

## EMBRYOLOGY

# Late Division of Embryo Causes Differences in Twins

## Theory of Chicago Zoologist Would Explain Why Some Pairs are Really Identical and Others Unlike

CONJOINED TWINS have been regarded by scientists as unquestionably of the type in which each pair has a single origin in one egg cell or ovum—identical twins, the biologist calls them. And yet they are far from identical.

The answer to this disconcerting puzzle is given in the theory of how twins are formed propounded by Dr. H. H. Newman of the University of Chicago in a report to the American Genetic Association, published in the *Journal of Heredity*.

Dr. Newman has been making a special study of the likenesses and differences of twins in appearance as well as in other physical respects. He has found some identical twins which are so much alike that they cannot easily be distinguished one from the other, and other pairs so little alike that their faces might belong to entirely unrelated persons. Strangely enough, the conjoined, or Siamese, twins fall at the unlike end of this resemblance scale.

### Heads Not Same Size

As examples, Dr. Newman cites the Hilton twins, famous in vaudeville. One of these sisters has a much larger head than the other and she is an inch and a half taller. Their associates constantly emphasize their temperamental differences. Of the Godena twins, Simplicio and Lucio, Filipinos, also in vaudeville in the United States, one member is larger than the other. Their heads are of a decidedly different shape—one having a sloping forehead, the other a more vertical brow. This unlikeness of two beings so nearly one person that they have indeed no separate existence is due to the fact that for too long a time they were one undivided person, Dr. Newman believes.

Separate identical twins are formed by the separation into two parts of an embryonic cell mass derived from a single fertilized egg cell. What would have developed into the left half of the single person doubles itself and becomes a whole person.

At a certain stage in its development, the egg cell mass begins to develop a right and a left side. These are like each other, but like the mirror reflection of each other rather than an exact duplication. In the same way, your right hand is not exactly like your left, but like its image in a mirror.

If the separation which makes the twins takes place before this stage at which asymmetry develops, it is indicated by Dr. Newman's report that the two resulting individuals are likely to be almost exact duplicates of each other—more alike than the left side of your face is like the right side.

If, however, the separation takes place after the asymmetry becomes established, the resulting twins are more likely to appear as mirror images of each other. One may be right-handed and the other left-handed. The hair of one will grow in the opposite direction from that naturally taken by the hair of the other. The finger or palm prints of the left twin are likely to be reversed.

But this imaging is never perfect even in the two sides of a single individual. If you examine yourself or your friends very carefully you will find slight or perhaps marked differences between the right and left side of the face, between the left hand and the right hand, or the left foot and the right foot. Photographers recognize this and select the "best" side of the face for a portrait. It is said that Edison was commonly photographed from only one side because that side of his face better displayed his character as known to his associates. Shoe dealers find it advisable to try on both right and left shoes, for one foot is often larger than the other.

So, careful examination may detect differences in these mirror image twins that will enable parents and friends to know them apart.

Finally, if twinning comes too late to permit the complete separation of the two body halves, double monsters may be formed in which the two parts are complete reversals of each other. The

left part can produce only left characters.

"Both sides of the face of the right twin will be like the prospective right side of the face of the single individual; and similarly both sides of the face of the left twin will be left faces," Dr. Newman tells us. "No wonder, then, that the faces of conjoined twins are usually so different!"

*Science News Letter, November 14, 1931*

## PHYSICS

## New Scientific Council To Standardize Colors

A CLEARING house of reliable information on color for artists, scientists and industrialists, is being organized by thirteen cooperating scientific and technical societies.

The new Inter-Society Color Council, whose chairman is Prof. E. M. Gathercoal of the University of Illinois, will standardize the names, measurements and specifications of colors. Practical men confronted with color problems will, according to the plans of the council, be put immediately in touch with those who have appropriate technical knowledge. Duplication of effort and loss of time will thus be avoided.

At present there is a gap between those who have the scientific knowledge of color, such as physicists of the Optical Society of America or textile chem-



*Jr. of Heredity*

### TWO KINDS

Conjoined or "Siamese" twins from the Philippines, and their wives who are separate identical twins. Notice how the Siamese twins differ in height and facial expression.