

Babies Take Own Time to Develop

Psychology

Psychologists studying the behavior of young children have at last found a way to "have your cake and eat it too." That is, they have succeeded in giving a baby training that would alter the course of its development and yet they have been able to see what the youngster would have been like if it had never been trained.

This magic has been brought about by the Yale Psycho-Clinic, where Dr. Arnold Gesell and Dr. Helen Thompson have observed identical twin girls from the age of one month up to the age of eighteen months. Reporting their experiment in the *Genetic Psychology Monographs*, the psychologists say that it is doubtful if prolonged search could have secured for comparative study twins more extensively and profoundly alike than these. The blue-eyed blonde babies respond with remarkable similarity of behavior to almost any situation. In refusing or objecting, each twin's gesture is to turn the body slightly to the right and bend the left arm across the chest. when placed back to back and observed for several hours, their manner of handling a bell, spoon and other ob-

jects was strikingly similar.

For six weeks the psychologists gave one twin girl, T, a chance to practice climbing a set of five steps every day. Meanwhile, the other twin, C, had no such opportunity to learn the new activity. In the first three weeks of climbing lessons Twin T had to be frequently assisted. At the end of six weeks, when she was 52 weeks old, she climbed the steps in 26 seconds and was an enthusiastic climber. Yet when Twin C was introduced to the steps at the age of 53 weeks, she proceeded to climb the staircase without training or aid, taking only 45 seconds. At the age of 56 weeks T was climbing the steps in 11 seconds and C in 14.

Twin T was also given practice in handling cubes, the psychologists report, but her added early experience did not give her any advantage when Twin C was presented with three little blocks to bang with and to pile on top of one another.

The experience of the twins shows, according to Dr. Gesell and Dr. Thompson that a child begins to climb and to build towers with his blocks

when his nerve structures are ripe for such activities. Exercise may not even hasten the actual appearance of such reactions in a young child. The experience gained by early practice tends to be supplanted or modified by the process of the child's maturation. If it were not so, the infant could scarcely grow, they point out.

Twins identically alike offer a promising field for psychologists to study the difficult problems of human growth, the investigation indicates.

Science News-Letter, November 2, 1929

New Magic

Electricity

The busy housewife who prizes the last few minutes of her morning rest may now turn on the current for the electric percolator by a mere wave of her hand. This and many other modern "magic" tricks are made possible by the electric grid-glow apparatus now available commercially. The apparatus is so constructed that when the hand approaches it a slight current is started. This can be used to turn on other electrical appliances.

Science News-Letter, November 2, 1929

200-Inch Telescope—Continued

coated to a sufficient thickness with perfectly transparent quartz, free from bubbles. This crystalline quartz, in finely ground form, is sprayed on to the hot disc by means of an oxy-hydrogen flame; and the development of multiple burners needed for coating large surfaces without flaws has been one of the principal difficulties overcome. On this transparent face of water-clear quartz the final grinding, polishing, and figuring will be done. Finally, a thin coating of pure silver will be chemically deposited on the finished surface, just as is done periodically in the case of such glass mirrors as that of the 100-inch Hooker telescope on Mount Wilson."

While quartz seems to offer the most advantages, there are still other possibilities.

"Everything depends upon the success of the mirror, and we are therefore considering as possible alternatives several entirely different methods of construction, some of which are very promising," says Dr. Hale.

Probably the large disc could be made out of special forms of glass, such as pyrex, used in cooking utensils and laboratory glass ware.

The concentration of light by a telescope, and the speed with which photographic exposures can be made, depends on the ratio of the focal length to the diameter of the objective. It has been decided to make the focus of the 200-inch mirror only 55 feet, or 3.3 times its aperture. This would give it a speed of F.3.3, about the same as that used in lenses for motion picture cameras. If still greater speed is wanted, a special correcting lens, designed by Dr. F. E. Ross, can be used, which will increase the ratio to F.2. The ratio of the 100-inch telescope is F.5.

"During our own time spectrum analysis, initiated by Kirchhoff's study of the sun, has revealed the unity of terrestrial and celestial substance and provided the means of tracing the evolution of stars and nebulae and the systems in which they are grouped," Dr. Hale says, in pointing out some of the possibilities of the telescope. "Moreover, it has served as our guide to the true nature of matter and the advancement of the fundamental sciences of physics and chemistry.

"The first harmonic series of spec-

trum lines and the first ionized atoms (lacking one or more electrons), vital clues to the modern theory of matter, were found in the sun and stars. Quickly, with the aid of powerful telescopes the vast experiments performed for us in these celestial laboratories have added to basic knowledge. The three most vital tests of the Einstein theory can be made only with the telescope. Matter two thousand times as dense as platinum has been found in the companion of Sirius. Oxygen and nitrogen in 'forbidden' forms have been detected in the excessively rare gases of the Great Nebula of Orion.

"The transformation of matter into radiation, predicted by physical theory, is attested by stellar observations. And now we may hope that the problem of the curvature of space will be settled by celestial measures. Can one doubt that a telescope powerful enough to carry all these studies far beyond our present possibilities will prove profitable, not merely to the astronomer but to all who utilize the results of science in the many-sided problems of modern life?"

Science News-Letter, November 2, 1929