120 seedlings in 1 h with 3–4 ml. of the spore suspension.

The inoculated seedlings are then transplanted in 6-in. pots in the glass-house and irrigated with water. Leaf and stem rusts appear after 7 and 10 days respectively from the date of transplant on the first leaf with 100 per cent infection in the seedlings.

To obtain the culture of rust in a glass test-tube by this technique, the inoculated seedling is transferred to a glass test-tube containing 10 ml. of 0·5 per cent water agar. A few drops of water are added to the surface of the agar to maintain good humidity in the tube. The tubes with open mouth may be kept in the glass-house or in a room receiving direct sunlight. The seedling continues to grow in the tube and rust pustules appear on the first leaf, and in some cases on the second, third and fourth leaf, as well as on the first tiller.

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Occurrence of Unusual Bodies in a Marine Pennate Diatom

During an investigation of the marine phytoplankton in a shallow Rhode Island coastal salt pond[1], an abundant benthic diatom flora occurred throughout the water column on May 3, 1961. This community was probably roiled up from the bottom during the vertical mixing characteristic of the water-mass at that time (Table 1); a distinct halocline persisted prior to this date. The water-mass was 1·5–2·0° C warmer than in mid-April and while the bottom (6 ft.) salinity decreased by 2·5 parts per thousand, the mean water-column salinity decreased by only 1 part per thousand. Similarly, gross changes were not observed in other environmental factors studied: dissolved oxygen, nitrate, nitrite, silicate and phosphate.

Table 1. Physical Conditions and Pennate Diatom Abundance on May 3, 1961

Depth	*Gyrosigma* sp.	All pennate diatoms	Temp.	Salinity	Density
(ft.)	cells/l.	cells/l.	(°C.)	(°/₀₀)	σt
0	360	255,000	9·2	26·42	20·41
3	440	235,000	8·7	26·55	20·58
6	2,600	210,000	8·7	26·60	20·63

Included among these tychopelagic diatoms was the sudden appearance of a *Gyrosigma* sp., represented almost exclusively by empty, broken frustules and moribund individuals in the preserved 52-ml. samples examined microscopically from each depth in the phytoplankton census. One intact specimen was encountered, however, which differed from the other *Gyrosigma* specimens and all other pennate diatoms previously examined. This specimen contained 200–250 spherical, green bodies measuring 3·5–7·5μ in diameter, and distributed in a random, though clumped, manner throughout the intact cell. The periphery of these bodies was slightly thickened. Neither flagella, pyrenoids nor a nucleus were observed. Apart from these bodies, the specimen was devoid of its usual complement of cytoplasmic material and chromatophores.

Subdivision of the protoplast into atypical, non-flagellated bodies has been observed in three other species of pennate diatoms[2–4]. Recently, the occurrence of biflagellate swarmers within the cells of the marine pennate diatom *Amphiprora hyperborea* has also been reported[5]. However, the *Gyrosigma* bodies in no way resembled the *Amphiprora* swarmers. While they did possess a somewhat thickened wall, their general structure and number suggest that they were not similar to the spore-like bodies noted in the limnetic pennate *Surirella spiralis*[2]. Kolbe[4] observed the frequent occurrence of 6–16 naked, pigmented, pyrenoid-containing bodies in motile specimens of the brackish water pennate *Nitzschia vitrea*. He concluded that these rounded, pigmented bodies were formed by subdivision of the chromatophores, a phenomenon he designated as 'Hypertomie'. Kolbe suggested this might also be the origin of similar bodies observed in the limnetic diatom *Eunotia lunaris*[3]. The green pigmentation of the *Gyrosigma* bodies suggests a possible derivation from the original cell chromatophores, but their lack of a pyrenoid and great abundance distinguish them from those observed by Kolbe. Finally, the *Gyrosigma* bodies were morphologically distinct from the microspores commonly observed in centric diatoms[6].

While the *Gyrosigma* bodies bear certain resemblances to the non-flagellated bodies noted on rare occasions in other pennate diatoms, they appear to represent a new type. It is unknown whether they represent a reproductive stage of the life-cycle, an unusual decomposition of a moribund specimen, or are symbionts. The nature and function of the unusual bodies reported in the other pennate diatoms also remain an enigma[5,7].

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ENTOMOLOGY

Laboratory Colonization of the Horn Fly, *Hæmatobia irritans* (L.)

The horn fly is a blood-sucking insect (*Hæmatobia irritans*) the only host of which, for all practical purposes, is cattle. The adult remains on cattle almost continuously, leaving momentarily to lay eggs in the freshly dropped fæces. Horn flies have been reared on a caged steer at Kerrville since 1947, but it was only in 1961 that this colony could maintain itself without the addition of field-collected flies. Some attempts at colonization of horn flies away from a bovine host have been briefly reviewed by McLintock and Depner[1]. Many workers have reared adults from the egg stage and maintained the flies on laboratory diets (citrated bovine blood) but the production of fertile eggs has not been reported. On the theory that micro-organisms in citrated bovine blood were detrimental to the flies and/or that bovine blood did not contain all the essential nutrients for reproduction, a series of laboratory diets was tested. Flies taken as pupæ from the caged-steer colony were fed bovine blood containing antibiotics, and attempts