

years to show on the autopsy-table, the pre-existing vascular changes.

Gowers ("Diseases of the Nervous System," p. 264) refers to an examination made in 1885, by D. Drummond, on the body of a child five years old, who died after a few hours illness. In the cervical region of the cord, an undue redness in the anterior horns was noticed. The vessels were distended with blood from the periphery to the cornua. Microscopically there was distention of the capillaries, extravasations in the substance of the gray matter, swelling of the neuroglia and ganglion cells, and the latter granular and with indistinct processes.

Damaschino (*L'Union Médicale*, 1883, quoted by Jacobi in his "System of Practical Medicine," 1886) found in the cord of a child two and one-half years old, in whom the left leg and right arm became suddenly paralyzed, and who died twenty-six days after the commencement of the attack, foci of red softening in the anterior cornua of the left lumbar and right cervical regions. The blood-vessels were distended, there were granular corpuscles in the lymphatic sheaths and other changes.

These cases establish the fact that hyperæmia of the anterior cornua preceded its degeneration.

In cases of normal labor there is more or less venous congestion of the central nervous system, as shown by Dr. Sarah McNutt, of New York. This congestion is directly proportional to the obstacles to delivery. If traction is made upon an already congested cord, the conditions for the removal of the congestion cannot be said to be favorable. Rather, one would expect to find such changes as distended capillaries, extravasations, swollen neuroglia and granular ganglion cells.

Now of etiological factors in the nine cases reported in this paper, two stand out as common to all. *They are, greater or less obstacle to delivery and traction.* Thus in Cases III, V, VI, VII and IX, it is expressly noted that the extraction of the shoulders was difficult.* In Cases I to VIII there was traction in the shape of forceps, while in Cases III, V, VI, VII and IX there was additional traction by the hands of the accoucheur. The physiological congestion of birth, therefore, was increased in five cases by additional obstruction, while forcible traction was present in all. I cannot but think that microscopical examination of the vascular horns of the cord would show cause sufficient to account for the production of this particular form of palsy.

It remains, in this connection, to speak of the reasons of the right-sidedness of the type.

In Cases VI and IX the fetal position is given; in the remaining cases it can only be inferred.

In Case VI we are told that the position was an O. R. P., "gradually changing to a right transverse."

The marks of the forceps over the left eye and right ear bear this out, and show that they must have been applied to an incompletely rotated head. Traction, under such conditions, must have borne hardest on the right side, since this had the larger arc to pass through, and also on the cervical structures, since it was through these that traction was exerted on the trunk. Very possibly this forceps-traction was not sufficient of itself to produce the lesion; but the right side must have been already strained when the ac-

coucheur, seizing the head with both hands, "pulled until he was afraid the vertebra would dislocate."

In Case IX the circumstances were different. The position was an O. L. A., and the labor an easy one. Nothing worthy of note occurred till the head was born. Then the note says, "There was no advance." However this may be interpreted, there is one thing certain: it is the right shoulder in O. L. A. positions, which engages beneath the symphysis, while the left sweeps over the perineum. The most common cause of retardation at this stage is the locking of the right shoulder against the symphysis. Efforts to dislodge it by pulling on the head must of necessity bear hardest on the right shoulder and on the cervical structures connecting it with the head. Hence the occurrence of the lesion at this point.

Of the remaining cases nothing definite has been learned concerning the positions. Cases IV and V, however, could scarcely have been other than O. L. A. positions, since the former lasted but seven hours, and the latter two hours. In Cases I, II and III, the obstacles to delivery must have been considerable — the first lasting two and a half days, the second one and a half days, and the third three days. So the causes which were found to be operative in Cases VI and IX may very possibly have obtained in these other cases.

Prognosis. — The chances for recovery are not brilliant. On the contrary, they are rather against any decided improvement. Case I had lasted five years; and, allowing for the difference in size, there was scarcely any more control over the paralyzed muscles than was present in those of her infant sister, fifteen months old. Here, also, the likeness to anterior poliomyelitis is apparent, for pressure paralyses are comparatively transient affairs, and disappear in a few weeks or, at most, months after the removal of the pressure.

Treatment. — As regards treatment, little can be done beyond faradism, massage, and inunction with cod-liver oil. At the very beginning, it is possible some good might result from the internal administration of ergot.

ON THE MODIFICATION OF LABOR DUE TO EXTREME MACERATION OF THE FETUS.¹

BY CHARLES W. TOWNSEND, M.D.

My attention having been several times called to a modification of labor where the fetus was much macerated, I have been surprised to find no mention of it in the books. My experience is not peculiar, however, for on examining the records of the Boston Lying-in Hospital, I discovered six other cases besides my own, where the modification in the labor was so marked and characteristic that the subject seemed worthy of study and record.

The modification I refer to is the almost complete, and in some cases complete, cessation of labor pains after the os is fully dilated, and the soft macerated head has come well down into the vagina. This occurs only when the head is so macerated as to easily form a soft, elongated bag, accommodating itself to the vaginal canal. Where the child is but slightly macerated, as is the case in the majority of instances, this modification of labor is not seen, and it may also be absent in cases of extreme maceration. Let me illustrate by relating briefly two typical cases.

¹ Read before the Obstetrical Society of Boston, May 7, 1892.

* In Cases I and II there was trouble with the delivery of all the children.

CASE I. On June 20, 1888, I was called by an externe of the hospital to see Mrs. M., a multipara thirty-seven years old, who had been in labor for eight hours. The pains had been very slight and infrequent for several hours, and on my arrival at 7.30 p. m., and for an hour previous to this there was a complete cessation of the pains. The os was fully dilated and the vagina was filled with a soft elongated mass in which the bones of the foetal head were easily moved about. After waiting for half an hour with no appearance of labor, the woman remaining comfortable and free from pain, and the uterus soft, by means of external expression and urging the woman to bear down, at the same time exerting traction with the thumb and finger on the soft head, I succeeded in delivering the patient at 8.15 p. m., of a full term macerated foetus.

CASE II. Mrs. N., a primipara, said to be one month over her time began to have sharp pains on November 3, 1891, at intervals of twenty minutes. The pains gradually diminished during that and the succeeding day, and finally ceased. The externe in charge of the case was not called again till 11.30 p. m., November 6th. He found the patient very uncomfortable owing to frequent vomiting, but no labor pains were present. The os was fully dilated, as he supposed, by a large tough bag of membranes which reached to the vulva. I saw the patient at 8.30 the next morning and found the condition above described, the "bag of membranes" being, however, the soft head of a much macerated foetus. No labor pains were present as shown by the subjective symptoms of the woman, and by the soft condition of the uterus on palpation. I saw the patient again at noon and found no change in the condition of things, the uterus still soft and not contracting, but the patient was showing signs of exhaustion, the pulse having risen to 118. Being unable to express the child as in the first case, ether was given and the foetus easily delivered. I adopted a rather unusual course in the delivery which it may be of interest to mention. Wishing to deliver the head intact for the sake of the family, I first applied the forceps expecting, however, that it would slip, which it did. Delivery with the cranioclast was easy until the base of the skull came down to the floor of the pelvis, where it was arrested by the tight, undilated perineum. Still grasping the head in the cranioclast, the forceps was applied, and acting as a compressor brought out the head leaving the perineum intact. Both patients made normal non-febrile recoveries.

On examining the records of the hospital both out- and in-patient, I found eighty cases recorded where the foetus was macerated at birth, and where the labor did not differ, as far as could be discovered from the records, from the average case where the child is alive. In these cases the child is described as but slightly macerated, the skin peeling from the extremities and the head retaining, in most cases, its ordinary consistency and shape. Some of these labors were exceptionally easy, owing to the small, premature condition of the child.

There were, however, six cases in addition to those already related above where the course of the labor showed the peculiarity I have pointed out. Brief extracts from the records will illustrate this:

CASE III. Primipara, thirty-two years old. October 20, 1874, "slight pains." October 21st, "Os the size of a ten-cent piece; pains more severe, but diminished through the day." October 22d, "No pains at

all; head well down in uterus." The patient grew tired and the pulse went up to 120. In afternoon, "pains very slight and at irregular intervals." At 8 p. m., macerated child delivered by forceps.

CASE IV. Primipara, twenty years old. Os dilated very slowly and macerated child expressed by pressure on fundus.

CASE V. Primipara, thirty-seven years old, "pains very light." The vagina was filled by a great bag of the macerated head in which the cranial bones floated, the scalp protruding half an inch through the vulva. After the second stage had lasted seven hours, the foetus was removed by traction with the fingers on the scalp and pressure on the fundus.

CASE VI. A multipara in the out-patient department. The fluctuating head made a large caput protruding from the vulva and mistaken by the externe for the bag of membranes. After a slow labor the much-macerated foetus "came without pain to the mother; said she had to push it out."

CASE VII. Multipara. On the externe's arrival "the cranium was projecting from the vagina nearly as far as the ears—the child had been in that position for half an hour. She was not having much pain. I immediately slipped my fingers by the side of the head, caught them, and by the use of moderate force easily delivered the child."

The child weighed $9\frac{1}{2}$ pounds and was much macerated. The labor lasted sixty hours.

CASE VIII. A primipara. After twenty-four hours of labor during which the pains were very short and slight, the pains entirely ceased. On the externe's arrival at this juncture he found the head protruding several inches through the vulva, and the woman in a very nervous hysterical condition. To quote from his records: "The vulva was firm and not stretched. The head of the foetus was very soft, the bones crushed together, and instead of dilating the parts had slid through like a bag of jelly. With the fingers I slowly dilated the os uteri and the vulva. Twenty minutes after my arrival the child was born. During all this time there were no pains."

It is to be particularly noted that the cessation of pains in these cases was real and not merely apparent. It happens not infrequently, owing to malpresentation or to a relative disproportion between the size of the head and the size of the pelvis, that the uterus, being unable to expel the foetus, becomes tired and the rhythmic contractions with their subjective pains cease to be followed by a state of tonic contraction, accompanied by continual suffering but no sharp periodic pains. In this case where active interference is demanded, the unskilled attendant may be thrown off his guard and suppose that the pains have ceased, a most dangerous supposition to hold, and one easily disproved by palpation of the uterus. In the cases we are considering, however, the soft uncontracted state of the uterus showed a true absence of pains.

The reason for this state of affairs is rather difficult to understand, but may perhaps be explained by the fact that the vagina and cervical canal being but slightly distended by the soft elongated head, do not afford sufficient excitation to the uterus to contract. Another explanation suggests itself, that the uterus has lost its normal irritability owing to "missed labor" of perhaps a week or month previous. This would account for the great maceration of the foetus supposing it to have died at this time. There is, how-

ever, no record in these cases of a previous abortive attempt at labor, although one case was said to be a month overdue.

Medical Progress.

RECENT PROGRESS IN FOODS, DRUGS AND ARTICLES OF DOMESTIC USE.

BY B. F. DAVENPORT, M.D.

MILK FERMENTS.¹

THE caseine in milk seems to exist in a semi-solution, or colloidal state. While not rendering the milk noticeably viscous, it can yet be separated out by the use of porcelain filters. Its chemical nature appears to have a close relation to alkali albumen, and to distinguish it from curd it is called caseinogen. It is readily precipitated out of the milk by a slight excess of acid, and this without alteration in its nature. When precipitated out by rennet, however, it is chemically changed, being broken up into two different proteids, the one of which is, and the other is not, readily coagulated. The first of these is readily thrown out of solution by lime salts, and since these are always in milk the action of rennet is always to throw down a curd.

The ordinary curdling of milk is due to a lactic acid fermentation induced by micro-organisms which get into the milk subsequent to the milking. These are of a class rather than any single specific organism, although Lister held that there was one species normally present. This one he found common around dairies, but not elsewhere, not even in barns. This somewhat surprising observation has been confirmed by Dr. Conn.

The number of bacteria per cubic centimeter to be found in milk, even very shortly after it was drawn, has been reported by Cnopf and Escherich to be from 60,000 to 100,000. It is rare that milk reaches the consumer with a bacteria content which can be measured in smaller numbers than tens of thousands. These numbers are a striking commentary upon the bacteriological study of drinking-water. That when containing more than 1,000 is regarded as unsafe, while milk containing as many as 1,000,000 is frequently used as food without hesitation and without any evil results. It is evidently not the mere numbers of bacteria, but the kind, which may make a food dangerous.

Fokker has shown that fresh drawn milk, like the serum of fresh drawn blood, has for a few hours some power as a germicide. If samples of milk freshly drawn, and freshly sterilized by boiling, are inoculated in like manner, the sterilized sample will always be the one to curdle first. It loses this power within a few hours, or if it be heated. This property is confirmed by Freudenrich.

STERILIZED MILK.²

We are beginning to learn that the chemical changes induced in milk by sterilization are much greater than was supposed. The chief changes now known are the following: (1) As regards the destruction of germicidal power, careful experiments have

shown that when a known number of cholera germs, for instance, are placed in fresh milk, there will be a less number to be found at the end of three hours than at first. Not so if it has been sterilized. (2) The lactalbumin in the milk, which is closely allied to serum albumin, is coagulated by heat, whereby the milk is rendered more viscous. This albumin is thus rendered less soluble and seemingly more difficult of digestion, and is the cause of change in the flavor of the milk. (3) The starch-fermenting power of the raw milk is lost, a property of value in the digestion of an infant, whose saliva has not yet acquired that power. (4) The milk sugar is changed, undergoing a degree of caramelization. (5) The fat in the milk is more or less freed from its emulsion, so as even to be found sometimes collected into drops upon the surface of sterilized milk. As the fat must be in an emulsion to be absorbed from the intestines, the digestive organs have the task of restoring this. (6) The caseine is also affected, as proven by its being less easily and completely precipitated by rennet. According to Baginsky it requires more rennet and a higher temperature, and according to Soxhlet the addition of some lime salt. In experiments of artificial digestion the caseine is found to be less readily acted upon by pepsin and pancreatin.

Milk, therefore, which has been sterilized, is certainly no longer the original natural product in other respects than being free from bacteria. Whether it will prove to be as desirable a food remains to be seen.

THE CHEMISTRY OF BREAD-MAKING.³

M. Léon Boutroux has now published the results of his extensive series of investigations as to whether the part of the leaven useful to the baker in a yeast, is a bacterium, or an association of several micro-organisms; also whether the gas raising the sponge of dough is produced at the expense of the gluten of the starch, or of the soluble matter in the flour.

He concludes that the alcohol forming yeast is always present in the leaven of bread, and that it may be cultivated in successive batches of dough, multiplying itself to such an extent that a mere trace may be taken in the first place, and after successive cultures in dough, it will be found to permeate every part of the mass. The other micro-organisms found in the dough, which are capable of raising it, cannot be so cultivated. During the fermentation that occurs in bread new sugar is not formed in appreciable quantity at the expense of the starch. The small quantity of sugar that is fermented consists of that which pre-existed in the flour, together with what is formed from the carbo-hydrates which are more readily affected than the starch. In proportion as the activity of the yeast is great, so is the gluten actually protected against the bacteria by the yeast. Since the alcohol yeast is the only micro-organism of use in the process of bread-making, care should be taken by bakers to secure as pure cultures as possible. Thus the duration of fermentation might be curtailed, the gluten left intact, whilst the quality of the bread would be sensibly improved.

COLORED BLOOD ORANGES.⁴

For some while oranges have been sold upon the streets of Paris having the appearance of the so pop-

¹ Experiment Station Bulletin, No. 9, United States Department of Agriculture, 1892.

² New Jersey State Dairy Commission Report upon "The Preservation of Milk," 1892.

³ Ann. de Chem. et de Phys., xxv, [6] 145.

⁴ Jour. Pharm. Chem., 1892, p. 537.