

and is not the same as nephritis, another kidney disease for which the cause is known. Characteristic symptoms of nephrosis, Dr. Epstein said, are edema or dropsy, decrease of kidney excretion and presence of albumen in the excretion.

The disease, according to Dr. Epstein, occurs most frequently in young adults and children.

"The individuals particularly prone to this malady," he said, "are of a peculiar flabby type—some being definitely obese before the disease is discovered."

While in most cases the disease begins insidiously, occasionally it is ushered in by an infection, or it may occur during or after pregnancy or in the course of some gland disturbance, notably thyroid disorder.

"Experience teaches," Dr. Epstein said, "that although its etiology is uncertain and its duration is usually long, it is amenable to treatment and cure. In essence, genuine nephrosis represents a subversion of protein metabolism."

Science News Letter, November 13, 1937

GENETICS-PSYCHOLOGY

Why Do the Quints Differ? A Puzzle For Science

The Five Little Dionnes, So Much Alike in Looks, Are Not the Same in Personality or in Abilities

THE "QUINTS" have provided science with one of its most interesting puzzles of current years. They are "identical," that is, they came from the same egg in their development before birth. They are "more alike than five peas in a pod."

Yet they do have differences in ability and personality. Why? Several of the 200 scientists and educators who attended the Toronto conference (Oct. 30) on the Dionne quintuplets have analyzed this problem in special statements to Science Service.

Quintuplets "Identical"; Biologists Report Tests

By DR. JOHN W. MacARTHUR
University of Toronto geneticist

THE DIONNE Quintuplets are an identical or monozygotic set, after all. This is the conclusion reached by Dr. N. H. C. Ford, biologist, of the University of Toronto, and myself and announced Oct. 30 to the group of scientists and public officials assembled to hear reports of researches on the biology and psychology of the famous quintuplets.

The chief problem was to discover as certainly as possible the interrelations of the members of the set, and decide whether they were all related as fraternal, as identical, or were a mixed set, composed of both fraternal and identical pairs. The latter origin was suggested,

in SCIENCE NEWS LETTER of Sept. 1, 1934, as by far the most probable origin.

The new evidence that all five are division products of the same fertilized egg or embryo was derived from as many inherited characters as it was possible to study in the quints and some of their older brothers and sisters.

In a family where faces, ears, eyes, hair and skin characteristics vary over a wide range, the quintuplets are remarkably uniform, and any two of them proved as much alike as identical twins. The five are so confusingly similar in facial features that few can consistently identify them correctly, except after becoming intimately acquainted with small individual differences in the form of the faces, ears, teeth, etc. Throughout the set the iris color is the same medium brown flecked and bordered with gray. There are the same long, much-curled dark brown eyelashes and the light brown eyebrows; reddish brown, slightly wavy hair; and the fair, rosy and unfreckled complexion. And they all belong to the same blood group, O.

Particular emphasis was laid on the resemblance of the hand and sole prints, since these are fixed before birth and constant through life. In addition to a general likeness as close as in identical twins, the quintuplets all share two rare features; namely whorls among the palm patterns, and a mild form of syndactyly of the second and third toes on each of the ten feet.

There is little mirror-imaging in the set; only Emilie appears to be left hand-

ed, and only Marie's crown hair whorl turns clockwise. There is a hint that these two are products of the last division.

The right and left hands of any members of the set are less alike than one of her hands is like a hand of a sister; in the sib comparisons the opposite was the case.

Such close resemblance as the quintuplets show in many characters would not be expected unless they all carry the same inheritance, and this would occur only if all are identical.

From the medical literature some 60 other cases of quintuplet births were traced, among them at least one or two other monozygotic sets. Thus the Dionnes are unique only in the sense that they have survived past infancy, and as an unbroken set.

Since they all have a common inheritance, the differences which now exist or subsequently arise between them in physical, mental and social characters may be attributed to the influence of environment.

Too Soon To Tell How Quintuplets Will Turn Out

By DR. FRANK N. FREEMAN
Professor of Educational Psychology
University of Chicago

THE DIONNE quintuplets furnish the only case in the history of the world in which five persons who have exactly the same heredity have been tested and measured scientifically. At the conference held in Toronto, the first public report was made of the tests which show that the quintuplets are beyond doubt identical. This means that they came from a single egg cell which divided and re-divided until five separate and complete individuals were formed.

The identity of the quintuplets is shown most clearly by their fingerprints, in which all are remarkably alike and all different from their other sisters and brothers. They all, therefore, have exactly the same start in life. How are they going to turn out?

It is too soon to answer this question. At three years of age there are still many hidden possibilities in ability and personality. But enough is shown in the tests and observations now reported to show that these little girls who started out exactly alike are clearly different in abilities as well as in the leadership they exercise in their own group, in their emotional expression, in the way

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"

By DR. H. H. NEWMAN

Professor of Zoology
University of Chicago

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 quintas 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 quintas 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 quintas, a second examination of the quintas 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."

Science News Letter, November 13, 1937

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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