THE LUMLEIAN LECTURES

ON

THE TONGUE AS AN INDICATION OF DISEASE.

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

By W. HOWSHIP DICKINSON, M.D., F.R.C.P.,

Honorary Fellow of Caius College, Cambridge; Senior Physician to St. George's Hospital; Consulting Physician to the Hospital for Sick Children.

LECTURE I.

THE knowledge which enables many a practical physician to make the tongue an index of diagnosis, treatment, and prognosis is, for the most part, unwritten. It has been handed down to us as part of the tradition of the elders, and few attempts have been made to analyse or educe laws from the accumulation of experience of which it consists. The labour which has been bestowed upon the pulse is in remarkable contrast with the neglect which, in recent times, has been the lot of the tongue. "Various and full of meaning," says a great writer, one whose words must ever be received with reverence within these walls, "are the conditions and appearances presented by the tongue. A patient would think you careless or ignorant of your craft if you did not at each visit look at his tongue as well as feel his pulse." But of late the tendency in this matter has been to agnosticism; it has become the habit with many, and those not the least influential, to look upon the changes which this organ displays as of less and less importance, to regard them as accidental rather than essential, as the results of unimportant local conditions rather than as inseparably connected with constitutional disturbances. "The tongue," said a great surgeon in my hearing, "belongs to the mouth in the first place, and to the general system only in the second." I should have put the general system first; but I will not anticipate my conclusions.

I am about to examine the subject with a fresh appeal to Nature, and, putting aside for the present both ancient faith and modern scepticism, shall be content simply to collect the evidence of the wards and the dead-house, and let the tongue speak for itself. This is simple in theory but in practice complicated, as will become sufficiently apparent, and on this ground I ask not only the indulgence, but the patience of those who honour me by attending.

It is not my purpose to deal with ailments local to the organ, but only with those changes which have their origin outside it, or belong to the system at large. I look at the tongue as a physician not as a surgeon, and regard it as symptomatic of disease rather than as the seat of it. My first endeavour has been to make a trustworthy and usable classification. Many terms have been hitherto applied vaguely and in confusion; tongues have been described as "furred," "coated," or "dirty" almost indiscriminately, while there has been too often a failure to attach due importance to such signs as dryness and nakedness. To secure a working classification I prepared hardened microscopic sections of a number of tongues of many kinds (they amounted to 104), and made with the help of the camera lucida the outlines of those which are now before the College. I was thus enabled to associate the minute and intimate changes with the appearances presented during life to the naked eye. Taking together both naked eye and microscopic appearances, I arranged the series into what, if I may borrow from the botanists, I may call "natural orders," using as guides chiefly such characters as appeared on minute examination to be important, and which, at the same time, were distinguishable with the naked eye during life. It is sufficiently evident that no sub-division, excepting one connected with characters evident to common sight, could have any practical utility. Thus the classification, though made with the help of the microscope, can be applied without it. It might have been more accurate in some respects, more satisfying to the votary of pure science, could I have relied only on minute anatomy, for there are some changes, especially one—increase of the deep epithelium—which are not easy to be recognised without the use of microscopic sections.

[1421]

I may say more of this hereafter; putting it aside for the present, I have made a classification which I think will work in practice, in which the minute and essential particulars are conveniently bound up with obvious external characters. The amount and distribution of the superficial or horny epithelium is important, since this essentially constitutes the white covering which is so noticeable during life. Other characteristics are—the elongation of the papillæ; the presence of incrustation, by which the proper surface of the organ is concealed; loss or attenuation of the epithelial layers, by which the surface becomes red, bare, or raw; and the quality of dryness; this last is of great importance, and it may be added that it is recognised only with the naked eye.

The classification may be thus sketched. First comes the condition of health; rather a variable standard—an average state, rather than an absolute one. Next come the stages of addition, then those of subtraction. In the stages of addition the epithelium increases more and more, and finally acquires a superstructure largely composed of foreign material. This is the maximum of clothing; it is succeeded by a process of divestiture, under which the tongue may become not only naked, but flayed.

In detail the first stage is where the papillæ are separately capped with a minute white patch, which consists mainly of horny epithelium; this tongue I call "stippled" or "dotted." As the covering increases, the spots coalesce, cease to be discrete, and become confluent, or at least appear so to the naked eye. To this degree the term "coated" is applied, as indicating continuity. The increased growths on the papillæ form the larger proportion of the surface; the intervals are more or less filled up by the deeper variety of epithelium and adventitious matters. The coat attains its highest development in what may be conveniently designated as the "plastered tongue," of which the covering is thick, uniform, and conspicuous, and often looks as if laid on with a trowel. The term "furred" is restricted to another acquirement—elongation of the papillæ, which remain separate from each other, at least at their extremities, so as to give a shaggy look, or one suggestive of coarse hair or fur. The last stage of increase, one which may succeed upon the furred tongue, or ensue without its intervention upon the coated or plastered, is where the papillæ are concealed by an incrustation, usually dark and dry, by which the surface is overlaid. From this, as the climax of addition, the scale descends through processes of subtraction. The accumulation comes off to expose either a normal surface or one which is imperfect; the former generally when the crust shelves off gradually, the latter when it breaks away abruptly. Irrespective of the formation and removal of crust, there are other modes of waste and defective growth by which the surface of the tongue is swept clean, and its coverings attenuated or even abolished in parts, so that these become absolutely skinless. We now have the several forms of the red, denuded, and raw tongue, and with these the scale finishes.

Classification of Tongues.

Naked Eye.		Microscopic Description.
1. Healthy.	Moist.	White epithelium in small amount on papillæ, not continuous or superabundant.
2. Stippled.	Moist. Dotted with white.	Excess of white epithelium on papillæ, not extending between them.
2 (D).	Stippled. Dry.	Ditto.
3. Stippled and coated.	Coat continuous in parts. Moist.	White epithelium on papillæ in excess, with partial filling of intervals.
3 (D).	Stippled and coated. Dry.	Ditto.
4. Coated white.	Moist. Coat continuous.	Excess of white epithelium on papillæ. Intervals more or less filled up with epithelium and accidental matters.
4 (D).	Coated white. Dry. Coat continuous.	Ditto.
5. Strawberry.	Coated and injected, especially showing in fungiform papillæ.	Like the coated or plastered, but with more injection.
6. White, plastered.	Thick uniform coat, abrupt and striking.	More elongation of papillæ than with coated tongue; more filling of intervals, with superficial accumulation.
7. Furred or shaggy.	Moist. Greatly elongated papillæ.	Extravagantly long papillæ, mostly of horny epithelium.
7 (D).	Furred or shaggy. Dry.	Ditto.
8. Encrusted, dry, brown.	Thick felted dry coat over papillæ.	Continuous crust on and between papillæ, largely of parasitic matters.
9. Furred or encrusted, becoming bare.	Generally dry.	Crust breaking away, together with more or less of normal surface.
10. Denuded.	Red. Absence of normal covering.	General absence of all epithelium excepting the Malpighian layer; sometimes of that also.
11. Red.	Moist. Dry membranous covering.	Level membrane replacing epithelial processes.
12. Cyanosed,		Injected; hypernucleated; excess of deep epithelium.

Before dealing with these classes individually, I will say a word about the plan I propose to follow. I shall first describe each variety of tongue, and then mention the clinical conditions which have been found with it. With this in view, I have made a habit of arranging cases which have come before me in a tabular form, according to the state of the tongue, annexing at the same time other details. As I must content myself with producing only extracts of these tables, I may say that the particulars systematically noted were: the disease and its duration; the general state as to strength, prostration, and consciousness; the temperature of the body; the arrangements as to food and drink; observations relating to the bowels and stomach, to the nervous system, to respiration with regard to the mouth and nose; the presence of morbid discharges by diarrhoea, diuresis, or suppuration; the amount of the saliva, and the moisture or dryness of the mouth. My performances in this matter have fallen short of my intentions. I had hoped to have made a complete compendium of hospital practice; but many cases, chiefly the less important, have escaped notice, so that my tables include only 366 cases; these must be taken as a sample of hospital experience rather than as hospital experience in bulk. They do not fairly show the relative frequency of each kind of tongue, for the more trivial were more often omitted than those which were striking or considered interesting; but they show, I believe correctly as far as they go, the kinds of disease associated with each. However inadequate, I think these records will be of use, helped out as they must be with a larger amount of unrecorded observation. Having described each tongue with its environment of disease, I shall next regard the association from the other point of view, and, taking a few typical diseases and constitutional states, shall show with what varieties of tongues they are accompanied. Finally, I shall draw together such general conclusions and rules of practice as the foregoing details appear to warrant.

I will now proceed to describe the healthy surface of the tongue so far as is necessary for the purpose in view.

CLASS I.—*Healthy Tongue.*

The healthy condition of the tongue is by no means easy to limit or define. Not only does it change its aspect and character with often inconsiderable deviations from ordinary health, but it presents many differences within this state in different persons and in the same persons at different times. There are congenital varieties in the number and prominence of the papillae; and there are such habitual differences, whether congenital or acquired, in the amount of epithelium, that to some persons it is normal to have a clean tongue, to others not less normal to have a coated one. Thus, whether the tongue be looked at with the naked eye or with the microscope, the range of health is wide; the same degree of coating may be normal in one person and abnormal in another, so that it is impossible to set up an exact ideal and say that all departures from it are the results of disease. Nevertheless, some broad outlines may be adventured outside which pathology begins.

The shape, colour, and general appearance of the tongue in health are so well known that it is only necessary briefly to indicate what must be held to be consistent and what inconsistent with this condition. The shape is not too broad or the end too blunt, as with the flabby tongue of anaemia, of depression after alcoholic excess, and of many other asthenic conditions; nor is it indented with the teeth; nor is it narrowed and sharply pointed, as it is said to be chiefly with acute febrile and inflammatory states. The tongue should be protruded steadily and kept still, neither jerky nor tremulous. In colour it should present a basis or substratum of delicate pink, in which the forms of the papillae are distinguishable by their shape, but not by hyperaemia or injection, which conditions are conspicuous in many disorders, notably in scarlatina, as the chief characteristic of the strawberry tongue. The surface may be nearly clean or uncovered, but more commonly presents a superstratum which has been termed "fur" or "coating," to the amount and character of which much importance has been attached. In ideal healthiness this is no more than a delicate white sprinkling or stippling, which may be likened to hoar-frost, a little speck lying like a cap or summit to each of the filiform papillae, their extent not being enough to conceal, but only to modify, the general effect of the colour below. The filiform papillae are more constantly coated than the fungiform; the circumvallate seldom. But this covering, even in perfect health, is not always, even not often, so limited; sometimes it stretches between the papillae, partially fills up the intervals

between them, and spreads more abundantly on the central and back parts than at the sides or tip. The coat is nowhere excessively thick, nor enough quite to conceal the configuration of the surface; it thins gradually without abrupt demarcation; it is not absolutely white, but is greyish where thin, yellowish where thick; the proper tissue, where exposed, is not of a bright, but a dull pink, not exaggerated by injection, so that no striking contrasts of white and red are noticeable. The tongue and inside of the mouth are moist. Saliva can be voluntarily collected and spat out; it can be made to issue freely through a cannula in the parotid duct by placing a little acetic acid on the tongue.

To obtain an idea of the minute and essential changes which give rise to the altered appearances presented to the naked eye, it is not enough—it is, indeed, misleading—to be content with scraping the surface. It is needful to secure sections which show everything down to the muscular tissue; the amount, nature, and disposition of the epithelial investment must receive attention in its whole thickness, as well as the state of the corium with regard to injection, nucleation, and extravasation; and the characters of both apart from disease must be indicated. As the purpose is clinical, it will be enough to describe the upper surface, where what may be called the symptomatic changes are mainly observed.

Starting from within, and using the terms descriptive of the skin, which the covering of the tongue much resembles, we come first to the cutis vera or corium, a layer of dense connective tissue between the muscular tissue and the epithelial. Projections from this form the central parts of the papillae. The injection and nucleation of the corium are its chief points of morbid interest. The nucleation varies much, even in health; it is most abundant within the papillae and near the surface. Upon the corium is the epidermis, of which there are three layers, the deepest, or rete Malpighii; upon this a stratum composed of lozenge-shaped nucleated cells, which correspond, with a difference, to the corneum of the skin; and upon this a horny formation which is special to the tongue, and chiefly forms the white coat.

To take these separately, the rete Malpighii presents in contact with the corium a compact arrangement of columnar cells, in health little more than a single course, which are distinguishable, though not abruptly, from a bulky collection of polygonal cells which complete the Malpighian layer. Towards the surface these cells elongate and flatten, still remaining nucleated, and with rather a quick transition become squamous and form a layer which varies much in different circumstances, by which the surface of the tongue is generally covered. This corresponds with the corneum of the skin, though in the tongue, unlike what happens in the skin, the cells retain their nuclei. On the prominent parts, where the growth is oldest, notably on the ends of the papillae, the cells undergo a further change, losing their nuclei and cellular form and becoming fibrous, losing their power of staining with carmine, but greedily absorbing the aniline dyes. It is this horny epithelium which essentially constitutes the coat or fur, and to which many of the clinical characters of the tongue are due.

The superstructure has but a brittle connection with the rete Malpighii, a line of fracture often presenting itself with much regularity along their junction; on the other hand, the rete Malpighii is intimately attached to the corium, so that not only abnormal, but even exceptional, circumstances are needed for their separation. The Malpighian layer is a very definite and constant structure—the chief landmark anatomically; what is above varies almost infinitely; the deep layer should not be quite bare, nor should the accumulation be such as to be level with, and so obscure, the papillary eminences. The papillae themselves commonly show each a tip of horny epithelium, white to the naked eye, yellow to the microscope. This varies much in health; so much in disease that the characters of coating and furring mainly depend upon it.

On the surface of the tongue, attached chiefly to the prominences of the epidermis, is a varying amount of parasitic growth, chiefly in the shape of the micrococcus. This presents itself chiefly in the shape of rounded accumulations upon the outstanding fibrillae, like the inflorescence of a bulrush. Besides this, there are often seen, especially about the papillae, granular heaps of bacteria and other parasitic matters, as well as detached epithelial cells and accidental matters derived from food; but the total bulk of the accumulation, whether parasitic or accidental, bears but a small proportion to the epithelial structure of which the coat or fur essentially consists. The adventitious growth is

rather an appendage to the coat or fur than a necessary part of it. In certain conditions of disease, of which more hereafter, the parasitic growth, as well as the epithelial, may be in great excess.

The characteristics of health in the mucous membrane of the tongue may be thus summed up. The corium must not be over-injected or over-nucleated, nor must it present numerous the extravasation of leucocytes. The Malpighian layer must display no excess of proliferation. The middle layer of epithelium, which corresponds to the corneum of the skin, must be present but not superabundant. It should completely cover the rete Malpighii between the papillæ, but should allow these to be prominent at their points of emergence. The epithelial processes of the papillæ should be distinguishable, but not too long; upon these may be a few scattered points of vegetation. Finally, the surface described must be exposed, not concealed by any coat or accumulation, however derived, and it must be normally moist.

I need say little clinically about the healthy tongue. It will at once be seen that the healthy tongue is not the same thing as the tongue in health. There are individual peculiarities in the growth of lingual epithelium in virtue of which some tongues are always coated, others not so when coating might be expected. With some persons a coated tongue is habitual, and not only consistent with health, but a sign of it. On the other hand, diseases like pneumonia, in which commonly the tongue is quickly and thickly coated, may fail to produce this result. It takes time to coat the tongue. In the table two cases of pneumonia are referred to with a clean tongue. One was only in the second day, and scarcely counts. In the other, a not very severe case of pleuro-pneumonia with a temperature of 102° , the tongue remained throughout so far clean that it could not be called otherwise than natural. It displayed a general fine white sprinkling, like April hoar-frost spread, which did not overcome the underlying tint. This absence of coat is quite exceptional in the circumstances, and probably shows habitual but unusual scantiness of the epithelial crop. There are also peculiarities in health which concern the saliva. An old woman, to be later referred to, displayed under capillary bronchitis a red, dry tongue, from which I was disposed to augur ill. She got well and the tongue remained the same; she assured me that it had always been so, and I could only infer that the want of saliva, to which, as I shall presently show, the dryness and bareness of the tongue were due, was habitual and consistent with general health.

There are local and chronic diseases in abundance in which the tongue is normal, few involving pyrexia or any general disturbance. I shall show that this organ responds chiefly to constitutional variations. If the system at large is unaffected, so as a rule is the tongue. It is obvious that the conditions of observation in a hospital, whence my tables were chiefly derived, necessarily presented disease more abundantly than health, so that the morbid associations of the clean tongue are exaggerated.

1. Not Abnormal.

Tetanus	...	...	...	...	1
Chorea	...	...	...	...	2
Sunstroke	...	...	...	...	1
Valvular disease	...	...	...	...	1
Intra-thoracic aneurysm (dry diet)	...	...	...	...	1
Pneumonia (one on second day)	...	...	...	...	2
Pleuritic effusion (dry diet)	...	...	...	...	1
Pyo-pneumothorax	...	...	...	...	1
Phthisis	...	...	...	...	1
Whooping-cough	...	...	...	...	1
Ascites (hepatic); dry diet	...	...	...	...	1
Chronic albuminuria	...	...	...	...	2
Diabetes insipidus	...	...	...	...	1
Syphilis	...	...	...	...	1
Anæmia	...	...	...	...	1
Convalescent	...	...	...	...	6
Total	...	...	...	...	24

Observations relating to the above Cases.

Pyrexia (temperature from 102° to 104°)	...	2
Hyperpyrexia (temperature over 104°)	...	0
Temperature not recorded	...	1
Prostration	...	0
Chiefly on liquid diet	...	7
Diet strictly limited to liquids	...	0
Dry diet	...	3
Saliva abnormally deficient	...	2

Average temperature of 20 cases, 98.5° . Died, 2; recovered, 8; relieved, 13; not relieved, 1.

CLASS 2.—Stippled or Dotted Tongue.

This presents the first deviation from health. This is an excess of coat or fur, not uniformly spread, but displayed only on the points of the papillæ. The term "fur" is perhaps more suited to an interrupted or punctiform covering than coat, which may be limited to one which is continuous; the fur, however, is here but a mere beginning, which may develop into the coated tongue, or that which will be described as furred or shaggy.

Before proceeding to minute particulars, the naked-eye characters may be briefly indicated. The tongue in this phase presents merely an exaggeration or accentuation of the covering of health; the state may indeed be so nearly that of health that the difference may pass without notice. The tips of the papillæ are covered with white more closely and broadly than within healthy limits, and there is perhaps a little more than the normal contrast between the white summits and the pink intervals. The term "stippled" or "dotted" fairly describes the aspect of the dorsum. To borrow from the nomenclature of small-pox, the acquisition is discrete, not confluent. The spots on the papillæ are usually white, less often yellowish or brownish. The spotting is almost or quite absent on a narrow lateral margin, and also on a small triangular patch at the tip, the apex pointing inwards. These clear spaces are made so by the friction of the teeth at each side, and of the palate or gums at the tip.

The minute changes are to be made out only by examination in section. It is thus made evident that the essential alteration is in the amount and disposition of the epithelial covering. The change is in way of excess, but the excess relates only to the condensed superficial structure, where the cells are flattened, fibrous, and rejective of carmine; not, or but very slightly, to the deeper parts, where the early shape and characters of recency remain. There is as yet no considerable or constant increase in the epithelium of the deeper sort, though there may be indications of a tendency in this direction; and here and there, but as yet not abundantly, excess of nucleation appears in the corium, especially about the papillæ. There is no marked injection of the blood vessels. The intervals between the prominent papillæ are nearly empty, as in health. On their tips is commonly more or less parasitic growth, mostly the micrococcus, gathered, as it is apt to be, upon the projecting filaments. The proportion which these parasitic products bear to the total thickness of the coat or fur can be seen only in section. By mere scraping of the surface a false impression is given of the amount of these superficial products. The crop bears only a minor proportion to the bulk of the coat, the major part of which is epithelial. The parasites are the fringe of the garment rather than the garment itself.

We see in this tongue mainly the evidence of disuse. The length of the papillary processes may be explained by the absence of customary wear, and, indeed, is exactly what want of friction and scour might be expected to cause. There is little evidence of overgrowth in the shape of new epithelium, but only a retention of what must necessarily be old. In the parasitic formation there is nothing special or peculiar, but only what is found in health in less abundance. As with the epithelium, what is indicated is rather the retention of what is old than the development of what is new. We may attribute the accumulation, whether epithelial or parasitic, to the absence of food connected with loss of appetite, and perhaps in some measure to the stillness of tongue which illness engenders. I have referred to slight and early evidences of overgrowth of epithelium. This will become more apparent when I speak of more advanced changes.

This variety of tongue presents the first step in morbid acquirement and the first departure from health. A large number of persons could be found with this tongue whose condition is not abnormal. I have tabulated sixty-one cases in which this state of tongue was seen. All were hospital patients, in whom absolute health was scarcely to be looked for; among them acute disease was infrequent, chronic disease common. Heart disease was more numerous presented than any other disorder, occurring in seven. Pneumonia and pleurisy, taken together, were found also in seven; but among these was only one instance of pneumonia in an active and pyrexial state. Rheumatism described as acute was present in five cases, but in only three was this adjective applicable in its fullest sense.

The general absence of pyrexia was striking: the temperature in only three cases reached 102° , in no case was it known to pass

103°. The diet in the large majority of cases comprised solid food. Three patients were kept, for special reasons, as short of liquid as was practicable. In these the saliva was markedly deficient—a deficiency which was noted in but four other instances. Extreme prostration existed in but one, together with acute obstruction of the bowel. Thus this tongue does not belong to pyrexia, and seldom concurs with grave constitutional disturbance of any kind. With the acute obstruction the temperature was normal. It presents itself often with local or organic disease, where there is little fever and seldom much vital failure.

Subjoining the cases where the stippled or dotted tongue was dry, and putting aside one where the dryness was due to diet, a larger proportion of acute disease and of constitutional disturbance is apparent when the tongue is dry than when it is moist.

2. Stippled or dotted with white: moist.

General paralysis or paresis	...	...	2
Chorea	...	...	1
Hysteria	...	...	2
Neuralgia	...	...	1
Valvular disease of heart	...	...	7
Pericarditis	...	...	1
Pneumonia, pleuro-pneumonia, broncho-pneumonia	...	...	6
Pleurisy	...	...	1
Laryngitis	...	...	1
Bronchitis	...	...	2
Phthisis	...	...	1
Tonsillitis (follicular)	...	...	1
Acute obstruction of bowel	...	...	1
Fæcal accumulation in colon	...	...	1
Epistaxis (nostrils plugged)	...	...	1
Jaundice	...	...	2
Ulcer of stomach	...	...	1
Dysentery	...	...	1
Chronic albuminuria	...	...	5
Diabetes mellitus	...	...	2
Hæmoglobinuria	...	...	1
Acute rheumatism	...	...	5
Subacute rheumatism	...	...	2
Acute gout	...	...	1
Chronic gout	...	...	3
Anæmia	...	...	4
Lymphadenoma	...	...	1
Acute alcoholism	...	...	2
Dry diet (1 for ascites, 1 for pleural effusion, 1 for cardiac dropsy)	...	...	3
Total	...	...	62

Observations relating to the above cases.

Pyrexia ¹ (temperature 102° to 104°)	...	...	3
Hyperpyrexia (temperature above 104°)	...	...	0
Much prostration (acute obstruction of bowel)	...	...	1
Prostration not severe (pericarditis)	...	...	1
Chiefly on liquid diet	...	...	10
Strictly limited to liquid diet (acute obstruction of bowel)	...	...	1
Dry diet (liquids reduced as far as possible)	...	...	3
Saliva abnormally deficient (including 3 under dry diet)	...	...	7
Died, 15; recovered, 18; relieved, 25; not relieved, 3.	Average	...	temperature of 42 cases, 98.5°.

2 (D). Stippled or dotted: dry.

Pleurisy with effusion (dry diet)	...	...	1
Peritonitis (opium)	...	...	1
Acute obstruction of bowel (volvulus)	...	...	1
Chronic albuminuria	...	...	1
Total	...	...	4

Observations as to the above cases.

Pyrexia (temperature 102 to 104°)	...	...	0
Hyperpyrexia (temperature over 104°)	...	...	0
No observations as to temperature	...	...	1
Average temperature of 3 cases	...	...	98.6°
Much prostration	...	...	2
Prostration not severe	...	...	1

¹ The temperature was not noted in 13 cases; it may be taken as generally not materially elevated.

Chiefly on liquid diet	...	...	0
Strictly limited to liquid diet (1 fed by bowel)	...	...	2
Dry diet	...	...	1
Saliva abnormally deficient	...	...	0
Died, 1; recovered, 1; relieved, 2.	...	...	...

CLASS 3.—Stippled and Coated.

The next step in the acquirement of coat is intermediate between the stippled and the coated, presenting a mixture of the characters of both. The white accumulation is present on the papillæ, but is not limited to them; at the back and along the median fissure it fills up the depressions, so that the tongue, while displaying the dotted character about the anterior and lateral parts, is at the back continuously covered, the continuity being implied by the term "coated." This tongue is one of very frequent occurrence, perhaps more so than any other which can be regarded as morbid; it represents but a slight departure from health: since it partakes much of the class preceding and of that following, it may be dismissed with brief description. A partial stippling may present itself as a stage either in the formation of coat or its removal; an example of the latter is seen in the drawing taken during recovery from pneumonia.

The microscope displays in a more marked manner the characters which have been described as belonging to the stippled class; the papillary processes are elongated and conspicuous, but there is in addition some increase of the deep epithelium by which the intervals are partly filled, the filling up made more complete by detached epithelium and accidental matters. Though the deep epithelium does not present to the naked eye the whiteness of the superficial or horny kind, yet the increase of the latter and the mixing together of the sloping ends of the papillæ give a continuity of whiteness, though only in the central and back parts, where the epithelium is most plentiful. This tongue shows want of wear, together with more evidence of increased growth than in the preceding class.

Looking at this class clinically, we still find a large proportion of chronic disease, but note an increase of acute and constitutional affections. I may observe as an apparent exception that pneumonia is presented less numerously, though acute rheumatism is more so, and typhoid is now introduced. The change in the character of the cases is shown by the increase of pyrexia, though this is still slight compared with what will be seen presently, by the increase of constitutional depression, and by the number of cases in which the state of the patient was such as to necessitate liquid diet.

3. Partly stippled; partly coated; normally moist.

Bulbar paralysis	...	...	1	Constipation	...	...	2
Cerebral hæmorrhage	...	...	1	Colic	...	...	1
Cerebral embolism	...	...	1	Chronic albuminuria	...	...	6
Hemiplegia (cause uncertain)	...	...	1	Acute rheumatism	...	...	7
Giddiness	...	...	1	Subacute rheumatism	...	...	2
Chorea	...	...	1	Chronic rheumatism, or sci-	...	...	2
Hysteria	...	...	2	atica	...	...	2
Valvular disease of heart	...	...	5	Gout	...	...	3
Pericarditis (not rheumatic)	...	...	1	Congenital syphilis	...	...	1
Pneumonia	...	...	2	Anæmia, chlorosis, etc.,	...	...	4
Laryngitis	...	...	1	Addison's disease	...	...	1
Bronchitis	...	...	1	Ague	...	...	1
Asthma	...	...	1	Typhoid	...	...	3
General tuberculosis	...	...	1	Erythema nodosum	...	...	1
Phthisis with hæmoptysis	...	...	2	Eczema	...	...	2
Ulcer of stomach with hæ-	...	...	1	Pemphigus	...	...	1
matemesis	...	...	1	Acute alcoholism	...	...	1
Cirrhosis of liver	...	...	1	Abscess, internal, no dis-	...	...	1
Ascites (cause uncertain)	...	...	1	charge	...	...	1
Anasarca (cause uncertain)	...	...	1	Stricture of œsophagus	...	...	1
Diarrhoea	...	...	1	Convalescent	...	...	2
Total	...	...	69				

Observations relating to the above cases.

Pyrexia (temp. 102° to 104°)	...	...	6
Hyperpyrexia (over 104°)	...	...	0
No observation as to temperature	...	...	14
Much prostration	...	...	5
Prostration not severe	...	...	6
Chiefly on liquid diet	...	...	23
Strictly limited to liquid diet (stricture of œsophagus, 1; diarrhoea, 1; constipation, 2; colic, 1; typhoid, 3)	...	...	8

Dry diet, liquids reduced as far as possible (ascites) 1
Saliva abnormally deficient (decidedly), including 1 under dry diet 5

Average temperature of 54 cases, 98.7°.

Died, 7; recovered, 30; improved, 26; not improved, 5; uncertain, 1.

CLASS 4.—The Coated Tongue.

The next degree of epithelial excess, whether by retention or overproduction, results in the formation of a continuous coat, or one continuous over the greater part of the dorsum. This covering presents great variety and many indications to the naked eye. There is scarcely an acute or subacute disorder at some period of which the tongue is not coated; this holds good especially with febrile complaints. This state of the tongue is often a step to other changes, those often of more serious import. Two special varieties of coated tongue will receive separate notice: the "strawberry" tongue, which, besides being coated, is much injected; and the "plastered" tongue, in which the coat is superabundant, and has certain characters of recency. Putting these kinds aside for the present, the generally coated tongue is only an advance upon that which is partially so, just as the partially coated tongue is an advance upon that which is simply dotted.

In the ordinary varieties of coated tongue, the coat which is continuous between the papillæ covers the greater part of the dorsum, being thickest where friction is least, about the back and median furrow. It may be dirty-white, greyish, or yellowish. The limitation at the tip and edges is not abrupt; there are no striking contrasts of colour; neither is the coat very white, nor where it is absent is the mucous membrane vividly red. The fungiform papillæ may be visible where the coat is shelving, but they are not remarkably injected as with the strawberry tongue. Such a tongue may be anemic or sodden-looking, especially when the patient is anemic; the condition chronic, or associated with nervous depression. Good examples of the chronically coated tongue are presented in the drawings from a case of floating kidney and neuralgia under morphine; and in one from a case of chronic dysentery under opium. The coat may be variously tinted by accidental circumstances, especially by colouring matters, which are swallowed or vomited. It may be made bright yellow or olive-green by bilious vomit, or brown by faecal vomit. Iron will sometimes make it inky. Iron and port wine used alternately will sometimes convey a deep brown to the coat, tannate of iron resulting from this combination. I once knew an intensely black colour to be imparted to an otherwise light-coloured coat by artificial teeth. Probably some mercurial amalgam had reacted with sulphuretted hydrogen in the coat and produced the black colour.

The coated tongue may lose its coat in two ways: it may gradually thin off with a shelving edge, exposing a moist and natural surface; or it may break away in flakes after displaying a surface which is red and dry; the former method, implying, as it usually does, the restoration of the healthy surface, is obviously of the better omen.

Often, in circumstances which will hereafter claim attention, the coat becomes dry, brown, and cracked, sometimes presenting rectangular fissures like crocodile's skin. This amounts to what I shall presently describe as the "encrusted tongue," towards the making of which the coated tongue is a step.

Microscopic examination of the coated tongue shows as the essential change excess of epithelium of every kind. The papillæ are prominent, their pillars of corium stand well out, and upon them are long processes of the carmine-refusing epithelium, which is horny, superficial, and old. Between these protrusions is a superabundance of the full-bodied nucleated epithelium such as belongs to the intervals by which these spaces are more or less filled up. In some cases this accumulation is surmounted by a thin layer which has undergone the horny transformation. When this is so, it easily accounts for the continuity of whiteness, since epithelium of this sort is, when moist, white to the naked eye. The continuity of whiteness, however, upon which the definition of the coated tongue rests, is more commonly maintained by the approximation of the long processes, and the filling of the intervals by accidental matters. There is as yet no marked injection, no great evidence of overgrowth in the Malpighian layer, no constant hypernucleation of the corium. What alteration of growth there is in the direction of too much; but there is no such extravagance, as will be noted in some conditions to be presently considered.

On and about the papillæ parasitic growths such as have been already described are often abundant, but as these are not especial to this variety of tongue, nor add very materially to the bulk of the coat they need no detailed notice.

Clinically, the coated tongue brings with it a further increase of acute and febrile disease. Taking together the moist and dry kinds, pneumonia or pleurisy was present in 10 of 68 cases; typhoid was slightly more frequent than in the preceding classes, while other febrile disorders now intrude themselves into the list. Pyrexia and prostration are both on the ascent, showing that the generally coated tongue is associated with a larger proportion of constitutional affection than where the coat is more partial. It was observed that the saliva was noticeably deficient in a larger proportion of cases than heretofore—in 12 of 68 of the coated tongue, in only 5 of 69 where the coat was partial.

4. Coated white; normally moist.

Cerebral hæmorrhage	1	Dyspepsia	1
Hemiplegia (cause uncertain) ...	2	Repletion	1
Pneumonia (pleuro-pneumonia)	6	Stricture of œsophagus ...	2
Pleurisy	2	Starvation	1
Laryngitis	1	Peritonitis	1
Bronchitis	2	Chronic albuminuria ...	1
Cancer of lung	1	Œræmia, vomiting, suppression of urine ...	2
Phthisis	1	Acute rheumatism (including cardiac affection) ...	1
Phthisis and hæmoptysis ...	2	Subacute rheumatism (including cardiac affection) ...	3
Aneurysm (?)	1	Chronic rheumatism and sciatica	1
Acute obstruction of bowel (small bowel)	1	Typhoid	4
Chronic obstruction of bowel (sigmoid flexure) ...	1	Febricula	1
Diarrhœa	2	Erysipelas	1
Ulcer of stomach (hæmatemesis)	1	Erythema nodosum ...	1
Vomiting (uterine)	1	Convalescent	2
Total	48		

Observations relating to preceding cases.

Pyrexia (temp. 102° to 104°) ...	9
Hyperpyrexia (temp. over 104°) ...	0
No observations as to temperature ...	5
Much prostration	11
Prostration not severe	4
Chiefly on liquid diet	11
Strictly limited to liquid diet ...	15
No food by mouth; fed by rectum (stricture of œsophagus)	2
Dry diet	0
Saliva abnormally deficient	6

Average temperature of 41 cases, 99.1°.

Died, 11; recovered, 15; improved, 21; not improved, 1.

4 (D) Coated white; partly dry.

Hemiplegia	1	Acute obstruction of bowel ...	1
Myelitis (acute)	1	Tonsillitis	2
Valvular disease and disease of aorta	2	Dyspepsia	1
Pneumonia	2	Repletion (surfeit)	1
Phthisis and pneumonia (?)	1	Chronic albuminuria ...	1
		Diabetes	2
		Acute rheumatism	5
Total	20		

Observations relating to the above cases.

Pyrexia (temp. 102° to 104°) ...	6
Hyperpyrexia (over 104°) ...	0
No observations as to temperature ...	2
Much prostration	3
Prostration not severe	0
Chiefly on liquid diet	12
Strictly limited to liquid diet ...	3
Dry diet	0
Saliva abnormally deficient	6

Average temperature of 18 cases, 99.5°.

Died, 6; recovered, 5; relieved, 8; uncertain, 1.

CLASS 5.—Strawberry Tongue.

This needs but a brief mention. Usually with what may be called the acute coated tongue, more especially when this approaches the plastered character to be next noticed, the fungiform papillæ show through the coat at the tip and edges. These are often more or less injected, especially with scarlatina, where they

show in a striking manner the increased vascularity of the organ due to its participation in the cutaneous eruption.

The association with scarlatina would have been displayed more prominently in the table but that this disease is not, as a rule, admitted into St. George's Hospital. The strawberry state is sometimes seen in other disorders, most of which are of the acute febrile kind; pneumonia, typhoid, and perityphlitis are presented in the record. Injection of the tongue is an accompaniment of many febrile states, not only giving colour to the substratum, but also promoting the epithelial growth. Pyrexia is generally present with the strawberry tongue, and that to a greater degree than with the antecedent classes.

5. Strawberry tongue; moist.

Typhoid	1	Pneumonia	2
Scarlatina	3	Perityphlitis	1-7

Observations relating to the above cases.

Pyrexia (temp. 102° to 104°)	4
Hyperpyrexia	0
No observations as to temperature	2
Prostration, not severe	1
Chiefly on liquid diet	5
Strictly limited to liquid diet	2
Dry diet	0
Saliva abnormally deficient	3

Average temperature, 5 cases, 102°.

Died, 0; recovered, 2; improved, 3; sent out, 2.

CLASS 6.—Plastered Tongue.

The variety alluded to as plastered is well marked, has much clinical importance, and demands a separate notice. Clinically, this might be called the coated tongue of acute disease. The coat, which is white, moist, though generally not fully so, and uniform, except at the edges, is spread over the dorsum, excepting a narrow margin and a small space at the tip, with a thickness, smoothness, and definite limitation which suggests the laying on of plaster. The edges, though definite, are somewhat bevelled, and are perforated as they thin with the red fungiform papillae, after the strawberry style. Sometimes, as in the drawing displayed, taken on the fourteenth day of typhoid, the covering is so white, thick, and fine in grain as to give the idea of plaster-of-Paris or white lead smoothly spread; at other times it is coarser and less purely white, as if a fine kind of mortar had been used. The mucous surface, where exposed, is often redder than natural, especially when the coat is of the whiter kind. The more recent the illness the whiter the coat. When very thick, white, and strongly contrasted with the red margin, the indication is of acute disease—in other words, of disease recent and severe. Were it not recent, the coat would not be so purely white; were it not severe, the thickness could not have come in the time. Each day the tongue becomes less white, and gradually assumes a dirty yellowish or brownish tint. A brown colour associated with dryness and cracks commonly appears when the disease is severe, of long continuance, and attended with prostration. The properties of brownness and dryness may accompany many states of tongue, and will receive further notice.

I may in a few words indicate wherein the minute characters of the plastered tongue differ from that which is commonly coated. The difference is mainly one of degree. The papillae are now more elongated, even so much so as to resemble those of the shaggy or furred tongue. With this we have more complete filling up of the intervals, and even some overlying of the papillae with matters partly derived from the tongue itself as epithelium, partly parasitic and partly accidental. This condition is a great way towards the encrusted tongue, the chief difference being in the presence or absence of moisture. The plastered tongue, when dry, becomes the encrusted. In the plastered tongue the hypertrophy of the superficial epithelium, as yet uncomplicated to any great extent, attains its climax.

Clinically, this tongue never fails to arrest attention; it is the ensign of recent acute febrile disease. The chronic coated tongue is distinguishable from the plastered by its dirtier colour, and the less vivid apposition of white and red. Of 32 cases of the plastered tongue, the table shows 8 of pneumonia, 3 of acute bronchitis, 3 of acute rheumatism, 6 of typhoid, and 4 of other acute febrile affections. Pyrexia was marked in 18 cases, while the general average of temperature was 101.6°, a higher level than has yet appeared, save with the strawberry tongue, a nearly allied condition. Prostration, mostly such as belongs to the febrile state, was recorded in 8, while the increased proportion of patients on

liquid diet bears testimony to the same association. The saliva was noticeably deficient in a larger proportion of instances than with any tongue yet before us, save the small strawberry class. This does not imply merely that the tongue was dryish, which might be due to the evaporation caused by the increased heat of the body, but to lessened secretion, as was in some instances ascertained with the cannula. We see a close association with pyrexia which stimulates cell growth, and is probably the chief agent in producing the characteristic epithelial luxuriance, the products of which are abnormally retained partly by reason of the scantiness of saliva.

6. White; plastered; moist.

Cerebral tumour	1	Jaundice (enlargement of liver)	1
Pneumonia, pleuro-pneumonia	8	Acute rheumatism (including pericarditis, etc.)	3
Bronchitis (acute)	3	Typhoid	5
Phthisis and hæmoptysis	1	Febricula (or febrile attack of uncertain nature)	1
Stomatitis	1	Measles	1
Acute obstruction of bowel (volvulus)	1	Mumps	1
Dysentery	2	Pyæmia	2
Perityphlitis	1		
Total	32		

Observations relating to the above cases.

Pyrexia (temperature 102° to 104°)	15
Hyperpyrexia (over 104°)	3
No observations as to temperature	5
Much prostration	5
Prostration not severe	3
Chiefly on liquid diet	16
Strictly limited to liquid diet	8
Dry diet	0
Saliva abnormally deficient	13

Average temperature of 27 cases, 101.6°.

Died, 10; recovered, 11; improved, 11.

Before proceeding to other varieties of tongues, I will, now that we have reached in the plastered tongue the climax of simple coating, look back upon the several grades of that condition, and try to collect the instruction which flows from them.

First pathologically. The most important item is the lengthening of the papillae; and the first question, how far this depends on disuse, from want of food, etc., and how far on overgrowth. Want of wear must have some effect in allowing this elongation, but it would seem to be too rapidly produced to be wholly thus accounted for. A greater length is attained within the short duration of an acute disease than in its longer time of a chronic one, even though it entail more complete disuse. Not only are the epithelial ends to which only the wear applies elongated, but so in many cases are the deeper parts of the column which are unexposed. The epithelium also between the papillae, which, as being less exposed than they are, must be less influenced by wear, is also in many cases increased in thickness; when it is so it gives strong evidence of over-production as against deficient removal. Coating, therefore, is the result in part of disuse, want of rubbing and washing, as the somewhat increased surface parasites show, but chiefly of morbid overgrowth.

The clinical circumstances give similar evidence. It is true that the greater degrees of coating occur chiefly in patients who are kept without much solid food. On the other hand, in many conditions with which solid food and mastication are almost completely absent, the thick and rapid covering of acute disease does not present itself. I have watched with interest from this point of view cases of stricture of the œsophagus. In three such only the lower degrees of coating were presented, though in all solids were impossible, and in two food was introduced chiefly by the bowel. In a fourth the tongue was dry and furred, but the furring came on with dryness, on which it was apparently dependent. I shall revert to the influence of diet upon the tongue, and simply say here that a comparison between the thinly or partially coated tongue of simple abstinence, and the thickly and generally coated tongue, where a less degree of abstinence is associated with a febrile state, shows conclusively, as it appears to me, that in the latter condition we have something to look for beyond inaction.

I shall refer later to the effects upon the tongue of the limitation of liquid, but it is enough for the present to say that want neither of food nor of drink avails to produce the thick coating which in other circumstances is so characteristic.

A condition which may be briefly referred to in connection with

coating of the tongue is diminution of saliva, though I shall consider this subsequently on a wider basis. As a general rule, whatever be the reason, the saliva lessens as the coat thickens. Taking together the lesser degrees of coat presented with the stippled, and stippled and coated, classes, this secretion was notably deficient in 12 of 170 cases. Taking together the higher degrees of coat in the strawberry and plastered kinds, the saliva was notably deficient in 16 of 39. Thus generally, up to this point, the less saliva the more coat. But it will appear later that almost total absence of this fluid may concur with a tongue which is almost absolutely without coat. For the present it is enough to point out that the deficiency does not alone account for the excess of covering under consideration.

To account for this there remain but two causes which present themselves as probable: the hypothetical existence of a morbid poison as in fevers, and pyrexia. As to poison, looking at the high degrees of coat in the classes of strawberry and plastered, I find that of 39 such cases 14 were of typhoid, febricula, scarlatina, measles, mumps, or pyæmia, and 3 of acute rheumatism. Thus, unless we include pneumonia, of which there were 10 cases, less than half fell within this hypothesis. Among the rest were many cases of local or organic disease, which were clearly outside this supposition. Among these were 3 cases of acute bronchitis, 1 of phthisis, 2 of perityphlitis, 1 of volvulus—enough to show that local disease, or disease not connected, so far as we know, with any blood contamination, may give rise to what may be called acute coating of the tongue.

Pyrexia remains to be considered. When the tongue is normal, so as a rule is the temperature. I have already referred to one case as exceptional in which the tongue remained clean in the presence of pneumonia. Putting this aside, I have already referred to 22 cases in which, in different circumstances, the tongue was reasonably clean: the temperature was raised only once, and then only to 101.5°. Taking now the degrees of coating in ascending order, we find that as the coat increases, so with almost exact correspondence does the temperature.

Relations of Body Heat to Coating of Tongue.

Class of Tongue.	Percentage with Pyrexia.	Average Temperature.
Stippled	4.9	98.5°
Stippled and coated	8.6	98.7
Coated, moist	18.7	99.1
Coated, dry	30.0	99.5
Strawberry	57.1	102.0
Plastered	53.1	101.6

The annexed statement needs no explanation; whether we look at the frequency of pyrexia in the class, or at the average temperature of all cases in it, the figures are equally significant. Taking the strawberry and the plastered tongues as practically the same, the proportion between coat and heat is maintained with remarkable exactness; and we have as yet failed to find any other condition besides heat of body which has as uniform a relation to the alteration in question.

That heat up to a certain point promotes the growth of cells is a fact well known to experimental physiologists. I take it on the authority of Dr. Délépine that a temperature of between 100° and 104° is favourable to the growth of tissues, one of above 105° detrimental to it. It probably very rarely happens that the dorsum of the tongue, exposed as it is, and necessarily cooler than the constantly covered parts, reaches a temperature high enough to lessen growth; almost any degree of elevation possible in the circumstances must be within the limits of that which tends to increase. In pyrexia, therefore, we have, if not the only maker of coat, certainly the chief one.

CLASS 7.—The Furred or Shaggy Tongue.

As the papillæ of the coated tongue continue to lengthen, and adventitious matter to collect between and upon them, the advancing process presents itself in two shapes, which differ as the elongation or the accumulation preponderates. When there is great projection of the papillæ, so that these stand out distinctly, the term "furred or shaggy" represents this condition. Where these shapes are covered in, and levelled over by matter, whether derived from the tongue itself, or from without, the term "encrusted" may be employed. The two conditions occur in many similar circumstances, and are continually intermingled; nevertheless, they occur separately, and must be so described. A stippled or dotted tongue, by increase of each point of coating, may become furred, a process which dryness facilitates. In a different way a thickly

coated tongue may become furred. The lengthened papillæ may present themselves as a coarse pile like plush, and so make the "moist furred tongue." A little drying will cause the threads to collect in sheaves, and so form the "dry furred tongue" which I am about to describe.

To the naked eye and during life the fore part is irregularly rough, with large pointed papillæ, on the tips of which are brown spots, or the whole may be more or less brown. The central and back parts are often covered with irregular pointed masses, such as are represented in the drawing, frequently more or less mixed up with and obscured by dry crust often like crocodile's skin. I have seen after death (in a case of malignant disease of the larynx) much of the hinder region of the tongue covered with a shaggy villous growth, like coarse hair; but in life this hirsute state is commonly much obscured by incrustation.

Under the microscope the chief characteristics of the tongue are the enormously elongated filiform papillæ, every part of which is increased, both the deeper portion derived from the corium and the superficial epithelial part, the latter most so. Micrococci are sometimes present on the tips of the papillæ, but do not add materially to their bulk.

The elongation may conceivably be due either to over-growth or deficient removal; there is often some increase of the deep epithelium, but seldom much; occasionally some over-nucleation of the corium is present. In fine, there is some evidence of hyperplasia, but not enough to account for the striking changes which the tongue presents. These would seem to be mainly due to want of wear, of which the papillary ends, hardened by dryness, are especially resistant. Beyond the resistance which dryness entails, it is possible that the unnatural state of surface which goes with it may act as an irritant and stimulate growth.

As to the clinical relations of this tongue, I have been able to collect, notwithstanding the generality of dryness, a few instances in which the furred tongue was moist, or at least not dry. One of these was of a kind sometimes seen where great elongation of the papillæ is consistent with appetite and health. The only conditions which could be suggested as provocative of the state of the tongue in this case were old age and constipation. I have referred to the state of pile, which may be regarded either as an advanced stage of the coated tongue or an early one of the furred. In the table it is seen to be associated with pneumonia and with anæmia.

The "dry" furred tongue is of more importance than the moist, but it occurs in different circumstances and is by no means uniform in its indications. It may succeed, as has been shown, either upon the dotted tongue or the coated, in the course of advancing disease; it may also occur with retrogressive disease, as when the encrusted tongue sheds its coat so as to expose the subjacent elongated papillæ. The class therefore presents much clinical variety. It has been shown that the furred or shaggy tongue is largely the result of disuse and want of moisture, which latter condition is nearly essential, though not absolutely so. The papillæ harden with dryness, as has been stated, and become abnormally resistant of friction, which, in the absence of solid food and mastication, is diminished. The saliva is obviously deficient, as judged by the difficulty of spitting and by the results of catheterisation of the parotid. It must be stated, however, that the latter operation was not often performed, the extreme illness of the patient often opposing a hindrance. The fact, however, was clear without this test; and the conclusion warranted that the dryness was in general due to want of this secretion.

The accompanying tabulation speaks for itself. I need not allude again to the instance where a profuse hirsute growth was conjoined with sarcoma of the epiglottis and tonsil; here the results of want of friction were chiefly evident, though there was some evidence of overgrowth in hypernucleation. I may next refer to a group of cases in which, as presumably in the last case, the condition was present with little or no pyrexia. This includes two cases of coma from brain disease, two of advanced cirrhosis, one of enlarged liver of uncertain nature, two of diarrhoea, and three of enforced dry diet. Thus, dehydration, be its cause what it may, is a definite factor in producing the tongue in question. In other cases—to wit, typhoid and acute rheumatism—pyrexia was present, but it is clear that this is not essential. It is worth observing how infrequent is pyrexia, and how low its range in the dry tongue now in question, as compared with the plastered moist tongue last discussed. This shows how little of the desiccation is to be attributed to evaporation connected with increased heat of body. And I may make similar negation with regard to

another condition to which dryness and furring have been attributed, namely, habitual openness of the mouth, especially during sleep; I find but three instances in which this attracted notice, and I am persuaded that other causes of drying and furring are far more important.

In short, the dry furred tongue is essentially due to two causes which are connected together—want of saliva and want of wear. Among the causes of want of saliva, the most important is a state of system which cannot be otherwise defined than as failure of nutrition and vital power. With how great a variety of disorders this failure is associated I need not recapitulate; I have expressed the greater degrees of it by the term "prostration."

7. Furred or shaggy; not dry.

Pneumonia, pleuro-pneumonia	...	...	2
Perityphilitis, perforation of appendix	...	...	1
Chronic constipation	...	...	1
Granular kidney; uræmia	...	...	1
Total	...	...	5

Observations relating to preceding cases.

Pyrexia (temperature 102° to 104°)	...	...	1
Hyperpyrexia	...	...	0
No observations as to temperature	...	...	2
Average temperature (of 3 cases)	...	...	99.8°
Much prostration	...	...	2
Chiefly on liquid diet	...	...	2
Strictly limited to liquid diet	...	...	1
Saliva abnormally deficient	...	...	2

Died, 2; recovered, 1; not improved, 1.

7 (D). Furred or shaggy; dry.

Disease of brain (coma)	...	2	Stricture of œsophagus	...	1
Hemiplegia (embolic)	...	1	Diarrhœa	...	2
Chorea	...	1	Perityphilitis	...	1
Valvular disease	...	1	Abscess (in axilla)	...	1
Aneurysm or dilatation of aorta (dry diet)	...	3	Acute rheumatism	...	1
Broncho-pneumonia	...	1	Typhoid	...	1
Pleurisy	...	1	Convalescence from typhoid	...	1
Cirrhosis of liver	...	2	Febricula	...	1
Enlargement of liver (cause uncertain)	...	1	Movable kidney and rheumatism	...	1
Total	...	...	Chyluria	...	1

Observations relating to preceding cases.

Pyrexia (temp. 102° to 104°)	...	...	3
Hyperpyrexia	...	...	0
No observation on temperature	...	...	2
Average temperature of 22 cases	...	...	99.1°
Much prostration	...	...	6
Prostration not severe	...	...	2
Chiefly on liquid diet	...	...	9
Strictly limited to liquid diet	...	...	5
No food by mouth (fed by rectum)	...	...	1
Dry diet	...	...	3
Saliva abnormally deficient	...	...	8?

Died, 9; recovered, 7; relieved, 8.

DONATIONS.—The annual report of the Leeds General Infirmary acknowledges the receipt of £150 from the Yorkshire Football Club, making a total of £1,000 in eight years.—The Trustees of Prison Charities have given 100 guineas, additional, to the National Hospital for Consumption at Ventnor, and 100 guineas to the Metropolitan Convalescent Institution.—The Sheffield Church Burgesses have given £120 to the Sheffield Public Hospital and Dispensary, and £68 to the Jessop Hospital.—The Mary Wardell Convalescent Home for Scarlet Fever has received £100 as "A Jubilee Offering."—Mr. Harold Smith has given £100 to Charing Cross Hospital.—University College Hospital has received £85 from the People's Contribution Fund.

THE General Court of the Governors of Guy's Hospital have sanctioned the erection of a residential medical college upon a site immediately adjoining the hospital. It is proposed that the sum required for this purpose, estimated at £20,000, should be raised by private subscriptions among the governors, the medical staff, the lecturers and teachers in the medical school of Guy's Hospital, and their friends. The special appeal fund lately raised, and which is only available for purely hospital purposes, now amounts to £85,000.

THE TREATMENT OF DIPHTHERIA AND TONSILLITIS.

By THOMAS F. RAVEN, L.R.C.P., M.R.C.S.ENG.

FROM time to time communications appear in the JOURNAL, and other medical periodicals, relating to the treatment of diphtheria. Various drugs, applications, and antiseptics are employed, and, when the result is satisfactory, a record is made of successful treatment, and sometimes even the specification of a remedy is announced. The clinical features of the disease, however, are often omitted, and when this is so, the value of the observation must suffer.

It is held by many authorities that sore throat, with membranous deposit, is in itself a sufficient evidence of the disease called diphtheria. The writer of the article on diphtheria, in Quain's *Dictionary of Medicine*, inclines to this view. Others, however, are driven to the conclusion that sore throat, with membranous deposit, occurs sometimes sporadically, sometimes in epidemics (with local appearances exactly resembling those of true diphtheria), which can be clearly distinguished, especially, "after the event," from diphtheria. My own experience compels me to take sides with the latter view. Recently I witnessed, in an institution containing eighty children, a severe epidemic of exudative tonsillitis. The disease was sthenic in type, and the local appearances of wash-leather-like patches of considerable extent upon the pharyngeal mucous membrane were indistinguishable from those of diphtheria. The cases were almost all severe, with temperatures, especially early in the disease, as high as 105°; relapses were common. Three cases of acute rheumatism (with cardiac mischief), one of erysipelas of the face, and one of diffused cellulitis with suppuration (in an adult) were associated with the epidemic. The disease was extremely infectious, and it undoubtedly arose from the poisonous effects of sewer gas. Had I treated the patient with sulphurous acid, or biniodide of mercury, or sulphite of magnesia, or turpentine, I should have been justified, by authority, in recording the successful treatment of sixty cases of diphtheria, by one or other of these remedies. For under careful management, the disease ran its course, and all got well; and, although chlorate of potassium was freely given, I never thought of attributing the recovery of the patients to its employment. During the epidemic albuminuria was never found in any case, nor swelling of the glands at the angles of the jaw; and afterwards there was not a single instance of paralysis or peripheral neuritis.

Within the last few weeks a similar but smaller epidemic has been under my observation. Almost exactly the same symptoms appeared, but the disease was less severe than in the epidemic which I have just given an account of. Thirteen cases of exudative tonsillitis occurred, some mild, some severe. In one case laryngeal symptoms appeared, but subsided in the course of a few days without operation being necessary. All the patients got well, and no remedy but chlorate of potassium was given, and in no case were the sequelæ of diphtheria manifested. The disease, which resulted from the escape of sewer gas into a lavatory and near a bedroom window, was decidedly communicable. This was shown by the fact that when the first case was removed to a lodging for supervision, a little girl in the house contracted the disease.

It is to be hoped that the Collective Investigation Committee, with the new schedules, clear and simple as they are, giving scope to every contributor to record his own experience in his own way, will do good work by collecting sufficient evidence by which a distinction can be definitely drawn between diphtheria and exudative tonsillitis. The subject is one that can hardly be overrated in importance and interest, and most practitioners have experience and notes bearing on the matter.

SCARLET fever has, we learn, broken out on board the Thames training ships *Shaftesbury* and *Exmouth*, lying off Grays. Sixteen cases from the former and one from the latter have been removed to the hospital.

FRENCH ACADEMY OF MEDICINE.—At a meeting of the Académie de Médecine on March 13th Dr. de Sabin, of Rio de Janeiro, and Dr. Lusk, of New York, were elected Corresponding Members in the Section of Surgery. In addition to these two gentlemen, the names of Professor Victor Horsley and Sir William Mac Cormac, of London, Dr. Macewen, of Glasgow, and Dr. Sayre, of New York, were submitted to the Academy.