

Within the last few weeks I have had occasion to examine a water from a shallow well, which contained a very appreciable amount of lead and which had caused serious symptoms of poisoning in three out of four members of the family using it. The family consisted of a widow lady, her child and governess, and a maid. Four years ago the lady took a country house, the water-supply of which was derived from a well in the garden. About 18 months ago she exhibited symptoms of what was supposed to be gout and was sent to Buxton, where she became accustomed to drinking rather considerable quantities of hot water. Upon returning home she continued this practice only to find the "gouty" symptoms increased in intensity. She became very anæmic, suffered from colic and constipation, and finally had intense pain in the occipital region. The governess also suffered from anæmia, colic, and constipation, the last being so severe that at one time the question of some operation being performed was discussed. The maid did not suffer so severely and the child, who drank distilled water only, was not affected. Lead poisoning as a cause of all these symptoms does not appear to have been suspected until the lady's gums became very tender. These were then examined and the blue line pathognomonic of lead poisoning discovered. The same line was then found on the gums of the other patients. The source of the lead was at first a mystery but ultimately two samples of the water were submitted to me for analysis taken from two different pumps on the premises drawing from the same well. One was found to contain 0·65 grain of lead per gallon and the other 0·30 grain. Samples of water which had stood in the pump pipes all night gave 1·8 and 1·4 grains of lead per gallon respectively. When the water was allowed to stand 24 hours in contact with a piece of bright sheet lead it dissolved as much as 8·8 grains of the metal per gallon, the water remaining quite clear. Both the pumps referred to had long lead suction pipes leading to the well. One pump was over the kitchen sink and supplied the drinking water; the other was a force pump driving the water into the cistern supplying the bath, &c. Although the latter had a longer pipe attached to it it yielded water containing less lead, which fact I attribute to the pump itself being of gun-metal, whereas the kitchen pump was of lead and worked with a good deal of friction.

The analysis of a sample of the water taken directly from the well gave the following results in parts per 100,000: Pb, 0·3; Ca, 7·3; Mg, 0·75; K, 1·6; CO₃, 0·9; SO₄, 8·35; Cl, 8·7; NO₃, 15·1. The combinations were probably as follows:—

Lead carbonate	...	...	...	...	...	0·4
Calcium carbonate	...	...	...	...	...	1·35
Calcium sulphate	...	...	...	...	...	11·85
Calcium chloride	...	...	...	...	...	9·05
Magnesium chloride	...	...	...	...	...	2·9
Sodium chloride	...	...	...	...	...	1·25
Potassium and sodium nitrates	...	...	...	...	...	21·35

Total saline constituents 48·15

The carbonates would be retained in solution by the excess of carbon dioxide in the water. 100 cubic centimetres of the water contained 0·7 cubic centimetre of free oxygen and 1·9 cubic centimetres of free carbonic acid (over and above that necessary to convert the carbonates into bicarbonates). Like all other waters which dissolve lead the amount of carbonates present was very small and the water had an acid reaction to litmus, lacmoid, cochineal, and phenol phthalein, but not to methyl-orange. After boiling in a platinum vessel it became neutral but the boiled water acted as vigorously upon the lead as the unboiled.

I have since examined three other well waters from the same locality and find two of them have a similar action and there is reason to believe that other families have been affected by the lead. In such cases where another source of water-supply is not available I have recommended the removal of all lead piping and the introduction into the well of a load of clean chalk. The latter is necessary to absorb the carbonic acid and to prevent the oxidation of iron pipes, as waters which act on lead also corrode iron and dissolve zinc (from galvanised iron). The chalk appears to prevent this action or to minimise it to such an extent that the water does not become unsightly in appearance. The addition of two or three grains of carbonate of soda to a gallon of the water did not entirely neutralise the plumbo-solvent power but reduced the amount dissolved in 24 hours from 8·8 grains

to 0·5 grain. Digestion for an hour with chalk reduced the action but not nearly to the same extent. Notwithstanding the immense amount of work which has been done to elucidate the action of water on lead, both erosive and solvent, all theories so far advanced fail to explain the whole of the facts, but this is a subject which I purpose to discuss later. My present object is merely to direct attention to the possibility of lead poisoning being due to waters not generally regarded as being capable of dissolving that metal.

Chelmsford.

A CASE OF LARGE CHYLOUS ABDOMINAL CYST; OPERATION; RECOVERY.

By E. B. FULLER, M.B., C.M. EDIN., F.R.C.S. EDIN.,
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IN THE LANCET of March 4th, 1905, is quoted a case recorded in the *Boston Medical and Surgical Journal* of Feb. 9th, 1905, of a "rare condition of chyloous cyst of the abdomen." This case quoted was in a boy, aged 11 years. For two years there were symptoms of pain, wasting, and accumulation of fluid in the abdomen, and a provisional diagnosis of tuberculous peritonitis was arrived at and an operation was undertaken; a large vascular-walled retro-peritoneal cyst was found containing a gallon of chyloous fluid. The sac was separated carefully from the ascending colon, hepatic flexure of the colon, and vertical portion of duodenum. Whether the cyst was a dilatation of the receptaculum chyli or of one of its tributaries could not be made out. The boy made a complete recovery. The fluid was milky, of specific gravity 1020, and contained fat globules.

The following case taken from my surgical note-book bears so close a similarity to the above that there seems little doubt that the two were similar in origin. A coloured male, aged 20 years, was admitted into Somerset Hospital on May 26th, 1905, with a history of four years' pain in the stomach and bowels and gradually distending abdomen. Examination showed the abdomen generally to be distended; it was very dull over the lower and middle parts of the abdominal walls and there was some dullness in the flanks, which did not vary with alteration of position. There was only a small tympanitic area under the liver and upper part of the abdominal wall. Liver dullness was much diminished. Pain on pressure was present over the hypogastric and umbilical regions. There was no elevation of temperature or general wasting of the body. A provisional diagnosis of encysted collection of fluid, probably tuberculous peritonitis, was made. (N.B.—This was the same diagnosis as was come to in the American case quoted above.)

Operation—An incision was made in the middle line midway between the umbilicus and symphysis. The abdominal wall was very rigid even under an anæsthetic. The peritoneum was thickened. On opening into the peritoneal cavity a little blood-stained serum escaped. No intestines were visible but beneath the fingers was a large uniform swelling apparently filling the whole abdominal cavity, the surface of which looked like congested bowel and gave the impression of peritoneum closely adherent to congested bowel. This membrane was opened and a large quantity of milky chyloous fluid gushed out, showing the doubtful membrane to have been the sac wall of an enormous cyst which extended from the pelvis to right up under the liver, pressing the intestines into an extremely small compass. There were one or two subdivisions to the large cyst, making it apparently multilocular. In the cysts were also large quantities of pink jelly-like material and also a mass of the size of a large lymphatic gland filled with a fatty substance looking like thick cream. The walls of the cyst were adherent to the ascending colon near the appendix and to the transverse colon where there appeared to be a sort of pedicle attached to the reflection of the transverse mesocolon. Near this point of attachment was a knotted tumour of about the size of a Tangerine orange, looking like an inflamed lymphatic gland in consistence. This gland and as much of the cyst wall as could be safely detached, together with all contents, were removed and the abdominal cavity was freely flushed with saline solution. The abdomen was finally filled with saline solution and stitched up.

The patient made an uninterrupted recovery. Two weeks

after the operation a small cheesy mass came away from a corner of the abdominal wound and the wound then healed and remained sound. Presumably this was a little of the cheesy contents of the cyst which had escaped removal.

I am not in a position to say definitely what the origin of this cyst was, but in view of the case quoted above and the character of the contents of the cyst it seems to me probable that it was of lymphatic origin. A microscopic examination of the sac wall and contents gave nothing definite and the fluid was as described in the American case.

Cape Town.

CHRONIC PARALYSIS OF THE INTERCOSTAL MUSCLES AS A PRIMARY CAUSE OF DROPSY.

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THIS case is of the greatest interest, both to the neurologist and to the student of cardiac physics from the occurrence of several rare conditions.

The patient, a lad, aged 17 years, was injured four years ago by a blow on the neck, producing a dislocation of one of the cervical vertebræ. Myelitis followed, affecting the fifth, sixth, seventh, and eighth cervical regions of the cord, being probably secondary to small hæmorrhages arising from the concussion due to the injury. Sensation was rapidly recovered but atrophy of the muscle groups represented in this region gradually occurred, accompanied by a spastic paralysis of the legs. Respiration during these four years had been carried on entirely by the diaphragm, since the intercostal as well as the abdominal muscles were paralysed; and this was the more remarkable when it is noted that the boy suffered last year from an attack of acute bronchitis, with consequent difficulty in expectoration. It is also interesting to note that the patient was able to cough feebly but in doing so was unable to fix the chest, which expanded upwards with the forced expiration. In consequence of this purely diaphragmatic respiration there was diminished expansion of the upper lobes of both lungs and this had acted in the same manner as emphysematous or fibroid pulmonary diseases and caused obstruction to the venous circulation and to the right side of the heart, although the venous obstruction might be partly due to a diminution in the negative intrathoracic pressure. During the last few months the legs had become greatly swollen, the dropsy being due mainly to the conditions outlined above rather than to the diminished vaso-motor tone, since the complication had only recently appeared. Following this very intense cedema had appeared in the neck, face, and eyelids and latterly in the uvula and larynx and the distress in breathing had been great.

On keeping the patient entirely in bed the dropsical condition of the legs rapidly improved, while the parts supplied by the superior vena cava became at first much more swollen but finally improved also.

At the present time there is no definite enlargement of the heart, no murmurs are present, but naturally there is reduplication of the second sound on the left sterno-costal areas, and the heart is also subject to additional strain owing to the extreme action of the diaphragm. The kidneys and other organs are normal.

In conclusion, it may be noted that paralysis of the intercostal muscles is a primary cause of dropsy, being probably the rarest of the respiratory agencies which produce this disease; also that a patient may live for years by means of diaphragmatic respiration alone but that ultimately the circulation will fail through the right side of the heart and general cedema follow.

Toronto.

MOUNT VERNON HOSPITAL: POST-GRADUATE COURSE.—Dr. Harry Campbell will deliver the introductory lecture of the course at the central out-patient department, 7, Fitzroy-square, W., on Thursday, Oct. 12th, at 5 P.M. The subject is the Enlargement of the Chest in Pulmonary Disease. Medical practitioners and senior students are invited to attend.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

NOTE ON A CASE OF ACUTE DILATATION OF THE LEFT VENTRICLE.

BY T. NICOL, M.A., M.B., CH.B. EDIN.,
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ACUTE dilatation of the heart consequent on an attack of diphtheria is an occurrence which has been much diminished in frequency by the use of antitoxin, and an account of a case which presented some unusual features may prove of interest.

The patient, a boy, aged five years, was admitted to Monsall Hospital suffering from an attack of faucial diphtheria of moderate intensity. He had been ill a fortnight but antitoxin had not been given. A week later he presented some signs of palatal and ocular paralysis but no indication of any cardiac disturbance. The accidental introduction of a case of scarlet fever to the ward exposed him to that infection, and he took what was apparently a mild attack from which he soon seemed in a fair way to recovery. One morning, however, six weeks after the onset of diphtheria and three weeks after that of scarlet fever he was seized by a sudden and extremely severe syncopal attack. When seen he looked pale, listless, and almost moribund; there was frequent vomiting, his pulse was almost imperceptible, and his temperature rose rapidly to 103° F. His heart (which had been carefully examined the previous day and found to all appearance normal) showed extreme left-sided dilatation. The apex beat was diffuse and wavy, visible in the fourth, fifth, and sixth interspaces from the nipple line to the sternum. On auscultation the beats numbered 110 per minute and were markedly intermittent, the first sound at the apex almost inaudible but without definite murmur, and the second much accentuated and occasionally reduplicated in both pulmonary and aortic areas. On percussion the left border extended almost three fingers' breadth beyond the nipple line, the right being in its normal position. No reason could be assigned for the attack, since the child had not been sitting up or making any unusual exertion. That evening, however, the urine was found to contain albumin and blood in large amount, with numerous blood and granular casts. He was freely stimulated with brandy and hypodermic injections of strychnine, but his condition remained extremely critical for more than a week. After that time both the nephritis and the cardiac condition improved under treatment, and after a prolonged stay in hospital he was discharged with only a faint trace of albumin in the urine and a heart in which the most careful examination could detect nothing abnormal, the pulse strong and regular, the sounds pure, and the left border one finger's breadth inside the nipple line.

The special points of interest in the case would seem to lie in the exciting cause of the dilatation, not, as it usually is, some slight over-exertion, but the vascular disturbance associated with the onset of an acute scarlatinal nephritis; and the completeness with which a heart, at one time apparently irreparably damaged, eventually recovered.

For permission to publish the notes of the case I am indebted to Dr. A. Knyvett Gordon, medical superintendent, Manchester.

CHOREA DUE TO A THUNDERSTORM.

BY JOSEPH A. W. PEREIRA, M.D. BRUX., L.R.C.P. LOND.,
M.R.C.S. ENG.

A BOY, three years old, was brought to me a short time ago because he could not speak without stammering. Having known the child ever since his birth and being aware that he was a good talker, this sudden stammer was of great interest to me. He had lost the necessary control over his tongue and lips. The child's past history was briefly this. He was a healthy baby at birth. He was reared on cow's milk and had had two mild attacks of bronchitis. He was