described by words, and a distinct apprehension of it cannot be given by any analogy. The expiratory sound is continuous with the inspiratory, in natural breathing; it is still lower in pitch, much shorter, and the quality is neither vesicular not tubular. Its quality may be expressed by calling it a simple blowing sound.

In contrast to these characters of the normal respiratory murmur, the inspiratory sound in bronchial respiration is high in pitch and tubular in quality, its intensity, like that of the inspiratory sound in the normal respiratory murmur, being variable, and therefore not entering into the distinctive characters of the signs. The expiratory sound, separated from the inspiratory sound by a brief interval, is higher in pitch than the inspiratory sound, tubular in quality, usually more intense, and its duration is equal to or longer than that of the inspiratory sound.

Bronchial respiration is the respiratory sign of complete or considerable solidification of lung. Now, between a degree of solidification sufficient to give rise to bronchial respiration and the normal condition of lung, gradations in solidification are involved in different diseases, and in different stages of the progress of certain diseases. Pneumonia and phthisis are familiar examples of diseases involving these gradations. As regards the abnormal modifications of respiration caused by a slight or a moderate degree of solidification, there is not a little vagueness and confusion; the respiratory sounds have been called rude, rough, harsh, sharp and dry. These terms convey not only indefinite but erroneous ideas. As an illustration of incongruity, a cardiac bellows murmur is distinguished as soft, whereas a similar sound produced by respiration would be called rude. Supplementary or puerile respiration is harsher in quality than the sound which represents moderate solidification of lung. A late German author of a work on diagnosis, which has been translated into the English and the French languages, includes, under the name hyper-vesicular, the sign called by others rude, rough, harsh, etc., whereas a distinctive feature of this sign is diminution of the vesicular quality of the inspiratory sound.* The lack of a clear apprehension of the characters distinctive of the sign is implied in the term indeterminate *(unbestiment)* applied to it by Skoda, and still used by German writers.† I have proposed, as already stated, for the sounds representing graduations of solidification of lung falling short of the degree represented by bronchial respiration, the name broncho-vesicular respiration. This term expresses what analysis teaches—namely, a combination of the characters of bronchial respiration with those of the normal respiratory murmur. In broncho-vesicular respiration the inspiratory sound is both vesicular and tubular. The vesicular quality, always less than in healthy, is more or less diminished, and the tubular quality is more or less marked in proportion to the degree of solidification. The pitch is raised in proportion as the tubular quality predominates over the vesicular. The intensity is not important. The pitch, tubular quality, and length of the expiratory sound are in correspondence with the characters of the inspiratory sound. If in the inspiratory sound the vesicular quality predominate over the tubular, the expiratory sound is but little prolonged, its tubularity is not marked, and the pitch is but moderately raised; on the other hand, if in the inspiratory sound the tubular quality predominate over the vesicular the expiratory sound is more prolonged, its tubularity is more marked, and the pitch is higher. According to this description, a broncho-vesicular respiration may approximate closely to the bronchial, the chief distinction consisting in an appreciable vesicular quality in the inspiration; or, it may approximate to the normal respiratory murmur, the distinction consisting in the presence of an appreciable tubular quality. There are gradatory combinations between these extremes as regards the relative proportions of the bronchial and the vesicular characters. As regards the significance of the sign, the solidification is greater in proportion as the characters of the sign approximate to those of bronchial respiration, and the amount of solidification is small in proportion as the characters approximate to those of the normal respiratory murmur. The intermediate gradatory combinations are exemplified during the stage of resolution in acute lobar pneumonia. The practical value of the sign in that connection is obvious. The sign is still more valuable in cases of phthisis and other pulmonary affections which involve slight or moderate degrees of solidification, either diffused or circumscribed. This sign enables the auscultator, not only to recognise the existence and the limits of solidification when not sufficient to give rise to bronchial respiration, but to ascertain whether the solidification be moderate or slight.

The distinctive characters of the broncho-vesicular respiration may be studied by auscultation of the chest in health. It has been customary to apply to the modifications of the respiratory murmur, as heard over the primary and secondary bronchi, the name normal bronchial respiration. This term is a misnomer. The respiratory sounds in this situation are never purely bronchial, but they have the bronchial and the vesicular characters combined. An appropriate name, therefore, is the

* Guttman.

† Guttmann states that as indeterminate respiratory sounds cannot be compared with any other known sounds, it is impossible to describe them. The advantage of the analytical method of study is shown by the facility with which they are described by the characters pertaining to the pitch and quality of the inspiratory and of the expiratory sound. The endeavor to explain the mechanism leads this author into error as regards the significance of the so-called indeterminate sounds. Their significance is rationally understood when it is considered that they are not indeterminate sounds, but sounds intermediate between the normal respiratory murmur and bronchial respiration.