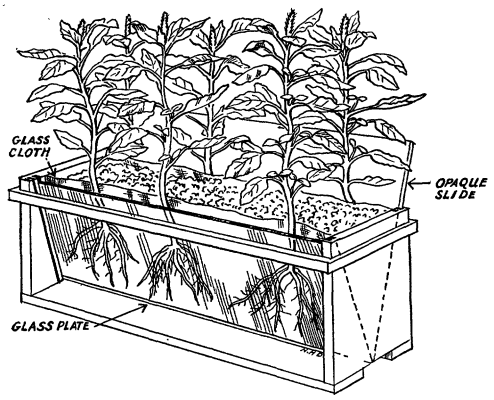

FIG. 1. Growth box for exposure of root systems to photoperiods.

expose root systems to differing photoperiods. Light-proof hoods, constructed to rest on the tops of the boxes, were used to control the photoperiods received by the tops. After transplanting, the plants in the culture boxes were exposed to long photoperiods for 6 days, a period sufficient to permit recovery from the transplanting procedure. The troughs were then divided into three experimental sets:

Set I—Tops exposed to daylight from 8: 30 A. M. until 4: 45 P. M.
—Roots exposed to daylight from 8: 30 A. M. until 4: 45 P. M.

Set II—Tops exposed to daylight from 8: 30 A. M. until 4: 45 P. M.
—Roots exposed to daylight from sunrise until sunset (from 13 to 14½ hours of daylight during the experiments), plus artificial light from 2 horizontal 47-in. fluorescent tubes (40 w) at a distance of 2 ft, from sunset until 11 P. M.

Set III—Tops exposed to daylight from 8: 30 A. M. until 4: 45 P. M.
—Roots received no light (i.e., opaque slides over glass sides not removed).

Observations were made during a period of 16 days upon inflorescence initiation and rate of inflorescence growth. The results with relation to inflorescence initiation are presented in Table 1.

TABLE 1

Days of exposure	Nos. of plants with inflorescences (inf) and without inflorescences (veg)		
	Set I	Set II	Set III
6	3 Inf, 9 Veg	1 Inf, 11 Veg	6 Inf, 6 Veg
8	9 " 3 "	5 " 7 "	12 " 0 "
10	12 " 0 "	9 " 3 "	12 " 0 "
12	12 " 0 "	12 " 0 "	12 " 0 "

Measurements made on the rate of inflorescence growth in the three sets are presented in Table 2.

The results of this experiment and of similar experiments indicate that exposure of roots to photoperiods retards both the initiation and growth rates of inflorescences of *A. caudatus* L., as compared with the initiation and growth rate of inflorescences of plants the roots of which receive no light. Since there were no apparent differences in the degree of development of roots and stems in the three sets of plants, it may be concluded that this effect of light is a direct effect upon the initiation of inflorescences and not an indirect effect in retarding growth of the plants. Both short and long illumination of roots results in delayed initiation of inflorescences and in their subsequent growth; the longer exposure of roots to light resulted in greater retardation of inflorescence formation and inflorescence growth, as compared with the effects of the shorter exposure of roots to light.

TABLE 2

Days of exposure	Av lengths of inflorescences (mm)		
	Set I	Set II	Set III
8	8.1	7.2	9.5
10	11.1	9.3	15.8
12	16.2	11.5	24.5
14	26.0	20.6	35.0
16	39.6	30.9	58.1

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The Radioactivity of the Hot Springs at Tiberias[1]

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In a previous communication the results of an investigation based on the counting of alpha tracks and stars in nuclear emulsions exposed to water from the spa at Tiberias were reported (*1*). The investigation has been extended by making use of an alpha methane –flow proportional counter. This has facilitated the identification of the isotope responsible for the major portion of the activity, as well as a measurement of its concentration. Several methods of preparing samples were tried; the following procedure has been found most satisfactory. A glass bottle is washed thoroughly with spring water, filled completely and sealed with a ground-glass stopper while beneath the surface of the spring. Five ml water from the bottle is evaporated on a sample pan. No more than 20 min should elapse between opening the bottle and inserting the dry sample pan into the counter.

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All samples of Tiberias water examined in this fashion yielded a large initial net alpha counting rate, which decayed within a few hours to levels close to background. The half-life obtained from a weighted mean of observations of 21 different samples was 36.8 ± 2 min.

It is well known that the "active deposit" of radon yields an alpha emission with a half-life of this order. The theoretical half-life of the "deposit" may be calculated from the known disintegration constants of Ra A, Ra B, and Ra C, but the result depends upon the relative initial quantities of these substances present in the sample pan at the moment it is introduced into the counter. Adopting reasonable values for these relative quantities, the theoretical half-life of the deposit may be shown to be 38.3 min, in good agreement with the experimental value quoted above. Hence, dissolved radon must account for the major portion of the radioactivity of Tiberias Hot Springs.

The concentration of radon in the water may be estimated on the basis of the initial net counting rates of the samples if corrections are made for: (*a*) the decay of the radon during the interval between bottling and preparation of the sample, (*b*) decay of the active deposit during the time (10 or 15 min) required to determine the "initial" count, and (*c*) self-absorption of the alpha particles in the sample. The modes of application of the first two corrections are obvious; the third correction is effected by means of the Bragg-Kleeman rule, as described by Evans and Goodman (*2*).

In the case of the strongest of the 21 samples examined, the initial alpha counting rate was 13.8/min, which, allowing for the background of 0.2/min, reduces to 13.6 net cpm. After application of the above three corrections this was found to correspond to a concentration of 2.18×10^{-11} curies/ml water from Tiberias Hot Springs. Most of the samples yielded an activity corresponding to at least one third this value; a few were as weak as one fifth.

A number of cold springs in the neighborhood of Tiberias were tested by the same method. The chief radioactive ingredient was again found to be radon, but the concentration was lower, ranging between 10^{-12} and 3×10^{-12} curies/ml water.

Tiberias Hot Springs were examined for traces of long half-life activity by means of aged samples of salts (obtained by evaporation of the water), which were introduced into the counter. In some cases no activity above background was detectable, even when very long counting times were resorted to; in others the net counting rate, corrected for absorption of the alpha particles within the sample, corresponded to as much as 10^{-12} curies of long half-life alpha activity/ml spring water. Apparently, some long half-life alpha emitter is present in Tiberias Hot Springs but, being a solid, it is naturally far less uniformly distributed than the radon. The average long half-life activity was found to correspond to as little as 10^{-13} curies/ml water. (This explains the results obtained by emulsions, referred to in the first paragraph.)

An attempt was made to identify the element responsible for the long half-life alpha emission by studying a few of the more active samples. Measurements of the range in aluminum of the alpha particles were carried out, but were necessarily inconclusive, owing to the very low activity and unavoidable thickness of the sources. They sufficed only to rule out elements such as uranium, with a very low energy spectrum.

Theoretically, the springs must contain some Ra D. The concentration of this long-lived isotope depends upon the length of time a specified concentration of radon is maintained, through an underground supply, in a given milliliter of water. This, in turn, depends upon unknown data, such as the manner in which the radon is picked up and circulated in the springs. Ra E and Ra F will, of course, be present in equilibrium with the quantity of Ra D. Thus, it is possible that all or part of the long half-life activity observed in aged Tiberias salts is due to the alpha emitter Ra F, maintained at a constant level by the decay of the 22-year half-life Ra D. Some experimental evidence supporting this theory was obtained, but was not entirely conclusive.

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An Action of ACTH on Adrenal Slices[1]

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The studies presented in this communication demonstrate, by two separate methods, a stimulatory effect of added ACTH on corticosteroid hormone production by adrenal cortical slices under conventional incubation conditions. Since the completion of this work Saffran, Grad, and Bayliss (*1*) have reported that the addition of ACTH to rat adrenal halves *in vitro* results in an increased output of adrenal cortical hormones as measured by the ultraviolet absorption of extractable lipid material and by biological assay.

The procedure followed in this study was, with slight variations, as follows: Fresh beef or pork adrenals were sliced freehand or with a Stadie-Riggs microtome. The slices were divided into two groups and placed in citrated whole beef blood containing sodium acetate-1-C^{14}. To one group was added ACTH (approx 6 μg of an Astwood preparation per g tissue every 15 min); the other group served as a control. The incubations were for 2 hr at 37° C in an atmosphere of 95% O_2 and 5% CO_2. After incubation the slices and blood were extracted with 70% aqueous

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