make its contribution to the planning and building of a Britain that will at least be a more comfortable place in which to live.

Economics and Finance

In an address on "Finance and the War" given to members of the Parliamentary Labour Party at the House of Commons on November 9, which has now been published by the Economic Reform Club and Institute, Prof. F. Soddy stresses the importance of distinguishing between genuine and fictitious credit if we wish to put an end to recurring economic booms and slumps and periodic world wars primarily of economic or monetary origin. We live in a world of potential abundance beyond our unscientific ancestors' powers of foreseeing, but that abundance cannot be realized until we clearly distinguish between the creation and the acquisition of wealth. All genuine money reformers are unanimous in demanding that money should not be put into circulation as a debt arbitrarily terminable, and most, if not all, that it should be paid into circulation by the nation for full value received by the nation.

In Prof. Soddy's view, the issue of new money under existing economic conditions is merely one form of forced levy in kind; for new money is a new legal claim by the issuer to anything of equivalent value on the market, with nothing to show that it is new or that the possessor in acquiring it has not given up the equivalent value and so has the legal right to claim it back on demand. He urges that the public should be instructed by its representatives that whether Parliament levies upon it, for the purposes of national expenditure, by recovering from it some of the existing meney, by taxation, or by issuing new money, the proportion between the two forms of levy in money and in kind is dictated solely by statistical considerations to maintain a constant price-level and the money in proportion to what there is to buy, so as to secure uniform and general prosperity.

Electrical Music

A PAPER on "Electrical Music" which was read on February 1 to the Midland Section of the Institution of Junior Engineers by Dr. W. Wilson and is published in the March issue of the Journal of the Institution, summarizes in a very thorough manner the chief existing methods whereby musical sounds can be produced electrically. The most important developments have taken place in connexion with apparatus which actually create musical sounds in the first instance. The first actual mention of music as produced by an electric source was in connexion with Duddell's 'singing' are, at the end of last century. The resistance of an electric arc decreases as the current rises. The result is that instability is produced, in the absence of a ballast resistance; thus the arc is continually going out and rekindling. If an inductance instead of a resistance is used and the whole is shunted by a capacity, a tuned circuit is formed in which the current will oscillate at a definite frequency. In so doing the current between

the electrodes will actually be reversed twice per cycle, the arc going out at each reversal. No serious musical instrument has developed from the singing arc, although it achieved fame as a wireless transmitter when slightly modified by Poulsen. Within the past decade the howling of a valve in a wireless set has been a common example of electrically produced sound and it forms the basis of two musical instruments. Theremin has reproduced the conditions of the oscillating wireless set in his 'etherphone'.

The second application of the oscillating valve is for the construction of a complete electronic organ, a good example of which is that designed by Coupleux and Givelet, and installed in a number of French churches. In this there are 120 valves, which are caused to oscillate singly, and to generate a full range of notes which are very rich in harmonics. A very successful electric organ was invented by Hammond in 1934. In this there are 91 small alternators all driven from a common shaft which is itself driven by a synchronous driving motor. The sound which accompanies a talking picture can be derived from a wave track printed upon the celluloid film, through which a beam of light is projected into a photoelectric cell. Organs have been designed on this principle. In conclusion, Dr. Wilson points out the many advantages of the electrical method of producing music, especially when the electronic organ is employed. The power consumption is very low, it being usually possible to obtain all the energy required by plugging all the supply leads into any ordinary lampholder. The first cost is low, being between 30 and 40 per cent of the ordinary pipe organ, the maintenance costs are low, and it can always be trusted to maintain its exact tuning. Its progress up to the present has been remarkable, and there is every reason to foretell an equally rapid expansion of its use in the near future.

Trends in Air Conditioning

In an article in the Electrician of January 31, some significant trends in air-conditioning plants are discussed. The proved reliability of compact highspeed condensing units has made practical completely self-contained factory-assembled and tested 'packaged' air-conditioning units of ever-increasing size. Last year they reached 25 tons, and there is every indication that they will be increasingly popular. This trend began seven or eight years ago with small, compact, self-contained room coolers of about half a ton capacity, which were offered almost as soon as compact condensing units were developed. Later came the so-called store-type coolers, package units containing a condensing unit, evaporator, fan, and controls, completely piped, wired, charged and tested at the factory. The success of these units and the development of suitable compact, high-speed, condensing units has led to the more recent factoryassembled-and-tested central plant units of 74-25 tons capacity. Those incorporate the features of a carefully engineered and installed central plant airconditioning system, but are self-contained in a sturdy