

EMBRYOLOGY

New Medical Nobelist Found "Leaders" Among the Cells

German Embryologist Discovered, At Early Beginnings Of Life, Cells That Show the Way to Differentiation

PROBING experimentally into the minute beginnings of life in its embryonic stages, a methodical German scientist discovered there cells that act as leaders, showing the way for the cells around them to develop into brain, spinal cord and other parts of the tiny structure that eventually grows into a man or woman.

Because of that discovery, Prof. Hans Spemann of Freiburg, Germany, has become the Nobel laureate in medicine for 1935.

American scientists learning of the award agreed that Prof. Spemann is one of the great world leaders in the particular branch of medicine known as experimental embryology. Although he is not the first scientist to study embryology by the experimental method, Prof. Spemann was one of the first to become dissatisfied with merely watching the embryo grow, in an effort to learn the secrets of how this tiny structure developed into a baby cat or dog or child. So he began experimenting with the growing embryo.

Among other experiments, he transplanted some of the leader cells into another fertilized egg, to see what would happen. In this way it was discovered that a spinal cord, for example, could be made to develop where one ordinarily would not have been found. The leader cells that stimulated development of the spinal cord continues to stimulate surrounding cells to develop into a spinal cord, even if the leaders are removed from their original location and placed elsewhere in the tiny embryo.

Various Names

These leader cells are known by various names, such as activators or inductors. At first they were thought to influence surrounding cells of the embryo by an abstract process called activation. Further research showed, however, that the effect is one of chemical stimulus. The same effect can be produced by the leader cells after they have been killed by heat as when they are alive and growing. The chemicals which make up the cells have this power to stimulate other cells, scientists have found.

Prof. Spemann is internationally known not only for his own discoveries but for the school of experimental embryology which he has built up in his laboratories. Among his followers in the path of science is one of his three sons, Dr. Fritz Spemann, who is teaching biology at Frankfurt-on-the-Main, Germany.

A daughter, Mrs. Margaret Cloos, is the wife of a scientist, Dr. Ernst Cloos, member of the geology faculty of Johns Hopkins University, Baltimore, Md. Mrs. Cloos is not a scientist, however, but occupies herself with the education of her two children.

Experimental research in embryology, which has attracted world-wide attention because of the Nobel Prize award to Prof. Hans Spemann, German leader in that field of science, is also being pursued in American laboratories. Among distinguished American investigators in this field are Dr. Ross G. Harrison of Yale University and Dr. George L. Streeter, director of the Carnegie Institution's department of embryology at Baltimore.

Science News Letter, November 2, 1935

ENGINEERING

Better Brakes Needed For Modern Motor Cars

UNDER the present conditions of road construction and braking ability present-day motor cars "should be considered decidedly unsafe" when driven at their top speeds, declared Prof. R. A. Moyer, highway engineer of Iowa State College, before the 24th Annual Safety Congress.

Safety, considering motor cars alone, said Prof. Moyer, lies in maintaining low stopping distances. To provide the same stopping distance when traveling at 60 miles an hour as at 40 miles an hour requires brakes two and one-half times as powerful.

"The manufacturers have not provided an increase in dependable braking power anywhere near that which these figures indicate should be provided, and until they do provide it the



PROF. HANS SPEMANN

present top speeds of cars should be considered decidedly unsafe," the highway expert concluded from the results of a four-year research study at Iowa State College.

Studies of speed distribution in large volumes of traffic indicate, Prof. Moyer added, that only ten per cent. of the traffic jeopardizes the safety; five per cent. consists of traffic moving slower than 35 miles an hour; and five per cent. the traffic moving faster than 55 miles an hour. Maintaining traffic speeds to about 45 miles an hour on open stretches of road would eliminate many of the hazards created by the present lack of a speed control plan.

Under present conditions of traffic it may prove far cheaper and possibly equally safe to use the airplane when speeds of more than 60 miles an hour are desired, Prof. Moyer indicated. Road tests show it costs twice as much to drive a car at 60 miles an hour than it does at 40 miles an hour. At speeds of 80 miles an hour the cost is probably four times as much as at 40 miles an hour.

Contrast in Records

The most recent demonstration of economy, Prof. Moyer pointed out, was the case of the new speed records on land and in the air. Sir Malcolm Campbell needed a 2,500 horsepower motor to average 300 miles an hour on the salt beds of Utah—probably the most perfect race course in the world. On the other hand Howard Hughes needed only a 1,000 horsepower motor to reach 350 miles an hour in the air.

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