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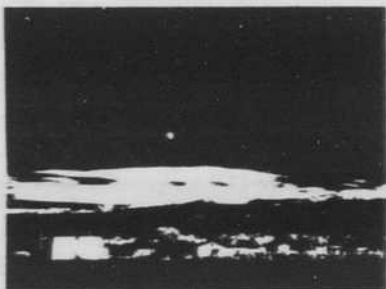
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# Down's children assisted

When you're only two or three feet tall, people five-foot tall can be a "big" factor in your life.

A University professor and a research assistant could be a very "big" factor in many children's lives.

Marjorie Wollacott and Anne Shumway-Cook are co-directing research that could establish a more effective therapy program for children with Down's Syndrome.

The control group for the research consists of ten "community volunteers" between three- and five-years old. Six are Down's syndrome children and 10 are children without the genetic disorder.

Down's syndrome is a disease affecting hundreds of thousands of children in the United States each year. The disease strikes in the embryonic stages of development, leaving its victims with learning problems, lack of muscular development and sometimes mental retardation.

The research, conducted at the University's Neuromuscular Control Laboratory, will investigate the activity of the body's muscular control systems in maintaining proper balance, says Wollacott, a physical education professor.

Wollacott and research assis-

tant Shumway-Cook designed and built a hydraulically controlled platform. The platform shifts and tilts, enabling therapists to study the movements children make to maintain their balance.

Electrodes hooked to an oscilloscope (a machine designed to depict, on a screen, periodic changes in electronic quantity) allow the researchers to detect the speed at which a muscle "fires," the strength of the muscle's reaction and the patterns of activity that a group of muscles present.

"We know that Down's syndrome children have developmental delays — that is, they may not be able to sit or stand properly for six months to a year after normal children," says Wollacott. "Most researchers have observed this lack of muscle tone and concluded that the problem lies in the muscles themselves. But we think it may be due to delayed development of basic reflexes."

Children experience three levels of muscular development, says Wollacott.

"Generally reflexes, which develop first, are very basic. Pulling your hand away from a hot stove, for example, involves only the spinal cord and nerves in the arm," says Wollacott.

"However, the automatic response system that controls balance and posture is directed by the brain and isn't fully functional until a child is seven or eight.

"The voluntary system that controls nearly every kind of movement and motion requires the brain, nerves and muscles, and it continues to develop even into adult life," she explains.

Current physical therapy for Down's children uses resistive training, or making movements against a weighted force, says Shumway-Cook.

"This kind of training is designed to strengthen the voluntary control system," she says.

But Wollacott's research with normal adults has shown that any voluntary motion is preceded by a type of reflex action. Catching a ball, for instance, requires an automatic response of muscles in the legs and calves to stabilize and prepare for the subsequent motion involved in catching.

The researchers have developed their hydraulic platform to measure that automatic response system.

"This will give us a detailed picture of just how each child's automatic muscular system is behaving," says Shumway-Cook.

# Organization honors physicist

Russell Donnelly, a University physicist whose research focuses on the properties and behavior of low-temperature helium, has been elected a fel-

low of the American Association for the Advancement of Science.

The 130,000-member organization recognized Donnelly for his "distinguished efforts on behalf of the advancement of science" during its annual meeting earlier this month.

A member of the University faculty since 1966, Donnelly and his research group are studying the hydrodynamics or movement of superfluid liquid helium.

At about two degrees above absolute zero, the minus

460-degree temperature at which all molecular motion theoretically ceases, liquid helium undergoes a profound change in its physical properties. A striking example is superfluidity, the ability to pass through fine channels or capillaries without friction.

Besides studying superfluid helium, Donnelly's group is conducting precision experiments on how fluids become turbulent — for instance, how an eddy forms in a river. The group also is examining ways to detect infrared radiation.

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