The deoxyribonucleic acid of *R. prowazeki* clearly differs in composition from those of *R. burneti* and of the host chick embryos. In the *E. coli*-phage system, the deoxyribonucleic acids of host and virus differ markedly[4], and it has been concluded from tracer studies[5] that host nucleic acid is utilized by the parasite only in the form of breakdown products. It is likely that any host nucleic acid used in synthesis of rickettsiæ would also be first extensively degraded.

A common pattern in the composition of deoxyribonucleic acid, first pointed out by Chargaff[6], has apparently wide validity. The molar ratios (adenine) : (thymine), and (guanine) : (cytosine (plus methyl cytosine when present)) have nearly constant values close to unity, whereas the ratio (adenine + thymine) : (guanine + cytosine) is characteristic of the source of the nucleic acid. The rickettsiæ are no exception :

	A : T	G : C	(A + T) : (G + C)
R. burneti	1·13	1·02	1·25
R. prowazeki	1·12	1·11	2·08

If, for as yet obscure reasons, nearly constant ratios of adenine to thymine and guanine to cytosine are the rule in deoxyribonucleic acids, this would greatly increase the probability of two distinct deoxyribonucleic acids having like composition by chance. This may account for the similarity of the *R. burneti* and chick nucleic acids.

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Symbiosis in *Ptilinus pectinicornis* L.

It is well known from the work of Buchner[1], Breitsprecher[2], and others that mycetomes occur at the anterior end of the larval midgut of several species of Anobiid beetles. The mycetocytes are distended with micro-organisms which are of obscure taxonomy, but appear yeast-like, and of which the symbiotic role has been established by Koch's[3] demonstration of their necessary presence in *Sitodrepa panicea*, if the larva is to grow normally. Blewett and Fraenkel[4] have shown that the presence of the symbionts in *Sitodrepa* larvæ can offset a dietary deficiency of five vitamins of the B group : the symbionts in *Lasioderma serricorne* can apparently supply six of these vitamins to the larva.

The vitamins could become available to the larva either by excretion from the organisms, or by digestion of organisms expelled from the mycetocytes into the gut. The former view now gains support from the observation that, in the larva of *Ptilinus pectinicornis*, the mycetomes have migrated forward from the anterior end of the midgut to form a pair of lobed organs dorso-lateral to the front of the gizzard. Connexion with the midgut is retained through a pair of slender ducts, about 16 μ in external diameter, with walls about 4 μ in thickness, passing on either side of the gizzard. These organs are observable both in sections and in dissections. In sections, the mycetocytes can be seen to be packed with minute, round organisms, none of which has been observed in the ducts.

There is therefore strong morphological evidence for concluding that the symbionts in the larva of *P. pectinicornis* secrete a fluid which, by analogy with *Sitodrepa* and *Lasioderma*, should contain vitamins of the B group which the larva requires but is unable to obtain in sufficient quantities from the dead, dry wood in which it normally lives.

When the larva pupates, the mycetomes retain their identity but become a little reduced in size, while the ducts contract and thicken until the mycetomes are drawn back into close contact with the anterior end of the midgut. The mycetomes then look little different from those in the larvæ of several other species of Anobiids in which they appear as short diverticula from the midgut.

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Occurrence of Malonic Acid in Plants

The occurrence of malonic acid has been reported in the leaves of lucerne[1] and in green wheat plants[2]. This acid is well known as a competitive inhibitor of succinic dehydrogenase, and has been used extensively in investigations of the tricarboxylic acid cycle. In consideration of this inhibiting effect of the acid, some further investigations have been made into its presence in plants.

The organic acids present in water extracts of plant tissue have been identified and quantitatively estimated by paper partition chromatography. The acids were extracted from mature leaves by boiling about 6 gm. in water with 1 ml. normal sulphuric acid. The tissue was then ground in a mortar and a clear extract obtained by centrifuging ; this was concentrated to 6 ml. before using on the chromatogram. The chromatograms were developed by a method similar to that of Lugg and Overell[3], using as solvent the water-poor phase of *tert.*-amyl alcohol (80 ml.) – chloroform (80 ml.) – water (80 ml.) – formic acid (30 ml.). The acids were detected by spraying with an aqueous solution of bromocresol green. The R_F value of malonic acid (0·59) is identical with that of tricarballylic acid and very close to that of maleic acid (0·60). Malonic acid was distinguished from the others by the use of two different sprays—ammoniacal silver nitrate and ceric ammonium nitrate as suggested by Buch *et al.*[4]. The organic acids separated satisfactorily in the presence of the other substances,