In order to show that touch or pressure receptors are sensitive enough to detect mechanical vibrations due to the attraction of charges under similar conditions, a condenser was made from two pieces of aluminum foil with slightly wrinkled tissue paper between. When the power line was connected across this condenser and the hand was placed gently on the aluminum sheet in contact with the grounded side, vibrations could be felt in places where the spacing happened to be favorable. Here, in contrast to the preceding experiments, the man was not in the circuit, so no current flowed through him, and the vibration could be felt whether or not the hand stroked the surface.

These observations lead us to this explanation of the original effect. The insulating layer, or the very dry outer skin, forms the dielectric of a condenser, of which the metal is one plate and the conducting fluids of the body the other. When an alternating voltage is applied to this condenser, there is an intermittent attractive force between the skin and the metal. If the hand remains stationary, the skin is not springy enough to allow perceptible motion around the receptors and there is no sensation. However, when the hand is moved with light pressure, friction between the skin and plate is increased as the condenser is charged, so there is an intermittent drag and release which does activate receptors and the surface feels resiny. The effect is not present when the finger is wet, because then the skin has a low resistance; the forces developed across the varnish are between the water outside the skin and the metal, and friction between finger and surface is not appreciably affected by the varying charge on this metal-water condenser. In general most of the energy for stimulating comes from the motion of the hand, and where the sensation is present this is modulated by the alternating electrical forces. Since these forces decrease as current decreases, the perceptibility of the effect when the body is completely isolated from ground is a striking demonstration of the high sensitivity of cutaneous receptors.

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The Resolution and Fungistatic Action of 1,4-Cyclohexanediol bis(bromoacetate)

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In examining organic substances so as to correlate fungicidal activity with chemical structure, it is intriguing, as in other studies of physiological activity, to note the variation in activity often caused by slight changes in molecular structure, especially optical or geometric isomers. The purpose of this report is to record some of the work done with the geometric isomers of 1,4-cyclohexanediol bis(bromoacetate).

TABLE 1

FUNGUS INHIBITION OF GROWTH OF A FUNGUS BY ISOMERS OF 1,4-CYCLOHEXANEDIOL BIS(BROMOACETATE)

Molar concentration	% retardation of growth		
	cis-trans	*cis*	*trans*
10^{-2}	100	100	60
10^{-3}	40	100	34
10^{-4}	12	31	15
10^{-5}	6	8	3

1,4-Cyclohexanediol was prepared by the method of Adkins and Cramer (*1*). This product was esterified by dissolving one-half mole (58 g) in 2000 ml of benzene and adding dropwise one mole (202 g) of bromoacetyl bromide. After the addition was completed, the mixture was maintained at gentle reflux for 5 hr (or until evolution of hydrogen bromide ceased) whereupon the benzene was removed by distillation. A brown residue weighing 152 g (84% yield) remained. This material was considered to contain equivalent quantities or nearly so, of both isomers since Olberg *et al.* (*2*) have shown that a similar preparative procedure for 1,4-cyclohexanediol yielded nearly equivalent quantities of both *cis* and *trans* forms.

The crude bromoacetate was recrystallized from hot 95% ethanol and the crystals obtained were washed with ether to remove the *cis* ester selectively, leaving on the filter the more insoluble *trans* isomer. The *trans* isomer was then repeatedly recrystallized from ethanol until a constant melting point of 137° was obtained. Ten grams of *trans* ester were refluxed with 19 g of barium hydroxide in water. The solution was evaporated to dryness, extracted with hot acetone, and this solution was concentrated and cooled. One gram of white crystals (30% yield) was obtained melting at 143.5–145°. This agrees substantially with Olberg's value (*2*) of 142° for the *trans* 1,4-diol confirming the assignment of *trans* to the bis(bromoacetate) melting at 137°.

The ether solution of impure *cis* isomer (contaminated with *trans* in the separation) was evaporated to dryness; and the brown crystalline residue was dissolved in acetone, decolorized with Nuchar, and cooled in a dry ice–isopropanol bath. The crystalline *cis* 1,4-cyclohexanediol bis(bromoacetate), remaining, melted at 114–115°. Recrystallization from acetone or benzene-ligroin solvent mixture failed to elevate the melting point above this value. In order to have sufficient compound for fungicidal assay, hydrolysis to the *cis* 1,4-diol was not carried out.

The fungistatic activity of the mixture and pure isomers was determined using the method previously used by this laboratory (*3*), in which the indices of toxicity are the radial growth rates of the test organism at the various concentration levels of toxic material.

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Table 1 gives these data against *Trichoderma viride* USDA T-1.

These data show the *cis* compound to be considerably more fungistatic than the corresponding *trans* compound. No conclusive reason for this behavior is now available.

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Preliminary Observation on a Hatching Stimulus for *Aedes* Eggs (*Culicidae*)

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Many aedine mosquitoes have a diapause in the egg stage. This diapause may be an obligate one or one brought on solely by adverse conditions. Diapause may be broken in various ways but often an additional stimulus is necessary for hatching. In experimental work it is important that hatching of the eggs occurs whenever desired. Moreover, ecological studies on such problems as succession of species require a knowledge of the factors which influence hatching. For example, why do the eggs of *Aedes campestris* Dyar and Knab hatch in the field in the region of Churchill, Manitoba, so much later than do those of *Aedes hexodontus* Dyar? These considerations make an understanding of hatching stimuli of interest.

Recent experiences with the hatching of *A. campestris* eggs and with *A. hexodontus* eggs have led to the conclusion that there may be some factor in an infusion of decaying mosquito bodies that stimulates hatching of these eggs at an appropriate temperature. Table 1 describes the experiments carried out and the results obtained.

Gjuillin *et al.* (*1*) found low dissolved oxygen of the hatching medium to be a factor stimulating *A. vexans* (Meig.) eggs to hatch. Therefore, it was decided to try a medium of low dissolved oxygen content with *A. campestris* eggs. In our experiments there was no hatch in distilled water at normal pressure, in distilled water subjected to reduced pressure to remove oxygen, or in distilled water over pyrogallol. Abdel-Malek (*2*) and Horsfall (*3*) found plant hormones to be a factor in the hatching of *Aedes* eggs; but for us a solution of 1:10 or 1:100 of indoleacetic acid in water gave no results with *A. campestris*.

It is interesting that Mail (*4*) kept *A. campestris* eggs in pond water for 20 months at a temperature between 0 and 10° C and when he returned them to 22° C he got a 25% hatch. There may have been some substance in the pond water similar to that which is present in the bacteria and mold infusion.

A. hexodontus eggs will hatch just above 0° C,

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TABLE 1

HATCHING RESULTS WITH EGGS OF *Aedes campestris* AND *Aedes hexodontus* IN AN INFUSION OF DECAYING MOSQUITOES

Expt. No.	Species	Number of eggs and history	Treatment	Results	Comments
1	*A. hexodontus* *A. excrucians* *A. campestris*	Unknown number stored together on filter paper with decaying mosquitoes. 15 days old.	Distilled water added.	First instar larvae of *A. campestris* appeared on 3rd day. No eggs of other species hatched.	No attempt was made to determine % of *A. campestris* that hatched since the eggs of the 3 species overlap in size.
2	*A. campestris*	150 eggs 15 days old, stored on clean filter paper.	Placed in infusion of decaying adult mosquitoes.	30% of the viable eggs hatched over a 3-day period.	A control of 150 eggs in distilled water gave a hatch of one larva. On dissection, the embryos were viable.
3	*A. campestris*	50 eggs stored 4 months in distilled water at between 4 and 10° C.	Placed in infusion of decaying first instar larvae.	90% of the viable eggs hatched within 24 hr at 25° C.	A control of 25 eggs in distilled water gave no hatch in 15 days at 25° C. On dissection, the embryos were viable.
4	*A. hexodontus*	250 eggs exposed to cold for 6 months to break diapause were placed in distilled water at 20° C for 5 days. No hatch resulted.	Half the eggs were then placed in an infusion of decaying mosquitoes.	In the infusion over 50% of the eggs hatched.	The exact % was not recorded. In the control there was no hatch. On dissection the embryos were viable.