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/ by Sir George Duncan Gibb.**

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VOCAL AND OTHER INFLUENCES

UPON MANKIND,

FROM

PENDENCY OF THE EPIGLOTTIS.



BY

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V.—*Vocal and other Influences upon Mankind, of Pendency of the Epiglottis.* By SIR GEORGE DUNCAN GIBB, Bart., M.A., M.D., LL.D., F.G.S., V.-P.A.S.L., Member of the Royal College of Physicians, Assistant-Physician and Lecturer on Forensic Medicine, Westminster Hospital, etc.

1. IN a continued series of experimental inquiries with the laryngoscope, which I have carried on during the last six years, in healthy persons of both sexes, different ages, and varying position in life, some important discoveries were made relating to the position of that remarkable cartilage known as the *epiglottis*. From time to time I have drawn the attention of scientific men to this subject, both in my writings and before societies, but more particularly before the British Association for the Advancement of Science at the Cambridge Meeting in 1862 and at that at Newcastle in 1863, when the normal position of the epiglottis, as described by all anatomists and physiologists before my time, was especially considered.

Up to the period of the Newcastle Meeting in 1863 I had examined 680 healthy persons, and the phenomena observed in them relatively to the position, form, and appearance of the epiglottis formed the subject of my paper. Four years had elapsed since then, and again I ventured to bring the subject before the British Association at its late meeting at Dundee, with an increased experience, founded on an examination of 4600 healthy persons up to the month of September 1867. No excuse is needed for submitting my paper to the consideration of the Fellows of the Anthropological Society, as the subject is one that bears upon mankind in general, and the European races in particular. As my observations will have reference chiefly, indeed almost entirely, to the *position* occupied by the epiglottis, whether vertical and perpendicular or pendent in an oblique or horizontal direction, and the influence which the latter exerts upon mankind at large, I shall endeavour to explain briefly the relative situation of the parts around the

epiglottis, so that every one who is not acquainted with the anatomy of this part of the body, may understand what is meant by pendency of the epiglottis.

2. At the root of the tongue, behind its base, is seen a triangular or oval-shaped cartilage, compared to a cordate leaf, with its edges curved or curled forwards, standing in *an erect or perpendicular position*. It is of a pale yellow or buff colour, not unlike the crust of a loaf of bread, and it plays a most important part in relation to the act of swallowing; from its situation it lies above and in front of the upper part of the larynx, a cartilaginous box existing on the top of the windpipe and readily felt in the neck. As the epiglottis is extremely flexible and elastic it is depressed in the act of swallowing, covers the larynx, allows the food to pass over it, and rapidly elevates itself into its erect position; by this means neither food nor any other substance can gain entrance to the windpipe. During the act of swallowing the tongue is drawn backwards and the larynx raised forwards, the glottis immediately closes, with its regulators, the epiglottis becomes pendent or depressed, and the contents of the mouth pass over it into the pharynx, or pouch at the back of the throat, leading to the gullet or œsophagus. The epiglottis is attached by means of a pedicle to the inside of the *Pomum Adami*, or Adam's apple, felt in the neck, and is likewise attached to the base of the tongue, the os hyoides or tongue bone, and the larynx, by means of folds of mucous membrane, receiving various names from the parts they serve to connect. Only one half of the cartilage is free, and for convenience I would compare it to a little tongue situated behind the larger tongue, but pointing upwards instead of forwards.

As described, it will be understood that the epiglottis should be quite erect or vertical, which moreover allows the top of the windpipe to be freely open for the purposes of comfortable breathing. All the older anatomists were correct in describing the cartilage as vertical, and I am quite willing to admit that that is its natural and proper position.

3. Having said thus much we are now prepared to understand what is meant by *pendency of the cartilage*, and I will explain what that is, how it was discovered, and the influence it exerts

upon all classes of mankind. At the commencement of my investigations I was struck very forcibly by the circumstance of finding in a great many healthy people, that the cartilage, instead of being erect as just described, was pendent, had fallen downwards and backwards over the top of the glottis, or wind-pipe, like a drooping leaf. In many, again, there was a disposition to it, but such cases have not been included in my statistics. The pendency was more or less complete, and when it was so nature compensated for this by allowing the cartilage to have a dome or arched shape to allow of the entrance of air with freedom. In a good many this shape was not seen, but the cartilage lay quite flat and sloping backwards. (The various forms presented by the pendent condition were illustrated by diagrams, and a comparison made between them and the erect or vertical position, formed a contrast that could not be misunderstood.)*

4. The examination was made, as stated before, in persons of apparently good health, of both sexes and at all ages, from the infant in arms to that of extreme old age, verging upon one hundred years; children, young people, persons in the prime of life, elderly and very old persons, were all alike submitted to examination. The social relationship extended to entire families, from the grandparent to the grandchildren, and even to the great grandchildren. In this way only could I obtain valuable information regarding the congenital or hereditary character of pendency of the epiglottis. In some instances parents and their children possessed it, and it seemed an hereditary peculiarity; in others, again, it was acquired; thus three or four children would have an erect epiglottis and a fifth a pendent one; in some instances one or two children would be born with it, whilst their brothers and sisters had it not, nor did the parents possess it. In some persons again it was acquired by residence and exposure in hot climates; it is not necessarily a concomitant of the aged, and I believe, as a

* The descriptive portion of this paper has been rendered in ordinary language, devoid of technicality as much as possible, so as to be readily understood by non-professional readers.

rule, that most old people do not possess it, in Europe at least, and old age *ceteris paribus* is more within the reach of those whose epiglottis is vertical or erect; than in those again in whom it is pendent.

5. The great majority of those I examined were natives of Great Britain and Ireland; but the number included residents of other European nations, whilst a certain proportion of the African race, and an equal number of the Asiatic, chiefly Chinese, are separately given. Enough, however, was determined to permit of my forming some general conclusions in regard to all classes of people amongst the various races of mankind, in hot, temperate and cold climates, in all parts of the universe.

6. To come now to my statistics. As time and opportunity would permit, parties of individuals, varying from three or four to fifty, were examined by introducing the laryngoscope, a small mirror previously warmed, into the back of the mouth. Many of these inspections were made at my own house, or at the houses of friends; a good many at Westminster Hospital, and some at other public institutions, such as, amongst others, the Home for Asiatics at Poplar and the Seaman's Hospital Ship "Dreadnought." The results were always noted at the time, and the general health of all was good; at Westminster the persons were healthy so far as the throat was concerned. On calculating the general result, it yielded the large number of 4600 individuals, extending over a period of between six and seven years. This is exclusive of 280 natives of Asia and Africa.

7. The number of the pendencies of the epiglottis was found to be 513 in the 4600 persons, which is equivalent to eleven per cent. and a fraction. This means that eleven out of every hundred healthy persons possess a pendent epiglottis; reckoning my hearers at 200 at the late meeting of the British Association at Dundee, eleven per cent. gave twenty-two persons who were present when I read my paper whose epiglottis was pendent. Curiously enough this per centage agrees with that brought before the Association at Newcastle in 1863, and I believe it holds good in the natives of Europe and of cold countries. It is increased in hot climates, as great heat would seem to exert a more perniciously relaxing effect on the cartilage than extreme moisture or varying degrees of cold.

8. Applying the calculation of this per centage to the population of Great Britain, which, by the last census, was determined to be 28,887,519, eleven per cent. gives the number of 3,177,627 persons who have not a vertical or erect epiglottis. Or, if the population of Europe be taken, which is estimated at 272,000,000, eleven per cent. gives the number of pendencies as 24,727,273. I think I am safe in saying that other European nations would resemble our own in the comparative frequency of pendency. But if the test is applied to the natives of Asia and Africa, the results are startling.

9. I have submitted some 280 natives of India and China and various parts of Africa, with the adjacent islands, to examination, and what does the reader suppose was discovered? It was this:—every single person, of both sexes—I may say without any real exception—had the epiglottis pendent. This startled me at first; but to test the matter fairly, through the kindness of my friend Mr. F. M. Corner, surgeon to the Institution, I was permitted to examine all the inmates of the Home for Asiatics at Poplar, as late as the 25th of July last, and without any single exception, the epiglottis was found completely pendent in all. There were several fine, young, and lively negroes from the River Congo in Africa, in whom we might have expected to find the cartilage in a vertical position. But no; it was completely pendent. Finding, therefore, that in the 280 natives of hot climates, such as exist in Asia and Africa, the epiglottis was pendent in all, or nearly all, we are driven to the conclusion that it must be a common peculiarity to the races of those great continents. There is this to be said, however, regarding these pendencies: the examination was made exclusively in this country, and it is just possible that the cartilage may have become pendent in a tolerable number on their change from a hot climate to our more temperate one. Nevertheless, I am not disposed to attach too much importance to this, because I have been satisfied on several occasions of the fact, that Europeans acquire pendency by a lengthened stay in hot climates. The estimated population of Asia is 750,000,000, and of Africa, 200,000,000; whilst Oceana is set down at 2,000,000. All these together amount to 1,150,000,000

of persons, of whom it would be rash in the highest degree to say more than that a large proportion, much greater, indeed, than amongst Europeans, possess pendency of the cartilage. Can it be wondered at that we should find a number of circumstances result from a condition which impedes free breathing and renders a proneness to disease in some shape ?

10. The influence of pendency of the epiglottis upon all classes of mankind, but especially on Europeans, may be described as follows :—

It will be remembered that the great aperture or entrance-door of the windpipe is closed three-fourths—I might say seven-eighths ; therefore, the air for the purposes of breathing has to enter by means of a narrow opening, which, however, after being respired, passes out again with greater facility than it entered. The first effect of this condition is a modification or alteration of the natural voice ; the voice, as a rule, has a tendency towards a bass tone in adult males, for the pendent epiglottis acts the part of the lid of an organ pipe. The singing voice is materially altered ; and in the female sex the higher notes cannot be produced at all in some persons, whilst in others the vocal power and compass are weakened, and pendency is inimical to anything like prolonged singing. I have never known a single instance of one of the great female singers of the day—and I have had several of them under my care from time to time—to possess a pendent epiglottis ; there may have been a disposition to a little pendency from relaxation, the result of cold or an over exertion of the singing voice, but that condition was always temporary. In singing the higher notes, as witnessed in the contralto and soprano voices, the opening into the larynx or top of the windpipe must be perfectly free and the epiglottis quite erect, so that the direction of the sound shall be towards the roof of the mouth, entirely in front of the soft palate. In pendency of the epiglottis, on the other hand, the voice strikes the back of the throat *behind*, instead of in front, of the soft palate. In some persons, the pendency is so complete, that a mere semicircular chink exists for the air to enter, and the inconvenience in singing is greater. Yet that very circumstance gives to a few of the male sex a

voice for declamatory reading which is remarkably powerful and beautiful; nevertheless, such persons are liable at all times to colds, from the necessarily impaired power of breathing. Young girls with this condition can never expect to become singers of any importance unless it is remedied; and in them, and in boys too, but especially in girls, the voice, in speaking, is not clear and silvery as it ought to be. In young people the tonsils are often enlarged when the epiglottis is pendent, for the natural circulation is not free and easy through the blood vessels of the throat.

11. Although the general health is apparently good, in a certain number of persons there is a disposition to sluggishness of body and general languor, the result of impeded respiration. In certain states of the atmosphere this renders them liable to attacks of disease to which they may be constitutionally predisposed.

12. During the prevalence of the ordinary exanthemata, such as scarlet fever, measles, whooping cough, and diphtheria, or of epidemics of throat and chest affections, persons with a pendent epiglottis, particularly children and young people, are more liable to become affected than others whose *windpipe door*, as I may call it, is wide open, and this for the reasons already given.

13. I am not going too far in saying, that in grown-up persons with a pendent epiglottis there is a greater risk towards the contraction of prevailing epidemic diseases than in those otherwise circumstanced; and perhaps it may help to explain why, sometimes, comparatively healthy persons are struck down, while others, seemingly more delicate, escape. For it must be remembered, that when the breathing is not free, the general health indirectly suffers, through deficient arterialisation of the blood, and its effects upon the entire system. A great many grown up persons breathe with discomfort in their beds with a pendent epiglottis; and not a few become asthmatic and subject to chronic bronchitis as they advance in life. I am satisfied that few, very few, or perhaps none, in this country, at least, ever reach extreme old age with a pendent epiglottis.

14. Heretofore no person, with the exception of myself, has dwelt upon the importance of such a peculiarity as that I have

described, or upon its general effects; and I would again remind the reader that there are 3,177,627 persons the subject of it in Great Britain alone. Its great frequency, especially in hot climates, might lead many persons to say, it is a natural condition; indeed, I thought so myself at first, but now feel satisfied that it is not. In conclusion, the reader would naturally ask me, what are the means proposed to remedy pendency of the epiglottis? They are these:—

15. Let him request his medical attendant to examine him with the laryngeal mirror, and if he finds the epiglottis drooping, or in a pendent position, more or less complete, it will be prudent for the reader to note it, have it attended to, and in a large majority of persons, the young especially, it can be rectified and elevated.

On the whole, however, I think it has been shown that the influence of pendency of the epiglottis upon mankind generally is prejudicial and pernicious, and therefore well worthy the attention of philanthropists and anthropologists.

I have elsewhere termed the process of examination, *Epiglottisation*, which possesses a meaning somewhat analogous to *vaccination*.

The first part of the book is devoted to a general history of the United States from the discovery of the continent to the present time. It is divided into three volumes, the first of which contains the history of the discovery and settlement of the continent, the second the history of the colonies, and the third the history of the United States from the Declaration of Independence to the present time.

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