Europe for example, without mutual interference, and explained that, although the number of possible frequencies available might be infinite, the useful range is not. He said that the service range of transmission might be said to be proportional to its wavelength, so that very high frequency transmissions have a very small reliable service area. If the band width occupied by a transmission could be reduced, the number of channels could be increased in the same proportion. Examples of narrow band transmissions cited included single sideband, suppressed carrier (for wired transmissions) and restricted modulation frequencies, and he mentioned an American invention by which an intelligible modulation range of 200–3,000 c./s. can be transformed at the transmitter to a range of from zero to a few hundred cycles a second, thus reducing the sideband frequency width to be accommodated, and providing further channels in a given range of carrier frequencies; the signal is re-transformed at the receiver. Captain Eckersley still believes, in spite of theories to the contrary, that sidebands were real.

Dealing with wired broadcasting, Captain Eckersley expressed the view that this system would provide a solution to ether congestion, and envisaged a future when perhaps even a special cable would be laid to every house, not only in Great Britain, but also in every country of the world, linking continents as far apart as Europe and America, although he realizes the present difficulties of operating a submarine cable of such dimensions. The number of channels available in a wired system would be infinite, and in this, together with the American invention described, he sees in the future a solution of our broadcasting problems.

Development of Fuel Research

ON March 26 Dr. E. W. Smith, director-general of gas supply, Board of Trade, addressed the Fuel Luncheon Club of London, choosing as his subject the question: "What do we want?" By "We" he meant the British community as a whole and not the interests of some particular industry or individual. He suggested that fuel, heat and power supply is more important than any other future concern of the Government, even than agriculture. Unrestricted competition, he said, should be abolished. The utilization of coal has led to our growth of industry and population, but the advantages so gained cannot continue indefinitely, and possibly not for long. To raise coal and sell it abroad at a loss is folly. To do the same with competitive fuels at home is equally foolish.

The Board of Trade has brought into one control coal, gas, electricity and oil, but if a Ministry of Fuel were established it should do more than regulate these. It should be a highly competent body, independent of vested interests, capable of advising, with long views, on the whole fuel policy of the nation. Fuel is becoming dearer and the mere stimulation of coal consumption is wrong. Allocation of fuel for domestic and industrial use should be made according to what has been determined as the best for a given purpose. This calls for a development of research on a great scale, greater than any hitherto known in Great Britain. Fuel research should no longer be distributed among many competitive research organizations, but co-ordinated in one comprehensive scheme with directors of the specialized branches. It should then be done with the most ample and best-equipped facilities for experiment.

Statistical Theory of Accident Proneness

THE scientific investigation of industrial accidents may be regarded as commencing in 1919 with the publication of a report by Prof. Major Greenwood and H. M. Woods for the Industrial Health Research Board, then known as the Industrial Fatigue Research Board, the data in which indicated that the hypothesis that persons were different in their liability to accidents from the start gave the best fit to the observed distributions. The mathematical considerations underlying these theoretical distributions were examined by Prof. Greenwood and Mr. Udny Yule in a paper published in the *Journal of the Royal Statistical Society* in 1920. A further paper on theory and observation in the investigation of accident causation by E. G. Chambers and G. Udny Yule has now appeared in the supplement to the same *Journal* (7, 89–109; 1941). In this, Mr. Yule gives a note on the statistical theory of accidents with special reference to the time factor, application of which to accident data leads to the conclusion that a lengthy period of experience is necessary for an individual proneness to accidents to manifest itself fully. Accident proneness may be regarded as a latent disposition needing certain circumstances to reveal it, rather than as an active function which is constantly in operation. Individual differences in accident proneness may, therefore, play their part chiefly in the earlier period of exposure to risk, their importance diminishing as the period of exposure increases. The maximum benefit gained by selective tests for proneness is, therefore, likely to accrue when the tests are applied to new entrants into risky occupations. The chief contributors towards accident rate might thus be found and eliminated during their most vulnerable periods. This conclusion is supported by the observed fact that selective tests are of much less value when applied to experienced workers than they are when given to new entrants.

To the discussion on this paper Dr. J. L. Irwin contributed an analysis of variance leading also to the conclusion that the most likely explanation of the differences between drivers is a difference in individual proneness to accidents, and Prof. Greenwood, commenting on the fact that Mr. Chambers had shown that a necessary condition for accepting the proneness hypothesis as a complete explanation of the fact is not fulfilled, agreed with his suggested explanation that the rate changes with time and pointed out that the study of Royal Air Force accidents might be of value here, since the high standard of selection probably eliminated the pathologically prone.

Fluorescent Light Sources

IN a paper before the Illuminating Engineering Society on April 14, Mr. J. N. Aldington pointed out that two types of fluorescent lamp have been developed within the last decade, both of which employ the mercury vapour discharge as the source of primary radiation. In the first type, envisaged so long ago as 1900 by P. Cooper Hewitt, a high-pressure mercury arc operates with a high luminous efficiency, and fluorescent coatings on the outer bulb containing the arc tube produce colour modulation of the emitted light. Ultra-violet and violet radiation of a wavelength above about 3,000 A. is absorbed by suitable inorganic sulphides and is re-emitted in the visible region to supplement the dominant mercury light. The change in overall efficiency brought about by