conidia are often present in the same culture (Fig 1). This might be a useful method of producing spores for insect pathogenicity studies and control studies.

The hair-loosening action was strongest when the culture was grown at a *p*H above about 5.0. At a *p*H below this the activity was much decreased, and if the *p*H dropped below about 4.0, no hair-loosening activity was present.

This organism was induced to grow fairly well on chitin by gradually increasing the chitin content of the medium while decreasing the other nutrients (Fig. 1). However, no hair-loosening activity was produced when the organism was grown on this medium. Attempts to make the fungus attack keratin (horn and hoof meal) were not successful.

When the organism was grown on a peptone-meat extract medium (nutrient broth, Difco), the *p*H dropped from 6.8 to 3.7. This occurred repeatedly when 350-ml volumes of the inoculated broth [24 g/liter (3 times the usual strength)] were placed in Fernback flasks and shaken at 84 cy/min at a temperature of 28°C on a reciprocating shaker. However, if only 200-ml volumes of broth were used, a surprising result was obtained—the *p*H, instead of dropping, increased to 8.2 to 8.8. This was probably due to changes in the degree of aeration caused by the differences in volume.

To identify the constituents responsible for the drop in *p*H, the fungus was grown on 350 ml of a peptone-meat extract medium, and a portion of this broth was treated with enough alcohol to make the solution 80 percent in alcohol. When this had stood 1 or 2 days a large amount of material (about 0.5 g) crystallized out. After filtration, the solution was examined by ion exchange and paper chromatography and found to contain oxalate as its main anion. Paper chromatography of the crystals and treatment with alkali showed them to be ammonium oxalate. The oxalate from the crystals and the oxalate remaining in solution were both precipitated as calcium salt and characterized by x-ray diffraction powder patterns. Approximately 20 percent of the original solids content of the broth was found to be oxalic acid. Peptone-meat extract broths in which the *p*H increased were not analyzed. A paper chromatogram of a broth from a culture grown on medium containing glucose showed no oxalic acid.

The production of oxalic acid from peptone by fungi has been discussed and documented by Foster (*3*), but as far as we know it has not been previously reported for fungi of this group.

The formation of unidentified crystals in the blood of insects infected by *Beauveria* species has been reported by Steinhaus (*4*). There is a very good chance that these crystals are the same as those we have isolated—ammonium oxalate.

THEONE C. CORDON
JOSEPH H. SCHWARTZ
U.S. Department of Agriculture, Philadelphia 18, Pennsylvania

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Diamonds in the Dyalpur Meteorite

Abstract. Diamond was found by x-ray diffraction techniques in the Dyalpur stone; this is the fourth meteorite in which this mineral has been discovered. The diamond crystallites resemble those of Novo-Urei more than those of Goalpara.

Meteoritic diamonds have been known since 1888 when Yerofeyev and Lachinov (*1*) discovered them in the ureilite, Novo-Urei. Since that time x-ray diffraction techniques have confirmed their presence in this meteorite (*2*) and in two others: the giant iron, Canyon Diablo (*3*), and the ureilite, Goalpara (*4*). The third known ureilite, Dyalpur (*5*), had never been examined.

In previous papers (*6*, *7*), I have discussed the formation of meteoritic diamonds. The conclusions were that they were formed from graphite by shock, during meteorite impact with the earth (Canyon Diablo) or during breakup of the meteorite parent body (Goalpara and Novo-Urei).

The Chicago Natural History Museum kindly gave me the opportunity to study several small samples from their two specimens (total mass 0.4 grams). These were examined by x-ray diffraction with techniques and equipment described previously (*7*).

Several samples showed lines at spacings corresponding to those of diamond (Fig. 1). In addition, I observed diffraction lines corresponding to those from graphite and kamacite (α iron) in the same specimens. Other portions from this meteorite revealed olivine (which was visually recognizable) and clinopyroxene, in addition to the kamacite. That the diffraction pattern of kamacite appeared in almost all of the samples taken implies that kamacite is spread approximately uniformly throughout Dyalpur.

Patterns taken from unrotated specimens revealed that the diamond crystallites fall into two size ranges, a few large crystals and a large number of rather small ones. In this respect, the crystallite size distribution (unpublished data, *8*) more closely resembles that in Novo-Urei than that in Goalpara; the crystallites in the latter appear to be only a few hundred Angstroms in size (*4*). The carbonaceous inclusions in Dyalpur appear as visible grains jutting from the meteorite's surface; in each grain there are about equal amounts of graphite and diamond. Some diamond crystals from Novo-Urei show octahedral faces and are therefore apparently well developed (*9*).

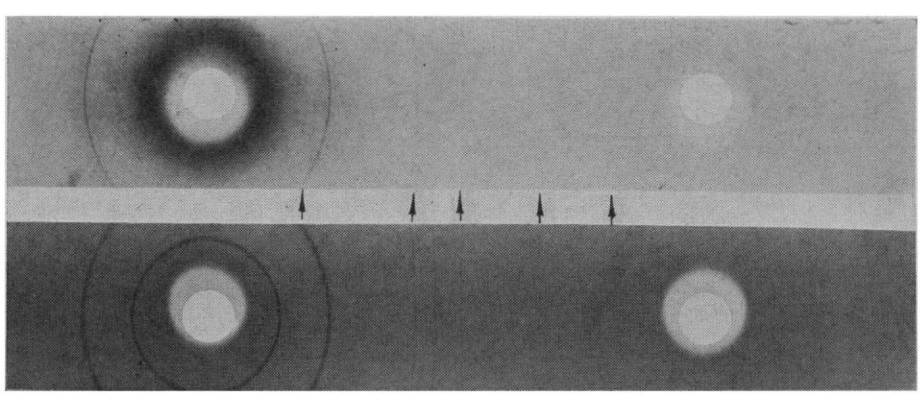

Fig. 1. (Top) X-ray diffraction pattern of 3- to 6-micron diamond powder. Nickel-filtered CuKα radiation. (Bottom) Carbonaceous inclusion from the Dyalpur meteorite. Graphite and kamacite (α iron) are present in addition to the diamond. The arrows indicate diffraction lines characteristic of diamond.

All observations to date are consistent with the view that the ureilite diamonds were formed by shock during the breakup of the meteorite parent body (*10*). A detailed discussion of this point will be given elsewhere (*8*).

MICHAEL E. LIPSCHUTZ
Goddard Space Flight Center, National Aeronautics and Space Administration, Greenbelt, Maryland

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Hypersexual Activity Induced in Females of the Cockroach Nauphoeta cinerea

Abstract. Corpora allata control mating in females principally by inducing feeding on the tergum of a displaying male. Mating induces an inhibitory nervous mechanism, the seat of which is posterior to the last abdominal ganglion, causing an immediate loss of receptivity by suppressing feeding behavior. After parturition, females may again be receptive. Transection of the nerve cord before or just after mating causes excessive sexual behavior.

The basic features of precopulatory behavior of *Nauphoeta cinerea* (Olivier) are raising of the wings by the male and feeding by the female on the exposed tergites of the male (*1, 2*). Females less than 3 days old do not mate, although they are courted by males. Eight percent ($N = 50$) will mate on the third day, 46 percent ($N = 50$) on the fourth, 66 percent ($N = 50$) on the fifth, and 96 percent ($N = 50$) on the sixth. More than 95 percent ($N = 600$) of virgin females older than 6 days remain receptive until they oviposit (24 to 35 days or more) (*3*). After females mate they become unreceptive during preoviposition and pregnancy periods. After parturition about 70 percent ($N = 106$) mate again (*4*).

Engelmann suggested that the corpus allatum hormone conditions females of *Leucophaea maderae* (Fabricius) to respond to the male (*5*) but he did not observe the behavior of males toward allatectomized females (in *6*). Barth (*6*) stated that the corpora allata regulate mating behavior of *Byrsotria fumigata* (Guérin) by controlling female sex pheromone production. Male display by *Nauphoeta* is evoked readily, even by females that are unreceptive. The sex pheromone, if it exists, appears to be a nonvolatile substance on the surface of the female and the male apparently recognizes her by contact chemoreception (*2*), a mechanism similar to that in *Blattella germanica* (Linnaeus) (*7*).

Receptivity of females of *Nauphoeta* can be correlated with activity of the corpora allata. In females less than one day after emergence, the oöcytes are 0.86 ± 0.03 mm long ($N = 5$) and do not contain yolk. Oöcytes of females that mated when they were 3, 4, and 5 days old were 1.02 ± 0.04 mm ($N = 4$), 1.03 ± 0.01 mm ($N = 23$), and 1.16 ± 0.02 mm ($N = 15$) long, respectively. Oöcytes 1 mm long usually contain yolk. Although yolk in the oöcytes may not be apparent in some of the youngest females that mate, the occurrence of colleterial gland secretion indicates activity of the corpora allata; this secretion is a more sensitive indicator of the presence of corpus allatum hormone than is yolk in the oöcytes (*8*). Females become receptive when there is a very low concentration of hormone and remain receptive, unless mated, until the oöcytes mature and are oviposited (*9*).

After a female oviposits, the basal oöcytes are about 0.51 mm long. These increase in length until parturition, when they are usually from 0.75 to 0.92 mm long. The corpora allata become inactive at oviposition and usually remain inhibited during pregnancy (*10*) probably because of a nervous stimulus resulting from the stretched uterus. Removal of the oötheca from the uterus results in premature resumption of activity of the corpora allata. The time required to reactivate the corpora allata varies with the age of the oötheca at the time it is removed. The younger the oötheca, the longer it takes for the corpora allata to become active again (*11, 12*). If the receptivity of the female is controlled by the corpora allata, then females in different stages of pregnancy whose oöthecae have been removed should subsequently become receptive at different times, depending upon when their corpora allata are reactivated.

Table 1. Multiple matings resulting from nerve cord transection in 15 females of *Nauphoeta*. The ten controls were with males for 88 hours.

Spermatophores recovered: Total	Spermatophores recovered: Per ♀	No. and site of insertion of spermatophores: Bursa and vestibule	Body cavity	Uterus
Nerve cord cut (15 ♀)				
93	3 to 11	38*	45	10
Unoperated controls (10 ♀)				
10	1	10†	0	0

* Only one large spermatophore can normally be inserted in the bursa at one time. However, sometimes two may be forced into the bursa; others may be stuck to the spermatophore that was inserted first or they may be deposited in the vestibule. One spermatophore in the bursa of each female represents the first normal mating prior to nerve cord transection. † In bursa only.

To test this hypothesis pregnant females were taken from cultures and their oöthecae were removed. The females were divided into two groups on the basis of the size of their eggs (*13*). Those females whose eggs in the oötheca were 4.5 to 5.3 mm long were considered to be in "late" stages of gestation and females whose eggs were 3.5 to 4.0 mm long were considered to be in "early" stages of gestation. A third group of females with intact oöthecae were used for controls. All females were exposed to an equal number of males for 1 hour daily for 23 days. Females that mated were removed and their oöcytes were measured, or the colleterial glands examined for secretion.

The results are shown in Fig. 1. Females that were in late pregnancy when their oöthecae were removed began to mate earlier than females that

Table 2. Effect of nerve cord transection at two places, on receptivity of females of *Nauphoeta*; the ratio of female to male was 3:1, the time allowed was 20 to 22 hours.

Treatment	Ratio of No. mating more than once to No. used	No. of spermatophores recovered per ♀ (Mean ± S.E.)*
Anterior to last abdominal ganglion		
Virgins	13/19 (68%)	3.5 ± 0.5
Mated	16/20 (80%)	4.5 ± 0.4†
All nerves arising from last abdominal ganglio		
Virgins	9/11 (82%)	4.8 ± 0.5
Mated	20/28 (71%)	4.1 ± 0.4†
Controls (mated)		
Unoperated	0/10	
Sham operated‡	0/10	

* Based only on females that mated more than once. † One of the spermatophores in each of these females represents the first mating before nerve cord transection. ‡ Incisions made between third and fourth sternites and some fat or tracheal tissue removed.