

PSYCHOLOGY

# Baby Skates

**Though Johnny is Carefully Trained From Infancy, There Are Some Things He Learns No Faster Than Twin Jimmy**

By MARJORIE VAN DE WATER

PSYCHOLOGISTS were amazed by a motion picture film given a private showing for them recently in Chicago. The film showed a little baby less than a year and one-half old doing the most surprising feats of muscular skill. He roller-skated like a miniature master of the art. He climbed off stools of much greater height than his own. He walked up steep inclines with perfect aplomb. And he swam under water without support or with slight support he swam on the surface like a budding Weissmuller.

But the picture did not originate in Hollywood, and this baby is not being exploited for his amazing abilities. He is one of the subjects in a psychological experiment being conducted at the Normal Child Development Clinic at Babies Hospital, New York City. There it was that the film was made.

The experiment is for the purpose of finding out what are the effects of intensive training on the development of the very young child. This little boy has been carefully and intensively trained and exercised from the time he was but 20 days old. His twin brother, for purposes of comparison, has been brought up in the ordinary routine of the modern infant—no systematic exercise, no unnecessary handling, mainly just peace and quiet in his crib.

## Twin A and Twin B

The surname of neither twin is revealed by the psychologist who is making the experiment, Dr. Myrtle B. McGraw. She does not wish them annoyed by those who might wish to exploit them. In her scientific report of the research before the American Psychological Association, she referred to them merely as Twin A and Twin B. But they are well known around the hospital as "Johnny" and "Jimmy."

Johnny, originally the smaller and weaker of the two, was the one who received the training. On five days a week both twins were brought to the Clinic at nine o'clock in the morning.

See Front Cover

Jimmy was placed in a cozy little crib in a quiet spot behind a screen in the nursery. There he was left, except for feeding, bathing, and other necessary attentions. Johnny, on the other hand, was immediately put in training.

At two hour intervals he was encouraged to reach and roll. He was turned over on his tummy and allowed to try to crawl. He was held up so that his toes could just touch some hard surface and thus tempted to make little stepping movements.

The purpose of this exercise and encouragement to physical activity was to see whether an infant thus "pushed" would develop physical skills earlier than one left passively to await his own urge to action.

The other twin, Jimmy, was each week put into the same situations and allowed to show what he could do without the training.

## "Chinning" Exercise

Another purpose of the experiment was to see whether the physical training would cause an infant to forget sooner the primitive reflexes with which each baby comes into the world.

The new baby is equipped with two queer mechanisms that seem to be handed down from his ape-like ancestors, and that in human development have lost their essential usefulness. One of these is the grasping reflex. If you place a small bar in the hands of a very young infant, he will involuntarily grasp it so hard that he can support his own weight unaided for quite a while before he will drop. Jimmy was stronger than Johnny in this ability to grasp; he would hang on for an unusually long time.

After a few weeks, the ordinary infant loses this grasping reflex, and the adult does not show it at all unless his brain or nervous system is diseased. If you should attempt to hold your weight in this manner, you would find that it requires a considerable effort of the will to continue holding the bar; it is no involuntary reflex with you.

The early training of Johnny in this

"chinning" exercise had no effect on either preserving the reflex or causing it to disappear at an earlier date, it was found. Apparently nature takes its own course in this regard, as in many others.

The other reflex in which Johnny received practice or training was that movement that babies make so automatically when they feel that they may fall. If a baby is lying on a bed and you jostle the bed suddenly, you will probably see him throw his arms up in a circular movement as though he were trying to embrace something.

## Nature Not Speeded Up

The movement is reminiscent of the movement of the frightened little baby monkey who clings tightly to the mother lest he fall from his nursery in the tree-tops.

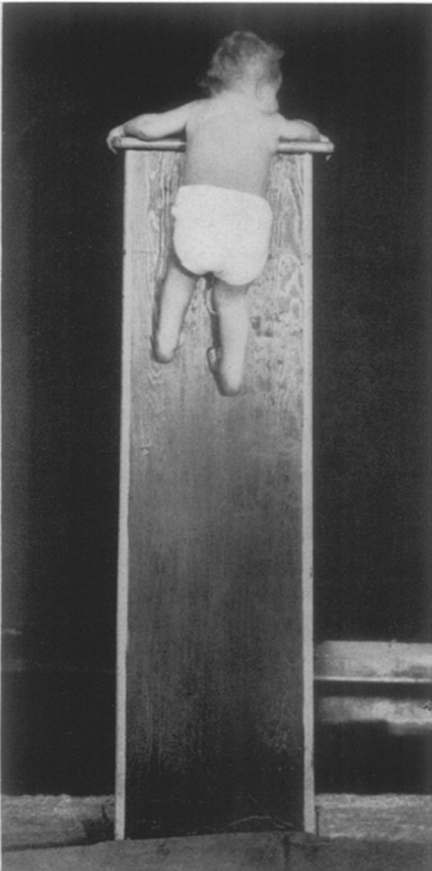
Here again training had no effect. The thing just persisted for a while and then vanished, just as it would in any baby—just as it did in the untrained twin, Jimmy.

And there were many other matters about which Mother Nature took her own good time, and all the training in the world seems to give not the slightest advantage.

When Johnny was ready to sit up erect, he sat. And so did Jimmy. They reached this stage at practically the same age. So all your best efforts in "teaching" a baby to sit up will not do him a bit of good. Neither will propping him up with pillows. You will just have to wait until he is old enough, and then you can't keep him from sitting up.

Reaching for toys, crawling, and standing up alone, seem also to be a matter of development rather than either of training or exercise. The twins paralleled each other in extraordinarily close fashion in the development of these abilities. But as soon as the baby became consciously active in the exercise, the differences in them became not only apparent, but startling.

Climbing is one of the activities of infants that do improve through training. Johnny's training in climbing began with a slide of smooth varnished wood inclined at an angle of 11 degrees, or the very gradual slope you would get by putting one end of a six-foot board up on a block just one and a quarter feet high.



#### COMING DOWN

*This is the way Johnny quickly and easily clambers down a stool sixty-three and a quarter inches high.*

Both Johnny and Jimmy, when they first were allowed to play on this slide, showed a desire to go up it and both could make some headway.

Then they were given steeper and steeper slides until little Johnny, not yet a year old, was dauntlessly going up and down on a smooth slide tipped at the thrilling angle of 61 degrees. It was as though that six-foot board had been placed on a block five feet high, making an incline as nearly straight up as anything less sure-footed than a cat could hope to navigate.

Jimmy, who had no training and saw the slides only at the time of his weekly tests, made no attempt to scale the heights. In fact, after the first few trials, he even refused to attempt the very lowest slide.

Ladders and high stools were not introduced to the babies until they were 12 months old.

It took Johnny only two days to learn to toil up the ladder, which towered way above his head. And in but 12 "lessons" he was coming down un-

aided—with some difficulty, to be sure, but at least with great courage and considerable skill.

Jimmy looked at the ladder, and immediately found his interest was in something else.

The stools were graded in height. Johnny soon learned to turn over so that knees or stomach were down on the stool and then let himself slide off to the floor. The gradually increasing height of the stools failed to discourage or alarm him. When he found that even when he stretched his very longest, his toes were still not touching the floor, he would kick his foot against the side of the stool and then let himself drop.

#### Two Ways of Doing It

In three months, he was coming down without the slightest hesitation from the top of a stool 63¼ inches tall, as high as his teacher's head.

Yet when Jimmy wants to get off a stool, be it high or low, what he does is to put on his cutest smile and hold out his arms for help. Some people find that that scheme works quite well, too. Jimmy's smile is very winning.

But the feat that leaves spectators gasping with surprise is the sight of Johnny on roller skates. At the time that he was learning to walk, when he was still not yet one year old, tiny roller skates were obtained for him and strapped onto his little pink feet. They delighted him.

Of course there was many a hard bump while he was learning to glide about on them. The learning was made more difficult by the fact that at first he felt that he must walk on them, trying to lift his feet in a stepping movement. But bumps did not deter him, he would just get up and try again.

Within three months, he was scooting around on skates like a veteran—keeping excellent poise, coasting down grade, and steering himself around corners. Jimmy has never tried this stunt.

Both babies have had their turns in the water, however, and Johnny has learned to swim beautifully, so that he goes unaided across a regular adult's swimming pool, swimming under water.

The practice began when he was only 7½ months old, the time when most babies are just becoming expert at sitting alone in their cribs.

To keep the babies from harm, a special type of swimming apparatus was constructed. A broad strap was placed around the baby's chest just under his

arms, and this strap was attached to ball-bearing rollers and hung from a rod above the pool. In the strap the child couldn't possibly sink, but as his swimming motions carried him through the water, the support would move along easily with him.

Within a month Johnny was holding his own head above water and making real swimming movements. And he was liking the sport. Yet he was not nine months old!

At that time Jimmy's behavior in the water consisted mainly in trying to wipe the water off his face. He would also struggle and roll over. He did nothing that could be considered a real attempt to swim. Evidently the theory that if you just dump an infant overboard he will naturally make swimming movements is completely demolished by this experiment.

Jimmy was 14 months old before he could do as well as Johnny did at 8 months. By that time Jimmy was making rather effective swimming movements with his legs, but he had not yet caught on to the use of the arms or how to keep his head above water.

Johnny is now able to discard the mechanical aid and swims freely under water in a large adult swimming pool. He is also learning to dive.

At first his teacher would hold his feet on the edge of the pool just above the water line. Little Johnny standing straight on his support, would then bend until his head would go into the water in a nice dive. Gradually he got a little spring into it and at the advanced age of 16 months he was doing a voluntary dive, frequently flat but nevertheless creditable.

#### Cannot Tricycle

Surprisingly, there is one accomplishment that Johnny has not been able to master. Indeed, after four months of practice and 53 lessons, not the least bit of improvement can be noticed by his teacher.

This feat, so impossible for Johnny, is none other than the childish art of tricycling. Johnny, up to date, simply cannot tricycle. Neither can Jimmy.

Riding a tricycle is not nearly so difficult, from a purely physical standpoint, as is roller-skating. It doesn't require anything like the complex movement and coordination of movements that swimming does. Why, then, was it so hard for Johnny?

It must be that the mental process involved in the voluntary pushing of the feet one at a time, and one after

the other, in pedaling the tricycle is of a higher order than that required for skill in the other sports.

If you have ever noticed a young child with a new tricycle, you may have observed that he is inclined to use the new vehicle as a kiddie car and propel it by "walking" it with feet on the ground. Not until the child reaches a certain stage in mental development will he be capable of pedaling.

This discovery was more interesting to the psychologist than the more striking discovery that Johnny could make such unexpected progress in other ways. For it points to a fact of great interest to educators. Apparently, each kind of motor skill may have a corresponding mental age, or stage of mental development, at which it can be learned. Until that age is reached teaching is useless and only serves to waste the time of pupil and teacher and provide annoyance for both.

Perhaps, there may be another age beyond which learning becomes less easy. Perhaps there is one best age at which to learn tennis. Another when baseball should be taken up. Another when writing should be studied. Another for knitting, or billiards, or marbles, or typewriting, and so on.

The present research on Johnny and Jimmy cannot provide the answers to these questions. It does point the way to further study.

#### Personalities Different

But another result has developed from Dr. McGraw's experiment which she considers more important than the amazing differences in the motor achievements of the twin babies. That is the difference in personality which has been developed by training.

Jimmy obviously has adequate motor and mental equipment for doing many of the performances of which Johnny is capable. What he lacks is the confidence that comes from meeting obstacles and mastering them.

Jimmy looks at the steep slant of the slide, hesitates, and turns away.

Johnny walks right up.

"He has such confidence in himself and the world that after a few trials he will attempt anything he is directed to do," Dr. McGraw said. What a valuable attitude to have in these days of depressions and discouragements!

The most important result of the training of infants is the development of correct attitudes toward life and its difficulties, Dr. McGraw concludes.

*Science News Letter, December 9, 1933*

#### MEDICINE

# Sleeping Sickness Seen As Influenza of Brain and Nerves

## New Theory Holds That Filterable Virus Attacks Brain And Nervous System Instead of Nose, Throat and Lungs

**E**NCEPHALITIS, sometimes known as "sleeping sickness" and recently epidemic in St. Louis, may actually be virus influenza of the brain and nervous system.

This new theory of the baffling disease is suggested by Drs. Earl B. McKinley and Elizabeth Verder of George Washington University School of Medicine, in a report to the Society for Experimental Biology and Medicine.

The suggestion that encephalitis is brain "flu" of virus origin is purely theoretical, Dr. McKinley emphasized. So far, there is no proof for it, although there seems to be considerable circumstantial evidence. The theory developed as the result of ten years' investigation and study of the disease.

The name encephalitis simply means inflammation of the brain, Dr. McKinley pointed out. So far, no one has discovered what causes the inflammation. His own research has shown definitely that it is not caused by bacteria or disease "germs." Both Dr. McKinley and other scientists believe that it is caused by a filterable virus, such as causes smallpox and measles. A filterable virus has recently been found to be the causative agent of colds and influenza.

Dr. McKinley suggests that the same virus is the cause of both "flu" and encephalitis. The difference in the diseases is due to the fact that the virus attacks different parts of the body. In virus influenza, the nose, throat and lungs are attacked. A variety of influenza, known as gastrointestinal "flu," has been observed recently, in which the virus apparently attacks the stomach and other digestive organs, causing stomach and digestive upset with or without the other symptoms of influenza. When this same virus attacks the brain and nervous system, encephalitis or brain "flu" results, in Dr. McKinley's opinion.

Encephalitis first appeared after the influenza outbreak during the World War. It frequently follows an attack of influenza. In the St. Louis epidemic the patients suffered digestive upsets at the beginning of the encephalitis attack.

These facts all support the new theory.

Doctors have long suspected a relation between influenza and encephalitis, but it was impossible to explain this relation so long as a bacillus instead of a virus was considered the cause of "flu." Now that both diseases are known to be caused by a virus, a relation between them may again be considered.

Viruses are very susceptible to change in their passage through an individual's body, Dr. McKinley pointed out.

You know how, when you "catch a cold" from a neighbor or relative, you may have an entirely different sort of cold from his. This is because the virus changed in passing through his body and was different when it reached yours.

Just as there are different kinds of colds, there are different kinds of encephalitis attacks. The disease in St. Louis was quite different in some respects from what it had been in previous epidemics in this country. This probably was because the virus had changed somewhat. A more radical change may account for its attacking different parts of the body and causing, as a result, either influenza of lungs and other respiratory organs, digestive upsets known as gastrointestinal "flu," or brain and nervous disturbances, known as encephalitis, according to the new theory.

*Science News Letter, December 9, 1933*

#### ASTROPHYSICS

## Star Temperatures Now Found From Spectra Photos

**T**HE PHOTOGRAPHS that are made of the stars when a spectroscope is used in conjunction with a telescope show gradations in character as well as in brightness. These gradations have long been known to indicate the temperatures of the star's surface. Only recently, however, has it been learned how to read the actual temperature from these so-called star spectra. The method has been worked out by Prof. H. N. Russell of Princeton University in con-