

## THE CINQUEMANI "CHRONOLOGE."

THIS is a very singular and interesting contrivance. It is a clock with only one toothed wheel, yet it shows the hours, minutes, days of the week, &c., and strikes the hours and quarters at each quarter of an hour. Moreover, there is an arrangement for repeating the hours and quarters at will. The single toothed wheel spoken of is the escape-wheel, and this propels a pair of pallets and pendulum in the ordinary way. The rest of the work is done in the fall of a small leaden ball, a long chain of these balls being intermittingly elevated, and one of them discharged over a revolving drum each quarter of an hour. We will follow one of these balls through the course of its multifarious duties. It first enters a sling in a tape wound over the escape-wheel axle, and we notice that it is the weight of this and three other balls (which have been previously deposited in preceding slings) which is keeping the escape-wheel going. As the wheel turns round, the balls descend, and after a quarter of an hour the lowest will have arrived at a funnel-shaped opening, where it will get liberated from its sling, and fall. It first strikes a lever which enables the drum to move on and discharge another ball into a sling upon the escape-wheel tape. Then rushing down a tube it enters a zigzag. It is within this zigzag that the striking of the quarters is performed, for at each of its angles a bell is placed, against which the ball strikes sharply as it passes them. After leaving this zigzag, the ball is projected down another, where it strikes the hours. As the number of blows to be struck is regulated by a similar contrivance at each zigzag, we will confine our attention to that for the hours. The channel down which the ball passes is vertical to the face of the zigzag. Now the front or zigzag side of this channel is a moving tape, which carries a little trap. As the tape is always moving, the position of the trap depends upon the time, and the position of the trap also determines the stage of the zigzag upon which the ball will be projected. Thus, when the trap is opposite the sixth stage of the zigzag, the ball will encounter six corners upon its way down, and consequently six blows will be sounded. When the trap is at the top, twelve blows are sounded; and when the trap is at the bottom, no blows are sounded. When the ball leaves the zigzag, it enters a sling at the lowest part of the chain first spoken of, and is intermittingly carried up again to begin its work over again. For repeating the hours and quarters at will, there is a separate reservoir of smaller balls; and by pulling a handle one of these can be discharged above the first zigzag, and when it has done its work it disappears through a hole, which the regular balls cannot penetrate, back to its own reservoir. It may be mentioned that, in lieu of bells, the hour zigzag has a single vertical sonorous tube for each set of corners. The time, days of the week, &c., are shown by means of tapes carrying pointers suspended over the escape-wheel and another axle. The inventor, the Rev. Canon Cinquemani, maintains that the simplicity and precision, by reason of the constant force on the escapement of his "chronologe" (which he has patented), render it peculiarly advantageous for missionary and other distant stations, where the assistance of professional clockmakers is not readily procurable. H. D. G.

## THE NEW AUSTRALIAN MAMMAL.

IN vol. xxxviii. of NATURE (p. 588), Dr. E. C. Stirling, of Adelaide University, described as a "new Australian mammal" a small mole-like animal which had been obtained in Central Australia near the telegraph line between Adelaide and Port Darwin. The same description, with some additions, was afterwards published in the Transactions and Proceedings of the Royal Society of South Australia, vol. x. p. 21. But no decision was arrived at as to the exact affinities of this animal—nor even whether it is a Marsupial or a Monotreme—nor has

any name been given to it. On behalf of the zoologists of this country, who have waited patiently two years for further information, I now venture to urge Dr. Stirling to send one of his specimens of this extraordinary creature (in a letter subsequently addressed to me he speaks of having received two additional examples) to London, and allow us to endeavour to decide what it really is. I need not point out the extraordinary interest of this discovery. If a Monotreme, as seems probable, it will be the third known form of this very peculiar type of mammal-life; if a Marsupial, it is quite different from all known members of that group; and if it turns out to be a Placental Mammal, it will revolutionize our canons of zoological geography. On behalf of the Zoological Society of London, I think I may promise that the specimen, if forwarded, shall be submitted for examination to our very best authorities on the subject, and shall be fully described and illustrated in our scientific publications. Such a grand discovery should certainly not be concealed from the world's knowledge any longer.

P. L. SCLATER.

## RICHARD BURTON.

WE have already announced the not unexpected death, at the age of 69, of Sir Richard Burton, one of the most versatile geniuses and extensive explorers of any time, and one who, so far as Africa is concerned, deserves to be ranked with Stanley and Livingstone. He was born on March 19, 1821, at Barham House, Herts, of old families on both sides, and with a heritage of fighting and wandering propensities. It is curious now to think that Burton was sent to Oxford with a view to taking orders. He soon destroyed all prospects of any such career by getting himself rusticated. He succeeded in obtaining an appointment in an Indian regiment, and, while yet little more than a boy, his restless wanderings began. For half a century Burton lived a life of the fiercest intensity—equal to the lives of three ordinary men. Before his famous journey to Mecca he had published more than one book on his travels in India and neighbouring countries. Before attempting the hazardous enterprise to the holy city of the Moslems, in 1852, he took every precaution to delude his fellow-pilgrims into the belief that he was one of the faithful. His extraordinary gift of picking up languages made this easy; and whether his disguise was or was not penetrated, he succeeded in getting inside, and, better still, outside Mecca, to tell an expectant world of mysteries practically unrevealed before. This journey would certainly have made his name famous; but he meant to do even greater things. At that time it was as dangerous to attempt to enter fanatical Harrar as it was for a Christian to join the Haj. But Burton did it, and lived to tell the world the story of it; though he and Speke had a narrow escape when, the following year (1855), they attempted to reach the Nile through the Somali country.

A preliminary trip to Zanzibar produced a learned and interesting book on that island and its people. We say preliminary, because by this time, 1856, Burton had something much more important in view. Livingstone, it should be remembered, had been at work in Africa for many years; in 1856 he returned to England to tell the full story of his crossing of the continent. Through Livingstone, through Krapf and Rebmann, and others, rumours had been for a long time coming out of great lakes in the interior. Before D'Anville, in the end of last century, made a clean sweep of all the crowded features on the map of Central Africa which had accumulated since the end of the sixteenth century, there were lakes in plenty, scattered over the centre of the continent, and great rivers and mountain ranges, some of them an inheritance from the days of Ptolemy. But no one knew how these features ever came there. The hydrography they in-

licated was impossible; and there was no evidence that any white traveller had ever seen them. The probability is that these lakes and rivers were put down from the reports of natives who had communications with the interior. Much of the existing geography of Africa rests on no better foundation; but then we know better how to sift native reports now than our predecessors did 200 years ago. At all events, as some of us who were at school then may remember, the map of Africa, in 1856, had the word "Unexplored" spread all over its centre. As has been said, Krapf and Rebmann, the missionaries, who had seen Kilimanjaro, and thought they got a glimpse of Mount Kenia afar off, had heard of great lakes in the heart of Africa. It was to seek these lakes that Burton, accompanied by Captain Speke, set out from Zanzibar in June 1857. The expedition was under the auspices of the Government and of the Royal Geographical Society. Before leaving Zanzibar Burton wrote home that he was about to set out in search of "the Great Lake." His eyes were gladdened by the sight of the waters of Tanganyika, at Ujiji, on February 14, 1858. It is scarcely possible for us to realize what this meant at the time. The route, now so well known, from Zanzibar to Ujiji had never before been trodden by the feet of white men. The difficulties which beset this pioneer expedition were disheartening. Before it set out, there was no Tanganyika, no Victoria Nyanza, no Albert Nyanza, no Bangweolo on the map, and only the lower 200 miles of the Congo. Burton's discovery of Lake Tanganyika may be regarded as the centre from which all succeeding discoveries in Central Africa have radiated. It is the great central lake round which all others are grouped. Indeed Burton's companion, Speke, as we know, made a run to the north on the homeward route, and discovered that other great lake, the Victoria Nyanza, which he rightly surmised to be the source of the White Nile. Of the unhappy relations between Burton and Speke this is not the place to write, even if we had any inclination to revive a bitter controversy that ought to be allowed to lie in the grave where it was placed many years ago. That Burton's bitterness against Speke blinded him to the importance of his companion's discovery all will admit. That Burton was of a rough type, given, like other great and successful men, to carrying out his purposes at any cost to themselves and others, there can be no doubt. The big things in the world have generally been accomplished by such men.

Burton's discovery gained him the medal of the Royal Geographical Society, but hardly anything else. After a run to America, he, in 1861, with his newly-married wife, went as Consul to the White Man's Grave—Fernando Po. From here he explored the Cameroons, the Gorilla country, and Dahomey. A few years later a Consulate in Brazil gave him the opportunity of exploring the highlands of that country. After a short stay at Damascus, Burton was appointed Consul at Trieste in 1872, and there he was allowed to vegetate till his death, with no greater reward for all his valuable services to science than a K.C.M.G., given him four years ago. Visits to Iceland, to Midian, and to the Gold Coast, produced several volumes to add to the many he had already published; probably no traveller has ever been so prolific in books. It says little for the intelligence and enterprise of a Government that could find no better use for the services of a man of such power as Richard Burton than to give him the charge of a third-rate Consulate. Of Burton's versatile scholarship and its published results we need not speak in detail. He was one of the few survivors of the old type of adventurer of which our country has been so prolific—men who have been the makers of our Empire and the founders of modern knowledge. Science is bound to remember him as one of her pioneers into the great unknown.

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## PROFESSOR HEINRICH WILL.

THE sad announcement of the death of this well-known chemist from heart disease, on the 15th of this month, is made in the *Chemiker Zeitung* of the 22nd inst. Dr. Will was for thirty years Professor of Chemistry and Director of the Laboratories at the University of Giessen. He was born on December 8 in the memorable year 1812, at Weinheim, where his father held an important official position. After completing his studies at the High School of his native town, he devoted himself for a time to pharmacy. But in 1834 he entered the University of Heidelberg, and in the same year undertook the position of assistant in the laboratory under Prof. Geiger, and after that eminent chemist's decease, in 1836, under the celebrated Prof. L. Gmelin. In 1837, at the request of Prof. von Liebig, he removed to Giessen, where he occupied the position of assistant until his graduation as Doctor in 1839. He then habilitated himself at the University as Privat-docent of Chemistry, his dissertation consisting of a description of his "Investigation of the Constitution of the Ethereal Oil of Black Mustard." In 1842, Dr. Will undertook the direction of the newly-founded Filialslaboratorium, and in 1846 he received a call to the then recently inaugurated laboratory of the College of Chemistry in London. He, however, declined the offer, and was shortly afterwards appointed extraordinary Professor in the University of Giessen. After Prof. von Liebig's departure for Munich, in 1852, Dr. Will became ordinary Professor of Chemistry and Director of the Chemical Laboratories of the University. During the session 1869-70, Prof. Will occupied the distinguished post of Rector of the University, and his inaugural address was a memorable one, treating of the relations between matter and force considered from the chemical standpoint. After forty years' unceasing labour as a teacher and an investigator he retired, at his own request, in October 1882.

As an original investigator Prof. Will was characterized by his precision and the acuteness of his observation. He was also a most excellent teacher, understanding as few others of his time the art of explaining to students that which was so clear to himself. What, however, most struck those who had the good fortune to listen to his lectures, was the deep earnestness which he threw into his subject, and the manner in which he used to carry his students along with him through the most intricate branches of chemistry. His powerfully energetic character was even more apparent if possible in the laboratory, as he passed from student to student, speaking the right word of help and encouragement to each, and inculcating habits of work and thought which raised many of those students to positions of honour and usefulness in the chemical world. His especial fitness for the leadership of a laboratory is very manifest from a perusal of his textbook, "Anleitung zur chemischen Analyse," which appeared in its twelfth edition in 1883, and has been translated into several languages. A. E. T.

## NOTES.

THE Queen has been pleased to command that the Government institution now known as the Normal School of Science and Royal School of Mines shall in future be called the Royal College of Science, London.

THE President of the Institution of Electrical Engineers and Mrs. John Hopkinson will give a *conversazione* in the galleries of the Royal Institute of Painters in Water Colours on Wednesday evening, November 19.

THE death of Robert M'Cormick, F.R.C.S., R.N., Deputy Inspector-General of Hospitals and Fleets, is announced. He was one of the oldest and most eminent officers of the medical