OBSERVATIONS
ON THE
ANATOMY OF THE LUNGS.

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MANY others must have felt as I do, that it requires some nerve to make a demand upon the time and attention of such a Society as this ; they must have been conscious, as I am, that however interesting or apparently important the intended communication may have been in their own estimation, it may, nevertheless, be deemed by the Society at large, altogether unworthy the character and experience of the majority of its members. On the present occasion, I hardly know whether such apprehensions ought to be diminished or enhanced by the brevity and incompleteness of this communication : its brevity and incompleteness being almost a necessary consequence of its subject, forming a mere part or portion of the results of a much more extended inquiry into the healthy and morbid anatomy of the

lungs,—an inquiry by far too extensive, and of too much practical importance, to be quickly accomplished, or hastily presented to the notice of the profession.

In the presence of any body of professional men in any part of the world, but especially in our own country, it would be in exceedingly bad taste to insist upon the importance of all and every thing appertaining to either the healthy or morbid anatomy of the lungs ; nor would it be less superfluous to add any thing to what has been so repeatedly urged in proof of the necessity of acquiring an intimate knowledge of the former, in order clearly to understand and satisfactorily to demonstrate the latter ; it is not, however, by any means so certain that the converse of this familiar proposition has met with its full and legitimate share of attention ; it is by no means so apparent that morbid anatomy has been sufficiently rendered available to explain or demonstrate the function or structure of obscure, intricate, and complicated parts of the body in a state of health. For my own part, if I may be pardoned the egotism, I would venture to express my belief that very much assistance indeed may be derived from this source ; whilst, on the other hand, the increase of knowledge thus acquired respecting healthy anatomy, prepares us for still further advances in the investigation of changes induced by disease.

Proceeding on this principle of rendering healthy and morbid anatomy mutually subservient to the

elucidation of each other, I am not without a hope that I have succeeded in illustrating, if not in demonstrating, certain points of great interest as regards the lungs, some of which have already been pretty generally established, whilst others are familiar as mere matters of opinion, or are perhaps altogether novel. The results of my investigations, for example, seem to prove almost beyond dispute, 1st, that the ariel cellular tissue of the lungs is made up of well-defined, rounded, or oval lobules, united to each other by interlobular cellular membrane, each lobule constituting a sort of distinct lung in miniature, having its own separate artery and vein ; 2ndly, that these lobules do not communicate directly with each other ; 3rdly, that they do not, as Reissessen and others have supposed, consist of the globular extremities of as many bronchial tubes, but, on the contrary, as my friend Dr. Hodgkin has suggested, are made up of a collection of cells, in which, by a common opening, a minute filiform bronchial tube abruptly terminates ; 4thly, that the pulmonary artery accompanies the bronchi, branch for branch, to the minutest divisions of the latter ; 5thly, that pneumonia consists essentially in inflammation of the ariel cells ; 6thly, that pneumonia and inflammatory tubercle are identical ; 7thly, that acute pneumonia in moderately good constitutions scarcely ever leads to the formation of an abscess, unless deposit previously existed ; but that when it occurs in cachectic or broken down constitutions, or supervenes in the process of chronic or organic diseases,

it occasionally causes one or more distinct and separate lobules to soften down into an ill-conditioned abscess ; 8thly, that ordinary tubercles present the same varieties in the lungs, as they do in serous membranes ; 9thly, that emphysema of the lungs consists chiefly of mere dilatation of the cells, but in part also sometimes of more or less extensive laceration of them ; and lastly, that the circumscribed gangrene of Laennec is commonly, if not uniformly, a mere effect or advanced stage of pulmonary apoplexy. It is not, however, to any of these matters that I presume to solicit attention at present, my object, on this occasion, being merely to point out a mode of distribution of the pulmonary vein, which, so far as I know, has not been noticed by any preceding anatomist or pathologist, and which, on that account, I have thought would prove not unacceptable to the members of this Society.

The uncertainty and discrepancy which at present prevail respecting the origin and course of the pulmonary vein, may be gathered from the descriptions given of it in the works of some of the most distinguished modern authorities ; the quotations of a few of which may not perhaps be altogether superfluous or misplaced here.

Cloquet, in his large work, *Anatomie de l'homme*, sec. 509, observes, “ Les dernières ramifications de l'artère pulmonaire donnent naissance aux radicules des veines du même nom. Ces veines, qui augmentent successivement de volume, *marchent à côté et au-dessous des artères correspondantes*,” &c. &c.

Meckel, in his *Manuel d'Anatomie* translated and amended by Jourdan and Breschet, tom. iii. p. 518, in speaking of the lungs, says, “ Dans l'intérieur de l'organe, les veines pulmonaires accompagnent les ramifications bronchiques de plus près que les artères.” Adelon, again, in his *Physiologie de l'homme*, seconde edition, tom. iii. p. 147, on the subject of the pulmonary veins, observes, “ Ces veines commencent par des radicules qui sont aussi inapercevables, et par conséquent aussi peu connus que les dernières ramifications des bronches et de l'artère pulmonaire : *disséminés dans le parenchyme du poulmon*, peut-être continus aux ramifications de l'artère pulmonaire. *Situés probablement aux mêmes lieux où aboutissent ces ramifications et celles des bronches*, et où se fait la respiration,” &c. &c. Ollivier, in the article Poumon, of the *Dictionnaire de Médecine*, observes, “ Que les troncs des artères et des veines pulmonaires pénètrent dans le poulmon et en sortent par le même point, *et que les ramifications des veines pulmonaires sont plus voisines des canaux bronchiques que celles des artères pulmonaires.*” Bichat,* on the same subject, speaks thus ; “ Les veines pulmonaires nées du système capillaire de ces organes, *suivent une direction analogue à celle des divisions artérielles. Voisines, dès leur origine, des ramuscules aériens, elles n'abandonnent jamais ces conduits dans leur trajet. Elles se réunissent successivement en rameaux plus volumineux que l'on trouve*

* Anatomie Descriptive, tom. iv. p. 65.

toujours appliqués sur des rameaux bronchiques d'un volume proportionné. Ordinairement la veine est inferieure à la bronche, tandis que l'artère lui est superieure ; c'est du moins ce que l'on trouve tant que l'œil peut suivre ces vaisseaux."

In none of the accounts given by these high authorities do I discover the slightest allusion to the mode of distribution of this important vessel, which my own dissections appear so clearly and unequivocally to demonstrate ; but, on the contrary, find them to be totally at variance with it.

In order to accomplish this demonstration, the pulmonary artery was injected with size, coloured red, whilst the vein was injected with the same material, coloured yellow : the lung was then laid aside and kept moistened in a cool place for several days, with the view of softening, by approaching decomposition, the connecting cellular membrane distributed throughout the lungs. In this way the common cellular membrane beneath the pleura became so lacerable that the pleura itself was stripped off without much difficulty, and without inflicting any breach whatever in the aërial cellular structure of the lung, which it had covered. The lung thus divested of its pleura, presents to the eye, more or less distinctly, lines on its surface, which indicate the situation of what may be called the *pulmonary fissures*—a term more correctly applicable than that of interlobular, inasmuch as by the term interlobular is usually understood a something situated between either the longer lobes or smaller lobules ; whereas

by the term *pulmonary fissures*, is meant certain spaces, occupied by common cellular membrane, and which descend from the surface towards the interior, but without penetrating the aerial cellular tissue of the lung; thereby dividing more or less deeply the surface of the organ into a number of insular portions, some of which may comprise a great number of lobules. Guided by the linear indications on the surface of the now naked lung, we can in general, with the aid of a pair of points let into handles, or a pair of fine scissors, and without much difficulty, succeed in laying open and exposing the pulmonary fissures, at the bottom of which, merely surrounded by a loose cellular membrane, and resting on the unbroken aerial pulmonary tissue, we discover a vessel; that vessel is the pulmonary vein, alone, and unaccompanied by any artery whatever. This vessel may be distinctly traced from larger to smaller trunks towards its source, until we reach the common cellular membrane between the ultimate lobules, from the exterior of which the vein appears to originate; whilst on the other hand, by continuing the mechanical operation towards the root of the lungs, we, with almost equal facility, trace the vessel, still lying at the bottom of the pulmonary fissures, and becoming gradually larger and larger by the addition of branches, which proceed into the pulmonary fissure, and are derived either from the neighbouring smaller pulmonary fissures, or from the uniting cellular membrane between the ultimate lobules themselves, until at length it joins

the large trunks at the root of the lungs, to form the great pulmonary veins. A small artery is not unfrequently observed running across the pulmonary fissures, from a portion of lung on one side to a portion of lung on the other ; and in one instance I have found an exceedingly narrow strip of healthy lung passing like a bridge across the fissure, on the very surface of the lung.

Thus, then, the human lung may be said to be made up essentially of a vast expanse of membrane, the interior of which, during the whole of extra-uterine life, is unceasingly exposed to the influence of atmospheric air, and upon the surface or in the substance of which are spread out the capillary ramifications of the pulmonary artery ; these arterial capillaries passing from thence to the exterior of the membrane, to form the pulmonary vein, which throughout its whole course is found to be situated on the exterior of the aerial cellular structure of the organs.

It is unwise to be too sanguine, yet I cannot help indulging a hope, that with a knowledge of this striking and distinct distribution of the pulmonary vein, we shall be more successful in our investigations into some of the most interesting and important diseases of the lungs ; that it will be the means of throwing additional light on the origin and progress of that fatal scourge, phthisis pulmonalis ; and that it will enable us, almost without a doubt or difficulty, to set at rest the long-agitated questions respecting the origin and seat of pulmonary apoplexy, and more

especially of what has been called *œdema pulmonum*, or dropsy of the lungs. In these investigations I am at present engaged, and may take the liberty of adding, that for the future I hope to have the co-operation of my friend and colleague Mr. Hilton, demonstrator of morbid anatomy at Guy's Hospital, to whom I am already much indebted, and from whose extensive acquirements both as an anatomist and pathologist, I anticipate much assistance and instruction.