# THE INCUBATOR BABY

THE best way to treat a premature baby is a subject on which there are a variety of opinions; but undoubtedly in hospitals, where skilled and constant supervision is available, the incubator is of great value. It is a comparatively modern device: Denucé, of Bordeaux, in 1857, was the first in the field; Crédé brought out his pattern in 1864, it being further improved in 1880. In later years those of Lion (of Nice), Tarnier and Auvard, with sundry modifications, are those best known.

All types are open to objections. The danger of transmission of disease by germs is a very real one: at one time in Paris there was quite an epidemic of erysipelas among the incubator babies. They are extremely susceptible, and, owing to their weak resisting powers, readily succumb. It cannot, then, be too firmly insisted upon that the incubator should be made of material that is capable of sterilisation; this can be done by means of steam, or by thoroughly cleansing, first with soap and water, and then with a solution of carbolic acid (1 in 20), or a 2 per cent. solution of formalin.

Perhaps, however, the questions of ventilation and regulation of temperature are the most difficult. In order to obtain the best results the air should be admitted into the incubator at 60–65° Fahr. If the communication is, as most authorities agree it should be, with the outside air, it is difficult with our variable English climate to ensure an even temperature. In order to obviate this the incubator should be placed in a large, cool room, out of the direct sunlight. Insufficient air supply is occasionally the cause of death, though it is in most cases rather due to the imperfect working of the lungs. After the tenth day asphyxia from collapse of the lung is rare.

Authorities differ as to the temperature at which the air should be kept. Very delicate and premature children demand greater warmth than older and more robust subjects; it is laid down by one eminent physician that it should be such as to keep the baby's temperature normal (*i.e.*, between 97·5° and 100·5°) without perspiration; this will be between 85° and 95° Fahr.

It is often found that, owing to excessive radiation, the child has a sub-normal temperature; while, on the other hand, a case is recorded where the thermometer registered 108° Fahr.; on removing the infant from the incubator this fell to 93° Fahr., an extraordinary drop! The child did well afterwards. It has been urged that the change of temperature involved in the feeding of the child is harmful; this is open to question. It is better to reduce it gradually before the baby is taken out; this would naturally be done when treatment was to be discontinued. In those patterns where the temperature is automatically regulated it is easy; in others the child can be fed without removal.

As the incubator is closed in, the infant needs to be under constant observation; coughing, choking, and vomiting can only thus be discovered. If it becomes blue, it must be revived by reflex stimuli, the administration of oxygen, or a few drops of brandy.

To sum up, the ideal incubator should be sterilisable, it should have an air inlet in communication with outside, an ample outlet to allow of free circulation of fresh, warm air; and it should be possible to regulate the temperature according to the needs of the child, who must be watched night and day by a skilled nurse.

The "Lion" incubator is probably the one that meets all these requirements; but it is expensive and fairly complicated in its arrangement. It is made of metal, which is enamelled white, and stands on an iron support. Low down on one side is a tube, three inches in diameter, through which the air, first filtered through gauze, enters; the exit is by a chimney communicating with the open air. The rotation of a fan fixed in this indicates the strength of the current. The front is fitted with glass, through which one sees the baby, and at the side is a sliding window, which allows of the child being attended to without movement. The air is moistened by a pan of water in the bottom, and a thermometer and hygrometer indicate respectively the warmth and humidity. The temperature can be automatically regulated. The heating is effected by means of a syphon, through which hot water circulates; this communicates with a reservoir at the side. In the Tarnier-Auvard incubator the child lies on a padded shelf, about six inches from the floor of the box, directly over the tank or system of pipes filled with hot water. Fresh air, entering from below, passes over these; a wet sponge prevents it from being too dry; it passes out by a ventilator at the top.

Tarnier saved 65 per cent. of infants born at six months, 49·8 per cent. of infants born at seven months, and 88·8 per cent. of infants born at eight months. These two incubators are both used at the Sloane Maternity Hospital in New York, and in the course of a very interesting paper on the subject, Dr. Vorhees gives the following details of seventy-seven infants that survived for four days and longer. Their average weight was 3lbs. 13oz., five weighed less than 3lbs.; twenty-eight had attacks of atalectasis pulmonum, all but ten were more or less jaundiced, three vomited. The average initial loss was 7oz.; they remained in the incubator from three to eighty-two days.

The incubator-room of Esherich is perhaps the best idea of all; the dimensions are 4ft. by 8ft., and it is 6ft. in height. This allows of the nurse going in and out to feed the child.

In default of these more or less expensive incubators, a handy man can make a cheaper one modelled on these, their efficient ventilation being of primary importance; or a very good makeshift may be improvised with a cradle or wooden box. This should be lined thickly with raw cotton or cotton-wool; hot bottles should be placed in it on all sides, and a second thick layer

of wool laid over these. The baby, well oiled, should be covered in with this, head included, the face only being exposed; a hood covered with a blanket keeps out strong light and shields from draughts; a cotton-wool pad should be placed under the buttocks to absorb motions and urine. The box should be kept in a warm corner, screened off, the bottles being refilled when necessary.

In America an electric pad, known as the electrotherm, is found to be useful in maintaining an equable temperature. This can be attached to an electric light fixture; by means of a regulator, three grades of heat are obtainable. The most convenient size is 10 x 15 inches; it is placed between several thicknesses of blanket and replaces the hot-water bottle.

In order that a baby may be successfully reared in an incubator, it is necessary to have an intelligent and observant nurse always in attendance. Her duties will be:—

I. To carefully watch the thermometer which registers the temperature, and to keep it as uniform as possible. Where hot bottles are used they must be refilled in rotation.

II. To see that fresh air circulates freely round the infant. In some of the apparatus an aerometer is fixed which indicates the strength of the air current. If the glass cover at the top becomes cloudy, it shows that ventilation is defective.

III. To take the child's rectal temperature, to report to the doctor any great variations, to chart motions, feeds, and any change in colour or respiration, &c.

IV. To weigh the infant, if strong enough, every three days. In the "Rotch" brooder the child can be weighed without removal. It will gain weight slowly, but if at three weeks it has reached its birth weight, the result may be considered very good.

V. To change the diaper immediately after use, since the skin of the premature child chafes very easily. If the condition of the baby is good, it may be lightly sponged once a week; but all unnecessary exhausting movements should be avoided.

VI. To follow out minutely the doctor's directions as to feeding. With seven months' children, diluted breast milk seems to afford the best results. This may be given with a spoon or medicine dropper; about half-an-ounce should be given hourly, gradually increasing to one ounce. All fixed rules are, however, unsafe, the times of feeding, the quantity and strength of food depending upon the condition of the child.

The preservation of infant life is one of the problems of the twentieth century, and where prematurity is not associated with disease it is worth while to use every resource to tide the little one over the first few pathetic, uncertain weeks of its existence, taking courage and renewing hope when we see our incubator babies as they grow older among the fittest—living testimonies to science and persistent care. M. O. H.

# THE DIET OF NEURASTHENIC PATIENTS

(*Translated from the German.*)

THE diet of nerve patients cannot be laid down in express terms, as the doctor must individualise and decide each case on its merits. In the case of organic changes in the central or peripheral nerves, when the digestive system is healthy, ordinary care in diet will suffice, although sometimes even in these cases important questions of dietary arise. Apoplexy, cerebral tumour, or tabes may lead to the most serious digestive or intestinal disturbances, which cannot be relieved by drugs, but only by a specially adapted diet. The gastric troubles of diabetics are well known and rightly dreaded, as are the marked disturbances of the bladder and the large intestine in cases of spinal disease. The difficulty of swallowing in cases of paralysis sometime necessitates a purely fluid diet, and entails an exact control of bodily weight in order to test whether the diet is properly arranged. Still, in no nervous disease is a special diet the chief therapeutic agent, as it is, for instance, in diabetes, gout, Bright's disease, and others. This remains true, in spite of all the progress made during recent years in dietetics, and applies to the whole category of organic changes of the nervous system, as well as to vasomotor trophic nervoses, including Graves' disease. Neurotics even in the narrower sense are no exception, and we must admit that they give the best opportunity for dietetic measures. We may say that in no medical diseases (acute infectious illnesses, pulmonary consumption, and organic changes in stomach or intestine, as well as the constitutional anomalies mentioned above) is so much demand made upon the dietetic knowledge of the doctor, as in the case of functional nervous illnesses. This needs some explanation. The meaning of functional neurosis can in our present knowledge be defined only negatively. There are many illnesses, says Charcot, which obviously have their origin in the nervous system and yet leave no trace in the body. We have advanced no further to-day in our knowledge of these illnesses. Now it is self-evident that in a free harbour, flying such a comprehensive international flag, a gay assortment of wandering vessels will assemble. We find under the title "anatomically non-verifiable functional anomalies of the nervous system, conditions which have nothing whatever in common, except that they leave no trace at a *post-mortem*.

Let us glance at so-called nerve diseases, epilepsy, paralysis agitans, chorea minor, Huntingdon's chorea, tetanus, tetany, and many other uncommon conditions which bear no resemblance to each other; to these may be added neurasthenia and hysteria. It would be foolish, here, in speaking of the diet of nerve cases, to include this host of nerve illnesses; since many of these are totally different, only having in common no