On admission the legs and abdomen were swollen; he complained of weakness and shortness of breath. As regards the urine, specific gravity was 1020, the reaction was neutral, and it was full of albumin. The patient was treated during September and October on medical lines—jalap, diuretics of varying sorts, citrate and acetate of potash, diuretin, etc. Later he was given hot-air baths, pilocarpin in $\frac{1}{2}$ -grain doses. He had a vegetable and salt-free diet. Fluid was cut down to two pints and subsequently less daily. The urine varied between 30 to 45 ounces. With reference to the albumin, 3, 7, and 12 parts per 1,000 Esbach, with lesser variations, were recorded.

In November his condition was such that he could not lie down. His legs were enormously distended, his abdominal wall was oedematous, he had ascites and oedema of the lungs. On November 10th Southey's tubes were put into the right leg and 46 oz. were drained away; on November 13th tubes were put into the left leg and 147 oz. drained. On the 14th, 17th, and 20th other Southey's tubes were introduced and further drainage resulted.

As a result he improved. On November 22nd the note is: "Lung condition relieved, but dropsy still obstinate. Urine about 50 oz., albumin 12 parts Esbach per 1,000, but has been down to one-half part per 1,000. In December, 1920, he was given hot-air baths daily, and at intervals dry cupping to the loins. The diet was milk and vegetables. The urine had increased to from 40 oz. to 60 oz. On December 14th, 15th, and 16th the albumin was 8 parts per 1,000 Esbach, but has been down to one half part per 1,000. During January this treatment was continued and varying drugs were tried without any result. The oedema continued about the same. The patient could not lie down. Towards the end of January I saw him and made half a dozen incisions into his legs, which were then wrapped up in fomentations; 16 pints of fluid were quickly caught and this continued for some weeks. The dropsy diminished considerably, but by the end of January the note says: "Dropsy returned after the incisions had ceased draining; general condition much the same."

At this stage I proposed an operation to him, which he gladly accepted, and on April 29th I decapsulated the right kidney, which was very much enlarged, soft, friable, and pale in colour. At the end of the week his urine had risen to 62 oz. and the Esbach measurement was one-quarter part per 1,000. On May 15th the patient's general condition was much improved. The oedema had disappeared from the legs except the ankles, and completely from the arms. The legs were being massaged daily, and on the 28th the oedema had all gone from the legs, including the ankles. The legs were daily bandaged with soft crêpe bandages.

During this time I was away on my holiday, and on my return I found the patient walking about. With difficulty I persuaded him to have the left kidney decapsulated. Before consenting he went home, and returned for the operation on an arranged date free from all oedema, but with his urine loaded with albumin. I decided, however, to proceed, and the left kidney was treated in the same way as the right. On June 15th the urine was now clear to the Esbach test, but boiling showed the presence of a trace of albumin; the average amount of urine was 50 oz. daily. The patient subsequently left the hospital and returned home.

My attention was drawn to this procedure by an unusually sad case, an only child who was suffering from chronic nephritis. She was completely waterlogged, and the parents were anxious for anything possible to be done. I saw her several times in consultation with a friend and we decided against operation. After watching this case and studying the literature more thoroughly I now believe an operation would have been her best chance, as she died after a painful and prolonged struggle.

The published cases demonstrate that success is possible even in *extremis*, and some remarkably complete recoveries are recorded. Although the physiological and pathological findings are adverse, the clinical results prove that from the patient's point of view the outcome is often satisfactory. My patient is quite settled on this point. Moreover, he is probably characteristic of many in that, though not completely cured and possibly doomed eventually to die of the disease, the operation has been justified by the result.

The operation deserves consideration under two conditions:

1. As an emergency in eclampsia, uraemia, suppression of urine, etc. The more desperate the extremity the more certainly it should be discussed, and cases have been snatched from apparently impending dissolution.

2. In chronic cases, when medical treatment has failed after a thorough trial. In both the above classes the heart and arteries should be reasonably sound, which probably means that most success will be obtained in the first half of life.

DURING the last ten years the Japanese population in the United States has increased by 53.8 per cent., or more than all the other nationalities who have entered that country.

D

THE PASTEURIZATION OF THE MILK SUPPLY

BY

S. G. MOORE, M.D., D.P.H.,

MILROY LECTURER, 1916; MEDICAL OFFICER OF HEALTH
HUDDESFIELD.

LARGELY as the result of the persistent efforts of one of her citizens, New York has had a safe milk supply for the past five years. It is illegal there for milk to be sold for human consumption unless (a) it is from a herd of cows found by the tuberculin test to be free from tuberculosis; (b) contains less than 30,000 micro-organisms per cubic centimetre; and (c) is free from *Bacillus coli* in each of two samples—10 c.cm. each, or else *has been pasteurized*. Other milk may only be sold for commercial purposes, not directly to the public for food.

Milk may be classified thus: (1) Fresh pure raw milk: A living fluid, clean, free from tubercle bacilli and all other pathogenic organisms. (2) Pasteurized: The freshest and purest obtainable, heated to 145°–160° F. for twenty to thirty minutes in the same vessels in which it will be sealed and retailed. (3) Sterilized: Heated to boiling point for longer or shorter periods. (4) Dried: A form of milk in powder, obtained either by pouring ordinary milk over slowly revolving steam-heated cylinders or spraying it into a chamber against a current of hot dry air. (5) Last and worst, the form as vended among the public day by day.

The first grade is the ideal. It is scarce and costly; the total quantity available in England is insufficient for a single large town. Pasteurized milk offers the best prospect of a safe and satisfactory supply.

Sterilized milk is objected to from varying standpoints. Perhaps the fact that many persons dislike its cooked taste so much that they will not consume it is the most important. Again, it is alleged that infants fed on it develop scurvy, rickets, or Barlow's disease. These allegations are founded upon the conception that essential food factors are destroyed in the process of sterilization.

Dried milk has substantial advantages over ordinary milk in that it keeps indefinitely if properly stored, can readily be transported for long distances, can easily be stored, and is safe. The investigation carried out for the Minister of Health by Dr. Francis Coutts established that. On the other hand, the product does not permit of perfect reconstitution by the addition of water, however great may be the care exercised in the process. Not infrequently the butter fat appears in small globules rather than as cream. From time to time close examination reveals that the powder has a faint sub-rancid odour. On only one occasion during an experience of its use extending over twelve years has the writer found this condition so pronounced as to call for rejection of the supply. The makers readily and willingly replaced it, and expressed regret at the occurrence. It is costly. To some palates its taste is not agreeable. The "vitamin content" calls for investigation.

The process of pasteurization has made a place for itself in the United States of America which will repay careful examination. Reference has been made to the position in New York City. Similar statutes are in force in Chicago and in Cleveland, while in 95 per cent. of the cities of over 100,000 in the States pasteurization is approved and enjoined, though not enforced. The process calls for definition. A considerable proportion of milk sold in the ordinary way in large English cities is put through an operation called pasteurization, in order to delay souring, and so avoid the heavy losses entailed by milk becoming unmarketable, especially in hot weather.

There are various makes of apparatus on sale for this purpose, many originating in Denmark.* Milk flows through them in a continuous stream, entering at room temperature, passing through, or between, steam-heated coils, or chambers, and emerging at a temperature of 170° F. There need be no doubt that they adequately serve their purpose from the commercial point of view. But it is objectionable to call such apparatus "pasteurizers." The essential characteristic of the process devised by Pasteur to secure sterilization without alteration of essential

* A sample recently collected by the writer from such a machine, operated in good faith by a large co-operative society, gave a temperature of 170° F. at its point of emergence. It yielded abundant growth on culture.

properties of the fluids treated was the *maintenance* of a moderate temperature (145°-170° F.) for a sufficient period (twenty to thirty minutes). We would anticipate that milk treated by the "flash" method referred to above would either be like sterilized milk in its characteristics (if the temperature were high enough to render it free from micro-organisms) or, alternatively, would not be sterile.

In New York these methods are regarded as being ineffective imitations of a real safeguard. Properly pasteurized milk, such as has been distributed at less than cost from the Nathan Straus dépôts, is a satisfactory and safe supply. Mr. Nathan Straus devised a home pasteurizer, simple both to construct and to operate. It is not patented, and any tinsmith can readily construct it from the specification. There are no gauges to read. Only the proper quantity of boiling water applied for the indicated period is needed. Its effectiveness depends upon the specific heat of water in relationship with that of milk and to the respective quantities of each. The correctness of the calculations has been tested experimentally and verified by experience.

*Directions for the Use of Milk Pasteurizer—
System Nathan Straus.*

1. Only use fresh filtered milk which has been kept cold, and proceed as follows:
2. Set the bottles, after they have been thoroughly cleaned, into the tray A, fill them to the neck, and put on the corks or patent stoppers.
3. The pot B is then placed on a wooden surface (table or floor) and filled to the three supports C (inside section, showing bracket for tray in the pot) with boiling water.
4. Place tray A, with the filled bottles, into the pot B, so that the bottom of the tray rests on the three supports, and put cover D on quickly.
5. After the bottles have been warmed up by the steam for five minutes remove the cover quickly, turn the tray so that it drops into the water. The cover is to be put on again immediately. This manipulation is to be made very quickly, so that as little steam as possible can escape. Thus it remains for twenty-five minutes.
6. Now take the tray out of the water and cool the kettles with cold water and ice as quickly as possible, and keep them at this low temperature till used.
7. Before use warm the milk—in the bottles—to blood heat. Never pour it into another vessel.
8. The milk must not be used for children later than twenty-four hours after pasteurization. Never use remnants.
9. The advantages of pasteurization over other systems, such as sterilization or boiling, consist in the lower degree of heat applied, which is sufficient to kill all noxious germs, while the nourishing quality and good taste of the milk are retained.

Pasteurization on the large scale calls for an equipment not readily described, nor understood, without the aid of complicated plans and diagrams. It is sufficient to say that milk after being placed in sterile receptacles is kept at the indicated temperature for twenty to thirty minutes by means of steam. The receptacles are then closed and sealed, refrigerated, packed in ice (in hot weather), and dispatched.

The experience of Mr. Nathan Straus extending over a period of twenty-eight years in New York, his continued and ever-increasing confidence therein, but above all the formal endorsement thereof by the municipality, justify

the proposition that the pasteurization of milk supplies, with the exception of such as reaches the standard of "Grade 1, Certified," should be the immediate aim of all who are interested in public hygiene.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

ERYTHEMA SCARLATINIFORME.

DR. ANDERSON MURRAY'S memorandum in the BRITISH MEDICAL JOURNAL of November 12th (p. 796) raises an old question—namely, whether these cases of scarlatiniform rashes which follow septic wounds are not to be regarded as cases of scarlet fever, mild or severe, and hence whether they ought not to be isolated as such. Books vary in the significance their authors attach to "surgical scarlatina": Goodhart and Still, as well as Edmund Owen, pronounce the condition to be scarlet fever proper—with emphasis. The eighth edition of Osler's *Medicine* is more equivocal.

I have had three cases in the last twelve months similar to those mentioned by Dr. Murray. All three followed septic wounds of the type one has been taught to associate with streptococcus and which are seen often in erysipelas—that is, septic superficial wounds with a little thin pus and little or no surrounding local reaction. In one case, that of a little girl, there was a very intense rash with high temperature and vomiting; wholesale desquamation followed, and an axillary abscess; the original wound was on the hand. In the second case, of a lady aged 60, there was a small septic crack between the toes which gave rise first to lymphangitis up the leg and later to the scarlatiniform rash. Desquamation was slight in this case. The third case, of a little boy, showed a bright rash with a temperature of 100° F.; after sixty hours he was free from any symptoms and signs except the original wound. No case had any tonsillitis, but in all the palate shared the rash and the tongue was of the "strawberry" type.

Now, scarlet fever is associated with the streptococcus, and the question arises: "When does a streptococcal case become infective for scarlet fever?" I do not think many would wish to dogmatize on such a point, but I submit that, once a septic focus—tonsil, middle ear, or wound—has given rise to a scarlatiniform rash, there is ample justification for regarding the patient as infectious for scarlet fever, and he should be isolated until the septic focus is no longer septic, and until any desquamation has ceased. The absence of septic tonsillitis is no diagnostic criterion; scarlet fever usually includes septic tonsillitis, probably because it is from the tonsils that the infection commonly becomes generalized; when, however, the generalization comes from a wound I would not expect a tonsillitis.

The severity of scarlet fever is said to have been reduced very greatly of late years by efficient isolation of mild cases, and I believe that in surgical cases of this kind all terms such as "septic rashes" and "erythema scarlatiniforme" would be better abolished, the cases being isolated and treated as scarlet fever until all signs of possible infectivity have ceased. I am encouraged to express this opinion by the fact that others far more experienced than myself share it. On the other hand, I know that there is a large body of opinion in favour of less arbitrary distinctions in these cases. It is in the hope of eliciting further information born of experience that I venture to send these notes.

Broadstairs.

MARTIN O. RAVEN.

INGUINAL HYSTEROCELE.

THE patient whose case is described below was a female infant ten weeks old, whose mother was a primipara; delivery was at full time and the confinement normal. The mother noticed a "rupture," and two days later (August 16th, 1921) brought the baby to the King Edward VII Hospital, Cardiff, on her doctor's advice.

On admission the infant was well nourished and in no apparent pain. Examination revealed an ovoid swelling, the size of a small plum, situated in the left inguinal region. On palpation this was found to be fluctuating, somewhat tense, containing a small round movable body, corresponding in size to the infant ovary. All attempts to reduce the swelling failed. A diagnosis of irreducible hernia of the left ovary was thereupon made, and immediate operation deemed advisable.