have been chiefly concerned with uncovering the latent dream thoughts, the highly characteristic nature of the manifest dream for each person was observed by Freud (*2*) and corroborated by others, for example, Hall (*3*) and French (*4*). Although unique for each individual, the manifest dream seems to reveal similarities in those suffering from certain disease processes (*5*).

Hostility scale. In our material, hostility seemed present in greater intensity in the manifest dreams of hypertensives than in those of normotensives, and its presence in this degree can be used to distinguish the former from the latter. A 6-point scale to measure hostility has been constructed, demarcating three major categories in the intensity of its expression. The determination of the degree of hostility was arrived at on the basis of clinical experience. Each dream is broken up into what Freud has termed "conceptual elements" (similar to the independent clauses of sentences) which are scored individually and then totaled to give the hostility rating for the dream—any dream element that represents the actual or threatened: death of persons, receives a rating of 6; destruction of objects, 5. Such acts or scenes fall within the maximum category. In the medium category fall any elements that represent actual or threatened injury or damage —to persons, rated as 4; to objects, 3. The minimum category includes all elements that represent discomfort or minor impairment—to persons, rated as 2; to objects, 1.

Testing the scale. The scale was tested on 78 dreams obtained from 33 subjects, 17 of whom were chronic hypertensive patients from the Hypertensive Clinic of the Hospital of the University of Pennsylvania, and 16 of whom were normotensive summer school college students. Each subject provided at least two dreams of at least 30 words. The average length of the dreams was about 65 words, and there was no significant difference in length between the patients and the controls. The dreams of patients had to be collected by interviews with an experienced social worker, whereas control dreams were written out by the subjects on a standard questionnaire form. All dreams were dreamed within a period of 2 mo from the time of collection. Neither patients nor controls were aware of the purpose of the work.

Three judges were trained in the use of the scale. All three were second-year medical students at the University and were unaware of the purpose of the study. Hostility scores for each dream were computed by each judge and the rank difference correlations between the three were .83, .84, and .85, all significant at better than the .001 level.

Hostility scores for each dreamer were then computed as a mean score taken from the averaged scores given each dream by the three judges. The difference between the means of the hypertensive group and the control group was significant at better than the .001 level by the t-test appropriate for two samples where F is also significant.

Discussion. This series is limited by the fact that the control and experimental groups are not adequately random or well matched. The uncontrolled variables that merit further study include age, race, health, and socio-economic status. It is also recognized that hostility is significant in other psychosomatic illnesses. It is felt that this pilot work is encouraging and that further refinement and use of the hostility scale, plus measures of other emotional forces, now in varying stages of development, may contribute: a method for the quantitative study of emotional forces; further understanding of essential hypertension and other psychosomatic illnesses; possible applications to diagnosis, therapy, and prevention.

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The Effectiveness of 2,4,5-Trichlorophenoxyacetic Acid in Reducing Drop and Promoting Growth of Frosted Apricot Fruits[1]

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A marked increase in resistance of apricot fruits to low-temperature injury was obtained by the application of an aqueous solution of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) about 15 hr before the occurrence of a frost. In addition, severely frosted fruits, in which the ovules were killed and, in some cases, the endocarp tissue was injured, were induced to grow to normal size by a single application of 2,4,5-T, made either before or 2 days after the frost occurred.

As a continuation of a research program regarding the effects of 2,4,5-T on fruit size and maturity (*1, 2*), six trees each of the Royal and Derby varieties were sprayed with a 100-ppm solution of the trialkylamine salt of 2,4,5-T at Winters, Calif., the afternoon of April 8, 1953. At the time of spraying, approximately 40 days after full bloom, the pit apices in the fruits were just beginning to harden, and endosperm development had progressed to about 1 mm in length.

The morning of April 9, a radiation frost occurred in the Winters area, and the temperature, as recorded in a standard weather shelter, was 32° F for 3 hr and 31° F for 1 hr. An examination of both sprayed and unsprayed fruits a few hours after the frost revealed considerable blistering of the skin, particularly

[1] Appreciation is expressed to the Dow Chemical Company for supplying the 2,4,5-T used in this investigation.

TABLE 1. Effect of 2,4,5-T (100 ppm) application to the Royal apricot about 15 hr before the occurrence of a frost on subsequent fruit drop and embryo development in the fruit that matured.

Treatment	Fruit that dropped (%)	Fruit at time of spray application	
		Maturing with aborted or partially developed embryos (%)	Maturing with normal embryos (%)
2,4,5-T	12.3	21.7	66.0
Control	76.2	1.8	20.0

of those fruits exposed to the sky and not shielded by foliage. Extensive brown spotting of the integuments also was found to have occurred, a characteristic symptom of low-temperature injury.

To check the possibility that the 2,4,5-T spray applied the afternoon before the frost might have an effect on fruit drop, large branches, each bearing approximately 200 fruits, on three sprayed and three adjacent unsprayed trees, were selected with regard to uniformity of position on the tree and exposure to the sky. These branches were tagged, and the fruits were counted.

Three weeks after the occurrence of the frost, 69.5 percent of the fruit had dropped from the unsprayed Royal branches, whereas only 1.3 percent had dropped from the sprayed branches. At the time of harvest, fruit counts indicated that 76.2 and 12.3 percent of the fruit had dropped from the unsprayed and sprayed branches, respectively (Table 1). The data for the Derby variety were similar to those for the Royal; 5.7 and 70.6 percent of the fruit had dropped before harvest from the sprayed and unsprayed branches, respectively.

The fruits remaining on the branches were harvested when mature, their pits removed, and the condition of their embryos noted. Of these, fruits with aborted or partially developed embryos accounted for 21.7 percent of the original number on the sprayed branches and only 1.8 percent on the unsprayed branches (Table 1). In the former case, 2,4,5-T prevented the abscission of the major portion of the frost-damaged fruit.

More significant than this, however, was the apparent increase in resistance of the ovules to low temperature as a result of 2,4,5-T treatment. Of the fruits on the sprayed branches at the time of 2,4,5-T application, 66 percent reached maturity with normally developed embryos (Table 1). In contrast, only 20 percent of the fruit on the unsprayed branches at the time at which 2,4,5-T was applied reached maturity with normally developed embryos (Table 1). Thus, the sprayed branches not only dropped 83.9 percent less fruit than the unsprayed, but they also produced 69.7 percent more fruit with normally developed embryos.

The mechanism of this action in increasing resistance to low temperature is not understood but, perhaps, may be attributed to an increase in sugar concentration of the cell sap. A pronounced increase in total sugar content, both sucrose and reducing sugars, has been found to take place in apricot fruits shortly after the application of 2,4,5-T (*3*). It is of interest to note that Corns (*4*) recently reported an improvement in frost resistance of parsnip tops subsequent to the application of either 2,4,5-trichlorophenoxypropionic acid or sodium naphthaleneacetate. Prior to frost, he reported, these chemicals retarded growth of the main fleshy root. As a result of restricted root growth, soluble carbohydrate accumulation may have taken place in the top, so that consequently a lower temperature was needed to bring about injury.

A count of the total number of fruits on each of the sprayed and unsprayed Royal trees when harvested indicated that the former averaged 3500 fruits per tree, as compared with 1200 fruits for the latter. Even though 3 times the number of fruits matured on the sprayed as on the unsprayed trees, diameter measurements of a random sample of 100 mature fruits from each of the six trees per treatment indicated a difference of only 1.5 mm in favor of the unsprayed fruits. In view of the great difference in size of the crop produced by the sprayed and unsprayed trees, the former would be expected to produce smaller fruits than the latter. The application of 2,4,5-T to the apricot, however, has been shown to increase fruit size markedly (*1, 2*). In the present investigation, apparently the stimulation in fruit growth as a result of 2,4,5-T application was about equal to the stimulative effect resulting from the early dropping of 69.5 percent of the fruit from the unsprayed trees.

The application of 2,4,5-T 2 days after the occurrence of a frost, likewise, was found to be highly effective in preventing drop and promoting growth of severely damaged Tilton apricots. On the morning of April 8, a radiation frost occurred in the Davis area. The temperature, as recorded in a standard weather shelter, was 31° F for 4 hr. Since Swarbrick (*5*), in England, was successful in preventing drop of frosted apples by growth regulator application, it was decided to test the effectiveness of 2,4,5-T on the apricot in this respect.

On the morning of April 10, approximately 55 hr after the occurrence of the frost, half of each of three Tilton apricot trees on the university campus were sprayed with a 40-ppm aqueous solution of 2,4,5-T. Full bloom had occurred on these trees on March 9, just 30 days prior to the time of spraying. When the spray was applied, there was no evidence of pit hardening or of endosperm tissue. The exteriors of the major portion of the fruits presented a blistered appearance, while, internally, the integuments had turned brown and the nucellus was water-soaked.

By April 25, 17 days after the frost, 100 percent of the fruit on the unsprayed portions of the trees had dropped, as well as all the fruit on unsprayed neighboring trees. In marked contrast, counts on large

tagged branches revealed that only 1.5 percent of the fruit had dropped from the sprayed portions of the trees. When the fruit was harvested on July 3, a total of only 3 percent of that which was sprayed had dropped from the trees. When compared with fruit from a neighboring orchard that had been heated during the frost, the fruit from the sprayed trees was of normal size and flavor but somewhat misshapen. The skin was rough and scabby; suberization of the blistered areas had taken place. Not a single fruit was found to contain a normal embryo. In fact, in addition to the killing of the ovules at the time of frost, the endocarp tissue in most of the fruits was injured. When the fruits were examined internally at maturity, hypertrophy of large areas of the endocarp was found to have occurred.

Maturity of the sprayed fruit, both at Winters and at Davis, occurred from 7 to 10 days earlier than maturity of fruit that was not sprayed. The effects of 2,4,5-T application on maturity of apricots has been discussed in detail elsewhere (*1, 2*). Other than a temporary flagging of the foliage and an inhibition of shoot growth following spray application, no deleterious effects on the trees were noted. This also has been discussed elsewhere (*1, 2*).

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Communications

Air-Borne *Histoplasma capsulatum* Spores

In a study by Grayston and Furcolow (*1*) the epidemiologic features of 13 epidemics of histoplasmosis were presented and the conclusion was drawn that "the clinical features of the illnesses lead to the conclusion that infection occurred through the inhalation of air-borne organisms." Ibach, Larsh, and Furcolow (*2*) reported the isolation of *Histoplasma capsulatum* spores from the air in chicken houses located on farms where known cases of histoplasmosis had occurred. However, no one up to the present time appears to have reported the incidence of air-borne *Histoplasma capsulatum* spores in the open air.

During the pollen and spore season of 1952, a "continuous recording particle" sampler, described by Stenburg and Hall (*3*), was kept in continuous operation from early spring until late fall. With this volumetric sampler, air-borne particles are impinged upon a moving strip of adhesive tape. Upon re-examination of this permanent seasonal record for air-borne fungus spores, *Histoplasma capsulatum* spores were encountered (Fig. 1). Although we have just started this second study and have only scanned our records for Aug. 26–31, nineteen such spores have been identified. The maximum rate of spore deposition thus far was 6/hr. As each hour's reading represents approximately 1 cu yd of sampled air this would mean, if this dosage was maintained over a 24-hr period, an inhalation rate of *Histoplasma capsulatum* spores for the adult at rest, or approximately 100 during normal activity.

Although six *Histoplasma capsulatum* spores is the maximum number found for any one hour of sampling up to the present time, this dosage actually represents the minimum exposure of individuals living in this area, in that our sampler was placed on the topmost ledge (75 ft above the ground) of a tower on the Medical Laboratory Building in Iowa City.

All typical tuberculate chlamydospores were submitted for further examination to those engaged in research on histoplasmosis.[1] Although their study is being conducted on the same floor of the building where our records have been stored. contamination of

Fig. 1. *Histoplasma capsulatum*, typical air-borne tuberculate chlamydospores. Above, X = 450; below, X = 810. [Original magnifications, 750 and 1350.]

[1] I. H. Borts, director, and Gordon E. Nielson, senior bacteriologist, State Hygienic Laboratory, Iowa City.