that of syphilis, of malaria, and of tuberculosis. Disorders of this sort, like the microbial disorders, will naturally arrange themselves into groups; yet it will be found that all, in the words of Erasmus Darwin, can be brought within the fold of a "theory founded upon Nature, that should bind together the scattered facts of medical knowledge, and convert into one point of view the laws of organic life."³

REFERENCES.

¹ *Die Mneme als erhalten des Prinzip in Wechsel des organischen Geschehens.* ² *Darwin and Modern Science*, p. 142. ³ *Zoonomia*, or *The Laws of Organic Life*, second edition, 1796, preface, p. 2.

ULCEROUS LESIONS OF THE TONGUE.

BY

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[WITH COLOURED PLATE.]

WHEN every means at our command has been employed there should be no error in the diagnosis of, and consequently no difference of opinion as to the nature of, any ulcer of the tongue. We may, from a clinical standpoint, consider ulcers of the tongue as: (a) Evidently simple, (b) definitely malignant, (c) doubtful; but to delay the justifiable removal of a malignant ulcer or to excise a non-carcinomatous tongue are errors which will eventually carry with them their own condemnation, because they can be obviated if the precepts laid down in the following pages are closely adhered to and if the fallibility of clinical diagnosis is constantly borne in mind.

The "simple ulcer," recent in appearance and of obvious causation—for example, a sharp tooth, local trauma, or glossitis—is characterized by absence of neuralgic pain, absence of peripheral induration, and, though tumefaction may not be evident to the naked eye, a certain amount of local oedema is distinctly seen by means of a lens; further, there is an absence (?) of lymphatic enlargement, an absence of foul deposit on the neighbouring teeth, except that which may be accounted for by delay or neglect of cleanliness.

When the exciting causes are removed—projecting stumps or edges of teeth—or in the case of aphthous sores after due attention to gastric conditions, the general health, and salivary lithiasis, the simple ulcer invariably heals in a few days; if not, there is cause for grave suspicion.

Treatment.

1. *Medicinal*, by mouth washes, for gastritis or for infective folliculitis.

2. *Dental*, for removal of any projecting or irregular tooth; "no dentist should take any responsibility in the treatment of any ulcer of the tongue beyond the limited domain of his qualification as a dentist."

3. *Topical*, by chromic acid solution; by caustics (a) actual cautery, (b) thermo-cautery—Pacquein, (c) electro-cautery, (d) chemical caustics; by radium.

There is always a temptation to treat ulcers of the tongue by means of caustics, but this is a dangerous procedure, owing to loss of time and inefficiency, and should rarely be followed. The treatment by the application of caustics, such as silver nitrate, can do no possible good if the lesion is cancer, though in my opinion its application to simple ulcers or other lesions cannot induce carcinoma.

Whatever radiotherapy may do, such application must be topical, like all other thermal and caustic remedies. Some may object to the application of radium to ulcers, lest its effect be no better than a caustic, and valuable time be lost in the course of an undiagnosed carcinoma; the effect of radium is beneficial in cancer, and while causing healing superficially it likewise penetrates to a considerable depth.

The practitioner in all cases of soreness of the tongue or mouth must not forget that salivary lithiasis or pyalolithiasis is of more frequent occurrence than is anticipated, or, in other words, that many conditions of the tongue are due to salivary constituents, and not to gastric conditions.

Treatment includes cleansing of teeth, compressed-air jet containing a spray, revolving brush for removal of tartar, facial massage of the salivary glands; drinking of waters; fruit, especially oranges and pineapple.

Tuberculous Ulcer.

The tuberculous ulcer, situated generally on the dorsum or at the tip of the tongue, is readily recognized as a pallid solitary sore, often of considerable depth with sharply cut edges, indolent base usually devoid of induration, and almost invariably associated with pulmonary or laryngeal tuberculosis in young adults. With such associated manifestations the lesion is recognized with no great difficulty, but when the ulcer occurs primarily on the tongue the question is more difficult from the clinical side.

To the naked eye the bottom of the ulcer may appear to remain stationary, except for extension of its satellitic foci, and cause but little if any inconvenience, yet resisting all treatment except caustics, cautery, or curette; curettage is the ideal treatment. Its slow progress is, however, rendered apparent if examination is closely made with the aid of a good lens.

If an ulcer is suspected of being tuberculous the following considerations should be kept in mind as having a definite bearing on the diagnosis, treatment, and prognosis—namely, age and existence of tuberculosis in other parts of the body.

I will refer to the more recent methods which may assist when doubt or aversion to the use of the knife exists.

Tuberculin Tests.—The more recent modifications of the tuberculin test evolved from the original injection method have led to its more extensive employment, and have given to us a fair idea of their respective values. The following are now extensively employed:

1. The ocular instillation test, or Calmette's ophthalmic reaction. A drop of tuberculin (T.O.A.) is instilled into the conjunctival sac. In twelve to twenty-four hours an inflammatory reaction results in tuberculous patients.

2. The skin injection test, or Moro's percutaneous reaction. Equal parts of tuberculin (T.O.A.) and hydrated lanolin are rubbed into the skin, when a similar reaction to von Pirquet's will result.

3. The cutaneo-inoculation test, or von Pirquet's reaction. The skin of the forearm, cleansed and scarified, is inoculated with a drop of tuberculin (T.O.A.). In about twenty-four hours a reaction occurs followed by a characteristic papule or vesicle.

The wider use of these methods during the past few years has impressed me with their clinical limitations. The results fall considerably short of the requirements for an ideal diagnostic method in suspected tuberculosis, though relatively good in confirmation of the clinically tuberculous.

The diagnosis demands the employment of:

1. Tuberculin tests.
2. Scrapings of the ulcer (epithelioid cells and tubercle bacilli).
3. Excision of a piece (epithelioid cells, tubercle bacilli, and giant cells).

Scrapings are unsatisfactory, as by this means oftentimes only the detritus of necrotic cells is obtained; as in the case of the tongue a piece can easily be excised for microscopic examination, this procedure should be adopted.

More than one tongue has been excised with the idea that it was the seat of cancer for want of appreciation by the surgeon of these additional and essential diagnostic methods.

Actinomycosis.

Though this disease is not common in the human subject it should be borne in mind (1) that its most frequent avenue of entrance is the mouth, (2) that the only positive diagnostic evidence is the presence of the actinomyces, (3) that the occurrence of this disease is diagnosed absolutely by its yellow granules visible to the naked eye, greasy to the touch, which, when placed under the microscope, reveal the distinctive characters of the growth.

I have seen these points revealed after the tongue had been removed for a lesion which was not too extensive for the remedial processes of scraping, caustics, and iodine treatment. A biopsy for microscopic diagnosis prior to operation would have eliminated such a serious error.

Treatment is by mouth washes, progressive increasing doses of iodides, iodoglydine, etc., and locally by iodox, etc.

In the extensive literature on the antecedents to cancer of the tongue and pre-cancerous states of the tongue we find very little attention has been directed to lingual papillitis, which gives rise to more distressing symptoms than leukoplakia with which it may be associated.

Lingual Papillitis.

Lingual papillitis—a frequent associate of gastric disturbance, and often found in syphilitics—is predominated by a burning pain in the anterior two-thirds of the tongue, increased by any food except the most bland diet. Scarcely can any lesion be detected by the naked eye, but a lens will bring into view a varying number of minute red spots, as though they were the truncated bases of hypertrophied papillae with exposed nerve endings in the minute yet exceedingly painful ulcer. How far this may be an antecedent to either the localized or more rare diffuse variety of “carcinoma linguae” I cannot tell, but occasionally it may be the earliest evidence of commencing carcinoma. The only satisfactory line of treatment to adopt consists in: No alcohol, no condiments, no smoking; bland diet of milk and milk preparations; galvanic cautery directed to the small points (local anaesthesia being employed), which are picked out by means of a lens; application of chromic acid (solution of gr. xx in 1 oz. of water).

Syphilis of the Tongue.

This is probably the most common of all diseases of the tongue, being found as the following ulcerous lesions:

Superficial:

- Primary infective focus or chancre—rare.
- Fissures and ulcers on the dorsum of the tongue—irritable and sensitive to the touch.
- Ulcerous indentations around the edge of the tongue.
- Sessile warty growths—often multiple.
- Patches of faint leukomata.
- Denser patches of leukoplakia.

Deep:

- Indurated masses—gummata—which form in the substance of the tongue, with an upheaval of the surface, and on breaking down leave a crateriform excavation with little or no peripheral induration, but with its deep base covered by a dirty greyish-yellow secretion.

A multiplicity of lesions on the tongue, palate, lips, gums, and cheeks, with evidence of syphilis elsewhere—for example, small, hard, multiple posterior cervical glands, with an absence of enlarged submaxillary lymphatic glands, or lymphatic glands which produce a noticeable fullness of the sterno-mastoid muscle—aid in the corroboration of the diagnosis.

Syphilitic ulcers are relatively painless, often symmetrical; the breath has a characteristic (when recognizable) odour distinct from the peculiar fetid smell of cancer. Lastly, protrusion of the tongue is evidence that syphilis very rarely embarrasses its mobility. The real relation of cancer of the tongue to syphilis of the tongue has not been fathomed. Syphilides of the tongue bear no relation in their paucity to cancer of the tongue in the female. The diagnosis of syphilis has now advanced beyond the correct judgement of clinical signs to a scientific and almost incontrovertible certainty by means of (1) detection of the *Spirochaeta pallida*; (2) Wassermann's reaction, which is based upon the theory of complement fixation.

Leukoplakia.

No condition of the tongue to-day occupies a more important position than the white patches—of variable duration, and accompanied by only slight, if any, pain—which, though found not only upon the tongue but also on the cheeks, gums, lips, and palate, are viewed as the too frequent antecedents to “epithelioma linguae.” What are these white patches? Some arise after the establishment of the carcinoma, and are evidence of the non-removal of

epithelium heaped up owing to the limited movements of the tongue; others are nothing more than the mucous cicatricial coverings which overlie previously existing small ulcers and fissures; these are very liable to fresh crackings and fissurings.

We are told again and again that the history of cancer of the tongue is invariably based upon a life of syphilization and a period of leukoplakia, culminating in the cancerous stage which rapidly runs to death—a painful and distressing death to the patient, associated with much offensiveness to those who minister to his last wants. We are told that some irritation—heaven only knows what may not be included in the category of irritation according to the individual writer—is responsible for cancer.

I fail to see how a leukoplakia of heaped-up layers of epithelium induced by thickening from so-called irritation can be cancerous unless carcinoma is the cause of this proliferation, or unless fresh cracks and fissures allow the ingress of a *contagium vivum*.

In connexion with this question I would lead all cancerologists to ask themselves seriously why a visceral pericardial leukoplakia, commonly known as a milk-spot, is so frequent, whereas we have yet to learn of endo-thelioma pericardii.

Treatment.

The treatment is shown in the following table:

- (a) Bland diet.
- (b) Antisyphilitic régime.
- (c) Ionization by (i) potassii iodidi gr. x, aq. ad 3j; (ii) liq. hydrargyri perchlor. on alternate days.
- (d) Radium.
- (e) Chromic acid gr. xx, ad aq. 3j, better employed at intervals, the spots being picked out by the practitioner himself for the following important reasons: (i) The application is more efficiently made; (ii) observation is ensured.
- (f) Operation. If there be one, two, or even three patches, excision may be urged, as such alone can, with certainty, avert epithelioma from the patch itself.
- (g) The use of the following paste: Terrae siliceae gr. xxiv, resorcini gr. xlviii, adipis gr. viii.

If the lesion is of simple or syphilitic origin the treatment will correct the trouble, but if the diagnosis is doubtful can any loss of time before making a biopsy be in any degree justifiable?

Carcinoma of the Tongue.

Carcinoma of the tongue vies in frequency with carcinoma of the lower lip. Its occurrence was computed by Butlin as 820 cases per annum in England. The sex-frequency is represented as males 85 per cent., females 15 per cent. The age-incidence as 40+. No satisfactory explanation has as yet been given of this remarkable disparity of occurrence. The scars of syphilis, jagged teeth, smoking, pressure of pipe stem, alcohol, condiments, betel-nut and caustics are among the many accepted factors in the vague category of predisposing causes, but to my mind these one and all produce a condition of epithelium which retards or even prevents the healing of an abrasion, soreness, or ulcer. These factors fail to account for the greater frequency of faucio-glossal, linguo-mandibular and sublingual carcinoma in the male than in the female, whereas carcinoma of the larynx does not evidence such disparity.

The relation of cancer to pre-existing lesions has probably attracted more attention in the case of the tongue than anywhere else, and has led to the common usage of the word “precancerous,” a term much to be regretted.

Many conditions regarded clinically as precancerous have been shown microscopically to be definitely cancer. Persons who present long-standing marks of past syphilitic lesions of the tongue—leukoplakia or warty growths—are considered particularly liable to cancer of the tongue. The primary relation to my mind is not a cellular

DESCRIPTION OF SPECIAL PLATE.

Fig. 1.—Simple ulcers of tongue. Female, aged 59. Wearing dental plate.

Fig. 2.—Tuberculous ulcer of tongue. Male, aged 54.

Fig. 3.—Carcinomatous ulcer of tongue. Male, aged 63. White area indicates absence of linguo-palatal or linguo-dental friction.

Fig. 4.—Symmetrical syphilitic lesions. Yellow spots indicate present ulcerous conditions. White areas indicate healed ulcerous conditions. Male, aged 45.

Fig. 5.—Carcinomatous ulcer of floor of mouth. Male, aged 58. Commencing as a fissure across the fraenum linguae.

Fig. 6.—Carcinomatosis of syphilitic tongue. Male, aged 47. Leukoplakia indicate previous ulcerous states, raised papillary regions existing carcinoma.

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FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

metamorphosis, but a loss of surface which allows of an ingression. As on the skin so on the tongue, carcinoma may follow upon a simple papilloma or a papillary granuloma (syphilitic); the tendency of such lesions to lead to a breach in the surface is phenomenal. It is noteworthy that the disease frequently commences in a fissure or abrasion with gradual extending infiltration.

We cannot disregard the most workable of all hypotheses in the field of cancrlogy—namely, “that a living parasite lies undiscovered lurking behind the mysteries of carcinoma”; lesions, sometimes gross, oftentimes imperceptible, permitting of the ingress of this *contagium vivum*. Consequently you cannot neglect the advocacy of early removal of doubtful lesions, because operation prior to extension beyond the local condition is eminently satisfactory.

From a single small initial lesion the course of all the subsequent progressive and agonizing manifestations can be traced. A minute fissure, excoriation, or ulcer remains for a few weeks without healing, meanwhile being rubbed by the irregularity of a projecting tooth or denture, but at the end of this short period occasional burning with progressively distressing pains radiating from the ear are experienced. The little ulcer has extended, and within the brief space of a few weeks evidences the characteristic marginal induration with a limitation in the free movements of the tongue. The lymphatic glands, at first tender, have now become definitely palpable. Profuse and disconcerting salivation with an insufferably fetid breath hail the falling off of the general health and the presentation of one of the most hideous and piteous sights we meet with in our practice.

Conversely it is neither the leukoplague nor the single typical ulcer with its indurated, cavernous, ragged edge, nor yet several small nodules which eventually coalesce in the formation of an offensive ragged sore covered with a granular surface, but a diffusely infiltrated tongue with multiple distinct sores which the clinician finds—a rapid lingual carcinomatosis as is sometimes seen in other organs—for example, mamma, stomach, and uterus. Though the early appearance of this affection is a fissure or ulcer, hard to the touch, puckered in appearance, and productive of pain, a carcinomatous ulcer of the tongue may continue for weeks and even months without giving rise to pain or any inconvenience.

The patient too often delays seeking medical advice, whereas owing to the absence of the fourfold classical signs—pain, fixation, offensiveness, and deep ulceration—the practitioner applies a caustic, hoping, despite his constant fear of being in error, that the ulcer will heal.

As members of the medical profession we must constantly bear in mind that “success rests with early and accurate diagnosis”; this all-important question demands the co-operation of the laity with the medical profession. Every patient should be subjected to a thorough examination, due caution being taken neither to overlook any suspicious sign nor to disregard any symptom appreciated by the patient. The surgeon should be cognizant of and employ every assistance which pathology at the present day affords, otherwise he is liable to some cruel surprises when the results of his indifferent clinical acumen are exposed by the microscopist's subsequent revelations—the patient may unfortunately suffer and the blunder may never be published.

Situation.—Though any part of the tongue may be affected, especially when the patient has been the subject of syphilis, the edges exposed to trauma from the teeth are the more usual sites for epithelioma.

There are five particular points at which carcinoma linguae is found (see Diagram 1); three points coincide with the situation of glands:

- (a) Glands of Weber.
- (b) Intermediate group of glands (Evans).
- (c) Glands of Blandin and Nuhn.

The other two points are respectively:

- (d) Anterior sublingual region—sublingual.
- (e) Posterior paralingual region—faucio-glossar.

A knowledge of the lymphatic system is important, but we are not, despite the work of Poirier and others, completely equipped in this matter; further, we cannot expect to be certain of the lymphatic glands of the neck until a more accurate knowledge is obtained of the embryonal

segmentation in its relation to the ultimate complexity of the floor of the mouth and region of the primitive branchial apparatus. From experience based upon a close study of congenital lesions in the branchial region (Hunterian Lectures, 1907) I am led to consider that the lymphatic glands, which demand attention both clinically and operatively, are all situated above the omo-hyoid muscles.

In cancer of the tongue the “lymphatic gland infection-path” leads sooner or later, directly or indirectly, into the deep cervical glands; but be it closely noted that enlargement of lymphatic glands is preceded by (1) an insidious cancer cell growth; (2) a tenderness without distinctly palpable lymphatic glands.

It is even possible that the patient may seek advice for a persistent tenderness in the neck and enlarged lymphatic glands before any attention has been paid to the primary lingual focus.

Cancer of the tongue owes its rapid extension beyond the domains of surgery to the fact that there is almost a complete absence of fibrous tissue in the tongue; accordingly there springs up no barrier to oppose the rapid extension, and the diagnostic hard edge of a carcinomatous ulcer of the tongue is frequently absent, whereas a chronic septic condition may rapidly diffuse and a syphilitic lesion fail to present its typical appearance. Far be it from me, therefore, to criticize severely or adversely those authorities who state that removal of lymphatic glands scarcely

Diagram 1.

affects the final results. If the palpability of a lymphatic gland is the only criterion for its removal, we have not grasped the “invasion paths of cancer” and are negligent of the myriads of “implanted cells” which lie not only between the focus and the lymphatic glands but even beyond the glands themselves, as hereby the operator only removes a centre and disregards the lines of communication and channels of dissemination.

I will not trouble you with statistics of great authorities, past and present—mere records of their work. Experience, which cannot be dispensed, each man has to gain for himself. Nor will I now treat of the details employed in the varying operative procedures which may be adopted in accordance with the demands of each particular case.

Patience, ingenuity, and constant attention are necessary in inradicable cases, because neither in agonizing distress to the patient nor in offensiveness to the attendant—during the later stages of his affliction—is cancer of the tongue exceeded, except possibly by recto-anal cancer.

Cancer of the Floor of the Mouth.

Any ulcer or lump under the tongue demands that the clinician shall not forget consideration of the glands of Blandin and Nuhn, the possibility of calculi in the salivary ducts, and the organization of thrombosed veins, extra-vascular or intracystic haematomata.

No suspicious focus in the floor of the mouth should escape skiagraphy.

Salivary calculus often presents the following associated