By following a devious route the explorers arrived at the port of Islay on the coast of Peru in June with a supply of plants which were placed in Wardian cases and shipped to India via Panama and the Red Sea.

Spruce and Cross were successful in collecting seed and plants of *C. succirubra*, the red bark, from the slopes of Mt. Chimborazo, and these were shipped from Guayaquil in January 1861. Cross made several subsequent expeditions; he went to the Sierra de Cajanuma from Loja in the autumn of 1861, bringing back seeds of *C. officinalis*; twice he visited the forests of Pitayo in the extreme south of Colombia to gather seed of *C. pitayensis*; and finally, in 1877, he travelled to the upper reaches of the Caqueta River to obtain the seed of *C. Calisaya* and the soft Colombian barks. Pritchett collected plants and seed of the grey barks, *C. nitida*, *C. micrantha*, and *C. peruviana*, from the Huanuco forests to the north of Lima.

Charles Ledger was engaged on his own account in the bark and alpaca wool trades in Peru. He had made several expeditions to obtain bark, in one of which his partner, Mr. Backhouse, was murdered by the Chuncho Indians and Ledger had only escaped with his life. Knowing the desire of the British and Dutch Governments to obtain seeds of the best species, Ledger sent his old Indian servant Manuel Mamani to the cinchona forests in the region of Coroico. Mamani, faithful to his trust, persevered and at length, after several years of search, delivered seeds from the best (the *roja*) trees to his master. But he had roused the enmity of the Bolivians and soon afterwards was thrown into prison, beaten and half starved. Robbed of all he possessed, he died of the ill-treatment he received. Manuel Mamani deserves to be remembered, for to him we owe the seed of *C. Ledgeriana*. It is this species which in cultivation yields the highest percentage both of quinine and of the other alkaloids, and the productiveness of the plantations both in India and in Java is due mainly to the richness of its bark.

In the introduction of cinchona to India, the Royal Botanic Gardens, Kew, played an important part, not only by raising plants from seed, but also by tending those which arrived from Panama

so that they might recuperate ere they faced the perils of their further journey through the Red Sea. Although there were many casualties among the plants which were dispatched from South America, some eventually arrived safely in India. From small beginnings made in 1861 the large plantations in the Nilgiris and in the Darjeeling district of Bengal were gradually established. To Mr. McIvor, of the Government Gardens in Ootacamund, and to Dr. Anderson, of the Royal Botanic Gardens, Calcutta, the task of developing the plantations was entrusted, and Dr. Anderson was succeeded by Mr. C. B. Clarke, Sir George King, and Sir David Prain. We owe to them, too, a debt of gratitude. They have built up a great enterprise. In India we have now under cinchona some 3500 acres, yielding about 40,000 lb. of quinine each year. India, however, is the only country within the Empire in which cinchona is seriously cultivated.

Much has been accomplished, but there is still much to be done. The potential demand for quinine is far in excess of available supplies. India provides only about one-third of the amount of quinine she herself at present consumes. It has been estimated that in order to have any effect upon her malarial problem, she would have to increase her production by eighteen times; and what of the needs of the rest of the Empire and the 800,000,000 people who suffer from malarial fever?

There can be no more fitting manner in which to mark the tercentenary of the first use of quinine than by reviving and renewing our efforts to increase the production of cinchona, the principal agent in the combat of malaria. The problems to be faced are the finding of further areas of suitable land and the application of scientific research to increase the output from existing plantations. May we look forward hopefully to the time when the united efforts of the administrator, the medical officer, the planter, the manufacturer, and of those responsible for distribution and propaganda have brought the scourge of malaria well under control—when Sirius no longer

"O'er the feeble stars exerts his rays;
Terrific glory! for his burning breath
Taints the red air with fevers, plagues, and death."

Obituary.

COL. J. W. GIFFORD.

COL. JAMES WILLIAM GIFFORD, whose death occurred at his home at Chard, Somerset, on Oct. 27, in his seventy-fourth year, was one of that select band of scientific workers of whom Sir William Spottiswoode, Warren De La Rue, and others were brilliant examples; men who, in addition to their ordinary occupations, found time and opportunity to follow the pursuit of pure science for the love of it. Col. Gifford was by profession a lace manufacturer, and at his death was managing director of the firm of Messrs. Gifford and Fox, of Chard.

The present writer was first brought into touch with Col. Gifford in connexion with an inquiry into

the so-called musical properties of some sands that are found on the coasts of Scotland and elsewhere; these sands, when trodden upon, emit a musical note or squeak which becomes fainter and is soon lost altogether if the same specimen is used repeatedly. Col. Gifford found, by the simple operation of rolling the sand down an inclined board several times, that the musical property was restored, evidently by the removal of the fine dust of silica that was produced by the rubbing together of the grains of quartz.

On the discovery of X-rays by Prof. Röntgen in 1895, Col. Gifford entered with enthusiasm upon the new field of research and became an active member of the Röntgen Society, which was founded

by the late Prof. Silvanus P. Thompson, and he soon became an authority on the subject. He gave his services to the members of the medical profession at Chard and made many radiographs for them in the early days of the science.

Col. Gifford's chief activity was, however, in the field of optics, and he was the author of many valuable papers dealing with the construction and improvement of telescopic lenses. He was an active fellow of the Royal Astronomical Society, the Optical, Microscopical, and other kindred Societies, and communicated several important papers to the Royal Society, in the *Proceedings* of which the following are published: "The Refractive Indices of Fluorite, Quartz, and Calcite", "The Refractive Indices of Water and Sea Water", "The Refractive Indices of Benzene and Cyclohexane", and "The Existing Limits of Uniformity in producing Optical Glass".

Col. Gifford was the author of a book on "Lens Computing by Trigonometrical Trace". In a foreword to the book, Prof. F. Cheshire, formerly director of the Technical Optics Department of the Imperial College of Science and Technology, pointed out that "Col. Gifford never relied upon the glass-makers' catalogue for the optical constants of the glasses, but determined these data for himself, and the excellency of the systems that he produced was undoubtedly due to this fact". In the old Volunteer Force he held the position of hon. colonel of the Fifth Somersets; and when the War broke out he took an active part in military matters. He was sent to the front by the War Office to

report upon the proposed introduction of giant periscopes for use in the trenches, and later on produced a convenient short high-power telescope for the use of officers.

Taking an active part in local affairs in Chard, Col. Gifford was chairman of the Board of Governors at Chard School, of which he was an old boy; and for many years he maintained at his own expense a nurse for the district. He will be greatly missed there by all who knew him. In 1883 he married Emma, daughter of Mr. Ernest Rossiter, of Taunton, to whose assistance in his scientific work he pays grateful tribute in many of his papers. He had one son and four daughters, all of whom survive him.

J. H. GARDINER.

WE regret to announce the following deaths:

Dr. J. W. Evans, C.B.E., F.R.S., a past president of the Geological Society and of Section C (Geology) of the British Association, on Nov. 16, aged seventy-three years.

Dr. E. R. Frazer, a distinguished pathologist and benefactor of the University of Oxford, on Nov. 17, aged sixty-three years.

Dr. G. H. K. Macalister, formerly principal of the Singapore Medical College and editor of the *Malaya Medical Journal*, on Nov. 2, aged fifty-one years.

Dame Mary Scharlieb, D.B.E., a pioneer in medical education for women, on Nov. 21, aged eighty-five years.

Prof. J. H. Teacher, St. Mungo (Notman) professor of pathology at Glasgow University, on Nov. 21, aged sixty-one years.

News and Views.

DISSATISFACTION with the Government's decision to allow the Dyestuffs (Import Regulation) Act to expire on Jan. 15 next is not confined to circles associated with an industry of exceptional national importance; it is shared by all those who have a care for chemical education and research in Great Britain. The intimate relation which connects the existence of a flourishing dyestuffs industry on one hand with the acquisition and application of knowledge in many other branches of organic chemical science and on the other hand with the supply and facilities for training of competent organic chemists has already been pointed out in the columns of NATURE. This relation is patent to members of the scientific community, and it should not be difficult of appreciation by those responsible for the oversight of our economic and educational destinies. It is not our desire to enter into the polemics of the political aspect of the matter, although it would indeed appear from reports of Mr. Graham's answers and Sir P. Cunliffe-Lister's question in the House of Commons on Nov. 19 that prejudice to the dye-user could easily be avoided. The substance of our protest is rather that, so far as the evidence at present available appears to indicate, the decision rests entirely on political opinions, and ignores facts which relate both to the progress of science and to the maintenance of British scientific standing. Until scientific education is more wide-

spread than at present, it would be unreasonable to expect our political leaders themselves always to exercise appropriate judgment in scientific matters, but they are not thereby absolved from the duty of basing their actions on questions of fact ascertained judiciously or otherwise.

ORIGINATING with Sir William Perkin's classic researches, the coal-tar dyestuff industry in Great Britain was an early victim to German scientific enterprise and organisation. A tardy realisation of the place of chemical science in the national economy born of war conditions, followed by effective political action during the past ten years, has resulted in the home production of dyes rising to so much as 93 per cent of the consumption; coincidentally there have grown up in the universities of Great Britain and in industrial laboratories active schools of research directed towards a strengthening of the foundations of the chemical industries in general. This fundamental work has been in large measure rendered possible by direct assistance and by offers of employment by the industries concerned. Even were it possible to ignore the incidence of these developments on intellectual momentum, on future employment in parallel branches of manufacture, and on health and comfort, there still remains the fact that a million pounds is spent annually in the purchase of foreign