Metal finishing. One of the main investigations in the relatively newly formed Metal Finishing Laboratory at Euston Street is on the use of nickel in electroplating. Other researches in that field, designed to improve technique, are those on the electroplating of aluminium and on chromium deposition. The plating of aluminium is difficult, due to a tendency of the basis metal to form a film which prevents proper adhesion of the deposit. This is overcome by the initial formation of a thin zinc coating in one of two ways: chemical replacement, or electro-deposition. The conditions necessary to secure the optimum results in both these methods have been worked out, with marked improvement in industrial practice as a result.

Analysis. In the analytical field, the Association is responsible, apart from a vast amount of analysis required in its own investigations, for the development of new methods and apparatus. The exhibits during the open days covered an extremely wide variety of analytical methods, including the determination of gases in metals. In the chemical field great use is made of the polarograph (including derivative polarography) and of the spectrophotometer. In the field of spectrographic analysis, the Association has been responsible for a great deal of work aimed at improving the range and accuracy of the method. A direct-reading spectrograph (Quantometer) has recently been acquired, designed for the examination of copper alloys. The accuracy and field of use of this instrument are being explored in the light of its known success in the aluminium and steel industries.

DEODAR AS PENCIL WOOD

UNTIL recently the so-called East African cedar (*Juniperus procera*) from Kenya has held sway in Britain, the United States and elsewhere as providing the highest class of pencil. Formerly the eastern red cedar of America (*Juniperus virginiana*) was widely used for pencil-making in the United States; but supplies gave out and the Kenya cedar held pride of place for the best-class and highest-priced pencil. Another tree used for this purpose in the United States is the incense cedar (*Libocedrus decurrens*), which grows in California. The use of the beautiful Indian deodar wood (*Cedrus deodara*) for pencil slats is a new idea, due to the research work undertaken at the Research Institute at Dehra Dun, and Indian Forest Bulletin No. 149 (New Series) gives a brief account of this new application*. The deodar has been extensively used in the past for other purposes: after the Sikh Wars in the Punjab (1849), the province was taken over and the British made acquaintance with the deodar, practically the only wood used by the local people, in the building of stations and cantonments; later, in the early 1860's, with the coming of the railways, the wood was in even greater demand for making sleepers.

The habitat of the deodar is the north-west Himalaya at approximately 6,500–8,000 ft. It has a strong timber, of good grain and easy to work, and is free from warpage. The trees are felled on contracts by the mountain people, converted *in situ* as required for logs or sleepers and floated down the mountain rivers to the part of the hills where they are collected in

depots and built into rafts for the rest of the journey. The forests and work are mostly under the supervision of the government forest department. From the work done at the Institute, it is claimed that the wood makes first-class pencils. Unfortunately, its colour is light yellow; it is thought the public would be suspicious of the unusual colour, so the deodar slats are stained with a dye to a more popular colour. If the deodar pencil can be put on the market at a paying price, the results should be satisfactory, for the consumption in India to-day is about half a million gross of pencils, of which the deodar will supply the demand for higher quality pencils and save imports.

In supplies of material it is hoped to make use of part of the millions of cubic feet of sawn timber extracted every year as shipur; but perhaps more particularly to exploit the huge amount of off-cuts and small pieces left in the forest after the shipur conversion. The bulletin is silent as to the methods by which this material can be collected on the mountain-side in forests where chain-felling is not practical, and it also gives no indication as to the costs of such collection.

EARTHQUAKES DURING 1952

DURING 1952 there were eighty-nine earthquakes each having a magnitude 6 or greater than 6 on the Richter logarithmic scale. The greatest two had magnitudes $8\frac{1}{4}$ and about $8\frac{1}{2}$, these being rather less than the greatest the world has known. One of the two occurred on March 4 from an epicentre near the east coast of Hokkaido, Japan. Fissures in the earth were caused, and a section of the cliff sank into the sea. Several bridges were damaged, railway lines were buckled and two trains were derailed. When buildings collapsed, fires were started. There was probably some geological fault displacement in the sea-bed also, as a tsunami with waves up to eight feet high swept the coast and swamped a fishing fleet of twenty boats at Uzumai village. At least 31 people were killed and 169 injured, and there was extensive damage to property.

The other earthquake occurred on November 4 from an epicentre near the east coast of Kamchatka (see *Nature*, 170, 914; 1952). The epicentre, as calculated from observations at eighty-one observatories by the workers at the International Seismological Association Central Station at Strasbourg, was situated at lat. 52.9° N., long. 160.1° E., and the initial time was 10 hr. 58 min. 23 sec. G.M.T. The macroseismic effects in Kamchatka are not yet known, but the earthquake started a great tsunami which spread across the Pacific Ocean and reached as far as the shores of New Zealand, the Hawaiian Islands and South America.

During the past year five earthquakes were reported with a focal depth equal to, or greater than, 400 km., the one with the greatest focal depth (700 km.) being on February 11 with its epicentre in the Java Sea.

There were a number of earthquakes in or near Europe, and these included the following. On January 3 an earthquake occurred with epicentre near Hasankale in Turkey, Erzurum being affected; the shock caused damage to some 1,570 houses, and at least 94 persons were killed and 262 injured. On February 7 an earthquake at Arette in the Low Pyrenees, and on February 24 another near Worms

* Indian Forest Bulletin (New Series). No. 149 (Wood Seasoning): Deodar as Pencil Wood. By M. A. Rehman and Jai Kishen. Pp. iv + 7. (Delhi: Manager of Publications, 1951.) 5 annas; 6d.

and Ludwigshafen in the lower Rhine valley, were both felt with intensity 7 on the Modified Mercalli scale. On February 22 an earthquake took place with epicentre near Winsters in Derbyshire. Chimney-stacks collapsed and walls of buildings, chiefly in the main street, collapsed; some slight damage was done in the surrounding district, and it is likely that movement took place along the Crich-Cromford-Bonsall fault. The shock was accompanied by a sound like a double explosion. On March 9 an earthquake was felt with intensity 8 at Etna in Sicily, and on the same day a strong one occurred in north-west Turkey. An earthquake with intensity 7 was felt on May 20 at El Palmar in Spain. Shocks with intensity 8 occurred on June 8 at Pierre Longue (France), on June 13 at Perivolá (Peloponnese Islands) and on June 26 at Riberra Quente, Azores. On September 29 an earthquake was felt with intensity 7 at Munchhausen and Soufflenheim in the lower Rhine valley, and on October 8 there was a shock in lower Alsace with the same intensity. Twelve people were killed and a hundred injured on October 22 in an earthquake in the Adana district in Turkey.

Other earthquakes causing property damage and casualties occurred as follows. On July 21 in the Tulare Valley in southern California an earthquake caused extensive damage and several people were killed. The town most seriously affected was Tehachapi, some hundred miles north of Los Angeles. Permanent vertical ground movement at Bear Mountain fault was as much as one metre. On October 14 an earthquake from an epicentre at lat. 8.5° N., long. 83° W., near the south coast of Costa Rica, resulted in casualties and property damage, as did one on October 28 in Haiti (epicentre at lat. 18.5° N., long. 73.5° W.). On November 22 an earthquake caused slight property damage in San Luis Obispo County, California.

Reports have been received from the United States Coast and Geodetic Survey in co-operation with Science Service and the Jesuit Seismological Association, the International Seismological Association at Strasbourg, and from observatories at Aberdeen, Arkansas, Beograd, Cleveland (Ohio), De Bilt (Netherlands), Durham, Fayetteville (U.S.A.), Karlsruhe, Kew, Pasadena, Perth (Western Australia), Stuttgart, Toledo, Wellington and the New Zealand stations (including Fiji), and Zurich and the Swiss stations.

ERNEST TILLOTSON

EDUCATION IN INDIA

THE first elections in free India under universal suffrage showed that a large proportion of voters had voted not for any particular cause, or person, but for the sacred bull (*Science and Culture*, 18, No. 1; July 1952). Congress, which now holds power, had long been mindful of the importance of educational reforms. So far back as the Karachi session of the Indian National Congress of 1931, a resolution was passed defining the fundamental rights of citizens and stating in its preamble that to enable the masses to appreciate what Swaraj would mean to them, Congress should provide for free and compulsory education.

Since independence, the National Government has been seriously tackling this problem. A large number of committees was appointed to consider general

educational matters. Among them was the Kher Committee, which recommended that: (1) a fixed percentage of central and provincial revenues—about 10 per cent of the central and 20 per cent of the provincial—should be earmarked for education by the respective Governments; (2) about 70 per cent of the expenditure on education should be borne by Provincial Governments, including local bodies, and the remaining 30 per cent by the Central Government; (3) all contributions for education approved by the Provincial and Central Governments should be exempted from income tax.

The percentages recommended by the Kher Committee were not large. In certain States of the United States of America, nearly 30 per cent is spent on education, and in one State nearly 40 per cent. Apart from Mysore, which was already spending a larger percentage on education, no other major State, excepting a few like Bombay and Madras, have given serious attention to the Kher Committee's recommendations.

A comparison of State finances for 1951–52 shows that the total educational budget of all the States amounted to Rs. 65 crores, which is about 14.8 per cent of the total budgets of the various States against the Kher Committee's recommendation of 20 per cent. From these figures it is clear that the attempts to remove 'illiteracy' in the Indian Union has fallen short of the objective of Congress.

When Shri B. G. Kher's Committee recommended that 10 per cent of the central budget should be spent on education, it was implied that the bulk of it should be spent on higher and professional education. Ten per cent of the central budget comes to 30–40 crores of rupees, while the actual expenditure by the Central Government has varied between 3 and 6 crores.

The University Commission, appointed by Government on November 4, 1948, supported the National Planning Committee and Kher Committee's recommendation that democracy depends for its very life on a high standard of general, vocational and professional education. The academic problem has assumed new shapes. India now has a wider conception of the duties and responsibilities of universities. "They have to provide leadership in politics, administration, the professions, industry and commerce. They have to meet the increasing demand for every type of higher education, literary and scientific, technical and professional. It is for the universities to create knowledge and train minds who would bring together material resources and human energies."

The Commission found that the universities were unable to carry out these responsibilities because their finances were totally inadequate.

Like the Kher Committee, it recommended that the Central Government should make large grants for higher education through a properly constituted agency.

The Commission is aware that the Central Government has taken the responsibility of maintaining the Universities of Banaras, Aligarh and Delhi (and now, the Visva Bharati), and that a large amount of money has been given as grants to meet the needs of these universities. While welcoming and appreciating the grants that have so far been given, the Commission has suggested that, even though grants to other universities are mainly provincial responsibilities, they should also be the concern of the Central Government at least so far as postgraduate education and