distinguished honour of membership of the Institute (Academie des Sciences). In 1884 he took the position of his late master, Prof. Wurtz, in the chair of Organic Chemistry at the Sorbonne. His merits were fully recognised in this country. In 1876 he became a foreign member of the Chemical Society, and four years later he received the Davy Medal of the Royal Society. In 1894 he made one of his rare visits to England to receive the degree of D.C.L. of Oxford University, an honour which he acknowledged as a great encouragement.

His influence on the advance of science was of a two-fold character: as a teacher, and as an original investigator. He was not known as a popular lecturer or writer upon science; but he had the happy faculty of infusing the love of science into the minds of the large number of students who attended his professorial lectures or worked in his laboratory. This result was no doubt greatly enhanced by the respect and personal attachment with which he was regarded. The advancement of education was in fact one of the objects of his life. This was evidenced by the successful efforts he made in promoting the École Alsacienne in 1874, which, to use his own words, was "designed to react against the exclusively literary and formal instruction, and directed in a Protestant and Christian spirit, without having any denominational colour." Its aim was to develop in each scholar the faculties which belong to him, and to arouse a spirit of observation and scientific curiosity. Natural science has, of course, an honoured place in the curriculum. He watched over this school with great interest, and helped to make it one of the best in the capital of France. The technical side of science also engaged his attention; and he had a large share in founding at Paris, three years ago, a laboratory of practical chemistry applied to industry, at the Sorbonne, and to which he gave special attention. He was one of the founders of the French Chemical Society. It is said also that the French Association for the Advancement of Science owes its origin to his suggestion; at any rate he came to the meeting of the British Association at Brighton in 1872 to learn the details of its working, for the benefit of the French Association which was to be inaugurated at Bordeaux in September of that year. The two Associations, though very different in their constitution, are carried on in much the same manner. M. Friedel generally took an important part in the French Association's annual meetings. In the last of the numerous letters that I received from him, he made reference in hopeful terms to the approaching meetings of the two Associations at Dover and Boulogne in September next, and to the efforts which were in contemplation to bring together the savants of the two nations.

Throughout the whole of his career he carried on original research, the results of which are published in about one hundred papers communicated to the Academy of Sciences and other learned societies. Some of these refer to the artificial formation of felspar and albite, crystallised quartz and other minerals, and to the dimorphism of zinc blende; but by far his most important work has reference to the carbon compounds, and the long controversies which raged over the question of their constitution, and how it should be expressed. His first paper seems to have been a contribution, in 1857, bearing on the constitution of acetone. This was followed by others on lactic acid, glycerine, propylene and other members of the three-carbon family. The relation of these bodies one to another, and to their isomers, led to much fruitful controversy. To him, in fact, is due in great measure the introduction of the new views of atomic valency, of which the chief apostles were Cannizzaro and Kekulé. In France these ideas were not readily received; the chief advocacy of them came from the laboratory of Wurtz, and although Friedel had not the enthusiasm and brilliancy of the master, his expositions and arguments were wonderfully clear, and his experiments in support of them very convincing. Among these was the production, in conjunction with Ladenburg and Crafts, of a number of compounds of silicon and titanium showing the quadrivalence of these elements and their chemical analogy with carbon. In this way they broke down the barriers between organic and inorganic chemistry, and showed the generality of the laws of chemical combination. During these researches he was fortunate in discovering a new method, by means of chloride of aluminium, of bringing about the synthesis of organic compounds, often producing hydrocarbons of a highly complex character.

With the rapid advance of chemical knowledge, especially in the organic department, and the gradual growth of chemical theory, the nomenclature was found to be inexact and often misleading. Hence in 1892 a congress of chemists was held in Geneva to revise the nomenclature. Leading representatives of chemical science from many countries met together, and Friedel was appointed president. The recommendations arrived at were published in Wurtz's Dictionary of pure and applied chemistry, which was carried on under the direction of Friedel.

But he did not confine his work to scientific teaching and investigation. Born in a Protestant family, he seems from his youth to have adopted the religious principles in which he was brought up. He sympathised with all Christian, philanthropic or patriotic movements of his country, and took an active part in many of them, especially those that related to the welfare of young men. Those of us who knew him intimately will feel disposed, like the President of the Academy in announcing his death, to dwell not so much on his great scientific achievements as on the amiability and uprightness of his character and on the moral worth of his personality.

J. H. GLADSTONE.

CHARLES NAUDIN.

CHARLES NAUDIN, whose contributions to science extend over the last sixty years, died on March 19, at Antibes, at the age of eighty-four. A systematist by his studies of the orders *Melastomaceae* and *Cucurbitaceae*, a biologist by his work on hybrids, he is perhaps best known by many contributions to economic botany.

The bravery with which he met the hardships of his life wins admiration. His father, a schoolmaster, ruined himself; his mother died when he was but eight years old. At Montpellier, while working for a degree, he served as usher in small establishments: the degree gained, he became a teacher at Château-Chinon, then at Cette. In 1839 we find him at Paris earning his living by teaching, by copying commercial letters, and lastly as a gardener at the Jardin des Plantes, burning the midnight oil in order to obtain his licentiate in 1841 and the degree of Doctor of Science in 1842.

After helping Saint-Hilaire with his flora of South Brazil, Naudin became professor of zoology at the Collège Chaptal. But, when success seemed assured, severe facial neuralgia and an incurable deafness, worse than the neuralgia, cut him off from free communion with his fellow-men. Forced back from his course, he applied himself again to herbarium-work, and the study of the *Melastomaceae*—an order richly represented in Brazil—gave him employment till 1849.

Five years later Decaisne made him his aide-naturaliste, and under his stimulus Naudin commenced the experiments on hybrids which secured his reputation. Darwinism had disturbed science; and Decaisne, who, like others, was asking what are species, had commenced to experiment on variability with admirable patience by growing pears from seed. Naudin chose the Gourd

family for like experiments on the variability of hybrids, in doing which he came face to face with difficulties in classification needing the eye of a systematist. How these were met, Sir Joseph Hooker, whom he helped in dealing with this order for the *Genera Plantarum*, and others testify. It is clear that if he multiplied names unduly, he still grouped naturally and truly the allied forms. In the question of hybridity he emphasised abundantly the fact that hybrids frequently have a varying measure of fertility, stating at the same time that in varying they return to the parent forms, and for that reason fail to establish their race—a contention which led to a long controversy.

At this period his work as a gardener came into fruit: the *Manuel de l'amateur des jardins*, and a connection with the *Revue Horticole*, *Flore des Serres* and *Le bon Jardinier* testify to it. But the neuralgia increased, and drove him to seek an asylum away from work in the Pyrenees, whence in 1878 he was called to take charge of the experimental station known as the Villa Thuret at Antibes.

There, in the pleasant climate of the Mediterranean shore, he experimented in the acclimatisation of such plants as were suitable. Algeria, among French Colonies, needed improved cultivation; and the exigence of Algeria called his attention to the vegetation of dry countries. From Australia he grew *Eucalypti* and *Chenopodiaceae;* from South Africa he experimented with *Acanthosicyos;* and the flowering and fruiting and hybridisation of palms interested him strongly. To these experiments on Australian plants is doubtless due his connection with Sir Ferdinand von Mueller, which led to a joint *Manuel de l'Acclimateur*.

This must suffice to indicate the direction of his work—work for which the French-speaking people feel a keen gratitude. To us, it is interesting to recall that a few of his later notes appeared in our language in the *Gardeners' Chronicle*, while two of his earlier papers were considered of sufficient importance to merit translation.

I. H. B.

THE NEW BUILDINGS AT SOUTH KENSINGTON.

THE foundation stone of the new extension of the Art Museum at South Kensington was laid by Her Majesty the Queen yesterday. When completed, the Museum will be one of the most imposing structures in London, so far as size is concerned. It will have a frontage on Cromwell Road of 700 feet—almost precisely the same frontage as that of the Natural History Museum—and in the Exhibition Road there will be a frontage of 300 feet. The area of the new buildings will be equal to the whole of that covered by the existing Museum, including the temporary sheds on the west side of Exhibition Road.

The Art Museum thus completed is to be called the Victoria and Albert Museum.

The commencement of the new buildings does not directly concern us except that they are complementary to other buildings to be provided for Science on the ground facing the Imperial Institute. It has generally been understood since the Report of the Duke of Devonshire's Commission, which sat about a quarter of a century ago, that a Science Museum was to be built upon this ground. This being so, the building scheme might appropriately have included an Albert Museum for Science as well as a Victoria Museum for Art. But no provision has been made for such a new Science Museum.

According to the *Times*, the centre of the building which it is proposed to place opposite the Imperial Institute will be occupied by the Science Library, and in the plan given by the *Times* the proposed buildings are called "Royal College of Science." But this is not so. The remainder of the frontage will be taken up by chemical and physical laboratories alone; the other departments of the Royal College of Science—astronomical physics, geology, biology, mechanics, mining and metallurgy—will apparently be left in the same unorganised condition as exists at present. It is indeed generally imagined, and it may even be the view of the Chancellor of the Exchequer, that the new buildings are to accommodate all the departments of the Royal College of Science.

We read, for instance, in Tuesday's *Times*:—

"As regards the Royal College of Science, it will, as already indicated, occupy a position directly facing the Imperial Institute. It is to be of the same length as the Institute, and, in the interests of architectural harmony, it will reproduce several of its leading features. The College will be recessed from the road in the same way; the main entrance of the one will be opposite that of the other, and will be so rounded that between the two a large circular space will be left—in the centre of which a statue may be erected later on—the circle being flanked by the great buildings on each side. The domes or lodges at each extreme of the Imperial Institute will be repeated at corresponding points of the College, and the respective sets connected by a screen across the roadway, thus facilitating passage from one side to the other. The new College of Science will also form a front to the present Science Museum buildings, but there is no idea of the College forming in itself an additional "museum" in the recognised sense of that term. It will rather be devoted to strictly educational purposes, the right wing being occupied by the physical side of the College and the left by the chemical department, while the great laboratories and lecture theatres are to be in the rear, the whole being, further, in direct connection with the present Science Museum."

We repeat, the new so-called "College of Science" will represent only a small portion of the College. That the teaching of some of the subjects now carried on in buildings almost half a mile apart, gains nothing from the new scheme, might perhaps have been borne if it were perfectly certain that ultimately all the teaching would be brought together. But unfortunately this is now very much more unlikely than it has ever been before, unless the Science Museum is to be encroached upon, and its future possibilities of extension for ever wrecked; and the more the architectural effect is to be enhanced by recessing the new buildings from the road, the more, naturally, will the space difficulty be increased for College and Museum alike. We have heard that the plans prepared by the Professors of the Royal College themselves some years ago left the central portion clear primarily for the Museum suggested by the Duke of Devonshire's Commission, the chemical and physical laboratories having their frontage along Prince's Gate. That scheme was far preferable to the present one, so far as providing for the other requirements of both College and Museum are concerned.

In any case it must be acknowledged that the building of the chemical and physical laboratories is only a first step. We shall be glad to know that the future has been considered; and that there already exists a plan showing the condition of things when subsequent stages have been reached, even up to the final one. But we very much doubt whether it has been any one's business to consider any of these things, and responsibility is divided among so many departments that it is scarcely to be wondered at if the future has never been considered at all. But there is one thing greatly to be feared, and it is this. Not only does the plan to be carried out leave the greater part of the teaching in a chaotic state with no chance of betterment while the new buildings are going on; but when they are completed, some future Chancellor