

PSYCHOLOGY

Child's Growth in Capacity Precedes His Achievements

THE CHILD'S record of achievement should be distinguished from his progress in maturity or growth. The former does not always keep pace with the latter, Dr. T. Wingate Todd, Western Reserve University, told officers of the Mooseheart Laboratory for Child Research and others gathered in Washington for a Conference on Child Development, Care, and Training.

"Physical growth of the body covers some twenty years in human life, but physical growth of the brain is practically completed in six years, and in the better-nurtured children in four," Dr. Todd said.

The speed with which the child's achievements follow after his development makes them possible, depends upon his opportunities for education, he explained.

"Capacity for walking is attained at twelve months or soon afterward, but capacity for riding a tricycle is not attained until about three years. The achievement of these accomplishments is, however, not necessarily completed at these ages.

"By comparison with anthropoid growth, a child's life has four significant subdivisions namely: infancy (birth to two years), the preschool period (two to six years), the grade school period (six to twelve years) and adolescence (twelve to eighteen years). In human life, infancy and the grade school period are greatly prolonged for in the anthropoid these occupy about one year and two years respectively.

"Until the school plateau in physical maturity is reached, the better nurtured children are physically the larger and mentally the more advanced. After the attainment of six years bodily growth continues but the so-called mental growth is really a mental expansion depending upon the integration of experience in a brain which already has the functional capacity of adult structure."

The problems of adolescence are a result of the rapid spurt of maturity at that time, Dr. Todd explained.

"The attainment of adolescence is a feature of maturity progress rather than a stage in physical growth," he said.

"It is expressed in certain physical features which are intimately related to the mental outlook but social perspective and emotional balance depend upon the educational processes of experience. This is the clue to the differentiating personality.

"In a phase of rapid progress in maturity, such as occurs towards the second birthday or at puberty, change in outlook outruns the accumulation of experience and temporary disharmonies result in problems of social perspective and emotional balance.

"It is therefore during these periods when adjustment taxes the child's developing personality that understanding, patience and skill on the part of the guardians are of greatest significance in the developing citizenship-value of the child."

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CHEMISTRY-ENGINEERING

Molecules Packed on End In Best Lubricating Oil

ONE OF the hardest questions to answer has been why two oils almost identical in density, viscosity, and other common physical properties, may differ widely in their lubricating qualities. One cannot tell by any simple physical test, in advance of actual use of the oils, which will be the better lubricant.

Chemists have discovered that the molecule of a good lubricant consists of a long chain of atoms, so that the molecule has the form of a long slender filament. These molecules stand on end on a metallic surface, one end adhering firmly to the surface. In this way they pack very closely together, and pressure between two surfaces cannot squeeze them out.

A second layer of oil molecules stand on top of the first layer, another on that, and so on. Two metallic surfaces thus ride on velvety cushions and slide easily on each other.

The longer the filaments, and the more regularly and closely packed they are, the better is the lubricant.

These facts have been disclosed by the use of X-rays.

A new mode of testing has been applied by Dr. C. A. Murison and is reported in the London Philosophical Magazine. Dr. Murison directs a stream of electrons at a glancing angle at a film of oil and studies the diffraction pattern produced by the reflected electrons. From this he can tell at once the lubricating qualities of the oil. He found for one thing that oils of high molecular weight are superior.

Electron diffraction, it may be remembered, was discovered by Drs. C. J. Davisson and L. H. Germer of the Bell Telephone Laboratories in 1927, and demonstrated the wave properties of electrons predicted by Duc Louis De Broglie and Prof. E. Schroedinger.

An answer is thus given to those who want to know what is the use of all these recondite researches into atoms and electrons, for here is an application of great practical value.

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