

Kababish called them to the writer) are the surviving representatives of the old Nuba population of the hills of northern Kordofan, the remains of whose houses can be seen on so many hills. In spite of the contemptuous tone taken by the nomad Arabs when speaking of these folk, they are bold raiders, and do not hesitate to cross the border to lift the cattle and camels of even the strongest tribes, the herdsmen of which they kill or enslave as opportunity offers.

The Zaghawa are Hamiticised negroids who about the end of the eighteenth century emerged as a vassal State in northern Darfur under practically independent rulers. It was probably about this time, or a little earlier, that a party of Zaghawa migrated eastwards and seized the hills in the neighbourhood of Jebel Kagmar in northern Kordofan, where they settled and which their descendants still occupy, though none of these can speak a word of any language but Arabic, and have adopted a pedigree dating back nineteen generations to Khalid el Guhani, the brother of Abdulla el Guhani, to whom the usual faked *nisba* of the tribes of the northern Sudan goes back.

The mere mention of these two matters will serve to give some idea of the value and scope of the book.

A MEMORIAL TO SIR JOSEPH HOOKER.

A MEMORIAL to the late Sir J. D. Hooker, which has been placed in the Parish Church at Kew, near the similar memorial to his father, Sir W. J. Hooker, was unveiled by Lady Hooker in the presence of members of the Hooker family on Saturday, February 22. The memorial consists of a mural tablet of coloured marble bearing the following inscription:—

1817-1911 JOSEPH DALTON HOOKER, O.M. G.C.S.I. C.B. M.D. D.C.L. LL.D., ASSOCIÉ ÉTRANGER OF THE INSTITUTE OF FRANCE, KNIGHT OF THE PRUSSIAN ORDER "POUR LE MÉRITE," SOMETIME PRESIDENT OF THE ROYAL SOCIETY, FOR XX YEARS DIRECTOR OF THE ROYAL BOTANIC GARDENS KEW. BORN AT HALESWORTH 30TH JUNE 1817, DIED AT WINDLESHAM 10TH DEC. 1911. THE WORKS OF THE LORD ARE GREAT SOUGHT OUT OF ALL THEM THAT HAVE PLEASURE THEREIN.

Below this inscription is a Wedgwood medallion portrait of Sir Joseph, flanked and supported by five panels containing Wedgwood figures of plants with which, in the course of his long career, there had grown up some especial association. In the upper and corner panels, left and right, these plants are an *Aristolochia*, commemorating his connection with African floristic work and travel, and a *Nepenthes*, recalling a notable contribution to our knowledge of vegetable morphology and physiology. The left lower corner panel contains a *Cinchona*, commemorating Hooker's connection with one of the most humane episodes in economic botany during his lifetime—the introduction to south-eastern Asia of the medicinal *Cinchonas* of South America. The panel which balances this on the right contains a

Rhododendron, commemorative of Hooker's great Himalayan journey.

In a smaller central panel between the lower corner ones is a *Celmisia*, recalling the southern voyage with Ross and the labour bestowed on the flora of New Zealand. At foot are the family arms with the family motto and the motto of the Most Exalted Order of the Indian Empire, of which Hooker was a member in the highest grade. The portrait, a head profile to left, is the work of Mr. Frank Bowcher, and is an excellent likeness, recalling the same artist's treatment of his subject in the medallion executed in 1898 at the instance of the President and Council of the Linnean Society to record the completion of Hooker's "Flora of British India" and his sixty years' services to science.

SIR WILLIAM HENRY WHITE, K.C.B.,
F.R.S.

BY the sudden death of Sir William White on February 27, at sixty-eight years of age, the country has lost one of her best sons and engineering science one of its leading authorities. Sir William White was born at Devonport in 1845, and started his professional life by leaving a private school in the town, in which he was at the time "head boy," and becoming a shipwright's apprentice in Devonport Dockyard.

In the fullest sense of the term the boy was "father to the man," as on entering the dockyard he occupied the highest position among those entering with him, a position which he not only maintained but improved upon by rapidly becoming higher than apprentices who had been entered before him and had had longer practical training and longer education in the dockyard school.

In 1864 a Royal School of Naval Architecture and Marine Engineering was founded at South Kensington, and to this eight shipwright apprentices were appointed, of whom Sir William was the first in order of merit. Of these only one, viz. Mr. H. E. Deadman, C.B., who was principal assistant to Sir William on his retirement from Admiralty service, now survives.

During his study at South Kensington Sir William uniformly kept highest in order of merit, and although some of his college mates, notably the late Dr. F. Elgar, formerly Director of dockyard work at the Admiralty, Mr. W. John, of Lloyd's Register, Mr. W. J. Bone, of Newcastle, and Mr. H. E. Deadman, mentioned above, achieved great distinction, it fell to the lot of Sir William to be called upon to undertake still higher work, and this work he carried out most successfully under trying conditions, often involving shortness of Admiralty staff and inadequacy of office accommodation.

On completing, in 1867, his training at South Kensington, Sir William joined the Admiralty Constructive Staff, under the headship of Sir Edward Reed, K.C.B., and at once threw himself with his characteristic zeal into all of the many difficult matters existing at that time of changing

from wood shipbuilding to iron and steel shipbuilding and from unarmoured to armoured ships.

At this time the principal problems before the Admiralty naval architects were:—(1) What was the best method of constructing the armoured side of ships of the line; (2) what was the best method of disposing the armament; and (3) whether on the whole it was more advantageous to build a comparative short vessel like Sir Edward Reed's *Bellerophon*, notwithstanding the cost in machinery and coal involved in propelling each ton of her displacement, or to build such long fine-lined vessels as the *Warrior* and *Minotaur*?

Even at this early stage of his career Sir William threw much light on these questions, and, in addition, was of the utmost assistance to Sir Edward Reed in the preparation of his famous book, "Shipbuilding in Iron and Steel," published in 1869.

In 1870 Sir Edward Reed retired from his position of Chief Constructor of the Navy, and a Council of Construction, with Sir N. Barnaby (then Mr. Barnaby) at its head, was appointed to carry on the work of Admiralty naval construction. So valuable had been the work of Sir William White in the short time he had been at the Admiralty that he was retained in the position he had served in under Sir Edward Reed, and was gradually entrusted with more and more important work involving a continually increasing amount of responsibility on his part, and from then to the time of his leaving the Admiralty service in 1883 to become the head of the war shipbuilding department of Sir W. G. Armstrong and Co., at Elswick-on-Tyne, there was no work done by the Admiralty designing staff in which he did not play a very large part, which in many cases was a leading part.

In 1871 he read his first paper before the Institution of Naval Architects, which had been prepared by him with the assistance of Mr. W. John named above, and was entitled, "On the Calculation of the Stability of Ships, and Some Matters of Interest Connected Therewith."

This reading of papers before the Institution of Naval Architects he kept up for many years. They were always of first-rate importance; many of them dealt with semi-naval matters as distinct from matters of naval architecture; and the views he put forward were always met with the greatest respect. In addition to beginning in this period the contribution of papers to the Institution of Naval Architects, he commenced taking part in the discussion of papers read by other persons at the same institution, his first effort in this direction being in 1875 with respect to a paper by Mr. William Froude on the graphic integration of a ship's rolling, including the effect of resistance.

During the period of 1869-83, now under consideration, Sir William much interested himself in the education of young naval architects, and almost immediately on his appointment to the Admiralty Office in 1869 he was appointed to succeed Mr. Crossland, a member of an earlier school of naval architecture, as lecturer on naval designing at the South Kensington school. This posi-

tion he retained for some years after the transfer of the South Kensington School to Greenwich, where the school still exists.

While holding this position he, in conjunction with Dr. T. Archer Hirst, the Director of Studies at Greenwich, arranged a course of instruction in naval architecture for the benefit of executive naval officers, and the syllabus of instruction was so well chosen and so wisely given effect to under his guidance that large numbers of officers were attracted to the classes, and the classes continue in effective operation to this moment.

He also at this time put forward a well-considered scheme for the formation of a Royal Corps of Naval Constructors to replace the heterogeneous system then in force, and after some amount of consideration on the part of the then Controller of the Navy, Sir W. Houston Stewart, K.C.B., and of a committee appointed for the purpose and presided over by Sir T. Brassey (now Lord Brassey), the Crown in 1883, under an Order in Council, graciously created the corps on the footing it still holds.

The chief designing work on which Sir William was engaged in this earlier period of Admiralty work, viz. 1869-83, was that of the famous *Inflexible*, with two turrets in *échelon* each containing two 16 in. muzzle-loading guns. The design of this vessel excited very strong adverse criticism, led by Sir Edward Reed. A specially competent committee was appointed to report on the design, and after long and exhaustive investigation—much of it of a practical nature at sea on actual ships, and in the experimental works of Mr. Froude—the committee reported that the design fully satisfied the conditions it set out to meet.

This design was repeated on a smaller scale by two vessels, the *Ajax* and *Agamemnon*, and by two somewhat larger, viz. *Colossus* and *Edinburgh*, although these were still much smaller than *Inflexible*. On all these vessels Sir William took a very prominent part, introducing into *Colossus* and *Edinburgh* for the first time in our line of battleships the construction of the hull of the vessel of steel instead of as heretofore of iron.

From 1883 to 1885 Sir William was engaged on warship design and was head in all respects of the warship-building branch of Messrs. Sir W. G. Armstrong and Co. at Elswick-on-Tyne. He there designed and laid down several famous vessels for foreign Powers, and laid out the Elswick shipyard for warship-building in a manner securing the utmost efficiency for building purposes.

On the expiration of this period he was appointed by Lord George Hamilton, then First Lord of the Admiralty, as Director of Naval Construction in succession to Sir N. Barnaby, then retired on account of ill-health. It has long been recognised that no wiser choice could have been made; and then commenced that portion of the work of Sir William best known to the public, although it will be seen by what has been stated above that he had already a large and very varied amount of work to his credit.

To deal adequately with the work of Sir William

as Director of Naval Construction would be little short of writing a volume; and cannot be attempted here.

On rejoining the Admiralty in 1885, Sir William at once set about making improvements and developments in all classes of designs so as to embody in them all the improvements continually being made in guns, armour, and propelling machinery. Limitations of space will not permit us to describe the various type of vessels which received considerable development under his hands, and mention can be made of one or two points only.

As regards battleships, he made a special study of all the elements which go to make for fighting efficiency, having regard to the rapidly changing concurrent general features of the engineering world, and in 1889 wrote a famous paper for the Institution of Naval Architects, giving quite frankly all his views of the subject, and stating the points that had decided the Board in ordering the then new ships the *Empress of India* and her sisters. He was much criticised by many members, but it was generally felt that his views were sound. In principle and in main features they were adopted, with such extension as arose from the general increase in size and cost of ships up to the introduction of the *Dreadnought* type of ship.

Sir William received many distinctions. He was honorary vice-president of the Institution of Naval Architects, and past president of the chief engineering societies and honorary member of many others. He was elected a Fellow of the Royal Society in 1888, and was created K.C.B. in 1895. At the time of his regretted death on Thursday last he was the president-elect of the British Association for the meeting to be held at Birmingham next September, and his loss to the association will be severely felt. His name will ever be remembered in the annals of the British Navy and the records of engineering science.

PROF. ADAM SEDGWICK, F.R.S.

THE late Prof. Sedgwick was grand-nephew of Adam Sedgwick, Woodwardian professor in the University of Cambridge from 1818 until 1873, sometimes known as the "old Adam." Their ancestors had been "statesmen" in the Dale of Dent for several centuries. Adam Sedgwick, jun., was the son of Richard Sedgwick, vicar of Dent, and the affection he always bore towards his native valley was evidenced by the fact that he sent his second boy to the school at Sedbergh, at the mouth of the Dale.

Our Adam was born in 1854 at Norwich, where his great-uncle held a canonry. He was educated at Marlborough College, and after a short time at King's College, London, he entered in 1874 Trinity College, Cambridge. At that time the recently established professorship of zoology and comparative anatomy was held by Prof. Newton, and Mr. J. W. Clark was superintendent of the Museum of Zoology. Prof. (afterwards Sir George) Humphrey was professor of anatomy, and

Michael Foster had recently come to Cambridge as prælector in physiology to Trinity College. A demonstrator in comparative anatomy had just been appointed by the University, and the late Prof. Bridge was the first to hold that office; a curatorship of the Strickland collection of birds was founded in the year that Adam Sedgwick came into residence, and Mr. O. Salvin was the first Strickland curator. It has not always been recognised that Cambridge led the way in the practical teaching of zoology and biology. Three years before Adam Sedgwick came into residence, J. W. Clark had, with the aid of his friend Mr. Bridge, started laboratory work in these subjects. This class-work was carried on with renewed activity by Milnes-Marshall and by Frank Balfour, and by the time that Adam Sedgwick began to be interested in zoology and to be influenced, as he was for life, by Balfour, practical classes were in full working order, although conducted in adverse circumstances of space and equipment.

Sedgwick was placed in the first class of the natural sciences tripos in the year 1877. In the same list were the names of Prof. Bower, of Glasgow, Dr. Fenton, of Christ's, and Dr. Alex. Hill, of Downing. Compared with the modern days, the tripos was insignificant in numbers, but modern days may not find it easy to equal the quality of this list. After taking his degree Sedgwick definitely cast in his lot with zoology. In 1880 the zoology class conducted by Balfour, with Sedgwick as assistant, was held in the room now occupied by physiological chemistry, at the top of Fawcett's building overlooking Corn Exchange Street.

The University was so conscious of Balfour's ability that, in 1882, he was appointed professor of animal morphology, it being understood that the professorship would lapse with his death, and that it carried but a small emolument with it. The tragedy in the Alps the same year brought this professorship to an end, and Sedgwick was left in a peculiarly difficult position. He had but recently taken his master's degree, he was but little older than some of the senior students, and the management of a comparatively large and rapidly growing department devolved on him.

Before the beginning of the October term of the same year Prof. Newton, Michael Foster, Prof. Humphrey, and J. W. Clark addressed a letter to the Vice-Chancellor, urging that the work which Balfour had so wonderfully begun should be carried on, and that the general supervision of the class should be entrusted to Sedgwick, who had been Balfour's demonstrator for some years, and had been in charge of the class during the Lent and May terms, when Balfour had been either ill or away. This was arranged, and Sedgwick was happy in securing the assistance of Mr. W. Heape, of Trinity College, and Mr. W. R. F. Welldon, of St. John's, as demonstrators, and a little later on of Mr. W. H. Caldwell, of Caius, who was then, with the aid of Mr. Threlfall, of the same college, at work on their automatic microtome.

The University was anxious to assist Sedgwick