escaped infection, a second growth which may result may not have succeeded in making its escape, and, the growing points being invaded by the fungus, will carry the infection until ultimately producing infected ears. Besides, in the development of plant diseases, so much depends upon the even balance of conditions or 'constitution' of the host plant itself and the vigour of the fungus. The stronger will surpass the weaker element. In this way it would be reasonable to expect occasionally that one plant may produce sound and unsound ears, or sound, partly, and wholly diseased grains in the same ear, which as we have observed does occur (plate 2, fig. c).

Notwithstanding the statement that the smut fungus, while growing within the plant cells, produces no visible ill-effects until the ear appears, yet the fungus may be feebly present in the cells, and in some instances not succeed in reaching the ear, when that ear will escape infection but will show a poorer quality. Where it is desired to produce a good strain of wheat, it would be unwise to start with seed grain known to result from an infected crop, however successful the treatment for smut may be, for an imperfectly-developed grain possesses a reduced energy of germination, and we know that vigour of germination and the strength of the young plant are important factors in effecting an escape from infection. It is generally accepted that plump, well-developed grain produces the best plants, and grain of low vital energy yields less well, besides being liable to infection to a much higher degree.

Stinking smut confined to wheat.—Microscopically and biologically, stinking smut of wheat is quite different from other grain smuts. Each kind of grain has its particular parasites which cannot affect any other plant. When smut spores of wheat are sown with oats or barley, or *vice versa*, these plants will not become infected. If this were the case, their treatment or control would be uniform throughout, but we have already explained the different methods of infection that exist in various smut forms and which require different modes of treatment.

THE CONTROL OF STINKING SMUT.

Is it advisable to treat all wheat before sowing?—As it is decidedly doubtful if there is any wheat sold in this country originally free from infection, or, if originally free, kept in such condition, it appears advisable to make smut treatment just as much a part of one's routine as preparing the land for sowing. Though there cannot be any doubt that some wheat is more affected than others even when only a limited infection exists, it is very desirable to prevent its increase by treating it. Besides, there is much danger from the neglect of treatment owing to the fact that there are a number of fungi producing a more or less serious discolouration of the grain. We have recently devoted considerable attention to the cause of the various discolourations often found on wheat grains, and particularly abundant after wet seasons or on wheat from low-lying ground. There are fungi like *Fusarium* and *Septoria* which may cause destruction of the plant, or at any rate affect the yield and quality of grain, and other more superficial fungi like *Cladosporium, Heterosporium, Epicoccum, Hormodendron*, etc., which cause spotting of the surface of the grain. The nature of these fungi is as yet little understood, but they are, no doubt, often responsible for the decay of the grain when sown. It is reasonable to believe that seed treatment as recommended for smut would also prevent any injury from fungi of this nature, hence we strongly recommend that wheat and other grain be always treated before sowing. For experimental purposes one may select small samples of wheat which are reasonably clean, but this is not yet possible under general conditions of farming.

The treatment for the prevention of smut diseases, propagated by the spores of various fungi adhering to the seed, is directed against the destruction of these. There are two main methods of treatment generally practised, each of which has peculiar advantages and disadvantages over the other, but, nowadays, where scarcity of farm labour is an important consideration, that which requires the less work is to be preferred. The two methods referred to are known as 'steeping or pickling' and 'sprinkling' the grain with certain solutions.