

COMPARATIVE PSYCHOBIOLOGY

# Bringing Up Baby

## Chimpanzee Mama Plays With Her Infant, Teaches Him To Walk and Climb and Disciplines, But Doesn't Spank

By MARJORIE VAN DE WATER

THE chimpanzee is much more like his human kin than is any other animal. So it is not surprising to learn that Mama Chimp devotes a great deal of time to "bringing up" her baby, even as does the most enlightened human graduate of the best home economics courses.

In the chimp nursery, the mother plays with her baby. She rocks him in her arms. She disciplines him when he is naughty. She teaches him to walk and to climb. She even gives him "character training" in independence, self-reliance and good apeishness.

It is only recently that human parents have realized the importance of physical exercise for very young babies. Dr. Myrtle McGraw, in her famous experiment with the twin babies Jimmy and Johnny at Babies Hospital, New York City, demonstrated the profound effect of early exercise on physical development and probably also upon personality.

Johnny, who was trained and exercised almost from birth, far outdistanced his brother in developing certain muscular skills such as swimming and roller skating. But more than that, Johnny seemed to gain a sort of independence and "psychology of success"—at least he became much more of the go-getter type of person than his twin.

Whether or not the ape mother realizes the need for her baby to learn to stand on his own feet and to swing by his own hands, she sets about this same sort of physical training when her baby is only a few weeks old.

### Vary With Individual

All chimpanzee mothers do not follow exactly the same rules for these setting-up exercises. Different individuals may start them earlier or later. They may also vary the character of the drills, perhaps suiting them to the individual infant.

But, especially at first, there is similarity in the exercises and in their sequence. Dr. Robert M. Yerkes and Michael I. Tomilin have carefully observed them in the colony of mother and

baby chimpanzees of the Yale Laboratories of Primate Biology, at Orange Park, Florida.

The first exercise is a gentle stretching of the baby's arms and legs. The mother, lying on her back, lifts the baby up in the air and slowly and tenderly stretches the tiny limbs.

Sooner or later, as the infant grows stronger, this first exercise is followed by one in which the infant's feet are placed against the mother's chest and the arms stretched up as though in an attempt to teach the little one to stand erect.

### A Conservative Mother

Creeping, walking and running are taught just as they are in any nursery. Each chimpanzee mother has her own methods of teaching. A conservative, patient mother was Pati, who let her son take his own time in learning to stand alone. At first Ben worked within the safe enclosure of Pati's arms and legs as she sat on the cage floor. Next the circle was broken by the mother when she gently took away her arms and straightened her legs to give the baby more freedom of movement and to enlarge Ben's scope of action.

Finally, Ben was taken out of the safe little area before the mother and placed

at her side, where he could pull himself up by clinging to her hair.

As soon as the baby has learned to stand with his mother's help, the next step is to teach him to climb. The wire of the cages provides the "jungle gym" on which the little chimp babies at Orange Park learn.

### Climbing Lessons

The mother will carry her baby to the netting, place its hand against the wire, and then cautiously withdraw, leaving the baby clinging to the wire. Dr. Yerkes tells us of the next step in a report to the *Journal of Comparative Psychology*:

"No sooner did a youngster become accustomed to grasping the netting thus instead of its mother's coat than it began to climb.

"Invariably the initial direction was upward. When the roof had been reached, the climber, helpless and baffled, began to cry and the mother would come promptly and carry it down.

"Very considerable practice was required and much experimenting before a baby could climb downward and sideways as well as upward. Days or even weeks intervened between these stages in the development of climbing. And even then climbing along the underside of the roof netting continued to be impossible, for this acquisition is much more difficult.

"Finally, however, the infant comes to



### SOLICITUDE AND INDIFFERENCE

At the left is Josie, a young mother, fussing over her first baby's "bath." Contrast her engrossing interest with the bored air of Mona, the experienced mother who does not even hold her infant twins.

cling to the horizontal netting with hands and feet and to move along it cautiously with its back toward the floor. Later it learns to swing along, holding only by its hands.

### Value of Example

"The value of example in the case of ceiling climbing is indicated by the fact that the colony's chimpanzee twins Tom and Helene did not master it until early in the second year of life when they were caged with Bob and Dick, who for months had been adept in this activity.

"The mother of the twins, Mona, being large, fat and relatively clumsy, never mounted to the ceiling, so previously they lacked example. When it became available to them they profited by it.

"We have many other fragments of evidence that the chimpanzee mother influences her infant by example, as well as by gestural and vocal precept or command. Instead of being permitted to develop in its own way, our chimpanzee infant is inhibited, curbed, directed, driven, or encouraged in multitudinous ways by maternal attentions."

Good mothers and bad mothers are found in the chimpanzee as in the human world. When I visited the Yale station, I saw a mother with a tiny one-day-old infant. She seemed then to be contented with the baby. But later it developed that she regarded the infant in much the same way that an energetic four-year-old boy might feel toward a rubber doll. Her rough handling eventually proved to be such a real danger to the baby that he had to be removed from her in order to insure his survival.

The young mother of a first-born infant is much more solicitous and also more nervous about the care of her baby than is the experienced mother of a large brood.

### Fussing Over the Bath

Mona, whose twins came as the latest addition to a large family of offspring, treated her babies very casually. She groomed them perfunctorily and infrequently as though it were unessential. Contrasted with this, Wendy and Josie fussed eternally over the baby's "bath," grooming their infants until they were nearly denuded.

In exercising it was the same way. Pati, Josie and Wendy were devoted to it. Mona was almost wholly neglectful.

The youngest child and the first-born child in the chimpanzee family seem likely to be given unusual opportunities to develop independence—but in en-

tirely different ways! Josie, the inexperienced mother, was constantly training her baby, teaching him to walk, to climb, to run. She carried him in the most unconventional fashion as no experienced chimpanzee mother would ever carry her baby. Poor Dick would be hung over her arm as a rag doll might be flopped over the arm of a little girl. Or he was grasped by one arm or one leg and dragged along any old way. Josie was always gentle and watchful of Dick's welfare, but she just didn't seem to consider that there might be a possibility of hurting him by her unusual ways of mothering.

### Another Method

Mona encouraged independence by opposite tactics. She seemed bored with babies, or perhaps overwhelmed at the double task imposed by twins. She refused to let the babies cling to her, and would not carry them unless there was real necessity. She did not even want them to hold to her hair when she was resting.

Chimpanzee mothers are very modern when it comes to the matter of disciplining the baby. Corporal punishment is very rare in the chimpanzee nursery. All the mothers exercised discipline, generally by restraint of the baby's activity. But only the irritable Mona went so far as to treat her little ones roughly. And in so doing, Dr. Yerkes comments, "she evidently hurt her own feelings as well as theirs."

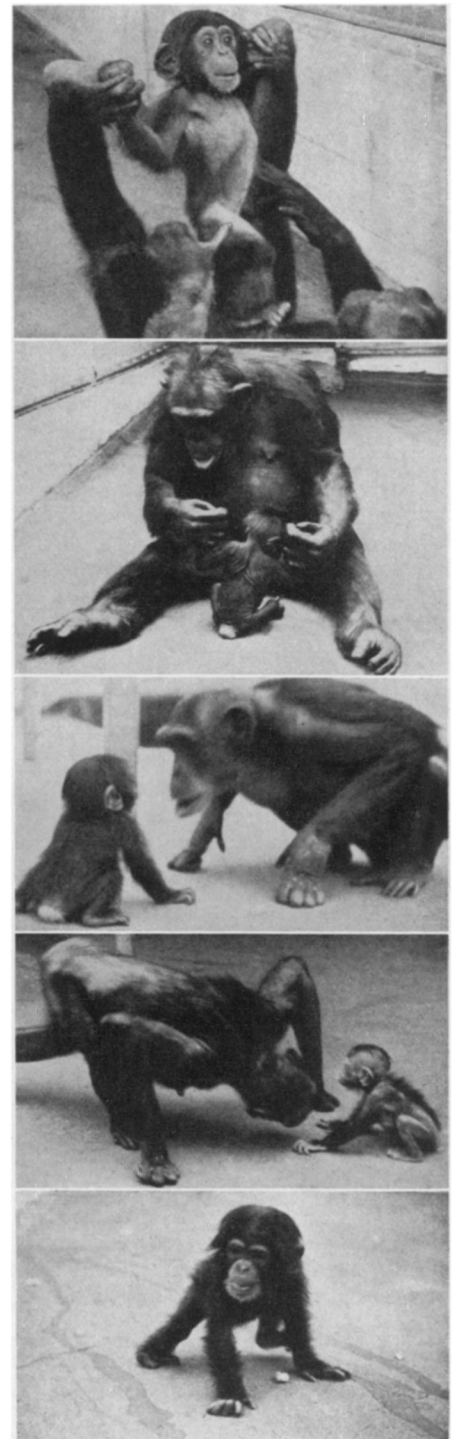
### Helpless Rage

When Mona was tired of the clinging babies, or wished them to fend for themselves, she would sometimes resort to this rough sort of discipline. She might brush one aside, shake it, strike it or bite its hands—never so hard as to seriously hurt it.

"Sometimes as the mother thus roughly treated her young she would scream as if in impatience or anger," the scientists said. "To us the behavior suggested impotent rage, for the infants usually complained so bitterly that they compelled their mother to relent."

Like a human bad child, when the chimpanzee infants failed to get what they wanted, they would throw themselves on the floor and scream.

"Mona seldom could long resist this infantile appeal. Manifestly struggling against conflict, she would go to the infant, take it up and for a time indulge it. Then self-interest having gained dominance, she would once more antagonize the twin and the scene would be



### TEACHING HIM TO WALK

At the top Pati exercises her baby Ben and Dita shows her baby Rosy how to sit up. These are the first exercises in the chimpanzee nursery. Later come the walking lessons themselves. In the center picture, the chimpanzee mother patiently calls the baby to come to her. Next—well, she is evidently saying, "Just one more step, baby"; below, the youngster (aged five months) takes his steps alone.

repeated. Usually the infant won eventually and peace was restored."

As any well-informed modern mother might expect, it was Mona—the older mother of the large family—who clung to the now outmoded practice of rocking the babies to quiet them. When one of her infants was restless or complaining, Mona would hold her hand or arm under the baby and then move her arm rhythmically back and forth until the child was soothed to rest. The mother was so large and the babies so tiny that both twins could thus rest on one arm of the mother.

### Diet a Problem

The baby's diet is a matter of concern for the chimpanzee mother as it is in the human nursery. Here is no problem of "formula" or of providing essential vitamins. Rather at first it is a problem of preventing the infant from grabbing and eating food not intended for him. There is a possibility that in thus restraining the infant the chimp mother is acting selfishly, because she wants to eat the food herself. The scientists are willing, however, to give her the benefit of the doubt and give her credit for an instance of maternal care.

At any rate, after the first few months of life, the infant is permitted and even encouraged by the mother to take supplementary feedings.

At the end of his first year, the chimpanzee infant is eating everything, although he has not yet been weaned. He eats cereal, vegetables, fruit and milk—just about the same foods that Junior begins to consume at the same age.

With the chimp baby's growing independence in the matter of food comes also an increasing tendency to be free of the mother's solicitude in other ways. Although the mother still watches over the infant, it is more likely to be from the background.

### Suspicious at First

During the first weeks of the infant's life, the mother was constantly on guard, suspicious of everything and everybody whose relations to her infant she did not know. This aggressively precautionary and protective attitude is likely to disappear before the baby is a year old.

"Pati, for example, who for several months constantly guarded Ben, rarely trusting him beyond reach and almost never beyond sight, and responding instantly to any threat to him and to his calls for help, became so far indifferent to such things during the twelfth month," the scientists report, "that in-

stead of rushing to him at the first cry of alarm, she would pause to look about, and then either calmly disregard the crying or go to him slowly.

"Yet even at this time, if she observed something in the environment which seemed seriously to threaten her infant, she would hasten to him and he would hide himself in her arms."

So it is emphasized that these animals, so close to humans on the evolutionary ladder, are, like man, extremely dependent in the early months of life. Upon the mother lies the responsibility for

teaching the young infant the skills that are necessary for his survival. The chimpanzee, it appears, like the human baby must be taught to walk, to climb, to protect himself, to associate with others of his age, and even, to a certain extent, to eat.

Like the human mother, the ape protects her young, runs to answer his call or cry, remains close to his clinging arms, but later gently teaches him to loosen the baby grasp and travel independently of her.

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PHYSICS

## Electricity of Blood Cells Enough to Light a Lamp

**T**HE RED blood cells of man and animals as carriers of electricity are being studied at the Biological Laboratory, Cold Spring Harbor, Long Island, it was revealed before the meeting of the American Physical Society, in Rochester, N. Y.

Dr. Laurence S. Moyer and Dr. Harold A. Abramson reported that red blood cells of man, among the animals studied, have the highest effective electrical charge at their surface, equivalent to 15,000,000 electrons. Electrons are the unit charges of electricity.

Studies of the amount of electricity carried by the blood cells have an important relationship to such basic human problems as the coagulation properties of the blood and problems connected with the anemias. For example, it has been found that in certain cases of with the anemias. For example, it has cells apparently possess a mechanism which is capable of preserving the normal surface charge of the cell in spite of wide variations in the surface area during the course of the disease.

A good idea of the size of this surface charge may be obtained from the estimation that if the charges from blood of a full-grown man could be collected and made to pass through a 25-watt electric bulb it would burn for at least 5 minutes.

Of all the animals studied in the tests Drs. Moyer and Abramson found that the rabbit had the lowest electric charge density—only 1,890 electrostatic units. Man and the rhesus monkey (used in experimental studies of infantile paralysis) had about the same charge density,

4,500 units. The dog had the highest charge density, 5,600 electrostatic units.

### Electrons Born

Sprays of electrified particles shoot out, now and then, from all kinds of matter. Rocks, metals, even our own bodies, are subject to this effect which physicists say is due to the unceasing cosmic-ray bombardment.

Disruption of atomic nuclei by the highly energetic cosmic-ray particles has been regarded as a likely explanation. The particles making up the spray were thought of as the flying debris from a shattered atom.

But it now seems more likely that the atoms remain intact during the collision and that the cosmic rays suffer the major damage. According to Dr. and Mrs. Carol G. Montgomery of the Bartol Research Foundation of the Franklin Institute the spray particles are pairs of positive and negative electrons created in that intense electric field which surrounds the nucleus of every atom. The raw material for the process is the energy of the cosmic-ray photons.

Dr. Montgomery described to the meeting experiments which he and his wife performed with a device called an "ionization chamber." Different kinds of material—lead, tin, iron, magnesium—were piled about the chamber and their electrical effects recorded on yards and yards of photographic film.

The heavier the material surrounding their chamber, the larger was the number of particles shot out in every spray. Heavier atoms have stronger electric fields about them; have greater power