

on numerous committees. In its analysis of the results of the examination of 848 samples of imported butter, the report shows that the water content of considerably more than half of the samples was between 15 and 16 per cent; the Reichert value of the fat varied from 24.0 to 34.0 (in 555 cases from 28 to 32), while the Polenské value varied from 1.0 to 3.35. Of 87 samples of tinned cream, 81 contained between 20 and 29 per cent of fat; of 127 samples of cheese, 17 per cent had been prepared from milk containing less than one half of its fat. In neither case is it at present possible to take exception to such importations. The examination of water included sea water studies for the use of hydrographers and biologists, on rivers in connexion with fish and fish food, and on water-cress beds in relation to the use of the national mark. Of 2,270 samples of brewing materials, 18 contained arsenic in slight excess of the accepted limit. It is satisfactory to learn that owing to the stringency of the tobacco laws and the high standard of the tobacco industry in Great Britain, adulteration is almost non-existent. The Laboratory has also been concerned with such widely different matters as the pollution of foreshores, the manipulation of radioactive materials, the carriage of dangerous cargo, and the work of the Bed-bug Infestation Committee.

Carrier Telephony

AN instructive address on carrier telephony was delivered to the London Students Section of the Institution of Electrical Engineers, on October 31, by its chairman, P. H. Pettifor. The frequencies present in the normal speech range are included between the limits 75-9000 cycles per sec., but for intelligible and 'natural' speech, it is only necessary for the listener to hear a very small portion of that spectrum, and in normal telephone practice the range lying between 300 to 2700 cycles per second only is used. This possible restriction in the range necessary for satisfactory speech is fully utilized in carrier telephony. The lower the frequency of the transmitted band the greater the number of channels which can be accommodated for that band. A carrier-current telephone system is one in which the normal voice frequencies are raised to a band of higher frequencies before being transmitted over the open-wire line or cable, conversion to the normal voice frequency band taking place at the receiving station. If different circuits have their voice frequencies raised by amounts such that the high-frequency bands do not overlap one another, then one cable pair can be used to transmit speech to several circuits, without the circuits interfering with one another. In this way the signals in several circuits can be transmitted over one cable pair without any interference taking place. The development of the principles of carrier telephony has been slow; the early experiments were made by Ruhmer in 1909, before the present-day thermionic devices were developed. A brief description was given of the post-War development in this field, including the latest cable design technique. Amongst the types of cable described was a cable containing a pair of air-spaced

self-locating conductors. This type of cable is laid around London for television purposes. Another type containing four coaxial conductors has been laid between London and Birmingham. A similar coaxial cable containing only one coaxial conductor insulated with para-gutta has also been found very useful. With modern systems the level of cross talk between channels is practically negligible when compared with the normal voice frequency systems.

A 'New Deal' in Education

PRESIDENT ROOSEVELT'S Advisory Committee on Education, appointed in September 1936, has presented a report (Government Printing Office, Washington, 1938. Pp. 244. 35 cents) on the whole subject of Federal relationship to State and local conduct of education. After a comprehensive study of the entire field of educational service, the committee found that there is great need for improvement of the public schools in a number of broad geographical regions and in the rural areas generally. To redress the existing gross inequalities of educational opportunity it submits a set of carefully articulated proposals forming, as is justly claimed, "a unified and coherent pattern of Federal policy" and involving a six years plan for Federal grants for educational services amounting in the aggregate to 1,200 million dollars. Most of the new grants recommended fall under the headings: general aid to elementary and secondary education, preparation of teachers and other educational personnel, school buildings, administration of State departments of education, educational services for adults, library service for rural areas. A system of co-operative research accompanied by demonstration projects throughout the country has proved its value in the field of agriculture, and the committee recommends the establishment of a special Federal fund for the immediate application of such a system in the field of education. In the first instance it would be utilized especially for elucidating in advance problems bound to arise in connexion with the operation of the six years plan for Federal grants.

The Colombo Museum

THE administration report for 1937 of the acting director of the Colombo Museum, P. E. P. Deraniyagala, shows that in many directions the activity of the museum is maintained. Steady additions are being made to the zoological collections, notably by expeditions carried out by the staff or by the staff jointly with representatives of the British Museum, so that the director considers that the accumulation of material is now sufficient to justify the publication of detailed monographs. At the same time, attention ought to be directed to the public galleries, and the replacement of the misleading and faded specimens in the bird gallery would doubtless be appreciated by the half-million visitors who pass through the galleries each year and especially by the large number of school-children (12,288) who make use of the exhibits in the course of their nature study instruction.