student. In 1825 he joined the medical school of St. Bartholomew's Hospital, London, and in 1826 he took his diploma at the Royal College of Surgeons. His professional studies having been completed, he began to practise in Serle Street, Lincoln's Inn Fields; but the bent of his mind was towards purely scientific investigation, and he soon had a good opportunity of exercising his powers. Dr. Abernethy, with whom he had acted at St. Bartholomew's as a dissector, had recognized his ability; and, in accordance with the advice of this famous surgeon, he was invited in 1828 to undertake the task of cataloguing the Hunterian collection at the Royal College of Surgeons. The invitation was accepted, and in 1830 the first catalogue of the invertebrate animals in spirits was published. In the same year Owen read at the first meeting of the Zoological Society's committee of Science a valuable paper on the anatomy of the orangutan, and afterwards he made many important contributions to the Society's Transactions and Proceedings. He was also well known as a reader of papers before the Medical Society of St. Bartholomew's and the Medical and Chirurgical Society of London. In 1832 appeared his well-known essay on the Pearly Nautilus (*Nautilus Pompiilius*), in which he gave most striking proof of his power of interpreting the facts of natural history in a thoroughly philosophical spirit.

Before he was thirty years of age Owen had achieved so good a reputation that in 1834 he was appointed to the newly-established chair of comparative anatomy at St. Bartholomew's Hospital. Two years afterwards he succeeded Sir Charles Bell as professor of anatomy and physiology at the Royal College of Surgeons, and he was elected to the newly-established Hunterian professorship at the Hunterian Museum. He also became conservator of the Hunterian Museum on the death of Mr. Clift, whose daughter he had married. He had gradually been withdrawing from the practice of his profession, and ended by devoting the whole of his time and energy to scientific work.

His connection with the Royal College of Surgeons lasted for twenty years, and during this period he achieved results which placed him in the front rank of original investigators. In the article to which we have referred we have already indicated the nature and importance of these results, and need not go over the same ground again. It must suffice to mention the completion, in five volumes, of his catalogue of the Hunterian