THE LUMLEIAN LECTURES OR THE TONGUE AS AN INDICATION OF DISEASE.

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LECTURE III.

Dryness.

I now come to the consideration of dryness of the tongue and its causes. A glance at the annexed table will suffice to show how largely this depends on constitutional and how little on local circumstances.

Concomitants of Dryness of the Tongue.

	Cases.
Tongue dry, irrespective of other qualities...	113
Pyrexia (temperature 102° or over) ...	37
Temperature not above normal ...	39
Discharge by simple diarrhoea or dysentery ...	6
Discharge, diarrhoeal or other, connected with lardaceous disease ...	2
Diarrhoea in connection with other forms of organic disease—phthisis, cirrhosis, etc....	9
Chyluria ...	1
Discharge by suppuration ...	8
Serous discharge by frequent tapping of pleura ...	1
Diabetes (including 3 of diabetic coma) ...	8
Dry diet... ..	6
Coma or unconsciousness, with general openness of mouth ...	14
Openness of mouth from obstruction of nose, tonsillitis, or other causes unconnected with coma ...	6 (?)
Great prostration or exhaustion ...	51
Cases ending fatally ...	56

The old physicians recognised dryness of the tongue as of evil omen. Hippocrates, who very seldom takes notice of the tongue, refers more than once to dryness of it as a bad sign. The great Willis speaks of the dry tongue in certain cases of fever, and refers it to constitutional causes as expressed in the fanciful language of his time. "The nervous juice," he says, "is thoroughly roasted by a long concoction, and so becomes almost like glue, thick; wherefore, not being able to be dispersed neither by spittle nor by insensible transpiration, nor to be separated by the urinary passages, at length leisurely runs out by the passages of the spittle, and forthwith by reason of its thickness grows into that glueiness." I think most physicians at the present time regard the dry tongue as a constitutional symptom, and as a bad one, notwithstanding that there are some who have sought to refer it rather to local conditions than to the system at large. My cases, collected without special selection, show with the dry tongue, be its origin what it may, a startling mortality—one of almost exactly 50 per cent.; of 113 patients with dry tongues, 56 died.

I will now come to the causes in detail. The immediate causes are two: increased evaporation from the mouth, diminished secretion into it.

1. Increased evaporation may be due to exposure of the mouth by persistent openness: as when the nose is obstructed, and when coma exists; or to increased heat of body, and as a consequence of expired air. Further, there is a double relation between dryness and bareness; dryness has been seen to cause bareness; but must not bareness at least help to cause dryness? Epithelium is conservative of moisture, as may be witnessed in any dissecting-room; wherever the surface of the skin has been rubbed off the deeper part dries and cornifies. Thus, if by chance the upper epithelium of the tongue should be lost, the deeper investments must be more amenable to evaporation and desiccation.

2. Diminished secretion may be either of the salivary or the

mucous glands; but the moisture of the tongue depends more upon the salivary secretion, which is abundant and watery, than upon the mucus, which is scanty and thick.

From the immediate conditions which determine dryness of the tongue I now approach the more complicated morbid circumstances which lie behind them. First, I will take conditions which entail persistent openness of the mouth, and so increased evaporation. Secondly, states of pyrexia, of which the bearing is more complex, but which involve increased evaporation from the tongue by reason of the heat of the expired air, and also general dehydration and consequent diminution of saliva from the generally increased evaporation which the heat of the whole body entails. Thirdly, profuse discharges which consist largely of water, by which the body is dehydrated and the salivary glands in particular stinted of their proper material. Fourthly, conditions of prostration or exhaustion, which states are adequate in themselves to suppress the saliva and dry the tongue, though often they are assisted by other causes, more especially discharges and pyrexia.

Habitual Openness of the Mouth.—Much importance—I think I can show too much—has been attached to this either as occurring during sleep, or from obstruction of the nasal passages, or from coma. If the tongue be persistently and generally dry, I believe that other causes are always at work. I have known the tongue to remain perfectly moist while the nostrils were, and had been for some days, plugged for epistaxis. On the other hand, it is common to find a path of dryness down the centre of the tongue, corresponding to the exposure to breath in tonsillitis and other throat affections. With regard to the chronic enlarged tonsils of childhood, when the child sleeps with the mouth open, I am assured by my colleague Mr. Bennett, who has removed many of these, and always does it early in the morning, that on waking the tongue is usually dry, but afterwards soon becomes moist; certainly such tongues are usually moist when they come under my notice. If the tongue is persistently dry from enlarged tonsils, I think the affection is usually inflammatory, so that causes other than exposure assist. In the earlier part of this inquiry it was my rule to examine into the course of the breath whenever I found the tongue to be dry; but the conviction was forced upon me that the state was generally due to other than mechanical causes, and I ceased to look for this with the attention I had before given to it. My figures are therefore less reliable than the general impression which I record. In the great proportion of cases where the mouth is habitually open, it is either from coma or some illness which interferes with full and alert consciousness; the relaxed jaw and gaping mouth are but signs of ebbing vitality, of which the failure of secretion is also a part. I have sometimes ascertained by catheterisation, what was obvious without, that the tongue in such cases is dry, not because normally abundant saliva has dried upon it, but because the secretion has been wanting. In cases where the tongue is dry and the mouth open, other circumstances generally concur in causing the condition: as in a case of tonsillitis with a temperature of 103°; one of acute rheumatism with a temperature of 101.5°; one of suppression of urine with profuse diarrhoea; and I might add others. But I need not dwell further upon a cause of dryness which, though it has a place, has not an important one; nor does it obscure to any considerable extent the great constitutional significance of the sign in question.

Pyrexia.—To take this next, dryness of the tongue is so frequent with it that the two must be connected; at the same time, the occurrence of the dryness with little or no pyrexia shows that other causes may produce it. As the temperature of the body rises the moisture of the tongue diminishes; on the other hand, it by no means follows that if the tongue be dry the temperature is, or has recently been, raised. Many causes intervene which complicate the relation between heat of body and dryness of tongue. With typhoid or acute rheumatism the tongue is apt to be dry at a temperature under which, with pneumonia, it would probably not be so. Something is due to time; the more chronic disease is the more drying. A temperature of 102° has little effect in drying the tongue. Even much higher temperatures are reached without the tongue becoming dry, though its moisture is lessened. I have noted many instances of acute disease where the plastered tongue has retained enough moisture to forbid its being called dry under temperatures of from 103° to 104°. It would appear that over 104° dryness is general; over 105° nearly constant. The extent to which other causes intervene is shown

by the annexed statement, showing the maximum temperatures in 103 cases of dry tongue.

Temperatures subnormal in ...	...	...	16
" ranging up to normal in...	...	...	19
" " " 100° " ...	...	...	16
" " " 102° " ...	...	...	28
" " " 103° " ...	...	...	15
" " " 104° " ...	...	...	5
" " " 105° " ...	...	...	3
" " over 105° " ...	...	...	1
Total ...	...	...	103

In a third of the number the temperature was not over normal; in half it was not over 100°. There is no variety of dry tongue which gives so high a mean temperature as the moist plastered tongue of acute disease. It is clear, then, that though pyrexia is a drying agent, yet there are others which are important.

General Dehydration.—Next, as a cause of dryness of the tongue, I come to general dehydration of the body, whether by deprivation of drink or excessive aqueous discharges. Apart from complications, we presumably have to do not with increased evaporation from the mouth, but with diminution of the saliva, often as a simple and direct result.

First, as to deprivation of water. I have never seen this carried to extremity, nor can I adopt as my own the experience of "The Ancient Mariner":

And every tongue through utter drought
Was withered at the root;
We could not speak no more than if
We had been choked with soot.

But of lesser degrees of deprivation, mostly in the treatment of aneurysm and some forms of dropsy, I have recorded eleven instances, in six of which the tongue became dry; I need say no more of these cases now than that they show the results of dehydration in its simplest form; diminution of saliva and dryness of the tongue, with sometimes furring, sometimes more or less denudation.

As a mode of dehydration less simple but more definitely morbid, I may next refer to diarrhoea. Of the 113 cases of dryness this flux, simple or complicated, was present in seventeen. I here exclude typhoid. Six were cases of simple or dysenteric diarrhoea; the rest were associated with phthisis, cirrhosis of the liver, lardaceous or other organic diseases, which it would serve no purpose to recapitulate. In six the temperature was 102° or over, in five not above normal. In the larger number the complications were such that it was impossible to assign the state of tongue to the diarrhoea only; but there were three which served to exemplify the dryness as a direct result of diarrhoea, without either organic disease or marked pyrexia; in one of these the temperature was subnormal. More often when this appearance presents itself under the flux some other condition is present, often organic disease, the fatal end of which is not far off.

The maintenance of the moisture of the tongue under diarrhoea, profuse even to death, is a matter of common experience in Asiatic cholera. The tongue here remains moist, creamy, and noticeably cold during the whole of the purging or algide stage. When the discharges have ceased and reaction and fever set in, then as the pulse rises the tongue begins to dry and becomes quite dry and brown, as often in typhoid, the edges and the tip being red. Probably the persistent moisture of the algide tongue is in some measure due to the watery vomit which so abundantly flows over it, but something must also be attributed to its low temperature. It is a matter of experience that a tongue which is in itself dry is not easily kept otherwise by external wetting. The patient may drink often to this end, but only with a superficial and evanescent effect.

Excessive discharges of urine may be next considered. Diabetes mellitus is a cause of extreme dryness of the tongue; of the 113 cases where this state of tongue was recorded, 8 were of this disease. When the tongue has been dry under a mixed diet it will often become moist under a restricted one. By restriction both the sugar and the water of the urine are lessened; the formation of sugar is checked, and with this the discharge of water. Whether the presence of sugar in the blood or the discharge of water takes the chief part in drying the tongue may be ascertained by a comparison with diabetes insipidus, where the loss of

water occurs without the production of sugar. I have notes of eight cases of this kind, in most of which the discharge of water was greater than with diabetes mellitus. The tongue was recorded as moist, generally slightly coated, in six; in one as "cleaning;" in another as "dryish, pale, and flabby." The desiccation was therefore decidedly less with diabetes insipidus than with diabetes mellitus, and in the latter disorder must therefore be attributed to some other cause than the simple loss of water by the kidneys. I may mention a case which bears on this point. A woman had profuse diabetes insipidus, passing on an average a pint of urine an hour for the twenty-four hours, and drinking to almost exactly the same amount. The tongue remained moist, slightly coated, scarcely unnatural, except that it displayed a syphilitic scar. Three years afterwards I saw the patient again, having lost sight of her in the interval. A very unusual change had taken place; the diabetes had altered from *insipidus* to *mellitus*; the urine was now loaded with sugar, and in exactly half the quantity, the amount of drink having fallen in the same proportion. The tongue was now dryish, reddish, and a little brown. The temperature of the body was subnormal. The patient was on the verge of diabetic coma, in which she shortly died. The access of dryness of the tongue with glycosuria, though the diuresis was diminished and the temperature not increased, was instructive. The osmotic action of the sugar in the blood is probably the chief cause of the dryness of the tongue in the circumstances, as it has been shown to be of the dehydration of the lens and consequent cataract. The proximate cause of the dryness of the tongue is absence of saliva, as is evident by the state of the mouth and of the parotid.

Prostration.—In speaking of the several varieties of dry tongue, I have shown how much fatal disease they present—altogether about 50 per cent. A dry tongue, more than any other, foretells the ending of mortality. The kinds of disease which it accompanies are chronic more than acute; if febrile, usually continued. Putting aside designed restriction in drink, and also diabetes, where the dryness is due to special circumstances, one is at once struck with the gravity of the cases and the large proportion of those which end fatally. The conditions are most various; it is not easy to see what they have in common, except it be something which may be indicated by such terms as "prostration" and "exhaustion." Exhaustion by suppuration of many sources, advanced phthisis and tuberculosis of other kinds are frequent when the tongue is dry and smooth. When it is dry and rough, the tables show concluding brain disease, concluding cirrhosis, advanced cancer, advanced pyæmia, and severe pneumonia. Of twelve cases of pneumonia in which the tongue was dry, seven ended fatally; of twenty-seven in which the tongue was moist, only five ended fatally. A dry tongue in rheumatic fever is commonly recognised as an unfavourable omen, though not necessarily a fatal one. In typhoid the converse may be stated—a persistently moist tongue is indicative of a mild attack.

I have used the term "prostration" as a somewhat inclusive one—one which can be better understood than defined—representing great failure of strength and nutrition, however brought about. With the 113 cases of dry tongue, this condition was noted in fifty-one; in 222 cases where the tongue was moist, it was noted in but twenty-four. We cannot but conclude that prostration or failure of vital force is the most important factor of the dry tongue; pyrexia takes the second place. Clinical experience warrants the assertion that, though dryness of the tongue may occur without great prostration, great prostration is never long continued without dryness of the tongue. Great prostration occurs with little alteration of the tongue in connection with abdominal collapse, as in acute obstruction and perforation, but the condition has not been of long continuance.

Besides prostration—or, be it rather said, together with it—coma presents itself in connection with lingual dryness; this is not wholly due in the circumstances to the open mouth, as I have already shown, but to deficient secretion of saliva. It is to this that the dryness of the tongue is usually due, and it is because the dryness is an index of this deficiency that it has the clinical importance which, I think I have shown, must be attributed to it.

On the Influence of Food upon the Tongue.

In considering the causes of the several states of tongue, more particularly of dryness, I have said much which I need not repeat as to various influences which bear upon it; but there are still one or two which demand separate consideration, however brief.

¹ In this description of the tongue in cholera I have been enabled to supplement my own recollections by the more extensive experience of Surgeon-General Cornish.

First comes the question of food. The act of eating undoubtedly has an effect in cleaning the tongue, which is mechanical; and coating has been thought to depend, more largely than upon any other circumstance, upon the absence of the attrition which this process entails. It has been shown that the tongue is commonly more coated before food than after, that it is apt to be coated on the side of a tender tooth where mastication is limited, while it remains clean on the sound side where it is not; and much of the effect of acute disease in coating the tongue has been ascribed to the attendant loss of appetite and limitation of diet. But I have already shown that coating is a matter not only of want of wear, but in part of overgrowth; and that other causes (notably pyrexia), are directly concerned. As regards the influence of food, I have sought instruction in cases where there was absence or limitation of it, apart from pyrexia or other causes which act upon the tongue. I have watched the state of this organ in many cases of stricture of the œsophagus where solid food has been entirely disused, and have before me the notes of five such, and I might add as a sixth a case in which the patient refused food in consequence of cancer of the larynx. The back of the tongue here was covered with long shaggy fur, like coarse hair. There was another instance in which the tongue was furred, but it did not become so, notwithstanding long total absence of solids, until it became dry under extreme prostration and absolute pulselessness. Among the other cases there was no instance (though, in some, solids by the mouth were impracticable, and feeding conducted chiefly by the bowel) in which the higher degrees of coat existed. In two the tongue was coated but not plastered; in one it was partly stippled or dotted, being coated only in the back and central parts; in one it was dotted only. In the last case, slight as the covering was, the difficulty of taking food was such as to call for gastrostomy. This case declared in a manner to which accident gave effect how slight is the coating produced by absence of food as compared with that due to acute febrile disease, for it chanced that I had at the same time in near proximity some typical cases of the plastered tongue of pneumonia and pyæmia. The difference was graphically displayed; among other points the general spread of the acute coat over the dorsum was contrasted with the tendency of the other to collect at the back and in the median line, leaving much of the tongue nearly free.

Cases of restriction to liquid diet, not as a mechanical but a physiological necessity, are seen daily. The physician knows that no other will "agree with" the patient; he is guided chiefly by the presence of pyrexia and the state of the tongue; the more coated the tongue the more liquid the diet; if the tongue be dry, the diet is wholly liquid, and alcohol part of it. Here the tongue determines the diet, not the diet the tongue; but not without instruction is the issue. As the acute disease abates the tongue cleans, notwithstanding the limitation; as it cleans, and because it cleans, solids are added and may help the process, but the cleaning comes first. In my table of normal tongues are seven which were so under a strictly liquid diet; on every ground, therefore, it appears clear that, though some influence must be ascribed to food and mastication in cleaning the tongue, yet these are of secondary importance.

I need not revert to the effects of 'dry diet' which have been discussed in relation to dryness of the tongue; these are briefly want of saliva, and in some cases furring, in others denudation.

On Conditions of the Alimentary Canal in Relation to the Tongue.

It is a common belief that the tongue is directly indicative of many disturbances of the stomach, bowels, and organs directly connected with digestion; some appear even to be possessed with the fancy that the tongue is but an exposed sample of the alimentary canal, and declares by its changes the existence of similar changes in the hidden parts. With those who do not go thus far the white tongue is taken as a sign of constipation, or that the stomach or the liver is out of order, and that alteratives, especially of the mercurial kind, are needed. It is not easy to disentangle the complications which involve this subject; in the endeavour to do so I must appeal to a wider experience than I have been able to tabulate.

First as to the stomach. I have examined this organ after death with the naked eye and with the microscope where the tongue has been thickly coated or furred. Examination of the stomach is unsatisfactory, partly from the *post-mortem* influence of its contents; but it may be safely said that this organ presents no changes which are obviously analogous to those of the tongue, and the

same statement may be extended to the rest of the alimentary canal.

I have not been able to discern any state of tongue especially connected with dyspepsia or ulcer of the stomach. When dyspepsia is associated with stomatitis the tongue is sometimes thickly coated, probably as a local result. In simple dyspepsia and ulcer the lower degrees of coating are usually present, possibly in connection with the loss of appetite and the limitation of food. In one case of ulcer I noted the tongue as clean but flabby.

Next as to the bowels. Some forms of constipation or diseases associated with it are undoubtedly connected with changes in the tongue; but that the arrest is not necessarily connected with any such change is evident. I have seen the tongue perfectly clean and normal after three weeks of nearly total constipation in a hysterical woman, and equally so after twenty-eight days of nearly total constipation in a woman who was next day made the subject of colotomy for stricture of the sigmoid flexure; and it would not be difficult to cite other cases where the tongue has remained natural under long constipation, either functional or connected with chronic obstruction. On the other hand, where the obstruction is acute, the tongue early becomes stippled, or coated and dry. I think the difference between the tongue of acute and of chronic obstruction, and between one case of chronic obstruction and another, is in the presence or absence of constitutional disturbance. The early dryness of acute obstruction is not, as a rule, associated with pyrexia, but depends on salivary deficiency associated with the constitutional state. The dryness determines the state of tongue. Unless there be constitutional disturbance, which with simple constipation or chronic obstruction there often is not, the tongue may remain natural. I have more than once noticed an old block in the rectum to be attended with thick coating, which has disappeared or lessened on the removal of the accumulation. It may be inferred that in such cases there is general disturbance and probably pyrexia connected with morbid absorption, as the fœtor of the accumulation cannot fail to suggest.

Passing from constipation to the opposite condition, diarrhoea is early and powerfully productive of lingual changes. The tabulated cases speak for themselves, and I might largely add to the evidence they present. Looking through my notes not included in the tables, I find the tongue of diarrhoea described as "thickly coated and dry," "thickly coated, mouth dry, saliva scanty," "foul and coated," "brown, dry, and furred," "coated with brownish fur," "very dry, brown in centre, coated," "dry, brown, and cracked." There is scarcely any condition in which the tongue becomes more rapidly dry, coated, furred, and encrusted than severe diarrhoea. The absence of saliva is self-evident; direct dehydration helps to cause this; and pyrexia, which is often present, helps the desiccation.

I have already referred to the red and bare tongue which is sometimes associated with dysentery, together with abscess of the liver. Here we have fever of the hectic type together with the purging.

Opium.

It is no part of my design to describe the action of drugs upon the tongue, but I will nevertheless insert a word as to opium. It is well known that opium makes the mouth dry. I have frequently given it experimentally to persons whose tongues have been clean, or nearly so, and moist. The effect has always been to coat the tongue, impair the appetite, and diminish the saliva. In one case the temperature rose from normal to 100°. Some of the coating may be due to the loss of appetite and of friction, but the diminution of saliva must also have importance attached to it, and falls in with what has been already said with regard to the relation of this secretion to the coat.

On the Influence of the Nervous System upon the Tongue.

This is not to be ignored, though I think more has been attributed to it than can be demonstrated. The late Mr. Hilton showed that coating of the tongue was often confined to the side of painful teeth, and referred this to reflex nervous irritation. I have already adverted to such cases in the view that the effect was due to want of wear on the tender side. It is a matter of common observation that in hemiplegia the tongue is not unilaterally affected as if from the local change, but bilaterally as if from the constitutional results of it. On the other hand, I have already cited an instance in which there was reason to believe that unilateral dryness and coating of the tongue depended on an injury

to the chorda tympani on the affected side. Here we have the intervention of saliva, and may with probability ascribe the coating to the want of this secretion rather than to the direct effect of the nervous lesion. It has already been shown how largely deficiency of saliva affects the tongue, and it is a matter of ancient as well as modern experience that this secretion is much under the influence of the nervous system. I do not now refer to physiological experiments, but to conditions of wider range. The mind affects the saliva, and may, or even must, by its means, or by means of its absence, affect the tongue. The dryness of agitation is well known; the tongue "cleaves to the roof of the mouth." The Eastern ordeal by rice, which can be swallowed by the innocent, not by the guilty, will occur to everyone. I have often noticed the tongue to be white and sodden-looking after an exacerbation of nervousness, associated in particular with phosphatic urine, and thought the first change to be a want of saliva, the coating secondary. I was told by Mr. Charles Hawkins that a certain practitioner, who saw many men of business after their business hours, could always tell how things were in the City by the tongues of his patients.

I need not here discuss in relation to the tongue the general conditions of dehydration, pyrexia, and prostration, since to do so would be but to repeat what I have said in connection with coating and dryness. Neither need I delay, or only for a moment, to point out that if one were to seek to connect the states of the tongue, as a general rule, with individual diseases, so various and apparently so contradictory would be the results that nothing but confusion could result. What can be said towards this end may be briefly put. There is a tongue of heart disease of which the

Denuded tongue covered with straight membrane like the roadway of a bridge.

cyanotic character is evident to the naked eye, and a somewhat similar condition which is apt to accompany chronic albuminuria, which needs the microscope for its detection. The tongue of diabetes mellitus has a special tendency to dryness, as has been sufficiently explained; but this does not prevent its being sometimes normally moist or even normal in all respects. Among the febrile diseases it would commonly be said that the tongue of scarlatina and that of typhoid are characteristic. The well-known strawberry tongue of scarlatina approaches nearly to the pathognomonic, for the eruption helps to make it so; but even here other febrile disorders, like pneumonia, in which the face and mouth are apt to be injected, produce an excellent counterfeit, besides which the strawberry character in scarlatina is soon replaced by other phases of coating and by denudation. The tongue of typhoid presents many varieties, according to the stage of the disease and other circumstances. In eighteen cases it was stippled and coated, coated, plastered, strawberry, furred, encrusted, and denuded. Only two presented the dry, furred or encrusted state, which is commonly regarded as typical. The dry, bare condition was not absent. The tongue of pyæmia more often shows the ideal typhoid state than does that of typhoid itself. I say nothing of the tongue of typhus, of which of late years I have seen but little. In the only case I have recently

seen it was dry and black, as it is known often to be. Lobar pneumonia presents a range of tongue which runs through the whole gamut, the plastered type preponderating, as it does with typhoid and most other acute febrile states. In bronchitis the lower degrees of coating are generally presented, but if the disease be considerably febrile the tongue is apt to be plastered, which may be accepted as a sign of severity. With regard to acute rheumatism the variety is considerable, the lower degrees of coating being more often seen than with diseases which present a higher temperature and more depression. Nevertheless, the dry, furred, and encrusted tongues, with their significations, are not absent from the series. It would serve no purpose, and would involve repetition, were I to dwell further upon the relations of the tongue to individual disease; the tables speak in this sense, though the experience therein recorded is but a fragment small indeed compared to what must be in the minds of many who honour me with their presence to-day.

I have not dealt with local affections of the tongue, nor have I had much experience of them. That local irritation increases the coat may readily be believed. The coated or thickly stippled tongue of the smoker is well known; this may even assume (though, I trust, but rarely) the startling form of leucoplakia, an exaggeration, I presume, of the epithelial growth, though here I speak without *post-mortem* observation. I present a drawing from a patient with regard to whom I had the advantage of the opinion of Mr. Jonathan Hutchinson. I will dwell no further on this part of the subject, save to repeat what I hope has been made evident, that general influences tell more widely upon the tongue than local ones.

It only remains that I should sum up briefly the conclusions which have been arrived at.

The tongue is an index of constitutional states, seldom of individual diseases. An ancient theologian described the face of a wicked man as a map of the empire of sin. It has been fancied that the tongue presents a map of the empire of disease; and a writer, though one of no great note, has gone so far as to divide the lingual surface into a number of rectangular regions as numerous as the United States of America, which he places under the rule of separate organs; the larynx, the bronchi, the lungs, the pleura, the large intestine, the small intestine, the kidneys, and the brain each possessing a distinct territory. The heart, says this writer very wisely, has a common control over all. But in truth the tongue has no such local signification; it seldom points to solitary organs or isolated disorders, but is rather a gauge of the effects of disease upon the system than an indication as to the locality of it. It is often a guide in treatment, so far as treatment is general, not local; and it is an important help in prognosis. It may, indeed, be doubted whether any means of observation open to the physician, including the pulse and the thermometer, give him more insight into constitutional states than he can derive from the tongue. Clinically it always speaks the truth, and in a language which is not foreign to the experienced physician. And how much truth, or rather how many truths, are to be read on how small a page! Conditions of fever and of feeding; states of the nervous system; the maintenance or abeyance of vital secretions; failure of vitality, though we may not be able to find out why; in one case that the disease is getting the better of the patient, in another that the patient is getting the better of the disease—all these are discernible to the educated eye. The clinical value of the tongue largely depends on the number of interests it represents; these are more or less mingled in its indications, and the impression they convey is a combined one, but it is none the less valuable because comprehensive; it gives to a glance what otherwise could only be learned by detailed inquiry.

It has been shown that the white coat of the tongue essentially consists of horny epithelium, and that the various grades of coating are mainly due to its increase. I have not dwelt upon the parasites which are apt to gather upon the coat; these are only of secondary interest; they do not determine the character of the coat or of the tongue, and they have been subjected to an exhaustive examination by Mr. Butlin, with results in negation of their practical importance. It has been shown that the several degrees of coat are mainly due to overgrowth of epithelium, though in a smaller measure to its want of removal, and that there is a remarkable correspondence between the heat of the body and the coating of the tongue. If the tongue be coated, the indication is usually of febrile disturbance without especial reference to the stomach or liver, and points more to the general system than the alimentary. Though something is to be ascribed

30 diams.

COATED.—Excess of horny epithelium on papillæ with epithelial and other matters in intervals.

30 diams.

PLASTERED.—Elongated papillæ surmounted by epithelial and accidental matters.

30 diams.

ENCRUSTED.—Heterogeneous crust on and between papillæ.

30 diams.

BECOMING DENUDED.—Malpighian layer, and in places corium exposed.

TO ILLUSTRATE
DR. W. HOWSHIP DICKINSON'S LUMLEIAN LECTURES ON THE TONGUE AS AN INDICATION OF DISEASE.

to disuse, yet I think I have shown that too much has been; and that more than one modern observer, like an uncharitable pedagogue, has attributed to idleness what is directly due to illness.

Superadded to the *forcing process*, if I may so speak, of fever, we have step by step other changes, dryness, furring, and incrustation, which are essentially connected with want of saliva. I have endeavoured to show that this diminution or arrest is declared by the state of the tongue almost as certainly by observations on the ducts, and is the chief cause of the furring and incrustation which accompanies it. It is true that in the crust are parasites, but these are secondary; the primary fact is the want of saliva, a clinical indication always of importance, though the process by which it is brought about is not always the same. I have shown the effect of dehydration in diabetes and by diarrhoea; but it has, I think, been made clear that the most frequent and important concomitant of the dryness is a certain failure of bodily force and function which I have not assumed to describe with physiological exactness, but have expressed by such terms as weakness, prostration, and exhaustion. I do not ignore the effects of deprivation of water, of alcohol, and of opium; but, nevertheless, the relation to which I have drawn attention, so far as it concerns such dryness as to cause incrustation, has a general hold. It is difficult not to infer that with the salivary are other glandular failures, more especially such as concern the digestive system. Good digestion waits on appetite. Putting aside diabetes, where there are special circumstances, it may be said with general truth that with the dry encrusted tongue appetite is *nil*, and solid food impossible, not merely from the local difficulty caused by the dryness of the mouth, but from inability more profoundly seated. It may be inferred without rashness that the loss of power to take food is connected with a loss of power to assimilate it; and if the digestive function is in abeyance it is not likely that the digestive fluids are abundant. Hence it presents itself as what may be called a working probability that a want of the more vital juices concerned in nutrition may be indicated by the want of saliva which is sometimes so conspicuously displayed. Physicians acknowledge in their practice some such guidance; the dry and encrusted tongue is seldom disregarded as a call for animal liquids, which require little digestion, and alcohol, which requires none. To translate theory into practice is not only dangerous because the theory may be wrong, but the means may be ill-adapted, though the theory be sound. I have often taken the dry tongue as an indication for peptonised food, and thought it beneficial, but have not as yet had enough experience to speak confidently.

Proceeding from the varieties of clothing which dryness produces, we come to the opposite, but sometimes succeeding, condition—that of nakedness. This is often connected, like the previous, as has been shown, with want of saliva, of which it is usually a latter concomitant. It may be simply due to this cause, but other circumstances are so often present that it is difficult not to assign to them some share in the loss of integument, and attribute this, in part at least, to the failure of nutrition which belongs to hectic fever and suppurative waste. When the tongue becomes dry and bare it is ill with the patient. He is not sure to die, but likely to. If, as has been said, the tongues of dying men enforce attention, it must be often directed to this. The indication of the red, smooth tongue, is for what failing nutrition calls for—tonics, stimulants, and food, probably liquid, but nourishing. The failing pulse does not more surely tell of asthenic tendencies than, as a rule, does the red, dry, and polished tongue.

The tongue, indeed, has a whole book of prognostics written upon its surface. When the tongue is approaching the condition of health, so, as a rule, is the patient, as is seen whenever the red, dry, and bare tongue acquires moisture and clothing. There is no better sign in diabetes than the resumption of the natural moisture by the tongue which has been dry. Something may be judged by the way an encrusted tongue cleans; if gradually and from the edges, well; less so when in scales, especially when the surface exposed is red and dry. One glance at the coated or plastered tongue may give an assurance, which perhaps could not be otherwise obtained, that the disease is on the wane. If the thick coat in the centre steeply shelves towards the sides and front, revealing a normal, moist, not over-injected surface, the tongue is in process of cleaning; the natural friction is overcoming the coating process, and tongue and patient are on the mend. A tongue acquires coat more evenly and generally than it parts with it; we can thus tell whether the coating is on the advance or decline, and apply this rule to the disease.

There remains to me only the pleasant duty of mentioning those to whom I have not yet referred to whom I have been indebted. No one who has worked at the tongue can fail to have profited by the labours of Mr. Jonathan Hutchinson, to whom, indeed, I have been under special obligation, though as surgeon and physician our points of view have not been the same. I must next record my debt to Mr. Sweeting and Mr. Armstrong, of the Western Fever Hospital, and Dr. Collie, of the Eastern Fever Hospital, for kindly providing me with scarlatinal tongues. Clinically, I have to acknowledge the services of a series of excellent clerks—Mr. Brushfield, Mr. Le Cronier, Mr. Sortain, Mr. Ogle, Mr. Drabble, and Mr. Barlow. And I have, finally, to thank the Fellows of the College and all who have formed my audience for the attention they have bestowed upon what I fear must too often have been tedious.

ABSTRACT OF LECTURES

ON THE

DEVELOPMENT OF THE ORGANS OF CIRCULATION AND RESPIRATION,

INCLUDING THE

PERICARDIUM, DIAPHRAGM, AND GREAT VEINS.

Delivered at the Royal College of Surgeons, March, 1888.

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LECTURE I.

THE lecturer began by saying that he did not think he could show his appreciation of the honour conferred upon him by his re-election to the post of Hunterian Professor better than by lecturing upon a subject which was especially in need of elucidation. Others might be mentioned of more immediate professional interest, but none of greater scientific importance. The development of the pericardium and diaphragm was involved in much obscurity and surrounded by many difficulties, more especially as English authors had not, so far, treated it systematically. In endeavouring to repair this the synthetic method had been adopted, and the various phases of development followed step by step, beginning with the simplest and gradually proceeding to the complicated. It had, however, been found impracticable to obtain human embryos to show the earliest stages, and these, therefore, had been studied in rabbits' embryos ranging from the eighth to the seventeenth day of intra-uterine life. The results of these investigations had already been communicated to the Royal Society, and in these lectures they would be described chiefly with a view of explaining and illustrating their applicability to human embryology. Ultimately it would be seen that, whilst bearing more directly upon the development of the vascular and respiratory systems, they threw light upon the origin of the foetal membranes, the placenta, and other problems.

Beginning, therefore, at the eighth day of intra-uterine life, it will be found that the uterus of a rabbit which has reached that stage has along each of its tubes three or four vesicular dilations which almost double its calibre. If one of these vesicles be opened in warm saline solution at the side furthest from the mesometrium and uterine vessels, after a little clear albuminous fluid has escaped, a delicate film (the blastodermic membrane) is to be seen spread out upon the surface of the interior of the uterus which faces the opening. The shadowy outline of the embryo occupies the central part of the film, and is of an oblong form, and slightly constricted at its middle. At the head end of the oblong the fore-brain projects very slightly, and behind it, on either side, and a little way apart, are two small fusiform swellings, which indicate the commencement of the heart in two separate halves. Section through the embryo, and through the part of the uterus with which it is in contact, shows that it lies with its dorsal surface, covered with epiblast, next to the uterus, and with its ventral aspect, lined with hypoblast, towards the interior of the blastodermic vesicle. In some types this arrangement is reversed in an extraordinary manner, and the lecturer argued that that