of the three who have again become negative two had phrenic evulsion and one sanocrysin.

Seven of the forty patients are dead. In six the immediate cause was extension of disease; one of these was treated with bilateral pneumothorax for a year; though the larynx healed the patient went steadily downhill. Only two of these six cases had become sputum-negative at any time during the treatment. The seventh died of lymphadenoma.

Thirty-three cases of "controls" have been followed up over the same period. These are cases which were chosen for pneumothorax on the same criteria as the eighty where induction was successful but where induction was not possible as no free pleural space or only a small pocket was found, or where a pneumothorax could not be maintained beyond a few refills owing to the presence of adhesions too gross and too numerous to justify submitting them at that time for cauterization.

TABLE II

	Alive		Dead	Totals
	T.B. +	T.B. - or No Sputum		
No space or pocket only...	6	4	11	21
Adhesions	—	1	11	12
Totals	6	5	22	33

Table II shows that the prognosis in these "control cases" is grave, and is much more so in those cases with adhesions as against those with no free pleural space, as only one of twelve is still alive as against ten of twenty-one. All were treated or advised on treatment by extensive rest, and forms of ancillary treatment were given full consideration. Only three of the twenty-two dead would consider even the minor operation of phrenic evulsion; of the six alive sputum-positive cases one has had phrenic evulsion and one thoracoplasty, and both are in fair condition.

For purposes of comparison the eighty cases where it was possible to induce pneumothorax have been grouped under the heading "successful," and they have been subdivided into those which did and those which did not develop signs of fluid during the treatment, while the thirty-three "control cases" have been labelled "unsuccessful." Table III summarizes the results; it gives the numbers and percentages alive and dead under each subdivision, and among those alive the numbers and percentages sputum-positive, sputum-negative, and fit for work.

TABLE III

		Alive						Dead		Totals
		T. B. +		T. B. — or No Sputum		Fit for Work				
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	
Successful	No fluid ...	7	17.5	25	65.0	27	67.5	7	17.5	40
	Fluid ...	6	15.0	25	62.5	24	60.0	9	22.5	40
Unsuccessful		6	18.2	5	15.2	6	18.2	22	66.6	33

From this table the following points emerge:

With a three-year to nine-year after-history,

1. Of eighty "successful" cases, sixty-four (80 per cent.) are alive, and of these fifty-one (63.75 of the total) are now tubercle-negative or have no sputum.

2. Of thirty-three "unsuccessful" cases only eleven (33.3 per cent.) are alive, and of these but five (15.2 per

cent. of the total) are now tubercle-negative or have no sputum.

3. Of eighty "successful" cases, fifty-one (63.75 per cent.) are now fit for work, as against six (18.2 per cent.) of thirty-three "unsuccessful" cases.

4. Of eighty "successful" cases sixteen (20 per cent.) are dead; of thirty-three "unsuccessful" cases twenty-two (66.6 per cent.) are dead.

5. The end-results in "successful" cases, with fluid and without fluid, are practically parallel.

OCULAR TORTICOLLIS: INFERIOR OBLIQUE TENOTOMY AND ITS INDICATIONS

BY

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For many years I have been vaguely aware of a syndrome associated with overaction of the inferior oblique muscle of the eye, but it is only during the last two years that I have given the subject the attention it deserves. Duane of New York published an article in the *Archives of Ophthalmology* in 1916, but since nothing, so far as I am aware, has appeared in British literature on the subject, I feel that some further reference based on personal experience may not be out of place.

It may not be amiss to remind the reader that, when looking straight ahead, elevation of the eyes is effected by the action of the superior rectus muscles. When, however, the eyes are directed sideways—for example, to the left—elevation is accomplished by the co-ordinated action of the left superior rectus and the right inferior oblique. This is another way of saying that, for purposes of elevation, when the eyes are directed to the left, the right inferior oblique and the left superior rectus are complementary muscles. The reason for this will be obvious on looking at the diagrams (Figs. 1 and 2). When either eye is directed outwards its long axis lies virtually parallel with the line of action of the rectus muscles. Elevation (or depression) as it affects this (outward-turned) eye will find the rectus muscle in a position of mechanical advantage. When, however, the right eye, for example, is turned inwards to the left, its rectus muscle forms, in relation to the long axis of the eyeball, a very obtuse angle. The superior rectus is now at a mechanical disadvantage as an elevator. Indeed, such action can only be minimal. The task of elevation of the right eye when turned to the left is now relegated to the right inferior oblique, which, it will be noted, now lies with its line of action parallel with the long axis of the eye.

ALTERNATIVES: OCULAR TORTICOLLIS OR SQUINT

It would appear that weak action (paresis) of a superior rectus is not very uncommon. Whether it is due to a congenital defect or to a birth injury I do not know; I suspect the latter. The mechanism of the co-ordinated movement referred to above is a delicate one, and when it is deranged the following is what I conceive happens. For the movement of the eyes upward and, say, to the left, a certain amount of nerve energy is available. That moiety which would normally act on the left (weak) superior rectus cannot now act with the usual effect, and so overflows to the other component, the complementary right inferior oblique, causing overaction. This hypertrophies, the initial diplopia becomes accentuated, and the overgrown muscle habitually overacts, resulting in the pronounced upshoot of the eye characteristic of the condition when looking laterally upwards.

To avoid inconvenience from the diplopia the child subconsciously seeks relief in one of two ways. If his refraction (hypermetropia, and especially anisometropia) favours it, he develops a convergent squint and suppresses the offending image. This, I believe, is what most frequently occurs. I have found a considerable number of

FIG. 1.—Primary position.

my case notes, both private and hospital, in which, in addition to the description of the squint, I have noted that, on looking up and to one side, the opposite eye "shoots up." I was not at the time fully alive to the importance and significance of the observation, and merely recorded it. The other way in which the discomfort of

FIG. 2.—Eyes looking to left.

diplopia is subconsciously avoided is by tilting the head to one shoulder, the so-called ocular or pseudo-torticollis. This expedient will occur, as I imagine, where the refraction is normal, and where there is no tendency to lack of fusion, and therefore to the ready suppression of one image. The appearance is quite typical. The boy (I have only met with it in boys, which lends force to the suggestion of birth injury, since boys have bigger heads than girls) carries his head on one side, rather like a bird, and it is this peculiarity which attracts the notice of the parents.

FIG. 3.—a-b. Line of incision.

REMEDY

Since the inferior oblique is inserted at the back of the lower surface of the eyeball it can only be reached at its origin. This is from a small shallow depression on the orbital floor, just within the inferior orbital margin, close to the opening of the naso-lachrymal canal. A skin incision an inch and a half long is made, commencing at the naso-orbital angle exactly over the inferior orbital margin (Fig. 3). A lachrymal speculum (Müller's) is now inserted, and the incision deepened through fascia and muscle on to the periosteum of the orbital rim, which is felt for with the gloved finger. This is defined in its whole length as far as the naso-orbital angle. Any bleeding points are clamped with forceps, and the deep fascia

lightly incised just within the orbital margin. Some orbital fat may appear, but it may be ignored. A squint-hook is now passed just within the orbit towards the naso-orbital angle, and the muscle will be withdrawn upon it, and will resemble a flat, grey earthworm. It is muscular throughout, and is also hypertrophied. A quarter of an inch is excised and the wound closed with two or three deep sutures. On two occasions I have encountered some difficulty in defining the muscle, but usually no trouble is met with if the deep fascia is carefully incised. The appearance of the muscle on the hook is quite spectacular, owing to its unexpected bulk.

The result in the head-tilting cases is very satisfactory. The head becomes straight, and diplopia is not complained of. I have performed this operation, apart from three head-tilters, on many old squints which had been rectified but in which this factor of an up-shooting eye remained. In future, in such cases I propose to tenotomize the oblique muscle first and see what effect this will have on the convergence, which was probably first induced by this delinquent factor; but this, of course, will depend on the duration of the squint.

CONSTRUCTION OF A VAGINA FROM A LOOP OF SIGMOID

BY

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In February, 1933, a young woman, aged 26, who was contemplating matrimony, sought advice because she had never menstruated. Her figure and general conformation were those of a well-developed young woman; the breasts were full and well formed; the anterior part of the vulva with the clitoris was normal, but there was no vagina. At the vaginal site it was possible, by pressure, to make a very slight dimple. Per rectum no uterine parts could be felt, though the pelvis appeared to be of normal dimensions. The girl stated that she had sexual feeling.

There was a large reducible left inguinal hernia, the contents of which were tender and seemed solid. The hernia was operated upon, and the opportunity was taken to make a thorough examination of the parts. Both ovaries were normal; the tubes with their fimbriated extremities were normal, but each ended in a long, thin, conical body, which appeared to be the rudimentary half of a uterus. In the peritoneal fold behind the bladder each tailed away into nothing. The left tube and uterine remnant entered the hernia, and possibly the ovary also, but this was not verified.

Inquiry elicited a hesitating admission that monthly periods had been recognized, in spite of there being no loss; it is very doubtful if that was really the case.

The operation for formation of a vagina was thus conducted. The whole sigmoid loop, freed on its left aspect, was examined to determine exactly the arrangement of the blood supply. By dividing the vessels so as to leave the springs of successive arcades intact, a length of seven inches of bowel was so isolated as to receive its blood supply from the lowest branch of the inferior mesenteric. Pulsation at the anatomically proximal—but henceforth the distal—end of the isolated loop was full and strong. Both ends were closed by inversion—the anatomically distal end with great care and thoroughness. The divided parts of the large bowel were then united end to end. An incision was now made in the skin, at the posterior part of the vulval site, and a passage enlarged upwards between the bladder and rectum. As soon as it was large enough a full-size tubular speculum was passed up to its full length.