netic field-shock sequence, despite the fact that training was continued for a longer period than in the other two sequences. The results gain added significance from the fact that the buzz- and light-shock sequences might be expected to facilitate the learning of a later sequence in which there is only stimulus substitution; that is, positive transfer of training should occur.

However, any conclusions drawn from the obtained results must be qualified in that the experimental design did not duplicate conditions as they are in nature and, consequently, as they are treated in Yeagley's theory. Although the magnetic stimulus used here passed through the intensity of the earth's magnetic field to a value of approximately 25 times the earth's field and did this 120 times/sec, it may have presented these intensities too rapidly, too intermittently, or in some other way that might affect their reception. Nevertheless, the failure to obtain any learning with the magnetic stimulus would seem to cast some doubt on a magnetic theory of homing.

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Relationship of Dental Cavities to General Health

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A concept of bodily health that might be termed *Gestalten* has generally been accepted for many years. Applications for school, employment, insurance, and even personal communications typically contain an assessment of the state of a person's general health. The condition of health is described in broad terms, such as good, fair, or poor, dependent mainly on the number or severity of bodily disorders a person has. Type or types of disorders leading to this designation are not necessarily considered. Furthermore, in all such descriptions the oral cavity and its pathology are almost always neglected. This may be largely due to the fact that dental disease and its treatment is a highly developed specialty which appears to be peripheral to the rest of medicine. A person who has numerous dental cavities filled during a year's time is rarely thought to be in "poor" health. Therefore, the possibility of a relationship between dental pathology and other bodily dysfunction on this level has never been seriously considered. The following are the results of a study undertaken to ascertain whether such a relationship exists.

Table 1. Comparison of DMF score for criterion group and unselected sample.

Group	N	$\bar{x}$	s	t	P
Criterion group	121	31.09	14.76	2.597	.01
Unselected group	1019	27.22	15.55		

The 8-mo cumulative medical histories of a sample of Naval Aviation Cadets were examined. This group comprised a total of 1080 subjects (26 consecutive classes). The name, serial number, complaint, diagnosis, treatment, and disposition of the case were tabulated for each man. It was found that five or more dispensary visits were made by approximately 15 percent of the total population. Assuming frequency of medical complaints as a health index, these 178 subjects could be assumed to represent the "poorest" on a general health evaluation.

The complete dental records, including roentgenographs, of this criterion group were then collected where possible. DMF (decayed, missing, or filled teeth) ratings were made from these records. The DMF rating represents a subject's total past and present dental caries experience. It is compiled by scoring 1 point for each surface of a tooth containing caries or a filling and 3 points for each missing tooth. The resultant mean DMF score of the criterion group was then compared with the mean Naval Aviation Cadet DMF rating formerly established.

Of the 178 subjects in the criterion group, complete dental records were found on 121. The other 57 records were unavailable because the cadets had dropped from the program (*1*). Table 1 presents the sample statistics for the criterion group and for a large sample representative of the over-all population of Naval Aviation Cadets. As may be seen, the mean DMF established on an independent sample of 1019 unselected Naval Aviation Cadets is 27.22 with a standard deviation of 15.55. The mean DMF of the criterion group is 31.09 with a standard deviation of 14.76. The t-test for the difference between these means yielded a value of 2.60, which is significant at the .01 level of confidence. We should note in passing that this difference was established on a population that can be considered above average in general health, having been screened by a rigorous physical examination prior to admission.

In recent years, dentistry, as well as other branches of medical science, has postulated that certain chronic illnesses affect dental conditions, and conversely (*2*). The present study therefore provides an interesting relevancy. It presents empirical evidence of a relationship between general health, as measured by frequency of medical complaints, and oral pathology

measured by a decayed, missing, and filled teeth rating. This finding demonstrates that dental caries, as well as other somatic complaints, should be considered in any appraisal that attaches a general term, such as good, fair, or poor, to a person's condition of health.

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Chemical Induction of Male Sterility in Cucurbits*

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Male sterility in crop plants is receiving increased attention for its usefulness in the production of hybrid seed. A chemical method of inducing male sterility would have great merit in certain cucurbits where daily hand removal of staminate flowers on a large scale is economically prohibitive and the maintenance of naturally occurring sterile lines is extremely difficult. This primarily monoecious family presents a special challenge in that flower sex expression has been reportedly altered by chemical treatment (*1–3*). The chemical suppression of all male flowers in cucurbits would be a means of producing purely female plants.

Preliminary studies were conducted in the greenhouse with cucumbers (*Cucumis sativus,* vars., National Pickling and Burpee Hybrid) and squash (*Cucurbita pepo,* var. Table Queen). By spraying young cucumber plants after 2 to 3 true leaves had formed with 100 ppm of α-naphthaleneacetic acid (NA) or 25 ppm of 2,3,5-triiodobenzoic acid, the ratios of staminate to pistillate flowers were reduced from approximately 23:1 to 8:1 in National Pickling and from 14:1 to 2:1 in Burpee Hybrid. Results were comparable to those reported by Laibach and Kribben (*1*), in which the decreases in ratios were accompanied by both an increase in the number of pistillate flowers and a decrease in the number of staminate flowers. NA (100 ppm) applied to Table Queen squash when the first true leaf had fully expanded resulted in an average decrease in staminate-pistillate flower ratio from 1.47:1 to 0.4:1, with occasional plants producing no staminate flowers.

Subsequent field studies (1953) with Table Queen squash revealed that NA (100 ppm) applied as a spray when the seedlings had 1 to 2 true leaves and the treatment repeated 10 days later (4 to 5 true leaves) delayed the appearance of staminate flowers, and treated plants produced exclusively pistillate flowers for 8 days prior to the opening of any staminate flowers.

During the fall, winter, and spring months (1953–54), additional chemicals, including maleic hydrazide (*4*), were evaluated. Table Queen squash (Stock No. D0421, Ferry-Morse Seed Co.) was used as the test plant (*2*) and was grown in the greenhouse at 68°F night temperature and a photoperiod of 16 hr. Such an environment normally favored the early production of staminate flowers followed by the presence of both staminate and pistillate types, as described by Nitsch *et al.* (*2*).

A remarkable suppression of staminate flower buds was obtained with maleic hydrazide (MH); the selective inhibition was comparable to that reported by Moore (*5*) and Naylor (*6*) for maize. Several spray patterns successfully induced male sterility during the 3- to 4-wk interval that each crop was allowed to flower in the greenhouse. Dipping or spraying the plants in a solution containing 250 or 350 ppm of MH when the first true leaf was expanding and followed by a second treatment when 4 to 5 true leaves had developed resulted in plants that produced the usual number (8 to 10) of pistillate flowers in normal spatial arrangement, with no staminate flowers. Characteristic flowering patterns following treatment showed only rudimentary staminate flower buds or bud initials at the nodes in which they normally occurred. In other instances nonfunctional staminate male flower buds developed in which the sepals were abnormally enlarged (Fig. 1*B*) and some flowers eventually opened, but the androecia failed to develop (Fig. 1*D*), having aborted in a manner similar to that of the male-sterile mutant in winter squash described by Scott and Riner (*7*). It was further found that a single application of MH (250, 350, or 500 ppm), applied when 1 to 2 true leaves had developed, resulted in a high percentage of plants that produced only pistillate flowers.

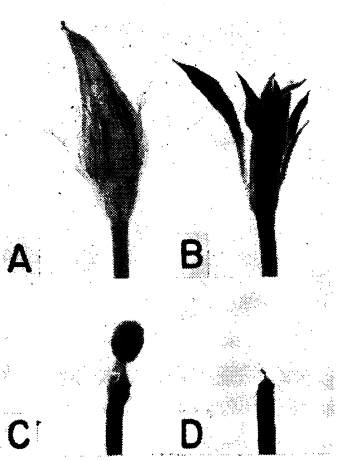

Fig. 1. Effect of maleic hydrazide (MH) on staminate flower bud development in squash (var. Table Queen). (*A*) and (*C*) Normal buds intact and with the sepals and petals removed to show the fully developed androecia. (*B*) and (*D*) Buds from plants previously treated with MH (350 ppm), intact and with the sepals and petals removed. Such buds were typical of treated plants, aborting prior to anthesis and containing no viable pollen.