

PSYCHOLOGY

# Girl Twins Repeat Famous Experiment of Jimmy-Johnny

## At 15 Months, Trained Baby Can Do Many Stunts While Untrained Twin Sister is Helpless at Them

**A** 15-MONTHS-OLD baby climbing fearlessly up a high steep incline, climbing unaided off stools as high as a grown person's head, and beginning to navigate on roller skates was watched by a group of scientists, educators, and others at a demonstration of the remarkable effects of special psychological training at the Normal Child Development Clinic of the Babies Hospital in New York City.

Florie, the athletically trained baby, is one of little twin girls who are repeating the experiment of Jimmy and Johnny, the famous boy twins one of whom was trained to swim, dive, roller skate, and do other feats at an age when other babies are just beginning to toddle around. Her twin sister, Margie, who looks so much like Florie that it is difficult to tell them apart, has been brought up without any special training, and has had her activities restricted. Like Jimmy, the untrained boy twin, she was not able to do any of these stunts although given plenty of opportunity to try. (*SNL*, Dec. 9, 1933)

Florie is said by Dr. Myrtle B. McGraw, the psychologist who has trained her, to be in these respects more like the famous Johnny than she is like her own twin sister. The baby girls are otherwise very much alike and are probably what are known to scientists as identical twins, that is, they had their origin in one single cell. In appearance and other inherited characteristics they are so much like one another that even their parents sometimes confuse them.

Their remarkable differences in ability to do the athletic stunts is clearly a result of the difference in their training, Dr. McGraw believes.

Florie and Margie are now only fifteen months old, but they are not quite so well developed as the average baby that age because they started life under the handicap of a premature birth. Like the Dionne quintuplets they came into the world nearly two months before their time.

Florie for this reason did not start her athletic training as early as did

Johnny. Instead of being only 20 days old when she began her exercises, Florie was 26 days old.

Now she is a charming little blue-eyed toddler, not saying anything yet but greeting strangers with a grave stare, and friends with a bright smile. She can toddle about fairly well, and finds it very thrilling to be able to walk. But when she occasionally loses her balance and flops down she will continue her way on all fours, just as well content with that mode of locomotion.

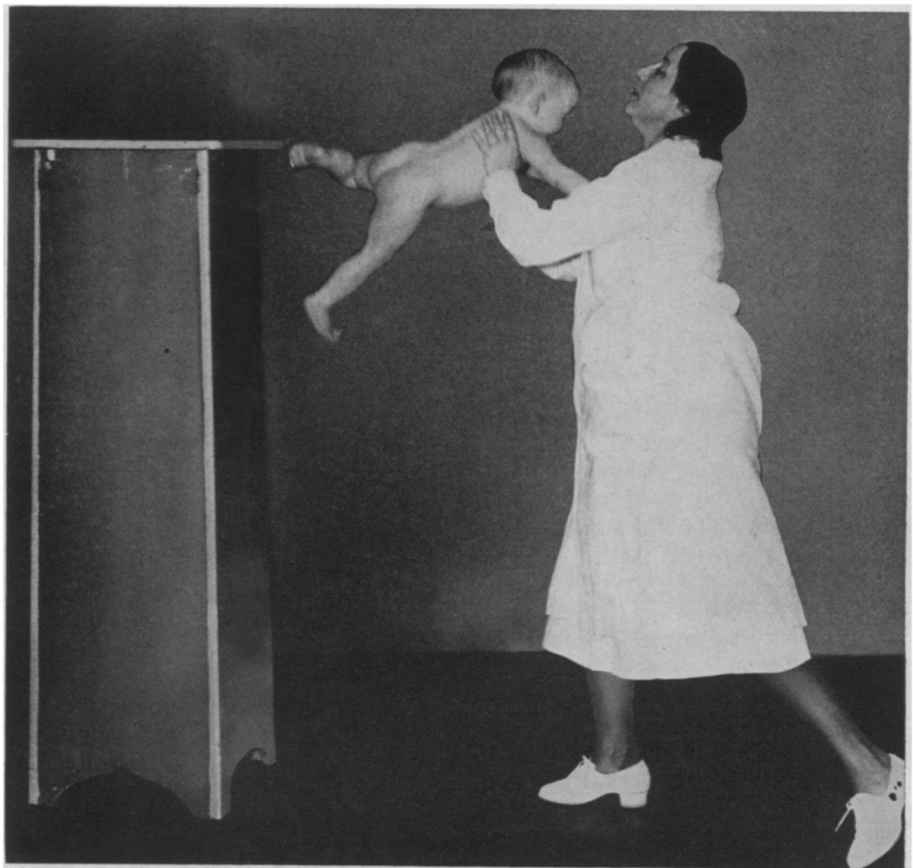
The learning to walk is at present so exciting to Florie that it is engaging practically all of her attention at the expense of her more unusual abilities, Dr. McGraw says.

Florie, like Johnny, has been taking a "memory course." Her teachers put

the baby on a stool and let her watch them hide a cookie or some fascinating toy. After a short time, Florie is released and allowed to go hunt the hidden object. She was picking up the game very well—not always going right to the toy, but at least hunting in "warm" places nearby to it. But when she started to walk, this ability was temporarily lost. Now she will watch the process of hiding with great interest and get down from her stool and start in the right direction, but as soon as she realizes that she is walking, the hunt is off and the walking gets all her attention.

Forgetting in this way is just as much a part of development as is learning, Dr. McGraw explained. Parents and teachers should not be worried when children after learning something suddenly seem to lose it all. The loss is usually only temporary and is caused by the interference of the learning of other new things. It is only after the new skill is mastered that the child is able to go back and re-learn the former skill and perhaps bring the two together.

How to run a kiddie car is one of the skills that Florie has temporarily lost in this way. Learning to use the legs independently to operate a tricycle or



FLORIE JUMPING TO DR. MCGRAW



FLORIE COMING DOWN THE SLIDE

kiddie car is very difficult for a young child, Dr. McGraw has found. Johnny tried in vain for seven months to learn this difficult feat, although his twin brother Jimmy when considerably older learned it without so much trouble.

For this reason, Florie was started out on the kiddie car. At first she would just sit on it and shake it without any attempt to push it. Gradually, however, she learned to push with her feet and make it go backwards, and at last was beginning to get the idea of propelling it forward when she learned to walk. Now she just sits on it without any attempt at locomotion in this way.

Every baby, Dr. McGraw has found, is all the time developing along many different lines. Sometimes these lines of growth converge and the one activity is a help to the other. Sometimes, however, they seem to cross, and the learning in one line interferes with the learning in another.

#### Study Brain

Dr. McGraw's studies of the learning of babies has been paralleled at the Babies Hospital by studies by Dr. Frederick Tilney of the structure of the brain

at different ages or stages of development.

The baby does not have a brain ready to function when he comes into the world. In fact, he probably does not have much use of the higher thinking centers of the brain, the brain cortex, until he is a year old.

This result of minute study of the structure of the brains of mammals, including humans, at various stages of development beginning long before birth and reported by Dr. Frederick Tilney, director of the Neurological Institute, Columbia University, to the same meeting.

What a child is able to do, whether he can walk or talk, whether he can learn to spell, whether he can even smell, see, and hear depends upon the stage of development of the brain and nervous system, Dr. Tilney has found.

At the very beginning, all the cells of the brain are like little round buds, capable of doing nothing except just lying there and growing. Little by little the buds begin to blossom out into mature cells. But they do not grow up at the same rate. Some areas of the brain and some types of cells grow up much sooner than others. Thus at birth

the animal has some parts of its brain completely developed, other parts in the unfolding stage, and still others in the bud stage not yet begun to unfold.

Learning to walk depends only partly upon the development of the leg muscles. It depends more upon control or direction of the muscles. The legs must work with the feet, and the toes with the feet and legs. More than that, the eyes must help too in guiding the progress, and the body must be kept in balance. All this cooperation between the senses and the many body muscles is made possible by the brain and nervous system.

The first part of the brain to develop is the area controlling what scientists know as the body sense. It is this sense that lets you know where your hands and legs are and what they are doing. Without it anyone is completely helpless. He could not move or even be aware of what he might be doing. In a disease of the brain, locomotor ataxia, this area of the brain is affected, and patients suffering from it gradually lose all ability to get about. At first they try to compensate for the loss of this important sense by watching carefully with the eyes, noting just where the foot is and where it moves in taking a step. In the final stages they are utterly helpless.

In the normal human infant, this part of the brain has begun to develop four months before birth.

Dr. Tilney has watched and recorded scientifically the behavior of mammals such as the rat, the pig, and the cat, and then examined the brain microscopically until he is able now to take sections of the brain of an animal and without any further information tell what that animal was able and what it was not able to do.

In the same way it will be possible to detect differences between the brains of humans of differing degrees of intelligence—between the genius, the normal man, the moron, and the imbecile. The brains of the feeble-minded are like those of undeveloped children, their brain cells are still in the bud stage.

Models of the brain, built up to be scientifically exact duplicates of the originals but on an enlarged scale, were demonstrated by Dr. Tilney to the audience, and the intricate process of making them was explained.

The animal brain is first set in celloidin and then sliced to make sections of almost transparent thinness. Every fifth one of these slices is stained and mounted on a slide to show up the various textures. Each one is then placed in a machine which projects it enlarged

onto a sheet of paper. There it is traced by Dr. Tilney. For a single brain it may be necessary to make as many as three hundred of these drawings although the whole brain of the immature animal may not be as large as a golf ball.

From colored wax of uniform thickness are cut little pieces exactly to match the drawings, the color corresponding to the particular texture of the brain area. Then these wax slices are assembled to form the complete brain model, exact in every detail and colored to indicate the development of the brain material.

Dr. Tilney now has over one hundred

of these models, graphically demonstrating the nature of the brains of six different mammals, including man, at many stages of development from the time when the brain has any structure at all up to maturity.

He now plans to make such a model of the brain of a scientist and inventor who has willed his brain for this research. He expects this study to be of great interest because of the great intelligence of this well-known man and also because of the peculiar fact that the man was tone deaf, that is, he could not distinguish one note from another when he heard music.

*Science News Letter, January 19, 1935*



MARGIE

PHYSICS

## Triple Weight Hydrogen Made From Lithium Atoms

**N**EW experiments in which triple hydrogen—three times as heavy per atom as the ordinary kind of hydrogen gas—is formed are reported from famous Cavendish Laboratory of Cambridge University.

The new discovery is the work of Prof. James Chadwick and Dr. M. Goldhaber. (*Nature, Jan. 11*).

The triple weight hydrogen was formed in experiments where slow neutrons were passed through paraffin after being liberated by a source consisting of radon gas and the element beryllium. This is a common neutron source used widely throughout the world.

The slow neutrons thus formed were allowed to strike the light element lithium having atomic weight six. The neutrons have an atomic weight of nearly one.

The combination of lithium atoms and neutrons may, by one picture, form an unstable form of lithium of weight seven. This lithium seven explodes violently and forms a helium atom of atomic weight four plus a triple weight hydrogen atom of mass three. Five million electron volts of energy come off in the explosion in addition, reported Prof. Chadwick and Dr. Goldhaber.

The current report on triple weight hydrogen is the fourth announcement about this rare type of isotope which exists in ordinary hydrogen in only about one per 10,000 million.

Lord Rutherford with Drs. M. L.

Oliphant and P. Harteck reported work in the spring of 1934 indicating that hydrogen of mass three was formed in atomic reaction experiments.

Drs. M. A. Tuve, L. R. Hafstad and Odd Dahl of the Department of Terrestrial Magnetism of Carnegie Institution of Washington followed shortly with the announcement that triple weight hydrogen existed in a stable condition in ordinary hydrogen.

Prof. Wendell Latimer and Dr. Herbert Young of the University of California, using the magneto-optic method of analysis, detected hydrogen three.

Finally came the work of the group at Princeton University confirming the results reported by Lord Rutherford and by the Carnegie Institution investigators. Working at Princeton were Drs. Gaylord P. Harnwell, Henry D. Smyth, Walker Bleakney, W. Wallace Lozier, P. T. Smith, S. N. VanVoorhis and J. B. H. Kuper.

*Science News Letter, January 19, 1935*

METEOROLOGY

## Atmospheric Stagnation Was Cause of Long Fog

**"S**TALLED air," a persistent stagnation in the atmosphere, with the country largely blanketed with a great warm air mass, was the cause of the fog that grounded airplanes, slowed

rail schedules and caused auto wrecks for several days during the second week in January, says C. L. Mitchell of the U. S. Weather Bureau.

A long drift of warmed air from the southwest brought about a condition of general cloudiness and thin rains. This, in itself, is not an abnormal or unusual occurrence in winter, Mr. Mitchell explained. What brought the fog was the apparent inability of this sluggish air mass to move.

The fog came because the heated moist air condensed over the cooler land and water of the Northeast. Such condensation occurs because of the presence of microscopic particles in the air which serve as nuclei. Atoms in the atmosphere from which one electron has been removed so that they become electrical ions are a common type of nuclei. Dust and soot particles from many chimneys also form convenient places at which moisture in the air can condense.

The dense fogs found in industrial cities known as "smoggy" weather—a combination of the words smoke and foggy—occur for this last reason.

Much of the recent fog in the East may have been due to this "smog," for during the winter the air is especially filled with ash and unburned coal particles.

The foggy condition was general over practically the whole of the Appalachian mountain region and the Atlantic seaboard. Fog was reported from as far west as Omaha; but the trans-Appalachian region was not under a continuous shadowy blanket.

*Science News Letter, January 19, 1935*