

Progress in Grass Drying

At the second Congress of Mechanised Farming held at Rhodes House, Oxford, on January 5-8, when recent developments were described, a paper by Mr. E. J. Roberts on "A Year's Progress in Grass Drying" excited much interest. A résumé of this paper is published in *Engineering* of February 5. The author points out that whereas there were only six driers in operation in 1935, there were 46 by the end of the 1936 season. The engineering difficulties in connexion with drying plant have been successfully overcome. This is confirmed by papers at the Congress giving the experience of users. We know that inventors are busy developing new methods and rapid progress in this direction will doubtless soon be made. For the year just closed it is expected that the production will be 10,000 tons. In the United States for the same period, it was 50,000 tons. In countries abroad the usual practice is to dry the grass in large centralized units. In Great Britain, in general, only small localized units are used. This is a pity as it is not the most economical method. In a paper read at the conference by Prof. J. A. Scott Watson, it was shown that the remaining problems are to bring down the cost of the drying plant, the fuel cost and the labour cost and to increase the output. Mr. Roberts in his paper stated that one large drier evaporated 9 cwt. of water with 1 cwt. of coal for a short period and worked at a normal figure of 8 cwt. Smaller driers give efficiencies of $3\frac{1}{2}$ - $5\frac{1}{2}$ cwt. of water per cwt. of coke. If we take the calorific value of the coal to be 14,000 B.Th.U. and that of the coke to be 13,000 B.Th.U., the advantage lies greatly in favour of the large drier.

Testing Broadcasting Receivers

At an informal meeting of the Wireless Section of the Institution of Electrical Engineers held in November 1935, Dr. R. L. Smith-Rose opened a discussion on the methods of examining the performance of wireless sets used for the reception of broadcasting. No specification was then available of the standards of performance at which it was desirable to aim in the production of such receivers. Quite recently, however, the Radio Manufacturers Association has published a "Specification for Testing and Expressing Overall Performance of Radio Receivers", and a discussion on this specification was opened by Mr. Stuart Hill at a meeting of the Wireless Section of the Institution of Electrical Engineers held on February 3. The above specification is in two parts, dealing respectively with electrical and acoustic tests. The first part describes laboratory methods of measuring the sensitivity and selectivity of a receiver, and also its susceptibility to noise and the performance of its automatic volume control. The second part describes the corresponding methods of measuring frequency response, acoustic sensitivity, hum and acoustic output. In each case the proposed methods of expressing the results are described and illustrated by means of typical graphs included in the specification.

THE discussion at the Institution indicated that the initiative shown by the R.M.A. in producing this specification is very generally appreciated, although some criticism was offered on matters of technical detail. In so far, however, as Mr. Hill stated, the specification has been drawn up by manufacturers for manufacturers, its useful purpose is somewhat limited at the present time. Furthermore, it does not contain a suggested standard of performance, and this might very usefully be added after consultation with representatives of the users of such receivers and of the B.B.C. and other Government departments interested in the matter. In fact, the time would now seem to be opportune for such a body as the British Standards Institution to take up the subject by setting up a representative committee for the purpose of drafting a specification dealing not only with methods of testing, but also with the standards of performance to be attained by the various types of modern radio receiver. Such a standard specification has long been needed; it would be of great benefit to the radio industry as well as to the general public; and the labours of the drafting committee will now be considerably lightened by the pioneer work already accomplished by the Radio Manufacturers Association.

Standards of Radio Frequency

MODERN electrical measurements are conspicuous for the fact that the frequency of alternating currents can be measured to a very high order of accuracy. In order to provide a standard of frequency for scientific and technical workers, the National Physical Laboratory undertakes the emission of two types of frequency of reference from its own radio transmitting station. One of these is in the form of a modulation frequency of one kilocycle per second superimposed on a carrier wave of 396 kilocycles per second, while the other is a simple carrier wave of frequency 1,780 kilocycles per second. The programme incorporating the first frequency is emitted on the second Tuesday of each month at 10.40-12.00 G.M.T., while the second is emitted on the first Tuesday in March, June, September and December at 21.00-22.00 G.M.T. The modulation frequency employed in the first programme is derived from one or other of two oscillators, which are maintained in continuous operation at the National Physical Laboratory. One of the oscillators is an electrically maintained tuning fork vibrating at its natural frequency of 1 kilocycle per second; while the other is a quartz ring oscillator generating a frequency of 20 kilocycles per second, with the necessary attachment for selecting the required frequency of one twentieth of this value. In both cases, the accuracy with which the frequency is maintained is one or two parts in 10 million, but during each emission the exact frequency is measured at the Laboratory, and the correct value is announced at the end of the programme. For the second standard frequency emission, a separate quartz crystal oscillator is employed; in this case, no correction is announced, the frequency emitted being accurate to within one part in a million. A revised programme giving full