have their integrity maintained, and are enabled to defend from any rude concussion the important organs they surround. Whenever we flex the trunk, the intervertebral elastic plates assist the muscles to restore the column to the upright posture, and afterwards to maintain that attitude without the expenditure of continual muscular effort. We walk upon an elastic arch, and every section of the bony apparatus of our limbs has more or less of elastic material interposed between and around them, so that when any member is exercised, by this agent it is greatly aided to resume its normal position. The skin and other tissues partake of its advantages; indeed, deprived of the elastic principle, life would be almost intolerable, and our movements, which are now performed with celerity and comfort, would, in the absence of this agent, become both irksome and dangerous.

I should however outstep my province were I to do more than illustrate the general use of elasticity by a few leading particulars. I have glanced at a few, that your minds may be suitably impressed with its extensive agency, and that you may be induced to set a proper estimate on the value of its influence.

We cannot accurately imitate muscular contraction; we cannot supply a principle precisely analagous to the nervous fluid; but we can supply the elastic property, and thus, in a variety of instances, help nature exactly in her own way. Nature abhors being treated abruptly. Where you cannot advantageously use coercion, you may beneficially exercise forcible persuasion. In mechanical surgery the rack and the screw I allow are powerful and useful instruments, but still they are felt as obnoxious agents, while the elastic media are recognized as the true natural allies. Vulcanized caoutchouc has this desirable elasticity, and simulates most closely this property of the living animal tissues. This is the medium that I would propose to be used. In its operation it will be found to exhibit the *fortiter in re*, and at the same time to exemplify the *suaviter in modo*—a happy combination, which in physics, as well as morals, is the great clue to the attainment of our object. By the great power of the screw or the rack we may suddenly overcome, and subsequently rigidly maintain the position gained, but it is only by occasional starts that progress is made, and there is nothing natural in the process. The elastic medium on the contrary, when once applied, is perpetually at work, and, like the drop of water that excavates the stone, not by its own inherent force, but by its unceasing action, so the caoutchouc, not by its native strength, but by its untiring exertion, is enabled to accomplish purposes which the fitful action of a stronger power is incapable of effecting. The one is an energetic sleepless sentinel ever active on duty; the other a powerful but dormant guard requiring to be aroused to efficient service; and this is not the only distinction, for the presence of the one in the human economy is viewed as that of an enemy, while the assistance of the other is regarded as that of a friend.

I would wish to be clearly understood that I do not aim to discard the use of the screw and other similar powerful mechanical instruments from surgery. There

are cases I know where these means are indispensable. I only desire to express an opinion that in numerous instances where that kind of power is exerted, the elastic principle would be more appropriate, and that to this mode the motto may be most aptly applied—

“Cito tuto et jucunde.”

Hitherto the caoutchouc has been principally used in surgery as a compressor; the novelty of my idea—if it have that claim—is in using it as a tractor, and in estimating its power in this respect at a much higher rate than others have hitherto done.

I will without entering into detail enumerate a few instances in which it has been found to act with marked benefit.

In lateral spinal curvature.

In bending rigid joints and straightening them when contracted.

In the removal of long portions of dead bone from the soft parts, and in withdrawing a sequestrum from its osseous shell.

In the removal of ligatures when they have been detained beyond the accustomed period.

In opposing the tendency of the cicatrix to contract after burns.

PURULENT OPHTHALMIA IN INFANTS.

By JAMES WHITEHEAD, Esq., F.R.C.S., Surgeon to the Manchester and Salford Lying-in-Hospital.

(Read before the Provincial Medical and Surgical Association, at the Anniversary Meeting, at Derby, Wednesday, August 4th, 1847.)

Purulent ophthalmia, as it is met with in infants, is of such frequent occurrence, and occasionally so disastrous in its consequences, that the subject will, doubtless, be allowed to possess considerable interest and importance in a medical point of view; and the uncertainty which has hitherto prevailed respecting its origin, and the means to be employed for its effectual prevention, appears to leave its history open at least to further investigation. The facts which I have to adduce are intended to bear directly upon this disputed question; and although scanty, and by no means fully digested, I am, nevertheless, emboldened to bring them under the notice of the Association on the present occasion, believing that any trifle capable of contributing to the elucidation of an obscure point in pathology, may not be deemed unworthy of being communicated.

The first indication of purulent ophthalmia consists in simple turgescence of the vessels of the conjunctiva, upon which membrane granulations are soon after seen to spring up in great abundance, and a very profuse secretion of pus ensues. This product has the property of generating a similar train of morbid phenomena on being applied to the eye, or to the mucous structure of some other organs, either of the same, or of another individual.

The inflammation is generally found to attack, in the first instance, the layer of membrane lining the

lower eyelid; at other times it commences in the ocular portion, and rapidly extends to some of the deeper structures of the eye. The cornea, owing, perhaps, to its peculiar anatomical construction, is especially liable to become early implicated. When the affection is severe, lamella after lamella of this part of the organ is destroyed, and in a very short space of time the whole is perforated by the diseased action, and loss of vision is the inevitable consequence. I have several times witnessed this lamentable consummation upon raising the eye-lid, on the occasion of the little patient being first presented for treatment, on the fourth, fifth, or sixth day after birth. Perforation of the cornea is accomplished at an earlier date in those cases wherein the disease commences in the ocular, than when it has its origin in the palpebral portion of the conjunctiva.

Purulent ophthalmia, as regards the date of its commencement, appears under two different aspects. In the first place, its invasion is observed at any period from the moment of birth, to the end of the fourth or fifth day; secondly, it commences from the last-named age, to that of ten or twelve weeks, or later. The great majority of cases, however, are brought under treatment on the second or third day after birth; and I have often witnessed evidences of the existence of the malady a few hours after delivery. The two forms of the complaint now mentioned, which, for the sake of distinction, may be designated *primary* and *secondary* purulent ophthalmia, are also different, the one from the other, in character, the disease being much more acute, more rapid in its course, although at the same time, perhaps, more easily controlled by remedies, if early applied, in the former, than in the latter form. Under both circumstances, it owes its origin to the same agency; but this, in the one case and the other, operates in different ways.

The causes of purulent ophthalmia have been variously stated by authors who have written on the subject. The cases which I now adduce, however, happened in the children of parents in whom a particular morbid condition of the uterus existed previously to the birth of the child. In the thirty-five cases, an abstract of the histories of which is given in the appended table, inflammation or ulceration of the lower part of the uterus of the mother was known to have been previously present. It is reasonable to presume therefore, that the disease, in its *primary* form, owed its existence to the direct application of the morbid secretion to the organ affected, and that the inoculation took place on the transit of the infant through the uterine orifice during parturition.

Mackenzie appears to have been sufficiently aware of the fact, that purulent ophthalmia in infants depends, in many instances, upon virulent inoculation during parturition, as he states, at page 432 of his work, second edition, that "it will in general be found, that when the child becomes affected with this ophthalmia, the mother has had leucorrhœa before and at parturition, and that the eyes have not been cleared for some time after birth." This author does not distinguish, however, between one kind of leucorrhœa and

another,—between simple catarrh consequent upon vascular excitement, without abrasion of texture, and that which is occasioned by ulcerative or inflammatory action, resulting in the secretion of pus. All the cases of this affection which have occurred in my practice, where an opportunity has been afforded for prosecuting the necessary inquiries, have happened in children whose parents laboured under such disordered state of the lower part of the uterus, visible to the eye by aid of the speculum.

Secondary purulent ophthalmia appears, more remotely, to be dependent upon the same agency. The case marked, No. 18, which was said to have commenced at the age of three weeks, was attributed by the parent to the application of cold. The child was brought under treatment when between ten and eleven months old. Its mother had yellow leucorrhœa, with all the sympathetic disturbances usually attendant upon uterine disease, the symptoms having existed upwards of eighteen months previously. She had fissured ulceration and induration of the cervix uteri. It is highly probable that the foetal system becomes imbued with the morbid product during its intra-uterine life. In such instances the mischief may manifest itself at any period after birth, its seat being determined by the application of cold or other cause to the part upon which the diseased action becomes determined.

Of the virulent nature of the secretion furnished by diseased surfaces situated near the lower part of the uterus, independent of specific causes, there cannot be a doubt, as may be proved by the occasional occurrence of all the phenomena of *blennorrhagia* in the male subject from inoculation, under such circumstances, effected during coition. The fact is further proved, moreover, by my own experiments upon dogs,* in whom a similar form of inflammation was produced on the matter being directly transferred from the human uterus to the eyes of these animals. A similar form of inflammation is sometimes witnessed in the ear, the nose, the vagina, or around the anus, instead of the eyes, in infants; and it is highly probable that this also originates from the same species of inoculation.

With a view to the prevention of this destructive malady, it is of the first importance, whether disease of the maternal organs be suspected or not, that the eyes of the infant be perfectly cleansed and washed immediately after delivery. If it be possible, the uterus of the mother should be restored to a healthy state before delivery takes place. For subduing the inflammation when once established, the most efficient plan with which I am acquainted, is the free application of the solid nitrate of silver to the inside of the lower eyelid, as first recommended by my esteemed and lamented friend the late Mr. Walker.* It may be remarked that cases of this character generally require constitutional as well as local treatment.

* See "Abortion and Sterility," case xxxi.

* "Oculist's Vade-mecum."

TABLE,
EXHIBITING AN ABSTRACT OF THE HISTORIES OF THIRTY-FIVE CASES OF PURULENT OPTHALMIA IN INFANTS.

	Age of the Mother.	Number of pregnancies, including Abortions.	Number of Children previously affected with Ophthalmia.	Age of the Child.	Results.	Character of the Paganal Discharge.	State of Uterus, ascertained by Speculum.	Nature & alleged Origin of the Uterine Affection.
1	24 yrs.	2	1	2nd day	Cured	Muco-pur.	Fissured ulceration	Sporadic.
2	30	8	3	2 hours	Cured	Ditto	Superficial ulceration	Ditto.
3	26	2	1	4th day	Complete opacity of one cornea	Ditto	Ditto	Ditto.
4	27	3	0	36 hours	Cured	Ditto	Ditto	Ditto.
5	31	6	1	3rd day	Cured	Ditto	Ulcern., diffuse inflam., endo-cervicitis	Gonorrhoea.
6	26	5	1	12 hours	Cured	Ditto	Granulating ulcer	Exposure to cold.
7	41	16	8	2nd day	Cured	Sanious	Endo-cervicitis, chronic	Suppurative menium
8	26	0	0	2nd day	Cured	Muco-pur.	Superficial ulceration	Sporadic.
9	26	5	1	2nd day	Cured	Ditto	Excortiation	Ditto.
10	24	3	1	36 hours	Cured	Ditto	Granul. ulcer, endo-cervicitis, aphthae	Syphilitic.
11	25	7	0	2nd day	Cured	Ditto	Superficial ulcer	Sporadic.
12	39	7	0	2nd day	Cured	Ditto	Ditto	Ditto.
13	28	4	1	2nd day	Cured	Ditto	Circumscribed granulating ulcer, endo-cervicitis, aphthae	Syphilitic.
14	28	4	0	36 hours	Cured	Ditto	Granulating ulcer	Strumous.
15	25	5	0	30 hours	Cured	Ditto	Ditto	Sporadic.
16	31	6	5	2nd day	Cured	Ditto	Fissured ulceration, induration	Syphilitic.
17	26	3	0	2nd day	Died emaciated, aged 5 weeks	Ditto	Spongoid ulcer	Sporadic.
18	30	7	0	3 weeks	Cured after 12 months existence	Ditto	Fissured ulceration, induration	Ditto.
19	33	6	0	4th day	Cured	Ditto	Granulating ulcer	Ditto.
20	36	8	1	2nd day	Cured	Ditto	Ditto	Ditto.
21	26	4	0	3rd day	Cured	Ditto	Ditto, aphthae	Syphilitic.
22	23	3	1	2nd day	Cured	Ditto	Ditto, ditto	Ditto.
23	19	1	0	2nd day	Cured	Ditto	Ditto, ditto	Ditto.
24	26	6	1	3rd day	Cured	Ditto	Simple ulceration	Sporadic.
25	30	6	0	2nd day	Cured	Ditto	Ditto	Ditto.
26	34	8	3	3rd day	Cured	Ditto	Ditto	Ditto.
27	30	7	1	3rd day	Cured	Ditto	Ditto	Ditto.
28	29	3	1	3rd day	Cured.—Died aged 9 weeks	Purulent	Ditto, and diffuse inflammation	Gonorrhoea, strumous.
29	30	5	1	2nd day	Cured	Ditto	Ditto	Ditto.
30	22	2	1	1st day	Died uncured, aged 8 days	Sanio-pur.	Simple granulating ulcer	Sporadic.
31	27	4	1	3rd day	Cured	Muco-pur.	Ditto	Ditto.
32	39	12	6	2nd day	Cured	Ditto	Ditto	Ditto.
33	32	4	1	40 hours	Cured	Ditto	Ditto	Ditto.
34	40	11	1	3rd day	Cured	Ditto	Ditto	Ditto.
35	35	4	3	2nd day	Cured	Ditto	Ditto	Ditto.