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THE APPRAISAL
OF THE
NEWBORN INFANT

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INTRODUCTION

The necessity for careful and adequate appraisal of the infant during the neonatal period has not been generally appreciated, nor have methods for making such an appraisal received sufficient attention. (The term "neonatal" is used to describe the period from birth through the first 30 days of life.) The neonatal period is one of great danger to the infant as well as one about which too little is known. That more attention should be given to the appraisal of the newborn infant and to his care is indicated by the high mortality rate among infants in the first month of life. It is well known that, although the mortality in the first year of life has been greatly reduced during the past 15 years, the mortality in the first month of life (neonatal mortality) has been reduced relatively little and the mortality on the first day of life has not been reduced at all. Contributions to knowledge of the problems concerning the neonatal period have been made through intensive study of individual infants as well as of groups of infants, but the information at hand with regard to these problems must be carefully evaluated and made readily available to all physicians. It is obvious, furthermore, that if appraisal is to be adequate new information must be collected, particularly in regard to well infants. The appraisal of the newborn infant will, of course, be made more exact by improvement in clinical methods of examination, by establishment of certain standards of growth and development, and by more intensive study of causes of neonatal deaths, supplemented by post-mortem and other laboratory examinations.

It is hoped that this bulletin will be useful to physicians in the examination of newborn infants and in the interpretation of the findings.

BASIS OF APPRAISAL

An appraisal of the newborn infant, to be adequate, should not be based on physical examination alone. It should involve also consideration of the socioeconomic background of the family; constitutional factors in the medical history of the family, especially the history of hereditary or transmissible diseases or defects; the prenatal history (the mother's pregnancy); and the natal and immediate postnatal history. Knowledge of the influence of these factors may tend to modify an examiner's appraisal.

The physical examination should be complete and should be supplemented by physical measurements, and, when indicated, by laboratory and roentgen-ray examinations. It should be repeated at least once during the first month, and more often if indicated by the history or by the development of some abnormal symptom. At the end of the first month of life another complete examination should be made.

SOCIOECONOMIC FACTORS

In the appraisal of the newborn infant socioeconomic factors play an important role which has not been sufficiently studied. That infant mortality is higher under poor socioeconomic conditions, such as low income, employment of mother, and congested housing, has been clearly demonstrated.[1]

HISTORY

FAMILY HISTORY

It is of great importance to inquire into and record the family history of the newborn infant, because, as has been noted, the influence of inherited traits (constitutional factors) and of transmissible diseases or defects must be considered in the total appraisal of the infant. There are certain hereditary or familial defects and diseases which are obvious at birth, such as harelip and cleft palate, and others that are not apparent until the period of later infancy or childhood, such as Friedreich's ataxia, progressive pseudohypertrophic muscular dystrophy, and amaurotic idiocy. Developmental defects such as Mongolism may be obvious at birth; others, such as certain cerebral defects which result in convulsions and spastic palsies, may not become obvious until later. Certain sex-limited defects, such as color-blindness and hemophilia, are not apparent at birth, and therefore a knowledge of the family history should be taken into consideration in the appraisal of the infant.

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[1] Causal Factors in Infant Mortality; a statistical study based on investigation in eight cities, by Robert Morse Woodbury. U. S. Children's Bureau Publication 142. Washington, 1925. 245 pp.

INFANT'S HISTORY

The history of the newborn infant consists of the prenatal history (mother's pregnancy), the birth history, and finally the immediate postnatal history, especially in regard to the onset of respiration.

Prenatal history.

The mother's health during pregnancy must be considered in relation to the maturity and weight of the infant and his adequacy for extrauterine existence.

The mother may have suffered during pregnancy from some disease which interrupted the pregnancy at some time before term or which may be transmissible to the infant. The most striking example of this is syphilis. That an infant infected by syphilis may be born prematurely or at term and with or without evidences of the disease is well known. Intrauterine transmission of almost any of the common communicable or infectious diseases, such as smallpox, chickenpox, and erysipelas, is possible. In fact, cases have been reported of infants born with typical scars of smallpox, as well as cases in which the acute lesions of the disease were present at birth. Erysipelas lesions in the infant may make their appearance within a few hours after birth if the mother is suffering from the disease. Tuberculosis, typhoid fever, and malaria have also been reported as transmissible to the fetus. On the other hand, the mother may confer on the fetus immunity to certain diseases, such as scarlet fever and measles. There are certain acute conditions in the mother, such as the toxemias of pregnancy, the effects of which on the fetus are not entirely clear. The infant is likely to be born prematurely, but studies have shown that if the infant is born alive at or near term no specific deleterious effects of the toxemia can be determined.

If the mother suffers from a deficiency disease the health of the infant may be affected. The outstanding example is thyroid disease in the mother resulting in cretinism in the infant. Women suffering with diabetes are likely to give birth to abnormally large infants.

There is some evidence that roentgen-ray therapy of the mother during pregnancy may result in injury to the central nervous system of the fetus (microcephaly).

In many instances the physical condition of the mother does not affect the infant, since normal infants may be born of diseased mothers. The history of the mother's pregnancy should, nevertheless, be considered in making the appraisal of the newborn infant.

The subject of immunity to disease in the neonatal period is an important one. The transmission of immune bodies and allergy from the mother to the infant has been rather extensively studied in recent years. It is well known that the antibodies of syphilis and tuberculosis may pass the barrier of the placenta and may be demonstrable in the infant's blood for weeks or even months after birth although the infant may be entirely free from infection. Likewise, immunity to scarlet fever, measles, poliomyelitis, and diphtheria in this period has been established.

Certain hormones that affect growth are probably transmitted to the fetus in the latter part of pregnancy. The therapeutic effect of such

hormones when given to prematurely born infants has been studied, but their value has not been accurately determined as yet.

Natal history.

When the course of the infant's birth is in any way abnormal, the effect on the infant may be apparent immediately or in the course of a few hours, or signs may appear at some period later in infancy and childhood which must be attributed to injury at birth. Of special significance are rapid or prolonged labor, dry labor, difficult delivery, instrumental delivery, and so forth.

Postnatal history.

The immediate postnatal history of the infant may be even more important than his natal history. Under ordinary conditions the respirations should start immediately and the infant's color should become good. If respirations are delayed artificial means to induce respiration must be used and the type and effectiveness of these methods must be considered in relation to immediate or remote effects on the organism. In this connection a history of any anesthetics and drugs given to the mother during labor must be known, particularly depressant drugs such as morphine and barbiturates. Appearance of cyanosis, pareses, paralyses, hemorrhages, twitchings, or convulsions in the immediate postnatal period, even if transitory, must be considered in making the appraisal of an infant that is apparently normal at the time of examination.

Fetal maturity.—After the birth of an infant the physician is at once confronted with the task of estimating its maturity. Since the exact date of conception is usually not known, calculations of the duration of pregnancy are ordinarily based on the date of the last menstrual period. The results of these calculations are often not accurate because menstruation may occur after conception takes place. It is usual to regard a fetus of less than 28 weeks' gestation as nonviable. When the time of gestation is estimated as between 28 and 38 weeks, the infant is called premature. When the time of gestation is estimated as between 38 and 40 weeks the infant is said to be mature. As a matter of fact it may be just as hard to draw a sharp line at the point where the "nonviable" fetus becomes a "viable" one as it is to set off sharply the "premature" from the "mature" infant.

A number of criteria are in use for the diagnosis of prematurity, none of which is entirely satisfactory from a scientific standpoint. Among them are (1) a birth weight of 2,500 grams (5 lb. 8 oz.) or less, (2) a crown-heel length of 47 centimeters (18.5 in.) or less, (3) relatively greater disproportion between head and chest circumference or head and shoulder girth than in the full-term infant, (4) an occipitofrontal diameter of the skull of less than 10 centimeters (3.9 in.), (5) a foot length of 7 centimeters (2.8 in.) or less, (6) roentgenographic evidence of absence of certain centers of ossification in the long bones.

Since two concepts are involved in any measurement of maturity—physical development and physiologic development—the exact period of gestation at which intrauterine life ends is a matter of legal or academic importance only. For clinical purposes, however, it is important that physicians recognize indications for special care and

that they have some basis for making a prognosis. The birth weight of the infant seems to be the best criterion from these points of view. In the first place weight is a measurement which is easily made and widely in use. Secondly, a background of statistics is available as to results of care in relation to birth weight. From clinical experience and mortality statistics it is clear that when the infant at birth weighs 2,500 grams (5 lb. 8 oz.) or less or measures 47 centimeters (18.5 in.) or less special care is needed. Moreover, statistics show that for infants weighing at birth 1,000 grams (2 lb. 3 oz.) or less survival is comparatively rare and that for infants above this weight at birth the chances of survival vary according to the birth weight. If the infant at birth weighs more than 1,500 grams (3 lb. 5 oz.) its chances of survival are four times as great as if it weighs 1,500 grams or less at birth. There are, however, some infants who according to weight or height or some other criterion should be capable of extrauterine existence and yet physiologically are incapable of such existence.

No rule should be laid down at present for determination of fitness for extrauterine existence, since the factors affecting viability are variable and not very well understood. "Immature" is a better term than "premature" to apply to infants who are physically or functionally unprepared for extrauterine existence.

The initial respiration.—Independent extrauterine life is not established until the infant breathes. Although the beating of the heart in the absence of respiration is evidence of life, it is merely evidence of persistence of intrauterine life. There is, moreover, evidence that the respiratory mechanism may function in utero, but the significance of this phenomenon is not clearly understood. Respiratory movements may occur when the head has been delivered and the body is still in the birth canal or immediately after separation from the body of the mother, or they may be delayed for varying periods, sometimes as long as an hour or more. Injury to an infant's central nervous system during birth or narcosis from anesthetics or such analgesic drugs as scopolamine, barbiturates, or morphine, administered to the mother during labor, may be a factor in delay of the onset of respiration.

Usually the infant at birth respires spontaneously and cries vigorously. When these physiologic processes do not occur at once it is necessary to take steps to induce respiration before the infant's heart stops beating. What is the best method to use is a debatable question. There is, however, agreement that, whatever method is used, the approach should be gentle and great care should be taken to keep the infant warm. Before any mechanical method is used the upper air passages should be cleared of mucus and other fluid by aspiration, through the use of a soft-rubber catheter attached to a negative pressure bulb. Following this, gentle rhythmic compression of the chest can be used, care being exercised not to squeeze the upper abdomen. Too violent compression in this region might raise intracranial pressure or rupture the liver. At the time that artificial respiration is being carried on inhalations of oxygen or of a mixture of 5 percent carbon dioxide and 95 percent oxygen may be given by various means, such as a mask or a nasal catheter.

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The infant should under no circumstances be spanked, swung, or plunged into cold water; but, as has been mentioned, care should be taken to keep him warm throughout the time when attempts are being made to make him breathe.

Considerable variation in the rate and volume of respirations may occur in the newborn infant in the early days of life without pathologic significance, so far as is known. Even during sleep the respiratory rate may vary widely (16 to 93 per minute). The rate and volume are greater when the infant is awake than when he is asleep. There is a tendency, moreover, for the volume of inspired air to increase from day to day. On the other hand, marked change in the respiratory rate—slowing or accelerating—particularly if combined with increase or decrease in volume, should be regarded as evidence of some abnormal condition such as intracranial injury or acidosis.

A certain degree of atelectasis is physiologic after birth. It has been stated that this may be demonstrated by an actual measured daily increase in the circumference of the chest, as well as by roentgenograms made on successive days after birth, showing that complete expansion of the lungs is a gradual process taking place over a period of days or even 1 to 2 weeks. The physician's attention is drawn to atelectasis of an abnormal degree when the color becomes cyanotic or the breathing becomes abnormal or when physical signs are present in the chest, such as râles, impaired percussion note, or diminished or increased breath sounds. When atelectasis persists and seems of sufficient degree to cause symptoms it is usually secondary to some condition interfering with the normal functioning of the respiratory center or to some abnormal condition within the thorax such as a congenital defect in the circulatory system or persistence of undeveloped lung.

PHYSICAL EXAMINATION

A detailed and careful physical examination of the newborn infant can usually be made with safety shortly after birth. There is no contra-indication to making as complete an examination of a newborn infant as of an older infant if the conditions are satisfactory. Indeed, it is of the utmost importance that such an examination should be made of every newborn infant, since on the basis of the findings treatment may be instituted which, in many cases, may save the life of the infant. There is, moreover, a distinct advantage in making an examination of the infant as soon after birth as possible to be sure that the upper respiratory tract is clear, the color of the skin good, the cry vigorous, and respiration well established.

If the infant is immature and weak the immediate examination should be brief and made with as little exposure as possible. Further examination may be made after the infant's rectal temperature has become stable.

It is of particular importance that the examination of the infant should be made in a warm room, since the infant must be completely undressed. The room should be well lighted, as observation plays a very important role in the examination of any infant.

All methods used in the examination of an older infant may be used in the examination of a newborn infant. The smaller the infant the more care should be taken to apply all methods known for a detailed and careful physical examination. Procedures cannot, however, always be carried out in the usual order. It may be best to use the stethoscope first, while the infant is sleeping, and to use palpation or percussion later. If information is to be gained by these methods the physician's hand as well as the bowl of the stethoscope should be warm, and percussion and palpation should be gentle.

MEASUREMENTS

Weight.

The infant is usually weighed immediately after birth. The average weight of the full-term infant at birth is stated to be about 3,175 grams (7 lb.).

An infant weighing 2,500 grams (5 lb. 8 oz.) or less should be regarded as needing the care given to a premature infant, regardless of the history of the duration of pregnancy. Some infants weighing more than 2,500 grams may also require such care.

In appraising the infant, comparison of his weight with the weight of the average infant is of little value, as weight is affected by a variety of factors, chief among which are sex and race. Male infants tend to weigh more than female, and white infants tend to weigh more than colored. The gain in weight is the important consideration. The weight of a newborn infant usually decreases in the first 3 to 4 days. This loss in a full-term infant is about 6 to 9 percent of the weight at birth. The birth weight is ordinarily regained between the tenth and fourteenth days. During the neonatal period after the first few days the average gain is at the rate of 30 grams (1 oz.) or more per day.

Skeletal growth.

Certain measurements of the infant should be made within 24 hours after birth because they are important from the point of view of determining maturity and also because they serve as a base line in respect to growth. These measurements should be accurately made and recorded. The important ones are as follows:

Crown-heel length.—The crown-heel measurement should be made with the infant flat on his back and extended. A measuring board or a metal anthropometer should be used. Measurements of the total length made by tape, with the infant hanging by the feet or even in a prone position, will obviously be inaccurate.

The average length of the full-term infant is usually stated to be 50.8 to 53.3 centimeters (20–21 in.). Length, like weight, is affected by various factors, such as race and sex. Growth in length during the neonatal period has not been satisfactorily studied.

Head circumference.—The occipitofrontal circumference of the head should be measured with a *steel* tape 24 to 48 hours after birth; this measurement should be made on the third or fourth day of life, since considerable edema of the scalp and molding of the skull are frequently present at birth. It is important to have this measurement recorded, as abnormal size of the head or abnormally rapid

growth of the head or disproportion between the head and shoulders or the head and chest has important clinical significance. The average circumference of the full-term newborn infant's head is 34.8 centimeters (13.7 in.). The head circumference should be considered in relation to the length. The head grows relatively rapidly, and the circumference at each age period is equal to approximately one-half the body length plus 10 centimeters (3.9 in.).

The occipitofrontal diameter of the head is a measurement that has been found to be closely related to weight. It may be used as a measure of maturity; a diameter of 10.5 centimeters (4.1 in.) or less is said to indicate prematurity. Calipers are necessary to make this measurement.

Measurements of the circumference of the thorax, shoulders, and abdomen are not easy to obtain accurately and are therefore of relatively little value in determining the degree of prematurity.

It is probable that some measurement of width should be made (the bi-iliac or bitrochanteric diameter, for example) to use in relation to crown-heel length in estimating the nutritional status. No indices have been worked out, however, for infants in the neonatal period.

TEMPERATURE

Immediately after birth the temperature of the infant is said to be slightly higher than that of the mother. In the next few hours it drops 1½ to 2 degrees and it has a tendency to remain low during the first day. The body temperature of the newborn infant is easily altered by changes in the environment and therefore even the normal full-term infant should be spared exposure and variations in the temperature of the environment.

GENERAL OBSERVATIONS

It cannot be too much stressed that ample time should be given to careful observation of the infant. Special attention should be paid to his color, the movements of his arms and legs, the ease with which he can be awakened or made to cry, the type of the cry, and his ability to suck. Observations should be made when the infant is asleep, or at least quiet, and again when he is awake or crying. The order in which the rest of the examination is carried out depends upon the state of activity or inactivity of the infant. When the infant is asleep is an opportune time to listen to the heart and lungs and to test the reflexes, as resumption of activity or crying makes these examinations difficult. On the other hand, the deep respiration during crying is of inestimable value in auscultation for the detection of râles.

Activity.

Normally a newborn infant remains asleep throughout the greater part of the day, but it is with difficulty that any part of a procedure requiring actual handling can be carried out without waking him. An infant is normally more active when hungry than after a recent feeding. He resists any attempt to change his posture, as well as any restraint of free motion of the head or extremities. Crying

is usually accompanied by vigorous movements of the arms and legs. Sudden noises or sudden change in body posture will often elicit in the normal infant a clonic flexion of the arms and legs (Moro reflex). A normal infant will remain awake throughout the examination while being handled, and if recently fed and comfortable will soon return to sleep when the examination is concluded.

The activity of the infant has great significance. The mature infant should cry when stimulated, maintain this cry for at least a few minutes, vigorously move the arms and legs, and then gradually settle back to sleep again. Difficulty in waking the infant and in making him cry and a feeble or poorly maintained cry are indications of the presence of some abnormality such as immaturity, atelectasis, narcosis, or intracranial lesions.

Posture.

The newborn infant lies with the head held to the right or the left and resists strongly any attempt to change this position of the head. (See Magnus reflex, p. 18). Usually, however, the head will be turned to one side when the infant is sleeping, and it will acquire a midline position when he is crying.

The newborn infant lies on the back with the arms and legs slightly flexed. There is normally slight outward rotation of the legs at the hips, and the legs tend to assume the same position both when the infant is awake and when he is asleep. The arms may assume varied positions when the infant is asleep. It is important to turn the infant over so that the back may be examined. The symmetry of bony points, such as scapulae, hips, and vertebrae should be noted. At birth two vertebral curves are present, a dorsal and a sacral, each convex posteriorly. The cervical and lumbar curves are not established until the infant is old enough to stand.

If the newborn infant is held upright and supported under the arms and the feet are brought in contact with a smooth, hard surface, he will tend to straighten the legs, flatten the feet, and bear a little weight on them; sometimes one leg and then the other will be raised and flexed as if making walking movements. When he is placed on his abdomen he usually makes an effort to raise his head. Frequently the newborn infant is able to raise his head well off the examining table and sometimes to maintain this posture for several minutes.

Special senses.

The special senses of the infant and the response to various stimuli have been studied to some extent. As is known, the infant can see light.

The sense of smell is probably present from birth. Observations of this sense in newborn infants are few and are not altogether conclusive.

The newborn infant is said to be deaf at birth and for several days thereafter. In the neonatal period infants vary greatly in their response to auditory stimuli, some starting at sudden or loud sounds, others not reacting to them. The testing of hearing is difficult in infancy.

Tactile and thermal sensibility and the sense of pain and of taste are all present at birth.

Crying.

It is important to determine the tone and strength of the cry. Most normal newborn infants cry during part of the examination. If the infant is hungry there will be a tendency to crying throughout the greater part of the procedure. If he has just been fed and is well satisfied it may be necessary to stimulate crying by gently snapping the soles of the infant's feet. If during the examination the infant cannot be made to cry or if the cry is feeble, shrill, difficult to elicit, or not maintained, it should be considered abnormal. A crowing cry, not accompanied by any signs of laryngeal obstruction such as cyanosis or retraction of episternal or suprasternal notch, is probably evidence of so-called congenital laryngeal stridor. It is attributed to looseness or redundancy of the vocal cords and has no pathologic significance. It usually disappears in a few weeks but may persist for several months. Tetany, and possibly enlargement of the thymus gland (very rarely) as causes of the crow should, however, be considered.

Yawning and coughing.

It is seldom that the newborn infant yawns or coughs. If he is examined before respiration is well established there may be gagging and vomiting of mucus or gastric contents, accompanied by irregular and difficult breathing. Hiccoughing and sneezing occur rather frequently in the normal infant.

Sucking.

Sucking is a well-developed reflex present in the infant at birth. Even after a sufficient feeding, sucking movements are stimulated when the nipple is placed in the infant's mouth. Absence or poor development of the sucking reflex indicates immaturity or the presence of some other abnormal condition such as intracranial lesions or narcosis.

SKIN

The skin of the newborn infant at birth is covered with vernix caseosa; the amount varies considerably. After the initial cleaning with oil the skin is normally moist, soft, and elastic. Pigmentation varies with the race of the infant and in the darker-skinned races may be deeper on certain localized areas, especially over the genitals, at the base of the nails, and around the areola of the nipples. Bluish pigmented areas, the so-called Mongolian spots, are frequently found on the back, buttocks, or extremities of infants of certain races, notably Italian, Jewish, Negro, and Oriental. The newborn infant's subcutaneous fat is well distributed and gives to the skin of the normal infant a soft, elastic feeling. The general color is normally a bright pink and in the dark-skinned infant is best seen by observing the palms, soles, nails, and mucous membranes. Physiologic jaundice is seldom observed during the first 24 hours of life. Coarse desquamation is sometimes present during the first 2 to 3 days of life. The hair of the scalp is present and varies in amount and length. It is fine or moderately coarse and usually is straight. The eyebrows are present, but in infants with light hair they may be difficult to see. The fingernails are normally well formed and often extend to or beyond the fingertips. The toenails are subject to great variations in size and shape, are often small, and appear embedded at the distal end.

LYMPH NODES

The various groups of lymph nodes are very frequently palpable in the newborn infant, especially if the subcutaneous fat is small in amount. Only when the nodes are definitely enlarged should they be considered abnormal. The groups of nodes most frequently palpable in normal newborn infants are as follows, in order: Inguinal, axillary, epitrochlear, posterior cervical. The anterior cervical, occipital, posterior auricular, and anterior auricular nodes are not palpable as a rule.

HEAD

The variation in the shape of the head due to molding may be very great in the first 24 hours. In some infants such changes are completely absent and in others they are very marked. The point of greatest molding may be asymmetrically located and may give the head a true asymmetry. Changes due to molding disappear rapidly and are usually gone in 24 to 48 hours, but may last much longer. The parietal bones normally are smoothly convex and slightly prominent. The forehead is usually on a horizontal line with the face but may be slightly prominent or slightly receding. The scalp should overlie the bones of the head closely and the bones should be firm. Careful palpation of the head is important, as edema, caput succedaneum, cephalhematoma, or defects in the skull bones, which are not obvious on inspection, may be present.

The principal sutures are: The sagittal or longitudinal; the coronals, which separate the frontal bone from the parietal bones; and the lambdoids, which separate the parietal bones from the occipital bone.

Great variation is found in the sutures in the newborn infant's skull; they may be overlapping, approximated, or gaping. Usually the bones at the edges of the sutures feel hard, but they may occasionally feel soft or thin or be movable. Within 24 hours after birth a suture that was overlapping at birth may became gaping. In hydrocephalus all the sutures are found to be gaping.

There are many fontanels, but the most important clinically are the anterior and posterior. The examination of the anterior fontanel is very important. There is a great variation in the size of this fontanel. It may be large enough to admit four or even five fingers in its anteroposterior and lateral diameters, or it may be so small that it is barely palpable, or even not palpable, on account of overlapping of the sutures. A wide-open fontanel may be impossible to measure because anteroposterior and lateral angles run into open sutures. The size of the anterior fontanel is usually of no significance if the tension of the fontanel is normal. A fontanel that is level with the surface of the skull or somewhat depressed is normal.

The posterior fontanel may be just palpable or may be widely open, but no clinical significance should be attached to the size of this fontanel when considered alone.

The parietal fontanel is a small fontanel situated about half way between the posterior angle of the anterior fontanel and the posterior fontanel. In many newborn infants it may be barely palpable or it may admit the fingertip. It has no clinical significance but is merely a developmental point in the growth of the skull.

There are a number of other fontanels which are not normally palpable, such as the mastoid and the sphenoidal.

Eyes.

When the physician examines the newborn infant on the day of birth, a solution of some silver salt has usually been instilled into the eyes, making the examination of them difficult. There may be a mild conjunctivitis, or a severe one with edema of the upper and lower lids and photophobia or even some purulent discharge. The possibility of gonorrheal infection must be kept in mind. These very acute symptoms, which are nonspecific, should disappear within the first 24 hours, leaving merely an injection of the palpebral conjunctivae. A mild inflammatory condition may persist for several days in spite of treatment. The tear duct or ducts may not be patent at birth, but this condition is usually remedied spontaneously.

The infant may stare fixedly or turn the eyes suddenly from one side to the other. A transient strabismus of one or both eyes is frequently seen. A few coarse lateral jerkings suggesting nystagmus are occasionally seen in the normal infant.

The pupils vary considerably in size from time to time and react very readily to light. It is important to note the reaction of the pupils and whether they are equal in size. Observations should be made with the light thrown with equal intensity into both eyes. Inequality of pupils or differences between them in reaction to light have important significance in relation to the central nervous system. After the photophobia of the first day or two the eyes do not seem to be especially sensitive to light, but the normal infant will wink if the light is brought close to the eyes.

Sight is difficult to determine in the neonatal period but perception of light can be determined readily, as described above.

Jaundice of the sclerae is seen in the majority of infants between the second and tenth days of life, a manifestation of the physiologic jaundice characteristic of the newborn period.

Frame-like subconjunctival hemorrhages are seen in so many infants in the first 3 days of life that although not normal they are more or less physiologic and are probably not significant except as evidence of changes in vascular tension during the process of birth. They disappear rapidly and completely.

No great difficulty should be encountered in examining the eye grounds of a newborn infant with an ophthalmoscope. If the infant is wrapped tightly and given a bottle of water or milk he will often open his eyes and hold them quiet for a considerable time, even when a strong light is reflected into them. Sometimes, and too often, of course, only transient glimpses of the disk can be obtained. The normal disk of the newborn infant is pale and sharply outlined. Small hemorrhages are frequently seen, which are evidence of increased intracranial pressure during delivery and are apparently of no pathologic significance unless other symptoms pointing to birth injury are present. Failure of the pupils to react to light is probably an indication for an ophthalmoscopic examination, for blindness may be due to retinal defects that will entirely escape notice unless ophthalmoscopic examination is made.

Nose.

The nose of the newborn infant is relatively small and flat. At the time of the onset of respiration the nares should be cleared of any secretion. Small whitish-yellow spots are often seen in the skin over

the tip of the nose. They are follicles of the skin filled with sebaceous material and they disappear spontaneously.

Ears.

The external and internal parts of the ear are well formed at birth. The drums may be retracted until the Eustachian tubes open. The surface of the drum forms an obtuse angle with the external auditory canal. If this angulation is appreciated and the otoscope tilted accordingly, examination is possible and the landmarks of the drums can be clearly made out. Otitis media is not unknown even in the first few days of life.

Mouth.

The lips should be red and smooth, but may show puckering and even desquamation of a coarse type apparently due to trauma from sucking.

The gums are smooth and pink and frequently show slight puckering or even grooving at the distal margins. Frequently small gray cystlike bodies are found, especially in the upper gums. When the infant cries the lips are drawn back symmetrically so that the nasolabial folds are equal. Rarely one or two teeth are present at birth.

The soft and hard palates and the uvula are well formed. There is often considerable variation in the width and in the height of the palate. In the midline of the hard palate whitish or yellow glistening raised spots may be seen, the so-called Bohn's nodules. They mark the fusion of the halves of the palate.

The tongue should be moist, smooth, and symmetrical. Fine fibrillary waves may be noted passing down over the sides of the tongue when it is extended during crying. The tongue should not normally be seen extending between the lips or protruding beyond them.

The buccal surfaces should be smooth and pink and usually the openings of Stensen's ducts are easily seen.

Throat.

Examination of the throat of the newborn infant is difficult because as soon as the tongue is touched with a tongue depressor the infant will make such strong sucking movements that the tongue cannot be depressed. In order that the examiner can see the throat satisfactorily the infant should be made to cry or should be gagged by the introduction of the tongue depressor. A good light should be thrown directly into the throat. The examination will be more satisfactory if an assistant holds the infant's head tipped back and straight in the midline. On the first day the throat will often appear red. This is due to trauma caused by the wiping out of mucus after delivery and perhaps to lack of fluids. The tonsils are not visible in the neonatal period, although occasionally there is a slight follicular appearance as if little bits of lymphoid tissue were present in the fossae. The voice should be clear and strong.

NECK

The newborn infant usually lies with the head turned on one side. The infant resents changes of this posture but there should be no actual stiffness of the neck when the head is turned from side to side or when the head is flexed on the chest.

The sternomastoid muscles are well developed and should be smooth and equal, with the head in the midline. When the head is turned from one side to the other the muscle on the side opposite that to which the head is turned becomes more prominent. The muscles should be palpated, as hematomata in these muscles are common as the result of trauma at birth. They are frequently not diagnosed until calcification takes place. Their only significance is that in an occasional case permanent torticollis results. This can usually be prevented by postural treatment.

The thyroid gland is not normally visible or palpable.

CHEST

The chest is normally well rounded (barrel shaped), although the contour may vary considerably. The costal angle is usually 90° or more.

Mammary glands.

Enlargement of the mammary glands is not present normally during the first day of life but usually appears in the early neonatal period even in male infants. The enlargement may be unilateral or bilateral. The breasts may contain a milky fluid. Manipulation should be avoided because of danger of infection; no treatment is necessary for this type of enlargement of the breasts.

Thymus gland.

The relation of the thymus gland to the well-being of the newborn infant is a matter which has been the subject of a vast amount of speculation and investigation.

Pathologic studies have shown a close relationship between the weight of the infant and the size of the thymus gland. The well-nourished infant has a relatively large thymus gland while the poorly nourished infant has a relatively small one. Any symptoms or clinical findings pointing to an enlarged thymus should lead to roentgenographic examination (see p. 19); but in the light of our present knowledge, treatment of an "enlarged" thymus gland by roentgen ray is justified only if symptoms are present that are regarded as characteristic of an enlarged thymus gland and that cannot be otherwise explained.

Lungs.

Respirations are chiefly abdominal in type. The rate and depth of the respirations are extremely variable, even in sleep. Light percussion produces normal resonance over the entire lung areas. Auscultation reveals bronchovesicular breathing of equal intensity over the corresponding areas of each side, without râles. The expiratory phase is longer and louder in the newborn than in the older child or the adult.

Heart.

Three points should be borne in mind when examining the heart of a newborn infant: The variability in the heart rate, the difficulty in determining the size of the heart, and the frequency of murmurs.

The heart rate of the new born infant is rapid and varies greatly with the phases of respiration and with crying and also with sleeping and waking (80 to 160 per minute). At times a very marked

bradycardia and again a very marked tachycardia may be found. These variations are merely manifestations of the instability or immaturity of cardiac regulatory mechanism and apparently have no significance unless they persist or recur.

The apex beat can be felt, well localized in the third and fourth interspaces, about 3 centimeters (1.2 in.) to the left of the sternal margin. Percussion of the borders of the heart is probably not worth while, since information obtained by this method is even less reliable in the infant than in the adult.

The heart sounds should be clear and distinct, the second being nearly equal in intensity to the first, giving the so-called "tick-tock" rhythm.

Murmurs in the heart occur frequently in the neonatal period. They may be present at birth, disappear, and reappear. The intensity of the murmurs may vary greatly from time to time. Differentiation between murmurs that have a pathologic significance and other murmurs is sometimes difficult. A final opinion probably should be reserved until repeated examinations can be made. The change from fetal to independent circulation is abrupt, but the functional as well as the organic closure of the fetal openings is not abrupt but gradual. No doubt many murmurs heard in the early days and weeks of life are explained by the persistence of these fetal openings or by pleuropericardial friction.

ABDOMEN

The ease with which the abdominal viscera can be palpated in the newborn infant may lead to wrong interpretations if the relative size and position of the organs are not known.

Liver.

The edge of the liver is usually palpable, and the distance below the costal margin should be carefully noted because increase in the size of the liver may be a significant point in later diagnosis.

Spleen.

The spleen can often be felt in infants that are apparently normal. As with the liver, an increase in the size of the spleen has more significance than mere palpability.

Kidneys.

The kidneys are easily palpable in most newborn infants, the lower poles lying at about the level of the iliac crests. The left kidney is usually lower than the right.

Umbilicus.

The condition of the umbilicus should always be noted, as at this point infections as well as abnormal persistence of fetal conditions may first be noted. The cord stump ordinarily drops off at about the fifth day, leaving a dry scab or scar. A hernia often is suspected when the stump is prominent but should be diagnosed only when bulging takes place during crying and when there is also a palpable defect in the abdominal wall in that region. Mild infection of the umbilicus is manifested by a slight discharge resulting in a granuloma; more severe infection, by redness and purulent discharge and occasionally by enlargement of the blood vessels.

Certain structures may occasionally be felt in the newborn infant's abdomen which represent persistence of fetal structures and may or may not have pathologic significance. The urachus, which represents the portion of the allantoic duct between the bladder and the umbilicus, may persist as a whole or in part. If it persists as a complete tube, urine may escape through it at the umbilicus. Fistulae at the umbilicus may, of course, be caused by persistence of the omphalomesenteric duct.

GENITALIA

The penis of the newborn male infant varies considerably in size and length. The foreskin is usually adherent to the glans and may be somewhat difficult to retract. The physician will have to decide whether forcible retraction, stretching, or circumcision is indicated, according to the findings. If phimosis is marked and is untreated the infant may have difficulty in voiding. The scrotum varies considerably in size from time to time. The scrotal tissue may, during the first day or two, contain a moderate amount of fluid, probably edema due to trauma and congestion during delivery, especially breech delivery. This condition is not a true hydrocele. The testicles should be palpable in the scrotum, but if the infant is slightly chilled or if he is active they may ascend toward or into the external inguinal ring. The testicles are usually quite small, firm, and of equal size, although asymmetry is sometimes observed.

The labia of the newborn female infant are usually prominent. The labia majora are not so close together as in the older child, and the labia minora are relatively large. When the labia minora are separated a white mucoid discharge is sometimes seen, which may be profuse in the first day or two. Slight bleeding may occur in the first few days of life, which, if unassociated with bleeding elsewhere, may be considered physiologic. The margin of the vagina may show a skin tag which requires no treatment. Sometimes a small cyst is seen closing the opening (hymenal cyst).

ANUS

The anal opening normally is closed tightly by the external sphincter. The mucous membrane is smooth and is free from venous engorgement, except in infants delivered by breech. In these cases submucous hemorrhages may be found at the mucocutaneous junction of the anus.

JOINTS, BONES, AND MUSCLES

Joints.

It is important to examine the infant's joints by inspecting them and trying out their function. By abducting the arm, the head of the humerus can be easily palpated in the upper axilla. Full extension of the elbows, knees, and hips is often difficult in the newborn infant, probably because the normal intrauterine position is one of flexion at these points. Flexion at the hips will be most marked in infants born by breech, and in these infants complete extension at the hips will be nearly impossible in the first 3 or 4 days. The great trochanter of the femur should be felt for on each side, and the leg should be rotated and abducted to determine whether the head of the trochanter is in the acetabulum. The contour of the buttocks and the level of

the gluteal folds should be carefully noted, as any asymmetry may indicate dislocation of the hip joint. Each extremity should be handled to see that function and muscle tone are normal.

Bones.

The clavicles are the first bones to be ossified and are the bones most often fractured during delivery. Fractures, however, will often be missed unless the clavicles are felt throughout their length. In an infant with a broken clavicle the stimulation of a sharp blow on the examining table, which ordinarily results in the so-called Moro reflex, fails for the arm on the side of the broken clavicle.

In examining the extremities the length and smoothness of the underlying bony structures should be observed. The skull also should be carefully palpated.

The vertebrae are occasionally broken during delivery. Palpation of the spine, especially in the cervical region, should be done, particularly after long and difficult labor and if the infant's respiration is not normal and the pupils are unequal.

Muscles.

The muscles of the extremities and of the abdomen should be palpated. Those of the extremities can be tested by pulling on the legs when flexed and palpating them when extended. Inequality of pull or tone should be tested for. Abdominal tone can be tested by palpation when the infant cries.

TESTS FOR REFLEXES

The clinical interpretation of the reflexes of the newborn infant requires very special consideration. There are many conflicting statements in the literature, due partly to differences in technique used for testing the reflexes but largely to lack of appreciation of fundamental conceptions of the development of the nervous system. Recent work has led to a conception that explains the variability of responses: namely, that the response to a specific stimulus is generalized and that specificity of response increases as a result of developmental and environmental factors, or both. Variations in response will be found, moreover, to depend upon the degree of activity or inactivity of the infant at the time when the tests of reflexes are made. In most reports no statement is made as to whether the infant was awake or asleep, or whether he was quiet, active, or crying. Standards for interpretation of reflexes have usually been based on tests made on an insufficient number of cases.

The following reactions to light are present at birth: Contraction and dilatation of the pupils, consensual pupillary reflex, corneal and conjunctival reflexes. The sucking and swallowing reflex is usually well established. Certain other reflexes should be tested for as a routine. Whether they are found present or absent in a normal newborn infant depends a good deal on the activity of the infant and the skill and patience of the examiner.

Chvostek sign.

Tapping the facial nerve in the cheek, especially if the infant is asleep, will frequently elicit the Chvostek sign, which usually has no clinical significance in the neonatal period. This response must be

differentiated from the mouth jerk that is obtained in an even larger number of sleeping infants in the form of a sudden pursing of the lips, which also has no clinical significance. By tapping the face a head-and-jaw jerk may be also found.

Abdominal reflexes.

The abdominal reflexes are easily obtained in the normal newborn infant when he is quiet, but cannot be obtained as a rule when the infant is active. These reflexes are very lively, even in the immature infant.

Knee jerks.

Knee jerks can be obtained in all normal newborn infants. There is great variability in the normal response, ranging from sluggish to hyperactive. Occasionally when the tendon of one knee is tapped there is a reflex response of the other leg. This is found usually in a sleeping infant and occasionally in an infant who is awake but not very active. The arm jerks (of triceps, biceps, and periosteoradials) are usually more difficult to obtain.

Ankle clonus.

The presence of an ankle clonus does not mean that the infant is abnormal unless it is accompanied by other signs or symptoms of disturbance of the central nervous system. Clonus that is not sustained or only moderately sustained (3 to 5 jerks) is frequently found in the newborn infant, especially if the test is made when the infant is quiet. When the clonus is sustained (10 to 12 jerks or continuous jerks) it usually has a pathologic significance, especially if accompanied by other symptoms.

Moro reflex.

Rapid rhythmic shaking of the arms and legs may occur spontaneously or may be brought on by suddenly rousing the infant or by jarring him by striking the fist on the hard surface of the table on which the infant is lying during the examination—the so-called Moro reflex. This reflex movement is a normal response and may occur during the first 2 or 3 days of life or even later. It has been shown that if after such stimulation symmetrical clonic movements of the arms do not occur this points to abnormality on the side on which the response does not occur. For example, if the clavicle is broken on the left side the left arm is kept close to the side while the right arm responds normally with a rhythmic or clonic shaking. The same type of jerking may occur spontaneously in the lower jaw or may be precipitated by depressing the jaw forcibly to examine the inside of the mouth and the throat.

Magnus reflex.

To test for the Magnus or tonic neck reflex rotate the head of the infant forcibly to one side. A normal newborn infant occasionally responds to this test by rotatory movements at the shoulders. The positive response to this test, which occurs only in the presence of a lesion of the central nervous system, is flexion of the arm on the same side and extension of the leg on the opposite side.

Cremasteric reflex.

The cremasteric reflex is present in the newborn infant. The movement of the testicle frequently cannot be seen in the first few days because of edema of the scrotum.

Response to plantar stimulation.

Because of the extreme sensitivity of the sole of the newborn infant's foot response to plantar stimulation is difficult to interpret. The reaction is usually a violent withdrawal. If the ankle is grasped firmly and a blunt object drawn from the base of the great toe to the other side of the heel the usual response is dorsal flexion alternating with plantar flexion; there may be no definite response. The Babinski sign has therefore little significance at this period of life.

Adductor spasm.

Adductor spasm should be tested for by grasping the knees, holding the legs extended, and abducting them. In the first few days of life a certain amount of adductor spasm is found, which gradually disappears.

OTHER TESTS

Laboratory tests.

Almost all the laboratory methods that are used for diagnosis in older children can be applied to the newborn infant. It is necessary, however, in some instances to make further refinements in technique for the application of the methods to very small infants.

Roentgen-ray examination.—The roentgen ray may be used as freely in the examination of the newborn as of the older infant, as an aid in diagnosis of pathologic conditions of the chest, including thymus, lungs, and heart, and of the gastrointestinal, genitourinary, and osseous systems. Frequently roentgen-ray examination is postponed or is not thought possible because of the relative lack of vigor of the newborn infant, but sometimes delay in its use results in loss of life. Since the use of the roentgen ray should become a common aid in the appraisal of the newborn infant, it seems worth while to give a somewhat detailed outline of its possible use in this period.

With the introduction of roentgenograms interest in the thymus gland was greatly stimulated, but because of the great variability in technique and in the interpretation of results much of the data gathered in the past are now known to be of relatively little value. Examination of the chest by means of the fluoroscope often gives valuable information in regard to the differential diagnosis of shadows in the mediastinum. When enlargement of the thymus gland is suspected roentgenograms should be taken in the lateral as well as the anteroposterior position, as in this way evidence of pressure of the thymus gland on the trachea may become apparent.

Considerable doubt has arisen as to whether abnormal clinical signs, or death, are ever attributable to enlargement of the thymus. However, there are instances in which the evidence that this gland plays a role is so strong that the best point of view to take at the present time seems to be that treatment with the roentgen ray should be given only if there is no other explanation of symptoms.

Roentgen-ray examination of the lungs of the infant in the neonatal period will sometimes reveal changes entirely unsuspected on physical examination. The interpretation of findings in this field is difficult, because of variations in technique used by different observers and because of the many changes in shape of the chest and density of the lung tissue due to expansion and growth of the chest during the first few days and weeks of life.

A certain degree of atelectasis is physiologic shortly after birth, as may be demonstrated by roentgen ray.

Roentgenograms of the heart of the newborn infant are difficult to interpret because the mediastinal shadows may partially obliterate the true outline of the heart and because of the technical difficulties met with in obtaining satisfactory films. However, gross deviations from the usual size can be made out from films taken with the infant in the prone position. The variation in the shape of the heart shadow that occurs in certain types of congenital heart disease may be a real aid in diagnosis.

The employment of the roentgen ray is important in the early diagnosis of congenital anomalies of the gastrointestinal tract. Certain of these anomalies are amenable to correction. Delay in making the diagnosis is a great factor in the high mortality from surgical procedure. Opaque substances may be used to define the tract, but will obviously be a handicap if operation must be performed.

Roentgenographic examinations of the bones in the neonatal period give important information from the physiologic as well as the pathologic point of view. Fetal maturity can probably be gaged fairly accurately in this way. The earliest signs of syphilis can often be seen in roentgenograms of the bones, and occasionally evidences of rickets can be found in this way. Cases of congenital rickets demonstrated by roentgen ray have been reported in infants whose mothers were suffering from osteomalacia. Fractures of bones, due to trauma of delivery or to pathology in the bone, may be seen by roentgen ray when unsuspected clinically. Congenital absence of certain bones and occasionally other anomalies may also be so diagnosed. Incompleteness of ossification makes the roentgen-ray diagnosis of congenital bone defects difficult, especially when joints are involved, as in dislocation of the hips.

Some idea of brain pathology in the newborn infant can be obtained from roentgen-ray examination of the skull by noting the width of the sutures, the appearance of the convolutional markings and the thickness and uniformity of ossification of the cranial bones. Encephalography and ventriculography may be done in selected cases.

The development of the vertebrae has been described by anatomists, but little information is available with regard to the roentgenographic examination of the spine of the newborn infant. Obviously, when any abnormality of the spine is found on clinical examination roentgenographic examination should be made.

Examinations of blood.—Fundamental to an interpretation of the findings in the blood of the newborn infant is the conception that the change from intrauterine to extrauterine life, with establishment of independent circulation, brings about readjustments in the physiology of the infant which are especially marked in the blood. Estimations of the number of cells, amount of hemoglobin, and so forth, have been found to vary widely with different observers. This variability in reports is probably due to several factors, among the most important of which are differences in technique of examination and variability in the time at which the examination was made. Cognizance must be taken of changes in the blood from day to day and from hour to hour.

The number of red blood cells of the infant at birth varies widely (from 4 to 7 million per cubic millimeter), with a definite tendency to range above the 5 million accepted as normal for adults. Shortly after birth, however, because of increasing oxygenation of the blood with the establishment of respiration, a rather rapid reduction in the number of red blood cells takes place and continues during the first week or 10 days. As a result of this destruction of red blood cells, blood pigment is freed and deposited in the organs. For this reason jaundice is found in varying degrees in most newborn infants, appearing on the second or third day and disappearing usually before the tenth day. This is a physiologic jaundice, the so-called icterus neonatorum. During the remainder of the neonatal period and for a few weeks afterward the number of red blood cells continues to decrease, though at a less rapid rate. The lowest count (3.3 to 5.0 million) is reached at 6 to 12 weeks, after which there is usually a tendency to rise slowly.

The hemoglobin content of the blood also is high at birth and parallels the red blood count closely but shows a tendency to be relatively higher in the first 2 months of life. At the end of the second month the hemoglobin should read approximately 13 grams per 100 cubic centimeters of blood and the red blood cells should number about 4 million per cubic millimeter of blood.

In the blood of the mature infant in the first few days of life 1.25 percent of the red blood cells may be nucleated. In the premature infant these nucleated cells may be found in larger numbers and persist longer.

The reticulocytes, which number approximately 3 percent at birth, fall rapidly to 0.17 percent through the first 7 days, after which there is little variation during the neonatal period. The platelet count has been reported by one set of observers as relatively low at birth (mean value 227,000) and to rise gradually throughout the neonatal period until at 2 months the mean value is approximately 325,000. Another report gives the platelet count as approximately 500,000 at birth, with relatively little change throughout the neonatal period. In the former studies blood was obtained by skin puncture; in the latter, by venipuncture. The bleeding time at birth is from 30 seconds to 3 minutes (Duke method), the coagulation time (fine capillary tube method) from 2 to 4 minutes.

The total white blood-cell count varies greatly in the neonatal period and is particularly unstable at the time of birth. As late as the end of the first week the count in normal infants has been found to vary between 5,000 and 20,000 cells per cubic millimeter. Knowledge of the differential count in the neonatal period is of particular importance. At birth the polymorphonuclear-leucocyte count predominates over the lymphocyte count. Between the sixth and ninth days the number of the two types of cells tends to become equal, but by the tenth day the lymphocytes predominate, and this ratio persists throughout the neonatal period. Immature cells are frequently found.

The blood culture as a means of diagnosis has been greatly neglected. When, without obvious cause, an infant fails to thrive on has fever or some other symptom, the blood culture is one of the most important tests that should be made.

Serologic tests for syphilis must be interpreted with care, since the complement-fixing antibodies may pass the placenta and appear in the infant's blood without actual infection of the infant. A positive Wassermann reaction of the mother's blood therefore does not necessarily mean infection of the infant. A positive serologic reaction of the infant's blood has the same significance in newborn infants as in older ones if this reaction is still present after the second or third month of life, particularly if the results of quantitative tests become stronger. If clinical or roentgen-ray evidences of syphilis are present, however, a positive serologic test at any age should be interpreted as confirming the diagnosis.

Isoagglutinins and isohemolysins are present in the blood of the newborn infant in a large enough number of cases to make it advisable to carry out compatibility (typing and matching) tests before blood transfusions are undertaken.

The chemistry of the blood of the newborn infant has been studied to a considerable extent. Not all the standards that have been established for adults have been established for newborn infants, since the number of cases studied has, as a rule, been somewhat meager. It is important to know, however, that the standards for the calcium and phosphorus content of the blood have been satisfactorily established for the neonatal period.

Examination of urine.—Examination of the urine is too often neglected. Routine urinalysis should always be done when fever, even if slight, is present. The finding of pus in the urine of an infant in the neonatal period should always suggest infection and, especially in a male, may point to the presence of a congenital anomaly of the genitourinary tract. If the diagnosis of congenital defect is made early, correction of the defect may in certain cases prevent the development of more severe and sometimes fatal infection.

The urine of newborn infants should be observed for blood and bile, since the presence of either of these usually is of serious significance. In the first 3 or 4 days of life light pink stains may be found on the diaper, due to undissolved uric-acid crystals; these are of no significance.

Examination of stools.—The stools of newborn infants should be observed carefully. The time of the first passage of meconium, the color of it, and the transition from meconium to soft yellow stool should be noted. The presence of gross blood or the absence of bile (white stools) is of special significance in the neonatal period because either one may be the first indication of some abnormal condition peculiar to this period of life. If there is any question as to the presence of bile or blood, laboratory tests should be made.

Examination of spinal fluid.—The importance of examination of the spinal fluid in the newborn infant and the safety and ease with which it can be withdrawn by skilled operators even in the smallest infants if the proper technique is used has been pointed out by several investigators. On the other hand, there is some disagreement as to whether or not lumbar puncture should be done in the presence of increased intracranial pressure, as in hydrocephalus and hemorrhage. Moreover, since there is also some question as to interpretation of findings with regard to the fluid, spinal puncture should

be done only after careful consideration of the indications. If fresh blood is present it may be the result of trauma from the lumbar-puncture needle and is not necessarily evidence of intracranial hemorrhage. Yellow spinal fluid (xanthochromia) may be evidence of the presence of old hemorrhage or staining with bile. The tension under which the spinal fluid flows gives evidence of the intracranial pressure and should be considered in connection with the different types of hydrocephalus and hemorrhage.

In the rare cases in which meningitis is suspected lumbar puncture should be done for diagnostic as well as therapeutic purposes.

Special tests.

Electrocardiography.—The use of electrocardiography in the study of the normal heart of newborn infants, as well as in the diagnosis of congenital defects, is possible and requires no adaptation of the apparatus except that the metal cuff must be of small size. Care must be taken of course not to expose the infant to cold.

Records of electrocardiograms in the neonatal period are few, but they indicate that there is a characteristic electrocardiogram for this period, which changes to the adult type at about the third month.

Blood pressure.—In taking the blood pressure of infants a small arm band should be used (4–5 cm). Since there is no agreement in the literature as to blood-pressure standards in normal newborn infants, readings of blood pressure are not especially helpful for diagnostic purposes. The systolic pressure at birth is reported as below 100 and not less than 43; the diastolic as not below 40. There is said to be a rise in blood pressure during the first 10 days of life.

Metabolism.—The basal metabolic rate or average daily requirement for maintenance is about 55 calories per kilogram (25 per pound) of body weight per 24 hours. This of course does not make allowance either for growth or for activity. During the first days of life the total caloric requirements are low, about 60 calories per kilogram; during the second and third weeks they rise rapidly to about 100, the maximum, 120, being reached at about the seventh week. There is then a gradual fall in the caloric requirements, so that at the end of the first year the requirement is about 100 calories per kilogram, or 45 per pound.

Mental tests.—Tests of intelligence have not yet been developed for the infant at birth and in the neonatal period. The tests that have been developed are applicable at 3 months at the earliest.

REEXAMINATIONS DURING AND AT THE END OF NEONATAL PERIOD

The methods of appraisal of the newborn infant that have been discussed apply to the entire neonatal period, which is ordinarily considered as including the first month of life. Too frequently an appraisal is made at or shortly after birth and no further observations or examinations are made, particularly if the weight chart shows that the infant is making satisfactory gains. This neglect of the infant by the physician in the neonatal period has often led to serious results. It is wise to keep the infant under close observation even if he appears to be well. The neonatal period is a dangerous period, not alone because of the many physiologic adjustments that are taking place but because certain serious conditions, such as icterus gravis and erythroblastosis occur in this period. Early diagnosis is of the greatest importance if proper treatment is to be instituted.

As a rule it is unwise to call the parents' attention in the first few days of life to minor abnormalities or suspected major abnormalities until sufficient time has elapsed to make sure of their significance. Reexamination of the infant in the neonatal period is important because certain findings present at birth, such as heart murmurs, may disappear or change in such a way as to alter earlier impressions. As already stated, another complete examination should be made at the end of the neonatal period.

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Standard Plans for Nurseries for Newborn

In Hospitals of 50 to 200 Beds

ETHEL C. DUNHAM, M.D.; MARSHALL SHAFFER; NEIL F. MacDONALD

HOSPITAL nurseries for newborn infants need especial careful planning at the present time. There are several reasons for this, among them—

The number of women entering hospitals for maternity care has steadily increased in recent years, with the result that nurseries have become overcrowded.

A new impetus to construction of maternity facilities has been given, under the terms of the Lanham Act.

Standards of care have been developed which call for more space per infant and new types of equipment in nurseries.

The plans herein set forth, although they may be adapted to any hospital, new or old, large or small, are for small general hospitals, with bed complements of 50 to 200, which are expected to be built chiefly in rural areas and in small cities. The plans have been developed with the aim of providing for the safety and welfare of the infants and of facilitating their care in the minimum space that conforms with modern standards.

It has been estimated that in different localities the proportion of the bed complement that must be reserved for maternity patients will vary from 10 to 25 per cent. In estimating the number of maternity beds needed, consideration must be given to the local situation; that is, whether there is a maternity hospital in the locality, how many maternity beds are available in other hospitals in that locality or nearby, how many live births occur annually in the community to be served by the hospital, and what are the customs of the people in regard to the use of hospitals for maternity care.

The most recent Census reports available show that in 1940 more than half (56 per cent) of the total live births in the United States took place in hospitals. The percentage of hospital births was much higher in cities (84 per cent) than in rural areas (25 per cent). For white infants in the country as a whole it was 60 per cent; for Negro infants it was 25 per cent; and for Negro infants in rural areas only 3 per cent. It is evident, therefore, that there may be considerable variation in the need for maternity beds, and hence for bassinets, even in hospitals of the same size. For this reason calculation of the number of bassinets needed in hospital nurseries should be based not on the total number of beds but rather on the local number of live births per year expected to occur in the hospital.[1] Consideration should also be given to providing a sufficient number of bassinets to allow for 75 per cent occupancy.

Although in some circumstances, a hospital of relatively small bed capacity may need more bassinets than another hospital of greater bed capacity, still, under average conditions, the four accompanying plans, which are intended to meet the needs of hospitals expecting 235; 470; 700; and 920 live births, should be applicable to 50-bed, 100-bed, 150-bed, and 200-bed acute general hospitals.

Planning of hospital nurseries has been given little consideration in textbooks on obstetrics and pediatrics, even in discussions of the routine for care of infants. The professional journals, however —medical, nursing, and hospital—have in recent years published a number of articles on the planning of such nurseries, largely from the point of view of preventing infection among infants cared for in a single nursery.

As a result of clinical experience and research,

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[1] Dunham, Ethel C., M.D., Tesone, Olivia F., and Tesone, Silver L.: Plans for Hospital Nurseries for Newborn Infants. *The Child*, vol. 7, No. 2. (August 1942), pp. 21-25.

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certain basic standards have been developed for nursery care of newborn full-term and premature infants.[2, 3, 4] The plans for hospital nurseries set forth in this paper meet the most recent standards, which require among other things that each nursery house relatively few infants; that the bassinets be widely spaced, or separated by partitions into cubicles; that facilities be provided for using aseptic technique and for giving individual bedside care to each infant; that optimum conditions of temperature, relative humidity, and ventilation be maintained; and that there be provisions for special care of premature infants, and for isolation of infants who are ill or suspected of being ill.

The Nursery

Location and Size

The nursery should be located in the obstetric division of the hospital, but out of the line of traffic from other services. There should be outside windows to admit daylight and sunlight if provision is made for controlling the sunlight in hot seasons and hot climates.

The size of each nursery should be such that it will provide a minimum of 30 square feet and 300 cubic feet per infant. Although this requirement is slightly in excess of older standards, it is the minimum space that will enable the nurse to give proper bedside care to each infant. (It should be noted that common bathing and dressing tables are intentionally not provided for in the standard plans.) It is preferable that the bassinets be separated by partitions forming cubicles of sufficient size to enable a nurse to give bedside care conveniently to each infant.

Each nursery should house relatively few infants. For full-term infants nurseries have been planned to house not more than eight infants, since this is the maximum number of infants that one nurse can care for satisfactorily. With this arrangement the traffic through the nursery, and consequently the bacterial contamination of the air, will be reduced to a minimum.

For premature infants, who require more specialized care, a nursery has been planned to house not more than four infants, the maximum number of premature infants that one nurse can care for satisfactorily.

If it is anticipated that fewer than four premature infants will, as a rule, be under care at any one time a separate nursery for them will not be practicable, and they may be cared for in the nursery for full-term infants. Suitable environmental temperature and humidity may be maintained in heated bassinets or incubators. Figure 1 shows such an arrangement in a hospital in which 235 live births are expected per year.

In larger hospitals, with 470 or more live births per year, it will be necessary to provide for four or more premature infants at a time, and there must then be one or more separate nurseries for these infants. Each nursery for premature infants should contain not more than four heated bassinets or incubators.

Control of Atmospheric Conditions

Adequate ventilation, and control of temperature and humidity, contribute to the welfare of newborn infants, especially premature ones. The ideal arrangement is complete air conditioning, that is, controlled temperature, humidity, and air motion, with filtering of air and sterilization by ultraviolet light or by some other method.

In the absence of air conditioning, windows or air ducts must be depended on as the source of fresh air, and they should be so arranged that there will be circulation of air without drafts around bassinets and with the air currents so directed that they will not strike the infant. In a nonair-conditioned nursery, partitions forming cubicles should reach only part way to the ceiling, so as to allow for ventilation. There should be thermostatic control of temperature. Sterilization of air at entrances to cubicles will provide additional protection. For premature infants, who require relatively high temperature and humidity, the environment may be controlled by the use of especially equipped incubators.

In plans for new hospitals, if air conditioning is not possible, the necessary ducts at least should be provided, so that later installation of air conditioning will be facilitated.

Walls, Ceilings, and Floors

The walls and floors of the nurseries and accessory rooms should be constructed of nonabsorbent material, and it is preferable to have all corners rounded to facilitate cleaning with soap and water. The ceilings should be acoustically treated with material which is easily washable.

If the nursery is air-conditioned, partitions should extend from floor to ceiling; if not, each partition should be about 5 feet high, leaving space between the top of the partition and the ceiling, to provide ventilation.

A section of each partition, extending about 18 to 24 inches above the bassinet level should be glazed and transparent, so that the nurse can see through it.

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[2] Crane, Marian M., M.D.: Standards for Care of Newborn and Premature Infants in Hospitals. *Hospitals*, Journal of the American Hospital Association, vol. 14, no. 12 (December 1940), pp. 57-61.

[3] Standards for Care of Premature Infants in Hospitals Having a Maternity Service. U. S. Department of Labor, Children's Bureau, Washington, 1941. 8 pp. (Mimeographed)

[4] Standards and Recommendations for the Care of Newborn Full-Term and Premature Infants. U. S. Department of Labor, Children's Bureau, Washington, 1942. 15 pp. (Mimeographed)

The plans have been drawn up in an effort to facilitate the work of physicians and nurses in providing for the safety and welfare of the infants in accordance with these principles, in the minimum space practicable. Some of the characteristics of a nursery unit that conform with these plans are:

The number of persons entering the nursery is reduced to a minimum. An examining room is provided, just outside the nursery, for the use of the physician. A closed window between the nursery and the corridor permits relatives to view the infants (visitors are not, of course, admitted to the nursery). *Thus the danger of air contamination is reduced.*

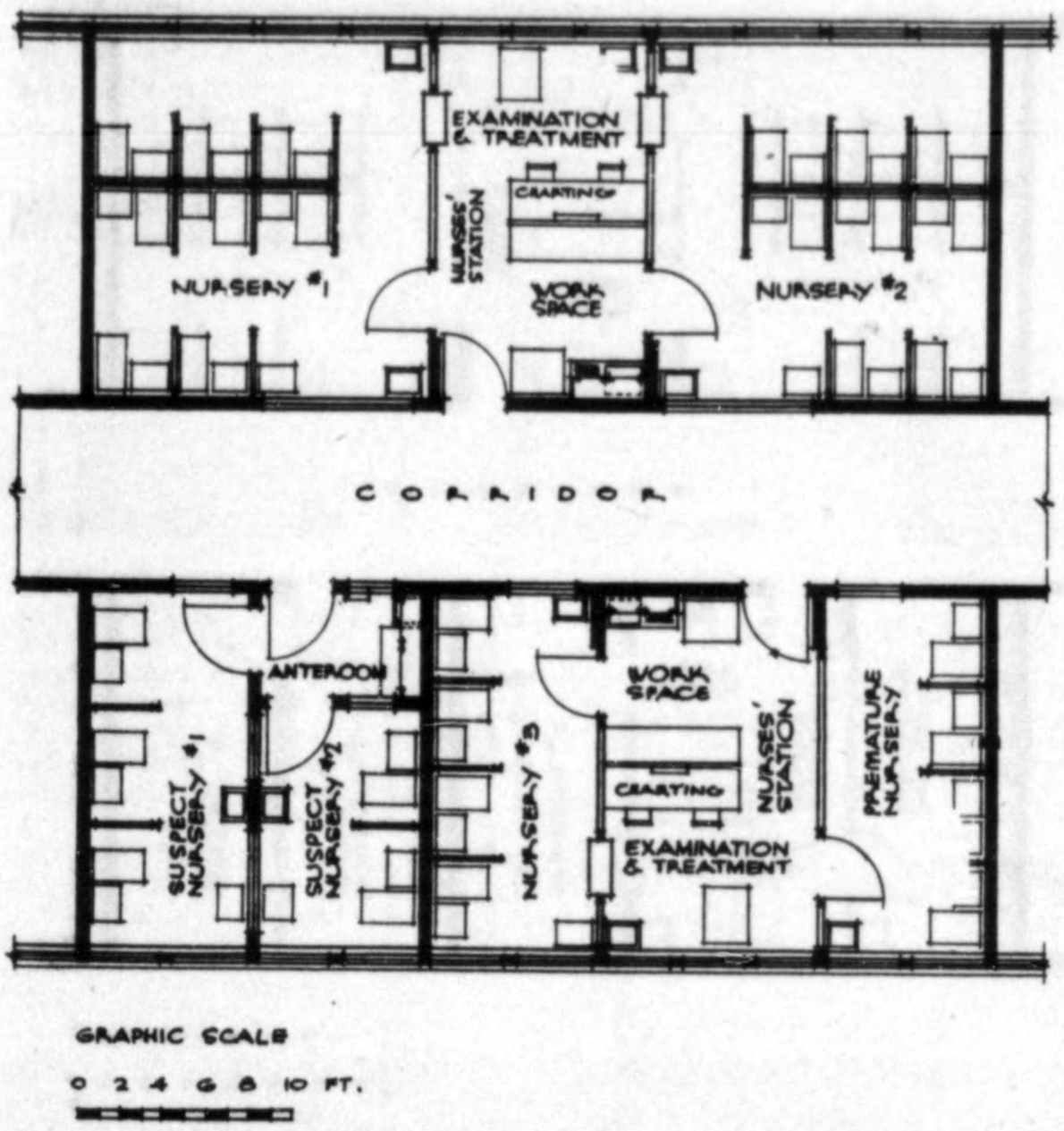

Figure 3—Nursery Layout for 700 Expected Live Births Per Year

The bassinets are separated by partitions into cubicles large enough to permit bedside care to be given. There is a suspect nursery, completely separated from the nursery proper. Lavatories that have hot and cold running water and faucets with knee or elbow control are conveniently placed in all nurseries and accessory rooms. *Thus the danger of cross infection is further reduced.*

The nurse's station is so situated that she is in a strategic position to control traffic and to work with a minimum of effort, because (1) the only entrances to the nursery are through her station, (2) windows in partitions make it possible for her to observe the main nursery and the suspect nursery, and (3) the work space is a part of the station. In addition, the bedside tables are stocked with a twenty-four-hour supply of clothing, bedclothes, and diapers, and feedings are delivered to the unit at regular intervals. All this should make it unnecessary for the nurse to leave the nursery in the course of her eight-hour period of duty.

Thus the work of the nurse is greatly facilitated, and her time can be used to the greatest advantage for the care of the infants.

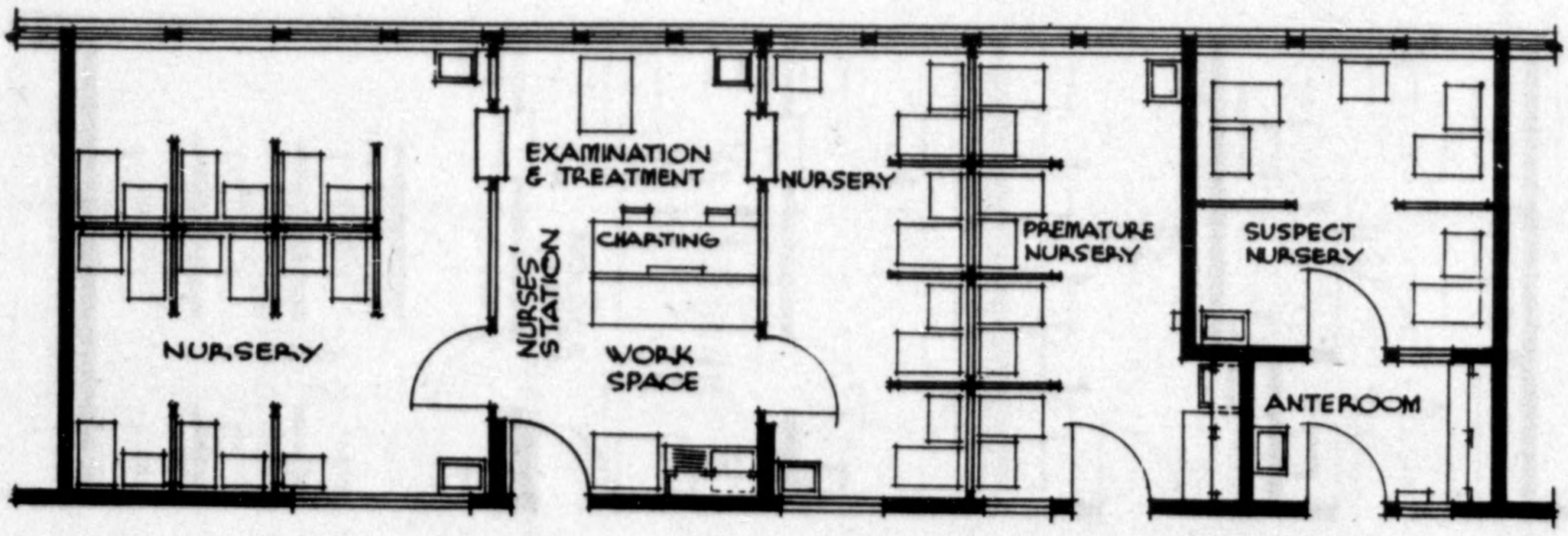

Figure 2—Nursery Layout for 470 Expected Live Births Per Year

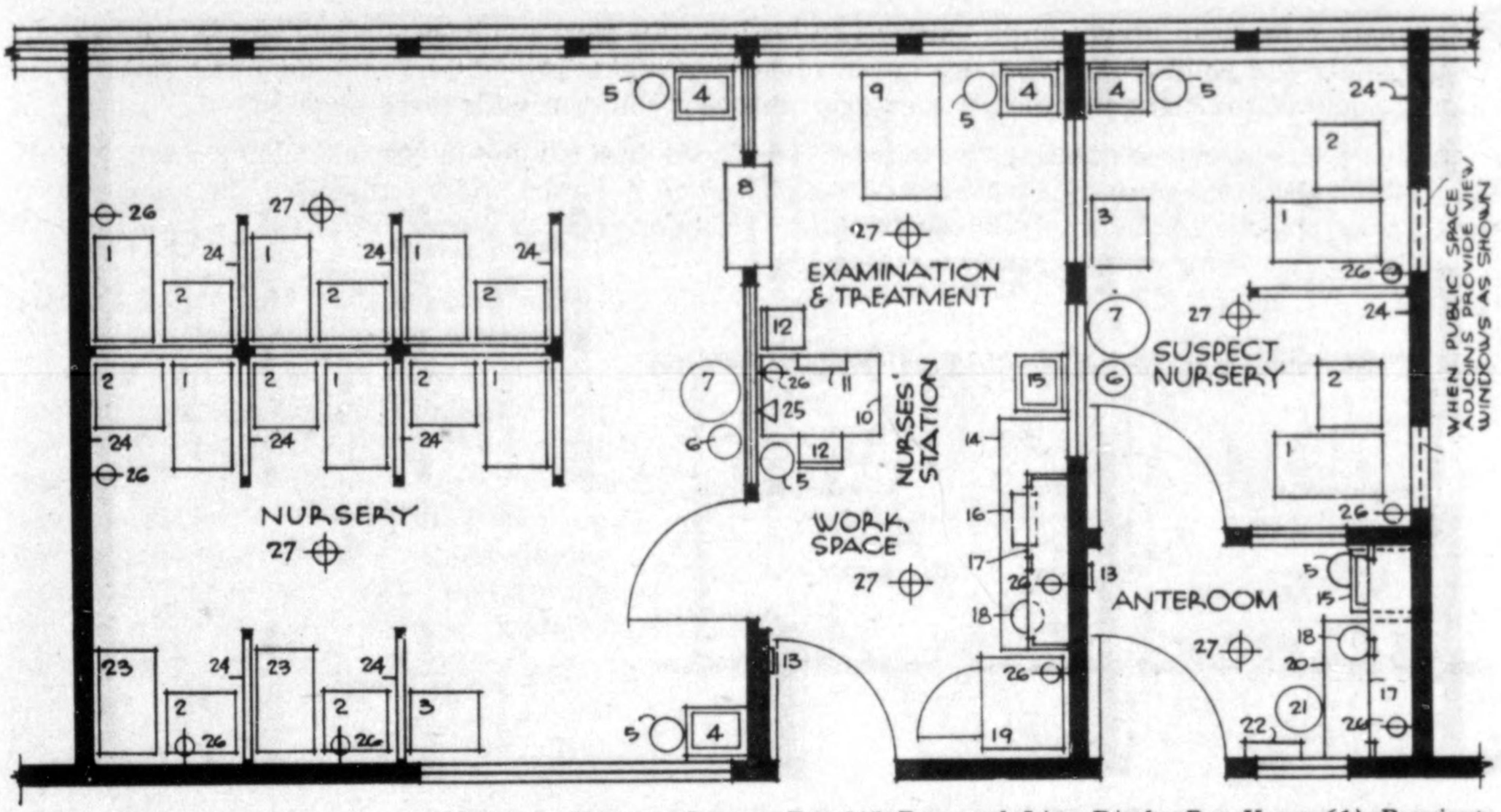

Figure 1—Nursery Layout For 235 Expected Live Births Per Year. (1) Bassinet; (2) Bedside Table; (3) Scales Table; (4) Lavatory; (5) Waste Receptacle; (6) Sanitary Receptacle; (7) Linen Hamper; (8) Pass Window with Shelf; (9) Treatment Table; (10) Nurse's Charting Desk; (11) Chart Rack for Ten Charts; (12) Chair; (13) Hook Strip; (14) Counter—Cabinets Below; (15) Sink; (16) Instrument Sterilizer; (17) Cabinet Above Counter; (18) Single Hot Plate; (19) Refrigerator, six cubic foot; (20) Counter and Desk, open below; (21) Charting Stool; (22) Rack for Two Charts; (23) Incubator; (24) Gown Hook; (25) Telephone Outlet; (26) Convenience Outlet; (27) Ceiling Light (Indirect)

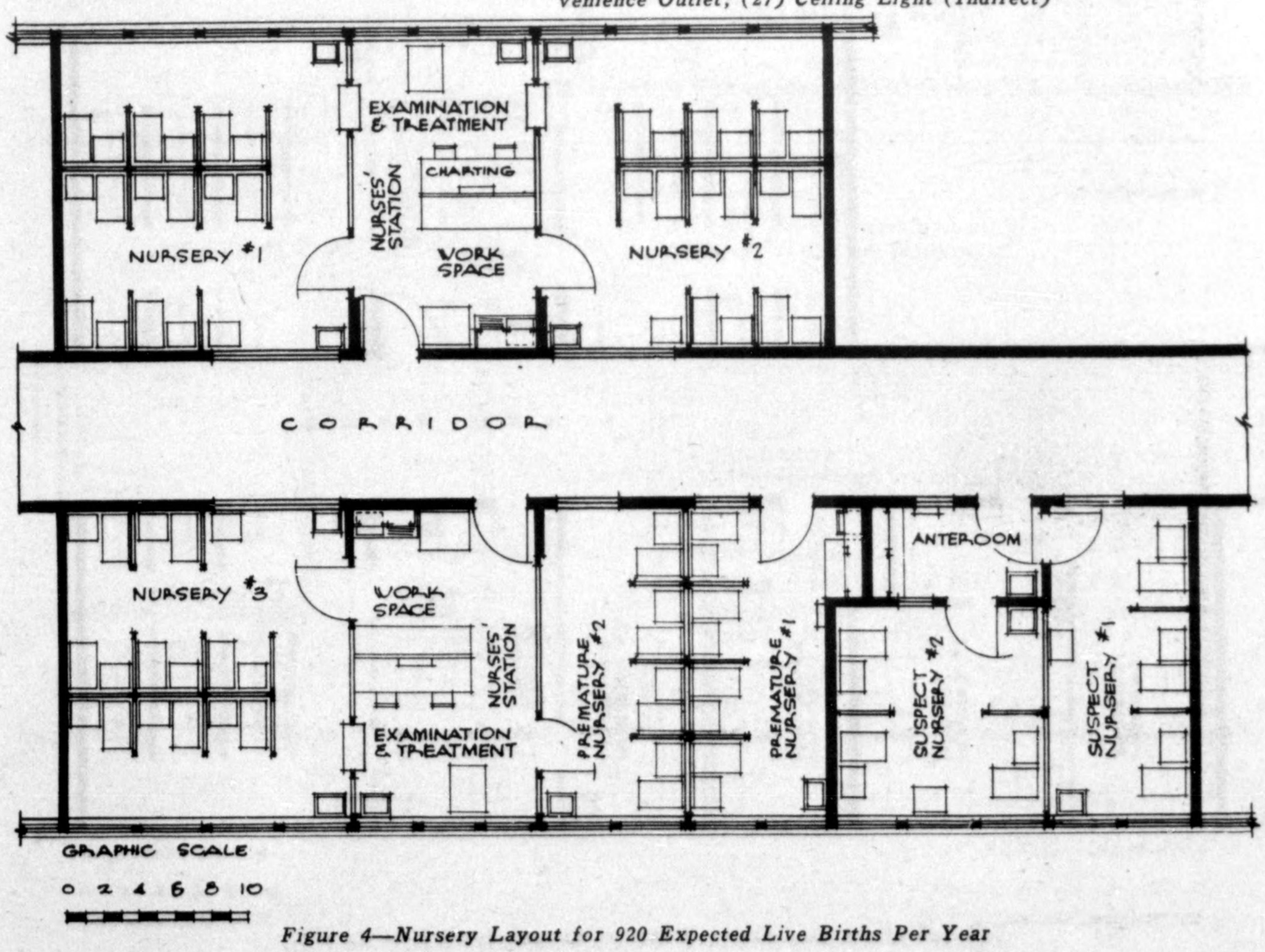

Figure 4—Nursery Layout for 920 Expected Live Births Per Year

A viewing window should be provided on the corridor side of each nursery, so that relatives may see the infants without entering the nursery.

Furnishings

The furnishings of the nursery should include the following:

Bassinets—Each bassinet should be of the type that consists of a single metal stand with a steel-band removable basket, to permit washing with soap and water.

Bedside table—A bedside table should be furnished for each bassinet, to serve as a work table and for storage of a 24-hour supply of equipment needed for care of the infant. Each table should have a top 16 inches by 20 inches, a drawer, a lower compartment with shelf, and a door. A "unit type" of bassinet is preferable but is relatively expensive. In this type there is a cabinet below the basket, which can be pulled out so that the top may be used as a work table; if the cabinet is stationary, there is a shelf that can be pulled out or up at one end to serve as a work table.

Incubators—The incubators may be either a commercial or a home-made type. They should conform to specifications that have been published.[5]

Lavatory—A lavatory with hot and cold running water should be in each nursery. Faucets should have elbow, knee, or foot control.

Sanitary can—There should be at least one metal sanitary can for diapers, with the top controlled by foot pedal.

Linen hamper—There should be at least one linen hamper with removable bag, for soiled linen other than diapers.

Accessory Rooms

Certain accessory rooms are essential; those used frequently should be so situated that traffic to and from the nursery will be reduced to a minimum.

Nurse's Station

The nurse's station shown in these plans is designed as a "control station," with provision for a work space and an area for the doctor to use for examinations and treatment. The nurse's desk is placed so that she occupies a strategic position from which she can guard the entrances from the corridor to the station and from the station to the nurseries for full-term infants. These nurseries are visible through observation windows in the walls. The nurse's station is provided with a desk, a rack for charts, a waste basket, and two chairs—one for the nurse and the other for the physician. In the plans for larger hospitals a double desk is provided, for two nurses.

Work space—In these plans, the nurse's work space is shown as a separate area, but as part of the nurse's station. This arrangement will enable the nurse to carry on nearly all of her activities without losing sight of the infants. In addition, the distance she has to travel in giving care will be reduced to a minimum. The work space should be provided with a refrigerator, a sink, a work table, an instrument sterilizer, a bottle warmer, and a hot plate.

Examining room—The examining room, which may serve also as the treatment room, is shown as a separate area of the nurse's station. It is separated from the nursery by a sliding window, or by a Dutch door with a shelf about 18 inches wide and 30 inches long for use in examining the infant. A table about 24 inches wide, 30 inches long, and 36 inches high, should be provided for use in giving treatments. In this area there should be a lavatory and a waste receptacle.

Suspect nursery—The suspect nursery should be a completely separate unit. A minimum of 40 square feet and 400 cubic feet should be provided for each suspect bassinet. This will give adequate space not only for bedside care but for treatment of the isolated infant.

There should be a minimum of two suspect bassinets even in the smaller hospitals. Suspect bassinets should be provided in the ratio of one for each five bassinets for well infants. No suspect nursery should have more than three bassinets. When positive diagnosis has been made, the infant may be removed elsewhere in the hospital.

It is important to have an anteroom between the corridor and the suspect nursery. It should be provided with a lavatory, a desk or shelf, a hot plate, and a cabinet for necessary supplies. Two viewing windows should be provided, one in the corridor wall, for visitors, and one in the wall between the work space and the nursery.

Accessory Rooms Not Shown in the Standard Plan

Milk room—The location of the milk room and the supervision of the work of making up the feedings will vary with the type of hospital, its personnel, and its special administrative problems. Under any circumstances it is essential that a separate room be provided for preparing the milk mixtures and that this room be used for no other purpose. The room should be situated where the danger of contamination is least and where the most adequate supervision can be given, by a dietitian or a nurse who is experienced in milk-room procedures. If the hosnital has a dietitian it may

[5]Dunham, Ethel C., M.D., Dickinson, H. C., Ph.D., Gowens, Grace J., and Withers, Juanita: Incubators for Premature Infants. *American Journal of Public Health*, vol. 30, no. 12 (December 1940), pp. 1415-1421.

be best to locate the milk room near the general diet kitchen and to have the preparation of the milk mixtures supervised by the dietitian.

Physicians' locker room—It is assumed that a physicians' locker room will be provided near the entrance to the hospital, where the physician may leave his hat and overcoat. In the nurse's station a rack or hook is provided so that he may remove his suit coat before he enters the examining room to scrub and gown.

Nurses' locker room—It is also assumed that a nurses' locker room will be provided.

Demonstration room—A demonstration room in which the nurse may teach the mother, before she leaves the hospital, how to bathe and feed her infant, is not provided for in the plans for these small hospitals. Such a demonstration may, however, be given in the nursery while the mother observes from the corridor through the viewing window. Provision of a loud speaker would make it possible for the mother to hear the nurse's discussion of the procedures she is demonstrating.

Summary

In an effort to facilitate the work of physicians and nurses in providing for the safety and welfare of newborn infants in accordance with modern standards, in the minimum space practicable, the United States Public Health Service, Federal Security Agency, and the Children's Bureau, United States Department of Labor, have developed plans for hospital nurseries. Four nursery layouts have been drawn, for hospitals expecting 235; 470; 700; and 920 live births per year. Although in some circumstances a hospital with a relatively small bed capacity may need more bassinets than one with a larger bed capacity, still, under average conditions, and allowing for 75 per cent occupancy, these layouts should be applicable to 50-bed, 100-bed, 150-bed, and 200-bed hospitals.

The plans meet standards requiring, among other things, that each nursery house no more infants than can be cared for satisfactorily by one nurse; that bassinets be widely spaced, or, preferably, separated by partitions forming cubicles; that optimum atmospheric conditions be maintained; that facilities be provided for using aseptic technique and for giving individual bedside care to each infant; and that provision be made for the special care of premature infants and for isolation of infants who are ill or suspected of being ill.

The nurseries should be located in the obstetric division of the hospital, but out of the line of traffic from other services. There should be outside windows to admit daylight and sunlight. Provision should be made for controlling the sunlight in hot seasons and hot climates.

Optimum atmospheric conditions may be provided by complete air conditioning, including filtering and sterilizing of air. In the absence of air conditioning, air should be circulated without drafts striking the infant, there should be thermostatic control of room temperature, and partitions forming cubicles should reach only part way to the ceiling, so as to allow for ventilation.

The minimum space provided in the plan is, for each well infant, 30 square feet and 300 cubic feet; for each infant who is ill or suspected of being ill, 40 square feet and 400 cubic feet. Not more than eight bassinets are planned in each nursery for full-term infants, as this is the largest number that can be cared for satisfactorily by one nurse. Except in the smallest hospital, at least one separate nursery for premature infants is provided, with not more than four heated bassinets or incubators in a nursery, as four is the largest number of premature infants that can be cared for satisfactorily by one nurse.

Each plan includes at least one suspect nursery, completely separated from all other nurseries, with a minimum of two and a maximum of three bassinets.

In these plans the bassinets are separated by partitions, with transparent upper sections, forming cubicles large enough to permit the nurse to give bedside care to each infant conveniently. Common bathing and dressing tables are intentionally not provided for in the plans. Instead a combination bedside table and cabinet is placed next to each bassinet, to serve as a work table and for storage of a 24-hour supply of equipment for the care of the infant.

A lavatory with hot and cold running water is provided in each nursery. Faucets should have elbow, knee, or foot control.

In order to reduce the traffic into nurseries, and thus to lessen the danger of air contamination, a Dutch door or a sliding window is placed between each full-term nursery and the area where physicians examine and treat the infants, so that the physicians need not enter the nurseries. Observation windows are planned for, so that the nurse from her station can guard the entrances into the nurseries for full-term infants and can see the bassinets. A viewing window is also provided between each nursery and the corridor, so that visitors may see the infants without entering the nursery.

The milk room is not shown in the plan. It is essential that this be a separate room, used for no other purpose. Its situation should be such that there will be the most adequate supervision of the preparation of the feedings and the least possible danger of contamination.

Recipes for Toddlers.

GERBER PRODUCTS COMPANY•
FREMONT•MICHIGAN

All measurements are level.

From the Experimental Kitchen
Gerber Products Company
Fremont, Michigan.

STRAINED FOODS

4½-OZ. CONTAINERS

VEGETABLE SOUP, with Oat Flour and Beef
VEGETABLES AND LAMB with Barley
LIVER SOUP, with Vegetables, Barley and Wheat Germ
VEGETABLES AND BACON, with Rice
CHICKEN SOUP, with Vegetables
MIXED VEGETABLES with Wheat and Oat Flours and Yeast
BEETS
CARROTS
GREEN BEANS
PEAS
SPINACH
SQUASH
CUSTARD PUDDING
CHOCOLATE FLAVORED CUSTARD PUDDING
APPLE SAUCE
PRUNES
PEACHES
PEARS
PEAR AND PINEAPPLE
APRICOTS with FARINA
APRICOT-APPLE SAUCE

JUNIOR FOODS

4½-OZ. CONTAINERS

VEGETABLES AND BEEF, with Rice
VEGETABLES AND LIVER, with Rice
VEGETABLES AND LAMB, with Barley
VEGETABLES AND CHICKEN, with Rice
VEGETABLES AND BACON, with Rice
MIXED VEGETABLES, with Barley and Yeast
CARROTS
GREEN BEANS
PEACHES
APPLES
SQUASH
SPINACH
PINEAPPLE-RICE PUDDING
APPLE-PRUNE-RICE PUDDING
APRICOT-APPLE

Preface

NONE of the recipes in this pamphlet is planned for use with infants. The mother using Gerber's Baby Foods for their primary purpose as a daily supplement to the infant's diet should secure from her physician the directions that insure the most effective diet schedule for her own individual baby.

We have had many requests from mothers, however, for suggestions for making vegetable dishes more attractive to children past infancy. The recipes offered in this book are especially suitable for young children.

Children can be trained to eat and to enjoy the foods which are good for them. It is partly a matter of the mother's tact and patience and the cooperation of other members of the household but it is also partly a matter of how attractively the foods are served.

Frequently children dislike foods because of the texture rather than the flavor. Seeds and skins of tomatoes, strings of green beans and celery, the compactness of carrots may be the cause for lack of interest.

Children often eat the same food day after day and enjoy and ask for it repeatedly. Such children should not be allowed to restrict their diet too closely but should learn to eat a variety. This does not mean changing from a simple diet to a complicated one. Your child may eat strained vegetables heated as they come from the can, with a little butter added, and be satisfied. If so, it is well to serve them simply most of the time but occasionally introduce the same food in another form, for instance, as a nutritious vegetable custard.

Many of the recipes suggest ways to use up the remainder of the contents of a can after the baby has had a feeding. Any of the vegetables may be made into a cream soup for another child, or added to the family soup.

There is no attempt made in this book to designate what foods any individual child should eat. Your physician is best qualified to give advice on that matter. For the normal child of pre-school age, vegetables should form an important part of the diet and a variety should be eaten. This recipe book is offered as an aid to mothers for the serving of strained vegetables in nutritious and attractive ways.

Many of the recipes in this book have been received from users of Gerber Products. We are always glad to have suggestions.

Soups

FOUNDATION RECIPE

1 tablespoon butter
1½ tablespoons flour
1 cup milk
1 can of any Gerber's Strained Vegetable or Strained Soup
Salt

Make a white sauce of butter, flour, and milk, stirring constantly until the sauce is thickened and smooth. Continue to cook gently for a few minutes to thoroughly cook the starch in the flour. Add the strained vegetable and salt. Bring just to the boiling point and serve hot.

VARIATIONS OF CREAM SOUP RECIPE

1. Use ½ cup evaporated milk with ½ cup meat broth instead of milk in recipe.
2. Add a few chopped celery or parsley leaves.
3. For increased nutritive value (especially in protein and iron) add egg. Add a little hot soup to beaten egg, with stirring, then add this to the rest of the soup.
4. Grated American cheese sprinkled over the top.
5. For a more concentrated soup, use milk and cream or undiluted evaporated milk instead of whole milk.
6. With Cream of Spinach Soup, slice or dice hard cooked eggs into bottom of cup and pour hot soup over them.
7. Addition of a bouillon cube.
8. Sometimes a little onion salt or powder may be added.
9. Add ½ cup of celery water, or water from any freshly cooked or canned vegetable to ½ cup evaporated milk. Use in place of milk in recipe.
10. Any single Gerber's Strained Vegetable or Vegetable Soup may be used, or two vegetables may be combined for variety.
11. A teaspoon of whipped cream or evaporated milk on top of serving.
12. The Chopped Foods (either the single vegetables or the combinations) may be used instead of the Strained Foods.

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LUNCHEON OR SUPPER DISHES

CEREAL RECIPES

DESSERTS

FROZEN DESSERTS

INDEX

ALL MEASUREMENTS ARE LEVEL

HIGH FOOD VALUE SOUP

1 can of a Gerber Strained Vegetable or a Strained Soup
1 cup milk
¼ cup Gerber's Cereal Food, Oatmeal or Barley Cereal

Add the soup and milk gradually to the cereal, stirring until smooth. Heat to correct temperature for feeding.

It is not necessary to bring the soup to a boil as the cereal is pre-cooked.

Increasing the amount of cereal makes a thicker soup. Either cereal gives a pleasing flavor and adds nutritive values.

CREAM OF VEGETABLE SOUP (not thickened)

1 can of any Gerber's Strained Vegetable or Strained Soup
1 cup meat broth (or bouillon cube in 1 cup hot water)
2 teaspoons butter
1 cup top milk or evaporated milk
Salt

Combine ingredients. Bring to boiling point and serve.

More easily fed through a tube than is a thickened soup.

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1 cup meat broth (or bouillon cube in 1 cup hot water)
2 teaspoons butter
1 cup top milk or evaporated milk
Salt

Combine ingredients. Bring to boiling point and serve.

More easily fed through a tube than is a thickened soup.

Jellied Cream Soups

FOUNDATION RECIPE

1 tablespoon plain gelatine
3 tablespoons cold water
1 can of a Gerber's Strained Vegetable or Strained Soup
1 cup milk

Sprinkle the gelatine on the cold water. Heat the vegetable and milk and stir into the soaked gelatine. Stir until dissolved. Pour into cups which have been rinsed with cold water; set into refrigerator until stiffened.

The stronger flavored vegetables, as carrots, beets, or spinach are the more desirable for jellied soups which are eaten cold.

Jellied soup is more easily eaten than thin soups by either young children or adults in a reclining position. For ease of eating, the jellied soup may be broken up with a fork or cut into cubes.

Beverages

CEREAL MILK DRINK

¼ cup Gerber's Cereal Food, Oatmeal or Barley Cereal
1-1/3 cups milk
2 scoops ice cream

Combine ingredients and beat well. If no ice cream is used, add 2 teaspoons of sugar and vanilla or chocolate syrup or a dash of nutmeg. Mashed banana or a strained fruit may be added.

VEGETABLE EGG NOG

1 egg, beaten
4 tablespoons Gerber's Strained Carrots
2 tablespoons orange juice
Salt
1 cup milk, very cold

Combine beaten egg, carrots, orange juice, and salt. Add the cold milk and mix thoroughly.

VARIATIONS

1. Use Strained Spinach instead of carrots.
2. A small serving of ice cream added with the carrots will improve flavor and food value.

FRUIT MILK SHAKE

1 egg, well beaten
3 tablespoons Gerber's Strained Prunes
2 tablespoons orange juice
1 cup milk, very cold

Add the prunes and orange juice to the beaten egg. Add milk and mix.

VARIATIONS

1. Add 2 scoops of ice cream to prunes and beat before adding other ingredients.
2. Instead of prunes, use Apricots with Farina, Apple Sauce, or Strained Pears.

HOT CARROT-ADE

1 bouillon cube
1⅓ cups boiling water
⅓ can Gerber's Strained Carrots

Dissolve bouillon cube in boiling water, add the strained carrots and stir until well mixed. Serve warm as a beverage or soup or for a between-meal feeding.

TOMATO-VEGETABLE COCKTAIL

1½ cups chilled tomato juice
1 can Gerber's Strained Vegetable or Strained Soup, chilled
1 teaspoon lemon juice
Salt

Blend ingredients and serve cold. The strained soups give especially interesting flavors. Serves two. One-half this recipe is an excellent way to use left-over strained vegetables and soups.

Buttered Vegetables

The strained and chopped vegetables are most simply prepared by turning them into a small saucepan or double boiler, heating and seasoning to taste with butter and salt.

VARIATIONS

1. Sprinkle with sieved hard cooked egg yolk or whole egg. Egg yolks, remaining from the preparation of some of the whips and sherbets in this booklet, may be poached done and sieved.
2. Sprinkle with grated cheese, if diet permits.
3. Serve on buttered toast.
4. Sprinkle with small buttered toast cubes.

Vegetable Custards and Souffles

Recipes for custards and souffles are practically the same except that for custards the whole eggs are beaten, while for souffles the yolks and whites are beaten separately.

Custards are of a more compact consistency, therefore have more food value in a spoonful, take less time to eat and are preferable in cases where the patient tires easily. Souffles are lighter in consistency because of the air which has been whipped into the egg whites and are a "daintier" dish. Custards may be kept for a few minutes after removing them from the oven but souffles need to be served immediately. Dishes used in service should be hot.

VEGETABLE CUSTARD

1 teaspoon butter
1 teaspoon flour
¼ cup milk
1 egg
1 can of any Gerber's Strained Vegetable
1 teaspoon lemon juice
Salt

Prepare white sauce of the butter, flour and milk. Add well beaten egg and then add the strained vegetable and lemon juice. Mix well and bake in greased individual custard cups in a moderate oven (325° F.). Set the cups into a pan with hot water in it. Bake for 50 minutes or until a knife inserted into the custard will come out clean. May be served hot or cold, but hot is usually preferred.

Although any strained vegetable may be used, carrot, spinach, asparagus, pea, or green bean custards are favorites.

Grated onion or cheese may be added where these are permitted.

The canned chopped foods may replace the strained for a custard with a less smooth texture.

SPINACH AND LIVER CUSTARD

- 2 teaspoons butter
- 2 teaspoons flour
- ½ cup milk
- Salt
- 4 tablespoons Gerber's Strained Spinach
- 4 tablespoons minced liver
- 2 eggs

Make a white sauce of butter, flour, and milk. Add salt. Add well beaten egg, spinach, and liver and mix. Pour into well greased custard cups. Place cups in a pan with hot water in it and bake in a slow oven (325° F.) about 50 minutes, or until set.

VEGETABLE SOUFFLE

- 2 teaspoons butter
- 2 teaspoons flour
- ¼ cup milk
- Salt
- 1 egg, separated
- ½ can of any Gerber's Strained Vegetable

Prepare a white sauce of the butter, flour, and milk. Add salt, the well beaten egg yolk, and vegetable. Mix well. Finally fold in carefully the stiffly beaten egg white. Pour into greased custard cups. Place cups in a pan with hot water in it and bake in moderate oven (325° F.) for about 50 minutes or until the center is set. Serve immediately.

VARIATIONS FOR VEGETABLE CUSTARDS OR SOUFFLES

1. 2 tablespoons grated American cheese may be added.
2. ½ teaspoon minced or grated onion may be added.
3. For Green Bean Souffle, add ½ teaspoon sugar and ½ teaspoon lemon juice.
4. For Spinach Souffle, ½ teaspoon lemon juice may be added.
5. Sometimes when onion cannot be used, onion salt or powder will be tolerated.
6. Celery salt may be added.

CARROT AND CHEESE SOUFFLE

2 teaspoons butter
2 teaspoons flour
Salt
¼ cup milk
1/3 cup grated American Cheese
1 can Gerber's Strained Carrots
2 eggs

Make a white sauce of butter, flour, salt and milk. Cook, stirring constantly, until thick and smooth. Add cheese and carrots and mix. Beat egg yolks and add, stirring in gradually. Beat egg whites until stiff and fold into the mixture. Pour into greased cups or a casserole. Place in a pan of hot water and bake in a slow oven (325° F.) for about 50 minutes, or until firm in center.

FROZEN SPINACH SOUFFLE

2 eggs
1 can Gerber's Strained Spinach
Salt
1 teaspoons lemon juice
1 teaspoon sugar

Beat egg yolks and whites separately. Mix ingredients, folding in the stiffly beaten egg whites last. Freeze about 1½ hours or to a stiff mush stage, not too hard. Stir once after freezing starts.

Salads

MOLDED CARROT SALAD

- 2 teaspoons plain gelatine
- 2 tablespoons cold water
- ½ cup meat soup stock, or 1 bouillon cube dissolved in ½ cup hot water
- ½ teaspoon minced onion
- 4 tablespoons orange juice
- 1 tablespoon lemon juice
- 1 can Gerber's Strained Carrots

Soften gelatine in cold water and then dissolve in the heated soup stock. Add the other ingredients. Pour the salad mixture into molds which have been previously rinsed with cold water. Chill. When set, unmold and serve on cut-up lettuce or other greens, and serve with or without salad dressing.

Gerber's Strained Beets may be used instead of the carrots. The use of individual ring molds makes attractive servings.

MOLDED SPINACH SALAD

- 2 teaspoons plain gelatine
- 2 tablespoons cold water
- ¼ cup soup stock or plain water
- 1 can Gerber's Strained Spinach
- Salt
- 1 or 2 hard cooked eggs
- 3 oz. cream cheese

Soften the gelatine in the cold water. Combine with the heated soup stock, add salt, and stir until dissolved. Add the spinach. Pour half of the spinach mixture into individual molds and allow them to stiffen in the refrigerator. Then put a layer of the mixed cream cheese and cream into each mold and add the rest of the spinach mixture.

The hard cooked eggs, chopped up, may be put into one spinach layer or may be placed in the mold before the first layer is put in. When firmly set, unmold and serve on lettuce with salad dressing.

MOLDED VEGETABLE SALAD

1 teaspoon plain gelatine
1 tablespoon cold water
1 can of any Gerber Strained or Chopped Vegetable
Few grains salt
¼ cup water
1 tablespoon sugar
2 hard cooked eggs

Soften the gelatine in the cold water. Combine and heat the vegetable and water and stir in the gelatine until dissolved. Add the salt and sugar and cool. When it begins to set add the chopped eggs (or the eggs may be sliced) and chill in the refrigerator. When set, unmold on lettuce or other greens and serve with salad dressing.

CARROT AND PEAR SALAD

2 teaspoons plain gelatine
2 tablespoons cold water
1 can Gerber's Chopped Carrots
1 can Gerber's Strained Pears (or Apricots with Farina)

Soften the gelatine in the cold water. Heat the carrots, then add the gelatine and stir until dissolved. Add the Strained Pears, pour into molds which have been previously rinsed in cold water. Chill. When set, unmold on lettuce. Serve with or without salad dressing.

CHOPPED VEGETABLES SALAD

½ can Gerber's Chopped Carrots
½ can Gerber's Chopped Spinach
1 egg, hard cooked, grated
1 teaspoon lemon juice
Few grains salt

Drain the vegetables through a sieve, saving the liquid for soup or sauce. Mound each vegetable separately, either in round or oblong shape, and place them together on lettuce which has been cut up. Sprinkle the salt and lemon juice over the vegetables and then the grated egg over all.

FRUIT SALAD

- 2 teaspoons plain gelatine
- 2 tablespoons cold water
- ½ cup boiling water
- ½ can Gerber's Strained Pears
- ½ can Gerber's Strained Apricots with Farina

Soften gelatine in the cold water. Pour the boiling water on the soaked gelatine and stir until dissolved. Add to the fruits and thoroughly mix. Pour into molds or cups previously rinsed with cold water and chill until firm. Unmold and serve as salad or dessert.

SALAD DRESSING

- 2 tablespoons lemon juice
- ¼ cup milk or cream or undiluted evaporated milk
- ½ teaspoon salt
- ½ teaspoon sugar

Stir the lemon juice slowly into the milk. Add salt and sugar.

SALAD DRESSING

- 2 tablespoons salad oil
- 2 tablespoons grapefruit juice
- 2 tablespoons honey
- Few grains salt

Combine the oil, juice and salt. Slowly add the honey, beating constantly. Chill. Mix well before using. For fruit salads.

Luncheon or Supper Dishes

SPECIAL BAKED POTATO

- 1 potato for each serving
- Butter
- Salt
- Gerber's Strained Spinach
- Bacon, partly cooked

Bake medium sized potatoes. Cut in half length wise. Remove pulp and whip up with butter and salt. Add half as much strained spinach as potato pulp. Refill potato shells, top each with half a strip of bacon and return to oven long enough to crisp the bacon.

Strained peas, carrots, beans or asparagus may be used instead of spinach.

VEGETABLE OMELET

- 2 eggs
- 2 tablespoons top milk
- Salt
- 1 tablespoons butter
- 4 tablespoons any Gerber Chopped Vegetable

Beat eggs slightly, add milk and salt. Melt butter in the frying pan and pour in the egg mixture. Cook slowly over low heat, carefully lifting the sides with a spatula to let uncooked part run underneath. When browned, fold in half and turn onto a plate. Put heated vegetable between the folds.

SPINACH OR CARROTS ON TOAST

- 2 slices bread
- 1 can Gerber's Chopped Spinach or Chopped Carrots
- 2 eggs, poached
- Salt
- Butter

Toast the bread, spread with butter. Cover the toast with the vegetable, which has been heated. Place the poached eggs on the vegetable, dot with butter and sprinkle with a little salt.

LIVER AND POTATO PIE

- ⅛ cup sliced cooked potatoes
- 1 can Gerber's Chopped Vegetable and Liver
- 1 tablespoon butter
- 1 tablespoon Gerber's Cereal Food, Strained Oatmeal or Barley Cereal

Arrange layers of potatoes and the Vegetable and Liver in a buttered casserole. Dot with butter and sprinkle cereal over the top. Bake 15 to 20 minutes in a moderate oven (350° F.).

CARROT AND POTATO SCALLOP WITH LIVER

- 1 can Gerber's Chopped Carrots
- ½ cup diced, cooked potatoes
- 1 can Gerber's Chopped Liver
- ⅓ cup white sauce
- 1 tablespoon butter

Arrange in layers in a greased baking dish, the carrots, potatoes, and liver. Add the white sauce and dot with butter. Either Cereal Food, Oatmeal or Barley Cereal (Gerber's dry, pre-cooked cereals) may be sprinkled over the top. Bake in a moderate oven (350° F.) for about 25 minutes.

GREEN BEANS WITH GRAPEFRUIT SAUCE

- 1 can Gerber's Chopped Green Beans
- 1 teaspoon cornstarch
- 1 tablespoon corn syrup
- ¼ cup grapefruit or pineapple juice
- ½ tablespoon butter

Heat the green beans. Blend cornstarch and syrup, add the fruit juice and cook until clear and thickened. Add butter. Serve the sauce on the green beans.

SPINACH AND RICE CASSEROLE

- ⅓ cup cooked rice
- 1 can Gerber's Chopped Spinach
- 1 egg
- Minced fresh parsley or parsley flakes

Combine rice and spinach. Beat egg until light and add to mixture. Add parsley and turn into a greased shallow baking dish. Bake in a slow to moderate oven (325° F.) for about 30 minutes. Cut into squares for serving.

SCRAMBLED EGGS WITH VEGETABLES

2 eggs
2 tablespoons evaporated milk or cream
½ can Gerber's Strained Mixed Vegetables
1 tablespoon butter

Beat eggs, add milk or cream and the Mixed Vegetables. Melt butter in a small frying pan, add egg mixture and cook over low heat, stirring until of a soft creamy consistency. Serve at once.

CHOPPED CARROT SANDWICH

4 slices bread
Creamed butter
1 can Gerber's Chopped Carrots

Spread the bread with the softened butter. Drain the carrots, saving the liquid for soups or sauces, and cover the buttered bread evenly. Add another slice of buttered bread to make a sandwich. Cut into squares or fingers.

FRENCH TOAST WITH HOT APPLESAUCE

2 slices bread
¼ cup milk
1 egg
Butter
1 can Gerber's Strained Applesauce

Beat the egg, add milk. Melt a little butter or margarine in a frying pan. Dip bread into milk mixture and sauté in the hot butter until browned on both sides. Heat the applesauce and pour over the slices of French toast.

This recipe is suitable for diets permitting sautéed foods.

Cereal Recipes

Any one of Gerber's Cereals may be used in these recipes. The Cereal Food is a wheat cereal with a small proportion of corn meal. The Oatmeal has no cereal in it other than oats, and barley is the sole grain represented in Barley Cereal. All are enriched in thiamine and in iron, are thoroughly cooked and dried. From ⅓ to ½ of the flour in recipes for drop cookies may be substituted by any Gerber cereal.

CEREAL FOOD MUFFINS

12 small muffins

- 1⅓ cups flour
- 4 teaspoons baking powder
- 2 tablespoons sugar
- ½ teaspoon salt
- ¾ cup Gerber's Cereal Food
- 1 egg
- ¼ cup vegetable oil
- 1 cup milk

Sift flour, baking powder, sugar and salt together. Mix the cereal lightly into the flour mixture. Beat eggs slightly, add to fat and milk. Add wet ingredients to dry. Mix quickly and only enough to dampen flour. Bake in greased muffin tins, filled ⅔ full, 20-25 minutes at 400° F. Gerber's Strained Oatmeal or Barley Cereal may be substituted for the Cereal Food or a mixture may be used.

CEREAL FOOD RENNET CUSTARD

- ½ rennet tablet
- ½ tablespoon cold water
- 1½ tablespoons sugar
- 2 tablespoons Gerber's Cereal Food, Oatmeal or Barley Cereal
- 1 cup milk (not canned)
- ½ teaspoon vanilla (optional)

Add the cereal to the milk before warming and follow directions on the package of rennet tablets. Turn custard into cups.

BAKED CEREAL CUSTARD

- 1/3 cup Gerber's Cereal Food, Oatmeal or Barley Cereal
- 2/3 cup milk
- 1/3 cup light brown sugar
- 1 tablespoon butter
- 1 egg
- ¼ teaspoon salt
- Few grains nutmeg (optional)
- ⅛ teaspoon vanilla

Place the dry cereal in the top of the double boiler and slowly add the milk, while stirring. Place over hot water kept just below the boiling point. Add brown sugar and butter and occasionally stir the mixture, until hot and well blended.

Beat the egg, add salt, nutmeg, and vanilla. Gradually add the hot mixture, stirring constantly. Pour into greased custard cups, place them in a pan of hot water and bake in a very moderate oven (325° F.) for approximately 35 minutes or until a silver knife inserted, comes out clean. 2 to 3 small custard cups.

Use any of the Gerber's Strained Fruits as a sauce.

CEREAL COOKIES

- 18 small cookies
- ⅓ cup shortening
- ⅓ cup sugar
- 1 egg, well beaten
- 2⅓ tablespoons milk
- 1 cup flour
- 1 cup Gerber's Cereal Food, Oatmeal or Barley Cereal
- 1 teaspoon baking powder
- ½ cup seedless raisins (soaked in a little water)
- ¼ teaspoon salt

Cream shortening, add the sugar and continue creaming. Add beaten egg, milk, and the dry ingredients which have been mixed together. Add raisins and beat thoroughly. This is a thick dough. Drop on a greased cookie sheet and bake in a moderate oven (350°F.) for about 18 minutes.

Desserts

In most desserts, the various fruits are interchangeable. In some recipes it is well to allow a little for slight differences in thickness.

The use of evaporated milk instead of cream is often preferable in the diet of young children. To whip evaporated milk, use one of these methods given: (1) pour the undiluted milk into a freezing tray of a mechanical refrigerator or into a bowl and set directly on the ice of an ice refrigerator. When it starts to freeze or is thoroughly chilled, beat with a rotary or mechanical beater. Bowl and beater should be cold. (2) To 1 cup of scalded evaporated milk, add 1 teaspoon plain gelatine which has been softened in 1 tablespoon of cold water. Chill in the freezing tray until almost frozen. Place in a chilled bowl and whip. (3) An unopened can may be chilled until ice-cold and the milk whipped. Remove label to hasten chilling.

FRUITS WITH CUSTARDS

For variety of flavor, use one of the strained fruits poured over a serving of Gerber's Custard Pudding. Or, the fruit may be stirred into the custard just before serving.

FRUIT SAUCE FOR PUDDING, CUSTARD, OR ICE CREAM

1 can of any Gerber Strained Fruit
1 teaspoon lemon juice
1 tablespoon sugar

Mix the ingredients and heat, until the sugar is dissolved. Use as a sauce.

BANANAS WITH FRUIT SAUCE

Any of the strained fruits may be used on sliced bananas. The Strained Pears or the Apple Sauce are especially pleasing.

FRUIT WHIP

½ cup evaporated milk
2 tablespoon sugar
1 tablespoon lemon juice
1 can any Gerber Strained Fruit

Whip the evaporated milk until stiff, then beat in the sugar. Add the lemon juice gradually, and fold in the chilled fruit pulp. This Fruit Whip may be chilled and served or frozen in a mechanical refrigerator.

LIME-APPLE WHIP

½ package lime-flavored gelatine
½ cup boiling water
½ cup cold water
1 can Gerber's Strained Apple Sauce

Dissolve the gelatine in the boiling water and mix until dissolved. Add the cold water and chill. As the mixture begins to thicken, beat with egg-beater until frothy. Beat in the apple sauce. Pour into serving glasses or cups and chill.

APRICOT-FARINA BAVARIAN CREAM

½ tablespoon plain gelatine
2 tablespoons cold water
1 can Gerber's Strained Apricots with Farina (or Strained Peaches)
3 tablespoons sugar
¾ teaspoon almond extract
Few grains salt
½ cup cream or evaporated milk

Soften the gelatine in the cold water. Place over boiling water until the gelatine is dissolved. Add the strained fruit and stir (over the boiling water) until thoroughly mixed and gelatine dissolved. Add the sugar, almond extract and salt. Chill. When the mixture begins to set, beat with an egg beater until light and fluffy. Whip the cream or evaporated milk until stiff and fold into the mixture. Put into sherbet glasses and chill in refrigerator until firm.

APRICOT-FARINA FLUFF

- ⅓ cup cooked rice
- 1 can Gerber's Apricots with Farina
- ⅓ cup powdered sugar
- 1/3 cup cream or evaporated milk
- Few grains salt

Mix the rice with the fruit and sugar; chill. Fold in the whipped cream or whipped evaporated milk just before serving.

For variety, substitute Strained Pears and 2 tablespoons lemon juice for the Apricot-Farina.

APRICOT-APPLE SAUCE CUSTARD

- 1 can Gerber's Apricot-Apple Sauce
- 1 egg
- 2 tablespoons sugar
- Chocolate, grated

Add the Apricot-Apple Sauce to the egg which has been beaten with the sugar. Pour into greased baking dish, or two custard cups, set into a pan of hot water and bake for 45 to 50 minutes in a slow oven (325° F.). When serving, sprinkle with grated chocolate.

APPLE SAUCE SOUFFLE

- 2 teaspoons shortening
- 2 teaspoons flour
- Few grains salt
- ½ cup milk
- 1 egg separated
- 2 tablespoons sugar
- 1 can Gerber's Strained Apple Sauce

Make a white sauce of the shortening, flour, salt and milk. Beat the egg yolk with the sugar and add the white sauce. Add the Strained Apple Sauce and mix thoroughly. Beat the egg white until stiff but not dry and carefully fold into the mixture. Pour into a baking dish, set in a pan of hot water and bake in a slow oven (325° F.) for about 45 minutes, or until center is firm.

PRUNE WHIP

1 egg white
Few grains salt
2 tablespoons sugar
1 tablespoons lemon juice
1 can Gerber's Strained Prunes

Beat egg white with salt until stiff but not dry, beat in sugar. Gradually beat the combined lemon juice and strained prunes into the mixture.

Continue beating until the mixture is very fluffy. Either (1) turn into individual dessert dishes and chill thoroughly, or (2) turn into a greased baking dish, set in a pan of hot water and bake in a slow oven (325° F.) for about 50 minutes, or until center is firm.

Serve plain or with whipped cream.

Note: Whips made with egg white may be served uncooked and chilled but should not stand long after preparation, or may be baked and served hot — serve immediately.

Other strained fruits may be used in place of prunes. With other fruits, 1/4 teaspoon almond extract may be used instead of the lemon juice.

Double-Boiler Method: Instead of baking, the Whip (or Souffle) may be cooked in the buttered top of a double boiler, keeping the water in the bottom just below boiling. Cover and cook for about 1 hour. This Whip will hold up for serving longer than one baked in the oven. Serve with a garnish of whipped cream.

Frozen Desserts

FRUIT ICE

1/3 cup water
2 tablespoons corn syrup
4 tablespoons sugar
2 teaspoons lemon juice
1 can of any Gerber Strained Fruit

Combine the water, corn syrup and sugar in a small saucepan, and heat slowly until the sugar is dissolved, then boil gently for 5 minutes, without stirring. Cool. Add the lemon juice and the strained fruit. Freeze until firm. If freezing in a mechanical refrigerator, remove to a chilled bowl, break up any piece of ice and beat with a rotary beater until free from hard lumps but still a thick mush consistency. Return to freezing tray to finish freezing.

1/4 teaspoon almond extract may be used with all of the Gerber Strained Fruits except prunes, instead of the lemon juice.

The Fruit Ice may be made into a sherbet by adding 1/2 egg white or the white from a small egg, beaten stiff and added after the first freezing to the mush stage.

A milk sherbet may be made by substituting milk for the water used in making the syrup, scalding the milk, corn syrup and sugar in the top of a double boiler.

For a creamy sherbet use undiluted evaporated milk or half cream and half milk.

APRICOT-FARINA SHERBET

- 1 can Gerber's Apricot-Farina
- 4 tablespoons sugar
- Few grains of salt
- 1 tablespoon lemon juice
- ¼ cup milk
- 1 egg white
- ¼ cup cream or evaporated milk

Mix together the fruit pulp, sugar, salt, lemon juice and stir this mixture gradually into the milk. Fold in the stiffly beaten egg white and then the whipped cream or evaporated milk. Freeze. Stir once during the freezing.

PEACH PARFAIT

- 3 tablespoons sugar
- ¼ cup water
- 1 egg white
- 1 cup heavy cream or ¾ cup evaporated milk
- ¼ teaspoon almond extract
- 1 can Gerber's Strained Peaches

Heat the sugar and water together, stirring until the sugar is dissolved; boil without stirring until the syrup spins a thread. Beat the egg white until stiff and gradually add the syrup in a fine stream, beating constantly until the mixture is cool. Chill. Whip the cream (or well chilled evaporated milk) until it will just hold its shape and fold into the chilled egg white mixture. Then fold in the almond extract and peaches. Freeze without stirring.

PEAR FROZEN SOUFFLE

- 1 can Gerber's Strained Pears
- 1 teaspoon lemon juice
- 3 tablespoons confectioners' sugar
- 1 egg white

Combine the fruit pulp, lemon juice and sugar. Freeze to a mush stage, then fold in the stiffly beaten egg whites. Freeze.

PRUNE ICE CREAM

- ⅓ cup milk
- ⅓ cup light cream or undiluted evaporated milk
- 4 tablespoons sugar
- 2 tablespoons corn syrup
- Few grains salt
- 1 egg, separated
- 1 can Gerber's Strained Prunes
- 1 tablespoon powdered sugar

Combine the milk, cream, sugar, corn syrup, and salt, and scald in the top of the double boiler. Beat the egg yolk and stir into it the hot milk. Freeze and when about half frozen, remove to a chilled bowl. Beat the egg white stiff, add the powdered sugar, continue beating and then add to the frozen mixture. Beat until well blended; return to finish freezing. When frozen, set the temperature control back part way to the usual operating temperature to keep the ice cream until ready to serve.

Apricot-Apple Sauce or Apricots with Farina make a pleasing flavored ice cream.

FROZEN PRUNE WHIP

- ½ teaspoon plain gelatine
- 1 tablespoon cold water
- ½ lemon, juice
- ½ orange, juice
- 1 can Gerber's Strained Prunes (or ½ can Strained Prunes and ½ can Apricots with Farina)
- ⅛ cup sugar
- Few grains salt
- 1/3 cup evaporated milk

Soften the gelatine in the cold water. Combine the fruit juices, prunes, and sugar and let stand until the sugar dissolves. Add the salt. Chill in the refrigerator until it begins to thicken. Chill the evaporated milk in the freezing tray, transfer to a chilled bowl and beat until just stiff; fold into the prune mixture. Freeze.

Some General Information About Food Values

PRINCIPAL SOURCES OF VITAMINS

Vitamin A — The liver oils, butter, cream, egg yolk, liver. Yellow and green-colored vegetables are good sources of carotene, the precursor of Vitamin A.

Thiamine — Yeast, rice polishings, wheat germ preparations, whole grain cereals, cereals enriched in thiamine, and milk. Small amounts are found in fruits and vegetables.

Ascorbic Acid — Citrus fruits, tomatoes, spinach, peas, green beans, cabbage, potatoes and certain other fruits and vegetables.

Vitamin D — Viosterol in oil, Percomorph liver oil, halibut liver oil, cod liver oil, vitamin D milk, salmon, egg yolk and liver.

Riboflavin — Yeast, liver, wheat germ, egg yolk, beet greens, spinach, kale, turnip and other greens, lean meats and milk. Small amounts in other vegetables and fruits.

☆

FOODS RICH IN PROTEINS — Meat, fish, poultry, eggs, milk, cheese, nuts, whole grain cereals, beans and peas.

FOODS RICH in CARBOHYDRATES — Sugar, syrup, starches, honey, jelly, jam, cereal, cereal products, potatoes and sweet fruits.

FOODS RICH IN FATS — Butter, cream, oils, margarine, mayonnaise, egg yolk, fat meats, cheese (not cottage cheese) and nuts.

FOODS RICH IN CALCIUM — Milk and cheese. Turnip tops, and other greens (except spinach), broccoli, cauliflower, celery, kohlrabi, romaine, lettuce, legumes.

FOODS RICH IN PHOSPHORUS — Milk, cheese, egg yolks, lean meats, fish, whole grain cereals and legumes.

FOODS RICH IN IRON — Liver, kidney, egg yolk, oysters, muscle meats (especially beef, lamb, veal), molasses, peas, beans, lentils, dried fruits (such as apricots, prunes, dates, figs, raisins), leafy vegetables (especially spinach, beet greens, chard), whole wheat grain cereals, and cereals enriched in iron.

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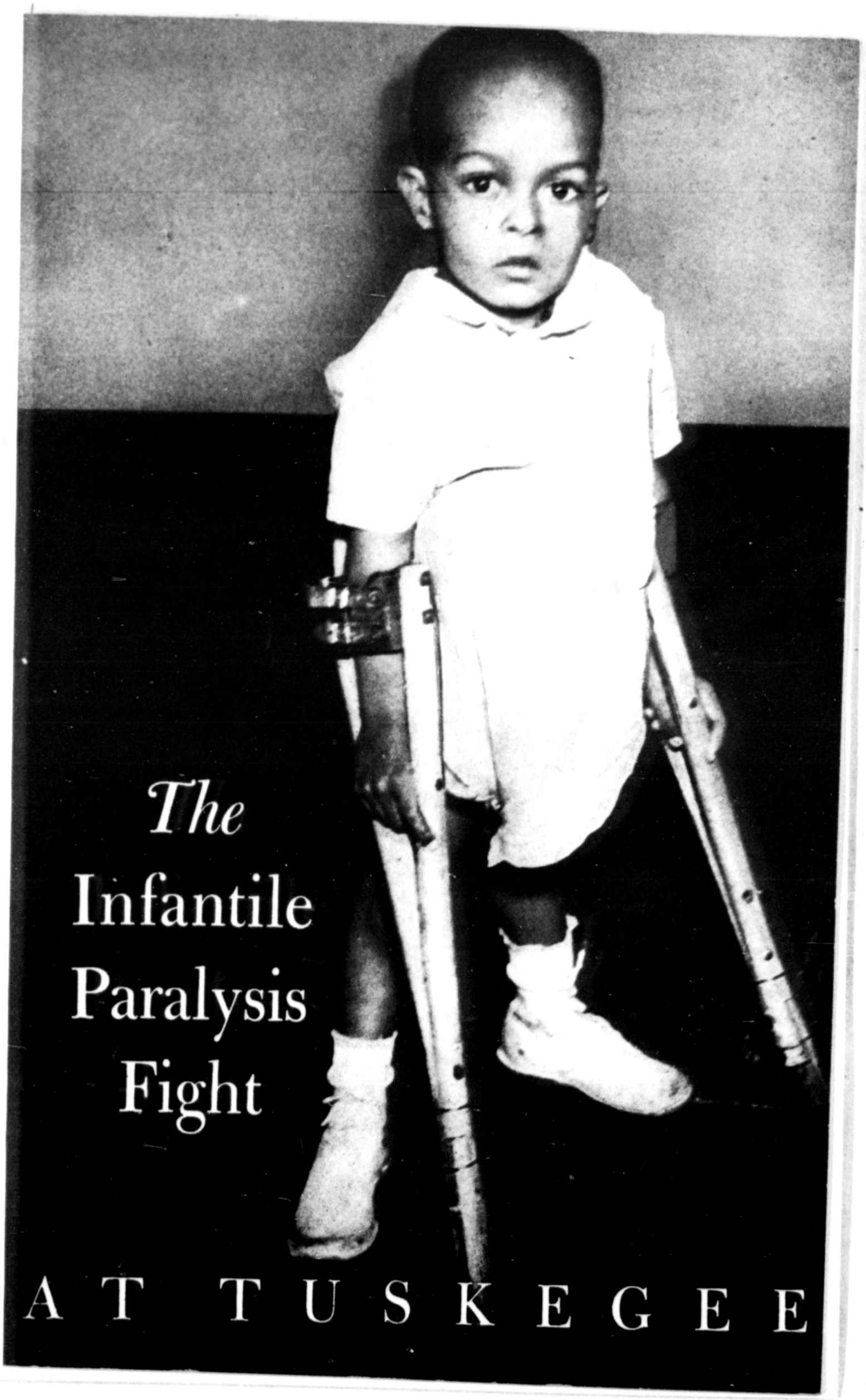
January, 1948

Litho in U.S.A.



The Infantile Paralysis FIGHT *at Tuskegee*

A Publication of

THE NATIONAL FOUNDATION FOR INFANTILE PARALYSIS, INC.

FRANKLIN D. ROOSEVELT, FOUNDER

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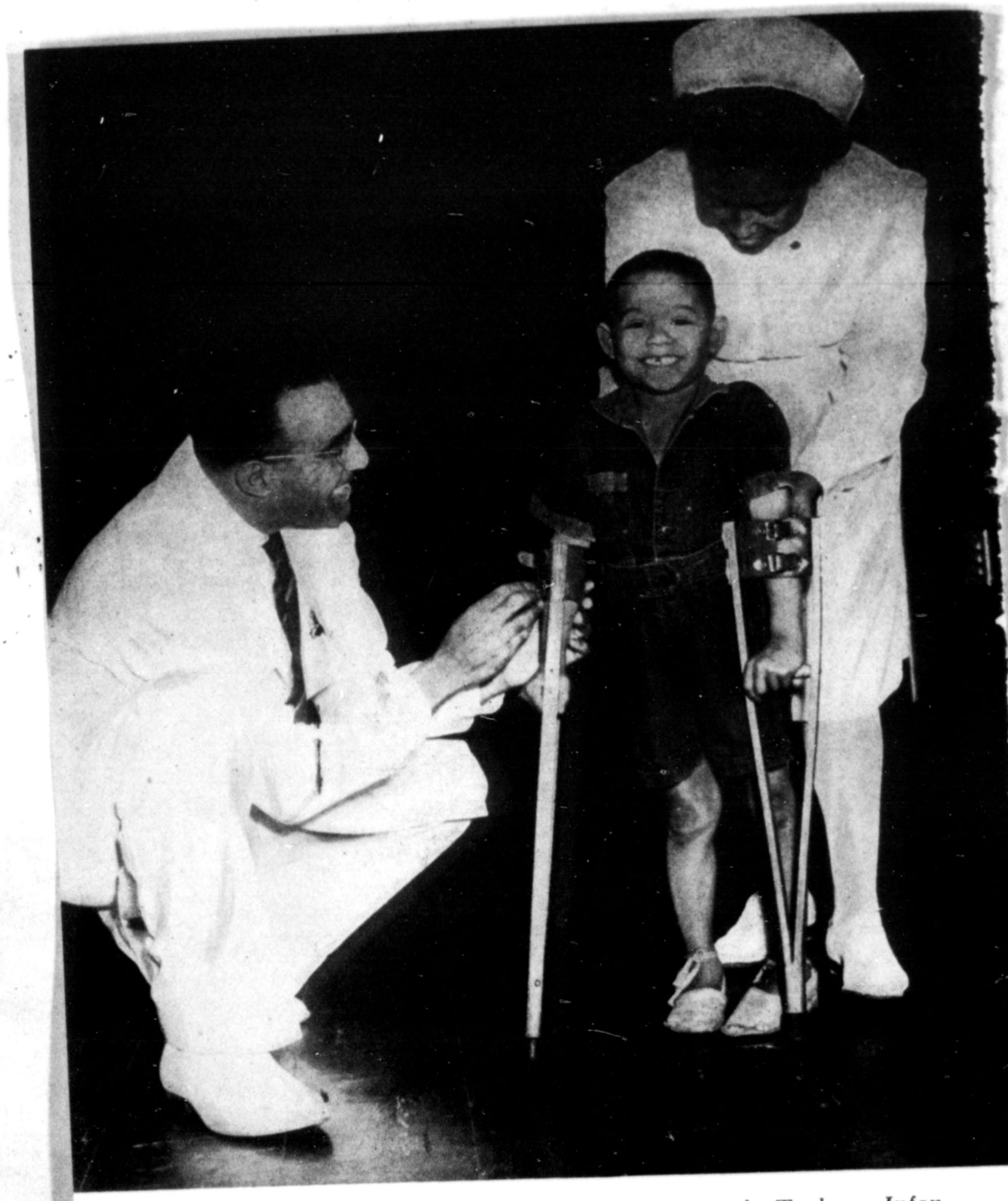


The medical director at the Tuskegee Infantile Paralysis Center, Dr. John W. Chenault, stops to encourage young Gordon Stewart of Lima, Ohio, who is being taught to walk again by Nurse Warrena A. Turpin.

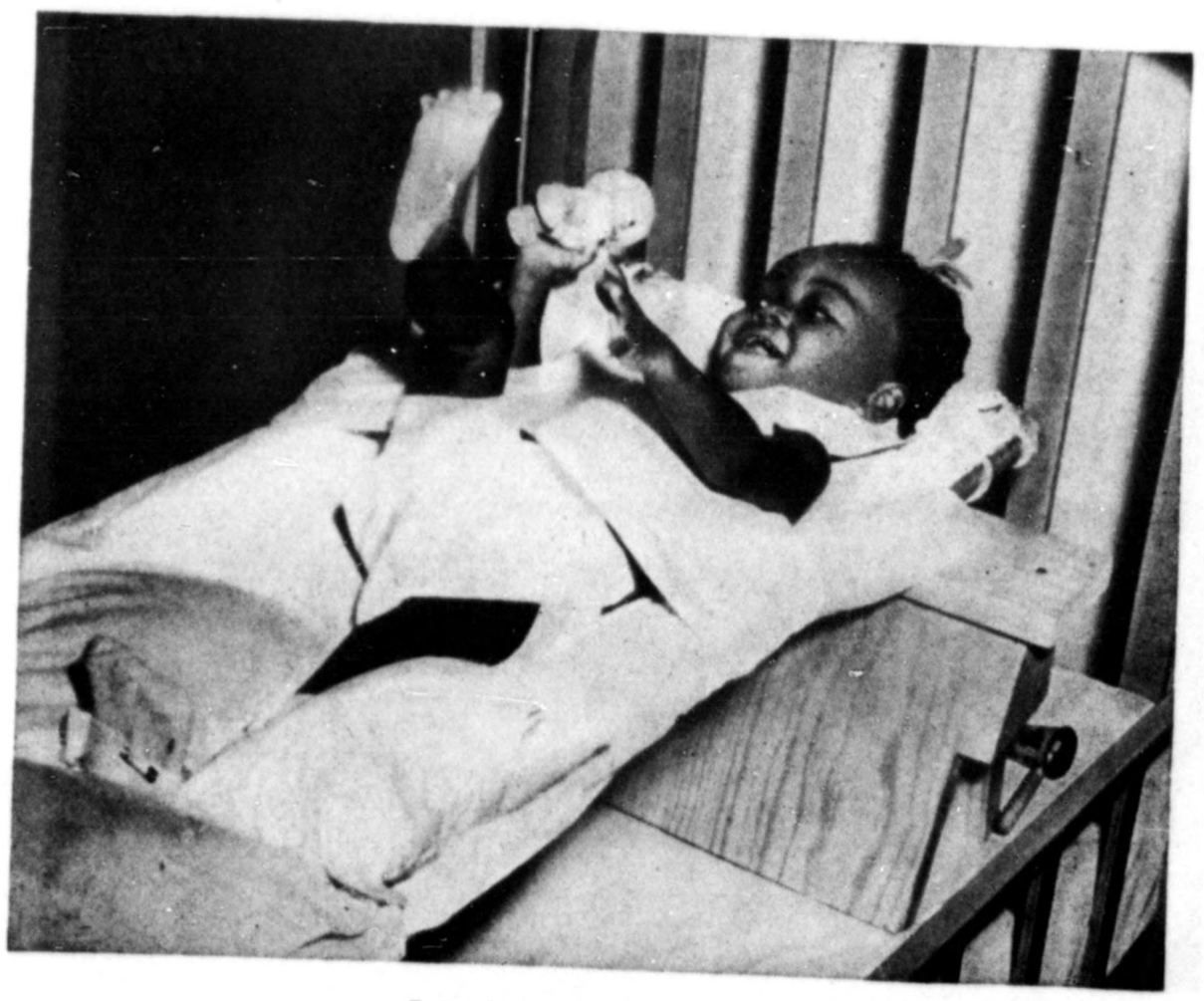
I.

Beginnings

SPREAD OVER 2,000 rolling acres on the southern edge of the Piedmont Plateau in the State of Alabama, forty miles from the capital city of Montgomery, lies Tuskegee Institute, life work of the great educator, Booker T. Washington. Here, on a campus which has seen some 30,000 Negro students, is a winding road that passes the Chapel with its graveyard in which the founder of the Institute and Dr. George Washington Carver, Negro scientist, are buried. Following that road you come to a square red-brick building on the fringe of the Campus. This is the Tuskegee Institute Infantile Paralysis Center.

The Center is a newcomer compared to the Institute or to the 34-year-old John A. Andrews Memorial Hospital, of which it is a part. It opened its doors only in 1941. But this tiny battle station in the nationwide fight against infantile paralysis, created by The National Foundation for Infantile Paralysis with more than half a million dollars given by the American people in the annual March of Dimes, is a completely equipped medical institution. Airy wards, sun decks, treatment pool, physical therapy treatment rooms, plaster room, laboratory, brace shop, recreation hall, doctors' and nurses' offices make the Center, in conjunction with the surgical facilities of the hospital, a haven for Negro patients and medical specialists unique among hospitals anywhere in the world.

Tuskegee's Infantile Paralysis Center is, on a smaller scale, the same kind of institution as Georgia Warm Springs Foundation, 90 miles away in a sister state of the South. The two, alone in the country, are devoted exclusively to the one disease of infantile paralysis, known to medical science as poliomyelitis, and especially to the care of those patients whose crippling after-effects of the disease offer unusual or unsolved problems. Both are important as centers for clinical research and the education of professional personnel to care for victims of the disease.



Jeanie Franklin, of Montgomery, Ala., shows the cheerfulness of most infantile paralysis patients as she plays, baby-like, with a toy and her one good foot.

Dr. F. D. Patterson, president of Tuskegee Institute, says: "The unit was not built with the idea of reaching all Negro patients, but to be a center for training doctors, nurses and physical therapists and for studying unusual cases. It is taking

some patients, and will take more. But the greatest good will come through the kind of cases successfully treated and the enriching experience afforded Negro doctors, among whom there are at present dangerously few orthopedic surgeons."

The Center's work has been planned to have far-reaching effect on the welfare of thousands. For, as patients are treated according to the newest and best methods available, Negro doctors, nurses and physical therapists are trained to use new techniques and new scientific information for the benefit of their race.

It was recognized in 1939 when the National Foundation, founded by Franklin Delano Roosevelt, made its first grant to Tuskegee — only one year after its own incorporation as the organization to lead, direct and unify the national fight on infantile paralysis — that such an institution was badly needed. There was no scientific evidence that Negroes were not as susceptible to infantile paralysis as members of the white race. Nowhere had accurate statistics been compiled or clinical studies made to determine whether the disease attacked all races similarly. Furthermore, there was a shortage of trained Negro medical specialists. The Center offered at least a beginning to the solution of these problems.

Why Tuskegee?

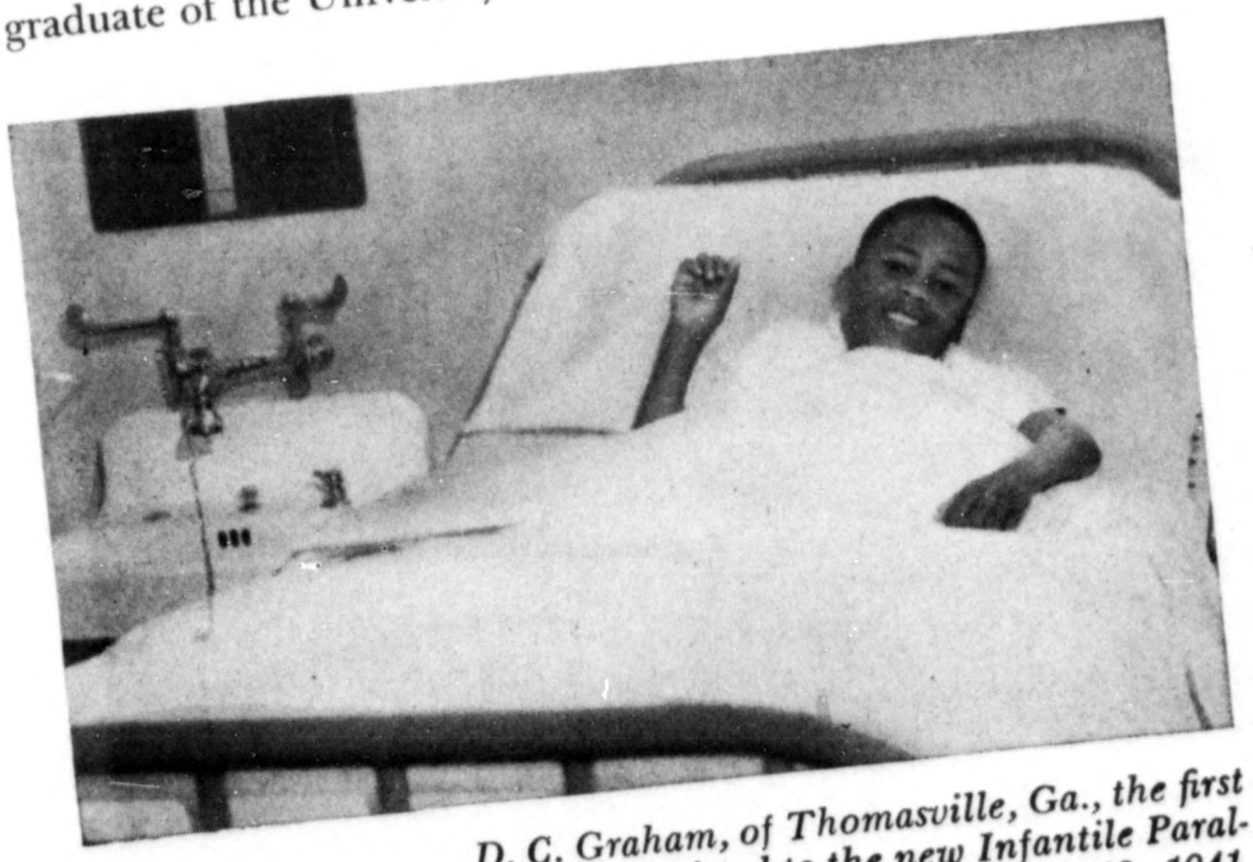
Tuskegee Institute was chosen as the location for the new unit because:

1. Its facilities — including its workshops in wood, metal, leather, etc. — provided unusual advantages for the many patients requiring mechanical appliances and vocational training.
2. The average low humidity, mild winters and temperate climate of this section of Alabama provided beneficial and attractive environment for patients.
3. The population of the surrounding country for hundreds of miles in all directions was preponderantly Negro, making it logical to draw patients from not too great distances.

4. There was no other *complete hospital* for the care of Negro crippled children in the area from Nashville, Tenn., to New Orleans, La., and from Atlanta, Ga., to Jacksonville, Fla., although there were beds for them, of course, in several general hospitals.

In addition, the record of the John A. Andrews Memorial Hospital, of which the Infantile Paralysis Center is a unit, was such as to justify the acquisition of a national research and educational center. Dr. John A. Kenney, its medical director, had organized there in 1912 the first medical clinic of the National Medical Association. This largest and oldest of Negro clinics in the United States has been held annually ever since.

Dr. John W. Chenault, the hospital's director of orthopedic surgery, is also head of the Infantile Paralysis Center and has been from its inception. During the war period he carried on as sole attending physician of the Center, assisted by consultants and private physicians of the area. Dr. Chenault is a graduate of the University of Minnesota, and former Rocke-

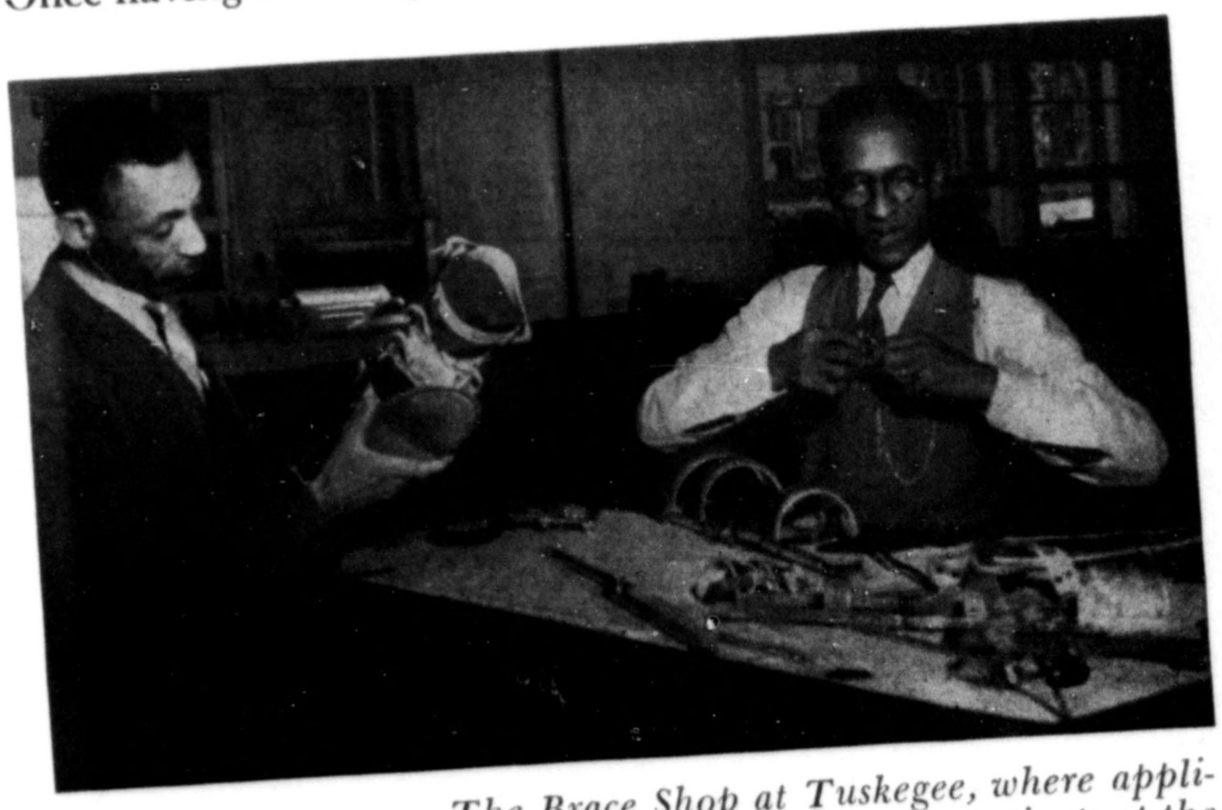


D. C. Graham, of Thomasville, Ga., the first patient admitted to the new Infantile Paralysis Center at Tuskegee on Feb. 19, 1941.

feller Fellow in Orthopedic Surgery at both the University of Chicago and the University of Iowa.

The Opening

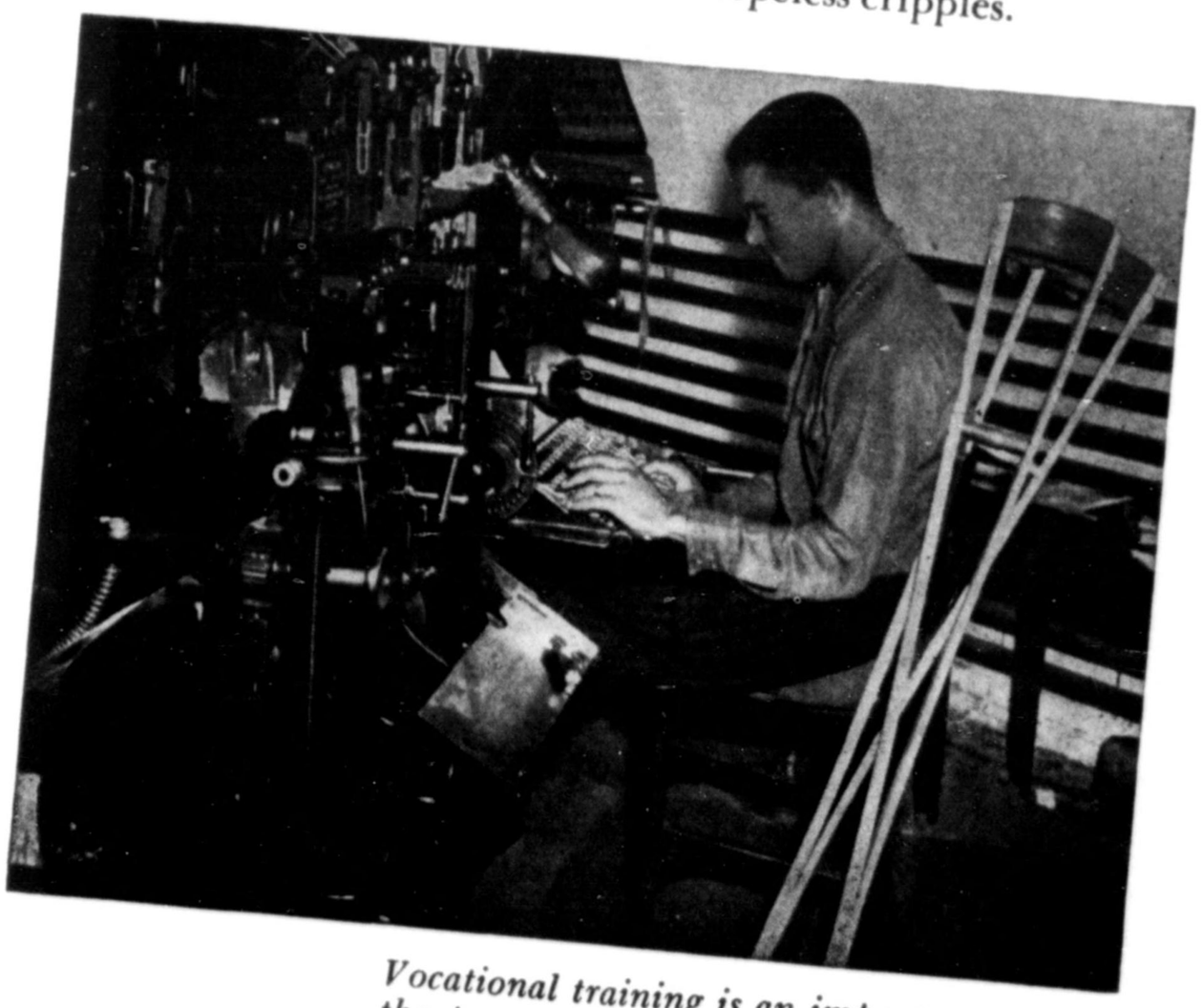
The Center was dedicated January 15, 1941. The first patient was admitted February 19th. He was nine-year-old D. C. Washington Graham, of Thomasville, Ga., whose father brought him to Tuskegee three months after he had been stricken by infantile paralysis. Young "D. C.," as he was always called, was as typical a Tuskegee Center case as any who came later. His right leg was completely paralyzed, and part of his left leg. Yet when he was discharged in April, 1942, he was walking with the aid of braces. He has been back once for a check-up and new braces, was due back again in 1945. This young patient exemplifies the spirit of the Center: badly-crippled, sometimes almost hopeless cases are accepted and a valiant effort is made to find a way to improve their condition. Once having taken a patient, the Center continues to provide



The Brace Shop at Tuskegee, where appliances and shoes are made for patients at the Infantile Paralysis Center. Left, G. L. Washington, former director of the Dept. of Mechanical Industries of Tuskegee; right, the late Frank West, Tuskegee shoemaker.

advice, appliances and whatever new treatments are possible as the years go by.

The first brace ever made at the Center was in March, 1941, for a 33-year-old woman, Pauline Freer, of Lafayette, Ala. More than 20 years before, she had had infantile paralysis which left her with a deformity of the knee. She stayed at the Center only two months. After she left, word came back that she had married. She, too, is typical. Renewed confidence and ability to live normally imbue most of the former patients. Through physical improvement; thanks to the Center, and vocational opportunities often offered by the Institute, economic and social independence can be achieved by infantile paralysis victims who, without their Tuskegee experience, might have remained helpless and hopeless cripples.



Vocational training is an important part of the program at Tuskegee. Lonnie May, of Luther, Oklahoma, has learned to operate a linotype machine, and will go home restored not only to health, but to social usefulness.

II.

Meet the Children . . .

STATISTICS, even when impressive, are cold. The tragedy of human suffering, the futility of human crippling, the dawning hope of human usefulness and physical well-being cannot be conveyed in terse reports of numbers of patients admitted and discharged at the Tuskegee Infantile Paralysis Center. Besides, the figures are and must continue to be relatively small. As an educational and research center for Negro doctors, nurses and physical therapists, the influence of the Center is widespread. But many more patients are and will be cared for in other institutions each year than the facilities of the Tuskegee unit ever can allow.

None the less, what has been and is being done for the patients at Tuskegee gives a bird's eye view of the human factors involved in every attack of infantile paralysis anywhere in the United States. And so, if you would understand what the work at Tuskegee means in human terms, meet the children — some of them at least — who have come to the Center in its first four years of life.

MARY LEE

A stocky, round-faced little girl of 12 was working in the cotton fields near Salem, Ala., about a mile from her home. It was a "rented field," and from it her father and mother, four sisters and six brothers, would wrest most of the family income for the year. Naturally, they all worked. Mary Lee was among the hardest workers in the family. That's why her brother was surprised when she put down her hoe and complained: "My head hurts!"

She walked across the sun-baked fields and along the winding red-clay road to her home, where her mother told her to "lay down and rest till you feel right smart again." That was on a Thursday. Mary Lee rested until Sunday morning, but

she did not feel "right smart." She felt, if anything, worse; so bad that, after church, her mother sent for the crossroads doctor. He discovered she could not move her arms or legs. He sent for another doctor. Together the diagnosis was made: infantile paralysis.

There was nothing to do but keep her quiet, in bed, and have the public health nurse visit each week—"to try to work her legs and arms for her," said her mother. That was in 1938, three years before the Infantile Paralyis unit at Tuskegee was opened.

Mary Lee got well in about four weeks; her fever receded, she began to eat, her eyes were only normally bright. But her legs were grotesquely drawn up under her. She had to be carried to church each Sunday in the car, and "even when she was layin' down she was fixed like she was sittin'," her mother declared. She could not go to school, but she got some books and tried to learn at home. Mary Lee overnight was a cripple — but as ambitious as before her affliction.

She went to the public health clinic in Opelika twice in the next four years, to see if anything could be done for her. When the Tuskegee Center opened, the clinic advised her to apply for admission. She was admitted in April, 1941, less than two months after the unit opened.

For more than a year, until her discharge in May, 1942, Mary Lee lived at Tuskegee. Through an operation her hamstring muscles were transplanted. She was given muscle reeducation, carefully nursed and fed and, when she was well enough, her schooling was continued at the hospital. She walked out of the hospital using two Kenny-type walking sticks, her legs perfectly straight, her head high.

In March, 1945, when a representative of the National Foundation called to see how Mary Lee was progressing, the girl was a mile from her rural home, visiting a brother. She had walked over after school, using her walking sticks to guard against the possibility of stumbling and falling. But she hardly leaned on them as she made her way out of the house to greet her visitor. Had she walked a whole mile? Why, that was nothing! She walked three miles a day, regularly — a mile and a half to and from school, where she was completing the 7th

Edward

grade at the age of 19. She confidently expected to be graduated in a year and to take a tailoring course at Tuskegee Institute after that. The whole family of 12, and even some of the 25 grandchildren her parents now have, are mighty proud of Mary Lee.

"If it hadn't been for the hospital, she'd have had to be toted everywhere," said her mother.

EDWARD

When the wood truck stalled on that country road outside Montgomery, Ala., on July 22, 1942, 12-year-old Edward got out and tried to help his father, two brothers and two sisters push it. The family ran a wood yard, making deliveries in the city; unless the truck moved, business ceased. But, after a time, Edward gave up.

"His head hurt him so bad he felt it was like to burst," said his mother.

That was the onset of his affliction by infantile paralysis. He had been subject to headaches for two years, so his parents thought little of it at first. When, after two and a half hours, the truck finally started, they told him merely to go to bed and, since the next day was Sunday, to lie a-bed all morning. His mother found him late that afternoon, when she thought he was playing in the yard with the other children, lying across a day-bed, burning up with fever. She put an ice cap on his head and called the doctor.

For two weeks Edward lay in bed, unable to move. Gradually "his head was carried back so far he couldn't straighten it out," said his mother. The doctor came. The visiting nurse followed – twice a day for weeks. A spinal tap was taken – and the diagnosis of poliomyelitis was made. A rudimentary foot-board

against which he could rest the soles of his feet and a bedboard under the mattress were provided. He did not get well. An ambulance finally took him 40 miles to Tuskegee.

For seven months Edward lay flat on his back. Then, for four months, he sat in a chair. Finally he was graduated to crutches. In March, 1945, he still was in the hospital but walking. Walking everywhere inside the hospital, on the sun deck, across the campus, his right leg dragging a bit, but without braces. It was joy to him just to walk. It was joy to his family when he went home for visits – four times up to March, 1945 – two Christmases and two Easters.

Edward was in the 9th grade two and a half years after he was struck down, and had started learning the shoemaking trade at an Institute class. Some day he hopes to earn his living at shoemaking or, if possible, bracemaking, in which he is gratefully interested.

Asked if he had a message for his mother when the National Foundation representative saw her, Edward said, smiling broadly: "Tell her hello – and tell her I'm doing fine."

DORIS

Doris lived in a gray-shingled shack perched on the side of a hill overlooking the smoky Montgomery railroad yards. She was sitting on the steps, barefooted, wearing a clean cotton dress, when the National Foundation representative arrived. Her father, a railroad worker, stood in the doorway as the visitor approached down the rutted valley path.

"I'm from The National Foundation for Infantile Paralysis," said the visitor.

At the words Doris looked startled.

"She thinks you want to take her back to the hospital," said the father apologetically. "She was only three when she went, and was powerful lonesome."

Reassured, Doris got up off the step and demonstrated how she could walk after more than two years back home from the Tuskegee Center. Her right leg was slightly stiff and the right foot turned out, but she walked with only a slight limp and this, her father said, was hardly noticeable when she wore her brace, which she did to go to school.

Doris was stricken in October, 1942. She took sick suddenly – headache, vomiting, fever. The local doctor pronounced it infantile paralysis at once and, although Tuskegee is not primarily a hospital for treatment of the acute stages of the disease, arranged for her to go there within a week. There was no other transportation, so she went by bus with her mother who took a day from her job at a shirt factory. Doris stayed at the hospital eight weeks, has been back three times since for check-ups and readjustment of her braces.

Like so many others, although Doris had a sister and a brother, she was the only one of the family who got the disease. She is six and a half now, in her first year at school. For many years to come Doris will go back to Tuskegee to be examined, to have her orthopedic appliances changed, to take whatever treatment can be given her to eradicate the marks of infantile paralysis.

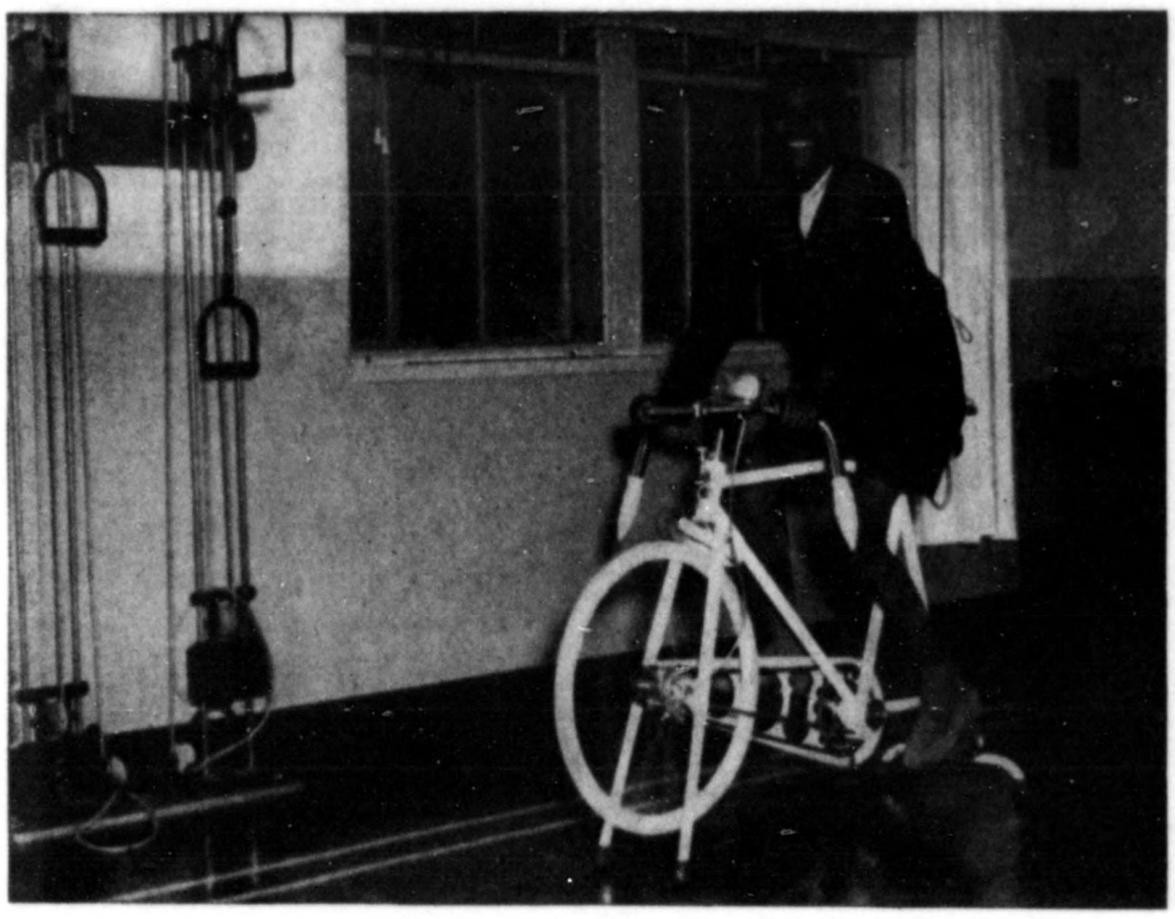
JOHN

There were 14 children in the fatherless family in August, 1941, on that Negro farm near Canton, Ga., where infantile paralysis struck. Four boys, ten girls, and all reasonably healthy – until first one, then two, finally three of the boys sickened, took to their beds, vomiting and feverish.

One hot, bright day toward the end of the month all three were carried through the entrance of the Tuskegee Infantile Paralysis Center. Three in one family, an unusual occurrence, warranted bringing them to the Center. Next day, however, two of the boys were dead. Only John remained alive.

John's hand and both legs were affected; all joint motion was limited; he was in pain. Toronto splints were applied to both his legs and both his arms. That was in August. By November no splints were needed for his legs. By May, 1942, he was discharged from the hospital, without crutches or braces, and with a newly-acquired skill: bicycle-riding.

John had received a variety of treatment not possible in many hospitals caring for crippled children: splints, hot packs, muscle re-education, underwater pool exercise, electro-therapy. All the facilities of a modern treatment center were there for him to use. His brothers came too late to be helped. But



John, only survivor of three brothers stricken with polio at Canton, Georgia, excercises on the mechanical bicycle in the physio-therapy department.

John is back at home with his 37-year-old mother and ten sisters — a 16-year-old boy now, able to take his place with his one remaining brother as the men of the family.

MADIE

Through the black-linoleumed corridor of the second floor of the Infantile Paralysis Unit of Tuskegee Institute's hospital a tiny girl with licorice-button eyes and an infectious smile pattered on sturdy straight legs. As she ran, her right arm hung useless from the shoulder.

"Say hello," said the nurse.

Madie clutched her right arm in her left hand and placed a tiny hand in the visitor's own. The fingers moved, lightly, in greeting. It was more than anyone had dared to hope for her only six months before.

Madie, not quite four, came from Abbey, Ga., in Septem-

ber, 1944, her legs and arms tight with the aftermath of infantile paralysis, her right arm and hand totally paralyzed. Her recovery, not yet complete, probably was made possible by prompt and conscientious efforts on the part of her mother and the county nurse from Sylvester, Ga. Two days after Madie came down with a headache and a fever of 101°, the nurse showed her mother how to give her hot packs. For almost two months she was cared for as tenderly as a distracted mother's love and energy allowed.

"She has a flail arm, but careful treatment and possible surgery may improve that," said the physical therapist. "There is strength left in her fingers. She cannot eat with her right arm, but she can move her hand. She is so young she can be trained to use her left hand for writing. Her mother's work probably saved her."

Madie walks, runs, bends over to touch her head to her knees. Some day, when she rejoins her mother, father, sister and brother, she will be able to go to school like anybody else.

ALBERT

He is hardly a child now, at strapping 22, but Albert still is a familiar figure in the halls of the Tuskegee Infantile Paralysis Center. For he is assistant to the official Tuskegee photographer.

Albert came to the hospital as a patient from Augusta, Ga., at the age of 18. He had been crippled by infantile paralysis when he was nine months old. He grew up without hope of being able to use his right leg, on which the foot was twisted and lifeless. He walked only with a crutch and had an awkward hampering limp.

But one day, when Albert was in the 8th grade, his teacher told him about the new unit at Tuskegee, wrote for him to find out if there were anything that could be done for him. He was admitted in June of 1941, discharged a year later.

While in the hospital, Albert had an operation on his leg and an amputation of his right foot. Then he was fitted with an artificial foot, which he learned to use with almost as much facility as his good left foot, setting it down squarely and firmly without any need for crutches. He uses a cane today, to keep

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him from limping at all. He can walk without the cane if he limps a little.

Albert never saw a photographer's dark room until he was sent as apprentice to P. H. Polk, Tuskegee photographer. His work was so promising that, when the one year rehabilitation course provided by the Crippled Children's Services of his native state of Georgia was finished, he was kept on as a paid worker. He lives on the Tuskegee campus, leading a completely normal life, rides a bicycle, works in a garden, even soon may learn to dance.

Willie

WILLIE

Six-year-old Willie also was in the hospital in March, 1945, eight months after his admission in July, 1944, when he was unable to walk at all. The Montgomery, Ala., boy received hot packs and muscle re-education for his paralyzed left leg and his weak right one. But Willie was walking now, without discomfort, though he leaned heavily on the outer border of his left foot. Corrective shoes, hot packs, continued muscle re-education, were reducing the foot deformity, the stiffness of his back, bringing back strength to both his legs.

It might take a total of two years to do everything for Willie that could be done. For if he went home and were allowed to run and play, he might not remember how he had been taught to use his muscles, and so would undo the benefits of a régime which, if followed, might demonstrate not only for Willie but for other children similarly affected what proper treatment can do to restore normal function and health. It takes a long time, even after a child walks, to establish patterns of motion which will continue to benefit him in normal life.

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Yes, these are seven children, picked at random from the 101 who have been patients in the Tuskegee Infantile Paralysis Center. Not all got well. Not all *will* get well. For infantile paralysis, when it leaves crippling in its wake, is a disease which cannot be wiped from the record of a human life like chalk from a blackboard.

There also is Leon, 36-year-old road-worker from Louisiana, stricken five years ago, who has been in the hospital two and a half years. His legs are useless, and he spends his time in a wheelchair, playing with the children among whom he is the only adult. Leon will be discharged as soon as a home can be found for him — his wife and daughter have disappeared; no one knows where they are.

There's Isaac, who at 16, has come all the way from Baltimore, after three weeks in a respirator, and who lives with useless arms and legs, stiff back, stiff neck, stiff shoulders, hoping for improvement as elusive as a will-o-the-wisp, five months after he was stricken.

There are Charles — with casts on both his legs — and Hester, whose whole body was involved, but who soon will be ready to try two walking sticks although her arms and hands still are weak.

Cripples, all of them, made so in the sudden onslaught of the disease which still baffles scientists in the year 1945, though they race with the paradoxical slowness of research toward final illumination of the mystery. Cripples, yes—but cared for. And as they are cared for, men and women learn how to give *better* care to infantile paralysis patients.

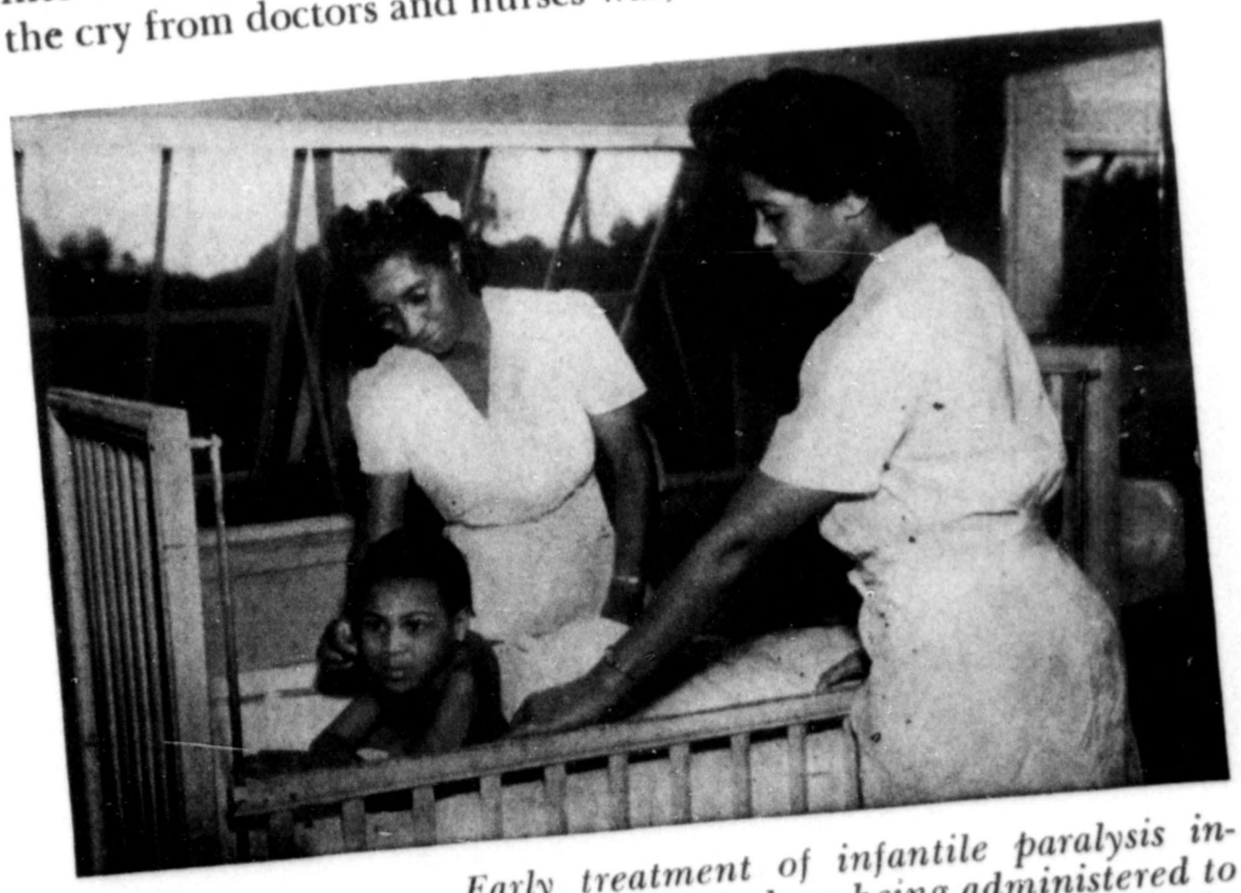
Charles Brooks, 24, of Ivy Depot, Virginia, is learning all over again to walk. Not so long ago he was helpless, a bed patient.

III.

The First Four Years

THE TUSKEGEE INSTITUTE Infantile Paralysis Center was established as an after-care center, *not* as a hospital for communicable diseases into which infantile paralysis patients traditionally go for the first weeks of their illness. But the year the Center opened, an epidemic of infantile paralysis broke out in Alabama. It was necessary to accommodate victims without delay, and even to add six beds to the 24 that had been the capacity of the Unit.

The daily visible improvement in those patients brought into the hospital in the early stages of the disease was such that the cry from doctors and nurses was, "If we could only *always*



Early treatment of infantile paralysis includes hot packs here being administered to Hester Fitts of Marian Junction, Ala., by Kenny Packers Mrs. Elaine Benn and Mrs. Fletcher Mae Cooks.

The Treatment Pool at Tuskegee Infantile Paralysis Center, where young Caleb Robinson is receiving treatment from Physical Therapist, Marjorie A. Franklin.

get them early!" Though still primarily a hospital for after-care, the Center admits enough nearby cases in the acute stage to ensure that professional workers going out from Tuskegee will have a wide knowledge of early techniques for minimizing crippling.

In 1942 and 1943, Alabama patients who had succumbed to the disease in 1941 continued to come for after-care. They came from other states, too — as far north as New York, as far west as Oklahoma. Most of the 101 patients admitted to the hospital from March 1, 1941 to December 31, 1944, were from the southern states, more than half from Alabama and Georgia — the surrounding territory. Twelve patients were admitted on two or more occasions; 58 stayed for more than a year. One patient, still there, has been in residence for two and a half years. In addition, out-clinic patients were served regularly until transportation difficulties in 1943 closed down the weekly clinic. It will reopen when the war ends.

Human Statistics

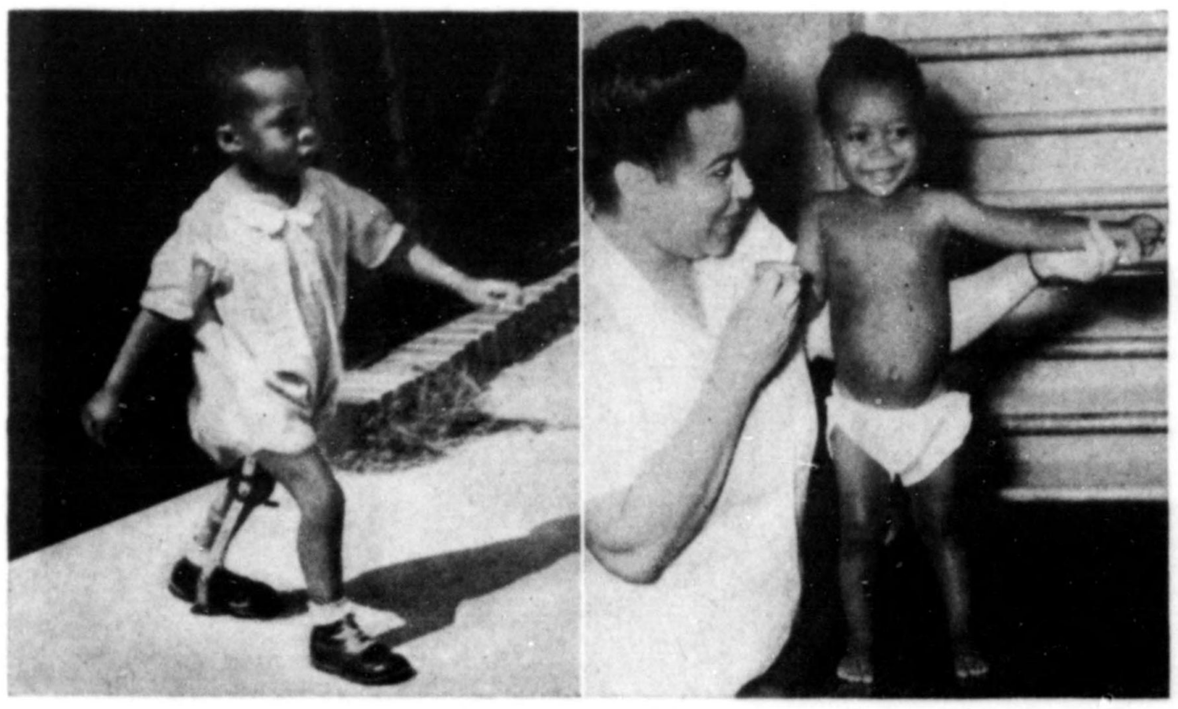
One hundred and one persons, chiefly children, hospitalized at the Center in four years, seem pitifully few in a nation

which, in the one year of 1944, saw more than 19,000 new cases of infantile paralysis! The significance of the 101, however, does not lie in their number. Other facts must be considered.

1. They were served by a staff of one doctor, seven nurses, and two physical therapists until recently, when the staff was reduced by two nurses and one physical therapist. This handful of Negro specialists has acquired invaluable experience in the care of infantile paralysis patients, forms a nucleus for spreading knowledge.

2. Most of the patients were in advanced stages of crippling, some so badly deformed and weakened that only expert surgery, treatment and re-education could create noticeable improvement. The majority improved to a great extent.

3. The patients received prolonged treatment, not readily available in most hospitals. They were not dismissed after a few weeks or months. The average length of stay ranged from



It was some time after he first came to Tuskegee before little Clifford Marshall, of Bowling Green, Ky., could stand on his own two legs, even with the aid of Physical Therapist Mrs. Eva Lee Baxter. Today he strolls nonchalantly about the grounds, aided only by a brace on one leg.

10.6 months in 1941 to 14.8 months in 1942, 15.6 months in 1943, and 18 months in 1944.

4. In the four years there were only four deaths, two in 1941 and two in 1943.

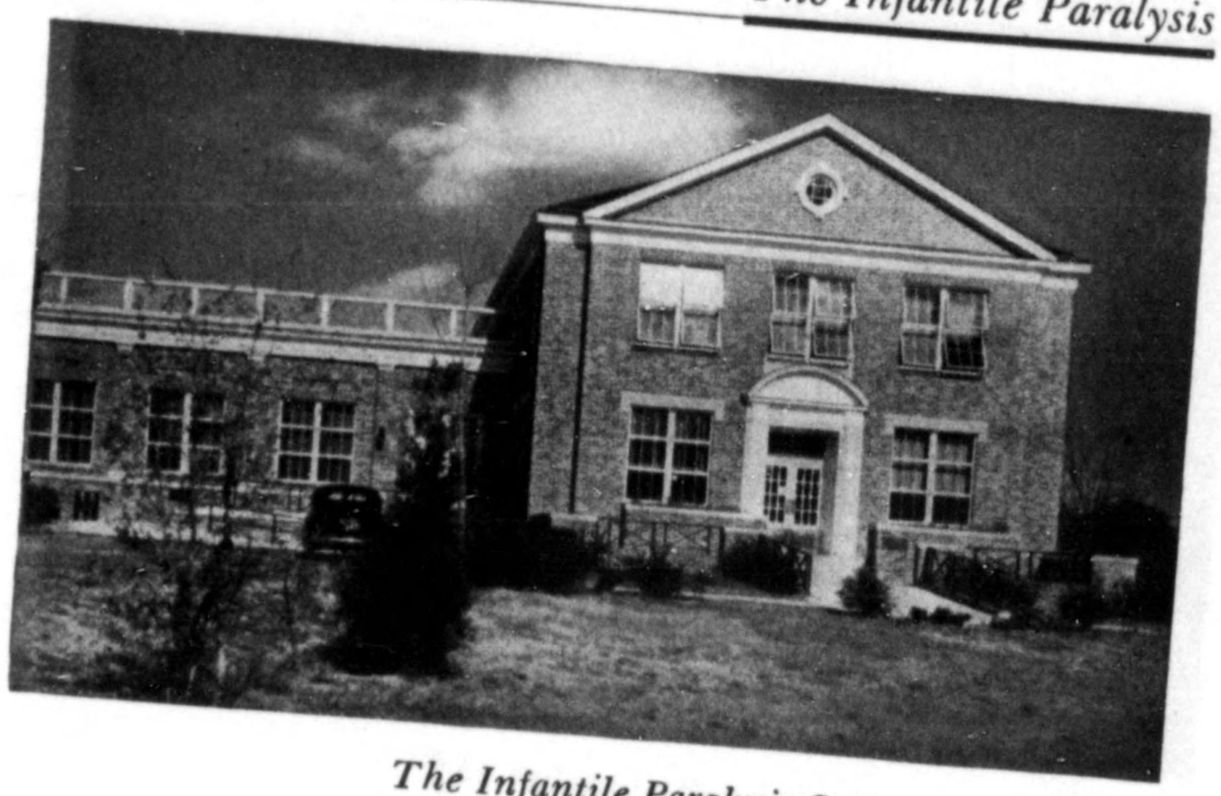
An indication of the *size* of the job done for the 101 persons lies in the fact that in 1944, with only one physical therapist employed, 2,324 physical therapy treatments were given. Of these, 832 were muscle reeducation, calling for the highest skills of the profession.

Professional Training

Another benefit to the Negro medical profession was a two-week institute on the care of acute and convalescent poliomyelitis, held in June, 1944, sponsored by the Georgia State Chapter of the National Foundation. Part of the teaching staff of Georgia Warm Springs Foundation participated, and six doctors, sixteen public health nurses, six institutional nurses, and ten private nurses attended.

Tuskegee Institute has a nursing school, to which 100 cadet (student) nurses have come since the Center opened. Three of the students' 30 months of training are spent in the Infantile Paralysis Center. This means 100 additional Negro nurses have had first-hand experience with the care of infantile paralysis patients during their training.

Plans for the enlargement of the Infantile Paralysis Unit were under way almost from the first. Toward the end of 1944, building actually started, financed in part by the National Foundation, although the Government supplied almost two-thirds of the funds. The expansion is a joint one for the John A. Andrews Hospital and the Infantile Paralysis Center. When completed, the Center will have 26 more beds, giving it a capacity of 56 beds for infantile paralysis patients. The hospital, which specializes in surgery and obstetrics, will have 34 more beds. The addition was scheduled to open in the summer of 1945, although additional staff had not yet been obtained. A new dormitory for student nurses also is to be built during 1945, partly by Government funds and partly by National Foundation grants.



The Infantile Paralysis Center at Tuskegee.

IV.

Let's Look Around!

IF YOU WERE to visit the Tuskegee Infantile Paralysis Center, this is what you would see:

A modern, three-story, fireproof building, bound to the John A. Andrews Memorial Hospital by a one-story corridor; over its white Georgian doorway in gold letters the words, "Infantile Paralysis Unit."

You would walk into a linoleum-floored soundproofed lobby. To the right, you would find the doctor's office, to the left the secretary's office, and beyond the lobby, through swinging doors, six rooms, three on each side of the hall, dedicated to three separate purposes.

First, on the right, the plaster room where casts are made and applied; then the head nurse's office; finally, a spacious room whose door proclaims it the "Recreation Center" but which, for six hours a day, is the schoolroom for the child patients. The room is always full of voices and activity, as the children with their crutches on the floor at their feet or sitting

in wheelchairs, strive to keep abreast of their friends on the outside. The pictures, books, curtains — in keeping with the restful green and gray color scheme of the hospital — were donated by the Phi Delta Kappa Sorority at Tuskegee Institute.

On the other side of the first floor hall are the laboratory, where urinalyses, blood counts and other pathological examinations are made, the nurses' lounge and the brace shop, where children's appliances are fitted after being made in the Institute brace shop which is part of the shoe-making division. The Center's brace maker participates in the teaching program.

In the basement, reached by electric elevator, are the physical therapy treatment rooms; a gymnasium equipped with whirlpool and leg baths, electrotherapy machines, facilities for massage; a smaller room with exercise machines such as a bicycle and a shoulder wheel; and a separate room containing a stainless steel Hubbard tank used especially for the treatment of small children who cannot use the pool. At one end of the basement is the green-tiled treatment pool, 25 by 30 feet in size, and four feet deep, with a capactiy of 20,000 gallons of water maintained at a temperature of 92 degrees. Gleaming chrome metal guard-rails and a hydraulic lift for the transfer of patients from stretcher-carts to pool complete the equipment.

The top floor is the patient floor, containing six rooms with hospital beds lined up so they face each other, not too close together. Except when physical therapy treatments are being given from 10 o'clock until noon, or when a teacher is visiting the bedside of a patient who is unable to come downstairs, there are always visitors — not from the outside, but ambulatory patients, going around to play with those who cannot get out of bed. Cheerful, noisy and mischievous, they are as happy a lot as you will find anywhere. One of the never-solved mysteries of this disease is the cheerfulness which seems to accompany its victims!

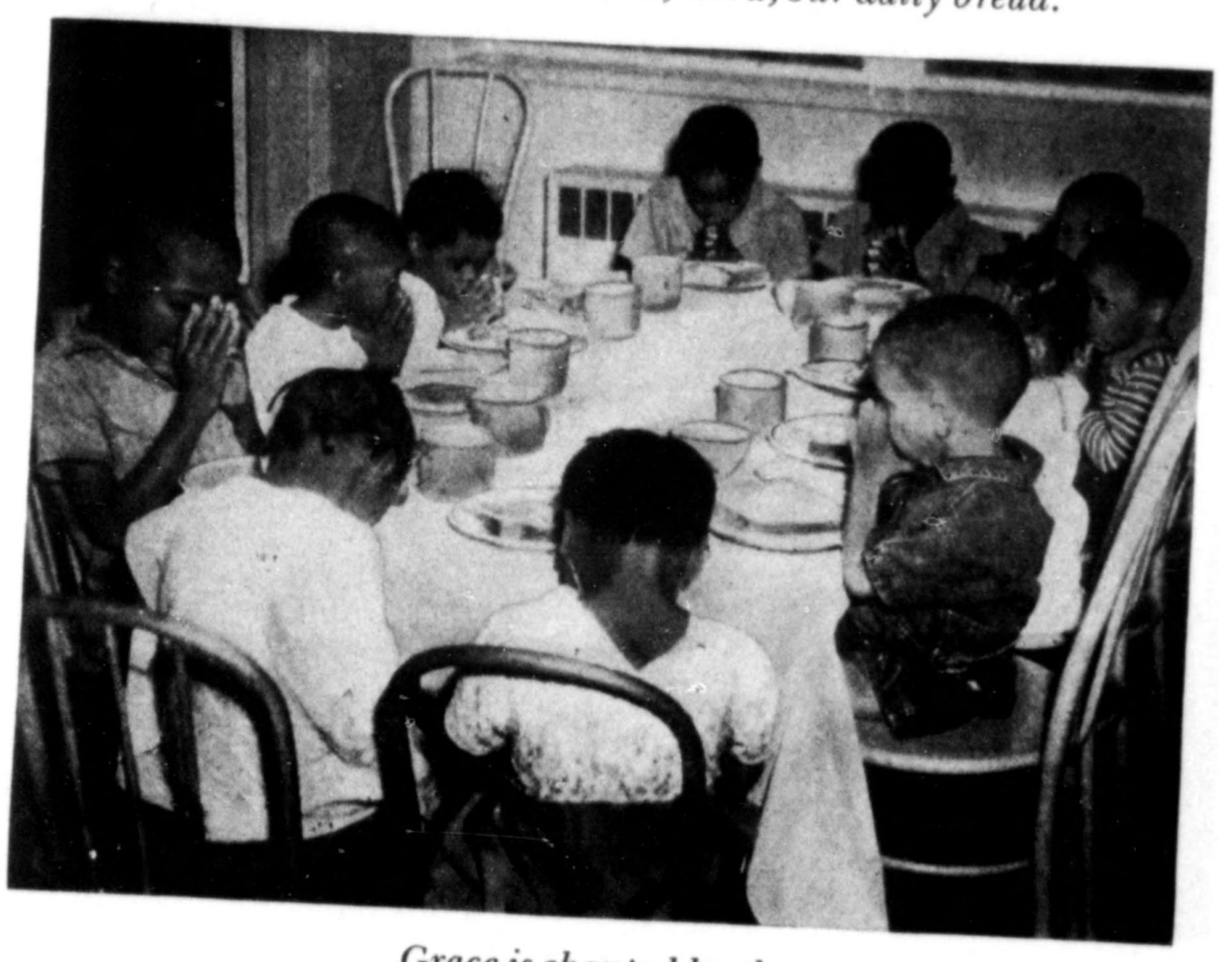
The bed patients wear hospital gowns, but others their own clothes: cotton dresses or denim overalls. They are urged to dress and undress themselves whenever possible.

On fair days, which means most of the time, the walking patients and those in wheelchairs go out on the sun deck for

part of the day. Sometimes the bed patients are moved to wheeled cots for sun baths on the deck.

Most of the children get out of their cribs or beds for meals, which are served in the wide upper corridor near a big back window. Even the two-year-olds wait until all are seated, then clasp their hands under their chins and chant a grace:

"God is Grace, God is good
And we thank Thee for this food
Bow our heads, must all be fed
Give us, Lord, our daily bread."



Grace is chanted by the young patients in the Tuskegee Infantile Paralysis Center before each meal. Those around the table are Ida Mae Wallace, Opelika, Ala.; James Hicks, Jr., Atlanta Ga.; Caleb Robinson, Notasulga, Ala.; Clifford Marshall, Bowling Green, Ky.; Charles Robinson, Douglasville, Ga.; Mary Jo Graham, Alexander City, Ala.; Theodis Sanders, Phenix City, Ala.; Hester Fitts, Marian Junction, Ala.; Madie Pickens, Abbey, Ga.; Willie Rufus Foster, Birmingham, Ala., and Willie Presley, Montgomery, Ala.

V.
Admissions

PATIENTS ADMITTED TO THE TUSKEGEE INFANTILE PARALYSIS CENTER

Year	*On Rolls*	*New Patients*	*Re-admissions*	*Kept from Previous Years*
1941	30	30	0	0
1942	57	22	7	28
1943	48	27	5	16
1944	36	22	0	14
	171	101	12	58

ADMISSION to the Center is made by the filing of application forms obtainable from the office of the Director of the Center. Any Negro patient, who has been diagnosed by a physician as having or having had infantile paralysis, is eligible. However, the waiting list is long, and patients must be selected on the basis of the problems presented by their cases, as well as the prognosis of probable improvement by treatment at the Center, which cannot be obtained by the applicant elsewhere.

Patients are classified as full pay, part pay and free:

	Full Pay	*Part Pay*
Adults	$4.00 per day	$2.00 per day
Children (under 12)	$3.00 per day	$1.50 per day

In order that a patient be admitted as a free case he must be referred by an authorized social agency or by a County Chapter of The National Foundation for Infantile Paralysis. The Chapter (there is one close to your home – look it up in

the telephone book) will pay the expenses of any Negro patient acceptable to the hospital who is unable to meet the hospital fees. It will also provide transportation if needed. No funds are provided by the hospital for the transportation of patients, but in the case of acceptable free patients all necessary medical and surgical attention and all mechanical appliances are provided.

Ambulatory patients or those requiring limited physical therapy may obtain accommodations in the surrounding community and receive treatments through the out-patient department at a nominal fee. However, patients in those parts of the country where adequate treatment is available are not encouraged to come to Tuskegee unless their cases present special opportunity for study and the use of new medical techniques.

While they're being treated, they're also under the supervision of a capable teacher learning reading, writing and 'rithmetic, at Tuskegee.

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