supplied to the plants either in the form of nitrates or by inoculating the seed with active bacterial strains. When suitable amounts of yeast extract were used, the test plants started blooming 5–10 days earlier than controls (test-plants 20–25 days, controls about 30 days after sowing). The number of pods was invariably some 50 per cent greater when the plants were given yeast extract. Excessive amounts of yeast extract were found to cause deleterious effects. Work is in progress to find out which particular factor in yeast extract is responsible for the stimulating action. Particular attention will be paid to the question whether the factor which stimulates the growth and blooming of plants is identical with the factor stimulating the cell division of micro-organisms.

Follicular hormone was found to have no stimulating effect on the development of blossoms.

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The Sycamore Fungus

THE circular black spots on the leaves of the sycamore, *Acer pseudoplatanus*, caused by attack by the fungus *Rhytisma acerina*, form such a familiar feature in the foliage of that tree that they are apt to be regarded as natural marks, like those on the mottled leaves of *Pulmonaria officinalis*.

Although I have given some attention to the matter, I have never found a sycamore without these blotches; until lately, in going through the plantations at Corrour in Inverness-shire, I noted that none of the sycamores had been marked by *Rhytisma*. It is true that these plantations are only from twenty to thirty years old, the ground having been treeless, except for a few scattered birch and alder, when Sir John Stirling Maxwell undertook experimental planting at an elevation of 1,200–1,400 ft. above sea-level; but I have failed to find anywhere else sycamores of that age free from the fungus.

Rhytisma has no perceptible effect upon the vigour of its host. It will be interesting to note whether, under conditions of climate in the Scottish Highlands, it will ever make its way to this high altitude and establish itself on the sycamores at Corrour.

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Exceptional Behaviour of the Synergids in the Embryosac of Angiosperms

THE synergids in the embryosac of angiosperms usually degenerate as soon as the process of fertilisation has been completed. During the course of a morphological study of *Ammania baccifera*, Linn. (Lythraceæ), however, we have found them to be persistent up to a very late stage of embryo formation and even to develop further during this period in a very peculiar manner which, so far as we have been able to find, has not before been reported in any flowering plant.

The embryosac of *Ammania baccifera* is perfectly normal and of the usual 8-nucleate type. There are three antipodal cells, two polar nuclei and an egg-apparatus of one egg-cell and two synergids. Both the synergids are uninucleate and quite distinct from each other before fertilisation; but so soon as this process is completed they begin to expand in all directions. Laterally their walls begin to press upon those of the other and finally dissolve. The two synergids from now onwards thus form a single structure more or less resembling a collar around the suspensor of the growing embryo. The nuclei of the synergids also divide a number of times as the latter increase in size. The synergids thus become multinucleate—the number of nuclei of both the synergids taken together becoming very often so many as 7–9. The divisions that give rise to such a large number of nuclei from the original two take place amitotically.

The above behaviour of the synergids in *Ammania baccifera* we have found to be constant. We have examined several hundred embryosacs and in every case we have found them to unite with each other laterally and become multinucleate after fertilisation simultaneously with the development of the embryo.

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Observations on *Arenicola marina*

ON July 19 whilst passing across the Dee sands (Cheshire) from Heswall to the cockle beds, many thousands of the common lugworm, *Arenicola marina*, were seen lying out of their burrows partly or completely exposed on the surface of the dry sand and in pools almost everywhere at half-tide level, while numbers were being washed downstream in the drainings from the sands with little chance of survival. None had been seen on similar visits made on May 27 and 31.

Of 116 individuals examined microscopically on July 19–20, 59 were females with almost ripe eggs and 45 were ripening males, of which 16 had tailed sperm-morulæ. No parasites were noticed in the coelomic fluid; other parts were not examined.

The general condition and habits of the worms indicated difficulties in respiration such as might be expected in very hot weather in an animal which does not appear to have a high oxygen reserve[1]. On July 20, temperatures of 71°–75° F. were recorded in pools and streams between 4 and 6 p.m., but whether such levels are very abnormal appeared doubtful. Later, on July 27, the Cark sands, Morecambe Bay, were visited and temperatures of 72°–78° F. on the afternoon ebb tide were recorded where lugworms were extremely abundant below the sand but none were on the surface. On July 31 extruded worms were still abundant on the Dee at environmental temperatures of 60·8°–61·6° F. Hence it was felt that high temperature, although possibly of incidental importance, was probably not the cause of the remarkable migration of the Dee worms. On the Dee, the general biological conditions were healthy so far as could be inferred from the presence of millions of young shrimps (*Crangon*) and shoals of gobies in pools and streams, and a heavy spatfall of tiny cockles ranging from 1·2 mm. on the adjacent beds. The presence of large numbers of rotting cockles[2] (and *Macoma*) in the neighbourhood, however, indicated that a bacterium feeder might have become abundant and attached to the gills or merely harassing the worms in their burrows. A sample of 29 worms, which were partly but not wholly protruding