AN INAUGURAL DISSERTATION
ON

Physical Diagnosis

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BY

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Auscultation from ausculto literally, the act of listening, is now properly applied in practical medicine to a particular method of exploration the object of which is the discovery and discrimination of disease in any part or organ of the living body, by the sounds which it gives out to the ear.

The signs of disease recognized by auscultation, may be derived from sounds produced, naturally, within the body by the motions of the organs, or from sounds artificially produced within the body or on its surface by percussion, succession.

Of the origin of auscultation, it is stated that upwards of two thousand and years ago Hippocrates availed himself of the means of auscultation.
to detect the existence and ascertain the nature of disease of the chest. The honor of the discovery at least of having first applied it to the disease of diseases of the chest is undeniably due to him.

But the practice of auscultation was comparatively unknown until the time of Lacrange to whom we are chiefly indebted for the great usefulness of this means of diagnosis in chest affections.

Subsequently, it has received the attention of Andral, Williams Stokes, Gerhard, and others each adding their excellencies until, in the language of Dr. Hope, they have not only redeemed these diseases from their obscurity, but actually rendered their
diagnosis more precise and certain than that of any other important class.

Twenty or at least only a few years since the diseases of the lungs and heart were considered more obscure than any great class in the nosology, auscultation is turned immediately and mediately accordingly as the ear is applied directly to the surface of the body or the sound is conveyed to the ear by the interposition of some conducting material.

The instrument which seems best adopted and almost universally used at the present day is the stethoscope, which is two well known to demand any description by me. Both methods of auscultation have their peculiar...
advantages, we should not reject or adopt either exclusively, our choice should depend upon circumstances of which, I will enumerate the following: The ear perceives sounds over a greater extent, all the parts of the head in contact with the body of the patient becoming conducting mediums. The stethoscope is not always at hand and is almost inapplicable to children, its sight causing alarm. The ear is also more easily and accurately applied to the posterior regions of the chest. On the other hand, the stethoscope has decided advantage of applicability in the axilla, the subclavian, clavicular region, & supra spinous grain.
Feelings of delicacy would prevent the physician from applying his malleus ear to certain parts of the
foetus.
In obstetrical auscultation the instrument is preferable for the above motive and also for its de-
cided superiority in collecting and concentrating the sounds of the
foetal heart.
It alone should be employed in auscultation of the Larynx, Trachea, bloodvessels and in all cir-
cumstances of altered condition, whilst imme-
diate auscultation is preferable in extensive disease as a /lupey, Bronchitis,
so, certain general rules relative to the
patient, and the physician, are
necessary to be observed in ausculta-
in order to establish a correct diagnosis. In relation to the patient, the part to be examined should be covered with a thin smooth garment. Thick clothing, or coarser stuff are objectionable, being bad conducting medium. Silken stuff also from the rustling noise they produce are prejudicial.

The position of the patient should vary according to the region to be examined, it should not be constrained. The practitioner may generally explore both sides of the thorax without changing his position, he should early habituate himself to the use of either ear indifferently, he should not be too hasty in the examinations.
to collect his thoughts as to be completely isolated from the external world. The pressure should be only moderate so as not to be painful to the patient nor obstruct the hearing. Both mediastinal and immediate auscultation should be used in order to establish a just and certain diagnosis.

As it is my design to restrict my remarks to the signs derivable from auscultation and percussion of the pulmonary organs, something, indeed, much might be said of the anatomic structure of the thorax and the organs contained within, as also the physiological action of the same which so favourably circumscribe them for the multiplication
and distinct of physical signs.

The human thorax may indeed be
not inaptly described says, Forbes as
a sort of elastic box or basket of bones
and cartilages the interspaces of the

vivian core being filled up by a
thin layer of flesh, and the whole
covered, both externally and internall y
by a membrane of considerable densi ty
the greater portion being of the inti mir cavity being filled with air

diffused through the spongy texture
of the lungs.

It is obvious then that when the
chest is struck the sound elicited
will be in direct proportion to the
quantity of air contained in its
cavity, and as the result of such or
ganic change in the lungs is a
diminution or increase in the quantity of air contained in the thorax. So the sound produced will be dull or clear in other words increased or diminished in corresponding degree. We must recollect the duplicity and separation of the lungs upon which depends, the great principle of comparison.

Let us consider the chest in relation to the construction of its walls and the mobility of the organs contained within them and abundant source of diagnosis presents itself in the displacements of these viscera and those adjacent in the abdomen in certain chest affections, again the motions of these organs which their functions require become, as
source of diagnosis, when they are in any case interrupted, at least let notice these as deviations from the healthy condition of these viscera. Facilities also are found in the elasticity and permeability of the lungs of which, I shall not attempt a consideration.

An accurate diagnosis is not obtained from the study of symptoms alone in Chint disease, or vice versa; signs are insufficient, without symptoms. There is no such thing as a perfectly pathognomonic symptom or sign of any thoracic disease. Hence to arrive at an accurate conclusion the study of the signs, or symptoms must be Combined.
In auscultation of the respiratory apparatus three orders of phenomena present themselves as objects of study, furnished by the respiratory murmur, the voice, and the cough.

The sounds of respiration can be heard by applying the ear to the chest; they vary in degree according to the distribution of the tubes of which, we may judge by attending to these sounds.

The sounds produced in the trachea is a hollow blowing sound resulting from the passage of air through in the windpipe" this is tracheal respiration, that is the bronchi of larger caliber is the same as the tracheal, modified somewhat by the caliber of tuba.
There is yet the respiration of the "pulmonary respirating" of the mucous, which is perceptible over all parts of the chest with which the lungs are in contact; it consists of two different sounds that of inspiration and of expiration. The one caused by the penetration of the air through the minutest tubes and into the air cells, the other, the expiratory, depends upon its expulsion. This respiration has been described as and agrees to what produced by a person in a quiet sleep.

It is defined by an author as a soft, quiet or a mellow, continuous gradual tender with a sensation of drying or humidity. I cannot say that this
Respiratory Murmur is heard both in inspiration and expiration. Mr. N. Barth & Rogers also describe it as being composed of two different sounds soft and distinct to the ear. The American editor to Stokes says that this is an error in Sammon; whereas it is in fact almost entirely produced during inspiration and when heard in a mouth it resembles expiration, but may suggest some morbid condition of the lungs. I am not the balance of authority contrary to this latter opinion. However numerous the modes by which this sound may be imitated an accurate idea of it can only be gained by practice. The intensity of the respiratory sound varies in different parts of the chest.
as does the sound on percussion, it is most perceptible in the axilla, the supra and sub-clavicular and sub-pulmonic regions. Difference of opinion exists as to the comparative loudness or intensity of the inspiratory sound in the right and left sub-clavicular spaces. Generally, it is thought to be louder in the right owing to the greater diameter and straightness of the right bronchus.

Mr. Gourlay thinks from the physical condition of the two lungs that there is no reason for their furnishing different sounds.

Dr. Staceys thinks that in many persons there is a difference and that the greater distinctness of this sound occurs in the left lung, when heard
Over those portions of the chest be
fore designated, viz those with
which the lungs are in contact.
These organs may be regarded as
performing their healthy functions.
Alterations of the respiratory
murmur. These may be considered
under the heads of Intensity Rhy-
tmic, Character and alterations by
adventitious or abnormal sounds.
Sucrose Respiration. This is so
called from the fact that in
children the respiration is much
faster than in adults.
The cause of this is not precisely
known but may be referred to the
activity of the organs in early life.
It consists in a more intense
ventricular murmur than natural,
and when occurring it announces a lesion not generally in the part over which it is heard, but in a corresponding part of the lung on the opposite side. The healthy parts making up for those affected, its seat is variable. It depends upon obstructions in air from various causes, we find it as a constant of Pneumonia, Pleurisy, foreign bodies in the bronchus, sometimes to tumours in the thorax, to the diminution of tubercles, and in all diseases which entail the healthy proportions of the organs of respiration.

Simple respiration. This in opposition to peculiar respiration is characterized by a diminution in the intensity of the normal respiratory flux.
It may be owing either to the sound being transmitted with less distinctness to the ear or to being less clearly produced, in the first case, the cause may be the presence of an intrathoracic tumour separating the lung from the walls of the chest by pleuritic effusions, thick false membranes; in the second case to obstructions by mucus, a foreign body or to pain, compression or contraction of the principal bronchi, size variable. The diseases in which it is most commonly observed are Phthisis, Emphysema, and Pneumonia, with effusion. If upon percussion there be dullness and this confined to the summit of the lung.
with pleural respiration in the opposite side, tubercels are almost certainly present. If feebl respiration coincides with increased reson one of the thorax i.e., may diagno ticate Pulmonary Emphysema. If the dullness exists and is circm seriled at the lower portion there is most probably, pleuretic effusion Absent respiration, Complete obstr uction to the entrance of air or the interposition of matter solid or fluid may give rise to absent respiration. The air may be prevented from ent ering the air cells by the occlusion of a large bronchus by tenacious secretions, in this case the sound on percussion is good, in inflamm ation of the lungs the air enters
the bronchus freely but the cells being incapable of admitting any
air being filled, with matter
solid or fluid the sound on
percussion here will be dull.
The lungs may be removed from
the walls of the chest by solid,
fluid or gaseous matter's destroying
the respiratory murmur and in this
case the application of percussion
will instantly reveal the nature of
the matter, the sound elicited being
dull if fluid or solid matters are
present, on the contrary Morbidly
clear if gaseous matters are interpo-
led. The diseases in which it occurs
the same as fell respiration, it in-
dicates more decided anatomical
lesions.
Alterations of Rhythm, slow respiration. This depends upon the nature of the disease of the respiratory or muscular system, occurring in disease of the cervical or dorsal region of the spinal cord, frequent respiration occurring in inflammation of the lung or abdominal viscera.

Respiration in frequent in proportion as the extent of the respiration movements is diminished.

Increased activity of the circulation will give rise also to frequent respiration.

Crying respiration, dependent on pain and the presence of pleuritic adhesions.

The prolonged respiration, as there are different opinions as to the physical cause of prolonged expiration.
I shall only observe that it is considered as a symptom of any two diseases Pulmonary Emphysema and Tuberculosis in the first stage of their development, heard generally at the summit of the lungs. Forbes states that he has occasionally heard prolonged expiration apparently as a natural condition.

Alterations of Characters.

Harsh Respiration is heard in Emphysema in cipient Phthisis and all cases where there is induration of the pulmonary substance and drying of the mucous membrane of the bronchial tubes. In Phthisis its seat is at the summit of the lungs in other cases it is variable.
Bronchial respiration, in the state of health bronchial respiration is not audible except perhaps over the course of the large bronchial branches being rendered imperceptible by the bad conducting powers of the texture of the lungs and masked by its intermixture with the more general sound caused by the entrance of air into the pulmonary cells, when the normal vesicular murmur is destroyed by the consequence of inflammation it is replaced by the bronchial or bubal blowing sound whatever causes condensation of the pulmonary substance as Pneumonia, Pneumonia, Pneumonia, with effusions, Pulmonary ophlezy.
If slight and confined to the summit of the chest most commonly it depends upon the presence of cicatricial blebs or supervening upon a chronic affection. If the attack is more acute, one must suspect the presence within of Pleurisy or Pneumonia complicating Respiration Cavernous truffle or blowing sound. This is produced by the entrance of air into a cavity formed either by the softening and expectoration of tubercles, by cancer or abscess, it generally occurs at the summit of the lung and from the comparative infrequency of the two latter-mentioned causes it may be considered as diagnostic of the first. It is sometimes difficult to distinguish from bronchial or
tracheal inspiration and in such cases, the diagnosis must be formed from other circumstances such as the character of the voice, grunting, and the results of percussion: amphoric inspiration produced by the passage of air into a large cavity by a moderately wide opening and above the level of any liquid contained in the cavity, may be imitated by blowing into a large empty pitcher. It is of a resonant metallic character and, when well marked almost certainly indicates Pneumothorax with pulmonary fistula, when not distinctly defined it is a symptom of a large cavity which is almost always tuberculous. Alteration by abnormal sounds,
Friction sounds, those sounds are only heard in certain pathological conditions of the pleura, the reflections of which in a state of health glides smoothly and quietly over each other. The condition necessary to produce them are asperities in or both of those reflections, which gliding over each other give the sensation which may be perceived by the hand applied or even sometimes by the patient, it is analogous to the sound produced by the rumpling of parchment, and presents variations in intensity, which have suggested its division into the soft, graying, and the rough grating or scraping friction sounds. The former,
probably dependent on slight asp-
erities, which rub against each
other in the elevation and depressi-
on of the rills, occurring in Pleuro-
in the forming stage, or tubercles
of the chest. The latter dependent
on thick false membranes without
adhesions in pleurisy at the period
of plastic exudation or absorption.
Friiction sounds are heard in
Emphysema and also in Pleurc
Pneumonia towards the decline.
It is almost always heard in ins-
piration at least with most dis-
tinctness in that movement.
Rales, Phrenic, or Rattles.
Besides the simple sounds of res-
piration there are others generated
by the mixture of air and a liquid,