ppm of O-isopropyl N-phenyl carbamate and a wetting agent. Care was exercised to prevent contamination of the soil by the growth regulator. The subsequent plant growth appeared normal, and there was no reduction in yield of grain. These results indicated that O-isopropyl N-phenyl carbamate does not influence the growth of such plants when applied to the

TABLE 1

EFFECT UPON OATS OF EXPOSING SOIL TO SPRAYS OF O-ISOPROPYL N-PHENYL CARBAMATE

Rate of O-isopropyl N-phenyl carbamate in grams/sq. yd.	Mean grain yield per pot (grams)	
	Soil exposed	Soil not exposed
0.5	0.55	4.00
1.5	0.04	2.31
0.0 (10% TBP*)	4.25	—
0.0 (30% TBP*)	4.05	—
0.0	6.05	—

Minimum significant difference between means at the 5 per cent level of probability is 2.0 grams; at the 1 per cent level, 2.68 grams.

* 10% or 30% tributyl phosphate in oil applied in same proportion as in the 0.5-and 1.5-gram rates of O-isopropyl N-phenyl carbamate, respectively.

leaves at these concentrations. In order to establish that these preparations possessed herbicidal activity, applications were made to the soil of similar plants, each application being equivalent to 5 mg. of compound/4-inch pot. This treatment was lethal.

To test the effects of sprays of this compound when allowed to contaminate the soil, potted oat plants approximately 15 inches in height were sprayed in quadruplicate with O-isopropyl N-phenyl carbamate in an oil spray. Tributyl phosphate was used as a cosolvent at the rate of 2 ml./gram of the growth regulator. The desired concentrations were made by diluting with No. 2 fuel oil. The rates of application were 0.5 and 1.5 gram/square yard in 10 ml. of solution. The plant-growth regulator was applied to plants at each rate, the soil being

TABLE 2

EFFECT UPON OATS OF EXPOSING SOIL TO SPRAYS OF O-ISOPROPYL N-PHENYL CARBAMATE

Treatment	Mean grain yield per pot (grams)	
	Soil exposed	Soil not exposed
O-isopropyl N-phenyl carbamate	0.63	1.45
Acetone-water (1:2) control	1.18	1.26
Untreated control	1.51	1.51

Minimum significant difference between means at the 5 per cent level of probability is 0.36 gram; at the 1 per cent level, 0.48 gram.

protected from the spray in one instance and exposed in another. It is to be noted (Table 1) that the yield of grain from the plants where the soil was exposed to the spray was significantly less than that from the corresponding protected series. This suggests that much of the effect from such sprays of this substance results from soil contamination.

Since considerable injury to the plants was caused by tributyl phosphate in the above spray, a further experiment was carried out using acetone as a cosolvent. Oats 12–15 inches in height were sprayed with acetone-water (1:2) solutions of O-isopropyl N-phenyl carbamate with the soil protected from the spray in one case and exposed in another. The carbamate was applied at the rate of 0.5 gram/square yard in 20 ml. of solution. The plants making up the series in which the soil was protected from the spray were not noticeably affected, whereas the series having the soil exposed to the spray yielded highly significantly less grain (Table 2).

Practical implications of these findings are that spraying O-isopropyl N-phenyl carbamate may not be the most efficient method of application, since in these studies inhibitory effects were not induced in young oat and barley plants by exposing the aerial plant portions to sprays or solutions of this compound. Should sprays be used for application of this plant-growth regulator as a herbicide, it appears that emphasis should possibly be directed toward actual soil treatment. It is suggested that this may be achieved by applying the carbamate with a suitable diluent or as an impregnated material. Since it has been reported (*1*) that young cereals are more susceptible to O-isopropyl N-phenyl carbamate than older plants, it is further suggested that for most efficient use it should be applied when the plants are in a young stage of development, or even prior to seedling emergence.

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Is Sterility Induced in Growing Rats on a Tryptophane-deficient Diet?

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Some months ago Keller (*3*) reported that permanent sterility was induced in albino rats which, at the age of 28–48 days, had been placed on a tryptophane-deficient diet for 3–18 days. According to him, male and female pairs of such rats failed to show sexual interest upon reaching maturity, and did not produce litters, even when mated to control animals of proven fertility.

Because there were several possible complicating factors in Keller's experiments, we undertook to test his claim. As a tryptophane-deficient source of nitrogen, Keller used gelatin, which, unfortunately, is a notoriously poor protein, possibly lacking valine (*4*) as well as tryptophane and being low in other essential amino acids and very high in glycine, proline, and hydroxyproline. Keller presented no evidence that his animals had been provided with vitamin E or with factors of the vitamin B complex during the deficiency period. We assume that the 5 grams of "castor oil" recorded as a dietary component was an error and that cod-liver oil was meant.

In planning our tests we tried to avoid as many complicating factors as possible. Three types of tryptophane-deficient diets were used. In one (G), bacto-gelatin served as the sole source of amino-acid nitrogen; in a second (Hy), acid-hydrolyzed casein (*1*) was employed; and in the third (Pr-free), there was no protein. The compositions of these diets, the control diets (Gt, Gvt, Hyt), and the stock diet are recorded in Table 1. A synthetic mixture of the factors associated with the vitamin

B complex was fed separately twice daily to each rat except those maintained on the stock diet, which provided an ample natural supply in the yeast. Each vitamin allotment was fed in the form of a pellet containing thiamine, 20 μg.; riboflavin, 30 μg.; and pyridoxine, 30 μg.; calcium pantothenate, 0.1 mg.; nicotinic acid, 0.5 mg.; p-aminobenzoic acid, 1.0 mg.; inositol, 1.0 mg., choline, 10 mg., starch, 50 mg., and corn syrup, 25 mg. Crisco supplied vitamin E.

At 26 days of age, 19 male and 19 female rats of the Sprague-

TABLE 1

COMPOSITION OF TRYPTOPHANE-DEFICIENT, CONTROL, AND STOCK DIETS*

	G (grams)	Gt (grams)	Gvt (grams)	Hy (grams)	Hyt (grams)	Pr-free (grams)	Stock (grams)
Bacto-gelatin	30.0	29.8	28.4				
Tryptophane-deficient casein hydrolysate				17.7	17.5		
Casein							17.7
l-Cystine				0.3	0.3		0.3
l-Tryptophane		0.2	0.2		0.2		
dl-Valine			1.4				
Starch	25.0	25.0	25.0	37.0	37.0	55.0	29.0
Yeast							8.0

* Diets other than the stock diet are designated by symbols which suggest their nitrogen composition: G, gelatin; Hy, casein hydrolysate; t, supplementation with tryptophane and v, with valine; Pr-free, protein free. Per 100 grams, each diet also contained glucose, 15 grams; Crisco, 19; cod-liver oil, 5; salt mixture (*2*), 4; and agar, 2. The B-complex vitamins were provided in pellets as described in the text.

Dawley strain were placed on the diets outlined, the same number of males as of females on each. After 20 days (2 days longer than the longest period of Keller), all of the animals

TABLE 2

AVERAGE GROWTH DURING THE 20-DAY PERIOD ON THE VARIOUS DIETS TOGETHER WITH SUBSEQUENT REPRODUCTION HISTORY

Diet fed during the 20-day period	G	Gt	Gvt	Hy	Hyt	Pr-free	Stock
Pairs of rats tested	4	3	2	4	2	2	2
Avg. initial wt. per rat (grams)	43.1	42.0	41.5	43.7	45.0	47.0	43.0
Avg. change in wt. per rat (grams)	−13.6*	0.0	+1.0	−11.7	+44.0	−12.0	+79.0
Size of litters†	11, 13	10	6	10, 7, 8	14	9	11
	10, 11	9	6	8, 11	10	8	8
	5, 7	8		7, 14			
				6, 10			

* One of the females on the unsupplemented bacto-gelatin diet died on the 20th day.

† One of the females that had been on the tryptophane-deficient diet, Hy, was mated three times and bore three litters; all others that had been on diets G and Hy were mated twice and bore two litters.

were transferred to the stock diet, and the separate feeding of the synthetic vitamin B complex mixture was discontinued. At 100 days of age, male and female rats which had been given the same diet during the initial 20-day period were paired off for mating. To make sure that the supply of vitamin E was adequate for implantation and gestation, 15 grams of wheat-germ oil were added to each kilogram of stock diet. Table 2 summarizes the observations made on growth in the 20-day deprivation period and indicates the number of young in the litters resulting from each mating.

During the 20 days on the experimental diets, the animals on the tryptophane-deficient hydrolysate (diet Hy) lost about one-fourth of their initial weights. The fact that this loss was essentially the same as that in the rats on the protein-free diet (Pr-free) indicates that the casein hydrolysate was markedly deficient; stimulation of growth by the incorporation of tryptophane (diet Hyt) affords evidence that the hydrolysate lacked chiefly this amino acid (*1*). The weight loss on the unsupplemented gelatin diet (G) was slightly, but possibly not significantly, greater than on the other tryptophane-deficient diets. Supplementation of gelatin with tryptophane (diet Gt) or with both tryptophane and valine (diet Gvt) prevented the loss in weight but did not promote significant growth in the 20 days. This supports our earlier implication that it is quite unfair to assume that unfavorable responses on gelatin diets may be attributed, without question, to their deficiency in tryptophane.

The reproductive performance of the pairs of rats which had been fed the tryptophane-deficient diets (G, Hy, and Pr-free) compared very favorably in every way with that of the control pairs fed supplements of tryptophane (Gt, Gvt, and Hyt), as well as with that of the control pairs fed the stock diet throughout.

We are not prepared to account for the observations reported by Keller, but the tests recorded in this communication convince us that a period of *uncomplicated* tryptophane deficiency in young rats, lasting as long as 20 days, *does not induce subsequent sterility.*

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Cypress Domes

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The extensive flatlands of the peninsular area are a monotonous part of the Florida landscape, characterless except for vegetation growths. One of the most unique of these are large stands of cypress that appear, at a distance, to be buttes standing out against the horizon (Fig. 1). These stands of cypress occur in dome-like masses, with the taller trees growing in the center and those toward the periphery being successively shorter (Fig. 2). Some of these groves are of immense proportions, being up to a mile in diameter. The map appearance of the dome may be round, elliptical, or, in rare cases, there may be open water in the center, the dome appearing as a doughnut. Both species of cypress are present in these stands, *Taxodium distichum* (L.) Richard, for example, growing along the St. Johns River Valley, and *T. ascendens* Brongn, in the Big Cypress of the southern Peninsula. The uniform occurrence of these domes throughout the Peninsula of Florida suggests a close relationship to the geomorphology of Florida and is therefore of interest to others than the botanist.