fatal certainty, but which other less vital parts can support without important interference with their functions.

In the early months of intra-uterine life the arrangement of the corneal tissue is allied to that of the sclerotic, and it is only as foetal life increases that this arrangement of the former is by degrees assuming the peculiarity which at length characterizes it. Should, then, an arrest of development occur, the sclerotic would be found abnormally prolonged at the circumference of the cornea, and sometimes, in place of being present as simply a slight filmy rim overlaying this part, the sclerotic structure occupies the place of the cornea to greater depth and breadth, and the senile arc is proportionally more closely simulated. Himly states the congenital cases of arcus to be the result of an imperfect separation of the cornea and sclerotic, and the same view is entertained by Monrenheim, Kieser, and Sieler. On looking closely at the eyes of individuals of all ages, we almost invariably find the sclerotic invading the cornea, both above and below, and it may be, that the two portions, by their union, leave between them an elliptical part only of clear cornea. Such an instance is mentioned by Monrenheim.

Peculiarities.—We sometimes, though very rarely, see the fatty zone to be situated at a greater distance than usual from the edge of the overlapping part of the sclerotic. An example of this description I witnessed, a short time since, in a man, aged seventy, who applied at the Royal Westminster Ophthalmic Hospital, and in both of whose eyes the interval between the sclerotic and arc was nearly twice as broad as it is ordinarily found to be. The fatty cincture may so encroach on the cornea as to leave in its embrace only so much of the cornea translucent as will correspond to a moderately dilated pupil. In a case of this description, which I had the opportunity of examining after death, I found that the oily deposit was, by degrees, diminished in amount the nearer it encroached towards the centre of the cornea, so that the depth of colour lessened gradually from the outer to the inner circumference of the zone. In this instance, the lens was of the yellowish hue so commonly seen in elderly persons, but there existed no deposit in the capsule of this body in either eye. Both eyes presented the appearance above described. The continuity of the arc I have never seen to be interrupted, but in one case noticed that a small opaque patch advanced from it towards the centre of the cornea in either eye of an elderly woman. We may sometimes see that the cornuæ of the arcs do not unite on the two sides of an eye; this may occur on the temporal or nasal side of the organ.

Opinions of Authors respecting the Nature of the Arc.—Mr. Walker* states the arc to be composed of a firmer and more opaque substance than that of which the cornea is originally formed, arising from an impaired action of the secretory vessels, which cease to pour out healthy corneal matter. Mr. Hays† assumes the arc to be “a deposit of lymph, formed, perhaps, by a slow chronic inflammation.” Velpeau‡ says, “The senile zone cannot, properly speaking, be attributed to disease of the cornea, the structure of that membrane not being altered, nor its thickness increased.” Respecting the change, Tyrrell§ “cannot offer any explanation.” Lawrence|| remarks, “No essential difference has been found in the part; there is no new growth, nor any deficiency of its usual density. I can only compare it to the change which takes place in the internal coat of the larger arteries in old age.” The author whose description most nearly approaches to fact is Dr. Schön,¶ of Hamburg. He has “often examined, anatomically, corneæ affected with arcus senilis, and found the affected portion changed into a homogeneous, sometimes fat-like, (speckartige) mass, often of considerable firmness. The laminated structure has entirely disappeared, the laminae being consolidated into one mass; this was more particularly the case with the external than the internal laminae.” The latter paragraph is entirely erroneous. Middlemore** has hinted at the probable nature of the arcus when he writes, “If it be not a mere alteration effected by age, I am quite unprepared to say what it really is—no circumstance with which I am acquainted, except age, seems capable of producing it. The change wrought in the arteries by age presents the only analogy to the formation of the arcus senilis which now occurs to my mind.” The opinion of Meckel†† I must add, as forming

a strong contrast to the above, and as showing how readily an opinion may be raised, though wanting the sure groundwork of facts for its support. “Gerontoxon undoubtedly depends on the slowness with which the substance of the cornea is renewed, whence the fluids have more tendency to coagulate.” The last opinion I shall quote (being the most recent one) is that of Dr. Artha,* who states the cornea to be converted, at its periphery, into a tissue analogous to that of the sclerotic, in consequence of an atrophy of its fibres incidental to old age, and likens the change to a condition of the cornea, which, he says, is to be seen under the microscope when this part is affected with nebula. In nebula he has observed that there is a greater degree of interlacement, an approximation or contraction of the fibres of the cornea. The fibres pass, uninterruptedly, from the healthy to the diseased part, and beyond it. There is no visible alteration in their form, but they lie at the diseased part much closer together, are opaque, and from this it seems, as also after inflammation of the conjunctiva, contraction of the elementary fibres takes place, in consequence of which they lose their transparency—a condition which in this state the cornea has in common with the conjunctiva, and might be best termed *sclerotic transformation* of the cornea. The old view, that nebulosity consisted in an exudation between the fibres of the cornea, is erroneous, inasmuch as the contrary is seen under the microscope. The exuded matter which in the inflammatory stage was effused between the fibres of the cornea, is re-absorbed, but has rendered them opaque; they are contracted, and their interstices obliterated.” The above views respecting the structure of nebula I have never had the opportunity of verifying; but from frequently-repeated examination of the cornea affected with arcus senilis, I can state, that the condition of this tunic in the situation of the arc is not the same as that described by Dr. Artha, as to be found where a part of it is nebulous.

This list of quotations might be considerably amplified, without, however, augmenting its utility. It serves to point out how discrepant are the opinions of authorities on the subject; and the sequel of this paper may show, that whilst many have greatly erred in their views, others, in drawing conclusions from analogy, have imagined a truth which can now be established on the surer basis of microscopical inquiry.

Method of Preparing the Cornea, to examine the Arc.—There are many other points in connexion with the arcus senilis which have yet to be treated of under separate heads, as, concomitant implication of the capsule of the lens; analogous affection of the sclerotic; a similar condition of the conjunctiva over the arc; ossification of the ophthalmic artery, &c.,—all of which, from collected evidence upon them, I shall have, in a second part, to communicate, but should deem this portion of the “Observations” incomplete, were I not to explain the best method (as I consider it) of preparing the cornea, so as to demonstrate the senile zone to be due to “fatty degeneration.”

Cut the sclerotic through, circularly, at a short distance from the cornea, and detach the two, conjoined, from the ciliary muscle. The piece removed is to be divided into four equal parts, by two incisions intersecting at the centre of the cornea. Pin each triangular portion to a wax tablet, and let all dry in a current of air. After drying, remove carefully, with a sharp knife, a thin “shaving” from the edge of the preparation; place it on the slide, in a drop of water, to which is added a little acetic acid; and having (after a few minutes) covered the object, proceed to its examination. In this manner the fatty deposit may be shown; and after subsequent immersion of the specimen in ether, a re-examination of it will display the tissue of the cornea at the site of the affection to be entirely free from the oil-drops which encumbered it.

Savile-row, May, 1850.

ON OAK-BARK AND ALUM INJECTIONS IN VAGINAL AND UTERINE DISCHARGES.

By THOMAS WEEDEN COOKE, Esq.,
MEDICAL OFFICER FOR THE DISEASES OF CHILDREN AT THE ROYAL FREE HOSPITAL.

SOME months since, a lady placed herself under my care, for a slight prolapsus of the uterus, induced, as she supposed, by violent exertion, in lifting her husband (a large man, suffering from gout) into bed. Besides the prolapsus, there was also a polypus, protruding from and distending the mouth of the uterus, and there had been, previous to my seeing her, con-

* THE LANCET, 1840.

† Diseases of the Cornea. American Journal of Med. Science, v. iii. p. 337.

‡ Clinical Lectures. Medical Gazette, 1839-40, vol. i. p. 105.

§ Diseases of the Eye.

|| A Treatise on Diseases of the Eye, p. 356.

¶ Quoted by Lawrence.

** Diseases of the Eye, vol. i. p. 455.

†† Manual of Descriptive Anatomy, translated by Doane, 1838.

* Entwurf einer Anatomischen Begründung der Augenkrankheiten. Prag. p. 121. 1847.

siderable leucorrhœa. Upon digital examination, I was surprised to find, considering she had had children, and was past the meridian of life, so contracted an inlet that the index finger was with great pain and difficulty passed into the vagina; there was also a roughness and dryness of the mucous lining, and very considerable heat; the bowels were very much confined; there was ardor urinæ, whilst the whole system was affected with a symptomatic fever, suggestive of local inflammation; hot skin; thirst; dry tongue; small, quick pulse, &c. Such violent symptoms appeared strange and unaccountable, until the history of the case disclosed the cause of all this distress. For some weeks she had been injecting decoction of oak bark with alum, and had not taken the precaution to wash out the congealed albumen of the leucorrhœal discharge. The consequence was, this leathery compound collected upon the walls of the vagina, and os and cervix uteri, contracting the external orifice, and inducing all the inflammatory symptoms I have described. I was enabled to remove a small portion only of the offending matter with my finger, and on the next day, Dr. Locock saw her with me, and suggested another attempt, but the pain produced was so great that it was impossible to succeed entirely. By warm water injections, however, some lubricating ointment, and saline aperients, the vagina was cleared in about a week, and all the urgent inflammatory symptoms subsided. A case in every respect similar has just occurred to me, although the symptoms were less severe, and the same means of relief were resorted to, with beneficial result. Whilst in consultation with Dr. Locock on the former case, he kindly gave me the history of a still more interesting one, which occurred in his practice some years ago, where a large sausage-like portion of hardened albumen proceeded from the upper part of the vagina, and had been mistaken for a hernia of the bowel. He, however, broke off the supposed hernia, and removed it, much to the wonderment of the attendants. I trust Dr. Locock will pardon me for mentioning this case without his consent, as, indeed, I am sure he will, if it should be considered likely to prove a serviceable warning, or, rather, reminder; for, of course, we all know, although we may not always think to warn our patients of it, that these astringent injections do solidify the albuminous discharges females are so obnoxious to; and may produce the evil consequences these cases represent. For myself, I always request the patient to syringe with water three or four times, both before and after using the astringent.

Lower Brook-street, Jan. 1859.

PRACTICAL OBSERVATIONS ON
THE HISTORY, CAUSES, AND TREATMENT
OF SOME OF THE
MORE IMPORTANT DISORDERS AND DISEASES
OF EUROPEAN INVALIDS ON THEIR RETURN
FROM TROPICAL CLIMATES.

BY JAMES RANALD MARTIN, F.R.S.,
SURGEON, BENGAL ARMY, RETIRED; LATE PRESIDENCY-SURGEON, AND
SURGEON TO THE NATIVE HOSPITAL, CALCUTTA.

(Continued from p. 445.)

ANÆMIA.

OF all the conditions incident to tropical invalids, anæmia is the most general. It presents the sequel most common to fevers, whether remittent, intermittent, or continued; indeed, whatever may have been the nature of his previous acute disease—whether it was fever, dysentery, diarrhœa, hepatitis, or cholera—we are pretty sure to find, in the tropical invalid, that ill state of the general habit termed cachexia. All the diseases just mentioned tend, directly or indirectly, to spoil the blood.

Where organic lesions are present, as the results of previously acute disease, or of a long residence in hot climates, they will generally be found associated with an anæmic condition of the system, so as seriously to complicate the case, and add to the difficulties of treatment. These considerations have induced me to select ANÆMIA as the first subject for attention; for the cachectic state now referred to must be very generally kept in view in the treatment of the European invalid, on his return from tropical climates. It has an important bearing on much that relates to the history, nature, and treatment of most of his disorders and diseases. The

depraved state of the blood, in diseases of the spleen, has been noticed in the work already referred to,* and there the subject has received a separate and special consideration.

Anæmia is frequently produced by long residence in the malarious districts and stations of tropical climates, even in persons who have not been sufferers from actual disease, acute or chronic. This is what may be termed the *cachexia loci*. European females of the better class, though far less subject to the more formidable of the tropical diseases than males, are yet, through long-continued disturbance of the nervous, vascular, and secreting functions, very liable to become anæmic. The excessive perspiration will of itself produce anæmia in weakly constitutions. The very treatment necessary to the cure of acute disease, especially bloodletting, mercury, and drastic purgatives, along with the most rigid abstinence, tends powerfully, even in young persons, to produce a deficiency of red particles; while the same courses of treatment, in persons of more advanced age, along with their more protracted exposure to malarious influences, are sure to diminish the old blood-globules, and prevent the formation of new globules. The "debility" spoken of by all writers who have noticed the condition of tropical invalids, as one of their main characteristics, will be found, in the great majority of cases, to be none other than the debility of the cachectic habit—of anæmia, in fact.

Owing to this impoverished state of the circulating fluid, all the functions of the body are enfeebled—all the secretions defective and depraved. I often find severe and protracted anæmia to result from the unguarded application of leeches. Three hundred leeches, and in one instance five hundred, were mentioned to me as having been applied to the abdomen in remittent fevers, attended with gastric or hepatic complications, and in dysenteries.

Mr. E—, then a youth of sixteen, fell into the hold of a ship, upon his loins. He writes: "I was bled three times; hot fomentations were used for ten days, and I had seventeen dozen leeches on, (204,) and was bled once more."

Lieutenant S— says: "I had three different times sixty leeches applied, and I think twenty more afterwards, making in all two hundred in less than ten days." This officer was tall, slender, and of delicate frame, and only nineteen years of age. If, as generally believed, the Indian leech abstracts an ounce of blood—nay, if it be allowed to abstract but half that quantity, how large must be the aggregate amount of depletion in these cases?

Mr. Twining, speaking of the congestive fever of the cold season in Bengal, observes: "The altered appearance of the blood, in many of those fevers which arise from exposure to the malaria of the jungles, is very remarkable, and merits careful investigation. Connected with this morbid condition of the blood there appears, occasionally, some corresponding disorder of the solids, and particularly of the vascular system, which favours prolonged and profuse oozing of blood from leech-bites." The condition of the blood here mentioned is the anæmic; and without stopping to inquire as to the author's meaning on the other points of pathology here only hinted at, it may be questioned whether, in such a condition of the system, bloodletting ought at all to be practised. Certainly no one can doubt the unhappy consequences of the "prolonged and profuse oozing of blood, from leech-bites," in such cases. Some men never recover from the effects produced on the blood.

The anæmic patient generally presents a pale, sallow, or dingy, bloated, and exsanguine complexion, the eye being of a morbid, pearly whiteness, the expression dull and inert; the mind being irresolute, feeble, and despondent, the memory impaired; in extreme cases, the mind is fatuous. The abdomen is tumid, inelastic, and congested; the skin harsh and constricted to the touch, and of a temperature generally below the natural standard.

The digestion is feeble and depraved; the processes of depuration are imperfectly performed; the feet swell. In anæmic patients, I have found the temperature in the mouth to be generally below the natural standard. The mean of eighteen observations, by insertion of the thermometer in the mouth of an anæmic patient, during the months of November and December, afforded a temperature of 90°. On four days the temperature was taken before he left home, and after his return from a walk; the mean temperature was 85° before going out, and 88° on his return. The patient was an officer of engineers, a man of high scientific and practical attainments.

Neuralgic pains of the abdomen are very commonly to be

* Influence of Tropical Climates on European Constitutions.