Life Begins

YALE FILMS OF CHILD DEVELOPMENT

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WIDE RANGE RECORDING

WESTERN ELECTRIC SOUND SYSTEM

PRODUCED BY YALE CLINIC OF CHILD DEVELOPMENT

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NARRATION BY ARNOLD GESELL, M.D.

Of all living creatures, the human infant has the most prodigious and, of course, the most fascinating powers of growth. This growth is both mental and physical. You will soon see on the screen how the infant grows and takes shape in mind as well as body. He has in… He has intelligence, feeling, will, personality. He has an inborn individuality, governed by natural laws. We need a better understanding of these laws, and then we shall have a more adequate appreciation of the psychological importance of infancy. The social and economic costs of mental abnormality have now become so heavy that science is literally compelled to investigate those early life forces which determine the patterning of human behavior. We cannot manage our […] civilization unless we build firmer foundations of mental health in infant and child. And nurse, doctor and scientist all have a part to play in the protection of the mental welfare of the infant. One of the great tasks of medical science is to penetrate into the nature of human personality, and into the conditions of mental health. In our clinic at Yale University, we have, for many years, been studying the mental growth of normal infants. Our

purpose is to establish a baseline as a line of reference for the diagnosis of the mental characteristics of the infant in their early formative stages. We have used the motion picture camera as a scientific tool for charting, month by month, the growth of the infant's behavior. His posture and locomotion, his grasp and manipulation, his play, exploitation, learning, and his social reactions. The cinema is an ideal tool for making visible the forms and the structured essence of the mind.

Here is one of the many mothers who have helped us in our program of research. She knows that we are going to make a motion picture record of her baby in a special clinical crib, in a photographic dome, encased in a one-way vision screen. Here is the clinical crib and the infant-size Morris chair, in which the baby will sit during part of the examination. And here are the pockets at the end of the crib, which contain the psychological test materials to be used in the developmental examination. The mother now takes her baby into the photographic dome, a glimpse of which is now before you. The baby is 16 weeks old and already our observations have begun.

This, remember, is a 16-weeks-old infant. How does the infant react to the dangling ring? He gazes at it, slashes arms and legs, closes in, and finally seizes it. A primitive form of prehension, typical of 16-weeks maturity. A significant behavior pattern testifying to normal growth. The camera permanently records the growth of all these behavior patterns in the sensitive cinema film. The records of the patterns are stored away in this film for future reference. The film has an infallible memory, and the patterns can be restored to life by threading the film upon a specially designed projector. This projector throws the image of behavior upon the viewing glass of the desk. Here, for example, you see again that bit of 16-weeks-old behavior in the presence of a dangling ring. The image may be studied at leisure and in great detail, even the attitude of the baby may be traced with a pencil for detailed analysis. In this manner, we make the growth of behavior patterns visible for systematic and comparative study.

EARLY PATTERNS OF BEHAVIOR

52 WEEKS

12 WEEKS

Let's turn back to an infant boy at the age of 12 weeks, and see what patterns of behavior are revealed in test situations. First, a simple postural test. When he is pulled to a sitting position, his head lags and drops forward, his back curves.

12 WEEKS

16 WEEKS

At 16 weeks of age, his head is steadier, his trunk more rigid, and his back is not so uniformly rounded as it was at 12 weeks. This is due to the advancing organization of his growing nervous system.

16 WEEKS

20 WEEKS

At 20 weeks, he erects his head nicely when he's brought to the perpendicular position. He can move his trunk slightly and can sit a moment without support when he's allowed to lean forward.

THE INFANT HAND

Interesting changes in the course of its development, by means of animated diagrams, which will briefly delineate the transformations which occurred in the prenatal period. The anterior limb bud first appears, then five nod-like structures, resembling the human fingers, take form. This development proceeds rapidly, and during the first 12 weeks, the beginnings of the forearm and fingernails become evident. The configurations then rapidly change and long before birth, the hand becomes well-defined and even active.

BIRTH

Growth continues, but

8 WEEKS

8 weeks after birth, the hand still retains some of its prenatal characteristics. The infant cannot yet lay hold of the physical world. His hand is almost a useless organ, it remains for the most part fisted, night and day. Consequently, the movements of the fingers are limited and non-adaptive.

24 WEEKS

But at 24 weeks, the fingers are open, the fist has unfolded. The fingers play in a lively manner and curl over every object they touch. Slender objects like a spoon easily become entangled between the fingers, but the patterns of prehension and manipulation have clearly elaborated. Note the intense reaction to the cube. He grasps it, there it is, he is now well beyond the stage of mere corralling. Now observe the patterns of behavior in the two-cube situation. At 24 weeks, the examiner has placed one cube in the infant's left hand and has presented a second cube. The infant holds the first cube but gives only momentary and secondary regard to the second cube. He transfers, chews, bangs the cube, but he confines his attention chiefly to one cube, even in a multiple-cube situation. These patterns of behavior persist; he grasps one cube, and gives only fleeting heed to the several cubes before him. He remains preoccupied with the cube in hand.

24 WEEKS

28 WEEKS

In four more weeks, his behavior patterns are significantly transformed. At 28 weeks, in addition to holding the first cube, he grasps the second one as soon as he sees it, and he holds both cubes. He even brings the two cubes together sketchily. He inspects one, then the other, and then both together. His attention as well as his grasp takes in two cubes.

24 WEEKS

28 WEEKS

By double or coincident projection, the two age levels are now brought into comparative view. The pictures have been slowed to half speed so you can divide your attention equally between them. You may make your own comparisons and draw your own deductions. The difference in complexity of these two sets of behavior patterns represents one month of mental growth. It is quite evident that time visibly transforms the patterns of prehension and manipulation.

Here are depicted 6 consecutive pattern phases of cube behavior at 24 weeks. Reading from left to right, you see grasp, transfer, inspection of the first cube, inspection of the second cube, banging, and mouthing.

Turning now to 28 weeks, we see these pattern phases: regard for the second cube, prompt approach, grasp, inspection of the first cube and inspection of the second cube and rubbing of the two cubes. These reactions occur in pattern sequence in less than 30 seconds.

28 WEEKS 40 WEEKS

The patterns of prehension change visibly every month. This comparative view depicts the infant's manual patterns at 28 and at 40 weeks. At 40 weeks, he sits independently. He no longer needs the examining chair. He brings two cubes into constructive relationship.

28 WEEKS

40 WEEKS

Let us examine more closely his patterns of behavior at 40 weeks. Finger and thumb are coming into definite opposition, and when a third cube is presented, he manages even to hold 3 cubes at one time. The index finger now takes a leading part in manipulation. Take particular notice of this index finger; he at once pokes the tip of the handle of the bell with his extended finger. He rotates the bell, rings it, presses it forward, holds it at different angles. He is under an irrepressible impulse to pry and to poke with his index finger. This is a significant well-defined pattern of behavior, a very deep-seated pattern which asserts itself again when a tiny pellet is presented. Once more, the index finger projects. He plucks the pellet, pursues it with the poking index finger. And when pellet and bottle are presented, again the poking index finger comes into prominent play.

AGE 12 WEEKS AGE 16 WEEKS

And now, for a rapid survey of the progressive growth changes, which transform the patterns of cube behavior from 12 weeks to 40 weeks. At 12 weeks, simple regard for the cube. At 16 weeks, incipient approach.

AGE 16 WEEKS AGE 20 WEEKS

At 20 weeks, corralling and contact.

24 WEEKS 28 WEEKS

At 24 and 28 weeks, direct approach and grasp.

28 WEEKS 40 WEEKS

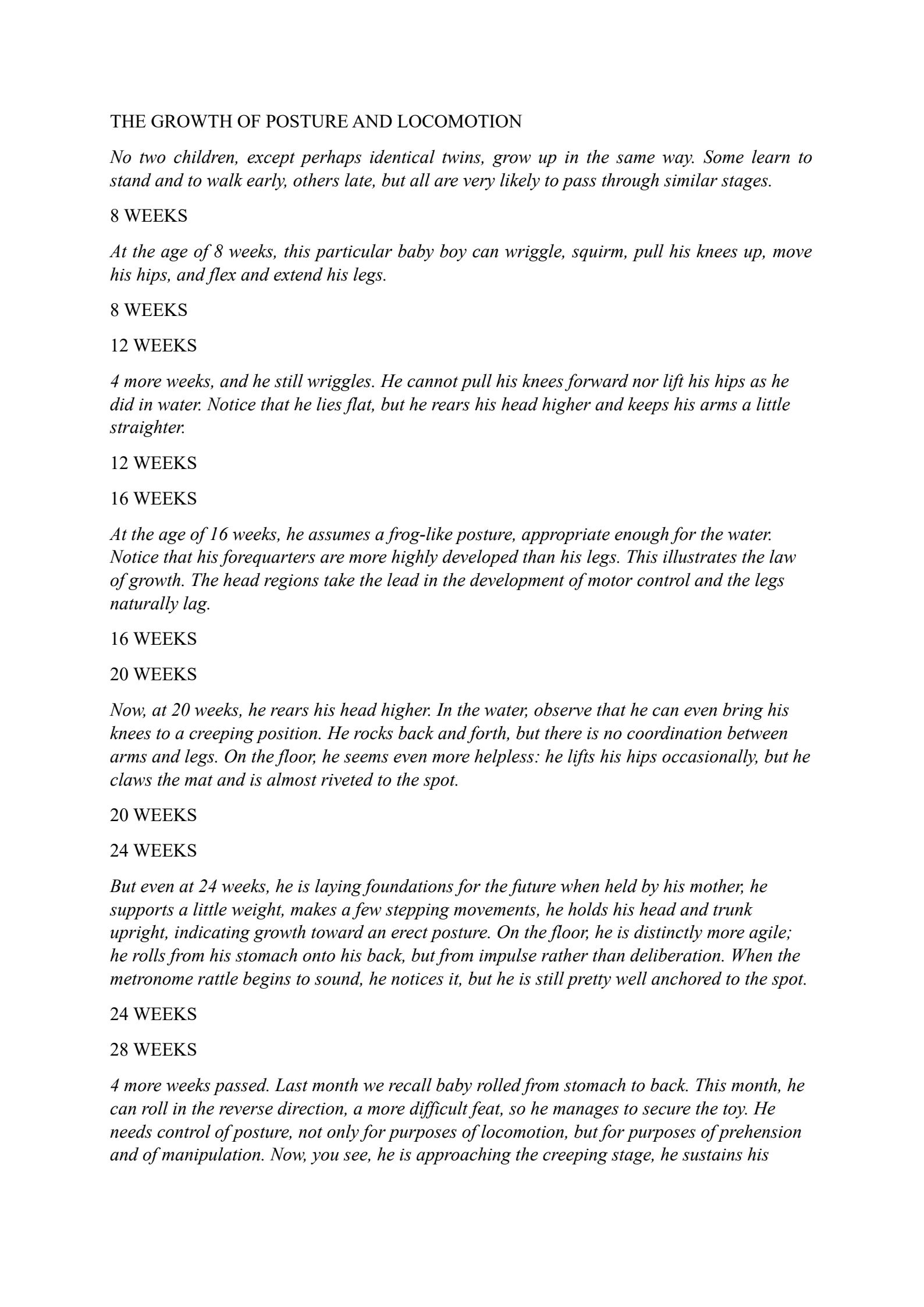
At 40 weeks, exploitive combining of the two cubes. These growth changes continue with each passing month.

THE GROWTH OF POSTURE AND LOCOMOTION

No two children, except perhaps identical twins, grow up in the same way. Some learn to stand and to walk early, others late, but all are very likely to pass through similar stages.

8 WEEKS

At the age of 8 weeks, this particular baby boy can wriggle, squirm, pull his knees up, move his hips, and flex and extend his legs.



8 WEEKS

12 WEEKS

4 more weeks, and he still wriggles. He cannot pull his knees forward nor lift his hips as he did in water. Notice that he lies flat, but he rears his head higher and keeps his arms a little straighter.

12 WEEKS

16 WEEKS

At the age of 16 weeks, he assumes a frog-like posture, appropriate enough for the water. Notice that his forequarters are more highly developed than his legs. This illustrates the law of growth. The head regions take the lead in the development of motor control and the legs naturally lag.

16 WEEKS

20 WEEKS

Now, at 20 weeks, he rears his head higher. In the water, observe that he can even bring his knees to a creeping position. He rocks back and forth, but there is no coordination between arms and legs. On the floor, he seems even more helpless: he lifts his hips occasionally, but he claws the mat and is almost riveted to the spot.

20 WEEKS

24 WEEKS

But even at 24 weeks, he is laying foundations for the future when held by his mother, he supports a little weight, makes a few stepping movements, he holds his head and trunk upright, indicating growth toward an erect posture. On the floor, he is distinctly more agile; he rolls from his stomach onto his back, but from impulse rather than deliberation. When the metronome rattle begins to sound, he notices it, but he is still pretty well anchored to the spot.

24 WEEKS

28 WEEKS

4 more weeks passed. Last month we recall baby rolled from stomach to back. This month, he can roll in the reverse direction, a more difficult feat, so he manages to secure the toy. He needs control of posture, not only for purposes of locomotion, but for purposes of prehension and of manipulation. Now, you see, he is approaching the creeping stage, he sustains his

weight on straight rather than on bent arms. He pats his hands on the floor, he can pivot slightly.

28 WEEKS

32 WEEKS

In the next 4 weeks, he becomes still more locomotor-minded. In the creeping position, take good notice, he can now extend his right arm forward and his left leg backward. This definitely anticipates creeping. But pivoting comes before creeping. Here you see the infant executing a pivot in the clockwise direction. He almost gyrates. Arms and legs are coming into better coordination. He […] out his right hand, turns his head, twists his body, shifts his hands, extends his legs. This pivoting pattern represents a growth gain. The anchor is loosening. Pivoting promises progression ultimately.

32 WEEKS

36 WEEKS

4 more weeks bring him to the verge of creeping. Notice how well he supports himself by his arms. His mother no longer needs to place her hand under his chin. He pulls himself forward toward the water toy and manages, finally, to secure it. On the floor, notice how he puts his legs into the creeping position and advances by a combination of crawling, creeping and wriggling. Observe the increased agility in his movements, the flexibility of his trunk.

36 WEEKS

40 WEEKS

And now, at 40 weeks, he creeps. He goes directly for the rattle and moves it, with better manipulation. Without assistance, he assumes the erect posture; he cruises around his pen by a combination of clambering and side stepping. Cruising is an intermediate stage between creeping and walking. Walking, cruising and in creeping, the hands are still used for locomotion. When he feels the tingle of the grass, he goes completely on all fours. His hands become feet, and you have a classic example of quadrupedal locomotion, creeping on all fours.

40 WEEKS

44 WEEKS

Notice at the age of 44 weeks, how versatile his postural behavior has become. See how he changes rapidly from one attitude to another. Already he is less engrossed in pure locomotion. He sits, he kneels, he stands, but never does he cease to exploit all objects within his reach. He splashes, he dabbers, pokes and investigates. Constantly he brings his abilities into correlation: posture, prehension, locomotion and adaptive behavior altogether. He does not develop first one ability and then another, he grows as a unit. Nature sees to it that he brings away abilities into ever-advancing combinations. On the floor, he is far from helpless. He pivots and reaches his goals. Notice the screwdriver action of his wrist and forearm.

44 WEEKS

48 WEEKS

At 48 weeks, we witness further changes. There is little danger that this boy will prefer the quadrupedal method of locomotion. He is extremely efficient on all fours, but he cannot escape the force of intrinsic growth, nor can his mother. He is now under the irrepressible impulse to stand on his two own feet. He is truly becoming a biped.

Ready for his first guided steps, his legs are willing, but his trunk bends backwards, his stomach forward. But notice that even at this precarious early stage, he tries to wave the rattle and to walk at the same time. Nature does not divide his tasks into small bits, she always makes demands on his total organism.

48 WEEKS

52 WEEKS

1 year old, and he walks quite alone, but not without some effort, as testified by a protruding stomach, and also by a protruding tongue.

52 WEEKS

60 WEEKS

During the next half year, he walks […] and with plenty of new action, with adept balance over sticks and stones. The progressive stages by which this baby attains a posture and locomotion will now pass for us in brief review.

8 weeks, 12 weeks, 16 weeks, 20 weeks, 24 weeks, 28 weeks, 36 weeks, 40 weeks, 44 weeks, 48 weeks, 52 weeks, 18 months. By these gradations, this boy's learned to walk.

Transcript: Harry Freyburger