duced by the injection of freshly prepared heptyl aldehyde. Extreme care, however, of keeping the heptyl aldehyde free of excessive decomposition products has always been employed. A temporary edema was produced with the larger injected doses.

So far, ten dogs with various types of spontaneous tumors have received periodic injections of heptyl aldehyde. Improvement of the dogs by body weight increase, physical appearance and general activity has been the rule in all cases. Softening of the tumors (with complete regression of the mass in several dogs) has been obtained in all dogs, except one that has a mammary gland tumor which is heavily infiltrated with calcium. The same type of liquefaction has been obtained in dogs as was had in the tumors of the mammary gland in mice. Following periods of softening and of draining of clear fluid, the tumors as a rule have gradually disappeared.

Injections have usually been performed at sites remote from the tumors. In a few cases, however, when the tumor was large (the size of a baseball or larger), the first injection was performed directly into the tumor and this was followed, when the tumors began to slough off, by injections at remote sites to the tumors.

The details of this investigation shall be published within a reasonable time. The data so far obtained, however, are so encouraging that this note is published.

The first two dogs with spontaneous tumors (both fibroadenoma of the mammary gland, as indicated by biopsy) which have been given the present treatment of the injection of heptyl aldehyde warrants further comment. One dog, a cocker spaniel female, eight years old, had numerous hard nodules throughout the mammary gland. These ranged in size from a pea to a lump 2.5 inches in diameter by $\frac{5}{8}$ inch thick. A mass 2 inches in diameter had been removed by operation a year previously. The dog had not had a normal heat period for more than two years. For example, at her last period in August–September, 1937, she had remained in heat for at least 40 days, during which time she accepted a male eight times over the entire period without any signs of pregnancy. Two months following the start of the first treatment with heptyl aldehyde she had a normal heat period. She was bred to a male normally and twenty-four days later, she had normal size embryos. These embryos subsequently became resorbed—a phenomenon which is not surprising when it is realized that heptyl aldehyde in mice acts as an abortifacient. This resorption of embryos may, however, have been due to the age of the dog. The dog has gained weight and is in normal health at the present time without any sign of tumor. The second dog, a Scottish terrier of similar age, had a solitary nodule in the breast about the size of a small orange. After several treatments with heptyl aldehyde (remote to the tumor) the mass completely regressed. The dog has gained weight and is apparently in normal health, having since treatment had a normal heat period, whereas, previously she had a long history of prolonged and abnormal heat periods with numerous failures to conceive.

It is realized that spontaneous tumors in dogs do occasionally regress. It is also recognized that many dogs do continue to grow their tumors until death results. The proper analysis and evaluation of the present data must wait until statistically significant numbers are obtained. The data so far obtained are noteworthy, and it is planned to carry on the work on a larger series of dogs and other animals suffering from spontaneous tumors.

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RELATIONSHIP BETWEEN MEAN SEA LEVEL AND SAND MOVEMENTS[1]

AT the Scripps Institution of Oceanography there is a 1,000-foot pier, extending from a sandy beach out into the open ocean. For two years, weekly measurements of sand elevations were made from the pier to determine the beach profile and the changes in sand elevation. These observations were taken at stations 20 feet apart, along the length of the pier. Since October, measurements have been made daily, and during one 36-hour period, on October 20 and 21, these measurements were made every 40 minutes.

Continuous readings of sea level are available from the Coast and Geodetic Survey tide gauge, located on the end of the pier. Averaging these hourly sea level heights for days, weeks and months gives the mean sea level for these periods. The distances from the deck of the pier to the sand at 50 equally spaced stations were averaged for the same periods. Both mean sea level and mean sand level show considerable variation. The accompanying figure shows that there is a decided relationship between the two.

It will be observed that a rise or fall in mean sea level is accompanied by a rise or fall in the mean level of the sand. The average ratio of these changes is roughly 3 to 1, that is, a rise of one foot in mean sea level is accompanied by approximately a three-foot rise in the mean level of the sand. The agreement of course is not perfect, and some instances of marked deviations will be observed.

These changes show a distinct relationship to the seasons during the two-year period. It will be noted

[1] Contributions from the Scripps Institution of Oceanography, New Series, No. 7.

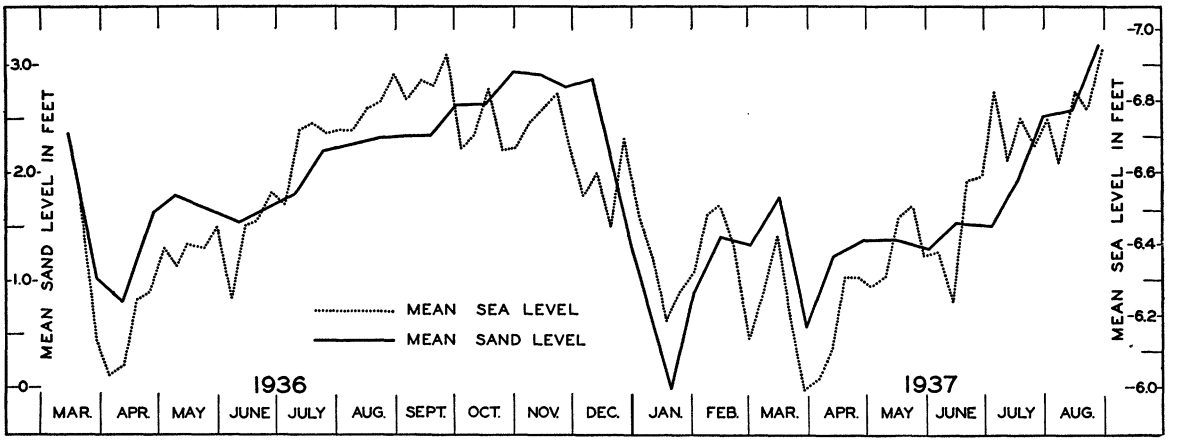

FIG. 1. Relationship between mean sea level and mean sand level. Sand level is expressed in feet above the lowest level and sea level is the tide staff reading in feet.

that there is a rise each summer and fall and a decline in winter and spring. However, it is not only in these large seasonal changes that the agreement of the two curves is found. Changes in shorter periods can be observed, as, for example, the rise in February and March, 1937. Furthermore, the changes in tide level during the 36-hour survey, when observations were made every 40 minutes, showed that the variations of tide level were closely associated with the fill and cut of sand along the pier.

The causal relationship of these changes to each other is not easily understood. It should not be concluded that the rise in sea level alone causes a building up of the sand, but many of the factors which influence the sea level must likewise affect the sand movements. It seems likely that changing currents and winds which affect sea level must have similar influence upon the sand movements. Such an influence may be increased by large swells which tend to occur during certain wind directions and which stir up the sand and keep it in suspension.

Continued observations, which include current studies, wave height observations and meteorological data, together with the sand measurements, which are now in progress, may be expected to throw more light upon the underlying cause of this relationship.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SUBSTITUTE FOR CARGILE MEMBRANE IN THE CONSTRUCTION OF BRODIE BELLOWS

VOLUME recorders of the bellows type have a wide variety of application in physiological experiments, but their construction as described by the originator, Brodie, and subsequent experimenters, involves the use of Cargile membrane for the actual bellows. Cargile membrane is the peritoneum of an ox and has been used by surgeons and goldbeaters, but unfortunately it is now both difficult to obtain and quite expensive. A search was therefore made to find a suitable substitute.

We found that the Japanese tissue paper which is used in model airplane construction when properly prepared works most admirably. Since the heavier types of this tissue are too stiff and tend to crack when folded, it is important that only the thinnest and toughest variety be used.

The tissue is prepared for use in the following manner: Care being taken to avoid wrinkles, a section of the paper is placed over the open end of a tin can or other container of suitable size and shape and glued at the edges with banana oil. With a tuft of cotton the entire surface is gently moistened with water. This serves to align the fibers and stretch the tissue. In order to render it impermeable to air and moisture it must then be treated at least three times with a mixture of one part banana oil and five parts acetone. This is done by simply brushing the mixture on gently with a soft brush. The membrane may then be removed and will be found to be smooth and flexible.

The construction of the bellows is self-evident from the illustration, but great care must be exercised in applying the membrane so that it folds smoothly and without bulging out when the bellows is in actual use. Most efficiency was obtained when the membrane was first cemented on so that it formed the sides of a box the top and bottom of which are the metal surfaces (A). The sides are then gently pushed in with thumb and forefinger so that they fold as in (B). Now, at one end the metal top is pushed down to form an angle