OBSERVATIONS

ON

YAWS,

AND ITS INFLUENCE IN ORIGINATING

LEPROSY;

ALSO OBSERVATIONS ON

ACUTE TRAUMATIC TETANUS,

AND

TETANUS INFANTUM.

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TO

SIR GEORGE BALLINGALL, M.D.,

PROFESSOR OF MILITARY SURGERY IN THE
UNIVERSITY OF EDINBURGH,
LATE PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS,
&c. &c. &c.

My Dear Sir George,

There are few to whom I could dedicate these pages with so much propriety as to yourself.

Your extensive knowledge of tropical diseases enables you justly to appreciate the usefulness of a work like this, having for its object the simplification of treatment, and the prevention of maladies which have hitherto proved so destructive throughout the West India Colonies.

In addition to these considerations, I am allowed an opportunity of gratefully acknowledging many friendly offices conferred upon,

My Dear Sir George,

Yours very truly,

JAMES MAXWELL.

PREFACE.

FEW diseases have more claims on the attentive consideration of the physician than Yaws, yet few have been less explicitly described. So far as I know, there is not a treatise upon this disease to which the junior members of the profession can confidently refer to as a guide when they commence practice.

The late Dr. James Thomson has left the most original and best monograph on Yaws, in the Edinburgh Medical and Surgical Journal, with which I am acquainted; but his observations are too restricted for general utility.

To supply a desideratum long required, I have been induced to submit the result of my observations and experience to the public, and this determination has been considerably influenced by the favourable opinion which the Senatus Academicus of the University of Edinburgh has expressed in regard to the practical usefulness of such observations, by awarding a Gold Medal for my Inaugural Dissertation on this Disease.

Medical practitioners in the West Indies have but

too generally considered the Yaws to be beyond their province, and its treatment has almost been consigned to the negroes by tacit consent. This is partly owing to the ignorance and superstitions of the blacks, which present almost insuperable impediments to our acquiring an intimate knowledge of the disease, as well as to the disgusting nature of the malady itself. A wide field for interesting inquiry remains open for zealous cultivators of medical science in reference to Yaws; and no one can be more sensible of the imperfections of the present treatise than the Author himself.

The views which I have adopted of Yaws being the source from which Leprosy originally sprung, and afterwards spread over the globe by virtue of its hereditary power, are for the present only slightly adverted to, as it is my intention to pursue this subject at some future period.

It has been my aim to simplify the treatment, and to insist upon the total abolition of mercury in the cure of Yaws, being convinced that any apparent advantages which might accrue from its exhibition will be more than counterbalanced by the uniformly distressing consequences arising from the use of that mineral.

The figures representing the progressive appearance of Yaws are rudely sketched, but the character of the disease is so far faithfully represented.

The observations on Tetanus Infantum have already led, and no doubt will continue to lead to the general adoption of the prophylactic treatment, as simple as it is efficacious in preventing the occurrence of an irremediable disease, which has hitherto exerted such a depopulating influence in the West Indian Colonies.

How far these objects have been attained, *time*, and the subsequent observations of others alone can determine.

EDINBURGH,
November 1839.

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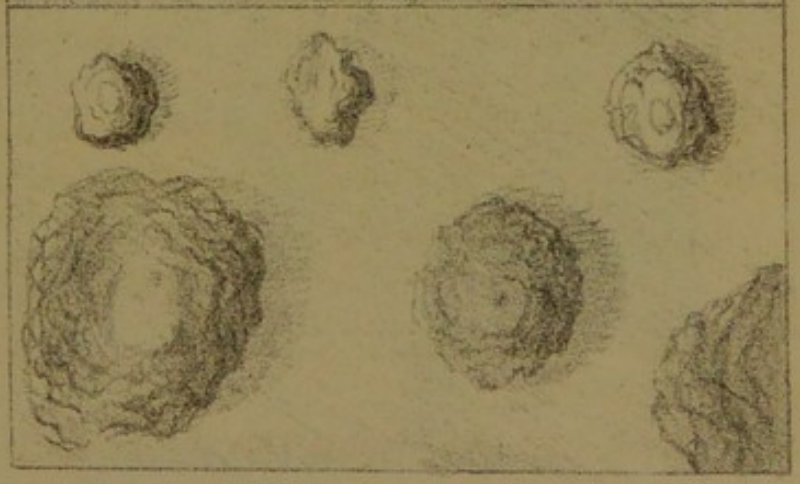

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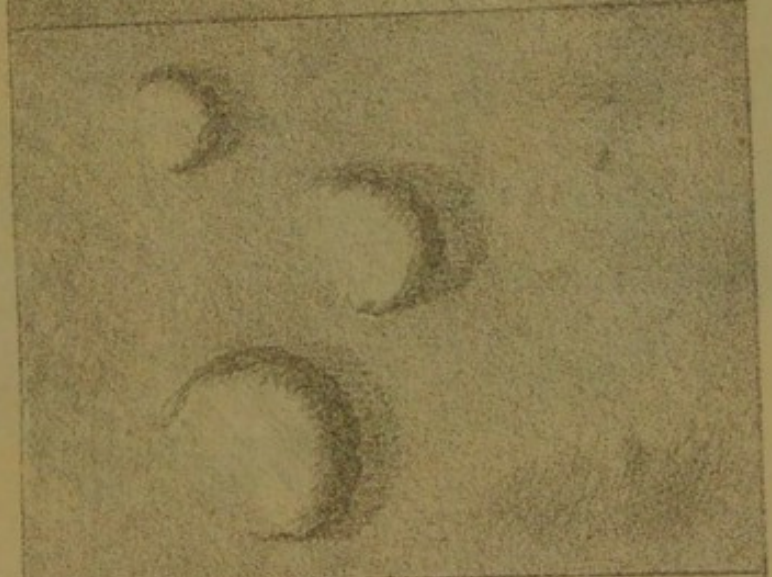

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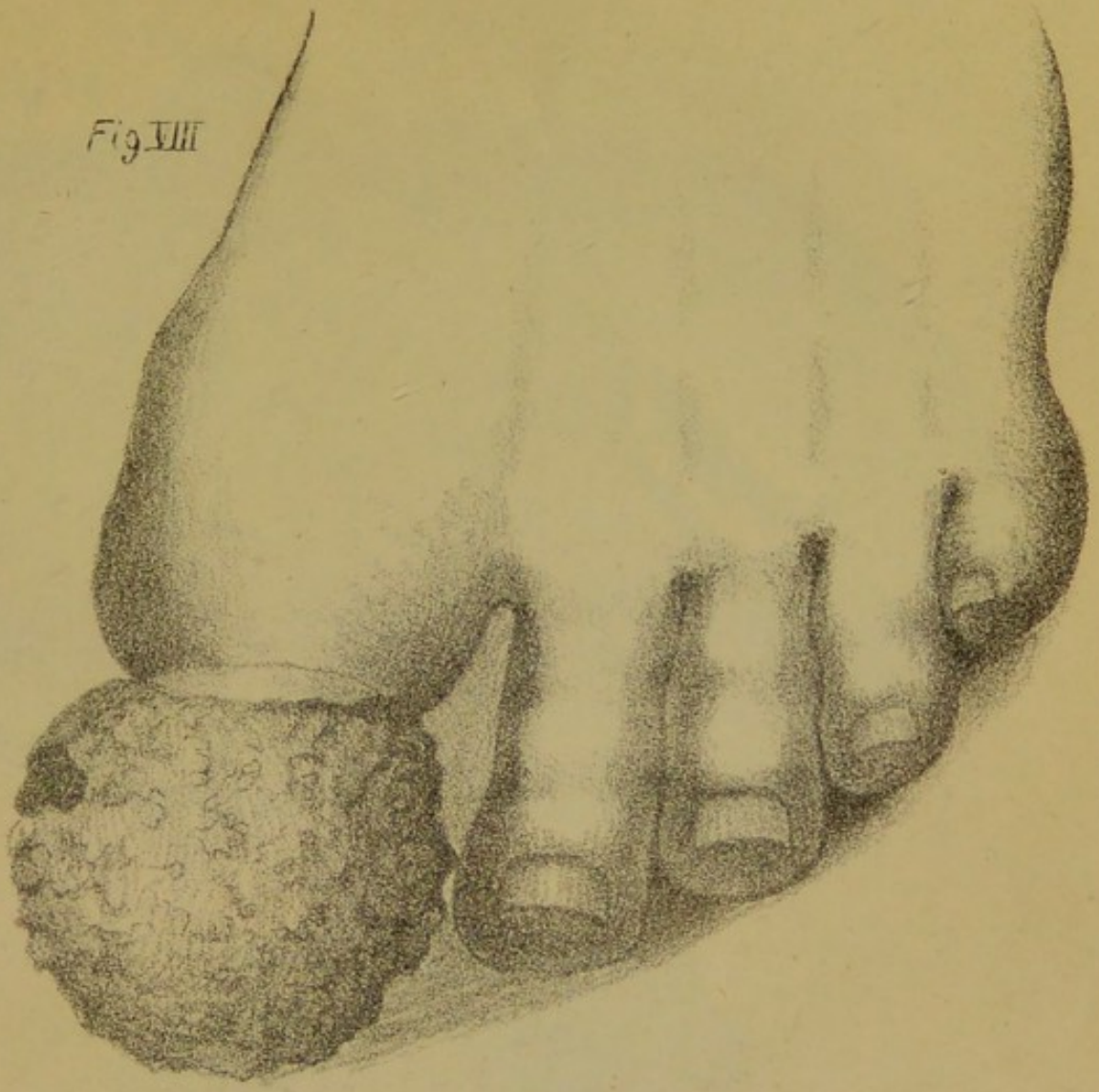

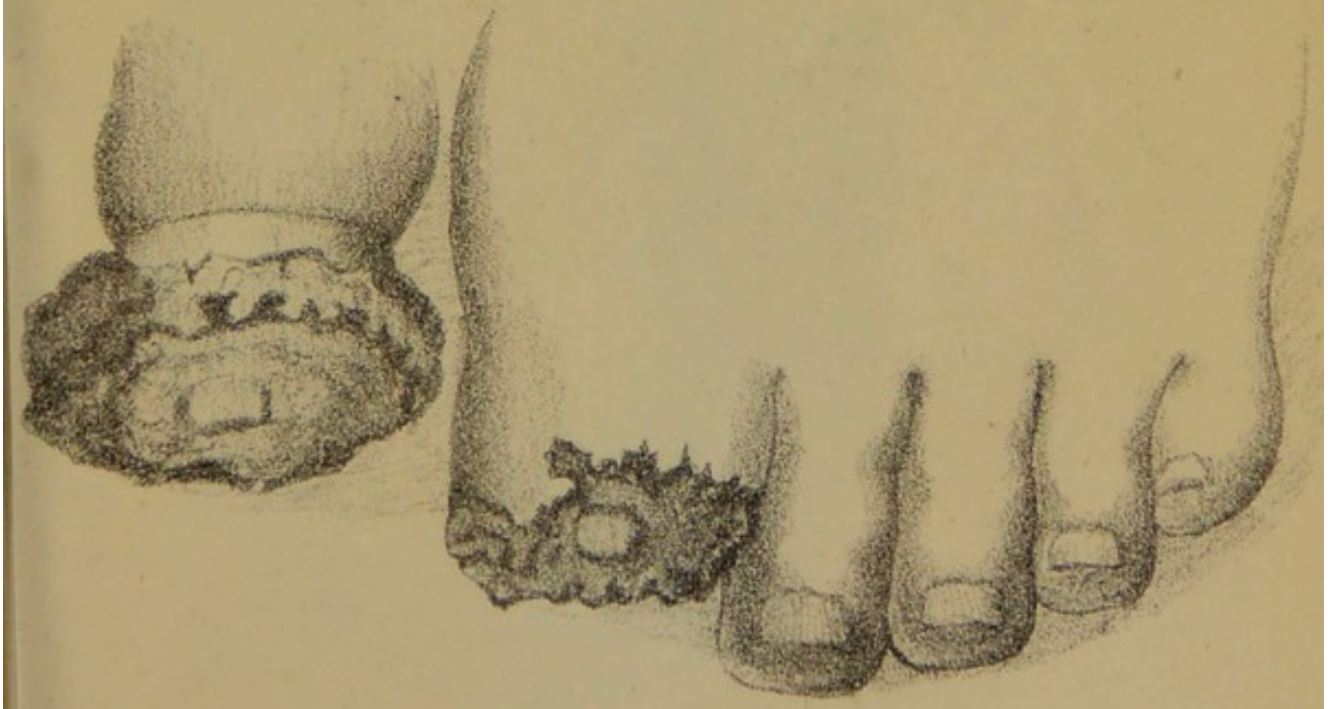

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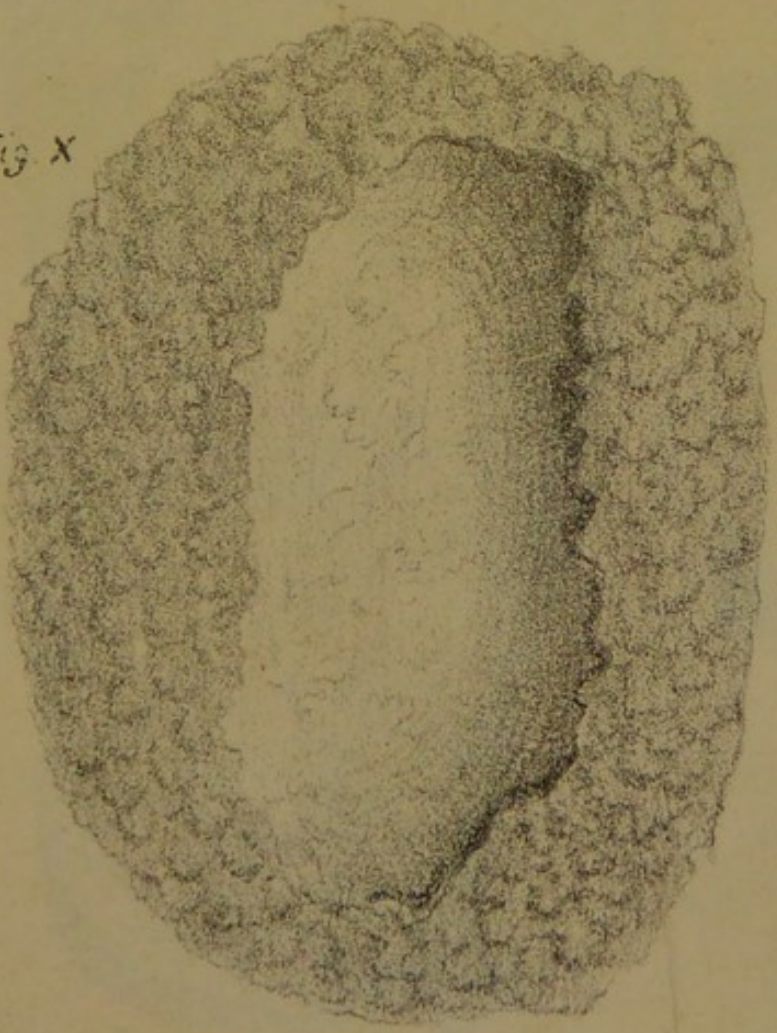

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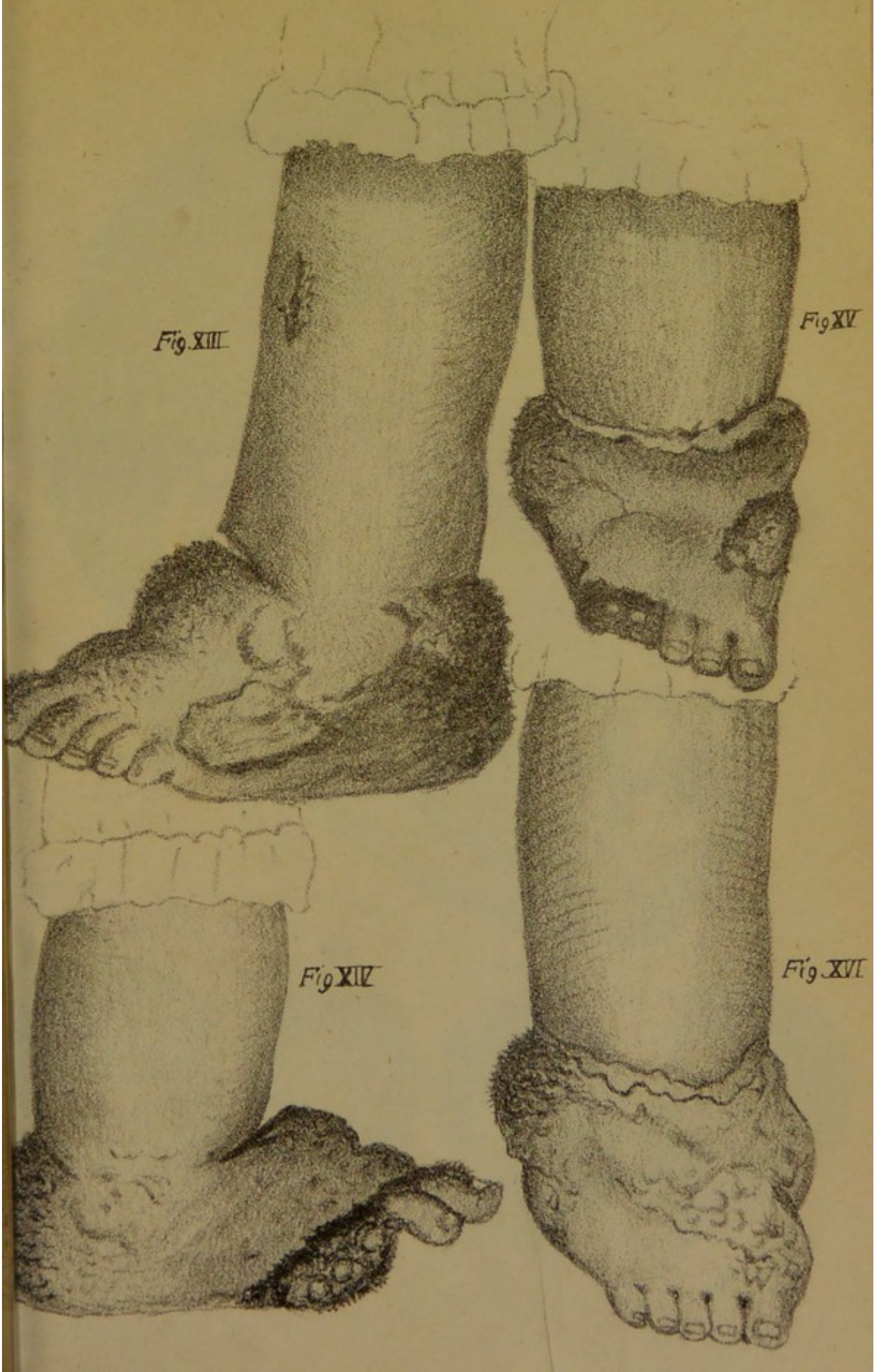
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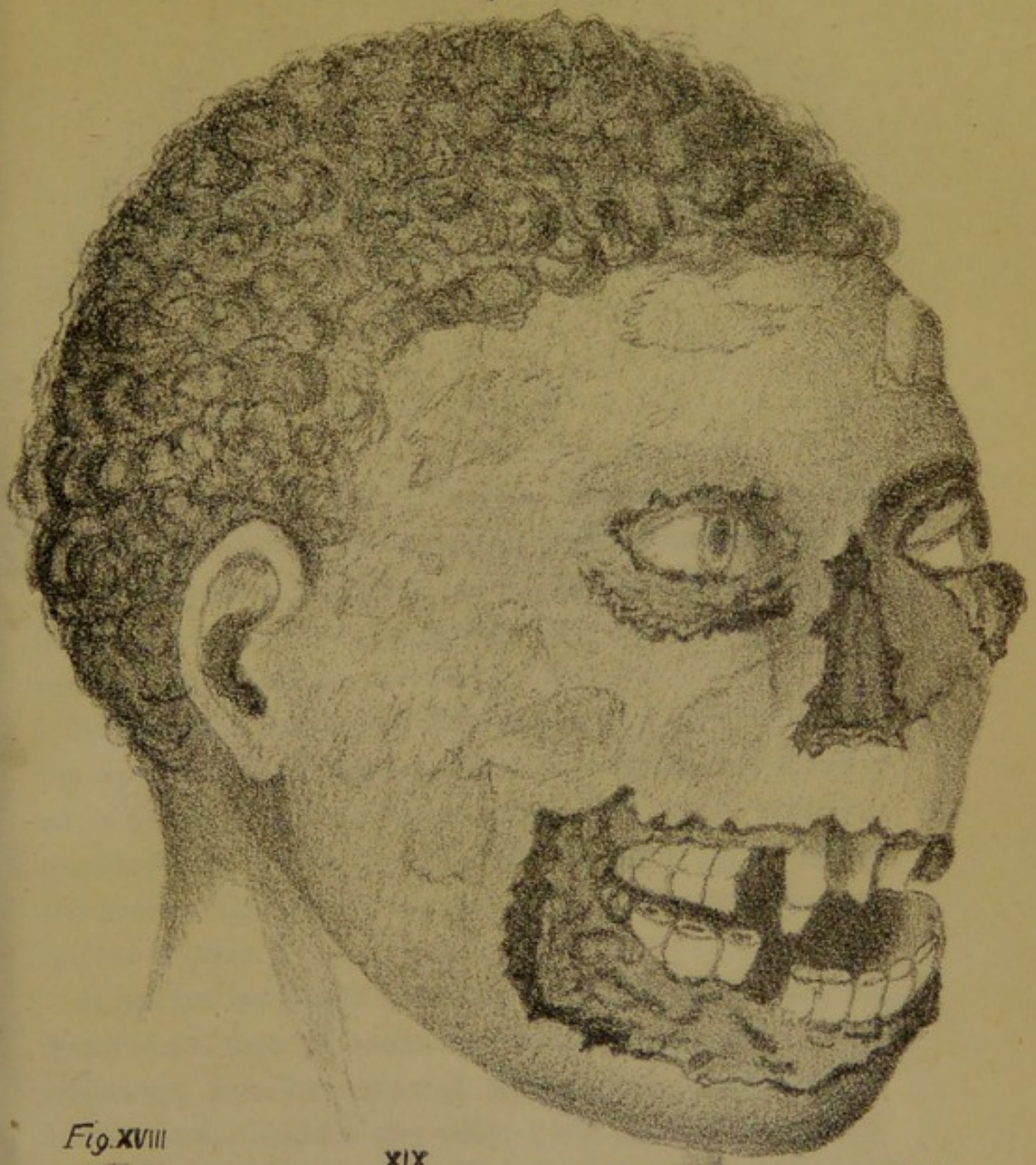

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OBSERVATIONS ON YAWS.

CHAPTER I.

Yaws is a disease of African origin, accompanied by one or more eruptions of amber-coloured fungoid excrescences of various sizes, appearing at an indefinite period after inoculation, capable of propagating itself by contagion, and running an indeterminate course.

It has been considered by some authors identical with the leprosy of the Jews, a disease which Moses has described in a diffuse and obscure manner; but, upon attentive consideration, it will be apparent that the plague-spots of the ancient Egyptians possessed none of the specific characters of yaws.

It has had various fanciful terms applied to it, such as, Frambœsia, from its resemblance to a raspberry, Rubula anthracea, from its supposed likeness to a blackberry or burning coal, besides many others; but there appears to be no reason why its present well known name of Yaws should be changed. I shall therefore retain it throughout these pages.

Ludford,* Winterbottom,† and Thomson‡ have describ-

* Ludford de Frambœsia. Edinburgh, 1791.

† Winterbottom's Account of the Native Africans, Vol. II.

‡ Dr. James Thomson. Med. and Surg. Journal. Edin. Vol. XVIII.

ed yaws as an exanthematous disease, accompanied with an essential eruptive fever, having its periods of efflorescence and decline, and appearing only once during the lifetime of the patient. This is taking a very superficial view of the disease, and is drawing its character more from certain appearances which occasionally occur, than from the combined phenomena usually observed during its progress through the system.

There can be no doubt that, in the generality of cases, there are cutaneous precursive eruptions ushered in by febrile symptoms, but they are so extremely irregular in their appearance, character, and duration, that even admitting they were exanthemata in the strict nosological meaning of the term, and that they had their regular periods of efflorescence and decline, it would still be insufficient to restrain the consecutive and diversified eruptions of yaws within the limits of the exanthemata.

The series of morbid changes which result from the introduction of the poison of yaws, from the primary cutaneous efflorescence, to the various appearances assumed by reiterated crops of fungoid excrescences, and depascent ulcers; the tendency which the disease has to reappear at indeterminate periods during life, producing all the phenomena of local and constitutional symptoms, and its power, under certain circumstances, of transmitting itself by hereditary descent, under an assumed form, render it exceedingly difficult to assign it a proper place in nosological arrangement.

The truth of this remark becomes apparent, when we consider the number of distinguished writers who have failed to arrange this disease in a satisfactory manner. To place it in the class Cachexia would be very erroneous, as we occasionally observe yaws to run a favourable course without a symptom of constitutional disturbance; to ar-

range it as a tubercular disease would display a want of knowledge of its varieties, as it sometimes passes through the system in the form of one or more ulcers; and to call it a rash, would be to restrain it within imaginary bounds, and to pourtray its character from occasional contingent appearances.

Without attempting to trespass farther upon the province of the nosologist, I shall rest satisfied with endeavouring to give a faithful delineation of a disease which imbitters the lives, and blightens the prospects of thousands of our fellow-creatures; and, if these imperfect sketches should tend to lessen a pang of human misery, or excite a spirit of inquiry into the nature of a loathsome and destructive malady, I shall be more than amply rewarded.

Precursive Eruptions.—Yaws is generally preceded by symptoms of constitutional derangement, which not unfrequently appear for weeks before the development of the primary eruptions. The patient loses flesh, becomes unusually pallid, listless, and inactive; is affected with pains of the larger joints, aggravated at night, and to these are superadded distinct febrile accessions, succeeded by a cutaneous efflorescence.

There are two common varieties of precursive eruptions.

The first consists of dry tesselated scaly patches, not unlike Pityriasis versicolor, and exhibits a remarkably distinct appearance upon the skin of a negro, as if lime-water had been dashed over the surface. (Fig. 1.)

This eruption is considerably influenced by constitutional peculiarities, and is sometimes a precursor to each successive crop of yaws; its duration is so uncertain, that in some rare instances it accompanies the disease to its termination; but in by far the greater number of cases its continuance varies

from ten to fifteen days. The parts most commonly affected are the bends of the arms, hams, chest, neck, and forehead; and, if viewed through a glass, groups of minute papulæ may be observed interspersed amongst these exfoliations of the cuticle, shaded by a slight erythematous blush, and attended with intolerable itching. By watching the progress of these papulæ, some may be seen gradually to increase without suppurating, and to acquire a granular fungoid character, while the greater part will recede and desquamate with the superficial eruption.

In the second variety, the patient complains for several weeks of diurnal accessions of fever, severe harassing pains of the large joints and cylindrical bones, which become exceedingly annoying during the night; he loses flesh and turns sallow; but is partially released from these symptoms by the appearance, on various parts of the body, of numerous smooth ovoid or circular blotches, of a dark brown or dull redish colour,* varying in size from a shilling to a crown piece. These blotches are occasionally succeeded by a profuse vesiculo-pustular eruption, (Fig. 5.), more particularly on the forehead and face, of a straw colour, with stigmatized apices, which contain a sparing quantity of lymphy fluid. The smaller dry up and gradually disappear with the exfoliation of the cuticle, while a few of the

* When a negro suffers from chronic illness or repeated febrile attacks, the healthy jet black colour gradually acquires a sallow tinge, the lips become pale; and not only are blotches of various hues rendered palpably distinct, but the different shades of exanthematous diseases are perceptibly displayed, although not in such clear colours as on the European skin.

The effects of blushing are not so finely seen on the face of a black as a white person, but those conversant with negroes can readily distinguish the effects of mental emotions by the countenances assuming an appearance of fulness or turgidity, as in passion, or during the act of blushing, from the surcharge of the capillaries.

larger assume a fungoid form, and progressively increase to full-sized excrescences. This eruption is well known to the negroes under the name of *Guinea-corn* yaws, from its resemblance to the small round whitish seeds of that grain; and, when it occurs in a person of a cachectic habit, it very often ushers in the ulcerated form of the disease. Sometimes these varieties coexist, and recede as the yawy eruption becomes developed. It is impossible to speak with certainty of the duration of these dark discolorations of the skin, but they are generally more chronic in their nature than the scaly efflorescences, and are more frequently the precursors of ulcerative than fungoid yaws.

Varieties.—For the sake of convenience, the yaws may be classed into the fungoid and ulcerative, and every other variety ought to be considered as modifications of these two forms. These varieties depend upon constitutional idiosyncracy, and not on any specific difference in the morbific poison; for we are warranted in believing that the fungoid yaws is the normal state of the disease, from daily observing every other form to spring from this source.

The first, or fungoid, is by far the most common, while it is also the mildest variety of yaws.

The term tubercle has been applied to designate this eruption, not in its usual pathological sense, but agreeably to Willan's definition, in his order Tubercula, where he defines it to be "a small hard superficial tumour, circumscribed and suppurating partially." This does not appear to me to convey a sufficiently precise meaning of the nature of the eruption of yaws, indeed, it is difficult to fix upon any term sufficiently characteristic of the disease; but I give the preference to fungus, with some modification, as approaching nearest to the real nature of a yawy excrescence,

more especially the larger groups of them, where they are soft, excessively tender, and bleed from the slightest irritation.

Shortly after the appearance of the preliminary eruption, or contemporaneous with it, small pimples or pustules may be observed in detached clusters on various parts of the body, some of which assume an active form, and gradually and imperceptibly increase in circumference, until they have acquired their greatest magnitude, and vary from the size of a split pea to that of a fig. (Fig. 3.) They acquire a rough granulated fungoid character from a very early period, and never contain purulent matter, but are covered with a glutinous film, formed from the exudation of fluid from their surface, which gives them an appearance as if coated with yellow varnish, and which does not fill up the deep irregular fissures peculiar to these excrescences. If this glutinous crust be rubbed off, the surface beneath displays a florid red and extremely irritable appearance, is excessively tender and painful, and bleeds from the slightest touch. If left undisturbed, they are soon coated with an opaque amber-coloured secretion, which serves to protect them from external influences; and if no peculiar constitutional symptoms supervene, the principal yaws preserve their character with but little deviation during the continuance of the crop. The time which these yawy excrescences take to arrive at maturity is so obviously influenced by peculiarities of constitution and other causes, that no definite period can be assigned for their duration, and we may expect to see differences in the eruption as these circumstances exist. In young persons, in the plenitude of health, the fungoid excrescences are often fully developed in a month; whereas, on the other hand, when the system is impaired from previous ill health, they require several

months, and after all never form properly. In some cases the crop of yaws appear to shrink or recede from accidental circumstances, leaving dark-coloured blotches, and upon a favourable reaction taking place, they again emerge and arrive at their full size. "The same constitution may be apt to receive or produce it at one time more than at another, and if it is produced by external infection, may hasten or retard the symptoms. This I know by experience, that negroes who were lusty and in good plight, and had full nourishment allowed them, in a month after discovering the white spots, have had several yaws as big as a mulberry; and the negroes that were low in flesh, and have had but a poor scanty diet, in three months time none of the yaws have exceeded a common strawberry in size."*

When the eruption of yaws has acquired its full magnitude, it remains stationary from a period varying from two months to as many years before it makes room for another crop, and during the whole of this period yaws of various sizes may be seen successively to advance, arrive at maturity, and recede, without influencing or changing the character of the larger excrescences, and these desultory eruptions continue up to the time when the disease is about to make a temporary retreat, when they simultaneously disappear. The usual character of this variety is circular or nearly so, of a convex form, indented with irregular linear fissures or furrows projecting from the surface a few lines, and sometimes environed with whitish and faint redish-coloured areolæ close to their base. In this, as in all other diseases, deviations from the normal state may be occasionally observed, and instead of the eruption advancing in a

* A Description of the African Distemper called Yaws.—Medical Essays and Observations. Edin. Vol. V. part II. Edition IV, p. 313.

progressive manner, from minute points to form into yaws, they are sometimes to be seen opening to view as large as the flattened heads of brass nails, smooth, upon a level with the skin, and protruding slowly through the receding or absorbed cuticle, shaded with an annular border of a darker hue than the negro skin, and becoming in time large amber-coloured excrescences.

After an eruption of yaws has acquired full maturity, it begins to decline by gradually shrinking or receding without the formation of crusts or scabs, Fig. 4, and the process with some is accomplished in a few days, while in the majority it will take several weeks. The parts previously occupied by yaws, more particularly the larger excrescences, are marked by an evanescent dusky shade, and have a puckered shrivelled appearance, but the cuticle soon regains its natural colour, and the corrugated spots become so perfectly obliterated that an indent of the skin cannot be perceived. Ludford, Adams, and others, assert that the larger excrescences invariably leave persistent scars, but this is only observed in very rare cases of yaws, where the parts have been destroyed by ulceration, and never in the fungoid form of the disease.

A solitary fungus has sometimes been all that has appeared of the disease, and where this happens, it frequently occupies one of the toes. The circumference of the skin contiguous to the nail becomes smooth, shining, and inflamed, and assumes a vesicated appearance; or it originates beneath the nail like a whitlow, quickly destroying it, and forms into a bright florid fungus, which acquires the size of a lime, is excessively irritable and painful, and bleeds from the slightest touch. If at any time the disease bears a similitude to a raspberry, it is where the distal phalynx of the great toe is affected in this way, and it is perhaps from the

faint resemblance which it then has to that fruit that early writers applied Frambœsia as a general term. Through the medium of this granulated toe (Fig. 8.) alone, the suceptibility of the disease is now and then as effectually destroyed as if successive crops of well defined yaws had appeared, not however before the patient has very frequently lost one or more joints of his toe. The extent of the fungoid eruption varies from a single excrescence to confluent yaws, where the whole surface is covered so thick that they encroach upon each other; in the latter case, there is a remarkable turgescence of the skin, from increased capillary circulation, and the face assumes an unnatural aspect as in aggravated cases of small pox.

The neck and arms, the nates, perinæum, labia, inside of the thighs, and the skin over the orbicular muscles of the mouth, are, most frequently, occupied by this variety; and it is by no means uncommon to see the scrotum involved in one fungoid excrescence. The prepuce is also frequently affected, but in no instance do I recollect having seen the glans the seat of fungoid yaws. Mr. Mason, who writes a sensible Essay on Yaws, has fallen into an error in supposing "the mucous tissues incapable of producing yaws tubercle."* That an attack on these membranes is an unfrequent occurrence I am ready to admit, but cases have occasionally come under my observation where the mucous tissues, not only of the throat and nostrils, but also of the ears, were affected, and although much inconvenience was experienced, from these delicate parts having been the seat of yaws, they always disappeared with the general eruption, and when the constitution was unimpaired, no disagreeable consequences followed. The yawy fungus in

* Edin. Med. and Surgical Journal, Vol. 35. p. 55.

the throat has not inappropriately been likened to a piece of toasted cheese; and I have, in a few cases, seen the palate and fauces occupied with excrescences, when the dermoid tissue was very partially affected.

Dr. Thomson is inclined to think that each successive crop becomes fewer in number and larger in size, till the disease is expended; such is occasionally observed in very favourable cases, where nothing interferes with the regular succession of the eruptions in a vigorous constitution; but when this form of yaws exceeds its ordinary duration,* and the visits are of more frequent occurrence than usual, or when it reappears, as it occasionally does, after an absence of several years, the health becomes impaired, and each succeeding crop is so palpably influenced by these circumstances, that the disease generally loses its fungoid character, and merges into ulceration. Symptoms of a more serious nature now arise, marked by racking deep-seated pains in the bones, periostial swellings and nodes, followed by ulcers in the nose and throat, extending to the larynx, which render the case exceedingly difficult, and the patient often dies in a state of extreme emaciation.

Instead of the eruption appearing in the usual form of round convex excrescences, it occasionally assumes a crescentic or annular shape, (Fig. 6—7.) sometimes completing the circle, and leaving the skin in the centre untouched; but, in many cases, where the system has been reduced from severe irritation, it is partially suppressed, and never becomes fairly developed, till, at length, an ulcerative process is induced, which terminates in the breaking up of the constitution, unless the health be speedily improved.

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* When the disease is left to itself in good constitutions, or, what is much the same, when treated by the negroes with native simples, the majority of cases terminate with the third crop of yaws.

This has been called the Ring-worm yaws, from a supposed resemblance which it has to that disease; and its deviation from the normal state may generally be attributed to an impaired state of health. I have frequently endeavoured to change the features, both of this and the ulcerative form of the disease, by inoculating from healthy persons, in whom the large benignant yaws existed, but, as might be expected, without success; and it was only by improving the general state of the health, by remedial and dietetical means, that a change could be effected, and when the habit was sufficiently improved, the subsequent eruption displayed the fungoid character.

In persons of a cachectic habit, who unfortunately contract yaws, instead of the raised excrescences displaying the usual amber-colour, they are flattened, and assume a dull lurid appearance, and have, as a frequent accompaniment, Ecthema cachecticum interspersed.

In infants and children, labouring under hectic fever, marasmus, or other chronic diseases, the consequence of incessant irritation, the eruption becomes dark and melanotic before it strikes in, and either dysentery supervenes and proves quickly fatal, or it terminates more slowly by effusion in the chest or abdomen.

There are other trifling varieties, which depend altogether upon causes affecting the constitution, and not from any specific difference in the virus; as it is well known that the whole children on a plantation may be inoculated from a favourable case of yaws, and that the disease will present as many shades of difference, as there are peculiarities amongst the persons affected.

Some confusion has occurred in reference to what, in negro phraseology, are called Master and Mamma Yaws, many considering the terms synonymous, but there is a material

difference, inasmuch as the former is a fungus of unusual size and activity, while the latter is an ill-conditioned ulcer.

The *Master-Yaw* differs in no respect from the others except in size, and this circumstance is owing to the increased activity or inflammation of the part; indeed, the term is altogether fanciful, for in well developed fungoid eruptions, where numerous large excrescences exist, I have been puzzled to say which was the master yaw, until the patient pointed to one which he regarded with more consideration than the others. Many talk of this yaw with as much confidence as if it were characterized by infallible distinctive characters, and give directions for its local treatment on the supposition that, if it can be made to yield, the rest will immediately disappear.

Dr. John Hume, who was surgeon to the Naval Hospital, Port Royal, Jamaica, upwards of a century ago, advocates this popular belief, and says, that "the Master-yaw, when in full bloom, is merely topical, and easily cured by topics, although it contains infection enough to produce the yaws in hundreds by inoculation."* Another opinion prevails, that it originates upon the spot where the virus was first introduced, and that it is always the last in healing; neither of these is correct, although it would be reasonable to suppose that a fungus, embracing twice the size of the others, will generally be longer in healing than those of less dimensions. When situated upon the knee or elbow-joint, it occasionally assumes a conical appearance, not unlike Rupia prominens.

The *Mamma-Yaw*, when it occurs, generally precedes the eruption, and invariably takes up its position on the lower

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* Medical Essays and Observations. Edinburgh. Vol. V. part II. 4th edition.

extremities, fixing upon the toe, or ancle, or upper part of the foot, and occasionally heals with the first or second crop. It, however, more frequently continues during the progress of the virus through the system, and if, unfortunately, the patient falls into bad health, it is apt to become phagedenic and spread, communicating its destructive influence to the bones, and may preserve its obstinate character long after the specific poison has been eradicated.

The Second or Ulcerative Variety—Only occurs where the general health is impaired, and where the system is inadequate for the development of the eruption in its more prominent form. In this variety, the patient is long harassed with bone-ache, swelling of the large joints, and restless nights from nocturnal exacerbations of pain; and after suffering in this way for weeks together, partial eruptive blotches, and scaly efflorescences appear, introducing in some cases a few fungoid excrescences, which are generally quickly absorbed, and their places supplanted by ulcers. In some cases, the first indication of this form is a dull smooth shining appearance of the toes, followed by ulceration, depriving them of their nails; and when it assumes a chronic state, some of the phalanges are occasionally destroyed. If during these desultory attacks, a favourable change can be effected in the health of the patient, we may have the gratification to see the normal disease prevail over this exceedingly annoying variety, but notwithstanding all our efforts, it sometimes pursues its sullen course, and imperceptibly glides into a form which will be more fully noticed hereafter. Persons labouring under the malus corporis habitus, or those whose systems are deeply tainted with hereditary leprosy, are more liable to ulcerative yaws, than those whose constitutions are sound; and under such circumstances the disease may be invariably regarded in an unfavourable light.

The slightest atmospherical vicissitudes, or the accidental occurrence of fever, often cause the eruptions to recede, and the ulcers prematurely to dry up, and puffy swellings of the joints, deep-seated pains of the bones, nodes and exostoses, pave the way for a fatal termination of the malady by dropsy. In many instances, this imperfectly developed form of yaws is accompanied with blotches, and scaly eruptions throughout, and these combined circumstances exhibit an index to the general state of the constitution; and the danger of ultimate bad consequences, will be in an inverse ratio to the healthy state of the system.

Those conversant with the disease know, that after the preliminary eruption, many pass through yaws with no other sign than an ill-conditioned ulcer situated on the lower extremity, possessing the following pathognomonic characters: An ulcer of a dull livid character, covered with unhealthy fungoid granulations, which occasionally rise higher than its edges, and bleed from the slightest irritation; discharging a peculiarly disagreeable fœtid ichor, with edges environed with a whitish elevated turgid border, from half an inch to an inch in breadth, rough, spongy, and as if partially vesicated, and attended with acute pain. This ulcer is technically called the Mamma Yaw (Fig. 10.) by the negroes, and through it alone, the susceptibility of the disease is at times exhausted. In some patients it assumes a modification of form, and appears on a line with the adjacent skin, thickly studded with minute whitish spongy flattened granulations, like millet seeds, unattended with pain, and having a few large fungoid eminences interspersed, as if rising from a diseased bone. Should these ulcers not possess characters sufficiently diagnostic to enable those slightly acquainted with yaws to form a due estimate of their nature, their judgment may be assisted by at-

tending to the scaly eruptions, or copper-coloured ovoid blotches, which precede or accompany them, and it sometimes happens, that upon minute examination, one or more fungoid excrescences will be found concealed in the axilla, or about the perinæum, which will banish all doubt of the real nature of the ulcers. The virus of yaws appears to have been directly applied to such ulcers while they were in a healthy state, and I have frequently seen the truth of this verified, when common sores progressing favourably towards a cure would suddenly assume a suspicious character, remain stationary, and the granulations be absorbed. If any doubts existed relative to the exact nature of the change which the ulcer had undergone, they were soon dispelled by the development of concomitant eruptions, obscure febrile symptoms, and pains of the larger joints. A boy of a fair complexion contracted a small sore upon the external malleolus of his right leg, at a boarding-school; his parents took him home to have it cured, and while the curative process was going on favourably, it suddenly became excavated, and filled with large spongy granulations, attended with acute pain, and bled whenever he attempted to walk. The ancle became contracted, and, when I was consulted, he was reduced to an extreme degree, from constitutional irritation. The great change in the appearance of the ulcer, and the distortion of the ancle, induced the boy's father to believe he had dislocated the joint. I immediately recognised it to be a yaws ulcer, and on questioning them, was informed that there were several cases of the disease in the vicinity, and that the youth had occasionally associated with them in play. He was put under a course of sarsaparilla, and the hydriodate of potass was occasionally administered, his health rallied, and a few weeks from the time I first saw him, three yaws began to appear, which soon acquired a large fungoid

character; the ulcer was dressed with the chloride of lime, and in four months he was cured. He was subsequently sent to England for his education, where he has been for some years, and since my arrival from Jamaica, I have heard of him enjoying uninterrupted good health.

In an excellent anonymous paper, which was intended by the author, Dr. Downer, as an answer to my Circular relative to Yaws, but which, by some accident, was published without his permission before it reached me, that gentleman, in reference to the probability that the morbid poison may be occasionally exhausted through the medium of an ulcer, says, "The yaws thus originated in an ulcer, may run its course without the formation of any tubercles elsewhere than in the ulcer, which may continue for many years, and perhaps to the termination of the patient's life. But even in these very irregular cases, constitutional derangement, and discoloration of the skin are not awanting, neither do I think, on strict investigation, would it be found that the usual febrile symptoms are ever absent. This mode of attack is certainly not very common, yet I am quite sure that the disease occasionally proceeds in this form."*

Crab-Yaws is an affection of the soles of the feet, occurring as sequelæ of the disease. The etymology of this adjunct I am unable to trace, unless it be derived from the sinister manner in which the land crab (Cancer ruricola) walks, as applied to the helpless state of those whose soles are covered with these painful excrescences, causing them to walk on the sides of their feet with extreme caution. From negroes going habitually without shoes, the cuticle of the feet is subject to much pressure, and consequently becomes excessively thickened; the formation of fungi on the subjacent

* Jamaica Physical Journal. November 1836.

cutis, and their confinement under the dense unyielding cuticle, produce intense pain, and strong constitutional disturbance when they are approaching to the surface; and, unless assisted in their progress, it will require several weeks before their transit be completed; this is accomplished by the gradual process of absorption of the indurated mass, which at length cracks, and allows the crab-yaws to protrude. Negroes are very expert in paring the thickened cuticle, to allow both these and collections of matter to escape. They are exceedingly prone to subcutaneous inflammation, which terminates in an abscess, vulgarly called "stone bruize," and which, if not early opened, frequently insinuates itself amongst the muscular and tendinous substance, and either appears at the sides or the top of the foot, and in some cases produces extensive sloughing. In rare cases crab-yaws affect the palms of the hands, causing much uneasiness, and, in a case of secondary yaws, I have seen a fungus appear as a sequela of the disease at the point of the thumb, close to the nail, attended with great pain, and proving very obstinate. This affection sometimes appears as a primary eruption, without being followed by the disease in its usual form, and in this way the virus has been exhausted; it likewise occasionally happens during the first, second, or third crop of yaws, but these rare visitations may be considered exceptions to the general procedure of the disease, and their occurrence may be strictly classed as sequelæ of the original affection. Crab-yaws often appear in profusion, in cases where the progress of the normal eruption has been improperly arrested by injudicious treatment, and in some instances they exude a corrosive ichor, which destroys the neighbouring skin, and in this state they are highly contagious.

Running Yaws—Is a loose expression for another con-

secutive affection. It principally consists in a diseased state of the cuticle, at times involving the subjacent tissues, and forming into linear ulcers and honey-comb perforations. (Fig. 11.) The soles of the feet and palms of the hands are occasionally extensively invaded, and portions of the cuticle not engaged in this crebriform ulceration become dry, indurated, and disorganized, and resemble the bark of a decayed tree.

The *Yawy Whitlow* is sometimes observed as a concomitant affection, but it may be more strictly regarded as a sequence of the disease. In most cases the inflammation appears to be of a sub-acute kind, and is not attended with that inordinate pain which accompanies the various forms of Paronychia. It commences with obscure pain, and is followed by an inflamed shining state of the distal phalynx of the finger or toe, which partially forms into a superficial abscess, and is usually succeeded by the loss of the nail. The part then assumes an ulcerated character, devoid of granulations, and is covered with a straw-coloured matter, which, when removed, displays a smooth red irritable surface. I have known the whole toes, and part of the fingers, affected at the same time with this chronic ulceration, in persons whose health was undermined by the virulence of long continued yaws; and it not unfrequently happens that children affected in this way, have recourse to eating various kinds of earth and clay, to afford a tempory relief of a morbid state of the digestive organs. When this complication of evils are allowed to exist for any length of time they prove fatal.

The precise seat of yaws appears to be in the cutis-vera. In the progress of the virus towards the surface, an inflammatory process is set up in a papilla, the structure of which becomes gradually enlarged, and the morbid action is quickly communicated to others, and in their advancement

to the surface, they form into fungoid excrescences of greater or less magnitude; and the superincumbent cuticle is removed by absorption, as in crab-yaws, or it flakes off in scales. In parts unusually vascular, and where the cuticle is thin, as in the lips, scrotum, labia, axilla, &c. the excrescences acquire a greater size than in other situations; and it is by no means uncommon for the whole mouth to be surrounded by a continuous fungus, elevated to about a quarter of an inch, or even more, and extending to an inch in breadth.

The manner in which the fungoid form of the disease disappears has already been described. In the ulcerative variety, after the virus has been destroyed, they heal up as common ulcers, and during this process a beautiful illustration is occasionally observed of the share which the cuticle has in contributing to the black colour of the negro; where, in addition to the closing of the ulcer from its edges, small insulated portions may be seen springing up from the centre, becoming in time covered with black cuticle, and increasing and extending laterally till the loss of substance be supplied.

The characteristic hue of the negro's skin principally depends upon the dark colour of the epidermis, as may be seen in abrasions, extensive detachments by vesication and scalding, and from raising it in flakes, by inserting needles under it. When the cuticle is detached either by accident or by blistering, the subjacent textures are seen of a dull red tint, which appears to be its natural colour, and it continues so during the regeneration of the black epidermis. In these cases, the formation of the new cuticle commences in exceeding minute points, which increase into small patches, (Fig. 12.) and by degrees they coalesce, until the surface is covered with a texture, a shade lighter than the

adjoining skin, but which soon assumes the uniform dark colour of the contiguous parts. The same remark has been made by Professor Rudolphi of Berlin, who "infers from the dark colour of the epidermis, that it is the principal seat of the colour of negroes. An American anatomist also found the epidermis nearly black, and the rete mucosum, the supposed seat, the same tint of colour as in Europeans.*

Latent Period of Yaws.—With the exception of the late Dr. James Thomson of Jamaica, and Mr. Mason, I am unacquainted with any authors who have described the latent period of this disease; nor have I been successful in obtaining information on this interesting point in answer to queries addressed in a circular to my medical friends in that Island. I have ascertained by experiments, that the period which intervenes between the insertion of the virus and the appearance of the fungoid eruption, varies from six weeks to three months. In a few cases of inoculation performed by Mr. Mason, the yaw fungus appeared at the end of three weeks. My former partner, Dr. Robertson, whose opportunities for observing this disease were exceeded by few, writes me, that "from two to three months after the insertion of matter, febrile symptoms supervene, the skin becomes scurfy, and small pustules appear over the body, which gradually proceed toward the formation of glutinous excrescences." Dr. Thomson arrived at a similar conclusion, and makes the latent period extend from seven to ten weeks; and, in addition to a number of direct experiments, he says, in further illustration, that "a number of healthy children were removed from a mountainous situation to a sugar estate. The children were mixed with those already on the property,

* Edinburgh Phil. Journal, July 1824.

and had their meals together; seven weeks after their intercourse three were seized with fever and pains, the eruption appeared all over the body; the rest, at the end of ten weeks, showed symptoms of the disease, and in eight months they had all recovered." A healthy girl of colour under my inspection, was inoculated by inserting matter taken from a favourable case of yaws, into an abrasion on her arm. The part healed up, and exactly three months afterwards a few large yawy excrescences appeared on different parts of the body, attended with no perceptible constitutional irritation, and in three months more they disappeared and never returned.

The difference of time which elapses from the insertion of the virus to the appearance of yaws, is no doubt influenced by idiosyncracy, and the state of the patient's health; but the concurrent testimony of those who have attended to this point, agree that it does not exceed three months. Dr. Adams relates the case of a Danish nobleman, in whom he says yaws appeared ten months after he left the West Indies; but, with every submission to that talented author's general accuracy and judgment, I am inclined, from its history, to think it was a different disease; and an intervening period of ten months is of itself sufficient to establish my position.

When the matter of yaws is inserted into an ulcer, either by accident or design, if it be of any considerable size, it rarely heals until the eruption appears and declines; and, as has already been stated, should the patient labour under an impaired state of health, the yaws may never be fully developed, but will lay dormant in the system, and appear at a future period, in the form of an inveterate constitutional disease. When the virus of yaws is introduced into a slight wound a persistent scab is sometimes formed, under

which a yawy excrescence protrudes, quickly followed by a general eruption, or it heals up, and the matter is carried into the system, afterwards to be developed in parts remote from the original site of inoculation. It is by accidental inoculation that negro children generally contract yaws. The healthy are allowed to mix with the infected, and those with porrigo or itch, or abrasions of the cutis, have the disease readily communicated, either by actual contact, or by flies, and in this way it is indiscriminately propagated, and unfortunately but too often from those whose constitution are deeply tainted with hereditary maladies.

If negroes were less superstitious, and would submit their children to proper medical treatment, the disease might be modified, and many lamentable consequences be prevented, by inoculating under the same precautions which are adopted in vaccinating. We have daily opportunities of observing the mild nature of the disease, when a healthy child contracts yaws from a favourable case, where the constitution is vigorous and unimpaired; and how much more favourable would it be, were we permitted to prepare the system, and select the most benign cases from which matter might be taken, in order to propagate the affection. Negro mothers are so convinced of this, (although they will seldom allow others to interfere), that many of them inoculate their children a little before they are weaned, while they are in good health; and if they have been fortunate in the selection of matter, the disease progresses to a termination, without being followed by bone-ach or other disagreeable consecutive symptoms. If, on the other hand, a child recovering from the effects of severe previous illness, or a person of a bad habit of body advanced in life, should accidentally contract yaws, it invariably appears in an aggra-

vated state, assumes a chronic form, and not unfrequently remains for life.

I was informed, by a very intelligent African negro, that in his country the yaws is called Buba,* and that it is of short duration, in consequence of the great care taken of the infected. He says that inoculation † is general, and that the operation is performed during childhood. In about two months after the matter is inserted, according to his account, the eruption appears like small pox, and afterwards breaks out in a large form. During the primary stage of the eruption, they are not allowed to go into cold water, but as soon as the yaws fully appear, they are anointed with "maccaw fat," (Palm oil,) taken to a river and washed, and every joint is stretched till it cracks; they are again rubbed with palm oil, and should rain fall, they are sent out naked to be drilled in the shower, and anointed upon their return. In this way they are regularly washed, exercised and anointed, and the disease is generally cured in a few months, without being followed by bone-ach. A black woman from Anamaboo, informed Mr. Edwards,‡ "That the natives on the Gold Coast gave their children the yaws by inoculation, and she described the manner of performing the operation to be, making an incision in the thigh, and putting in some infectious matter. I asked her what benefit they expected from this practice? She answered, that by this means their infants had the disorder slightly, and

* The Spanish name for Yaws in South America is Bubas.

† The practice of inoculation for yaws appears to be pretty generally adopted amongst certain African tribes or nations. I have had some interesting accounts from natives brought to the West Indies, of a process which they consider renders the disease shorter and less virulent, when communicated in childhood.

‡ Edwards' History of the West Indies.

recovered speedily: whereas by catching it at a late period of life, the disease, she said, 'got into the bone,' that was her expression." From the above, it would appear that these untutored Africans are aware of the meliorating influence of inoculation in childhood, while they are convinced that the appearance of the disease at a late period of life, proves intractable, and can seldom be thoroughly eradicated.

An opinion prevails among some authors, that yaws, like small pox and measles, may be communicated through the medium of the atmosphere. It is unnecessary to say that this opinion is entirely speculative, and has no foundation in fact; for if this were the case, the whole children in certain districts, and on particular plantations, would be simultaneously affected whenever a case of yaws appeared, whereas it is well known that none contract the disorder unless the integrity of the skin be broken, and virus be directly applied. What may have led to such a supposition, is that the disease is occasionally observed to appear amongst a number of people at the same time, but it is then propagated during the prevalence of some cutaneous eruption, such as porrigo or itch, either by contact or by the common house-fly. A child with a burn or a scald, who is allowed to associate in play with the infected, rarely escapes yaws; and when a general eruptive disease breaks out amongst twenty or thirty uninfected persons, no other agency is required to account for its dissemination than the direct application of the virus.

I have myself often sat for hours in a yaws-house amidst the fomites of this supposed infectious disease, with the patients ranged before me, inspecting them closely, and taking notes of their cases, with no other precaution than

having a person to fan away the flies; and I have seen young men, as book-keepers, daily superintend the same patients for months together, to see that their food was properly administered, and who had not the least dread of contracting yaws so long as the cuticle remained entire.

Dancer says that "an abrasion of the cuticle, or wound, does not appear absolutely necessary; the matter applied to the surface is sufficient."* It would require something more than bare assertion to invalidate the united testimony of the medical men of the present day, who are unanimous in opinion that yaws can be communicated in no other way than through the medium of an abraded cutis.

It is by no means uncommon for servants who have yawy excrescences on parts of the body beneath the clothes, to conceal their complaint, in order that they may not be sent away, and who, during the time that they laboured under an active form of the disease, performed their domestic duties, had constant intercourse with the family, and washed and dressed the children; yet, nevertheless, it was seldom that yaws was imparted under such circumstances. I knew a white man whose child had a regular crop of fungoid yaws, who kissed and handled it with impunity, because his skin was free from abrasion; and Dr. Robertson communicated to me the case of another white man who slept with two of his children while they had yaws, and escaped, owing to the clean unruffled state of the cutis. Instances of this kind might be multiplied, were it necessary, to shew that yaws is never communicated through the atmosphere; and there are no persons practically acquainted with the disease who believe that it is capable of being propagated in any other way than by inoculation.

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* Dancer's Medical Assistant. Jamaica.

Alibert considers the dermoid tissue of negroes to be endowed with an unusual share of sensibility, and asserts that they are more susceptible of yaws than the whites. Hillary and Dancer incline to this hypothesis. The latter says, that "independent of the circumstance of their being more exposed to it from contact with others, they seem to have a disposition to receive it more readily than white people."*

It may seem unnecessary to refute an opinion so perfectly gratuitous, but as it is one of those vague assertions which is copied from one author to another, it is time that it should be laid aside. White children, as well as children of colour, are carefully secluded from negroes affected with yaws, superior habits of cleanliness are observed, and, consequently, cutaneous affections of a contagious nature are propagated with more difficulty. During the prevalence of epidemics, children of all classes and colours are indiscriminately affected with exanthematous diseases, and wherever a disregard to cleanliness was evinced, porrigo and itch affected white with the same facility as black children. Most medical men in the West Indies have opportunities of knowing that white people contract yaws as readily as blacks, if they are exposed to similar causes of contagion; so that the assertion of a superior degree of susceptibility in the negro to receive this disease is without foundation. Alibert's idea that negroes are vested with an increased share of sensibility, is entitled to an equal share of credence with the converse opinion of Mosley, who affirms that they shew an extraordinary indifference to pain. I have invariably found them give vent to their feelings under severe operations in a similar manner to white people.

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* Dancer's Medical Assistant. Jamaica, p. 221.

It is a very general opinion that measles and small-pox occurring during the eruption of yaws, exert a specific influence in destroying the susceptibility of the disease. Dr. Ludford, in his excellent Essay on Yaws, says, that "Frambœsia laborantis aliis exanthematibus, qualis sunt rubeola, et variola, obnoxii sunt. Haec arte seu insitione induci potest, que melius fatiscente Frambœsia tentantur; tunc enim Frambœsiam variola vel penitus tollit, vel saltem per aliquod tempus coercebat, neque dein perstabunt fungi, si forte iterum in superficie se ostendunt."*

Dancer quotes Dr. Nembhard to prove that yaws gives the pas to small-pox. "During the universal prevalence of the small-pox in this island, in the year 1784, it was remarked that several negroes, affected with yaws, who had the yawy pustules on the surface of the body, and *had been a considerable time* under the afflicting circumstances of the disease, were inoculated promiscuously among many other negroes. The result was, that upon the decline of small-pox and drying away of the pustules, the yaws also gradually disappeared, as if both might be considered in the light of one congenial disease. Dr. Dancer very properly remarks, that if such a result could be obtained, "the discovery would be little short of that which prevents small-pox by the cow-pox."

Dr. Robertson, already alluded to, speaks in positive terms of the efficacy of small-pox in destroying the virus of yaws in the system. "Upon my arrival in Jamaica," says he, "about thirty years ago, I was requested to inoculate all the children upon several large estates, with small-pox, indiscriminately, without reference to any local affection;

* Loc. citat.

and that most of them had yaws, in all its stages, from the scurfy eruption to the yellow sordid glutinous excrescence. During the eruptive fever of variola, the yaws retained their station, without the slightest variation of colour, but, upon the maturation of small-pox, both eruptions disappeared together. No distinction could be perceived in the character of variola in those who had previously gone through it. In 1831, the last time the small-pox made its appearance, I observed the same effects, and no solitary instance can be adduced of the yaws returning at any period where both diseases has existed together."

I have examined these opinions with that consideration which the experience and respectability of such gentlemen are entitled to, and during two of the most extensive epidemics which ever visited Jamaica, had ample opportunities of observing the principal phenomena to which they severally allude, so far as the temporary retrocession of yaws was concerned; but beyond this I cannot agree with them, as my observations lead to diametrically opposite conclusions; and as this is a subject of great physiological importance, affecting the welfare of a dense population, subject to one of the most deplorable diseases that ever blighted the happiness of mankind, I shall briefly state my reasons for dissenting from those who have advanced the opinion that the yaws is thoroughly eradicated from the system by the introduction of small-pox. In the first place, I have no hesitation to admit their premises, that small-pox, during its progress through the system, usurps the place of yaws, but dissent from their conclusions, that it possesses the power of destroying the future susceptibility for the disease; and, in the second place, I will endeavour to shew the source of fallacy which led them to such inferences.

In the extensive epidemic of measles in 1821, and of small-pox in 1831, which ravaged Jamaica, yaws of a fungoid form underwent a manifest change in its character, as soon as the exanthematic eruptive fever became fully developed, and from that period it began to retrocede, and, finally, to give the pas to the prevailing epidemic. The effects produced by the repulsion of one disease upon the appearance of another, were various in different individuals. In those whose health was little impaired by the primary eruption, and where the yaws had nearly completed its course, the disagreeable consequences were trivial, compared with those who had the disease in a recent state, and who were suffering from great constitutional irritation. In the measles of 1821, dysentery appeared in a congestive form as a consecutive affection, selecting those of a cachectic habit, more especially those of them who had yaws thus repelled; setting all remedial measures at defiance, and proving fatal, to a lamentable extent, over the whole island. This was one of the most extensive epidemics which had appeared for many years, and few persons escaped who had not been previously affected. Now, as measles has also been thought by some to have the same influence in destroying the susceptibility of yaws as small-pox, how did it happen that, a few months after the cessation of the epidemic, this disease was as generally prevalent as before the appearance of measles? Simply for this reason, because, although rubeola had the power of superseding the progress of yaws, *pro tempore*, it possessed no specific influence to eradicate the disease.

In 1831, small-pox appeared as a very general epidemic, and proved exceedingly fatal to those affected with yaws.

The eruption gradually receded upon the appearance of variola, and, where the course of the disease was nearly completed, it disappeared not to return. It was otherwise when yaws was only in its early stage, or had made little progress; here it likewise dried up, but invariably returned whenever the system was able to develop the repelled disease.

A few months after the decline of small-pox, yaws was observed almost as prevalent as if no epidemic had occurred; and had variola possessed the power attributed to it, yaws, owing to the extreme slow manner in which it is propagated, never could have appeared so generally, and in such a short time after the decline of small-pox. Another circumstance which militates against the supposed sanative influence of small-pox over yaws is, that, during the prevalence of the epidemic, although the fungoid eruption underwent a change, the character of the yawy ulcer was little affected, shewing, in the most unequivocal manner, that a temporary effect was only produced upon the disease, similar to what daily happens from other causes.

The opinion of Dr. Adams, on this point, is so consonant with my own, that I have no hesitation in quoting it. "It is probable," says he, "that the irritation from small-pox and measles being greater than that from yaws, may intercept the latter at any time. But the laws of that poison requiring a certain course to be pursued, if the new irritation is induced before the course is completed, the disease must return as that new irritation ceases. If, on the contrary, that irritation has not been induced till the course of the yaws is completed, and nothing remains of it but an habitual ulceration, the new irritation will not only supersede

the old action, but, by breaking the habit, very much expedite the cure."*

There is no cutaneous affection more easily influenced by accidental circumstances than yaws in its fungoid state, and, whenever febrile symptoms supervene, they invariably have a tendency to repel the eruption. An attack of inflammatory anasarca, the occurrence of chronic diarrhœa or dysentery, the inveterate propensity of "dirt eating," or any thing which suspends the functions of the skin, has a decidedly detrimental effect upon the disease. The retrocession of yaws, from imprudent exposure to cold and moisture, is very common, and, from whatever cause it is repelled, the symptoms are nearly the same. The patient assumes a leucophlegmatic appearance, becomes bloated, which is sometimes partial and confined to the face, but more frequently the whole cellular substance is infiltrated. There is a peculiar distressing dyspnœa, with short dry cough, and strong febrile symptoms, the skin turns dry, furfuraceous and discoloured, and is marked with stigmata, or blotches upon the former seat of the eruption. The lungs appear to be primarily affected with inflammation, variously modified according to circumstances, while the external dropsical symptoms are generally of an active nature, not unfrequently terminating in Erythema œdematosum, or confirmed dropsy.

In drawing conclusions relative to the supposed specific influence which small-pox has over yaws, the great sources of fallacy are, that, in the latter disease, the intermediate periods of the eruption are so uncertain, and its reappearance so indefinite, that few persons have taken the trouble to

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* Adams on Morbid Poisons.

watch the future progress of the affection with a sufficient degree of accuracy. Besides, there is an almost insurmountable barrier in doing so, from the patient's being removed, and so secluded from observation amongst the negro houses, that few medical men have sufficient opportunities of correcting their judgment on the point in question; and, by thus seeing the yaws succumb, in the first instance, to small-pox, they have hastily and erroneously concluded, that the disease is thoroughly eradicated from the system, whereas it is only held in abeyance till all constitutional irritation from the more recent disease be removed.

It has been said that yaws are not possessed of much sensibility, neither are they the seat of pain, except when they appear on the soles of the feet as crab-yaws. Such assertions scarcely require refutation. That yawy excrescences do not excite such excessive pain as phlegmons or carbuncles is admitted, chronic affections not being attended with an equal severity of symptoms as acute complaints; but those who have attended to the progress of confluent yaws in an active state, will readily allow that the eruption not only possesses sensibility and pain, but that dangerous sympathetic fever is occasionally induced from such an extensive source of irritation.

One of the most painful and distressing consequences of suckling a child, with fungoid yaws surrounding the mouth, is, that a destructive species of ulceration is sometimes communicated to the breast of the nurse, who has already been affected with the disease in its usual form. The ulceration begins and insulates the nipple, by excavating a border of more or less breadth around its base, which often stops here; but, in some cases, it extends laterally, destroys the greater

part of the breast, and the nipple is now removed by ulcerative absorption. If the disease be not arrested, it spreads towards the axilla, strong constitutional disturbance supervenes, and, ultimately, both breasts may become affected; the child, in the interim, is attacked with febrile symptoms, and, unless weaned, it dies in a state of great emaciation, and the nurse becomes hectic, and gradually sinks from the irritation of a painful disease.

There are certain family lineaments peculiar to Yaws, Syphilis, and Sibbens, which bear an affinity to each other, although they do not stand out in sufficiently broad relief to prove their identity with precision at the present day. It is by no means unreasonable to suppose that they are descended from one common origin, and are now varieties, modified and altered by a long train of circumstances, in their transmission for ages through people of various nations, who differ as widely in their character and external appearances, from the race to which they owe their descent, as the disease in question.

The primary eruptions, blotches, condylomata, excrescences, nocturnal pains, and affections of the bones, are, with modifications, common to yaws and syphilis; and the secondary symptoms of sibbens described by Dr. Gilchrist,* where the whole surface was mottled of a dusky copper-colour, with pustules, scabby eruptions, excrescences about the anus, and fungoid tubercles resembling raspberries, are likewise common to yaws and syphilis, and afford strong presumptive evidence that the assertion relative to the common origin of these diseases is not altogether hypothetical.

* Observations, Physical and Literary, of a Society in Edinburgh. Vol. iii. 1771.

Syphilis, as it appears in the present day, is comparatively a mild disease to that described by early writers; and sibbens, which a few years ago attracted so much notice, from the frequency and severity of its symptoms, has almost disappeared. However closely allied these diseases might originally have been, they have now so far lost their relationship as no longer to be considered kindred affections. It therefore becomes necessary to exhibit the characters which at present distinguish them.

DIAGNOSES BETWEEN SYPHILIS AND YAWS.

1*st.* Syphilis appears in six or eight days after contagion.
Yaws takes from six weeks to three months.

2*d.* Syphilis may occur frequently from distinct infection.
Although yaws may recur oftener than once, from the susceptibility not having been destroyed; yet it cannot be communicated by future inoculation, so as to display the disease in its normal state.

3*d.* The constitutional symptoms of the venereal disease are generally progressive, and seldom disappear without the aid of medicine.
The yaws generally admits of a spontaneous cure.

4*th.* Syphilis is capable of affecting the fœtus in utero.
Yaws never has been know to do so.

5*th.* Exanthematous eruptions and febrile affections have a temporary power in suspending yaws.
Not so in syphilis.

DIAGNOSES BETWEEN SIBBENS AND YAWS.

1*st.* The primary local action of sibbens is superficial

ulceration of the uvula, tonsils, lips, and gums, with a small rising of the skin, of a pearl or whey colour.

Yaws never originates in this way.

2*d*. Sibbens is communicated by a foul pipe or spoon to a whole family.

Yaws cannot be communicated unless the skin be abraded.

3*d*. Sibbens never attacks the bones.

Bone-aches are amongst the first symptoms of yaws; and in chronic aggravated cases it frequently produces nodes and exostoses.

4*th*. Sibbens readily yields and is cured by mercury.

Yaws is invariably rendered worse by that mineral.

5*th*. Sibbens does not admit of a spontaneous cure.

It has been shewn that yaws frequently does.

CHAPTER II.

GENERAL OBSERVATIONS.

THE most prominent of our West Indian diseases have often been well described, with the exception of Yaws.

The reason of this is obvious. The extremely loathsome and contagious nature of this affection, and the disgrace and ruin which would be the consequence to any respectable white person contracting it, deter most medical men from making themselves conversant with this interesting disease. There have been instances of distressing acts of suicide committed by genteel young men, who had been accidentally infected, to escape the overwhelming obloquy which is associated with a European labouring under yaws.

There is another reason which operates against our acquiring an intimate knowledge of this singular affection. Negroes are exceedingly superstitious relative to certain points connected with yaws; and think that it ought to be left to nature, without any other interference than the local application of some simple vegetable dressing: moreover, they believe that they possess better information, both of the pathology and treatment of the disease, than their white brethren; and that person will have no inconsiderable share of influence who will be able to convince them that sys-

tematic treatment is preferable to the nostrums of the empiric.

The manner in which yaws appear in different individuals is extremely diversified. Some have only one crop in a mild and modified form, without the usual accompaniments of severe constitutional irritation, while others will have three or four; a few will escape, with the system rendered unsusceptible for future attacks, in a few months, while others, apparently under similar circumstances, require as many years before the morbid action be exhausted. A solitary fungus, in the shape of a crab-yaw, unattended with any of the acute symptoms, or any of the subordinate eruptions, sometimes relieves the patient from a more troublesome form of the disease, and insures him against its reproduction; and a deep excavated ulcer, with a pale spongy surface, with or without the preliminary eruptions of normal yaws, is an occasional substitute for a more complicated disorder.

It is impossible to speak definitively with regard to the time which a crop of yaws requires to complete its course, and much more so to state the precise time which the disease will take before it exhausts itself in the constitution. The character and duration, as well as the recurrence of the several crops, depend upon age, habit, and peculiarity of constitution, and much may be done in modifying and shortening the disease by judicious treatment.

If the patient be young and healthy, and is descended from parents uncontaminated with an hereditary taint, and has likewise been fortunate enough to have received the infection from a person with the full developed fungoid variety, the yaws may spontaneously disappear in about twelve months, and, if properly treated, in less than half of that time; but should a converse state of things happen,

and the health be impaired from previous disease; or what is at all times peculiarly unfortunate, if the system is deeply imbued with a leprous diathesis, and to these are superadded infection from an unfavourable case of ulcerative yaws,* instead of having two or three crops terminating favourably in a few months, it will take years before it be exhausted, and each succeeding crop will have more and more a tendency to assume the ulcerative character, and at length terminate in confirmed constitutional disease.

I have spoken of the yellow elevated fungus appearing in the throat and nose, and disappearing with the general eruption, without producing any disagreeable consequences. Occasionally a deep excavated yawy ulcer appears on the uvula, or tonsils, or palate, or back part of the fauces, sometimes at an early period of the disease, but more commonly at an advanced stage, preceded by and accompanied with acute inflammatory symptoms and tumefaction of the neighbouring parts; a similar ulcer also attacks the nose, and unless prompt treatment be adopted in both cases, the ulceration will spread, and part of the bones of the palate may be scooped out, or the face be disfigured from the destruction of the nasal bones.

In chronic cases of unusually protracted yaws, where the system is apparently saturated with the virus, the symptoms eventually begin to assume a confirmed constitutional character, attended with periostial inflammation, deep-seated

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* Although I believe the morbific poison of yaws to be originally the same, still experience teaches us, that the character of a disease may be considerably influenced by the peculiar source from which the virus is derived; a circumstance which is frequently exemplified in syphilis, and was very well illustrated in Portugal by the appearance of the *Black Lion*.

pains of the bones, ulcers in the nose and throat, &c., which gradually merge into a disease possessing the power of transmitting itself from generation to generation. Dr. Hume has fallen into a palpable error with regard to a supposed change which the hair undergoes in yaws, and this, as well as most of his other observations, have been servilely copied by succeeding authors, down to the present day, without the least acknowledgment. He says, " That the black hair that grows out of the parts now covered with the *yaws*, change gradually white: I do not mean, appears white by the *ichor* of the *yaws* drying upon it, as all the skin does towards the end of the distemper, but the substance of the hair itself is changed from black to a transparent white, like the hairs of an old man."* Hillary almost uses his identical words. " The black hairs which grow out of the places where yaws are, gradually turn to be perfectly white, like the hair of an old man."† Winterbottom has committed a similar mistake, in asserting that "where these eruptions appear upon any part of the body covered with hair, it is gradually changed from black to white,‡ and Lagneau has copied Hume's error in these words: Les poils des parties qu'elles affectent tombent ou diviement blancs avant l'epoque fixee par l'age."§

In the 13th chapter of Leviticus, Moses, in several places, points out the change of the hair to a white colour, as one of the most prominent and distinctive marks of the plague of

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* Medical Essays and Observations. Edinburgh, Vol. V. part 2, Edition 4th.

† Diseases of Barbadoes.

‡ An Account of the Native Africans at Sierra Leone. Vol. II. p. 140.

§ Dict. De Medicine. Tom. XVI.

leprosy, a circumstance which sets at rest the often repeated assertion of authors relative to the identity of yaws and the plague of the Egyptians. I have attended minutely to the assertions of these and succeeding authors, relative to the supposed change which the hair undergoes in the immediate vicinity of yawy excrescences, and having had ample opportunities of testing their opinions, have no hesitation in saying that they are incorrect, for the hair never turns white under any circumstances, and their speaking in such positive terms of this occurrence, induces me to think that they were careless observers of the disease. I have frequently, as in Cases VI. and X., seen the hairy scalp affected with yaws without a single hair changing its colour, and did such an occurrence take place, it would be daily observed amongst excrescences situated upon the perineum, pubis, labia, and in the axilla.

Bajon has asserted that yaws can be communicated to domestic animals, but from experiments made by Dr. James Thomson, he has proved the assertion to be incorrect. Dr. Mosley's assertion that it is of beastly origin, is equally fanciful. Alibert has quoted Desportes to prove that yaws originates amongst certain of the Gallinaceæ, from the use of unwholesome nutriment: " Un pareil genre de nourriture influe sans doute sur le developpement le confirmer c'est l'observation interessante spontanement lez quelques gallinacees de Saint Domingue, surtout chez les pintades et les dindons qu'on alimente uniquement avec les semences, de l'holcus spicatus."*

The young fowls of Jamaica, especially turkies, are very liable to a tuberculated disease of the head and wattles,

* Diction. Des Se. Med. Tom. XVI. p. 563.

which is vulgarly called yaws, and occasionally appears, whether they are fed upon Guinea-corn or maize, or cocoanuts, or any other food; but it is no more allied to that affection than the rough tuberculated state of the feet of pigs, which now and then arises from chigoes.*

An opinion has received a currency from a very early period, and prevails to the present day, that yaws attacks a person only once during life. Each succeeding author has copied his predecessor with great fidelity, and has perpetuated an error which an attentive observation to the progress of the disease would have rectified. It is one of those complaints, says Thomas, "which affects a person but once in his lifetime," and Grainger and Wright express a similar opinion. "Simul tantum," says Ludford, "in vitæ decursu aliquem afficit." Dr. Thomson concurs in these sentiments, and quotes Dr. Owen, to show how exceedingly rare the recurrence of the disease is, as an exception to the implied general law. Dr. Owen only saw two cases where yaws occurred in the same individual, and that at an interval of twenty years. I am convinced that yaws can only be communicated once by inoculation, so as to produce the usual phenomena of the disease, but I could shew by numerous well authenticated cases, contrary to the opinion of these authors, more explicitly expressed by Dr. Owen, that it re-appears in the same individual much more frequently than is supposed; and that whenever it does recur at a subsequent period of life, it assumes the characteristic features of the original disease, so as not to be mistaken. I knew a negro, who after having yaws in the regular way, had a partial re-

* Pulex Penetrans.

turn of the affection annually during his lifetime; and I have seen several cases recur after the lapse of four and five years, in the usual form; and this circumstance is so well known to negroes themselves, that an occasional return of a few fungoid excrescences excite no surprise amongst them; and when the disease appears in this erratic way, they call it *Memba yaws*, because its irregular visits remind them that the disorder is not thoroughly eradicated from the system. Cases V. and VI. will serve to illustrate my meaning, without entering into minute details, and will shew, contrary to the general opinion of authors, that subsequent visitations of yaws are not imaginary.

The yaws is considerably modified during pregnancy, and it is never communicated to the fœtus in utero. It is very common to see young children at the breast with the disease, but the earliest case which I ever witnessed was the following: A young healthy woman, in her second month of pregnancy, had a scurfy eruption of a pretty general description, unattended with constitutional derangement, shortly afterwards followed by yaws in a mild form, which spontaneously healed before her delivery. Her infant boy, when three months old, was seized with stiffness, appeared to be in great pain, and cried almost incessantly. The symptoms were attributed to a fall, when an eruption of benignant yaws suddenly broke out. At the time this happened there was not a case of the disease upon the plantation, and as the mother was apparently clear of it, the relatives conjectured that it must have been contracted in utero; but a more rational explanation would be to suppose that the mother had some remnant of yaws about the labia, and that it had been communicated to her infant through the medium of a scratch in transitu.

The following inferences may be drawn from what has been adduced.

1*st.* The greater the susceptibility for the disease, and the farther the patient is removed from his usual healthy state, the greater will be the severity of the affection.

2*d.* That the susceptibility is most likely to be destroyed when the disease has been fully developed, and where the health has been little impaired, and *vice versa;* that yaws in its suppressed form, accompanied with a cachectic habit, is more likely to pass into a constitutional disease.

3*d.* That other morbid actions may temporarily suspend yaws.

4*th.* That the poison may be exhausted through the medium of an ulcer.

5*th.* That whites are as susceptible of the disease as blacks.

6*th.* That yaws has the power, under certain circumstances, of producing leprosy.

Treatment.—From the similarity of some of the leading features of this disease to syphilis, and the high opinion that medical men entertained of the specific virtues of mercury over the latter complaint, we may readily suppose that this mineral was had recourse to at a period coeval with the introduction of yaws from the African coast by the first slave traders. The irritation excited in the system from mercurial action, has, no doubt, a temporary influence in suspend-

ing the operation of the posion of yaws, and in repelling it altogether for a time ; but its power over the disease is soon destroyed, for it either re-appears after the mercurial action has ceased, or it asumes in a suppressed form, a more inveterate character than it ever would have done if left to its own operation, and entails upon the unhappy sufferer an additional train of ills, such as dropsy, diseases of the bones, or a peculiar form of phthisis, resembling that arising from the worst kind of long continued syphilis. For some time after my arrival in Jamaica, I had nothing to guide me in the treatment of this disease but the current practice of the country, warranted by such respectable authorities as Hume, Hillary, Thomas, and Wright, and I faithfully followed up their recommendations in exhibiting mercury in every form, and to its utmost extent. It was not long, however, before I saw the disease become aggravated in all its symptoms ; and having frequent opportunities of watching the progress of yaws, as it was treated by mercury, and when left to itself, I soon perceived that the exhibition of this mineral in any of its preparations, possessed a temporary influence in repelling the eruption, but the number of fatal cases which followed its use, and the lamentable consequences to which the wretched patient was doomed, induced me to look upon mercury as an exceedingly dangerous and destructive medicine in the treatment of yaws, and I abandoned its use in every case, and have no reason to regret my determination.

Dr. Hume, in recommending mercury, says, " that when the yaws are at their height, then is the time to throw your patient into a gentle salivation by calomel, without any preparation of the body. I never exceed five grains at a time

in a pill, or bolus, and repeat the dose once, twice, or thrice a-day, as I found the patient could bear it, and never designedly raised the salivation to above a quart spitting in twenty-four hours."*

Hillary, who has appropriated Hume's observations on yaws to himself, and nearly in the words of that ingenuous author, says, " The best method is to give calomel grains, five or six twice a day, till a moderate salivation is raised, and the patient spits a pint and a half every twenty-four hours, and never raise it higher; for few patients in this hot climate can bear a ptyasme to be raised higher, without danger of sinking under it, or bringing on some other bad symptoms."

The treatment adopted by these authors has been very little altered or improved to the present day; it is, therefore, not surprising if our practice should be stigmatised as empirical, and less sufficient than that of the negroes themselves. Medical practitioners in general receive very little credit from the blacks for their skill in the cure of this disease, and it is not to be wondered at, when they daily witness the distressing results of the mercurial treatment. They place more faith in the primitive treatment of their African forefathers, and however barbarous that may be, it is infinitely preferable to the practice of those who endeavour to cure yaws by the various preparations of mercury. A subject of paramount importance in the treatment of yaws, is to preserve the health as near the natural state as possible, for it is an established maxim, that not only is the disease more mild, but its duration is considerably shortened, and the cure is more likely to be perfect, when this is attended to.

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* Medical Essays and Observations. Edinburgh.

When the patient is harassed with anomalous and obscure symptoms precursive to the appearance of yaws, such as deep-seated pains of the joints, with severe nocturnal exacerbations, and febrile irritation, he soon becomes sallow and emaciated, and instead of the disease approaching to the surface in an open fungoid state, it advances in a masked character, and not unfrequently assumes an ulcerated form which entails the most grievous consequences. The ordinary method of exhibiting mercury under such circumstances, exercised the most pernicious influence, and the most affecting spectacles of human wretchedness which I ever beheld, were to be traced to the use of that mineral.

The occasional employment of a warm bath, the use of additional warm clothing, and the exhibition of an antimonial opiate at bed-time, with a proper regard to the state of the bowels, and the infusion of sarsaparilla given as common drink, are the only remedies considered necessary at this early period. The diet should also be mild and nutritive, and every thing salted or smoked, or difficult of digestion, ought to be abstained from. Such treatment in ordinary cases answers tolerably well, but it is comparatively inefficient to what I now use for the cure of yaws. When the health is impaired, and the joints are racked with incessant pain, opium is had recourse to, both in this disease and leprosy, to afford momentary relief; and the quantity consumed by some patients is very great. Having failed to relieve these excruciating symptoms, which at times almost drove the patient frantic, I had recourse to the hydriodate of potash, and found it to answer my most sanguine expectations in soothing distressing pains, and allaying constitutional irritation, when every narcotic failed. Its physiological action is both prompt and efficient, its

salutary effects become quickly manifest; and patients who were using opium in large dozes for these deep-seated pains, with very little advantage, have assured me that after taking this medicine for a short time, they experienced relief, had refreshing sleep, and all the painful symptoms disappeared. It may be given in the following manner:—

℞ Potassæ Hydriod, ʒiss,
Aquæ Font. ℔ i. Misce.
Sumat unciam ter in die.

The medicine may be increased in strength according to circumstances, and continued until the yaws are fully developed, using at same time the compound infusion of sarsaparilla.

The first favourable effects experienced from the use of the hydriodate of potash in the cure of yaws, are the alleviation of pain, and the enjoyment of sleep: the suspended functions of the skin resume their healthy offices, the irritative fever disappears, the appetite returns, and the patient gradually regains that state of health necessary for the full development of the eruption.

The warm bath is an useful adjuvant, and proves grateful to the feelings, by assisting to sooth the extensive source of irritation when the yaws are generally diffused over the surface, and besides, exerts a salutary influence over the cutaneous capillaries. The larger excrescences should be bathed with a warm aqueous solution of opium, or anointed with oil, and the utmost care should be observed that nothing of an astringent nature is applied, otherwise the eruption may be repelled, and fatal consequences ensue. Where exercise in the dry open air can be used, it ought never to be dispensed with, as it materially assists

the general indications which we are anxious to have fulfilled. Exercise should be moderate, and never carried to fatigue; many err egregiously in thinking that too much of it cannot be used, and are equally regardless of the physical powers and former habits of the patient. A person, for instance, who had been previously labouring under some chronic affection, or one whose health had suffered from the effects of Cachexia Africana, prior to the attack of yaws, could not stand severe exercise, and, instead of assisting in the cure, it would, as a matter of course, aggravate constitutional irritability, and induce symptomatic fever.

The cold bath is a favourite remedy amongst the negroes in this disease. I have often seen the whole affected children upon a plantation, to the number of fifteen or twenty, marched into a river, under the superintendance of the *black doctress*, and there kept standing knee-deep, till they all underwent their morning purification. This was done by the superintendent taking a bunch of the husk of the maize, or the corn-stick* of the same, and submitting each of them to a summary and merciless scrubbing, amidst the shrieks and screams of the urchins, till the surface frequently streamed with blood. Such barbarous and cruel practice is on the decline; but it was considered to be a *sine qua non* in the treatment of yaws, by this female Esculapius, and its having been used indiscriminately, regardless of the feelings or ailments of those under her charge, the consequences were often fatal. The cold-bath ought never to be used during the presence of the eruption, under any circumstances, otherwise it will frequently be re-

* The corn-stick of the maize is used for scrubbing crab-yaws.

pelled, and inflammation of the lungs, inflammatory anasarca, or dropsy, be the consequence.

The infusion of sarsaparilla is to be allowed *ad libitum*, during the progress of the virus through the system, and, however lightly this medicine may be esteemed, by those members of the profession whose prejudices never permitted them to test its virtues by experience, I can vouch for its efficacy in the cure of many obstinate cutaneous complaints, depending upon an impaired state of the constitution. There is no beverage with which I am acquainted, not even excepting malt liquors, which improves the condition, and brings the patient into a state of healthy plethora, (where no organic affection exists), sooner than the compound infusion of *fresh* sarsaparilla.

This treatment should be continued until the eruption has entirely disappeared, and the system has recovered perfectly from the exhausting effects of the disease, increasing the nutritive qualities of the diet, by allowing a proportion of animal food, and occasionally a glass of wine. When such treatment has been faithfully attended to, I have seen yaws cured in three months, and never return. I have not had a sufficient number of select cases to enable me to draw a positive inference, that under proper care the disease might be restrained within certain limits, and be confined to one eruption; but I have seen sufficient to convince me, that the worst form of yaws, under the least favourable circumstances, may be invariably modified in character and shortened in duration, and there can be no doubt that were our efforts seconded amongst the blacks, and all their ignorant objections and superstitions removed, this disease might be compassed by certain bounds, and be radically cured in a few months.

If this consummation, so devoutly to be wished, could be

attained, the disease would be divested of its horrors, and the sad spectacles of human wretchedness and deformity, that exist in such appalling numbers, would gradually disappear, and thus would years of suffering be saved to themselves, and ages of misery to posterity.

The yaws ulcers should be bathed frequently with a warm aqueous solution of opium, and pledgets dipped in the same, be applied, if they are painful, and when irritation is subdued, they may be dressed with a dilute solution of chloride of lime. I am averse to the application of any stimulant dressings to yaws ulcers until the virus has been exhausted; such remedies always produce mischief, and when once the character of the ulcer is changed, it becomes a common sore, and can be treated accordingly.

Acute inflammatory affections of the throat occasionally occur during the progress of the disease, and require active treatment. Venesection has sometimes to be used to subdue them, but the topical abstraction of blood by cupping, or by leeches when they can be procured, is in general preferable. The administration of small quantities of saline purgatives, with tartar emetic, the inhalation of steam, and the application of a blister, when it can be done conveniently, prove beneficial; and no gargle appears to answer better, in an ulcerated state of the throat, than a weak infusion of capsicum.

Worms infest those children whose health has been much shattered from yaws in incredible numbers; and I have known a child pass an hundred and twenty ascarides* in one morning. Invermination appears inversely as the state of the health, and it is a remark peculiarly applicable to negroes, that in all cases producing a cachectic habit,

* Ascaris Lumbricoides.

that not only are worms generated readily, but it is next to impossible to prevent swarms of chigoes from selecting the toes and feet for the deposition of their ova. From comparative experiments made with indigenous vermifuge medicines, none prove more efficient with children than the Geoffrœa inermis; but, as an unusal pallor, languid, enfeebled circulation, extreme prostration of the powers of life, and other symptoms of narcotism, are sometimes induced even in healthy children, I am averse to use this valuable remedy when the system is reduced. The Dolichos pruriens, although an effectual vermifuge in large doses, is not altogether safe, as I have observed it produce great excitement of the mucous coat of the intestines, attended with a discharge of blood, and followed, in some instances, by dysenteric symptoms.

Turpentine mixed with castor oil, and given for a few successive mornings, appears to answer best in persons reduced from long illness, and, on the final expulsion of the worms, the infusion of Quassia excelsa, or amara, may be advantageously administered as a tonic.

It unfortunately but too often happens that negro children, whose constitutions are much impaired by chronic yaws, contract a habit of eating dirt,* and they devour various extraneous substances with great avidity,—the cure in such cases is rendered exceedingly difficult. The state of the stomach must be attended to, and the carbonate of soda, oxide of bismuth, and hydrocyanic acid, should be given to relieve pyrosis; and the tincture of steel in bitter infusion will prove an excellent tonic.

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* See a Paper of mine in the Jamaica Physical Journal, on the Pathology of Cachexia Africana.

When dysentery follows in the rear of protracted yaws it generally proves fatal: it appears to be of a congestive form, connected with chronic ulceration of the intestines. Opium and calomel, Dover's powder, and ipecacuanha, the warm bath, and a blister to the abdomen, with the frequent administration of anodyne and arrow-root glysters, are of occasional service; but we have more often to lament the inefficacy of every remedy devised for the cure of this dysenteric affection.

In extreme cases of debility, extensive sloughing precedes death. In one patient, the sloughing commenced upon the buttocks, exposing the gluteal muscles, the right foot became gangrenous, the bones were exposed in a black dry state, and death ensued three weeks from the appearance of these symptoms. Medicines will be of little avail here; we must endeavour to support the strength, by means of a generous diet, with wine, and give the sulphate of quinine, opium, and camphor, as circumstances may require.

Repelled yaws has hitherto been considered a disease of debility, and treated as such. It is generally induced from imprudent exposure to cold and wet; the eruption sinks and suddenly strikes in, and symptoms of acute inflammation quickly supervene in organs of vital importance, which invariably prove fatal, unless prompt treatment be immediately adopted.

It is of no use to deceive ourselves by administering diaphoretics,* in order to re-establish the eruption on the surface, for this never will be effected unless the inflamma-

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* After the inflammatory action has been removed, the warm bath, diaphoretics, &c. may be advantageously used.

tory action be first subdued, and nothing but the lancet will effect this. How far such a measure is to be pushed, depends upon the urgency of the symptoms and the strength of the patient; and although many circumstances may apparently contra-indicate venesection, it is our dernier resort for life, and frequently succeeds, whereas the usual inert treatment by diaphoretics, allows the case to run to a speedy and fatal termination.

Much mischief is frequently done, by attempting to remove crab-yaws, by the indiscriminate application of escharotic substances, before they have matured perfectly. It ought to be held as a maxim, that all topical applications are pernicious in every form of yaws, until we first endeavour to destroy the susceptibility of the disease by constitutional remedies; for although these excrescences may be generally regarded as the sequelæ of yaws, it has been shewn that the system is sometimes primarily affected in this way, and to attempt to cure them by caustic dressings is both improper and hazardous. The most efficient treatment, in these cases, is first to improve the health by the remedies advised, and should the excrescences not yield to these general measures, which they seldom fail to do, if properly administered, then the application of gentle escharotics, and the subsequent immersion of the feet in a strong decoction of mammee-bark,* for several days, will effect a cure both of this affection and running yaws.

The madar, or the powdered bark of the root of the Asclepias gigantea, used in India for the cure of leprosy and obstinate ulcers, is a remedy which I have not had an opportunity of trying; but I have used the bark of the Bombax ceiba, as well as many other indigenous herbs

* Mammea Americana.

and plants, strongly recommended to my notice for the cure of yaws, with very little benefit, and I now look with a degree of suspicion upon many of the simple vegetable substances thrust forward with superior claims upon our attention, having found their pretensions very far from infallible.

The following cases will be found exceedingly interesting, and are given to illustrate what has been said of yaws. I have selected those which were not under medical treatment, purposely to shew the disease in its natural state; and although medicines were not administered, from the prejudices of the parties concerned, I took a lively interest in watching the progress of the affection from beginning to end. When it is taken into consideration that yaws may be safely and effectually cured, in from three to six months, by the means here recommended, it is to be hoped that the advantages of this over the mercurial treatment will become apparent, and that in time the disease, like the leprosy of Europe, and the sibbens of Scotland, will soon cease to have a local habitation or a name in the Western Archipelago.

Case I.—J. B. A mulatto boy, early in March 1829, had the preliminary scurfy eruption, succeeded by a large amber-coloured yaw-fungus upon his left elbow, which was quickly followed by others on different parts of the body, more particularly on the chin, lips, wrists, nates, hams, and ancles; one on each side of the anus increased to the size of a dollar; they are irregular ragged oblong excrescences, and rise about one-eighth of an inch above the surface. The scrotum is almost entirely occupied by a fungus, and the dorsum penis has one upon it of the size and shape of a nutmeg split through the middle. A large excrescence is also situated over the right calf, of a sulphur-yellow colour, with

an inflamed base. The febrile symptoms which preceded the eruption were unaccompanied with bone-ache, and the boy enjoyed previous good health.

April 2.—The master-yaw on the left elbow assumes a dry appearance, and the one on the calf is the size of a dollar,—elevated above the surface, and environed with a whitish border. The others remain in a moist state; the fungus under the lip is irregularly circular, yellowish on its surface, and studded round the base with whitish granulations.

May 5.—The master-yaw has nearly disappeared, the one on the calf is dry, and is reduced to a level with the skin. The excrescences in other parts of the body are subsiding rather prematurely, owing to partial attacks of fever.

May 10.—The fever has abated, and a few dark-coloured blotches, the size of a sixpence, have appeared on the nates, the yawy excrescences appear in a suppressed state, with the exception of *one in the left nostril*, and another under the lip.

May 21.—In consequence of the improvement in the boy's health, the fungi, since last report, have changed from a dull dry striated appearance, to a moist sulphur-yellow colour; in negro phraseology, they "look fresh." The disease remained in this stationary way till the middle of June, and gradually disappeared upon the occurrence of *slight accessions of fever*, which ushered in an eruption of a dull, papular nature, precursive to the *second crop*, and which shortly afterwards displayed itself in a modified form, neither so numerous nor so large as the first. From repeated attacks of fever, with harassing bone-aches, he fell into a bad state

of health, and continued so up to the 11th February 1830, before this crop disappeared.

April 26, 1830.—About a couple of weeks ago, a partial eruption of papulæ is stated to me to have appeared and declined. The back part of the legs are now stained with large irregular, oblong, and circular blotches, from amongst which six smooth amber-coloured yaws are emerging; one is of a larger description, with an inflamed base. There is a small round whitish excavated ulcer under the penis, a little behind the glands, without granulations, and it discharges a thin ichor. General health improved. This is the third crop.

June 10.—More blotches have appeared on the thighs, circular in form, and of a copper colour. A few of the fungi have their apices darkened, and another excrescence has appeared on the back of the leg. The feet are covered with crab-yaws.

July 5.—A congeries of small pustules, the size of millet seed, surround another small fungus at the angle of the mouth; one upon the lumbar region is also presenting, encircled with a scaly ring, and numerous scaly circular patches have appeared on various parts of the body. From this time his general health improved, and, with the exception of a few crab-yaws, he was clear of the disease by the end of the year, having had it for a year and ten months.

Case II.—R. A. Black boy, ætatis 10.—For several weeks complained of deep-seated pains of the joints, with smart febrile accessions, loss of flesh and colour, followed by a scurfy eruption, interspersed with small yaws, which gradually increased to the size of peas, in clusters of from

three to six, joined at the base, the apices of which were of a shining straw-colour without any discharge

These fungi are most numerous about the face, extremities, scrotum, and penis. The principal yaw is situated over the left tibia, the size of a shilling, of a bright vermilion colour, and bleeds from the slightest irritation. Towards October the eruption became almost confluent, and acquired a large size. The mouth was surrounded by a fungoid excrescence. Constitutional irritation was severe, and a scurfy efflorescence occupied the interstices of the yaws. By the end of the year this crop subsided, and was followed by another slight eruption of three months duration, and the third and last crop invaded the feet superficially. In eighteen months he was well.

Case III.—R. B. This boy had a regular attack of yaws when an infant, and recovered completely. Is now five years old.

May 6.—After enjoying good health for upwards of three years he became feverish, lost flesh and colour, and had a profuse scurfy eruption followed by several yawy excrescences, one of which is situated over the left orbit, the size of a garden bean. There is a fungus on the sternal extremity of the right fourth rib, slightly elevated above the surface, covered with a crust, and appears like a confused congeries of papulæ. The inside of the thigh is occupied by a circular excavated ulcer, the size of a dollar, filled with spongy granulations, and its edges are ragged, turned out and elevated.

Sept. 26.—The yaws of a secondary description have healed, leaving the ulcer on the left thigh in an open state, discharging an ill-conditioned puriform fluid. The consti-

tutional disturbance is great, he is racked with the bone-ache, especially during the night; and both his elbow-joints are enlarged, shining and painful. He continued in this state till January, when the ulcer healed up, leaving nodes on the tibiæ, and swelling of the elbows and wrists.

Case IV.—J. M. A black, parents healthy, contracted the yaws in 1818, when fifteen years of age.—The disease first appeared as an ulcer on his ancle, followed by a general eruption of large yellow excrescences. The duration of the attack was eighteen months, and he enjoyed perfect immunity from the disease till 1821, when an eruption of fungoid yaws appeared, and literally covered the body: it followed a similar course to the former.

In 1824 the yaws again appeared, preceded by severe bone-aches, nocturnal pains, and loss of flesh and colour. An excrescence, the size of a nutmeg, occupied the root of the nose, and several large fungi formed on the trunk and extremities. The attack was abridged both in duration and violence, and during its continuance in an open state he improved in health, and attended to his ordinary duties till 1827, when this merciless visitant again re-appeared. A few fungoid yaws, about the size of a shilling, were scattered over his body, attended with constitutional irritation, and, after continuing for eight months, vanished. In 1830 a solitary fungoid yaw, the size of a gooseberry, appeared, which continued for a few months and healed up, leaving him a strong healthy-looking man. In 1835 copper-coloured blotches, of a circular form, broke out on different parts of his body, he became sallow, had frequent febrile attacks, and complained of deep-seated pains, particularly of the frontal bone, and his nose began

to swell. On examination, a deep excavated ulcer was discovered in the posterior fauces, and another on the inside of the right inferior maxilla; shortly after which the malar bones became enlarged, and the ulceration extended by degrees from the lower jaw to the tongue, cutting deep into its side towards the root, and threatening its entire destruction. The whole of the soft palate became involved in this destructive ulceration, the bones were eroded, and the nose fell in. An urgent husky cough, with hectic fever, and expectoration of purulent matter succeeded, and reduced him to a skeleton, and after nine months of unparalleled suffering he died.

This is a most interesting case in several respects:—1st. As it serves to refute the common opinion that yaws only appears once during life; and, 2dly, That it merged into that form which is allied to leprosy, and which I shall afterwards endeavour to prove owes its origin to yaws. The boy, when first attacked, was one of my servants, and I was obliged to put him aside; but, notwithstanding the obstinacy of the disease, he could not be prevailed upon to take medicines regularly till too late. I had opportunities of observing the progress of the malady from first to last, and it convinced me, at an early period, that yaws occurred oftener than once in the same subject, a fact which I have frequently seen verified since.

The next two cases will illustrate the annular or crescentic form which yaws occasionally assume.

Case V.—A healthy negress, about six weeks previous to the appearance of yaws, experienced deep-seated wandering pains of her legs, which were particularly severe in her ancle joints during the night, and had frequent attacks

of fever, which reduced her considerably. These symptoms were followed by a scaly eruption on her neck, which was studded with minute papulæ of a yellowish colour, and attended with great itching.

March 2.—A yellow flat fungus, with an inflamed base, about the size of a pea, begins to appear on the fore part of her neck.

24*th*.—Several small fungoid yaws are appearing about the neck: on the 2d of April they were observed to assume a crescentic form, and by the 10th had acquired various sizes, from that of a split pea to a shilling and upwards.

April 15.—The left foot is swollen and painful, and the scurfy eruption remains. A few more fungi have appeared on the side of the neck. The yawy excrescences have assumed generally a crescentic shape, of an amber-colour, and elevated several lines above the surface.

May 10.—The edges of the lunated excrescences have almost subsided to a level with the skin, and are drying up. The bone-aches have never left her, although they became more tolerable on the appearance of the yaws.

She is in her fourth month of pregnancy.

June 1.—The yawy excrescences remain stationary.

Has been lately suffering from severe harassing bone-ache, which continued till the 12th of August, when the crescentic-shaped yaws became elevated, and on the 21st changed from an amber to an inky colour. Her health improved shortly before her delivery; the excrescences resumed their amber-colour, and gradually disappeared. The scurfy eruption was an accompaniment throughout the disease. This woman was considerably annoyed by the appearance of crab-yaws about two years afterwards.

CASE VI.—*March* 12.—W. P. a black child, 13 months old, and weaned. An incision was made into each arm, as is done in vaccinating, and matter taken from a healthy boy who had yaws was inserted. Had a slight pustular eruption on his head, into a few of which virus was also inserted.

22.—The incision on the right arm has not closed, the left has healed, and the eruption on the head is drying.

April 2.—The child is in good health, the eruption on the head is well, and the right arm is healed.

May 24.—The part on the right arm where matter was inserted, begins to rise up like a small button, smooth, whitish, and afterwards scurfy. A few detached pustules are appearing in other parts of the body. No perceptible fever.

June.—Patches of a white laminated nature, not elevated above the surface, appear on the arms, and a miliary eruption of a straw-colour on other parts of the body. A circular yellow yaw begins to rise over the right pectoral muscle towards the axilla, leaving the central portion of the skin entire. General health unimpaired.

July.—The yawy excrescences are beginning to appear general over the body, interspersed with lenticular vesiculæ of a faint yellowish colour. Where virus was inserted into the arms, there are peculiar looking circular scurfy eruptions, of a whitish hue, gradually shaded lighter towards the borders, as if dusted with flower. The excrescences have generally assumed a crescentic or circular form, considerably elevated above the surface, leaving the skin within entire.

August 13.—The scalp is thickly studded with circular and crescentic shaped yaws, *leaving the hair of its natural*

colour. The appearance on the arms continues in circular discolorations an inch in diameter. The miliary eruption, formerly noticed, disappears and resumes its station on various parts, chiefly the face. The forehead is principally occupied with it at present.

21.—One of the annular excrescences has acquired the size of a dollar. Towards the beginning of October, the mouth was surrounded by a fungoid excrescence of an amber-colour, and very little alteration was observed in the character of the disease for two years afterwards, when the child contracted a chronic state of ill health from eating dirt, and the yaws continued in a suppressed form for five years more, and finally disappeared upon the restoration of health.

The next two cases are given to show the disease existing in the form of an ulcer.

Case VII.—*March* 10.—A negro girl, aged nine; after the preliminary eruptions which usually usher in yaws, a foul ungranulated ulcer appeared on the top of her left foot, close to her toes, with elevated edges, which discharged a glairy corrosive ichor, and had healed up and broken out twice within eighteen months, at the expiration of which time, *a yaw appeared in the left nostril.*

April 2.—The ulcer looks cleaner, and shows a disposition to heal round the edges.

May 6.—The left nostril is entirely occupied by a fungoid yaw, and the ulcer remains stationary, having lost its former formidable appearance. Both the yawy excrescences and the ulcer remained, with little alteration, to the end of the year, when the latter assumed an active state,

and by the end of February healed, and was followed by the disappearance of the fungus in a couple of weeks more. The skin remained free from any eruption till the end of April, when an ulcerative process was set up at the root of the great toe, which destroyed the nail, and terminated in a large round vermilion-coloured fungus the size of a lime, which, after continuing for six months, healed up. From the commencement of the disease, in its open state, till its termination in the healing of the fungus on the toe, it occupied three years and six months.

Case VIII.—A negro boy twelve years old. Has had an ulcer on his heel for two years, of the size of a dollar, it is of an irregular oblong figure, with ragged everted edges, and smooth ungranulated bottom. It is surrounded by a spongy whitish border, of a straw-colour as if vesicated. Before the ulcer assumed the yawy character, it was an insignificant sore, and attracted little notice, until its obstinacy in refusing to heal upon the application of the usual dressings, and the appearance of a scurfy eruption, with numerous copper-coloured blotches, excited suspicion. The boy was likewise harassed with bone-ache about this time, and lost his healthy colour. He was treated with the hydriodate of potass and sarsaparilla, and by perseverance for three months his health improved, and the ulcer healed.

The next case, where the yaws assumed a dark colour, is occasionally observed in persons of a cachectic habit of body, and is sometimes accompanied by ecthyma cachecticum.

Case IX.—A negro boy five years old, of a cachectic habit. After frequent irregular attacks of fever, numerous ovoid blotches appeared on his face, arms, and legs, from

the size of a sixpence to a dollar, on a level with the skin, surrounded by an outer reddish elevated crust resembling dried gelatine, within which is another ring of a deep black colour in its extreme margin, gradually shaded lighter towards the centre of the patch. The skin continued dry and constricted, and several fungoid excrescences came out, of a dark lurid hue, which continued in that state for three months, when his health was improved, and the yaws were fully developed in their normal state.

There are several interesting particulars in the following imperfect case:—The sore through which the virus passed healed up, contrary to what is commonly observed when the system is affected through the medium of an ulcer; the preliminary eruptions were of a mixed nature, being both scurfy and miliary; and the yaws were partly fungoid and ulcerative. I have had frequent opportunities of observing this irregular form of the disease assume a favourable aspect, by improving the health; and when this can be accomplished, and all constitutional irritation removed, we may confidently predict that the second crop will appear in a fungoid character, which is at all times to be desired, as it is less liable to be followed by constitutional disease.

Case X.—B. P. A negro boy. Had a healthy ulcer the size of a shilling, which gradually healed, during which time he freely associated with a number of children affected with yaws on the plantations; and, as his skin was clean, and free from abrasions and eruptions, his parents attributed the disease to infection received through the sore. About four weeks after the ulcer healed, an eruption the size of millet seeds appeared partially diffused over the trunk and neck, but more copious on the face and forehead.

They did not at any time contain matter, but when laid hold off, a film or crust came away, leaving a whitish spot. They were stigmatized on their tops, and gradually enlarged by the skin ulcerating at their base, allowing the incipient yawy excrescences to form. Contemporaneous with this miliary-looking eruption, the body was in part affected with an efflorescence as if dusted with flour, and which continued for three weeks.

Previous to these precursive eruptions, the boy suffered severely from bone-ache, and became sallow and dejected from repeated attacks of fever.

About twenty days from the disappearance of the scurfy efflorescence, an elevated conical yawy excrescence appeared on the knee, and soon acquired the size of a crown-piece; it was surrounded by a scurfy eruption, and was the only well-formed stationary fungus to be observed, for no sooner did they arrive at the size of a pea or a sixpence than an ulcerative process was set up, and they were absorbed, leaving ulcers with edges slightly elevated, and covered with a yellowish glutinous film. There were about a dozen of yawy excrescences on the head amongst the hair, the colour of which was not changed, and which also underwent the ulcerative process. With the exception of the fungus over the patella, none of them retained their fungoid character for any length of time. This case came under my notice shortly before I left the island, and I have not heard of its result.

In the next case, the disease never became fully developed, but merged into ulceration, and proved fatal in a few months.

Case XI.—A negro boy, after suffering from frequent

febrile attacks and severe bone-ache, a yawy fungus appeared on the bottom of the right foot, close to the small toe, and after remaining for nine months healed. Shortly afterwards it was succeeded by an ulceration around the mouth, of a fungoid character, and of a dirty yellow colour. The palate, velum, and throat, were subsequently affected with ulcers of a dull whitish hue; the constitutional disturbance became great; and irritating cough, hectic fever, and emaciation, hastened the fatal termination of the disease.

The following is illustrative of both forms of the disease existing together.

Case XII.—B. P. A negro boy, four years of age, contracted yaws, without much previous suffering, in January 1830, and by the middle of February it was pretty fully developed.

February 11.—The mamma yaw, situated on the right malleolus, is a shallow ulcer of a lunated form, with a hardened base, and is studded with large spongy granulations. The lower lip is occupied with a ragged excrescence of a dull reddish tint, and the surface is here and there sprinkled with straw-coloured spots, the size of peas, on a level with the skin. By the end of April an amber-coloured, convex, yawy fungus, the diameter of a dollar, formed on the calf of the right leg, and at each angle of the mouth an excrescence, the size of a sixpence, likewise appeared. The ulcer on the malleolus continues to increase in a circular form. The straw-coloured spots continue, and, when examined through a glass, appear to be composed of a congeries of minute stigmata. There is no constitutional disturbance, and he has never had any bone-ache.

June 10*th*.—The mamma-yaw has closed into an irregular ovoid, which is represented of its natural size in Fig. 9, its centre is filled with fungoid granulations, which protrude beyond the level of the adjacent skin. Above the large yawy excrescence on the calf, and towards the ham, a circular ulcer, with a yellowish margin and detached spongy granulations, has appeared, and one of a similar kind has formed on the left hip. The back is covered with a scurfy eruption, as if dusted with flour.

June 26.—The yawy ulcer on the external malleolus shows a disposition to heal, and by the 5th of July it had gradually contracted, leaving a part of a semicircular form. A yawy fungus has appeared in the left ear, and occupies the whole meatus externus, the scrotum is covered with a fungoid excrescence, the inguinal glands are tumefied, and the health continues pretty good.

This case continued with little variation for eighteen months longer, at which time numerous small superficial ulcers, discharging a bloody sanies, were interspersed among the yawy excrescences. The fungus on the scrotum, and the one in the meatus of the ear had disappeared; the boy now laboured under great constitutional irritation, became sallow, and was considerably emaciated. The case had hitherto been treated by the female superintendant of yaws; and although I had an opportunity of observing the progress of the disease, it was only when she had exhausted her skill that my services were solicited. By the administration of the hydriodate of potass, and the occasional use of a warm bath, giving the compound infusion of sarsaparilla as common drink, and increasing the nutritive qualities of his diet, his health improved, the ulcers gradually healed, and in less than four months more the disease was eradicated.

The following incipient case, as well as another fully formed, will shew the temporary influence which measles possesses over yaws, and will also answer as an illustration of the manner in which small-pox repels that disease for a time.

In January 1837, a negro child had a white scurfy eruption generally diffused over the body, which remained for three weeks, and was succeeded by a profusion of copper-coloured blotches, which continued for a month, when measles, then prevailing as an epidemic, attacked him, and the blotches entirely disappeared as the eruptive fever of rubeola formed. The child recovered from the measles in the usual time, and no more signs of incipient yaws appeared till the middle of April, when a flat white raw yawy fungus was observed on the perinæum, unattended either with scurfy eruption or fever, and from this time the disease gradually displayed itself, till it acquired a very general form.

A child on Fort-Stewart estate, who was covered with a profuse eruption of yaws of three months duration, was seized with measles. During the eruptive fever the excrescences underwent no change, neither was much alteration observed during the progress of the rubeolous affection; but, upon the decline of the measles, the yaws dried up and disappeared, without leaving the least vestige of the disease, except the faint-coloured blotches on the seat of the former yaws. The child continued in a very debilitated state for two months, when an evident re-action took place, and, as the health improved, a numerous crop of yaws re-appeared, at first of a subdued character, but which spread out into full-sized excrescences as it gained strength.

CHAPTER III.

Having, in the preceding chapters, considered yaws in its normal character as a primary or local affection, and described its various appearances, I shall now exemplify the secondary, or, more properly speaking, the constitutional symptoms of the disease, and briefly trace their progress through the system, to that form where it takes on a new and independent action, and produces a hereditary affection; reserving to a period when I shall have more leisure, some observations on the affinity which it bears to syphilis, scrofula, &c.

Both yaws and leprosy are possessed of an identity of phenomena in many of their operations, and exhibit sufficiently satisfactory and distinct generic marks to shew that they are closely allied to each other. When we survey the leading features of these diseases apart, we are struck with a parallelism of character which indicates their near relationship, but when we approach closer, and analyze the symptoms, and trace the progress and operations of both diseases, we recognise in our more intimate acquaintance with them, that the one is the immediate offspring of the other.

The virus of yaws does not necessarily affect the system with an hereditary taint in all cases, any more than the lo-

cal effects of syphilis uniformly excite the secondary symptoms of that complaint; but under certain peculiarities of constitution it undoubtedly possesses the power of producing leprosy, which, when once established, afterwards becomes capable of transmitting itself from generation to generation, till modified or exterminated by causes similar to those which arrested the progress of that disease a few centuries ago in Europe.

The most direct and satisfactory way to establish the opinion, that yaws is the source from which leprosy originates, will be to select a few cases bearing upon this point out of an abundant collection in my possession, and afterwards to make such observations, and draw such inferences as the premises may justify.

Case I.—Edward, a negro. Parents and family healthy. Has had yaws in the usual way. A crab-yaw was removed from the sole of his foot, by corrosive-sublimate, leaving a deep foul ragged ulcer, which gradually became more superficial by healing on one side and excavating on the other. After continuing in this state for twelve months, it assumed a disposition to heal, when suddenly it extended by an ulcerative process over the greater part of the bottom of the foot, and remained so for two years more, when it healed. About three months afterwards he complained of deep-seated pain of head, aggravated at night with febrile symptoms and loss of colour. The skin was unusually dry and scurfy, and became spotted with livid blotches. After suffering for some weeks, the nose began to swell, and the speech became nasal. On examination ulcers were discovered in the nose and throat, with rugged edges, giving out an intolerable fœtor, and the pains and fever mo-

derated from this period. The ulceration in the nose and throat made rapid progress, destroying the soft parts, and corroding the bones of the palate and nose. The orbicular muscles of the mouth and eyes, the cartilages of the nose, and the skin and cellular substance of the face were destroyed by ulceration, and the unfortunate patient presented a most hideous appearance. In two years from this time, the disease having lulled, the face was cicatrized, and he enjoyed tolerable health for eighteen months, when he became feverish, and complained of deep-seated pains in his legs, followed by nodes on the tibiæ, and a large deep uneven ulcer opened on his right foot, and afforded him temporary relief from his sufferings.

The above is a very common way in which the constitutional effects of yaws terminate. The unhappy sufferer is often harassed, during the remainder of his life, with ulceration of a migratory nature, which, after destroying the soft parts in one place, heals up and passes on to another, traversing, at a slow pace, over the whole of the surface until checked; and it often happens, as in this case, that the appearance of an ulcer in an extremity, partly arrests the disease, and affords a sort of compensation for nocturnal pains and bone-ache; not, however, without being in some instances encumbered with elephantiasis of the foot and leg. Although this man's family were healthy, he is now as capable of bequeathing leprosy to his offspring as if he had been descended from a long line of ancestors hereditarily affected with that disease.

Case II.—A fair young man, descended from a healthy family, as far back as they could be traced, contracted the yaws when a boy; it assumed, at one time, a confluent

form, and was seven years before it admitted of a spontaneous cure. Several years after the disappearance of the disease, he had occasional intercourse with a negro woman affected with the yaws, who had a large fungoid excrescence upon the labium,* and attributes the present symptoms to this cause. A few small pustules appeared upon the prepuce, which coalesced and formed into a yellowish looking ulcer, superficial towards the centre, and deepened around the margin; it spread with rapidity to the glans, and involved the whole in one ragged deep-spreading ulcer. He put himself under a gentle course of mercury without relief. I saw him three months after the appearance of the disease.

March, 1831.—A livid circular spot, the size of a shilling, appeared on the left great toe, which became elevated and fluctuating, and gave way, discharging a thin whitish glairy matter, and leaving a round ulcer.

The ulceration of the genitals has progressed, half of the penis is consumed, and hæmorrhage is of frequent occurrence. A month after the appearance of the ulcer on the toe, another of a similar nature formed at the external canthus, and discharged a thin puriform matter; the conjunctival lining of the eye is involved in inflammation of a chronic kind. The ulcer on the stump of the penis has thick ragged edges, and is covered with a foul yellowish slough; it continued to spread, and, by the end of September, the whole of that member was destroyed; the ulcerative process then ceased. About this time an excavated ulcer broke out on the front part of the tibia, the other sores remained open, and the nocturnal pains were very severe. Towards the end of

* I had an opportunity of ascertaining this fact, as this woman was put under my care for the cure of the disease.

October the distal phalynx of the great toe dropt off, the ulcer on the tibia discharged a copious thin puriform matter, leaving the bone denuded; and, in the latter end of November, a piece of the tibia, two and a half inches in length, and three-fourths of an inch in breadth, exfoliated. From this time he improved in health, and, by the end of the year, all these symptoms disappeared.

In September 1832, he complained of hoarseness and difficulty of swallowing, but no pain. On examination, a deep ulcer was discovered on the back part of the fauces, covered with a brownish slough. The tonsils were suffused with an erythematous blush, and, shortly afterwards, an ulcer formed on the lower part of the forehead, close to the root of the nose, all of which in time healed, and he appeared in apparent health till June 1833, when he exposed himself to a heavy shower and got wet; he was immediately afterwards attacked with bone-ache, his nose and face were destroyed by ulceration, and he became an object of horror and disgust. He has been bed-ridden since that period, and is now, (1837), covered with scales from head to foot, attended with intolerable itching, and they fall off in flakes when he applies the least friction.

The most prominent symptoms in this case bear a strong identity to those of syphilis, and it would require some diagnostic tact to discriminate the difference. Such occurrences resulting from the effects of yaws are by no means unfrequent; and, as they appear under circums tances that preclude the possibility of their having arisen from syphilitic infection, we are warranted, from reiterated observation of such phenomena, to conclude that the constitutional effects of yaws exercise a morbid influence *sui generis*.

It is well known that a child at the breast, with yaws

around the mouth, occasionally communicates an ulcer of peculiar malignancy to the nurse who has previously had the disease, which corrodes the nipple, often destroys the breast, and spreads towards the axilla, undermining the health from constitutional irritation, and eventually proves fatal unless arrested.

This patient had connection with a healthy female, whom he kept for a short time after the primary symptoms appeared on the penis, without infecting her.

Case III.—A negro boy, ten years old. Parents healthy. Contracted yaws of a confluent form, and recovered after three years suffering. Two years afterwards he was attacked with obscure deep-seated pain of the bones, lost flesh and colour, and had frequent accessions of fever, which, after continuing for a month, ceased upon the appearance of a soft glistening tumour under the left trochanter, which terminated in an ulcer the size of a dollar, with indented ragged edges, the bottom of which was studded with granulations the size of small shot. The ulcer spread from one side and healed up directly opposite, the ulcerating and healing process keeping pace with each other, till it extended round half of the thigh, and then gradually cicatrized. Numerous blotches appeared on various parts of the body, followed by another tumour, the size of a walnut cut through the middle, this discharged its contents, and formed into a sore similar to the former, advancing on one side and healing up on the other, until several inches were involved in ulceration. This also healed, and almost immediately afterwards similar tumours appeared on the forehead and shoulders. The nose and throat became ulcerated, and threatened to destroy these parts, but, by counter irritation, insert-

ing setons into the extremities, and the adminisiration of proper remedies, the destructive progress of the disease was stayed, and he recovered, until some exciting cause may renew the malady.

The brother of this boy, after the cessation of yaws, when twelve years of age, was attacked with long continued deap seated bone-ache, followed by numerous copper-coloured blotches; and these symptoms were succeeded by tubercular or Arabian leprosy, in a very general form.

Case IV.—A young man, of fair complexion, whose parents were healthy, had yaws when a boy, and shortly after its disappearance, was affected with bone-ache, with eruptions of a copper-colour, circular in form, and varying in magnitude from a silver penny to a shilling. These were succeeded by a persistent ulcer on his left foot, which resisted every remedy. From constitutional irritation the glands in the groin became occasionally tumefied, his foot swelled, and acquired a rough tuberculated appearance, and, finally, terminated in an enormous mass of elephantiasis,* confined to the foot and leg. (Fig. 13.)

Case V.—May 1824.—J. G. a negress. From the time

* Some confusion is made by applying the term elephantiasis to the smooth shining enlarged state of the extremities, described by Hendy, and called the Barbadoes-leg. Elephantiasis of the extremities is characterized by a hardened tuberculated state of the feet and legs, which occasionally acquire an immense unwieldy size, and are indented with sulci, and thickly studded with rough spinous projections. Contrary to the opinion of some, both legs are, at times, affected with this disease, and increase to an enormous bulk. The largest mass of elephantiasis which I ever saw, occurred in the person of "Jamie," a watchman on Spring Garden Estate, the property of John Rock Grosset, Esq., where both feet and legs increased to a monstrous size.

she had the yaws when a girl, has never been free from copper-coloured circular blotches, with ulcers on the lower extremities, which frequently heal and break out. This month had frequent accessions of fever, the veins of the legs became tortuous, enlarged, and painful to the touch, the inguinal glands swelled, and the feet assumed an œdematous appearance.

In June several tubercles, the size of kidney-beans, were observed on her left foot, and the heels acquired a rough granulated character. Towards the end of the month the tumefaction of the feet increased, accompanied with intolerable itching, small superficial ulcers formed between the toes, and discharged a thin corrosive ichor.

July 31.—Has had occasional attacks of fever. A reddish line extends up the leg to the groin, in the direction of the vena saphena, and the inguinal glands continue swollen. The left foot increases in size, the tubercles extend in a lengthened direction, especially about the instep, where they are forming a deep sulcus. She says that her foot feels tighter, and enlarges after every febrile attack. The disease remained nearly stationary till the end of the year, when the right foot increased in bulk, and became partially tuberculous.

June 1835.—The left foot has increased to an enormous size, and is thickly studded with hard tubercles, and the heel and sides of the feet have acquired a rough spinous appearance, like the fruit of the Artocarpus integrifolia, hence negroes call this peculiar roughness, in elephantiasis, the "Jack fruit heel." The superficial ulcers between the toes continue to discharge freely, and when this secretion is stopped, she experiences great pain, and the swelling increases rapidly. The skin is covered with dark-

coloured blotches, interspersed with papulæ, which excite troublesome itching. The foot acquires a perceptible increase after each accession of fever, and she has an idea that this occurs more particularly about the full of the moon.* She requests to have her left leg amputated,† but as the right is also affected, and there are numerous leprous blotches, her wishes cannot be acceded to with propriety.

The disease remained in a chronic state till 1829, when her left heel became affected with a deep uneven ulcer; the face swelled, and acquired a tuberculated appearance, and she continued in this state till 1833, when her health failed. The ulceration increased, and she died in a state of extreme emaciation.

This woman had two daughters, one of whom is affected with elephantiasis of the labia, with a profusion of dusky-coloured blotches on various parts of the body, and the other is a puny sickly girl, never free from cutaneous eruptions.

Case VI.—A young man, after an attack of yaws, having been similarly affected as case V., had ulcers between his toes, from which an incessant copious discharge of thin fœtid ichor exuded, which made it very disagreeable both to him-

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* Negroes have an idea that the moon possesses a peculiar influence over elephantiasis.

† Another popular error with regard to elephantiasis is, that if an affected limb be removed, the other will be seized with the disease. I do not mean to deny that the morbid diathesis will not sometimes affect the remaining leg, but it does not follow as a necessary consequence. I amputated an extremity of this description, of long standing, in presence of Dr. Robertson, where an unusual number of branches of arteries had to be secured; it is now upwards of a dozen of years, and the man continues free from disease. I lately amputated another with a similar result, and my assistant, Mr. Rapkey, removed two extremities, affected with this disease, in 1837, with complete success.

self and others. The ulceration extended to the ligaments and tendons, and destroyed them, the toes dropped off one by one, as in Fig. 14, and after the disease had removed part of the foot it remained stationary. I pressed upon him the necessity of having such a burdensome annoyance removed, but certain superstitions which he entertained, connected with the cause of the disease, induced him to withhold his consent. During the progress of the malady frequent eruptions of copper-coloured blotches appeared, and, subsequently, symptoms of tubercular leprosy were displayed on his face.

These few cases are selected from those whose parents and families had never been subject to leprosy, in order to shew the power which yaws possesses of originating this disease, under circumstances not easily cognizable. From having seen Arabian and Grecian leprosy, and elephantiasis of the extremities occur in different members of the same family, and having likewise observed the character of the ulcers which accompany these affections to possess an identity not to be mistaken, I think there can be little doubt that they are only varieties of one disease, which has originally sprung from yaws; and being invested with hereditary qualities, they have, at a very remote period of antiquity, spread over extensive portions of the globe, and are now propagated by the same laws which regulate hereditary maladies. As the leprosy of the Greeks is the most common form which results from yaws, I shall take a short view of the disease as it at present exists in Jamaica, under the garb of hereditary leprosy.

Leprosy seldom begins to be developed till the age of puberty, unless in those peculiarly predisposed to it. Like gout, scrofula, and some other diseases, it is hereditary,

obeys similar laws, and is influenced by peculiar habits and constitutions. When it has been confined to a long race of ancestry, it becomes possessed with powers of great inveteracy, and *vice versa*. When there has been a plentiful intermixture of healthy people by marriage amongst those affected, it acquires a modified form, and, no doubt, from these causes, combined with other favourable circumstances, such as diet and cleanliness, it became more and more mitigated in Europe, till at last its virulent character was lost, except in a few sequestered parts of Sweden and Norway, where it still exists under the name of Radesyge.*

The disease may be described under the following heads.

1*st*. The latent period, where the health is unimpaired.

2*d*. The incipient, where the patient begins to complain of anomalous symptoms before the disease develops itself.

3*d*. The ulcerative and confirmed state.

4*th*. The period of repose when the virus becomes expended.

The latent period of hereditary leprosy, under ordinary circumstances, continues to the age of puberty, and in some persons favourably circumstanced, or those who have been little exposed to exciting causes, it may slumber until adult, or even senescent age, and occasionally spares the present generation to attack the next. During this period they enjoy apparent good health, but are seldom able to undergo the athletic exercises of those not tainted with the malady, and during the visitation of an epidemic, are less able to bear active treatment, or withstand the impetus of the disease, than those not similarly circumstanced. If by

* Commentatio de Morbo Radesyge Vocato, Fred-Holst. 1817.

some unusually strong disposition, the disease attacks the infantile frame, the child becomes dull and fretful, looses flesh and the bloom of health; and the jet black colour of the skin yields to a dingy yellow dry constricted state of the surface; febrile symptoms, with a permanent quick irritable pulse supervene; the digestion fails; the abdomen becomes enlarged and tympanitic, and the patient pines away with emaciation or marasmus; and when these symptoms do not prove presently fatal, the disease appears in an open state of ulceration.

Previous to the development of this disorder, while yet in its incipient state, it displays an endless proteiform variety of anomalous symptoms. There is scarcely a disease which it does not simulate in its progress to open ulceration; the periosteum, bones, ligaments, and bursæ mucosæ, are alternately affected with deep-seated parts of vital importance, but the most frequent seat of this morbid affection, in its obscure form, is in the cylindrical bones, and their envelopes. Of these bones, the tibia and radius are oftenest affected, commencing with deep-seated pains resembling rheumatism, aggravated at night, and terminating in inflammation of the periosteum, and nodular swellings.

The patient is frequently affected with distressing pain of head and dimness of sight, and the frontal bone becomes the seat of nodes. Contemporaneous with these chronic affections, the pathognomonic signs of the disease appear in pustules, blotches, and scales; at the same time one or more dull cineritious smooth circular patches arise on the shoulder or forehead, or extremities, on a level with the skin, and give way by a sort of punctuated ulceration around the extremity of the spot, and sometimes in the course of twenty-four hours the central portion is removed by rapid

absorption, and discharges a thin corrosive puriform matter. There is now a temporary immunity from racking pains, and life is rendered tolerable, till another accession. The joints, especially the larger, are affected with acute pain, the capsular ligaments are occasionally eroded, and discharge a synovial fluid, and another stage of the disease is commenced. Certain perplexing obscure phenomena sometimes occur, and deep-seated organs, as the heart, lungs, &c. are sympathetically affected.

A patient will complain of great anxiety, palpitation of the heart, difficulty of breathing, cough and sputa of a mucuous nature, with irritable pulse, and pain under the sternum, all of which are aggravated at night; and phthisis pulmonalis is occasionally so closely mimicked, that it is only by attending minutely to concomitant circumstances that an accurate diagnosis can be arrived at. Another patient will have deep-seated pains in the loins, stretching down the thighs, with hectic cough, sympathetic fever, loss of colour and adipose substance, and the eyes will assume a wild glistening appearance, with most of the symptoms which indicate some renal affection or lumbar abscess. These anomalous symptoms bear the sufferer to the verge of the grave, when a sudden and unexpected accession of periosteal inflammation, precursive to the open state of the disease, again affords a season of comparative repose. These operations teach us to imitate nature by counter irritants, and often with happy effects, especially in weak constitutions, where the conservative powers are inadequate for the development of suppressed symptoms, as well as to draw the affection by such means from the face and throat. It unfortunately happens too often that nothing affords relief, and the unfortunate patient sinks before the disease appears in its open form.

The metastical, or migratory tendency, which these symptoms at times assume before the actual appearance of leprosy, are very remarkable. The periosteum may be attacked with inflammation, and deep-seated pains of the bones be so severe, that those possessed of the greatest fortitude will writhe under the torture, and give way to feelings of inexpressible agony; when suddenly, without any apparent atmospheric change or other cause, the tension, pain and swelling, will subside, leave the lower extremities, and travel to the shoulders, or take up its position on the forehead, or in the articulation of the elbows or wrists, shifting from joint to joint, and from bone to bone, till the parts ulcerate, and discharge a puriform matter, followed by an abatement of pain.

Where a strong hereditary disposition exists, it is sometimes excited by accidents and diseases; and injuries which, on ordinary occasions, would heal without difficulty, become, under such circumstances, very tedious to manage. Gonorrhœa not unfrequently awakens leprosy which might otherwise have remained dormant for years, and probably for life. A person contracts this complaint, which progresses favourably towards a cure, the acute stage is about subdued, and when we expect the complaint to disappear, a train of inverate symptoms supervene, which resist all remedies. The discharge from the urethra stops, but the ardor urinæ occasionally continues, although more frequently that sensation is only experienced toward the termination of making water; the lower part of the abdomen becomes hard and painful, there is a copious deposit of mucus, or muco-purulent matter mixed with blood, in the chamber glass, and a constant heavy dull pain is felt about the neck of the bladder, which creates much uneasiness. These symptoms are not attributable to stricture, but to a peculiar morbid irrita-

bility, or sub-inflammation of the mucous surface of the bladder, which is of very common occurrence amongst persons hereditarily tainted with leprosy, who have the additional misfortune to be infected with gonorrhœa. A patient of mine received a trifling injury of the knee-joint, which for sometime advanced favourably, but suddenly stopped; the cartilages of the joint were absorbed, producing a rough grating motion, shortly afterwards a shining blotch appeared on the tibia, which extended to the size of the hand, and subsequently formed into a well-defined leprous ulcer, which explained the reason why such a simple injury terminated so unfavourably. To enumerate instances of this kind, where the disease was called into action from the extraction of a chigoe to a compound fracture, would extend to an indefinite length.

After the appearance of the preliminary eruptions of blotches and scaly efflorescences, and the patient has suffered from periosteal inflammation, and numerous painful symptoms, the disease gradually appears in an open ulcerated state, and its extent, severity, and duration, depend upon a variety of circumstances. Some persons are partially affected, and never have more than one attack; others again suffer severely, and either have repeated attacks, or it continues in an open form, and accompanies them to the grave;—in some the extremities are affected, in others the head, while a few are so unfortunate as to be covered with the disease. Its ravages are confined to the surface in some, and in others the nose and throat are destroyed by ulceration, and the bones become extensively affected with nodes, exostoses, and caries.

Various forms of papular and pustular eruptions precede the march of this disease; but as they are not uniform in their appearance, they may be considered adventitious affections.

A very common form of cutaneous eruption is where numerous copper-coloured blotches, varying in size from a shilling to a crown piece, of an oval or circular figure, arise, giving to the face a shining appearance, attended at same time with great itching. Amongst these blotches, small, smooth, round fluctuating elevations may be observed, of various sizes, which suppurate, and discharge an ill-conditioned pus: they form into superficial ulcers, and progressively extend over the whole body; healing up in the rear, and invading fresh portions, till few parts remain unaffected. After the continuance of these local affections for months or years, a more grievous train of ills succeed in many cases. The functions of the skin become suspended, it acquires a rough scaly appearance, and the countenance assumes a withered haggard look. Large circular ulcers form on the extremities, trunk, and head, which keep up a constant drain, with extensive constitutional disturbance, and produce extreme emaciation; the joints are attacked with chronic inflammation, their cavities are penetrated by ulceration, the toes and fingers become carious, and drop off in succession, sometimes destroying the whole foot, and involving one or both hands in an unwieldy morbid mass. The humeri and thigh-bones are rendered fragile, and are occasionally fractured from the action of the muscles; this I have seen in several instances; and, after the disease has expended its fury, the helpless beings drag on a wearied existence.

This is not permitted in all cases, for, after a temporary truce, the work of destruction is occasionally resumed. The genitals, both of males and females, are liable to attacks of ulceration, which, at times, destroy the penis, and cut deep into the labia; but, unlike syphilis, such ulcers are incapable of propagating the disease. It is fortunate for man-

kind that this malady is not contagious, or who would be safe in a community where every variety exists? That such is the case, we infer from numerous examples of sound and diseased persons cohabiting together, without being necessarily affected; and I have farther satisfied myself of its non-contagious nature, by inserting matter taken from such ulcers on the genitals into healthy sores, without being followed by any disagreeable consequences.

The manner in which leprosy invades various parts of the body, especially the head and face, is so parallel to that of syphilis, that, were contingent circumstances left out, they might easily be confounded with each other. The pericranium covering the frontal bone, is affected with inflammation, the superincumbent part becomes shining, tense, and painful, accompanied with deep-seated headache, dimness of sight, and unremitting nocturnal pain. Considerable tumefaction, of a dull red colour, is observed extending over the forehead, and spreading towards the eyes and cheeks; after a time a soft fluctuating tumour appears on the os frontis, and gives way by a sinuous opening, and discharges a glairy matter. This is sometimes followed by an abatement of pain, and the part heals up slowly, occasionally leaving an indent or excavation, the size of half a hazel nut. In less favourable cases the puffy tumour opens into a spreading ulcer, with hard everted elevated edges, the frontal bone becomes carious, the skin of the forehead is destroyed by ulceration, and boggy tumours arise in various parts of the head, burst and discharge a puriform fluid, the bones beneath are eroded, and the skull, in some patients, is literally riddled. The superciliary ridges, in such cases, are also destroyed, the eyelids are removed, and the ulceration extends into the nose, undermining it by the erosion of the nasal and spongy bones. The soft palate partici-

pates in this destructive process, and the palatine arch is rendered carious; the tongue, in rare cases, is attacked, and the muscular substance of the mouth is destroyed, displaying the teeth and alveolar process, and imparting to the patient a hideous and unsightly appearance, which, combined with an intolerable foetor, render him an object of pity and disgust. The uvula and tonsils are successively removed, the ulceration extends to the larynx and trachea, and a species of laryngeal and bronchial inflammation, of a chronic nature, destroys the voice, and, after a lapse of time, the patient.

Such is leprosy, as it exists in the West Indies, involving a greater share of misery, and far more lamentable consequences than many are aware of; for it would not be overrating it to estimate the amount of the disease amongst the blacks, in certain districts, at one-tenth* of the whole population.

The brief notice of this disease, which I allowed to myself, precludes my entering into the statistics and treatment of this formidable malady; but it will be well to remark that, like yaws, leprosy is invariably aggravated by every preparation of mercury, and the use of this mineral uniformly accelerates its progress. The same treatment recommended for yaws, answers eminently well in the primary stages of this; and it is to be hoped that, by abolishing the use of mercury, using a more generous diet, and attending to cleanliness, that these kindred diseases will, in time, be disarmed of their terrors, and, by degrees, vanish from the western world as the leprosy has done from the shores of Europe.

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* That is, existing in all its forms.

OBSERVATIONS

ON

ACUTE TRAUMATIC TETANUS

AND

TETANUS INFANTUM.

OBSERVATIONS, &c.

There is no disease within the range of human suffering that proves more formidable than Acute Traumatic Tetanus, as it occurs within the tropics, nor is there one which involves medical men in more genuine chagrin and disappointment. To see a patient writhing under agonies for which there is neither palliation nor cure, and to hear his shrieks, as muscle after muscle is put upon the rack, whilst he implores the ineffectual aid of those around him, is a sight at once painful and humiliating to the medical attendant.

The general pathological distinction of this disease, is into idiopathic and symptomatic, and these are again very appropriately divided into acute and sub-acute forms, which it is well to bear in mind, as much confusion has arisen from not attending to such a division.

The cases of symptomatic tetanus, (with one exception), which have come under my notice, have been of the acute kind, a form, so far as I have seen, heard, or read of, uniformly proving fatal within the fourth day.

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* The substance of this Paper was published, a few years ago, in the Jamaica Physical Journal.

This was particularly noticed by Hippocrates in his fifth Aphorism, where he says, "Quos tetani vis magna exercet intra quartum diem intereunt; quod si hos effugerunt levantur et sani evadunt;" a parallel passage is to be found in Celsus, Lib. IV. cap. iii., where he seems to have copied him with his usual concinnity, "Ea sæpe intra quartum diem tollunt: si hunc evaserunt, sine periculo sunt." Observations which shew that they were familiar with the disease, both in its acute and sub-acute varieties, and that they considered the acute form as little amenable to remedial treatment as we do in the present day.

It is by not attending to these distinctions that we hear of cures said to be effected by the most dissimilar modes of treatment, from the broth-bath* of Sir James M'Gregor, and the stimulating plan of Rush and Grimstone, down to the sedative measures of Duncan, Anderson, and others.

All or either of these remedies may be useful in idiopathic tetanus, and in that mitigated form arising from wounds which are ushered in by comparatively mild symptoms; and the fact that opiates, mercurial frictions, warm-baths, purgatives, &c. have been successful in two-thirds of the idiopathic cases which I have treated, prove the truth of this assertion.

Tetanus generally commences in a slow and partial man-

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* Something analogous to the broth or slush-bath of Sir J. M'Gregor, was a favourite remedy with the ancients, and Celsus, in treating of the cure of tetanus, recommends, "nonnunquam etiam in calidum oleum totum descendere, vel in aquam calidam, in qua fœnugræcum decoctum sit, et adjecta olei pars tertia:" Hippocrates directs, "totum corpus oleo immergatur tepenti; et calido oleo copioso, crebroque illinito." De Morbis, Lib. III. cap. xii. Avicenna, like his predecessors, recommends after frictions, to dry the sweat occasioned by inordinate pain, or by medicine, "ut sedeat in oleo calefacto." Lib. tertius De Tetano.

ner, with a dryness and constriction of the throat, difficulty of swallowing, and a restless uneasiness. To these succeed more or less rigidity of the lower jaw, and a painful stiffness of the neck, and of the muscles of the back and loins, resembling rheumatism. These symptoms do not continue long in this modified state, but gradually become more and more severe, till a sudden snap of the jaw, or retraction of the neck, indicates the true nature of the disease, and excites extreme alarm in the patient. The countenance in some now exhibits terror, and in proportion to the severity of the symptoms, despair seizes others, and, from this moment, a regular and quick succession of spasmodic actions succeed, which retract the extensor muscles with such inordinate violence, as occasionally to make the sufferer utter the most piercing screams, while the body is bent into the arc of a circle, and, during the continuance of the spasms, he rests upon his occiput and heels. The flexor muscles may be affected in a similar way, so as to bend the body upon itself; this I have never seen, but have sometimes observed, in severe cases of dry belly-ache, the body so violently convulsed, as to be rolled up during the spasms, so as to resemble emprosthotonos.

The muscles not engaged in violent contractions acquire a permanent rigidity, and it occasionally happens that the body is so placed between the antagonism of two forces, as to be immoveably fixed.

The jaw is not always locked, as the muscles may be observed in all the intermediate states, from partial rigidity to permanent contraction, where the greatest difficulty exists in obtaining sufficient admission for medicines. In cases where the fixation of the jaw appears complete, it has been recommended to punch out one of the front teeth, to allow the introduction of medicines; such a proceeding

would be a wanton exercise of cruelty, as we can, by watching periods when there is an abatement of spasm, find sufficient opportunities for such purposes; and, should our efforts be ineffectual, they may be introduced by means of an elastic tube through the nostrils.

After long watching and exhaustion, the effects of almost incessant spasms, the worn-out patient sometimes slumbers during the brief remission of convulsive action; the muscles are then partially relaxed, a sardonic smile now and then plays about his face, and an occasional heavy sigh indicates that the sleep is tumultuous, and he awakes unrefreshed and terrified by a repetition of tetanic symptoms.

The latest period from the infliction of the injury, to the invasion of tetanic symptoms, varies from a few hours to several weeks.

I have seen tetanus commence as early as seventeen hours after the reception of a slight abrasion, and terminate in seven hours more; and have known a period of twenty-eight days to intervene from the time of the injury to the attack. A case is generally quoted which came under the notice of the late Professor Robinson of Edinburgh, where tetanus proved fatal an hour after the reception of the injury, but as sufficient time could not be allowed for the formation of the disease, the death of the patient may be attributed to some other cause.

Sir James M'Gregor says, that if "it does not occur for twenty-two days from the date of the wound, the patient is safe; and states from his returns the latest average period to be three weeks." Sir Gibert Blane has known it to occur at all periods, from the second to the fourth week; and Dr. Rush says, "between the time in which the body is thus wounded or injured, and the time in which the disease makes its appearance, there is an interval which extends from one

day to six weeks." Mr. Curling* mentions a favourable case of a female in the practice of Mr. Ward of Manchester, where the symptoms did not appear till ten weeks after a burn in the axilla; and very properly remarks that it is questionable whether the disease should not be viewed as idiopathic.

It would be interesting, in a medico-legal point of view, to ascertain the extreme range when wounds or injuries cease to excite tetanus. The period does not appear to be so much influenced amongst adults by an intertropical residence, as the severity of the disease itself; and from data which we have before us, we might fairly question the nature of tetanus to be traumatic, if it exceeded the sixth week at the very farthest.

I knew a physician of much practical knowledge give his opinion before a jury in the West Indies, that a person could not be said to be exempt from the occurrence of traumatic tetanus, while the wound remained in an open state. This might be applicable to the ordinary cases of injuries, but I question its accuracy as a general assertion, as we frequently observe compound fractures remain open for months without being followed by tetanus, and where suppuration is freely established, in such accidents the disease is rarely observed to follow.

Dr. Parry† makes an observation in reference to the state of the pulse, the value of which has been variously estimated; to me it appears of little practical interest, as the state of the circulation is frequently observed to be at direct variance with his assertion. "If in an adult," says he, "the pulse, by the fourth or fifth day, does not reach 100, or

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* On Tetanus, for which the Jacksonian Prize was awarded in 1834.

† Cases of Tetanus and Rabies Contagiosa. By Caleb H. Parry, M. D.

perhaps 110 beats in a minute, I believe the patient always recovers. If, on the other hand, the pulse on the first day is 120, or more in a minute, few instances will, I apprehend, be found, in which he will not die."

I have seen, in idiopathic cases, the pulse rise to 130 during the first twenty-four hours, and the patient recover; and, in similar affections, have observed the circulation to be very little affected, and the cases prove fatal; nothing can be more vague and uncertain than trusting to the state of the pulse, as mental excitement, in irritable persons, will have a perceptible influence on the arterial system. This remark holds equally true with acute symptomatic tetanus; in some fatal cases which came under my observation, the pulse was very little affected till towards the close of the disease.

The extreme morbid heat* of the skin noticed by several authors, has not occurred to my observation, and although the circulation might be excited, the surface was generally bathed in a clammy perspiration, and the patient evinced no febrile disposition. In the most violent paroxysms of bodily pain, patients, for the most part, preserve a most astonishing degree of equanimity; and although in others hope and despair raise or depress the unfortunate sufferers, still they remain free from delirium till the last struggle.

The torpor of the intestinal canal, and the offensive matter said to be occasionally contained in the bowels, previously to the appearance of the disease, are circumstances

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* I confess my inability to corroborate the assertions of some writers on this disease, that the temperature has arisen as high as 110°. My attention has been directed to this point for some time, but neither in tetanus nor in the highest grades of intertropical fevers, have I been able to observe the heat of the skin to exceed 104° of a well regulated Fahrenheit's thermometer.

which have not uniformly appeared in my practice, and probably such irregularities may be regarded as accidental occurrences, especially when we take into consideration the rapidity with which the spasms sometimes supervene to the infliction of the wound, and the want of time to effect any perceptible change in the functions of these viscera.

Symptomatic tetanus arises from wounds, contusions, and punctures: considering the number of accidents which daily happen, it is of unfrequent occurrence; and, so far as my experience goes, it is not peculiar to the injury of any particular texture. The apparently insignificant puncture from a splinter of wood, or iron, or any other substance, the abrasion of the cutis, or the simplest operation of surgery, in whatever part they may occur, will occasionally be sufficient to throw every muscular fibre into inordinate spasmodic action, and produce a series of morbid associations, which will destroy life in a few hours.

To shew how arbitrary this disease is in selecting its victims, I shall instance a few cases where it supervened to wounds so very trifling as to attract little notice at the time of their reception; and, as a contrast, will point out a few injuries which, to all appearances, were peculiarly favourable for the production of tetanus, but where no disagreeable consequences followed.

A stout healthy negro man, in the prime of life, was stripping off shingles from the roof of a boiling-house, and received a slight scratch on his hand from a rusty nail, which scarcely drew blood; it created little pain, and did not hinder him following his business that day. Next morning, he complained of pains shooting up his arm towards the axilla, quickly succeeded by spasms of the extensor muscles of the neck; these symptoms were rapidly followed by severe spasms of the dorsal muscles, and general tetanic con-

vulsions supervening, closed the tragedy exactly twenty-four hours from the reception of the wound, and seven from the invasion of the disease.

A negro had the operation of hydrocele adroitly performed, by a gentleman who communicated the case to me, tetanus succeeded, and the patient died in extreme agony forty-eight hours from the time the puncture was made. A medical friend of mine extracted a tooth from a healthy negro man, the operation was attended with no difficulty, yet tetanus followed, and death ensued on the third day. Another fatal case has lately occurred from a puncture in bleeding.

The following is a well marked case of acute symptomatic tetanus arising from a trivial wound, pursuing its steady path without the alleviation of a single symptom, and terminating fatally in 52 hours.

Archy, a yellow-skinned negro, 22 years of age, while in the act of pulling cocoa-nuts, fell from the tree, and wounded his head slightly about the juncture of the saggittal and lambdoidal sutures. Up to the seventh day the wound discharged healthy pus; but on the morning of the eighth it assumed a pale dry appearance, with puffy edges, and ceased to secrete purulent matter. This change was noticed, by the estate's black dispenser, to take place a few hours previous to the induction of spasms. On the afternoon of the same day, he complained rather suddenly of an uneasy sensation about the back of his head, which increased rapidly, and affected the extensor muscles of the neck; at the same time his features were contorted, and his jaw became fixed.

13.—I saw him immediately after the development of these symptoms, he was now labouring under acute opisthotonos, the extensor muscles were strongly convulsed,

and the head was violently retracted every three or four minutes, occasioning the most excruciating pain. Head, face, and neck, covered with globules of sweat; the whole surface generally moist, face suffused, eyes full, and apparently ready to start from their sockets. Pulse 88, strong and regular, bowels open, tongue covered with a dark-brown fur, respiration not laborious, no sternalgia.

Let mercurial ointment be rubbed in with a view to produce salivation as speedily as possible; use the warm bath occasionally, and apply frictions, with hot turpentine and laudanum, to the spine and extremities. Three grains of opium to be administered hourly, the wound to be dressed with hot turpentine and a poultice laid over it.

14.—The spasms returned at short intervals during the night, and he once or twice dozed between the paroxysms; there is a mixed convulsive action this morning, the head being first drawn backwards, then to the left side, where it is permanently fixed during the spastic state. The act of swallowing is attended with extreme difficulty; he has no aversion to fluids, but would rather decline taking them, as every effort throws him into convulsions. The jaw, although stiff, is not so rigidly locked as to prevent him taking medicines. Pulse 110, strong and full; during the continuance of the spasms he streams with perspiration. Sternalgia is awanting: suspend the use of the opium for a few hours, and give a cathartic powder. The mercurial frictions to be continued.

1 P. M. — The purgative has operated freely, evacuations natural, spasms as strong and as frequent as formerly. Resume the use of the opium, and increase it to four grains hourly.

15.—Passed a very restless night, with an aggravation of all the symptoms. The spasms are frequent and into-

lerable; has been generally convulsed, hands clenched, feet contracted, abdominal muscles knotted, and the anguish expressed in his countenance surpasses description. Had two fainting fits during the night, which were of considerable duration, and the moment he revived, the tetanic symptoms returned with increased severity. His forehead is covered with large drops of sweat, tongue dark-brown and furred, pulse 150, rather weak and indistinct. The mercury has affected his system, and he is spitting freely; wine has been given in addition to his opium.

6 P. M. — Dozed a little in the afternoon, is covered with profuse perspiration, has had a copious evacuation of a natural colour, and the spasms appear to be modified both in force and frequency. There is a tendency to syncope, which is temporarily relieved by the application of hartshorn to his nostrils; and he experiences relief from the nurse blowing in his face. The mouth is now streaming; the abdominal muscles are permanently contracted, and appear as if divided into four sections. The opium was continued till a short time before his death, when a general convulsion closed the scene at half-past eight o'clock.

Dissection ten hours after death.

The hard contracted state of the abdominal muscles yielded as he became cold. The viscera of the thorax and abdomen were sound. The wound of the scalp was pale and flabby, neither the pericranium nor skull was injured. The substance of the brain was of a natural appearance, the right ventricle contained about a tea-spoonful of serum, and the dura mater, throughout its whole extent, but more especially towards the basis of the brain, exhibited a singularly beautiful and highly injected appearance of a dark red colour, with here and there tortuous vessels unusually

gorged with black blood. The cerebellum was minutely examined, but presented no deviation from the sound state. The cerebral nerves were individually dissected, without any remarkable appearance being discovered. The cavity of the spine was opened from the back part, and the covering of the spinal marrow was found to be highly vascular, suffused and turgid: the nervous mass, with the nerves, were raised and examined, but no morbid alteration was observed in this stage of the inspection, indeed the only unnatural appearances detected were in the involucra of the brain and spinal cord, which presented something like an intense vascular anatomical preparation.

There are three remarkable circumstances to be observed in this case; the absence of pain under the cartilago ensiformis, the open state of the bowels, and the anomalous affection of the neck, being a mixed spasm, first of the opisthotonic and then of the lateral traction. The spasm under the sternum is generally regarded by medical writers as pathognomonic of the disease, but erroneously so, as that symptom is sometimes awanting. When it is a concomitant, it varies in different individuals, from a slight uneasiness or pain, to a peculiarly oppressive weight or sense of suffocation, and when it prevails to an extreme degree, it produces a distressing state of anhelation, with hurried laborious breathing, and is accompanied by the wild looks and gestures of a person perishing from partial strangulation.

The costive state of the bowels is occasionally observed in tetanic affections; but as opiates are generally administered, it is doubtful "whether the costiveness has been the effect of the opiates or of the disease;" notwithstanding the liberal use of opium in this case, the bowels were in an open state throughout, a circumstance which I have ob-

served once or twice before. The singular manner in which the paroxysms were renewed, by violent retractions of the head, and afterwards by lateral fixation during the continuance of the spasm, is one of those deviations which occasionally happens in all diseases. Sauvages mentions a variety of this affection, under the head of Tetanus lateralis, but, unless in this instance, I have never seen it.

The following case was treated in a different manner, and proved fatal within the fourth day.

Wm. Gray, ætatis 28.—A negro on Woodstock estate, received a splinter of wood into his thumb, which he concealed as it gave him little uneasiness. Eight days afterwards he went a journey of twelve miles, and returned on the 31st of July.—Next morning, August 1st, he complained of stiffness of his jaw, with difficulty of swallowing. His hand was examined, and found to be slightly inflamed, and the splinter was extracted. I saw him for the first time on the morning of the 2d, when he was labouring under acute tetanus with frequent spasms, locked jaw, and the body rigidly bent back. The respiration was hurried, with slight pain under the sternum, pulse 118, strong and full; great terror depicted in his countenance, with general profuse perspiration. He complained of being very thirsty, but the least attempt to swallow any fluid, or to move himself, immediately excited convulsions. The bowels have been in a costive state for three days.

Was bled to ℥xxx, took a drachm of jalap with ten grains of calomel. A blister was applied along the whole course of the spine, and his hand was immersed in a large shallow wooden bowl filled with hot water.

Vespere.—The medicines have operated freely, and the blood exhibited no buffy coat. A tobacco injection has

been given, which produced a state of prostration bordering upon syncope, attended with vomiting, and a relaxation of the muscles. The jaw became partially relaxed, but the suspension of the spasmodic action was of short duration, for as soon as reaction took place the paroxysms were renewed with increased violence. The pulse is now 120, strong and full, with thirst and considerable morbid heat. Repeat the bleeding and administer another tobacco glyster. He is eager for water, which he greedily swallows, but which invariably brings on spasms.

3d. Passed a very restless night; the tobacco glysters have been repeated occasionally, and the nausea produced has generally the effect of relaxing the jaw, and modifying the convulsions for a short time. The hand and arm are kept constantly immersed in hot water.

A. M.—Dozed for about a couple of hours, morbid heat not so great, pulse 90.—2 P. M. The pulse has risen to 100, and is now strong, regular and full: abdominal muscles hard, morbid heat of surface continues, bowels freely open. The spasms have returned with increased severity, and he refers to the sternum as the principal seat of pain. With a view to induce syncope, which hitherto relieved the spasms, I had him again bled to ℥xxx, which produced a state approaching to deliquium; he now experienced a slight amelioration of sternalgia and of spasmodic action, but as formerly, when reaction commenced, the convulsions were resumed, and the symptoms became as severe as before.

4th. Slumbered a little during the night, but the return of spasms interrupted sleep. The distressing pain under the sternum is completely removed; bowels open, pulse 120, still strong and full; has been again bled, thirst very urgent. When he takes the cup into his hands during the

interval of spasms, he makes the most ludicrous motions before he can carry it to his mouth; the sight of the fluid does not excite that degree of dislike as formerly, but convulsions invariably come on every time he drinks.

Vespere.—There is a remarkable change in the pulse since last visit; it is now 160, and he is very much exhausted. The spasms do not return so quickly, neither are they so severe, the skin is bedewed with cold clammy sweat, and his countenance is divested of terror.

He is conscious of the approach of the spasms, and requests not to be held, but the extreme violence with which they come on, and the struggles which he makes render it necessary to have four strong men to keep him upon his mattress. He has taken arrow-root occasionally, and may now have wine with it. A full opiate to be given.

5th. Passed a very restless night, with occasional brief confused slumbers, interrupted by spasms; jaw rigidly stiff; skin cold and clammy, pulse 150, excessively small and weak, and now and then intermitting.

Abdominal muscles not so rigid; pupil slightly dilated, he has been quite collected in his mental faculties since the invasion of the disease. Complains much of minor spasms of the dorsal muscles, and muscles of the legs; had a few convulsive fits of extraordinary severity, which bent him like a bow, and he rested upon his heels and occiput during their awful continuance. In this way he continued till nine A.M., when he expired, immediately after one of these severe fits.

Dissection four hours after death.

The dura mater turgid with blood; between this membrane and the pia mater there was a general serous effusion, which extended over the surface of the brain, nothing particular seen in the cortical or medullary substance, and the

brain was of its natural firmness. The ventricles were filled with greenish serum, and the basis of the brain exhibited appearances similar to those upon its upper surface. The crura cerebri were enveloped in a highly vascular covering. The cerebellum was inundated with serum, and, on separating the medulla oblongata from the medulla spinalis, a similar fluid issued from the spinal canal in profusion.

The spinal cavity was opened, and its contents examined, but, with the exception of the unusual vascularity of the sheath, and collection of serum, nothing else particular was observed.

The abdomen was inspected, and the viscera found to be sound.

I was induced to adopt the above line of treatment, from having observed the powerful effects produced by venesection and tobacco enemata in hepatic ileus; the strong convulsive spasms in this disease, attended with excruciating pain and profuse perspiration, were generally benefited by this treatment, and, as acute traumatic tetanus has some symptoms in common with that disease, although infinitely more severe, I gave them a fair trial.

The administration of the tobacco glysters were uniformly succeeded by extreme prostration of the powers of life, bordering upon syncope, and, during this collapsed state, the spasms were always moderated, holding out illusive hopes that, by their repetition, some favourable change might take place. The alarming symptoms invariably produced from the use of tobacco enemata, render them a hazardous remedy, even in tetanus, unless the utmost precaution be observed, as we might, in endeavouring to avoid the spasms, fall into the opposite extreme, and induce fatal syncope.

I had, subsequently to this period, an opportunity of per-

using a paper by Dr. Anderson of Trinidad, in the second volume of the Transactions of the Edinburgh Medico Chirurgical Society, wherein that gentleman speaks in the highest terms of tobacco baths, and fomentations of the indigenous herb in traumatic tetanus. From the confident manner in which he recommends the baths and fomentations, and from the temporary suspension of spasmodic action in the preceding case, I was determined to give them a fair trial whenever an opportunity should present.

It was not long before the following case occurred. A stout healthy European seaman, in the prime of life, was admitted into the Marine Hospital, with tetanic symptoms, which were observed twenty-four hours previous to his admission. When I saw him, immediately after admission, he complained of a crick in his neck, and rheumatic pains, which he said he was occasionally liable to, but from the manner in which he turned his body, it became immediately apparent that he was labouring under tetanus. Upon inquiring whether he had received a wound, he said no, unless it was a slight puncture from a nail in the point of his great toe, which he considered of no consequence. On examination the toe was partially tumefied, and when squeezed a thin sanies exuded.

He complained of a pain darting down his spine to the lumbar region, where it extended across, and braced him up with great tightness; a similar pain stretched from the back, across both sides, and met at the ensiform cartilage, producing considerable anxiety and difficulty of breathing. When desired to put out his tongue, the jaws suddenly snapped, they were stiff but not fixed; he complained of soreness of throat and difficulty of swallowing. Pulse 120, strong and full; face and upper half of the body covered with profuse perspiration. The extensor and flexor muscles

appeared to be equally balanced between a continued spastic action, and, when he wanted to turn, he was compelled to do so gradually, and in the most rigid way. Has been bled and purged previous to my visit. Recommended to use tobacco-baths, strongly impregnated with the indigenous plant; the foot to be immersed in hot water for an hour, and afterwards to be covered with tobacco cataplasms. Enemata of the herb were also ordered, but, although they produced extreme nausea, vomiting and exhaustion, every time they were used, the spasms returned with renewed severity, and a general convulsion terminated his sufferings, exactly forty hours from the time the symptoms were first observed.

Dissection.

The body was opened six hours after death by my assistant, Mr. Rapkey, and the following appearances noted:—

The skin had generally a purple appearance, like a stage in ecchymosis, but was not swollen. The contents of the abdomen were sound, with the exception of the liver, where a few tubercles were found; the thorax showed more disease; the pleura pulmonalis adhered to the pleura costalis; the lungs appeared turgid, and a few well-defined tubercles were observed in their parenchyma. On removing the calvarium, the dura mater was particularly vascular, and the vessels felt like a hard thread under the finger; about four ounces of black blood oozed out from the longitudinal and lateral sinuses. On removing the dura mater, there was an appearance, like a successful injection, of blue and scarlet, where the pia mater dipped among the convolutions of the brain, the medullary part of which was studded with minute bloody points; the brain was highly congested, and heavier and firmer than natural. The cerebellum, medulla

oblongata, and spinal marrow, exhibited appearances similar to those observed in the brain.

The preceding cases of tetanus were induced by wounds so slight as scarcely to attract the notice of the patients. This circumstance is so well known to negroes generally, that the moment a punctured wound is received, that does not bleed freely, they take a knife or sharp stone, and lacerate, and open it, so as to convert it into a simple incised wound, or into one which will heal by a suppurative process, and, when this is effected, they consider themselves secure from an attack of tetanus. Dr. Morrison notices the same precaution amongst the negroes in Demerara. "The disease, I apprehend, is not uncommon in Africa, for I have known persons from that country, on receiving a punctured wound or cut, immediately to have the parts adjoining well beaten, or rather bruised, with any blunt instrument, such as a piece of wood or a stone. This, with a warm poultice, (say these) are used in Guinea to prevent the 'jaw lock.'"*

From negroes going barefooted, they are constantly receiving punctured wounds from nails, spines of the prickly palms, &c., and the rude surgery of their forefathers, as old as the days of Podalirius or Machaon, is indiscriminately applied as a prophylactic to all punctured wounds received in their daily pursuits.

Empirical as this practice may appear, it involves a surgical principle, which admirably answers the ends for which it is applied, and, accordingly, a punctured wound of moderate depth is enlarged by an incision, and one which has penetrated deeper they content themselves by beating

* A Treatise on Tetanus by John Morrison, M.D., Newry 1816.

and bruising; and afterwards induce suppuration by the application of a large warm cow-dung poultice. Were not such means used, there can be no doubt that tetanus would be an exceedingly frequent occurrence.

The following supervened to a slight lacerated wound, and may be considered as a case of sub-acute tetanus; at all events, it is the only successful case of symptomatic tetanus which I have ever had the good fortune to treat.

Cyrus Emslie, a negro, ætatis 18.—Four weeks ago fell from a horse, and had his wrist slightly lacerated; the wound healed favourably. On Friday, the 30th of April, complained of great pain and stiffness of the lumbar region, with wandering pains over his whole body, and an uneasy sensation under his sternum; jaw partially closed, and rigidly fixed. Bowels costive; pulse 120, strong and full; tongue foul. Was copiously bled, and had forty grains of jalap and twelve of calomel administered; the warm-bath was directed to be frequently used; and, as the part which had been recently wounded was painful, the whole hand and wrist were enveloped in a large soft poultice, and occasionally immersed in hot water.

Evening Visit.—The medicine has not yet operated, and he is inclined to vomit: he turns with great difficulty, and anxiety and dread are expressed in his countenance. Pulse 104. An injection to be given, and three grains of sugar of lead and one of opium to be administered hourly in a bolus.

31*st.*—Passed a very restless night, and had a fainting fit, is now covered with profuse perspiration, and the substernal pain is slight. The rigidity of the muscles and stiffness of the jaw continues; any attempt to swallow is at-

tended with extreme pain. Pulse 118, tongue furred, bowels still inactive. Repeat the bleeding, administer a smart cathartic, with occasional glysters, till the bowels be freely opened. The sugar of lead and opium to be discontinued till the medicines operate.

Evening Visit.—There is a tendency to syncope, and he would faint in the erect posture. The edges of the closed wound have partially reopened, and it was freely cauterized and poulticed. Pulse 120. The spastic rigidity of the muscles continues, without convulsions. None of the medicines have operated; continue the occasional use of the glysters, and let a dose of castor oil be given. Resume the sugar of lead without the opium.

April 1st.—The wound has opened, and with a little purulent matter a few particles of coarse gravel have been discharged; the bowels have acted freely, and there is an amelioration of all the symptoms; the jaw is still stiff, but can be more freely moved. Discontinue the sugar of lead; let the bowels be kept gently open, and allow a generous diet, with a little wine.

6th.—From the first to this date, the symptoms progressively moderated, and the only inconvenience he experienced was a slight stiffness of the jaw; which, after continuing for a few days, left him, and he perfectly recovered. From having observed partial paralysis, or a modified suspension of nervous energy to follow the use of lead, and having been uniformly unsuccessful in the treatment of traumatic tetanus heretofore, I was induced to try the effect of the sugar of lead, and to continue its use until the more urgent symptoms abated; but as time was not allowed for the physiological effects of this medicine to be developed, we may attribute the favourable result to the general

treatment adopted in this modified case of symptomatic tetanus.*

Having shewn the disease arising from wounds so trifling as scarcely to attract notice, I shall now briefly enumerate a few cases, where, to all appearances, the injuries were eminently calculated to bring on tetanic symptoms, and leave the physiologist to reconcile such contradictory anomalies.

A gentleman, in the act of loading a fowling piece, had his hand severely lacerated from the explosion of the powder flask; the wound gradually healed over a piece of copper which burrowed amongst the flexor tendons of the hand, gave him constant uneasiness, and prevented him using it. I was requested to extract the foreign body, and removed a rugged piece of copper the size of a quarter dollar, which had kept up a constant state of irritation, with occasional constitutional derangement, for twelve months.

A negro of a desperate character, who practised Obeah, and was the terror of the plantation, wishing to render himself unserviceable for field labour, siezed a blunt bill in a passion, and attempted to cut off his right hand; the radial artery was divided, the tendons of the wrist severely mangled, and the radius fractured. By the constant use of emollient poultices, and subduing constitutional disturbance, the wound healed kindly, and the hand was saved.

A gentleman returning from muster in his chaise, the

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* It is not my province now to notice idiopathic tetanus, but I may be allowed to observe, that the last case of that disease which I treated, yielded more favourably than any I had ever seen before, to lengthened incisions by the scalpel along the spine, encouraging the bleeding, and administering four drops of hydrocyanic acid hourly, with the additional use of the warm bath and fœtid glysters.

horse took fright, became unmanageable, and set off at full speed; he leaped from his seat, fell upon his hands, dislocated both wrists, and received a severe compound fracture of both bones of the left arm, and the radius protruded through the wound a couple of inches. It was one of those serious accidents which involves the question of amputation. I, however, determined to try to save his arm, and had it (as is my practice in all such extensive injuries) enveloped in a large soft poultice, unincumbered with splints, and, notwithstanding that spiculæ of bone were occasionally detached for months, creating considerable constitutional irritation, no tetanic symptoms supervened, and a cure was completed in about six months.

I extracted a splinter of a prickly pole,* the size of a writing quill, and about an inch and a half long, which had been firmly fixed betwixt the tibia and fibula for three months; and another from the elbow which remained for three weeks, both of which produced great pain and inflammation, without a single spasmodic symptom ensuing.

A blacksmith, much addicted to intoxication, had his leg amputated. From urgent business at the time, the dressings were entrusted to a black dispenser, but the patient became obstinate, and would not submit to have the leg dressed at the usual time; the consequence was, the bandages became deranged, maggots were generated in the wound, and when I saw him, the surface of the stump was all in motion from them. The leg was dressed, and, from similar causes, the stump again became infested with vermin, which produced an intolerable itching sensation, and from this time the patient was regularly attended, and the cure proceeded favourably.

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* Cocos Guieensis.

A similar list might be made to embrace all the extensive lacerations, compound fractures, and punctured wounds, that daily occur, without tetanus being a consecutive affection. A question, therefore, naturally arises: Why does acute symptomatic tetanus supervene in ninty-nine cases out of an hundred, to accidents deemed unworthy of notice, while severe injuries, and capital operations, are so seldom followed by spasmodic action? The question can only be resolved upon the principle, that the latter appear so formidable as to require the adoption of efficient measures to insure immunity from tetanus, while, in the former, precautionary means are seldom considered to be necessary.

A decided change takes place in the state of the wound previous to the induction of spasms; it assumes a hot, dry, puffy appearance, and the secretions either cease altogether, or a thin ichory fluid is discharged. This is so obvious in the generality of cases, that experienced negro dispensers, and midwives, predict with great accuracy the approach of tetanus. This altered state of the wound is often the only perceptible avaunt courier to the awful train of symptoms which follow, and no doubt hinges upon a deranged state of the system, however obscurely it may be developed.

It is a point of great practical importance to attend to this circumstance, as it serves to draw our attention to the impending danger, and affords us an opportunity of removing any constitutional disturbance without delay; as well as to take such steps with the wound as will place the patient beyond the range of tetanic influence. A similar change in the state of the wound has been noticed by Dr. Reid,* who says, that in removing the dressings, instead of healthy pus, the surface of the wound was covered with a darkish un-

* Edinburgh Medical and Surgical Journal, July 1815.

healthy looking matter, which he had in two former instances noticed as the forerunners of tetanus. Larry states that the suppuration of the wound suddenly diminishes, and at length totally ceases, the surface becomes puffy, and dries up, is at first red, and afterwards marbled; and Rush* relates, that "in most of the cases of this disease from wounds which he saw, there was a total absence of pain and inflammation."

In rare cases the wound heals up before the occurrence of tetanic symptoms; a case of which happened in my practice; but, previous to the disease, it inflamed, broke out, and discharged a few particles of gravel. Rush takes notice of this, and says that some of the wounds had entirely healed before any of the symptoms had made their appearance.

Prophylaxis.—Until a more successful method of treating this fatal form of tetanus be discovered, our efforts must be principally directed to its prevention.

Tetanus is of less frequent occurrence in the West Indies of late than in former years, and this may in a great measure be attributed to the improved state of modern surgery. The prophylactic system is followed by such gratifying results that whenever it is faithfully carried into effect, the symptomatic forms of tenanus are so exceedingly rare that their appearance may often be traced to some failure in the application of the measures which operate so efficiently in preventing the disease. Numerous instances might be adduced to support this assertion; but the simple fact, that infantile tetanus, or locked-jaw, as it has been erroneously called, which destroyed two-thirds of the negro children

* Medical Inquiries and Observations. Vol. I.

born in the Leeward Islands, has almost disappeared in certain districts of Jamaica, is so convincing and undeniable, that even prejudice is fast assenting to its truth.

In the seventh volume of the Medico Chirurgical Transactions of London, Dr. Dickson, with great propriety, places considerable stress upon the attention which ought to be paid to the state of the bowels in preventing the disease, a recommendation which must necessarily be attended with beneficial results, and to which I most cordially subscribe. But it is to the state of the wound or injury that we must primarily direct our especial attention, as the local treatment has much more influence in the future result than many are inclined to concede to it.

There is a necessary degree of healthy inflammation required in the reparation of every injury; and if this process be either deficient or in excess, wounds not only fail to unite, and injuries to proceed favourably, but they may act, and be reacted upon, by circumstances connected with the constitution, so as to produce dangerous consequences.

If healthy suppuration be induced in extensive contused and lacerated wounds, where there is no reason to hope for immediate union, there will be little danger of tetanus, even in the most complicated injuries; and the surest guarantee from such consequences in compound fractures and amputations of the extremities, will be by enveloping the injured part with a large emollient poultice, renewing it at proper intervals, and occasionally immersing the part in a vessel of warm water, where it is practicable. Such practice does not excite suppuration in wounds after operations, as many suppose; but restrains the inflammatory action within such bounds as is most conducive to adhesion; for it is well known, particularly within the tropics, that

wounds oftener fail from an excess of inflammation than from any other cause.

I have only known tetanus to succeed to amputation of the extremities in one instance out of about forty capital operations in my practice,* exclusive of numerous cases of amputated toes and fingers; and, in that case, it was doubtful whether it originated from the operation or from cold contracted from imprudent exposure to a shower before the wound healed.

The patient earnestly requested that his leg might be removed, on account of elephantiasis of the foot and lower part of the extremity, where an enormous ulcer had acted as a perpetual drain for years. I performed the operation below the knee, and every thing proceeded favourably till the eleventh day, when he walked to a little distance, with the assistance of his crutches, and sat down on a damp stone, and remained during a continued drizzle, till he became wet. He returned, and, very soon afterwards, complained of catarrhal symptoms, and, during the night, felt his jaw stiff; this was soon followed by pain and rigidity of the back and neck; and, by next morning, he laboured under as severe a form of opisthotonos as I ever witnessed. His pulse was upwards of 120, the spasms

* It may be well to state, that the circular operation was invariably performed for two reasons. 1*st*, Because I was taught that method; and, having found it eminently successful, did not like to abandon it: my former partner Dr. Robertson's extensive experience goes farther than mine, as I do not recollect a case of symptomatic tetanus succeeding to any of his numerous operations by the circular incision. 2*d*, Because, when properly performed, it is done as quick, leaves as good a stump, and the nerves are not unevenly divided as in the flap operation, a circumstance which may, or may not, be of very great importance; but until I find an equally successful result by the flap within the tropics, I would not feel disposed to change the circular operation for one of doubtful advantage.

returned at intervals of from three or four minutes, and he was frequently bent like a bow; and remained in that rigid state during the dreadful continuance of the paroxysms, uttering the most piercing screams.

This case was treated with cold affusion, opium, and purgatives, without relieving a symptom; and he died in thirty-six hours from the invasion of the disease.

The following case will not only illustrate the safest method of treating wounds of every description, but will also shew that tetanus, in its incipient form, may sometimes be arrested.

A stout healthy negro, by occupation a cooper, received a contusion on his hand, shortly afterwards followed by stiffness of the neck, soreness of the throat, difficulty of swallowing, and rigidity of the jaw, with other incipient symptoms of tetanus, which alarmed both himself and his friends. The wounded part had been dressed with lint and laudanum, and was observed, the preceding day, to assume a hot, dry, puffy appearance. I saw him immediately after he complained of these symptoms, and bled him almost to deliquium. The irritating dressings were removed, and the whole hand and arm were plunged into a large wooden bowl filled with hot water, and kept at an uniform temperature during the night. The bowels were freely evacuated by calomel and jalap. Next morning the alarming symptoms were much moderated, particularly the difficulty of deglutition and stiffness of the inferior maxilla; the injured part shewed some disposition to suppurate, and the constant immersion in warm water was persevered with. At night the hand and arm were laid in a large emollient poultice,*

* After amputation, when the wound is stitched, and a few light turns of calico is applied, the stump, being covered with a large soft

a bolus of calomel and opium was given, and the following day a free discharge of pus was excited; and, from this time, all the disagreeable symptoms vanished.

Had the above case been allowed to proceed without removing the irritating dressings, or adopting effective constitutional means, I have no hesitation to say that it would have gradually merged into the irremediable stage of the disease; and were we called in during these incipient or premonitory symptoms, our efforts would be equally successful in similar cases.

Treatment.—Little practical improvement has been made in the succinct account of this disease and its treatment, which Hippocrates* has left us, down to the present day; and it is the concurrent testimony of writers, both of this and of former times, that acute symptomatic tetanus pursues an uncontrolled and fatal course in defiance of remedial measures.

However painful it may be to make such an admission,

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poultice, using immersion in tepid water for a short time previous to the renewal of each poultice, the cure progresses much quicker than when dressed with a profusion of straps and bandages; and, if the process should appear somewhat clumsy, it is compensated by the rapidity of cure and infrequency of tetanus.

A very good practical illustration of the utility of emollient poultices may be adduced from the beneficial effects observed after docking horses and mules. I have seen several cases of traumatic tetanus amongst horses and mules from docking. The barbarous method of chopping off the tail, or removing it with a rough common knife, and afterwards searing it with a hot iron and rosin, was a fruitful source of tetanus; and, with brutes as with mankind, it invariably proved fatal. When the operation is performed with a sharp instrument, the arteries secured by ligatures, and the stump enveloped in a large poultice, tetanus never follows docking.

* De Morbis, Lib. iii. Caput xii.

in the present advanced state of medical science, it is preferable to be candid, instead of deceiving ourselves in trusting to medicines which possess no influence over this dreadful disease. With the aid of the recent discoveries of modern physiologists, we may eventually arrive at a nearer approximation of the pathology of tetanic affections, and thus be pursuing the only legitimate path which will direct us to a rational method of treatment.

Opium—which deservedly ranks as the first and the best of medicines, and is our sheet-anchor in most spasmodic diseases, has failed, in acute traumatic tetanus, to arrest a single symptom, even when administered in doses which would scarcely be credible; indeed ounces of it have been given without affording the unhappy sufferer one moment's repose. From the high official situation in which Sir James M'Gregor has been so long placed, and the facilities afforded him for generalization, he says, "from the extensive trials which were made with us with opium and mercury, I consider them as perfectly inert in this disease, when acute and fully formed."

Venesection—has been tried, from moderate depletion to the most copious abstraction of blood which the system could bear; nausea and syncope have been the alternate objects of practice; and although the tetanic symptoms have temporarily yielded while the powers of life were prostrated, no sooner did reaction commence than the train of convulsions were resumed, and the disease pursued its fatal course.

Mercury—another of our most valuable and efficient remedies, has proved utterly abortive in every case where it has been tried. It has been thought that if the system could be brought under the influence of this medicine, that

the morbid catenation of symptoms would be broken, and the patient have every chance of recovery. So far this holds true in reference to modified cases of idiopathic tetanus, arising from cold, as well as the sub-acute variety of symptomatic tetanus occurring in temperate climates, where these comparatively mild forms succumb both to this and to other remedies; but the failure of mercury in several cases *where the mouth was streaming*, and where the system must have been fully saturated by inunction, disproves the assertion that acute symptomatic tetanus yields to this medicine, and leaves us to regret that one of the most active agents in the mineral kingdom should possess no sanative influence over this intractable malady.

Mosley mentions that many persons have been attacked in the West Indies while under a course of mercury, and expresses his opinion that "it has killed more than it has cured."

Tobacco.—In idiopathic tetanus I have seen cures effected almost by the agency of this remedy alone; and from having, likewise, derived valuable assistance from it in subduing the inordinate spasms in dry belly-ache, I anticipated much benefit from it in the symptomatic form of the disease; but my hopes have been uniformly disappointed, although it still stands in the foremost ranks for giving a temporary truce to the awful symptoms. Mr. Curling, in his treatise on tetanus, after carefully examining the comparative merits of various remedies, inclines favourably towards the use of this herb, and says, "I conceive that more has now been adduced in proof of the efficacy of tobacco, than can be advanced in favour of any other remedy yet resorted to."

Hydrocyanic Acid—promises to be a valuable adjuvant in

the treatment of this disease. I have administered it successfully in a case of idiopathic tetanus, but have not had an opportunity of trying it in the symptomatic form; and, although it has been used by others, my attention was drawn to its powerful sedative virtues from having observed its efficacy in gastrodynia, and from the power which it possesses in allaying excessive irritability of the stomach in tropical fevers of high excitement. In my future practice I would be inclined to give this medicine a fair trial, and look with anxiety to the results of others.

The cold affusion was recommended by Hippocrates, and has its advocates to the present day. I have given it a very fair trial in acute traumatic tetanus; and not only has it proved unservicable, but it seemed to be extremely annoying to the patient.

I have little to say in favour of blisters and antispasmodics; they may be used at discretion, with remedies of a more powerful kind, and purgatives may be given with much advantage where the bowels are in a torpid state.

Amputation—has had numerous advocates, amongst whom Baron Larry stands the most prominent. In my opinion, when once the spasmodic symptoms are fully developed, the disease becomes a general constitutional affection, and the wound, from that moment, is released from all further responsibility; so that, to remove the limb after tetanic spasms are in full operation, is both useless and cruel, as has been repeatedly proved by many of our most eminent army surgeons, especially Dr. Hume and Mr. Guthrie; and Sir James M'Gregor states, that, after the battle of Toulouse, amputation was extensively resorted to without affording relief.

Dr. Murray* relates a case of traumatic tetanus, in a midshipman, on board of the ship James Patterson, a passenger from England to Calcutta, who received a punctured wound from a rusty nail, between the metatarsal bones of the great toe, cured by the division of the posterior tibial nerve.

Larry treated a French general successfully by a similar operation ; but these cases were probably the modified form of traumatic tetanus, which occasionally yields to any kind of treatment, or may, with equal facility, sometimes admit of a spontaneous cure.

From having been uniformly disappointed in curing acute traumatic tetanus, I shall be more anxious to rely upon the prophylactic treatment, until some successful mode of curing this formidable malady be discovered. In the meantime, my sentiments are in perfect accordance with those expressed, in reference to this disease, by Sir James MacGregor: "At this moment I am unable to say precisely the number of cases that were treated, as they are included in the returns under the head wounds ; however, there were some hundred cases, affording room for extensive trials. I am, however, obliged to confess, that little or no dependence is to be placed in any remedies, and I have to regret that the method of cure is yet to be discovered."†

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* Transactions of the Medical and Physical Society of Calcutta. Vol. VI. p. 409.

† Medico Chirurgical Transactions, London. Vol. VI. p. 419.

TETANUS INFANTUM.

Infantile tetanus has always operated as one of the principal causes of decrease amongst the negro population, not only in Jamaica, but throughout the whole British and foreign possessions in the West Indies.

Much anxiety has been evinced, both by the proprietary and by medical men, to obviate this uniformly fatal disease; and some of the leading physicians of Europe have been consulted as to the best practical method of averting and curing this destructive malady, but with as little success as had hitherto characterized the efforts of tropical practitioners.

The disease was of much more frequent occurrence a few years ago than it is now, and was considered as a necessary endemic on every plantation. From observations made for a series of years, while this disease was in its plentitude, in a field which embraced a wide range, with access to plantation records and other authentic sources of information, I found the depopulating influence of infantile tetanus to be twenty-five per cent. of all the negro children born. Fearful as this estimate appears, it is exceeded by that of Dr. Hancock, who makes the deaths from tetanus infantum, double of that which occurred in Jamaica; and I have good authority for stating, that at this moment it is ex-

erting an equally fatal influence in the island of Cuba; but this circumstance excites little notice in that colony, as the natural decrease of the blacks is more than counterbalanced by the recent enormous increase of the slave trade by the Spaniards.

Dr. Hancock says, "it is so frequent and fatal in the colonies of Essequebo and Demerara, that, at an average estimate, it kills half of the number of infants which are born there, and I am informed that nearly the same proportion is destroyed by it in the neighbouring islands."*

This appalling decrease, which has no parallel within the bills of mortality, must necessarily have attracted the early attention of the profession; but the undeviating manner in which the disease pursued its fatal course, soon convinced medical men that all their resources lay in the prevention and not in the cure of this convulsive affection.

Every writer upon this disease, has considered himself bound to assign causes for these fatal occurrences, such as the retention of the meconium, damp marshy situations, the smoke of wood in close apartments, &c.; whilst the *sole cause, the neglected state of the navel*, was altogether overlooked.

Infantile tetanus scarcely acknowledges any other cause than the improper manner in which the navel is treated; and this assertion is corroborated by the entire disappearance of the disease in every instance where a proper attention has been paid to this important circumstance. In the early part of my practice, I had opportunities of almost daily observing cases of this convulsive affection, and exhausted an endless variety of remedies in endeavouring to

* Observations on Tetanus Infantum.—Edin. Med. and Surgical Journal. Vol. XXXV.

check its progress, whilst I, in common with others, overlooked the *fons et origo mali.*

In my visits to negro women immediately after labour, a few years ago, when it was difficult to combat with African prepossessions and superstitions, I have frequently, nay almost universally, observed a mixture of castor-oil and rum standing by the bedside, and, when asked for what purpose it was to be used, they replied, that it was "to feed the baby with till the ninth day." This was given with an idea that it would purge off the meconium, the retention of which they, in common with their more enlightened white brethren, considered to be one of the principal causes of tetanus.

During this period the air was carefully excluded from the apartment—a fire was kindled—and the midwife inculcated the necessity of not allowing the navel to be dressed till it dropped spontaneously.

The predisposition for infantile tetanus no doubt was heightened by such erroneous treatment, and miliary eruptions, and strong febrile symptoms, were by no means infrequent consecutive affections; but my more recent experience has convinced me, that although these causes did operate detrimentally, still (leaving out the state of the navel) in themselves they were not sufficient to account for the frequency of tetanus infantum.

It must have been from observing causes similar to these in operation, that medical men placed so much stress upon the smoke of wood inducing tetanus; but the disease continued its destructive influence when most of these causes were removed, and was as fatal in the well-ventilated apartments of estates' laying-in-hospitals, which were subsequently erected on many properties, as in the closest negro house.

It signified very little where the women were delivered, so long as the fatal method of dressing the navel was persisted in; and a more refined species of cruelty, or one better calculated to produce the disease which it was intended to prevent, could not have been adopted, than the application of spirits of turpentine to the tender skin of a new born infant. A little reasoning soon convinced me that turpentine, laudanum, tobacco-ashes, burnt rag, bark, arrow root, &c. were highly irritant and dangerous dressings to be applied to such an extremely sensitive part as the navel, and, besides that, I have more than once seen extensive patches of erysipelatous inflammation spreading over the abdomen of the infant, from the careless and profuse application of these *terebinthinate* dressings; and cases have actually happened where, from neglect of ignorant nurses, inflammation of the bowels have proved fatal from such causes, where tetanus did not supervene.

This disease of new born infants may be considered as acute traumatic tetanus, pursuing the same fatal course as in adults, and terminating generally within the fourth day from the induction of spasms. I am aware that some ridicule the idea that infantile tetanus originates from the irritable state of the navel; but careful observers will soon recognise the leading features of this disease to be exactly similar to those of symptomatic tetanus, and will have no difficulty in perceiving that both arise from neglected wounds.

Trismus is an inappropriate term, as its etymology implies that which seldom forms a prominent symptom of the disease. Gnashing or spastic rigidity of the lower jaw occasionally takes place, but both are rare in comparison to the general convulsive affection of the body. The term jaw-

fall is also erroneous, inasmuch as it is never seen in that position; and as infants are very frequently observed to suck in the interval of the spasms, *locked-jaw* is equally inapplicable. It is true that the jaw is sometimes firmly and closely locked, and is, now and then, one of the first symptoms which appears; but, in such cases, the whole system subsequently participates in the convulsive action; and it would be more appropriate to designate the disease by the name of infantile traumatic tetanus, than to characterize it from a particular symptom, which is by no means uniform.

The disease generally appears from the second to the fourth day, but may occur at any period within the ninth day, beyond this it seldom takes place.

The approach of tetanus is indicated by a restless feverish disposition of the infant; it is affected with slight twitchings about the angles of the mouth, with subsultus during sleep, awakens crying, and at this stage very often refuses the breast. If the navel be examined, it will be found to have assumed a dry livid appearance, and the intense inflammation not unfrequently extends around to a considerable distance on the abdomen. Negro midwives predict with considerable precision the approach of "big sick," as they call it, from the unnatural appearance of the funis. To a person unacquainted with the disease at this early period, the symptoms might be apt to deceive, and lead him to suppose that the child was griped; but the occasional convulsive clenching of the hands, and drawing up of the legs, together with the incipient rigidity of the dorsal and cervical muscles, and peculiar expression of countenance, are signs too significant to be misunderstood. By degrees these symptoms become more intense, the jaw is now either fixed, or, what is more common, a series of spasmodic retrac-

tions are ushered in, occurring at intervals of from two to three minutes, exciting the most intense agony in the innocent sufferer, and sometimes causing its whole frame to vibrate. Like the acute form of tetanus in adults, the flexor and extensor muscles appear at times to be equally antagonised by spastic rigidity, and the infant utters the most pitiful cries, while the whole body is bathed in clammy perspiration. The abdominal muscles are occasionally convulsed. The spasms increase in frequency, and death appears sometimes to be induced, from the suspension of the heart's action, during one of these violent convulsions.

In numerous cases of infantile tetanus, I have not seen a single case of emprosthotonos. As I have nothing favourable to say of the cure, *having never observed a case to recover*, I shall speak more confidently of the preventive treatment, and have no hesitation in declaring, that wherever the navel is carefully attended to in the simple manner to be recommended, tetanus will never follow. In the early part of my practice it was exceedingly prevalent, but, by perseverance in abolishing prejudices, and pointing out the danger of irritative dressings, it has totally disappeared for the last ten years, with the exception of a few solitary cases from gross neglect. It has been said that the offspring of blacks are more liable to this disease than white or coloured children. There is no denying this truism; but that they are naturally more susceptible of tetanus, I am prepared to deny, from having seen white and coloured children attacked with it whenever the same favourable causes were present; but the reason that white children are so seldom attacked with tetanus, is that their navels are better attended to, and cleanliness is rigidly observed, whereas a mass of putridity is often allowed to collect around the navel of black infants,

and maggots* have actually generated amidst the corruption before it was removed.

The disease may be occasionally arrested in its incipient stage, if proper means be adopted before the induction of spasmodic action, as the following case will show:—An infant, four days old, became restless and feverish—the eyes assumed a heavy glassy appearance—and it cried almost incessantly. I saw it at this time, and was struck with an intolerable stench which proceeded from the body; upon removing a dirty bandage which surrounded the abdomen, the navel was covered with putrid rags, which, when taken away, displayed the funis in a high state of inflammation and tumefaction. A bluish disk, about two inches in diameter, surrounded its base, exhibiting a morbid colour quite distinct from the rest of the black skin. The irritant dressings being removed, the child was plunged into a warm bath, and a large emollient poultice, with oil, was applied over the whole abdominal surface. From this moment the child experienced relief, and became quiet; a little opening medicine was given, and all threatening symptoms of tetanus disappeared. If these dressings had been allowed to remain a few hours longer, according to the midwife's wish, nothing could have prevented the supervention of spasmodic action.

A healthy negro infant, whose navel was directed to be washed and daily dressed with simple ointment, was unfortunately visited, on the second day after birth, by an officious midwife of the old school, who persuaded the nurse to remove the dressings, and permit her to apply laudanum

* A medical friend communicated a case of this kind to me, which occurred in his practice.

and burnt rag to the funis, which was accordingly done, and a bandage was applied, with injunctions not to remove it till the navel dropt. Almost immediately after the application of these irritant dressings, the child became restless and feverish, and continued in apparent great pain till the fourth day, when tetanus supervened, and proved fatal the same evening.

A healthy negro woman was delivered on Monday of a fine boy; the navel was dressed with burnt rag, and bound up, with directions not to be opened till it separated. On Wednesday, a putrid smell was perceived to arise from the funis; but, agreeably to the midwife's orders, nothing was done to it till Thursday, when the dressings were removed on account of the intolerable fœtor. Burnt rag and laudanum were now applied without washing the part; towards night it refused the breast; next morning, when I saw it, at nine o'clock, it was labouring under tetanic spasms, and foamed at the mouth; the jaw soon became locked, and it died in extreme agony on Friday night.

These two last cases briefly illustrate the dangerous practice of applying irritant dressings, and allowing filth to accumulate; any other result than tetanus could not have been expected under such improper treatment; but, strange to say, notwithstanding the fatality of this disease, it was exceedingly difficult to convince these people of the impropriety of such practices, and equally so to overcome a superstition that the navel ought not to be interfered with till it separated.

These fatal customs begin to yield to a more rational method of treatment, and the disease is now comparatively rare to be met with.

The directions I have been in the habit of giving to mid-

wifes, are so plain and so easily understood, that, since their adoption in my practice, infantile tetanus may be said to have disappeared.

I direct them to deliver women in a cool, well ventilated apartment, without fire; to put the infant to the breast as soon as possible; and, if the milk does not act as a laxative, to give a gentle dose of magnesia or castor oil. The state of the funis is represented to be that of a simple wound, which, if large, is to be carefully washed with milk and warm water morning and evening, and dressed with a pledget of simple ointment; but, if of a moderate size, one dressing a-day will be sufficient; and this treatment is to be continued till the navel has separated, and the part has healed. I prohibit them from applying any of the old dressings, under any circumstances, and point out the dangerous consequences if they depart from these rules. Simple as this treatment appears to be, it has exceeded my most sanguine expectations, and entirely supersedes such hazardous expedients as have been suggested in the application of irritant dressings and the actual cautery.

As nothing can possibly place in a stronger light the important part which the navel has assigned to it in producing tetanic convulsions, I shall select, out of many, the following circumstances. I was consulted by a lady, on account of the ravages which the disease was making on her plantation; she informed me that twenty-five infants had perished, in a few years, from locked jaw. The women were removed from the negro houses and delivered in one of the airy apartments of the mansion-house, under her immediate superintendence; yet, notwithstanding all her care and attention, the mortality was as great as it had been under less favourable circumstances. The treatment was,

to give the child a dose of castor oil shortly after birth, to dress the navel with bark, and each day to add a fresh portion, to absorb the acrid matter, without washing it till it dropped. I advised her to change her method of dressing the funis, and to bathe it carefully with milk and warm water once a-day, or twice if it was large, and after each ablution to apply a pledget of cerate or spermaceti ointment, carefully abstaining from purgatives and irritant dressings. Slight as this alteration was, she entered upon it with a determination to give it a fair trial, and her efforts were crowned with perfect success; for she lately informed me that, since its adoption, for several years past, she has never lost a child from tetanus.

The two following cases will give a general idea of the morbid appearances usually found on dissection.

A woman, on Fort Stewart estate, was delivered in a very easy labour, of a mulatto child. On the morning of the seventh day the infant commenced crying, and, shortly afterwards, refused to take the breast; the fists now became clenched, with partial spasms, which soon terminated in general tetanic convulsions, and it expired next morning.

Dissection four hours after death.

The navel was unusually large, and did not drop till the commencement of the fits; the boy was well formed, and born to the full time. On viewing the body externally, a blush of purple-red was observed suffused over several parts of the abdomen and back.

The pericranium presented an injected appearance, and, on slitting it open, a coagulum of blood was found, effused immediately over the junction of the parietal with the occipital bones. The dura mater was exceedingly vascular, pia mater turgid, and the corpora striata gorged with black

blood; no lymph was found in the ventricles, but their lining was beautifully injected, and the right ventricle contained a small quantity of blood. Tentorium and basis of the brain highly vascular. The cerebellum exhibited similar appearances to that of the brain.

The spine was opened and carefully examined, involucra externally covered with blood, and internally a slight effusion of blood and lymph, the appearances generally were highly vascular, but nothing farther was observed throughout the inspection than a preternatural injected appearance.

A woman, on Gray's Inn estate, brought a fine boy on Monday, after an easy labour; every thing went on well till Friday, the fifth day, when, about two P.M., it appeared uneasy and gaped, shortly afterwards refused the breast, became restless, and was covered with profuse perspiration. A few hours later the jaw was found to be locked, and towards morning it was seized with convulsions. The whole of Sunday the fits recurred at intervals of two to three minutes, and were of a modified kind, but on Sunday night they assumed an extremely violent form, and the head was now and then thrown back with great force, accompanied with dreadful spasms of the abdominal muscles, which became constricted and unyielding during the paroxysm. The breathing was hurried, and the arms were drawn upwards, while the hands were clenched. The body was thrown into a general tremor, with pitiful moaning; and it foamed at the mouth, previous to the spasms. Died during the night.

Dissection a few hours after death.

Brain.—The dura mater was of a natural appearance, and presented no signs of inordinate vascular action. Pia

mater covered with turgid tortuous vessels, and had a minutely injected appearance. The sinus longitudinalis was gorged in the back part with coagulated blood. On making a horizontal incision through the middle of the cerebral substance, it was minutely studded with vessels, which poured out drops of blood; the left ventricle was half filled with serum.

The falciform process, tentorium, septum of the ventricles, and inferior dura mater, evinced signs of intense vascular action having existed, had a colour between vermilion and purple, and the depressions on the base of the brain were covered with layers of coagulable lymph. On cutting through the tuber, blood exuded from small points.

Spine.—Dura mater morbidly suffused thoughout its whole extent.

The involucra of the lateral nerves of the same appearance.—After inspecting the spinal cord very minutely *in situ*, it was carefully removed, and the nerves individually examined; the only unusual changes observed during the whole dissection were in the involucra of the brain and spinal cord, appearances which I have repeatedly noticed in many diseases not referable to spasmodic action.

Abdomen.—The navel was inflamed and tumefied, and an inflammatory blush extended a small way around it; the appearance of the intestines was natural, but inflate;d gall bladder turgid, with green bile.

Thorax.—Healthy.

The deep obscurity which envelops the pathology of tetanus, and the innumerable difficulties which beset the path leading to a precise knowledge of morbid alterations in such a delicate tissue as the nervous system, can only be removed by a patient investigation, by the accumulation of

faithfully recorded facts, and by carefully discarding every circumstance that leads to premature generalization.

Nothing tends more to impede the intellectual march of science than preconceived opinions, a bigotted partiality to favourite systems, and an impatient haste to establish general principles upon insulated facts. No disease requires the solid aid of observation and experiment more than tetanus, and records of fatal cases, with *post mortem* appearances, become exceedingly interesting to the pathologist, in as much as they may enable him to bring the light of induction to bear upon the darker features of this convulsive affection.

Several eminent pathologists have endeavoured to ascertain the nature of this disease by anatomical investigations, but, as yet, their researches have led to no important practical results, and it still remains a matter of speculation and conjecture.

In most necroscopic examinations a similarity of result has been observed, such as an unusual turgescence of the vessels of the brain and spinal cord, and their involucra, together with a copious effusion of serum amongst the cerebral convolutions, as well as in the ventricles and spinal canal, but these morbid appearances cannot be said to belong exclusively to tetanus, as they are also occasionally identified with the higher grades of tropical fever, and the various modifications of coup de soleil, or insolation.

To say, therefore, that it originates from inflammation of the neurilema of the injured nerves, which is afterwards propagated to the medulla spinalis, or to inflammation of the cerebral substance itself, to acute spinal meningitis, or to a deranged state of the intestinal canal, or digestive organs, acting upon a peculiar indiosyncracy, are palpable admissions

that we understand as little of its nature as did Hippocrates and Celsus; and down to this day it remains what it emphatically was then, an *opprobrium medicorum.* "Indeed we may lay down this medical paradox, that the number of diseases of the nervous system which are unattended with any change of structure whatever, infinitely surpasses the small number in which we can find some appreciable sign after death."*

The striking pathological appearances observed in all the cases which have occurred to me, whether in adults or in infants, bear a strong similarity to each other, and all evince, in the most unequivocal manner, the unequal distribution of the blood, and its concentration on those parts most essential to life. Such appearances, however, are not to be regarded as the cause of tetanic convulsions, but rather as the effect of some unknown nervous influence, which produces an abnormal action upon the circulating system, and probably increases the convulsive tendency of the mechanical irritation of inordinate vascular distention.

In the present imperfect state of our knowledge of this disease, there is some consolation to think, that one of the greatest ills that can cross the path of humanity, may in a great measure be obviated by keeping constantly in mind the never too often to be repeated precept: "Principiis obsta :—venienti occurrite morbo."

* Andral's Lectures. Lancet, Vol. I. 1835–6.

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