the South Atlantic and Gulf States have within their borders more than a hundred million acres of 'cut-over' lands and more than twenty-five million acres of abandoned farm lands. Despite the carelessness of owners, magnificent forests of yellow heart pine trees have sprung up. If this wood is suitable for making pulp, then the whole needs of the United States, and in addition a flourishing export trade, could be maintained from this supply. A laboratory has been built in Savannah, and investigations on a commercial scale have been made. From the colour point of view, early experiments showed that the pulp was as good as that made from spruce in the northern mills. Later on, evidence of blue stain appeared on some of the samples and experiments were made to overcome this. It was discovered that logs left with the bark on them for three weeks showed no sign of stain (or fungus growth). The wood was therefore pulped and ground within three weeks after it had been cut. The quality of the printed paper made from it gave every satisfaction. It had a marked velvety feel, required little ink for printing and was more pliable than the average newsprint. While this work is being carried on in the laboratory, reforestation with young pine trees is proceeding at a rapid rate in Georgia.

The Load-Dispatcher

In the early days of electricity supply, the chief engineer of the station was in charge at the main switchboard. To this, all the generators and the supply mains were connected. The engineer was responsible not only for the condition of the machines, but also for putting them into operation at the right times so as to obtain the maximum economy. Now that many stations of very different types are linked together, a suitable staff and a 'load-dispatching' plant are necessary in order to run the system economically. The office and plant may be part of one of the stations or may be quite separate. A paper on this subject was read by Dr. Sleicher to the Institution of Electrical Engineers on May 3. He gave an account of modern practice in Germany and in other European countries of the supervisory control systems as applied to large interconnected supply areas. He showed how important the work of the load-dispatchers is to the prosperity of the undertaking. They must know the right number of machines to be started and the time required to start them. In the Berlin municipal works, for example, the period of preparation from the moment of the order of starting until the opening of the stop valve is from 8 to 35 minutes. The time from the opening of the valve until full speed is attained is from 15 to 90 minutes according to the size of the turbines. The time for the synchronising and switching on to the system is very short in comparison with the starting-up period. A sudden demand for power cannot be met by turbines. When surplus water-power is available it is most useful when peak loads have to be carried. Eleven pumping stations are already in use in Germany for this purpose.

Wind Tunnels for Aeronautical Research

The Aeronautical Research Committee's "Reports and Memoranda No. 1569" (H.M. Stationery Office. 1*s*. net), recently issued, gives a description of the new open jet wind tunnel at the National Physical Laboratory, and also describes the preliminary model experiments carried out in order to ensure the most efficient aerodynamic performance from the actual tunnel. The results are a striking vindication of the exponents of the use of the principles of dynamical similarity in comparing the behaviour of objects of similar form but varying sizes. These principles offer a convenient, and often the only possible, way of investigating questions in aircraft design and aerodynamic problems generally. Two model tunnels were made, the second based upon experience with the first and also the compressed air tunnel—in matters of the shape of the ducts, shape and positions of guide vanes at the corners, design of air screws, etc. The power factor of the models was subject to a large scale effect. At the jet speed mainly used during the experimental work, namely, 50 ft./sec., the power factor was 1·8. The variation with Reynolds's number indicated that a full-scale power factor of about 2·6 might be expected. The full-scale tunnel now completed has exactly equalled expectations. The distribution of velocity in the jet is as good as was anticipated, and the power factor has the predicted value of 2·6. The elliptical nozzle of the tunnel has a horizontal major axis measuring 9 ft. 1½ in., and a minor axis of 7 ft. 0 in., and an input of 375 B.H.P. at the air-screw yields an airspeed of about 210 ft./sec. in the jet. The final model is being used for further small-scale research.

Problems in Deep-Level Mining

The Association of Mine Managers of the Transvaal (Johannesburg) has just issued an interesting volume entitled "Some Aspects of Deep Level Mining on the Witwatersrand Gold Mines with Special Reference to Rock Bursts". The volume contains six papers by leading practical authorities on Witwatersrand mining, together with the discussions of these papers and an appendix specifically dealing with rock bursts. In spite of the title, rock bursts are not discussed in all the papers submitted; thus, in the very first paper, dealing with mining on the Robinson Deep Mine, is the following statement with regard to rock bursts: "This is a subject of such importance that a detailed discussion of same is outside the scope of these notes". The other papers, however, deal with rock bursts at considerable length, although some of them confine their attention mainly to a class of rock bursts which are called "pressure bursts"; these are defined as follows by Mr. R. E. Mickel, the underground manager of the Durban-Roodepoort Deep Mine: "this type of burst includes bursts in the mined out areas, except punch bursts, and bursts on faces where the solid is not completely destroyed"; apparently this definition is accepted by everybody, but there seems to be a general feeling that that particular variety of rock burst which is known as a

pressure burst is fairly well understood by those who have to deal with these very dangerous phenomena. One short paper deals with "Rock Bursts Prevention", but it would seem that the author has not really succeeded in preventing these serious accidents. The volume may be strongly recommended to all interested in deep-level mining problems.

Missions in New Spain

INTEREST inspired by the archæology of Mexico and Central America is apt to divert attention from the study of the Indians themselves who lived in these regions, and the effect on them of the clash of cultures which arose out of the Spanish conquest, both at the time and in their subsequent history. It is, in fact, only comparatively recently that it has been realised that the customs and beliefs of the Indian of to-day present an unrivalled field for the study of syncrisis in culture and religion. The possibilities of such study are suggested, for example, by a recent publication of the Institut d'Ethnologie of Paris, "La Conquete spirituelle du Mexique", by M. Robert Ricard (*Trav. et Mem.*, **20**), in which it is remarked that the failure of the Church to establish a native priesthood as part of the campaign of Christianisation has never ceased to affect the course of history in the country down to this day by segregating the native population, even though the Spaniards were never affected by the colour-line in the accepted sense. M. Ricard's able study of the Catholic missions in Mexico from 1523–4 until 1572, that is, from the first arrival of the mendicant friars, after the conquest of Cortez, down to the arrival of the Jesuits, is based on a careful study of early records. It has, as one side of the picture, the culture of the Indians whom the friars sought to convert, as seen through the eyes of writers such as Sahagun, who recorded native customs for the instruction of those whose duties called them to the work. M. Ricard's researches have placed the early work of the Church in a more correct perspective than has hitherto been possible.

Studies of American Social Areas

THE thoroughness and detail with which American investigators carry out their inquiries is well exemplified in a series of bulletins recently published by Cornell University Agricultural Experiment Station, dealing with the social and economic characteristics of various counties in New York State. In one of these bulletins written by Mr. H. C. Hoffsommer and entitled "Relation of Cities and Larger Villages to Changes in Rural Trade and Social Areas in Wayne County, New York", it is explained that the villages with a population of 500 persons or less have suffered severely from the competition of the larger villages. The smaller villages, however, have maintained their status better socially than economically, and it is interesting to note that the average distance travelled is shortest for church attendance and greatest for the purchase of women's dresses. The data show that social life at present is carried on in relatively small areas. That it will always be so does not follow, and a trend towards the uniting of small social areas into larger ones is evident. But the expansion of the social areas has been much less marked than that of commercial areas. This leads to the conclusion that although churches, schools, and other social and educational agencies may unite for better and more effective work, the areas which they can effectively serve will remain relatively small as compared to those of the more specialised economic services.

Showers of Fish

FOR more than two thousand years, occasional showers of fish are said to have occurred in various parts of the world, but especially in India, in stormy, or at least showery, weather. In the *Journal of the Asiatic Society of Bengal* (**29**, No. 1; 1933), Dr. Sunder Lal Hora discusses Indian examples of the phenomenon, and gives references to papers dealing with these, some of which appeared more than a century ago. He also considers various explanations that have been advanced, and obviously inclines to the one according to which the fish in such a shower are sucked up from a pond or river by a waterspout and are deposited on the ground when the waterspout collapses. There is on the face of it no obvious objection to the theory, for the waterspout does sometimes occur in India, when the funnel-shaped tornado cloud that occasionally depends from a cumulo-nimbus cloud passes over any inland sheet of water. Dr. Hora's paper is followed by one by S. N. Sen, who for a number of years was on the staff of the Meteorological Office, London. Sen examines the meteorological conditions over India at the time when a recent shower of fishes was reported from the Muzaffarpur District, Bihar, on July 10, 1933, and finds that they were such as would frequently give rise to very disturbed cyclonic weather and violent thunderstorms, and that some notably heavy rains occurred on the day in question. The theory favoured by Dr. Hora remains, however, to be proved. One is tempted to think that what has generally been *observed* has been heavy rain and afterwards many small fish on the ground, but not a shower of fish, and that the minds of native observers of the two separate phenomena have been affected by mythological beliefs that seemed to offer an explanation of what had been observed. Dr. Hora refers to such a myth (a Hindu myth) connected with the rain-god Indra, according to which the waterspout is the trunk of one of Indra's elephants (the rain clouds are believed to be his elephants), who are engaged in sucking water up from the underworld during a storm in which the funnel cloud appears

Forest Fires

DURING last year's drought, fires caused considerable damage in plantations in Great Britain; also to the beautiful heaths and commons which form so picturesque a feature of certain English counties. This year, apart from official statistics, the reports in the Press afford evidence that this fire damage