

The First Stethoscope

A TREATISE ON THE DISEASES OF THE CHEST, in which they are described according to their Anatomical Characters, and their Diagnosis established on a new principle by means of Acoustick Instruments. Translated from the French of R. T. H. Laennec, M. D., with a preface and notes by John Forbes, M. D., Philadelphia, 1823.

However dangerous diseases of the chest may be, they are, nevertheless, more frequently curable than any other severe internal affection. For this reason medical men, in all ages, have been desirous of obtaining a correct diagnosis of them. Hitherto, however, their efforts have been attended by little success,—a circumstance which must necessarily result from their having confined their attention to the observation and study of the deranged functions only. From the continued operation of the same cause, we must even now confess, with Baglivi, that the diagnosis of the diseases of this cavity is more obscure than that of those of any other internal organ. . . . Nay, I will go so far as to assert, and without fear of contradiction from those who have been long accustomed to morbid dissections,—that before the discovery of Avenbrugger, one half of the acute cases of peripneumony and pleurisy, and almost all the chronic pleurisies, were mistaken by practitioners; and that, in such instances as the superior tact of a physician enabled him to suspect the true nature of the disease, his conviction was

The Stethoscope

—A Classic of Science

Medicine

Laennec's stethoscope was the first instrument ever placed in the hands of a physician to help him diagnose disease in the chest cavity. His account of it was written in 1819. Our Classic is from the first translation of that book into English. Forbes took many liberties with the original arrangement in making his translation, and apologized for a few of them. "As it is, however," he added, "I still think the present arrangement very superior to the original."

rarely sufficiently strong to prompt and justify the application of very powerful remedies. The percussion of the chest, according to the method of Avenbrugger, is one of the most valuable discoveries ever made in medicine. By means of it, several diseases, which had hitherto been cognisable by general and equivocal signs only, are brought within the immediate sphere of our perceptions, and their diagnosis, consequently, rendered both easy and certain.

Where It Fails

We must still admit, however, that the method of percussion is far from being complete, or generally available. It frequently affords no indication in phthisis; and in no case does it enable us to distinguish this disease from chronic peripneumony. Even in peripneumony it fails us in a great measure when the inflammation is confined to the centre of the lung, or when both lungs are equally affected, and only in a slight degree. It does not enable us to distinguish the disease just mentioned from pleurisy, hydro-thorax, or any other effusion into the cavity of the chest. It completely fails us, or rather certainly misleads us, in the disease called *Pneumo-Thorax*. It gives no indication of the diseases of the heart until this organ is greatly enlarged; and it is often before this takes place that the disease proves fatal. It affords no assistance in aneurisms of the aorta and large vessels, until the nature of the disease is appreciable by the sight, or by the touch. In many other respects, also, the indications afforded by percussion are rendered

The translation was inspired by genuine interest for the new method, which Forbes hoped to see widely used, though he felt that it was "opposed to all our habits and associations." "It must be confessed," he said, "that there is something even ludicrous in the picture of a grave physician formally listening through a long tube applied to the patient's thorax, as if the disease within were a living being that could communicate its condition to the sense without."

equivocal by peculiarities of formation, by the niceties required in its performance, and by the circumstances under which it is performed. It is more particularly in diseases of the heart that we regret the insufficiency of this method, and wish for something more precise. The general symptoms of disease in this organ greatly resemble those produced by many nervous complaints, and by the diseases of other organs. The results afforded by the application of the hand to the part, with the view of judging from the tactual sensations communicated, have been found of some use, in doubtful cases; but, as a general method, this is by far too vague and uncertain to be of much benefit.

In these cases some physicians have attempted to gain further information by the application of the ear to the precordial region; and, doubtless, such a proceeding will increase the certainty of the diagnosis. Even this, however, is very insufficient; and there are, besides, many reasons why it cannot be followed, as a general guide, in practice. Nevertheless, I had been in the habit of using this method for a long time, in obscure cases, and where it was practicable; and it was the employment of it which led me to the discovery of one much better.

The Invention

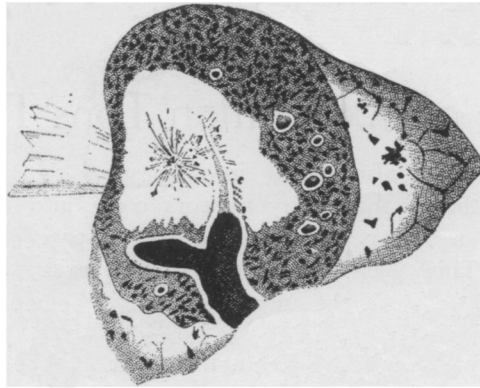
In 1816, I was consulted by a young woman labouring under general symptoms of diseased heart, and in whose case percussion and the application of the hand were of little avail on account of the degree of fat-

ness. The other method just mentioned being rendered inadmissible by the age and sex of the patient, I happened to recollect a simple and well-known fact in acoustics, and fancied, at the same time, that it might be turned to some use on the present occasion. The fact I allude to is the augmented impression of sound when conveyed through certain solid bodies,—as when we hear the scratch of a pin at one end of a piece of wood, on applying our ear to the other. Immediately, on this suggestion, I rolled a quire of paper into a sort of cylinder and applied one end of it to the region of the heart and the other to my ear, and was not a little surprised and pleased, to find that I could thereby perceive the action of the heart in a manner much more clear and distinct than I had ever been able to do by the immediate application of the ear. From this moment I imagined that the circumstance might furnish means for enabling us to ascertain the character, not only of the action of the heart, but of every species of sound produced by the motion of all the thoracic viscera. With this conviction, I forthwith commenced at the Hospital Necker a series of observations, which has been continued to the present time. The result has been, that I have been enabled to discover a set of new signs of diseases of the chest for the most part certain, simple, and prominent, and calculated, perhaps, to render the diagnosis of the diseases of the lungs, heart and pleura, as decided and circumstantial, as the indications furnished to the surgeon by the introduction of the finger or sound, in the complaints wherein these are used.

In prosecuting my enquiries I made trial of instruments of various composition and construction. The general result has been that bodies of a moderate density, such as paper, wood, or Indian cane, are best suited for the conveyance of the sound, and consequently for my purpose. This result is perhaps contrary to a law of physics;—it has, nevertheless, appeared to me one which is invariable.

The Stethoscope

I shall now describe the instrument which I use at present, and which has appeared to me preferable to all others. It consists simply of a cylinder of wood, perforated in its centre longitudinally, by a bore three lines in diameter, and formed so as to come apart in the middle, for the benefit of being more easily carried. One extremity of the cylinder is hol-



Upper lobe of a tuberculous lung, from the Forbes translation of Laennec's Treatise.

lowed out into the form of a funnel to the depth of an inch and half, which cavity can be obliterated at pleasure by a piece of wood so constructed as to fit it exactly, with the exception of the central bore which is continued through it, so as to render the instrument in all cases, a pervious tube. The complete instrument,—that is, with the funnel-shaped plug infixed,—is used in exploring the signs obtained through the medium of the voice and the action of the heart; the other modification, or

CHEST TAPPING DIAGNOSIS

Discovered by a Brewer's Boy

This method, recommended by Avenbrugger, under the name of percussion, consists in striking the chest with the ends of the fingers united; in which case, if the lungs are sound, full of air, and if no foreign body, either solid or fluid, occupy the interior of the thoracic cavity, the sound produced by the percussion has been compared (an exaggerated comparison) to that proceeding from an empty barrel when struck. Where, on the contrary, a solid or fluid body fills one of the cavities of the thorax, or both, the parietes give, to the extent so occupied, a sound which has been characterized by the term (*mat*) dull, and which is said to resemble that excited by striking the thigh in the same manner, or with the flat of the hand. The sound produced by percussion in some diseases of the heart, is but little less than in a natural state, and is then the index of a less decidedly morbid state of the viscera within. The knowledge of the degree of sound which denotes the perfect healthy state of all the organs of the chest can only be acquired by practice; and it is that alone also which enables one, in some sort, to judge of the solidity of the body which prevents the chest from sounding at all; but in forming a judgment, every allowance must be made for the natural thickness of the integuments, and for the very frequent anasarous state of those parts, which have, in many cases, led to the belief that the chest sounded badly, when it was entirely owing to these circumstances.—

Corvisart, 1808, translated by Forbes.

with the stopper removed, is for examining the sounds communicated by respiration. This instrument I commonly designate simply the *Cylinder*, sometimes the *Stethoscope*.

In speaking of the different modes of exploration I shall notice the particular positions of the patient, and also of the physician, most favourable to correct observation. At present I shall only observe that, on all occasions, the cylinder should be held in the manner of a pen, and that the hand of the observer should be placed very close to the body of the patient to insure the correct application of the instrument.

Using the Instrument

The end of the instrument which is applied to the patient,—that, namely, which contains the stopper or plug,—ought to be slightly concave to insure its greater stability in application; and when there is much emaciation, it is sometimes necessary to insert between the ribs a piece of lint or cotton, or a leaf of paper on which the instrument is to be placed, as, otherwise, the results might be affected by the imperfect application of the cylinder. The same precaution is necessary in the examination of the circulation in cases where the sternum, at its lower extremity, is drawn backwards, as frequently happens with shoemakers, and some other artisans.

Some of the indications afforded by the stethoscope, or *mediate auscultation*, are very easily acquired, so that it is sufficient to have heard them once to recognize them ever after: such are those which denote ulcers in the lungs, hypertrophia of the heart when existing in a great degree, fistulous communication between the bronchia and cavity of the pleura, etc. There are others, however, which require much study and practice for their effectual acquisition.

The employment of this new method must not make us forget that of Avenbrugger; on the contrary, the latter acquires quite a fresh degree of value through the simultaneous employment of the former, and becomes applicable in many cases, wherein its solitary employment is either useless or hurtful. It is by this combination of the two methods that we obtain certain indications of emphysema of the lungs, pneumothorax, and of (Turn to page 205)

Fishing Increases on Canada Prairies

Economics

THE Canadian prairies raise other crops than those of grain. Recent Canadian government statistics show that more than \$4,000,000 was paid last year for fish caught on the prairies.

This new industry has arisen in the three central provinces of Canada, which because of their wheat growing facility have been called the granary of the British Empire. Commercial fishing is an established industry, reaching north as far as Lake Athabasca. On the shore of this lake, nearly 1,000 miles distant from Winnipeg and some 1,700 miles from Chicago, are factories where whitefish and trout are caught in large numbers to be frozen, packed in special wrappers, boxed and shipped by refrigerator barges down the Athabasca River to Waterways, the end of steel, 200 miles distant to the south.

There are innumerable lakes in the prairie provinces. Each year during the past few years has seen more and more boats of all sorts going northward to the unfished lakes of the region. Fishermen are stationed at these lakes far from the railways, and are out daily during the summer season, pulling in their nets, and bringing their catch to their station, where a boat comes every day from the central station of the fishery company to call for the load. By easy stages the fish is brought to the railways, carried that far by water craft.

Big Winter Season

In the winter the fishing still goes on. A large portion of the annual fishing sales consists of winter caught fish. Through holes in the ice the fishermen work their nets, and daily they go out to haul in the fish which have thus been captured under the thick ice. Horse drawn sleighs call once a month during the winter months, making their way over the ice, from lake to lake. The sleighs are loaded with boxes of frozen fish, which are dressed on the ice, and packed in weather that is usually thirty below zero and often down to fifty below. By sleigh the fish are taken to the railway.

Commercial fisheries are of the opinion that the fish business of the Canadian prairies is still in its infancy. They see a great future for the business with the coming of better transportation facilities. Rail-

ways are now being built farther north in the prairie provinces, and they will tap the fish districts, aiding a growing industry which brings whitefish, tullibee, pickerel, grayling, trout and sturgeon to the tables of the prairies and the mid-western states of the United States.

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Stethoscope (*Continued*)

the existence of liquid extravasations in the cavity of the pleura. The same remark may be extended to some other means, of more partial application, such, for example, as the *Hippocratic succussion*, the *mensuration* of the thorax and *immediate auscultation*; all of which methods, often useless in themselves, become of great value when combined with the results procured through the medium of the stethoscope.

In conclusion, I would beg to observe, that it is only in an hospital that we can acquire completely and certainly, the practice and habit of this new art of observation; inasmuch as it is necessary to have occasionally verified, by means of examination after death, the diagnostics established by means of the cylinder, in order that we may acquire confidence in the instrument and in our own observation, and that we may be convinced, by ocular demonstration, of the correctness of the indications obtained. It will be sufficient, however, to study any one disease in two or three subjects, to enable us to recognize it with certainty; and the diseases of the lungs and heart are so common, that a very brief attendance on an hospital will put it in the power of any one to obtain all the knowledge necessary for his guidance in this important class of affections.

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Old Forest Protection

THE "modern" doctrine of the conservation of natural resources is no new thing under the sun in Switzerland. Ever since the middle ages the various cantons of this mountain republic have been taking care of forests, and of the birds and beasts that harbor therein.

In 1335 the Council of Zürich issued a law for the protection of birds, establishing fines for delinquents. In 1339 the legislative assembly of Schwyz regulated the exploiting of their forests and in 1424

caused all the oak forests or groves in the canton to be protected, fining all transgressors.

In 1511 Unterwalden issued several laws regarding the protection of their woodlands and also protected their game. In 1515 the cantonal conifer forests were placed under special protection.

In 1569 the legislative assembly of Glarus protected the forests in certain districts, and in 1612 an assembly of the league of the Grisons held at Davos issued laws to protect game in the Engadine, notably chamoix and ibex.

Efforts to protect forests and bird life have never ceased in Switzerland, so that the creation of the Swiss National Park in the southeastern corner of the Lower Engadine, was merely the natural and logical development of an idea as old as the nation itself.

This park has an area of about 58 square miles, and consists of several deep valleys, walled in by precipitous mountains that reach altitudes of about 9,000 feet. The natural boundaries are of such a character that wild life in the park is practically debarred from migrating.

Forestry

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