

direction—that progress can be made. Fortunately, the country possesses in the Research Board a body of experts, administrative and scientific, who can advise on the work, and in Dr. Wheeler it has a director of research who commands the full confidence of the Board. What is eminently desirable is to maintain the closest touch between the mining industry and the Research Board. The public are deeply interested in the problems the Board has to solve, and it should not be beyond the wit of man to keep the public informed of the methods used and the results obtained in language which can be followed by ordinary folk unversed in scientific formulae.

After the opening speech, the chairman, Col. Lane-Fox, the Secretary for Mines, called on Mr. Eustace Mitton on behalf of the Mining Association (in the absence through illness of the president, Mr. Evan Williams), and on Mr. Herbert Smith, president of the Miners' Federation. The latter at once struck a note to which the large audience were responsive. "There are two things," he said, "in regard to which coal-owners and miners are always friends—first, how to save life and limb, and secondly, how to rescue when life and limb are at stake." On that platform they stood as one. He warmly commended the Welfare Fund, and the work that had been done under the chairman's guidance. He admitted the difficulty of persuading miners that there is danger in coal-dust, and he recognised the importance of the artificial mine that demonstrated the destructive violence of a pure coal-dust explosion, but stated that the plant that appealed to him most as a Yorkshire miner was the building where artificial gob fires could be initiated and studied throughout their various courses.

On the new experimental station the most important sections of the research equipment are the two steel galleries which have been constructed for testing the explosibility of coal dusts under various conditions. One of these, in which the greater part of the systematic work will be carried out, is 4 feet in diameter and 1000 feet long. The other, which will be used mainly for demonstration explosions, is 7½ feet in diameter and 390 feet long. They are connected to fans arranged for creating a current of air in them in either direction.

The 4-foot gallery is equipped with instrument cabins every 100 feet, containing apparatus for measuring the pressures produced during the explosions and the speeds of the flames. These instruments are controlled from a distance at the observation station. Two special sections have been included in this gallery for investigating the effect of openings in the gallery (corresponding to the branches off an underground road) on the development of a coal-dust explosion.

Research on Firedamp Explosions.—The 7½-foot gallery is also used for the study of firedamp explosions. One of the principal series of experiments now in progress is to determine the distance to which the flame of an explosion can be projected along a roadway beyond the area originally occupied by the explosive mixture.

There is another gallery, one foot in diameter and 300 feet long, in use for studying the effect of restrictions in the path of the flame on its speed.

Research on Coal-mining Explosives.—The buildings for this work include (a) a research laboratory and gun-room in which photographic methods are used to investigate the flame and the pressure waves sent out by an explosive when it is fired, and (b) an explosion gallery and observation station where the igniting power of explosives under different conditions of detonation is tested directly by firing them into explosive mixtures of firedamp and air.

Research on Gob Fires.—Some coalfields suffer from fires which break out in the gob or goaf, the part of the mine where the coal has been worked. The building in which the study of gob fires is being made consists of a central chamber, 30 feet square and 8 feet high, simulating a goaf, with an air passage, approximately 6 feet wide by 7 feet high, circumscribing it. The main object of the research in progress is to determine the limiting conditions necessary for the production and ignition of explosive gas mixtures from a fire behind a stopping, and to study methods of sealing off a fire so as to avoid these conditions. Records of the temperature, and samples of the atmosphere at different points within the sealed-off area, can be taken periodically.

University and Educational Intelligence.

CAMBRIDGE.—Mr. Roger Fry, Sir John Marshall, and Prof. A. V. Hill have been elected honorary fellows of King's College. The Council has proposed to the University that the degree of LL.D., *honoris causa*, be conferred upon the Duke of Northumberland, Sir Archibald Denny, Sir Eustace Tennyson-D'Eyncourt, and Sir Charles Oman in connexion with meetings to be held at Cambridge this summer of the Institution of Naval Architects and of the Royal Archaeological Institute. It is also proposed that the degree of M.A., *honoris causa*, be conferred upon Lieut.-Col. J. E. Craster, late R.E. Sir Humphry Rolleston has been appointed to represent the University at the coming Imperial Social Hygiene Congress.

Mr. A. S. Besicovitch, of the University of Leningrad, has been appointed lecturer in mathematics. Mr. H. W. Florey, Gonville and Caius College, has been appointed to the Huddersfield lectureship in special pathology. Dr. C. M. Yonge has been nominated to use the University Table at the zoological station at Naples for six months.

The annual report of the Solar Physics Observatory gives an account of the preparations and programme of Prof. Newall's expedition to Aal in Norway for the total eclipse of June 29.

Mr. R. V. Sayce has been appointed lecturer in material culture and physical anthropology. Dr. J. Chadwick, Gonville and Caius College, has been re-appointed lecturer in physics and assistant director of radio-active research.

F. W. Shotton, Sidney Sussex College, has been elected to the Harkness Scholarship in geology. E. J. H. Corner, Sidney Sussex College, and A. L. Bennett, Christ's College, have been awarded the Frank Smart prizes in botany and zoology respectively. The Tyson medal, in astronomy, has been awarded to C. S. M'Leod, Emmanuel College, and the Mayhew Prize in applied mathematics to J. Hargreaves, Clare College. The Rex Moir Prize in engineering and the Ricardo Prize in thermodynamics have been awarded to J. N. Goodier, Downing College. The John Bernard Seely prize in aeronautics has been awarded to C. E. Maitland, Peterhouse.

A grant has been made by the Balfour Managers to E. B. Worthington, Gonville and Caius College, for researches on the plankton of the Victoria Nyanza.

EDINBURGH.—At the meeting of the University Court on Monday, June 13, it was intimated that the Highland and Agricultural Society had resolved to make a grant of £1000 towards the endowment of the Department of Research in Animal Breeding.

The Court decided to make an annual contribution of £50 to the newly established British Institute in Paris.

NEWCASTLE.—The Council of Armstrong College has made the following appointments: Mr. Clement Heigham to be professor of agriculture, in succession to the late Prof. D. A. Gilchrist; Dr. J. W. Heslop Harrison to be professor of botany in succession to Prof. J. W. Bews, resigned; Mr. James Holmes to be lecturer in geography (a new appointment).

Mr. Heigham was educated at Wellington College and Caius College, Cambridge. He was for some time director of studies in agriculture at Caius College, Cambridge, and during 1923 and 1924 was director of the Norfolk Agricultural Station. Since 1925 he has been farm director at the Ministry of Agriculture's Experimental Station at Rothamsted.

Dr. Harrison is an old student of Armstrong College. He was at one time head of the science department at Middlesborough High School, and since 1920 has been lecturer in zoology in Armstrong College. In 1926 he was given the honorary title of reader in genetics. His researches on genetics, particularly on the question of the transmissibility of acquired characters, have made him widely known.

Mr. Holmes is a graduate of the University of Glasgow, and for the last four years has been senior assistant in the Department of Geography there.

OXFORD.—The great utility of the private laboratories belonging to Balliol, Trinity, Jesus, Queen's, and Christ Church has been recognised by the University in a recent decree authorising the payment of money grants to these laboratories which are to be equal to the normal laboratory fees paid by students working therein. It has long been recognised that Colleges which have scientific laboratories of their own have a very great advantage over those which are not so provided.

The preamble to a statute providing that there shall be an Aldrichian praelector in chemistry to be held by one of the University demonstrators has been approved.

ON June 7, in the presence of a great gathering representative of the west of England, and amid memorable scenes of enthusiasm, the Prince of Wales, president of the University College of the South-West of England, laid the foundation-stone of the new arts and administrative building of the College. The ceremony was of a peculiarly picturesque character and was enhanced by the magnificence of the exceptionally beautiful site which, known formerly as the Streatham Estate, forms one of the beauty spots of the south-west. The deputy-president of the College, Sir Henry Lopes, in welcoming the Prince, outlined the history of the rapid growth of the College, and explained that the increasing number of students and the rising standard and volume of academic work has impelled the College to find fresh quarters, more suited to the expanding needs. He stated that the appeal for a building and endowment fund, launched a few months ago, is evoking from month to month an increasing response. The greater part of the first £100,000 required has already been subscribed, and the lists show that all classes are contributing to the fund. The Prince in his reply congratulated the College on the support which the plans of expansion has evoked throughout the whole area. A people's university, created by the wishes and efforts of all classes, deserves the best that can be provided both as regards building and teaching, and he expressed the hope that the building would be a worthy monument to the hopes and ambitions of the people. His unexpected announcement that Lord Glanely is giving £25,000 to the appeal fund was received with enthusiasm.

No. 3008, VOL. 119]

Calendar of Discovery and Invention.

June 26, 1794.—The balloon was invented by the French, and the French were the first to use balloons in warfare. In 1793 a company of military aeronauts was formed, Jean Marie Joseph Coutelle (1748-1835) was made captain, and at the battle of Fleurus, June 26, 1794, he made observations from a balloon which it is said contributed to the success of the French. Coutelle and his company accompanied Bonaparte to Egypt, but their whole equipment was destroyed in the burning of *l'Orient* at Aboukir.

June 27, 1889.—The statue of Leverrier at the Paris Observatory was inaugurated on June 27, 1889. In his discourse Tisserand said: "The celestial world gets larger every day. . . Yet our curiosity is inexhaustible; and however splendid may be the heaven which we are permitted to contemplate, we want to attain to greater knowledge still. We strive to realise what it was like in the most distant past, and what it will become in the most distant future. In this way—so it seems to us—our mind takes its revenge upon the shortness of our span of life and the frailty of our existence."

June 28, 1903.—It was at a meeting held at the Academy of Sciences, Munich, on June 28, 1903, that the Deutsches Museum von Meisterwerken der Naturwissenschaft und Technik was founded. Its inception and development owe much to the acumen and energy of Dr. Oskar von Miller, and its purpose is to represent physical science and its application to industry from the earliest times to the present day.

June 30, 1820.—Among the numerous papers contributed to the Linnean Society by Robert Brown was that read on June 30, 1820, on *Rafflesia*, the largest known flower.

June 30, 1866.—For centuries a barrier to human intercourse, the Atlantic is now crossed by steamships, submarine cables, aircraft, and radio signals. The first submarine cable, laid in 1858, failed after being in use a month, while the second, laid in 1865, was damaged in the laying. On June 30, 1866, however, the *Great Eastern* left the Medway with 3000 miles of new cable. The shore end was spliced on July 13, and on July 27 the ship steamed into Heart's Content, Newfoundland. No one contributed more to the final success of the project than Prof. William Thomson, afterwards Lord Kelvin, who for his share was raised to the knighthood.

July 1, 1858.—On July 1, 1858, Lyell and Hooker communicated to the Linnean Society papers which they described as relating to the same subject, namely, "The Laws which affect the Production of Varieties, Races, and Species," and as containing the results of the investigation of two indefatigable naturalists, Mr. Charles Darwin and Mr. Alfred Wallace, who "independently and unknown to one another, conceived the same very ingenious theory to account for the appearance and perpetuation of varieties and of specific forms on our planet. . . ." Of his own share Wallace said, "The one great result which I claim for my paper of 1858 is that it compelled Darwin to write and publish his 'Origin of species' without further delay."

July 2, 1919.—The only aircraft which has flown to and fro across the Atlantic was the airship R34. With a crew of 26 she left East Fortune, near Edinburgh, on July 2, 1919, and reached New York in 4½ days. Her return was made in 3 days 3 hours. She was 645 feet long and 79 feet in diameter, contained nearly 2,000,000 cubic feet of gas, and was driven by five Sunbeam engines of 285 H.P. each. A year or two later she was damaged and then dismantled.

E. C. S.