ing to note that these nuclear salts contain visibly more iron oxide than do those of normal cells. The cytoplasmic ash deposit is more abundant than in the normal.

Three factors are suggested which cause the increased appearance of ash in the cancerous ingrowths when viewed with the low power of the microscope. There are more nuclei per unit area present than in the adjacent fibrous stromal tissue and the nuclei themselves contain more inorganic residue than do those of normal cells. In addition, the cytoplasm of the neoplastic cells contains more mineral salts than is common for this type of tissue.

A survey of the inorganic structure of neoplastic and normal tissues demonstrates that the individual cells composing the malignant growths are richer in mineral constituents than normal tissues —especially in calcium and iron oxide. An additional interesting feature is the similarity between developing embryonic cells and cancer cells with respect to the distribution and arrangement of certain mineral salts. Both types are characterized by an extraordinary variation in intensity, concentration and orientation of their inorganic constituents and contrast greatly with the appearance of the mineral elements in healthy adult tissue which remain proportionally fixed.

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Experimental Fixation of the Mediastinum.

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One of the difficulties in carrying out surgical compressive therapy for various lung diseases is that in some individuals the mediastinal contents are so little stabilized that such procedures as artificial pneumothorax and theracoplasty merely result in crowding the affected lung over into the opposite side of the chest instead of producing the desired compression of pulmonary cavities. The theoretical considerations, together with the demonstration of the importance of having a fixed mediastinum in such conditions, upon which is based the modern treatment of acute empyema have been described by Graham.

The method producing fixation must be innocuous, *i. e.*, should not produce "Pick's syndrome" of adhesive mediastino-pericarditis,

and furthermore the duration of the various types of fixation should be of differing degree.

The anterior mediastinal space of rabbits is potentially large with ready extension to the anterior portion of the superior mediastinum. This space accommodates 15 cc. of fluid. Roentgenograms of injections of this space with radiopaque fluids demonstrate the feasibility of filling this space with fluid substances which either by action as mechanical barriers or by evocation of a benign, slowly progressive, productive inflammation would secure fixation of the mediastinum in the mid-line sufficient to resist large alterations of intrapleural pressure.

The standard of control was the shift of the mediastinum (adult rabbits) in response to 20 cc. of air introduced into the left pleural cavity. Uniformly in the 6 control animals such a pneumothorax succeeded in shifting the mediastinum far over to the right so that the left cardiac border coincided on the roentgenograms with the left margin of the vertebral column.

The following injections of the anterior space and of the anterior portion of the superior space were made through a needle introduced on both sides of the xiphoid process: (1) 15 cc. 30% acacia solution (4 rabbits), (2) 15 cc. agar (6 rabbits), (3) 15 cc. mineral oil (6 rabbits), (4) 15 cc. suspension of silicon dioxide in mineral oil (3 rabbits), (5) 15 cc. suspension of silicon dioxide in water (2 rabbits), (6) 15 cc. suspension of sodium and potassium silicate in mineral oil (3 rabbits), and (7) 15 cc. suspension of sodium and potassium silicate in water (3 rabbits).

Autopsies performed on a number of the animals have shown the fixing material to be in the distended anterior space and anterior portion of the superior space. The acacia (30%) disappears entirely after 36 hours; the agar has remained for at least 1½ months; the mineral oil persists for several months and engenders a low grade fibrotic reaction; the silicon dioxide and silicate in oil evoke a more pronounced fibrotic reaction; the suspension of silicon dioxide and silicate in water arouses a more intense productive exudative mediastinitis.

The fixed mediastina were observed roentgenologically to be widened moderately and situated in the mid-line. After variable periods of time (6 hours to 4 months, dependent on type of fixatant used) left pneumothoraces were induced in the identical manner as in the control rabbits. Roentgenograms were then immediately taken.

The results as illustrated by the roentgenograms may be sum-

marized briefly as follows: 1. Fixation of the mediastinum in the mid-line sufficient to resist the pressure of a 20 cc. left pneumothorax, which in unfixated rabbits causes shifting of the mediastinum far to the right, can be secured by injection of the anterior mediastinal space and anterior portion of the superior mediastinal space with 15 cc. of 30% acacia or agar or mineral oil or suspension of silicon dioxide and silicate in mineral oil. 2. Complete fixation of differing durations can be secured. The fixating effect of 30% acacia is evanescent, whereas that of agar is longer and that of mineral oil seems permanent.