but also to analyse with precision, periodic movements in explosion flames occurring with frequencies up to a million a second. A number of the resulting photographs were exhibited showing the influence of compression waves in accelerating explosion flames and setting up detonation therein and, more particularly, the new phenomenon of 'spin' in detonation, which is due to a highly luminous comet-like 'head' of detonation spiralling through the medium with a frequency of several tens of thousands a second, and appears to be a concentrated locus of positively charged particles. These developments are not merely important but have also opened up a new field in the investigation of the propagation of chemical change through gaseous media under the most intensive conditions of temperature and pressure.

Recent Acquisitions at the British Museum (Natural History)

THE Rev. A. H. Cooke has given the whole of his collection of shells of land-snails of the genus *Clausilia* and of the dog whelk (*Thais lapillus*); the former is very rich in series from central Europe and the Balkans, and the latter includes specimens from practically the whole distributional area, and illustrates very completely the remarkable variation of this species. Recent accessions to the Department of Entomology include the final instalment, consisting of several hundred Hymenoptera, of the very large amount of material collected by the Percy Sladen Trust Expedition to the Seychelles and other islands of the western Indian Ocean. This expedition, which was led by Prof. (then Mr.) Stanley Gardiner, in 1905 and 1908–9, resulted in the gift of many thousands of specimens to the Museum. The final instalment consists almost entirely of small or minute wasps, many of them obviously new, which it has so far proved impossible to work out owing to the lack of specialists in these groups. The Department has also received a set of the Hymenoptera collected on the island of Rodriguez by the late H. J. Snell and by Mr. H. P. Thomasset. From Mount Kina Balu in North Borneo a series of a new species of *Blepharocera* has been sent by Mr. H. M. Pendlebury. Flies of this genus have hitherto been found only in the north temperate regions, and their discovery in Borneo is therefore both surprising and of importance in zoogeography. The larvæ of these insects live only in waterfalls and rapids, attaching themselves to rocks and stones by means of ventral suckers; and it has been considered therefore that they would be able to spread only along land routes. The four, widely separated, compound eyes in this species give the head a most remarkable appearance. The American Museum of Natural History has presented to the Department of Geology a model of an extinct straight-tusked elephant.

Game Animals in the British Museum (Natural History)

THE Trustees of the British Museum announce the closing of the exhibition of the game animals of the British Empire in the New Whale Gallery at the Natural History Museum on March 19. As, owing to the financial stringency, it was impracticable to begin last year the removal of the exhibited specimens of whales to their new quarters, the Trustees decided to use the space available for the temporary exhibition of the game animals, grouped by the three great faunal regions in which they occur and arranged without glazed cases. Unhappily the skins are attractive to moths; it would therefore be risky to leave the specimens exposed when the moths begin to fly in spite of the daily dusting which these skins receive, and they will be returned to their cases before the end of the month. Capt. Guy Dollman, who was responsible for the arrangement of the exhibition, will talk in the New Whale Gallery about the animals in the three great faunal regions at 11.30 on March 4, Indo-Malaya; March 11, Africa; March 18, Canada and Newfoundland. Visitors will be admitted free.

Ross Institute for Tropical Diseases

AT a recent meeting of the Industrial Advisory Committee of the Ross Institute, Putney Heath, London, S.W., reports were received of the over-seas activities of the Institute. Seven research centres in Assam and northern Bengal have been opened, and anti-malarial work and the testing of new drugs for the treatment of malaria have been pursued there and in Rhodesia and East and South Africa. In the Assam tea gardens, anti-malarial work has resulted in much improved health, for in 1930 among a population of 13,248 the admissions to hospital were 23,226 but in 1932 with a slightly larger population the admissions were reduced to 15,141. A standard oil mixture for killing mosquito larvæ has been devised in conjunction with the Burma-Shell group. The health among lead miners in Yugoslavia was investigated and a health scheme was formulated and is now in operation. At the conclusion of the proceedings, Mr. Still and Sir Malcolm Watson addressed the meeting on the subject of yellow fever. Now that travel by aeroplane is so rapid, the grave danger that infection may be carried from the yellow fever zone in West Africa to East Africa and Asia, which would be followed with disastrous consequences, was emphasised.

Norwegian Antarctic Expedition

CAPT. H. RIISER-LARSEN, the leader of the forthcoming Norwegian expedition to the antarctic, has outlined his plans in the *Polar Record* for January. With two companions and eighty dogs, he hopes to be landed from a whaler at Enderby Land early this year. A hut will be built as a base for the winter months but various sledge journeys will be made in April and May. In the spring the three men will start sledging westward over the sea-ice along the coast of the Weddell Sea to Snow Hill or Hope Bay in Graham Land, where supplies were to be landed by a whaler this (southern) summer. The expedition is to be picked up early in 1934. A short wave radio equipment will be carried which will make it possible for arrangements with the whaler to be altered. Capt. Riiser-Larsen believes, from his view of the

ice during flights in recent years, that the land-ice round this coast is heavily crevassed and would make travelling difficult. On the other hand, he thinks that the sea-ice will give a suitable surface and that lines of stranded bergs prevent it breaking up near the coast. The experience of others in the Weddell Sea suggests that these are optimistic views, but Capt. Riiser-Larsen admits that if the route proves impracticable, journeys will be made in an easterly direction from Enderby Land, where there is much work to be done. The use of a sea-ice route will certainly allow plenty of seal-meat to be got for men and dogs, and so obviate the necessity of carrying full rations.

Institution of Mechanical Engineers

AT the annual general meeting of the Institution of Mechanical Engineers on February 17, Mr. A. E. L. Chorlton, M.P., was inducted as president and the annual report for 1932 was adopted. The total membership of the Institution is now 11,295, a net increase for the year of 134. While the numbers of associate members and graduates show considerable increases, there has been a decrease in the numbers of members and of students. During the year Sir Alfred Ewing, Sir Henry Fowler, Sir Vincent Raven, Sir J. J. Thomson and the late Mr. W. H. Patchell were elected honorary life members. The total revenue for the year was £34,052. The report refers to the work of the various research committees and also to the educational work done. Examinations for National Certificates and Diplomas in Mechanical Engineering were held in conjunction with the education departments in England, Scotland and Northern Ireland at which 2,829 candidates sat. Twenty National Diplomas (Air) in Mechanical Engineering were awarded jointly with the Board of Education and the Air Ministry to officers of the Royal Air Force on completion of the engineering course at Henlow. In addition to the meetings held at the headquarters of the Institution, full programmes were carried out by the nine provincial branches, the average attendance of members and visitors at each meeting being more than a hundred. The gifts to the Institution include a plaque modelled by F. J. Halnon and cast in steel, showing Faraday in his laboratory, the donor being Sir Robert Hadfield.

Illuminated Fountains

RECENT installations of illuminated fountains in Paris and Stockholm prove that magnificent effects can be produced in this way which fit in well with festive occasions. In the *Escher-Wyss News* for October an interesting technical description is given of an illuminated fountain which was constructed in the lake of Zurich for a 'lighting week'. A pontoon was moored 85 metres distant from the shore and away from the route of the steamers. The caisson is circular in shape, its weight is 12 tons and the upper platform is ten metres in diameter. Five pump sets are arranged in the bottom of the caisson each capable of delivering 220 lb. of water per second when the motors rotate at 1,450 r.p.m., producing a total pressure head of 20 metres. They can be connected in series or parallel. The play of the water is arranged in eight different ways producing the appearance of circles, tulips, baskets, etc. With one arrangement the main water jet rises to a height of 45 metres, the whole fountain being apparently enveloped in foam. The whole of the playing waters are illuminated by thirty-two search-lights, each taking between 1,000 and 1,500 watts. The lamps are hermetically sealed in concrete casings. The entire pontoon is painted in a neutral colour so as not to form a contrast and interfere with the picture presented by the lake. The general effect of this fountain fits in very well with the shore illuminations. The work was completed in a few weeks and the fountain was set in operation on October 1, 1932.

Steam, Electric and Diesel-Electric Traction

IN a paper read before the Institution of Civil Engineers on February 21, H. W. H. Richards, electrical engineer to the London and North Eastern Railway, makes a definite comparison, both technical and financial, between steam, electric and Diesel-electric traction. The comparison is based on the existing traffic conditions of load and speed, so that it is on exactly the same basis in each case. It can be shown that the most satisfactory unit to adopt is the trailing ton-mile per annum per single track. The average traffic density for steam trains is about three million ton-miles and for electric trains which are practically confined to suburban service it is about 4·5 million ton-miles. It appears that on an average load of about fifty per cent for the complete electrification of the main lines in Great Britain, the total power of the steam turbines required for the electric service would be 3·5 million brake horse power. If Diesel-electric service were adopted throughout, the total Diesel engine power required would be 15 million brake horse power. On the same basis, the total weight of electric tractors would amount to 850 thousand tons as compared with 1,300 thousand tons for Diesel-electric tractors. The capital costs for traffic densities ranging from 2 million to 10 million ton-miles are in all cases cheapest for steam and the costs of electric and Diesel-electric services are much the same at a traffic density of 4 million, after which electric traction becomes progressively cheaper. As regards operating costs, for main line services, including interest on capital, the cost of electric traction is lower than that of steam or Diesel-electric traction at traffic densities greater than 2·5 million ton-miles.

Reading under Vibratory Conditions

IN the paper on recent developments on electric lighting read by Mr. W. J. Jones to the Royal Society of Arts on November 30 and published in the Society's journal (*J. Roy. Soc. Arts*, vol. 81, p. 132) some novel experiments and phenomena were described in connexion with illumination. He showed a swinging pendulum with the letter *E* printed at various points down its shaft. The speed of translation of any particular *E* is directly proportional to its