At least 23 more substances (mostly other polymers or variants on those mentioned before) are being tested for their carcinogenicity, but they have been embedded too recently for any report at this time.

In addition to these plastics, we have similarly embedded other materials as controls. Adequate controls are of the greatest interest and importance in such an investigation; and, at this point an addendum must be made to our previous report in 1952 (*2*). In that publication we stated that up to that time no tumors had appeared with the three substances embedded as controls; i.e., (a) the linters from which the Cellophane A. was manufactured, (b) sterile surgical cotton, and (c) chemically clean cover glasses. Recently, however, just before the completion of this last cover glass experiment, we obtained a solitary fibrosarcoma that surrounded a cover glass; this tumor appeared 659 days after the embedding, and was successfully transplanted. The cover glass was found broken into two fragments, but similar breaks were frequently found in the cover glasses that did not cause tumors. No certain explanation of this one exception among the controls can be made, but it is possible that some unknown carcinogen accidentally contaminated the cover glass at the time of the operation. In view of this single exception, a new series of control experiments is under way.

Subsequent to our publication, but independently, Druckrey (*3*) has induced sarcomas by similar procedures, using regenerated cellulose film and Polyamid film. He also produced peritoneal sarcomas by embedding platelets of cellophane in the peritoneal cavity of rats. Druckrey also observed that another rat, which had received cellophane orally, developed a lymphatic leukemia (lymphosarcoma) with malignant infiltration of the lymph nodes, liver, spleen, and lung. As this was the only such observation, we are speculating as to whether or not the leukemia was perhaps spontaneous.

The mechanism of production of these malignant sarcomas presents an interesting problem, and experiments are in progress to try to find an explanation. Types of tumors produced by embedding plastics are:

(1) *Malignant*: fibrosarcoma (the great majority are of this type), rhabdomyosarcoma, liposarcoma, osteogenic sarcoma, reticulum-cell sarcoma, lymphosarcoma, rhabdomyosarcoma (atypical), undifferentiated sarcoma, plasmocytoma, histiocytoma, myxoma, malignant mesenchymoma.

(2) *Nonmalignant*: 2 granulomas.

Table 1 shows the tumors obtained by embedding various plastics under the skin, the rodent used, the number of malignant tumors produced and the respective percentages.

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Volumetric Flasks and Microcell Filling Adapter for Use with the Perkin-Elmer Infrared Spectrophotometer[1]

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One of the problems encountered in quantitatively handling a very few milligrams of material in a solution of a concentration great enough to permit the preparation of good infrared absorption records has been solved to a great degree with the use of the apparatus illustrated in Figs. 1 and 2.

The 1-mm Perkin-Elmer microcell (Fig. 1) re-

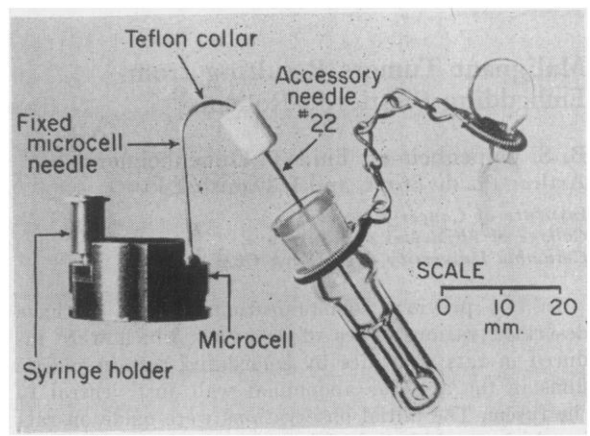

Fig. 1.

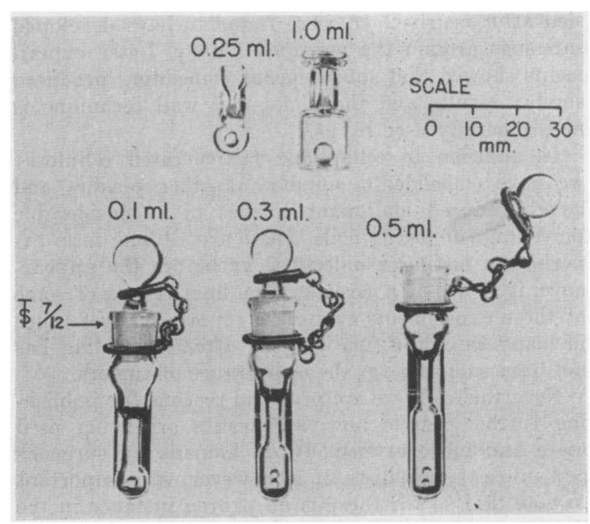

Fig. 2.

[1] Taken from a thesis submitted by O. D. Easterday as partial fulfillment for the degree Doctor of Philosophy. This work has been supported by grants from the Wm. S. Merrell Co., Cincinnati, and the American Cancer Society.

[2] Fellow of the National Institute of Arthritis and Metabolic Diseases, United States Public Health Service.

quires a volume of about 0.04 ml. By using a Teflon collar to connect the microcell needle to a second length of needle, it was possible to fill the cell from a solution volume of 0.1 ml by capillary action or by syringe in the usual manner. Thus the study of a 1-mg sample of a compound in 1% solution is possible. The flask illustrated in Fig. 1 has a calibration scratch on the constricted neck and a mixing bead which is slightly larger than the neck. The region of the flask above the neck is funnel shaped to allow easy addition of the sample by tapping the side of the flask with the finger. The glass stopper permits transportation and storage without loss due to evaporation. Solvent additions are made by using a No. 22 needle attached to a syringe.

Figure 2 illustrates several sizes of these flasks which have been used. The two at the top without glass stoppers are early models that were used successfully, but with difficulty, since many of the solvents are readily volatile. The lower models were made for us.[3]

[3] Made by Thomas J. Scott, of Metro Industries, Long Island City 1, N. Y. They may be obtained commercially from this company.

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Comments and Communications

Sea Urchins Damage Steel Piling

SEA urchins have been discovered making holes in the steel 8-in. H-beam piles of a pier near Ellwood, California. The pier belongs to the Signal Oil and Gas Company and company engineers brought the problem to the Santa Barbara Museum of Natural History.

These piles, put down in 1929, had to be replaced when their damaged condition was discovered. The culprit was identified as the purple sea urchin, *Strongylocentrotus purpuratus,* a species that often bores in surf-pounded rocks and reefs.

On the steel piles they clung to the lower few feet, where they nestled in the depressions they had made. When removed, the metal under them was clean, bright, and rough.

Their action apparently augments corrosion. So many holes had already been made clear through the ⅜-in. web of the H-beam that it was all eaten away at the bottom, leaving the lower few feet of the flanges completely separated. About half of the 40 piles pulled at this pier were damaged in this way, and the engineers are anxious to learn how to prevent such expensive damage by sea urchins.

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Thiouracil and Adrenal Glands

IN a paper on "Adrenal Hypertrophy in the White Leghorn Cockerel after Treatment with Thiouracil and Thyroidectomy" by Morris (*1*), the author erroneously ascribes to Baumann and Marine (*2*) the observation that feeding thiouracil to albino rats causes "atrophy and degeneration of the adrenal gland." Dr. Morris has missed the point of our report, and his search for the mechanism involved will be made simpler by a more careful reading of our work. What we stated was that the total weight of the adrenal gland is almost always decreased by feeding thiouracil due to an involution (not atrophy) of the adrenal *cortex*. The medulla (*3*) on the other hand, undergoes a very marked hypertrophy, rarely to such an extent that the weight of the entire gland may be increased, in spite of the great involution of the cortex.

We hope this comment will help Dr. Morris in analyzing his experiments on the chick.

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Received January 27, 1953.

Comparative Potency of a British and American Standard of Crystalline Vitamin B_{12}[1]

THE growth of several microorganisms has been shown to be influenced by the vitamin B_{12} concentration of the inoculated medium. These observations have led to the development of microbiological methods which are sensitive enough to assay the vitamin B_{12} activity of body fluids. *Lactobacillus leichmannii* (*1*), and the green alga, *Euglena gracilis* (*2, 3*), have been found suitable for the assay of vitamin B_{12} activity in serum. In both methods, the amount of growth of the organism in the test fluid is compared with that in a range of tubes containing varying known amounts of crystalline vitamin B_{12}. These latter tubes thus serve as standards.

[1] This study was made possible by a grant from the National Institutes of Health and in part by a grant from Squibb Institute for Medical Research.