Leithfield. The separation of a part of the population of each species into the pond at Leithfield provided a useful comparison of their reaction to adverse conditions. The habits of these two species are clearly contrasted, with the notonectid pelagic and carnivorous and the corixid bottom-living and mainly herbivorous. They come closest together in weeded areas. At Leithfield dense breeding populations of *S. arguta* and *D. zealandiae* occur from time to time in beds of *Elodea* floating over several metres of water.

It is surprising nevertheless to find such similar biology in the two families, with almost identical life cycles and flight polymorphism. The differences between them, as exemplified by the two species examined, are less than those occurring among corixid species in England and lie in such fine points as the differences in teneral development, conditioned by swimming habit, and in the response to changing conditions in spring which cause the notonectid cycle to lag behind the corixid one. In summary the differences are of degree not kind.

At both Leithfield and Kainga the first imagines of *S. arguta* appeared almost a month earlier than the first ones of *A. assimilis* and a similar gap, at least for the larvae, is indicated for populations of the same two species at Auckland by Barclay (1966, pp. 248–49). At the other end of the season eggs develop longer into autumn in *S. arguta* than in *A. assimilis* but even though the corixid has a longer active reproductive period both species have a similar annual cycle of one and a part second generation each year.

The first imagines in summer in both species are predominantly flightless even though those of *A. assimilis* appear much later than those of *S. arguta* and would have developed under different conditions. It should be noted, however, that the initial determination of the polymorphism occurs during the early larval instars, developing under more similar conditions. This early flightless development is short-lived and in both species soon gives way to predominantly normal growth. Its presence in *A. assimilis* at Kainga was established unequivocally by examination of the only mature larvae in the population on December 23: 23 of 33 larvae were found to be the flightless morph. The switch to the development of the flightless morph in late summer, after the long mid-summer period of mainly normal development, showed in the adult populations at the same date in the two species, about the end of February. This correspondence suggests that the labile developing stages were responding similarly to the same factors in the environment. Futhermore the two species behaved similarly to the changed conditions of the cut-off pond. From a similar starting point at the end of December, 77 of 96 (86 percent) of *A. assimilis* imagines and 94 of 115 (81 percent) of *S. arguta* imagines in this population had developed to the normal morph a month later.

It is interesting to compare these cycles of development with that occurring in the populations of *D. zealandiae* at Leithfield. This species is undoubtedly a primitive corixid sharing features with the Notonectidae but differs from both species examined in the present study through having the wings reduced in the flightless morph. The normal flying morph is comparatively rare and there is some evidence that the control of the polymorphism has a more direct genetic factor than in the other species.

The life cycle of *D. zealandiae* was similar to the other species with first imagines appearing in mid-December and laying eggs for a time to give a partial second generation. Few bugs with developing eggs were discovered after the end of January. Teneral normal bugs occurred from late January until early March but even when most common, normal bugs, both teneral and mature, made up little more than 10 percent of the population and later in winter this figure had fallen to less than 3 percent. In contrast to the other species none of the normal bugs matured early enough in the summer to develop eggs and the first oviposition of this morph consequently must occur in the following spring.