and *B. campestris* subsp. *napus* var. *toria*, as used by Alam (1936) should also be avoided.

It would also appear that one name only was needed for the two types of swede since these may differ by only two genes [Davey (1932)]. It is also possible to include both the swede rape and the swede in the same species and to call the swede *B. napus* L. var. *napobrassica* (L.) Petrm. (see Davey, 1932). It would seem, however, from comparison with the turnip species, to be useful to reserve *B. napus* for the swede rape and to call the swede itself *B. napobrassica* Mill.

In conclusion one would like to emphasise that in future the name *B. campestris* should be reserved for forms with $2n = 20$ and the name *B. napus* for forms with $2n = 38$. Forms with $2n = 20$ should not have the name *napus* in their botanical names.

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Diagenesis *versus* Mutation

A common European insect, *Cicadella viridis*, contains two symbiotic micro-organisms. One belongs to the mysterious group, Cicadomyces, supposed to be allied to yeasts and found only among homopterous insects; and the other is a long bacterium. It has been explained[1] that the so-called Cicadomyces are but protoplasmic debris, while the real germs have hitherto been mistaken for cell-granules or pigment-granules. The long bacterium produces β-Carotene; the other bacterium forms short rods and produces an olive-yellow pigment whose chemical nature is unknown.

On cultivating the above bacteria from insect-tumours, or Bacteriotomes, formerly called mycotomes, they grow together. At first their joint pigmentation is bright yellow while after some three weeks there appear orange-red spots showing it to be a mixed colony. The yellow bacterium can be easily separated and in pure cultures gives rise to the greenish-yellow pigment. The red bacterium is always dependent on its yellow companion or is a commensal of the latter. Both bacteria belong to the group Mycobacteriaceæ. The bright yellow colouration of their colony is due to the mixed pigmentation of these two bacteria.

The red bacterium grows very slowly on all media tried so far and must be classed as dysgonic, whereas the yellow companion grows faster or is eugonic; these terms were first introduced in the study of the tubercular germ, also a species of Mycobacteriaceæ. When a commensal is at the same time dysgonic, *i.e.*, where one-sided symbiosis is accompanied by a differential rate of growth, a new phenomenon also appears. The impression gained on cultivating the micro-organisms of *Cicadella viridis* is that the red bacterium appears as a result of later contamination, whereas it is to be interpreted as latent infection, the dysgonic partner being present from the very beginning. Such a subsequent growth of another bacterium can be misinterpreted as an instance of mutation by an observer who took care to exclude all further chances of contamination. Such cases, I believe, have been actually reported in the literature as genuine mutations while critics have unduly stressed the possibility of a subsequent contamination having occurred in some mysterious way, both overlooking the probability of a latent infection. The importance of this phenomenon was kindly pointed out to me by my friend, Prof. Kollath of Rostock, who also suggested that a new term may be coined for the purpose. Epigenesis means, growing after, and would have been a suitable term but it is unfortunately preoccupied so that it is proposed to introduce the word Diagenesis. It signifies the deferred appearance, even after subculturing, of a latent infection where a dysgonic bacterium *grows through* (Dia = through) the main colony

which has been formed by its eugonic partner. Along with Diagenesis there may or may not be commensalism but the presence of a dysgonic partner is essential for this phenomenon. In this connection it may be reminded that while isolating germs from stool, soil or similar natural sources a commensal may grow independently since the medium supplied in the laboratory may be superior to that offered by nature which would make it difficult to ascertain if a diagenete is not also a commensal in its natural environment. Diagenesis might have been designated Pseudo-mutation but it is not so expressive.

When a tissue is considered sterile it implies that experiments to isolate germs possibly associated with it have all given negative results. The controversy if certain cell-inclusions, which on account of their size resemble cell granules, are real germs can only be decided by the application of the bacteriological technique. That is also the crux of the Cancer problem. In the same way if a germ is commensal or not depends upon the composition of the media tried. However the red bacterium seems to be a true commensal for even in the bacteriotomes of the insect, where it can be easily recognised on account of its large size, it is invariably associated with the short rods of its yellow partner. Buchner[2] unwittingly illustrates a Bacteriocyte (replacing the older designation Mycotocyte), with bacteria of two different sizes, long rods of the red and elongated dots of the yellow bacteria, whereas the picture is intended to represent only one kind of bacterium.

The isolation of these bacteria and ultimate separation of the red commensal was undertaken at the Institute of Hygiene, Leipzig, where the Director, Prof. Dresel, kindly offered all possible facilities. The famous Firm, Merck of Darmstadt sent me gratis some nicotinic acid amide, a costly substance, not available on the market, for which I am specially obliged. With the addition of nicotinic acid amide to prune juice agar the commensal grew independently. If the original medium were naturally rich in this substance no commensalism would have been noticed. The red pigment of the commensal easily distinguished it from the greenish-yellow pigment of the eugonic partner and it was really due to the differential pigmentation that the existence of a mixed infection became self-evident. If the probability of a latent infection be denied it is still more difficult to believe how a bacterium, even before it develops a large colony, would repeatedly give rise to an identical mutation. In fact the yellow bacterium, which is also the dominant one, in pure cultures has never produced a mutant. The red bacterium has done so and will be reported elsewhere. Pigment producing bacteria are rarely studied and those mentioned here also give a clue as to how, elsewhere, in a mixed colony where no pigment is formed, a diagenete may be easily mistaken for a genuine mutant. Even repeated sub-cultures would not assure the purity of a culture for it would not exclude the possibility of diagenesis. In such cases the technique of single cell culture alone must be resorted to in order to obtain a pure culture.

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Sugarcane Smut in Bihar

THE existence of smut has been noted in Bihar this year during the months preceding the monsoon in parts where smut was not recorded before. The disease usually manifests itself after the monsoon when the cane is more or less mature and an earlier appearance is an indication of its severity. A few features of interest in this connection are described below:

In May when the crop was three months old thin cane stems with internodes varying from 1·5″–3″ in length could be seen in the affected shoots (Fig. 1). Butler's[1] suggestion that the smutted whip might be a floral shoot indicated that the development of the stem in the young diseased cane was probably a case of induced