from high-testing milk is too yellow in colour for the white-cheese trade of the United Kingdom. Cheese made from milk of abnormally low test is equally undesirable because it is too lean in body. Trials have shown that in the case of raw-milk cheese the best-quality cheese is manufactured from milk with a butterfat-test ranging between 3·7 per cent. and 4 per cent.

Cheese-manufacture.—The progress of investigations has shown that all practices designed to increase yields favours the development of openness in texture. Cheeses kept in the press for three days, accompanied by daily relaxing and renewing pressure, are definitely closer than cheeses pressed only for one day.

Temperature of Curing-rooms.—Experiments have shown the importance of paying due attention to the temperatures at which cheese matures in curing-rooms. In spring-made cheese, temperatures should always be maintained about 55° F. to hasten the ripening-process. In summer, however, when atmospheric temperature is high, 65° F. should be regarded as the upper limit of safety. Temperatures in excess of this figure have a detrimental effect on cheese-quality.

Discoloration.—Four types of discoloration are under investigation—viz., "mottling," "pink," "bleached," and "muddy." It is possible that the various colours are variants of one. "Mottling," which appears in the form of waves round the original curd particles, frequently arises very shortly after the cheese is made. The other forms of discoloration do not appear till the cheese has undergone considerable ripening. High curing-temperatures favour all forms of discoloration. Pink, bleached, and muddy discolorations are frequently associated with bad flavours and generally start near cracks or openings in the cheese. Investigations to date suggest that the cause of discoloration is bacterial, but the causal organism or combination of organisms has not been determined. Some experimental cheeses made from milk infected with discoloured cheese, and which were allowed to develop cracked rinds, showed discoloration in the vicinity of the cracks, while others of the same make, with sound rinds, showed no evidence of discoloration until some time after they were cut. These trials have shown how important it is to have cheese well bandaged so that the surfaces remain intact and free from cracks.

Dissemination of Results.

In order that the work of the Institute may be translated into practice as rapidly as possible, a course for factory-managers is held at the Institute each year during the first week in May. In view of the very direct contact of factory-managers in the manufacturing processes of the dairy industry, this provides a ready way of rapidly putting into practice new knowledge gained through the research activities of the Institute.

In addition, a monthly bulletin has been regularly supplied to the principal dairy journals of the Dominion. The following are the list of the principal separate publications issued by the Institute during the year:—

"The Effect of Salt on the Quality of Cheddar Cheese," by Riddet, Valentine, McDowall, and Whelan.
"Factors affecting the Rate of Ripening of New Zealand Export Cheese," by Riddet, Valentine, McDowall, and Whelan.
"The Distribution of Salt in Cheddar Cheese."
"The Influence of Bacilli of the Colon Group on the Production of Acid by *Lactic Streptococci* in Milk."
"Slow Development of Acidity in Cheese Manufacture."

PLANT RESEARCH STATION.

The Plant Research Station is conducted in co-operation with the Department of Agriculture. The work is under the direction of Mr. A. H. Cockayne, and is conducted principally at Palmerston North and Marton. This report deals only with those sections of the work at the Plant Research Station which receive assistance from the Department of Scientific and Industrial Research.

Mycological Section.

I. *Brassica Diseases.*

(*a*) *Dry-rot* (Phoma lingam).—A series of eleven trials with a total area of 300 acres, sown in various localities with swede-seed which had been disinfected, demonstrated the efficacy of the treatment by the resulting crops being entirely free from dry-rot. Arrangements are now being made to grow turnip and swede seed within the Dominion, so that stocks of clean seed will be available. For this purpose the Herning type of swede has been selected on account of its resistance also to club-root.

(*b*) *Club-root* (Plasmodiophora brassicae).—Work during the year has been concentrated upon the production of resistant strains of swedes, turnips, and rape and in improving methods of increasing resistance by the use of lime. Resistant strains under tests are several selections of swedes—*e.g.*, Station Herning, Superlative, and Canadian selections of Herning; in turnips, the variety Bruce, of Scottish origin; and, in rape, three selections made at the Plant Research Station.

In these trials local selections of Herning have proved to be the most resistant and showed an immunity greater than that displayed by the mother line. The local selection of Superlative, while showing high resistance in the preliminary tests, gave indifferent results when tested on a field scale.