ferences were 7.5 and 7.2, respectively. Among the females and males with moderately developed cloacas, the temperature is lower than that of the body. The lack of development of the cloaca in the birds subjected to 9-hr photoperiods is readily observed, but it is interesting to have the added observation of essentially no change in the temperature of this region. The data on body temperature in each species agree closely with those of other authors (*5, 6*).

The function of the seminal vesicles has not been clearly worked out. It is obvious that they store sperm, but it is likely that they have other functions. The epithelium is glandular (apocrine ?) and probably contributes to the somewhat viscous semen. The ejaculate appears to be a "pinpoint" of semen which is presumed to be placed directly in or near the opening of the oviduct (*7*). It seems possible that the sperm mature here in the seminal vesicles. Sperm obtained from the testes are not motile, while those obtained from the vesicles are. In the fowl, functional changes occur in the sperm as they pass through the male ducts, and functional maturity rarely occurs in the testis or epididymis (*8*).

If the main function of the seminal vesicles in these passerine birds proves to be maturation and maintenance of sperm, then it may be that these are temperature-sensitive functions. One of the functions of the protuberance, therefore, could be thermoregulation; another may be to facilitate intromission during copulation.

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A Note on the Flagellation of *Phytophthora infestans* (Mont.) deBary

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Examinations of swarmspores of *Phytophthora infestans* (Mont.) deBary with the phase-contrast microscope reveal paddle-like structures on the flagella. It was thought that further information concerning the structure of the flagella might be obtained from an examination of the swarmspores with the electron microscope. This paper is a preliminary report on the observations made with the electron microscope and an interpretation of the findings.

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Swarmspores were prepared for examination by a method similar to that used by Manton and her colleagues in their studies of the flagella of various organisms (*1*). A suspension of swarmspores in distilled water was prepared by incubation at 12°C of sporangia from a 10-day-old culture of the fungus. Droplets of the swarmspore suspension were placed on collodion-coated grids, and the grids were placed in contact with vapor from a 2-percent solution of osmic acid. After killing and fixation had occurred, the droplets were allowed to dry. Some of the preparations were shadowed with uranium before examination, and others were left unshadowed.

The electron micrographs show that one flagellum is ciliated and one is not (Fig. 1*b*). In pictures of shadowed preparations, it can be seen that the cilia of the ciliated flagellum are themselves terminated by still smaller projections (Fig. 1*a*). These findings are

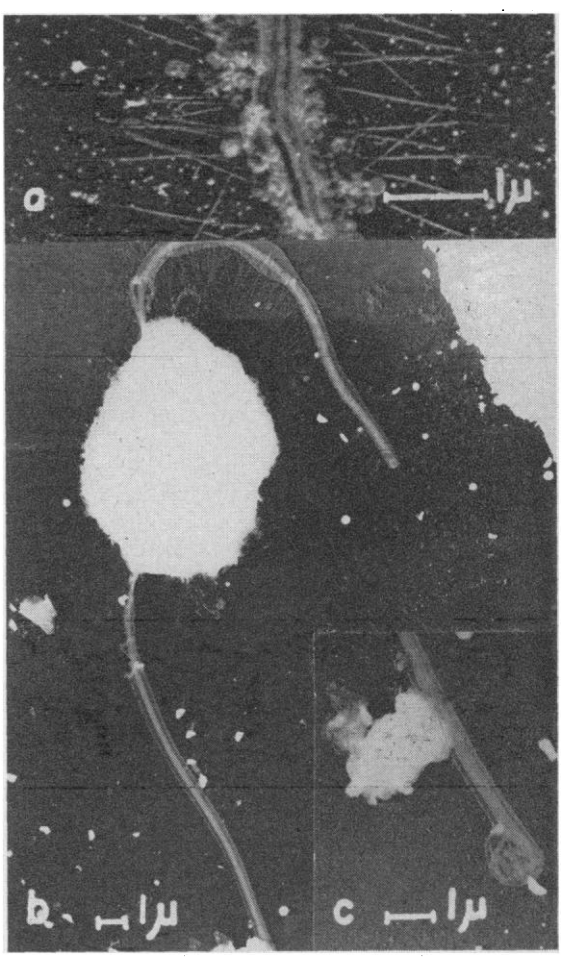

Fig. 1. (*a*) Part of a ciliated flagellum (not that of *b*) showing cilia terminated by smaller projections. Electron micrograph, shadowed, ×14,000. (*b*) Swarmspore, showing part of each flagellum. Electron micrograph, shadowed, ×3500. (*c*) Enlargement showing tip of the non-ciliated flagellum of (*b*) at the initial stage of rolling. Electron micrograph, shadowed. ×7000.

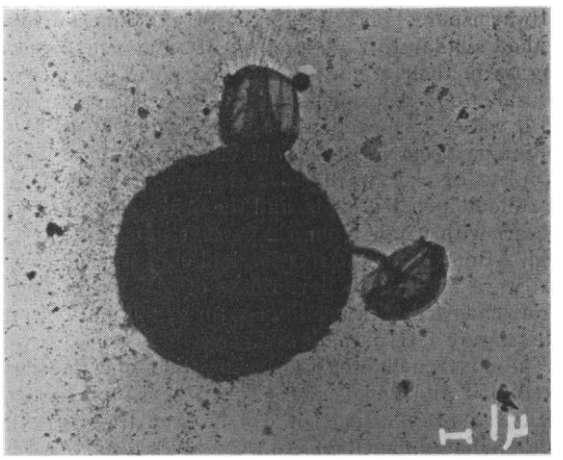

Fig. 2. Swarmspore with both flagella rolled inward from the tip. Electron micrograph, unshadowed, × 3500.

similar to those described from electron micrographs for the genus *Saprolegnia* by Manton *et al.* (*2*). Couch's (*3*) description of the flagellation of *Pythium* sp. based on staining procedures and observations with the optical microscope also fits closely the situation found in *P. infestans.*

The flagella of most of the swarmspores killed soon after their liberation from the sporangia and kept cold during the killing process are not paddle-shaped. The tip of the ciliated flagellum is slightly rounded, as is shown in Fig. 1*b*. The tip of the other flagellum often appears to be slightly tapered. In some preparations, however, a situation, such as that pictured in Fig. 1*c*, may be noted. Either one or both flagella appear to be rolled inward from the tip.

In droplets taken several hours after swarming, many swarmspores like that shown in Fig. 2 are seen. In these the flagella appear to have rolled up almost completely. Intermediate stages between those pictured in Figs. 1*c* and Fig. 2 also may be seen, and frequently a rolled-up flagellum is found detached from the body of the swarmspore. Occasionally all the stages can be found in the same droplet. In view of these findings, it seems likely that this is a way the swarmspore sheds its flagella preparatory to encystment and germination.

Further examination of living swarmspores with the phase microscope has confirmed this interpretation. Soon after swarming, the swarmspores are very active and will continue to be if they are kept cold. The flagella move rapidly and are difficult to see. However, they do not appear to be shaped like paddles at this time. As the water in the droplet begins to warm, the swarmspores begin to swim more slowly, and small paddle-like structures can be seen on some of them. The paddles soon become easier to see, partly because the paddle blades become larger, and partly because the swarmspores move more slowly. As the blade of the paddle enlarges, the handle separating it from the swarmspore body becomes shorter until often it cannot be seen. At this point, the swarmspore stops its movement. The flagella, still resembling paddles, become detached and float away.

These preliminary studies indicate that both time and temperature are factors in the formation of the paddles and their detachment. The flagellation of this organism is being studied further and will be described later in detail.

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Effect of Isonicotinic Acid Hydrazide on Several Higher Plants*

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Isonicotinic acid hydrazide (INAH) has been shown to be bacteriostatic *in vitro* in concentrations as low as 0.02 mg/ml (*1*), and it may possess some slight antifungal properties (*2*). Its effects upon the growth of higher plants and upon the enzyme chemistry of affected organisms have not been reported.

In three experiments conducted May–Oct. 1953, observations were made on vegetative, reproductive, and enzyme responses of bush beans, sugar beets, buckwheat, and spring oats treated with INAH. Each treatment, applied 21 days after sowing the seed, involved five pots of three to five plants.

The treatments were as follows: (i) aerial parts sprayed until wet with 0.1 percent Tween aqueous solutions of 0.1, 0.2, 0.4, 0.8, 1.2, or 1.6 percent INAH; (ii) one leaf immersed for 30 sec in the aforementioned solutions; (iii) one leaf, the upper epidermis of which had been removed by scraping with a sharp scalpel, immersed in 0.4, 0.8, 1.2, or 1.6 percent solutions; (iv) 50 ml of 0.4, 1.2, or 1.6 percent

Table 1. Green weights (grams per plant) of bean plant tops treated with isonicotinic acid hydrazide and harvested 51 days after treatment.

Concentration of INAH (%)	Aerial parts sprayed (g)	One leaf immersed (g)	One leaf abraded and immersed (g)	50 ml of solution on soil in pot (g)
0.4	41.9	43.6	40.7	42.4
.8	42.3	39.6	32.5	34.9
1.2	32.3	39.3	38.9	15.3
1.6	26.5	22.3	22.9	Dead

Untreated plants: 52.8 g.

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