who acted as Priestley's literary and commercial agent. Priestley's correspondence was often directed to Johnson, at whose house the itinerant cleric also occasionally lodged. Another business acquaintance on whom he called was Edward Nairne, a mathematical instrument maker to the Royal Exchange, who lived at 20 Cornhill. Nairne supplied electrical machines and air-pumps to Priestley, who, in one of his letters, directs attention to the fact that the recently imported commodity, caoutchouc, could be purchased at this establishment.

Priestley must have been very familiar with the road from the Royal Exchange to Westminster. At 36 Craven Street, Strand, where Benjamin Franklin lodged—a tablet on the house commemorates the fact—Priestley was a frequent caller, sometimes dining with the distinguished American, who, like himself, was a member of the congregation assembling at the Essex House Chapel, Essex Street, just opposite the Courts of Justice. Sometimes he preached at this church, giving a rest to his great personal friend, the Rev. Theophilus Lindsey, the officiating minister. A little to the east of the Law Courts is Chancery Lane, connecting the Strand with Holborn, and in this latter thoroughfare, at Featherstone Buildings, Priestley, as Lindsey's guest, was always *persona grata*. These buildings, which are to the west of Chancery Lane and on the north side of Holborn, are famous also as the temporary home of Sir Walter Besant, when he was a student at King's College, and at the corner house Sheridan and Miss Linley first set up housekeeping after their elopement from Bath. Another of Priestley's clerical friends was Dr. Andrew Kippis, the biographer of John Canton, the Spitalfields school-master, and likewise of Sir John Pringle, P.R.S.

As a preacher with a slight stammer, Priestley would not be at his best as a rhetorician, but in the library or round the festive board, what eruditional entertainments he must have given.

Can there be any doubt of the many cordial invitations he received when he came to London on his annual trip? Sometimes he stayed with Kippis in Whitcomb Street, parallel to the Haymarket, at other times with Dr. Price, who resided at Newington Green. It was this latter Non-conformist, who delivered a discourse on civil liberty at his chapel in the Old Jewry, Cheapside, which roused the ire of Edmund Burke to white heat. In the same place of worship, Priestley performed the mournful duty of preaching his friend's funeral sermon.

Having given some space to Priestley's devotional labours, it remains to mention those dealing with his scientific occupations. In 1773, he came to London as librarian and companion to Lord Shelburne, whose town residence, Lansdowne House, Berkeley Square, has recently been demolished. This post was ideally congenial to a man of Priestley's temperament and ability. The duties of his office were slight. In apartments reserved exclusively for him, he worked without let or hindrance. Distinguished foreigners paid visits to his laboratory and now and then William Pitt called on him to keep in touch with his latest experiments. At Lansdowne House on August 1, 1774, Priestley discovered oxygen, an event that will always be associated with his name.

After he left the service of Lord Shelburne, Priestley settled in Birmingham until a riotous rabble fired his house and chapel and caused him once again to seek safety among metropolitan sympathisers. Shortly after his flight to London, he was appointed to succeed Richard Price at the Gravel-pit Meeting House near Mare Street, Hackney. At this place of worship, he delivered his farewell sermon before sailing for America. His very last Sunday, however, was spent at the chapel in Essex Street, his friends "Sorrowing most of all at the words which he spake, that they would see his face no more". Next day he departed by river for Gravesend.

The Recent Japanese Earthquake

By DR. C. DAVISON

ONE of the greatest earthquakes of the present century—a century that includes the Kansu earthquake of 1920 and the Kwanto earthquake of 1923—occurred off the east coast of Japan at about 5.31 p.m. on March 2, G.M.T. (or March 3, 2.31 a.m., Japanese time). The centre, as determined from the Kew record, lay in about lat. 40° N., long. $144\frac{1}{2}^{\circ}$ E. This point is 140 miles from the north-east coast of Japan, near the foot of the western slope of the Tuscaraora Deep, the depth of water in this region being 4,000 fathoms or about $4\frac{1}{2}$ miles. It is, as Prof. Milne pointed out many years ago, the seat of some of the most violent of all Japanese earthquakes. Among them may be included those of the years 1563, 1659 and 1896, and perhaps that of 1668.

This centre is so distant from land that the destructive effects of the actual shock are not as a rule important. The recent earthquake was, however, of such strength that pictures were dislodged and ornaments thrown down within a district 235 miles in length from Morioka to Maebashi. It was strongest along the 54 miles of coast between Fudai and Kamaishi. As usual in great earthquakes, the shock was of considerable duration. At the observatory of Aomori, it was sensible for eight minutes, the greatest horizontal movement registered there being 87 mm. or about $3\frac{1}{2}$ in. At Tokyo, where it did not even shake down plaster or stop clocks, it was felt for four minutes.

Though much damage was caused by the

earthquake and subsequent fires, the sea-waves were responsible for the greater part. In the Iwaki prefecture, that immediately to the west of the epicentre, the sea-waves advanced in the form of a wall of water from four to seven feet in height, that swept away villages along the coast and wrecked several small towns. At Kamaishi, the sea-wall was broken down by the waves and 1,500 houses were destroyed.

The loss of life and the injury to property were considerable. According to official figures issued on March 5, 1,560 persons were killed, 956 are missing and 354 wounded; while 2,878 houses were washed away, 1,458 were thrown down, and 211 burned.

One of the most notable predecessors of the recent earthquake was that which occurred on June 15, 1896, and is known as the Sanriku earthquake. According to Omori and Hirata (*J. Coll. Sci., Tokyo Imp. Univ.*, vol. 11, pp. 161-195; 1899), its epicentre lay in lat. 39° N., long. $144\frac{1}{2}^{\circ}$ E., or some miles to the south of that of the recent earthquake.

In Japan, as elsewhere, great earthquakes seldom visit the same region, except at long intervals of time. The centres of successive earth-

quakes belonging to the same seismic zone are rather displaced some or many miles—in this case perhaps sixty miles—along that zone. On land, the Sanriku earthquake was much less violent than the recent shock, though it was felt to a distance of 320 miles from its centre, but it was followed by far greater sea-waves. All eye-estimates of the height of sea-waves are subject to large errors, and we cannot have much confidence in such figures as 94 ft. at Yoshihama and 60 ft. or 100 ft. along the eastern coast of Hokkaido. At Ayukawa, however, which is 170 miles from the epicentre, the tide-gauge showed for the chief movement a rise of 8 ft. above the usual level, followed by a fall of the same amount below it. The waves were certainly large enough to be recorded at Honolulu and Sausalito, at the entrance to San Francisco Bay, the latter station being 4,787 miles from the epicentre.

In 1896, the sea-waves were far more destructive to life and property than those of the present year. In Kamaishi, 4,700 of the 6,557 inhabitants were drowned and 88 per cent of the houses were swept away. Along the whole coast affected, the number of lives lost amounted to 28,321, and of houses ruined to 6,222.

Obituary

LORD LOVAT, K.T., G.C.V.O., K.C.M.G.

THE death of Lord Lovat on February 18 will prove a great loss to forestry both in Great Britain and throughout the Empire. To his strong personality, tireless energy and great grasp of detail, Great Britain owes it to-day that she has a Forestry Commission in being, a considerable addition to the afforested area, and, it may be justifiably hoped, a settled forest policy. In future years it may come to be recognised that Lord Lovat's greatest claim to remembrance by his fellow countrymen will be the great part he played in a resuscitation of the national forestry question, which had practically lain dormant for more than a century.

Lord Lovat's interest in forestry, from a wider point of view than his own estates, was aroused before the War. In the latter part of the great struggle he acted as Director of Forestry in France, to co-ordinate the forestry operations being carried out with the object of supplying the troops in the field with the essential timber and other products of the forests. During this period, he was one of the originators of the Acland Report drawn up as a result of the Departmental inquiry, 1916-17, with the object of pressing upon the Government the paramount necessity of taking up the question of afforestation in Britain at the close of hostilities.

A Forestry Bill to this end was presented to Parliament and passed in 1919 and Lord Lovat was appointed in 1920 chairman of the Forestry Commission, which was empowered to carry out

the provisions of the Bill. With the object of leaving the new Commission free from politics, a Treasury allotment was made and the Commission was not placed under a minister of the Crown.

With that energy and vitality for which he was renowned, Lord Lovat at once devoted himself to this new business, which involved commencing a planting campaign on land to be obtained from private individuals, since no State-owned land existed. That the organisation he and his Commissioners introduced was effective is proved by the fact that when he resigned the chairmanship in 1927 some 94,289 acres had been afforested and 391,511 acres of land had been acquired by the State. Before he resigned his post, with the spirit of generosity which animated him, he stated publicly: "If any good work has been done by the Forestry Commission, it does not lie with me but with the excellent body of Commissioners and staff which we have in the Forestry Commission." Yet it was an open secret that, but for Lord Lovat, the 'Geddes axe' might have brought the work of the Forestry Commissioners to an abrupt end and that on several occasions serious changes in policy were only prevented by his influence and tact.

Lord Lovat was chairman of the first Empire Forestry Conference, held in London in 1920 after the formation of the Commission, and of the second held in Canada in 1923, during which he visited most of the forests in the Dominion.

In connexion with forestry education and research, Lord Lovat held strong views which