

of the literature has yielded only two references to the phenomenon, one by Grocco in 1904, the other by Grocco's pupil, Frugoni, in 1910.

The phenomenon consists in the separation of the contractions of the diaphragm and intercostal muscles by a definite, though variable, time-interval. As far as has been observed, the movement of the abdomen precedes that of the thorax. In well-developed types of the phenomenon the abdominal wall may have reached the expiratory phase before the intercostal muscles begin to contract. In other instances, the lower intercostal muscles take up the movement of the abdomen and the contraction spreads as a wave over the thorax.

Asynchronism of the respiratory movements has so far been observed only in lobar pneumonia. It possesses grave prognostic significance. Nearly all patients who develop it die. Usually it appears late in the disease. Though generally associated with other indications of severity, it may give the first intimation that the disease is likely to be fatal.

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A skin reaction to pneumotoxin.

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The work reported is a part of the studies on the properties of pneumotoxin and its probable rôle in the pathology of lobar pneumonia. Previous investigators (Clough, Weil, Steinfeld and Kolmer) working with dried, autolyzed or heat-killed pneumococci failed to elicit any constant, specific reaction in cases of lobar pneumonia. The present authors used the endocellular hemolytic toxin of the pneumococcus freshly prepared for each test by dissolving the washed living organisms (Type I) in solutions of sodium choleate. Guinea pigs previously sensitized with sub-lethal doses of pneumotoxin or with the serum or lung exudate of dogs suffering from experimental lobar pneumonia, reacted to the

intracutaneous injection of 0.1 c.c. of the toxin by a local erythema and hemorrhagic edema in the subcutaneous tissue overlying the muscle. The skin reaction to heat-killed pneumococci was negative in most of these animals and when positive, was of a suppurative type, marked by less edema and more leucocytosis. Control animals gave uniformly negative results.

Among human adult cases of lobar pneumonia the reaction (which was characterized by a local edema and erythema) was elicited as early as the fifth and as late as the thirteenth day of the disease (two days before and six days after the crisis, respectively). In children it was demonstrable about the same time, but was negative immediately or one or two days after the crisis. Patients recovering by lysis reacted as late as the thirty-second day. In general, the test was positive in all active cases, that is, throughout the toxemia. Cases earlier than the fifth day of the disease were not available. Control patients, suffering with bronchopneumonia or with acute or chronic infections not of pneumococcal origin, as well as healthy adults and children did not react.

The reaction is regarded as similar to the tuberculin reaction and is indicative of a state of allergy to pneumotoxin. Sensitization to the toxin presumably takes place with its liberation (by the action of normal body enzymes upon pneumococci normally localized in the lung alveoli) at the time of the prolonged chilling due to exposure. Failure to elicit the reaction during convalescence indicates the establishment of a temporary immunity or the disappearance of excess of toxin. This skin test does not seem to be of value as a method of serological type diagnosis but may aid in differential diagnosis between appendicitis or tuberculosis and pneumonia (especially in children). It is also of interest because of its bearing on the mechanism of the crisis.