

they act when they are given directions by their nurses and teachers, in short, in their personality.

How they got to be different is still something of a scientific puzzle. Perhaps their individualities are in part a result of conditions occurring before birth that are beyond our control. Perhaps, however, they are partly the result of influences that we can discover and ultimately learn to control.

Studies of identical twins have shown that large differences in schooling may account for a difference equal to four years of mental growth. They have tested these twins only after the differences have occurred. The quintuplets are being studied by repeated tests through every stage of their growth. This should show how changes are brought about as well as the bare fact that they may be made.

It is to be hoped that the study of the quintuplets, so well begun, may be continued long enough to throw real light on this question.

Differences in Quints "Partly Artificial"

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THE MOST important result of the purely biological work of Drs. J. W. MacArthur and Norma H. Ford of the University of Toronto, is that they have conclusively diagnosed the quints as identical, derived through the division of a single embryo. The writer agrees with this diagnosis, which was necessary before the psychological studies would have much significance. Dr. William Dafoe's exhaustive account of the health, growth, nutrition, and care of the quints up till the present time is extremely valuable in the field of pediatrics.

Reports on the development of mental and emotional traits were also given at the University of Toronto conference by Dr. W. E. Blatz, director of St. George's School for Child Study and by his colleague Miss M. A. Millichamp. The most striking fact seems to be that all five little girls have developed individual characteristics and that there are fairly marked and consistent differences in mental ability. Whether these differences are the result of prenatal or unanalyzed factors beyond control was not determined.

That hereditary differences had arisen is an opinion abhorrent to biologists

and to at least one psychologist, Dr. F. N. Freeman, of the University of Chicago. The writer can visualize no significant environmental differences in a closely coherent group in which care is taken to treat all alike. He regards the present differences as partly artificial. Whatever real and consistent differences remain seem to us to have been set before birth by inequalities of fetal nutrition or the workings of the asymmetry mechanism. The controversy at the conference was well conducted but the heredity-environment problem is still unsettled.

The general tenor of the speeches at the banquet of the conference was that the scientific program with the quintuplets should go ahead on an ever increas-

ing scale and that the results already attained deserve the support of all agencies able to cooperate.

Many most commendatory remarks by all speakers at the conference attest the esteem in which Dr. A. R. Dafoe, "the country doctor," is held by all who know him.

Upon the occasion of the conference's special train trip to Callander for a visit to the quints, a second examination of the quints showed the writer that they are even more nearly identical physically today than they were a year ago, and confirms the conclusion first announced by Drs. MacArthur and Ford, that they are identical in their hereditary composition.

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GENERAL SCIENCE

10-Mile Shaft in Earth Is Called a Need of Science

SCIENTIFIC triumphs of the future—from production of super-men to the conquest of cosmic rays—were forecast at the annual dinner of the National Academy of Sciences.

When mankind has banished wars, science may hope for so ambitious a project as an international earth shaft 10 or 12 miles deep, said Dr. Arthur C. Parker, director of the Rochester Museum of Arts and Sciences, speaker at the dinner. Such a shaft, far beyond the present depth to which the earth has been probed, will enable scientists to study earth structure down where the mysterious cosmic rays have no influence. There, man can find out what it is like to avoid these cosmic bullets that bombard the earth from space.

When we get under the earth's skin, said Dr. Parker, we may possibly find that the cosmic ray is "the sperm of life."

Calling the study of hormones, secreted within the body, a challenge, Dr. Parker said:

"There is practical romance in this research for it means that the biologist of the future will have controls within his grasp that can produce the super-man or the super-woman, but, whether man or woman will depend upon what derivative of cholesterol the bio-builder uses. One can imagine also what effect the use of this substance will have upon the writer of fiction. He will analyze the love between the man and the maid. 'She was filled with C₂₇H₄₅OH,'

the writer will say, 'and he was energized by liberal amounts of C₁₉H₃₀O₂, which my dear readers, is so powerful that it sprouts combs on capons, so you can see what it did to our hero.'"

Fuller understanding of how the mind works, as master of the body, was also forecast by Dr. Parker, who said:

"We must look ahead for the true answer, though I am well aware that some psychologists will say they can answer now. Still, I am skeptical enough to believe that the real answer to this question will be one of the most startling achievements of this century."

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SURGERY

Signal Lamp on Forceps Gives Surgeon Go Signal

A NEW attachment to conventional surgical forceps that gives the surgeon a go-ahead signal during an operation by lighting a signal lamp, is one of the new devices demonstrated before the American College of Surgeons.

When foreign bodies, such as pieces of metal, are probed for, electrical connections on the prongs of the forceps will make contact and light the signal lamp only when the foreign matter is seized properly. If soft tissue such as muscles gets in the way, the light will not go on. The new instrument is always used in conjunction with X-rays.

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