as the pigs grew. The daily intake of copra and barley was varied within limits of ½ lb. to 1½ lb. to maintain each pair of pigs on the same growth curve. The average live-weight increase per 1 lb. of copra was 1·53 lb., while the figure for barley-meal was 1·13 lb. The difference was significant at the 5-per-cent.-point. In other words, a farmer can afford to pay 35 per cent. more for copra than for barley-meal to obtain the same financial result from its use at the rate of about ¼ lb. per day as a winter supplement for pigs receiving ½ lb. of meat-meal daily and sugar-beet to appetite.

Copra-meal versus Meat-meal as a Supplement for Whey.—In a trial with individual feeding of paired pigs a comparison was made between copra-meal and meat-meal as supplements for baconer pigs fattened mainly on whey. The pigs were fed the same amount of whey, and each of the pair received either 1 lb. of meat-meal or copra-meal daily. The average daily live-weight increase of the copra-fed pigs was 1·01 lb. daily, that of the meat-meal-fed pigs 1·20 lb. daily. This difference was significant at the 5-per-cent. point.

Mole-drainage Research.

Mr. A. W. Hudson.

Four additional experiments dealing with drain-installations were laid down during the year.

During the drainage season stopwatch and bucket measurements of the outflow from experiments were obtained as frequently as possible, and the conditions of the mole channels in the observational trials was recorded.

Root-development Research.

Mr. W. A. Jacques.

Fertilizer Placement.—The results obtained from pot trials with grass plants verifies American findings with crop plants that the correct placement of fertilizers leads to an increase in herbage yield. The problem resolves itself into a question of fertilizing the crop rather than fertilizing the soil.

The trials consist of a perennial rye-grass, cocksfoot, and white-clover plants grown in 12-in.-diameter pots with fertilizer at the surface, mixed in the top 6 in. of soil, and on a layer at 6 in.

There is no doubt that the surface application gave a fillip to seedling growth, and this was very marked as against the early response of the plants with the fertilizer at the 6 in. layer. Despite this early advantage, however, the plants with the fertilizer in a layer at 6 in. out-yielded the surface-fertilized plants by 17 per cent., and the fertilizer mixed in the top 6 in. yielded 13·5 per cent. higher than the top-dressed pots. This means that full use is not being made of the fertilizer when an area is being sown down to grass.

Root Development as affected by Seasonal Mowing Treatment.—Areas of grassland over the past two years have been mown so that hard or lenient treatments have been imposed at different seasons of the year. At present, root samples are being taken from these plots to determine to what degree root weight is affected by such treatment.

Sheep-breeding.

Mr. R. Waters.

The work is designed to effect a comparison of sires, based on their progeny tests, with a view to isolating any whose progeny are notably above average for characters of commercial value—meat and wool. Thereafter, by appropriate test matings, data is sought as to the homozygosity or otherwise of sires for commercial characters. Finally, with sires that satisfactorily pass these tests the possibility will be explored of establishing a nucleus flock for the production of rams prepotent for desired characters.

Progeny-tested rams or close-bred rams prepotent for required characters—good genotypes—are unprocurable, and our work to date discloses the same conditions as were found by Hagedoorn and other workers—namely, that high-priced males of notably good conformation (good phenotypes) or of reputedly good ancestry (*i.e.*, supported by good pedigrees), or of ancestry which actually have occasionally left good progeny, carry no guarantee of good performance. This condition of affairs for ram purchasers cannot be expected to improve until the search for outstanding sires, their progeny testing, test mating, and systematic utilization are seriously undertaken by breeders.

PHYSICAL TESTING LABORATORY.

Director: E. R. Cooper.

Advisory Committee (Industrial Standards and Testing).—Professor T. D. J. Leech (Chairman), Dr. E. Marsden, Squadron Leader G. Carter, Mr. G. W. Wyles, Mr. R. C. Porter, Mr. R. Burn, Mr. J. Brooke, Dr. E. R. Cooper (Secretary).

The above Committee was set up following a visit by Professor Leech and the Director to Australia primarily to determine the requirements of a sub-standards metrology laboratory essential to mass production in New Zealand. A broad view of the New Zealand manufacturing situation was taken, with the object of rapidly expanding the standards testing and development work of the Department of Scientific and Industrial Research in the fields of physics and engineering basic to industry. Modern production demands technical assistance, and it is the aim of the Committee to supply this. Such technical assistance involves laboratory facilities, and trained staff with experience in the properties and uses of materials and skill in applying scientific knowledge to industrial problems.

(1) Facilities.

The staff, now totalling fifty approximately, are still divided into three sections: (*a*) Laboratory, (*b*) Design, (*c*) Workshop. The Laboratory can make investigations into most problems in the fields of physics except radio, though lack of trained staff is a limiting factor at present.

The Design Section consists of personnel with an engineering bias, and this section has complete control of the workshop as well as the design and measurement of tools, gauges, and instruments. A very close liaison exists with the Munitions Controller who is using the engineering