Russians and Negroes; current studies of Europeans, Africans, Asiatics, Australian aborigines and Pacific Island inhabitants, however, are revealing striking racial differences in the gene frequencies of almost all blood group systems.—Philip Levine of Ortho Research Foundation.

"Social physics," which can serve business executives, legislators, lawyers and public relations counselors, needs to be explored more thoroughly to help the "human engineer" solve some of the industrial problems that arise from day to day.—G. Edward Pendray of Pendray and Co.

Science News Letter, January 9, 1954

CYTOLOGY

## Developing Brain Cell Nucleus Not Determined

➤ THE NUCLEUS of a cell that is developing into brain or bone in a frog embryo is capable of participating in the formation of all other body tissues, Drs. Thomas J. King and Robert Briggs, Institute for Cancer Research and Lankenau Hospital Research Institute, Philadelphia, reported at the American Association for the Advancement of Science meeting in Boston.

Drs. King and Briggs took the nucleus from cells that had partially differentiated and planted them in an undifferentiated egg cell without a nucleus. The experiment showed that the nucleus from the older cell can join with the egg to form a complete embryo.

The cell nucleus through the gastrula stage of embryological development is still unlimited in its potentialities. This shows that the basic changes in the cells as differentiation progresses do not involve the nucleus, the scientists pointed out.

Science News Letter, January 9, 1954

ICHTHYOLOGY

## Fish School "Swims" in Rock 350,000,000 Years

➤ A SCHOOL of 350,000,000-year-old fish, of previously unknown type, has recently been discovered in a rock formation near Oslo, Norway.

Completely intact, with heads, eyes, tails and fins clearly outlined in the rock, the 40 fossilized specimens were identified as belonging to a group known as cephalaspids, one of the earliest vertebrate types.

The discovery was made in the district of Ringerike, about 30 miles north of Oslo, by Dr. Robert Denisen of the Chicago Museum of Natural History, and Profs. Leif Stormer and Anatol Heintz of the Paleontological Museum in Oslo.

Other rare specimens of primitive fishes, sea scorpions and crustaceans, discovered in the same district in 1911, have been collected in the Oslo Paleontological Museum. One of the sea scorpions is over 31 inches long.

Science News Letter, January 9, 1954

GENERAL SCIENCE

# Research Business Costly

➤ IT COSTS American industry about $2,500,000,000 a year to give you more deadly insect killers, more efficient cars, more rugged electric mixers and more sensitive fever thermometers.

Add to this amount another $1,250,000,000. This is the bill covering the development of better airplanes for your son in the Air Force, or a bullet-proof vest for your boy in the Army, or better lifeboats for your sailor son and his buddies, or a safer landing craft for your teen-aged Leatherneck.

In short, research in this country is big business. It cost $3,750,000,000 just to keep America clicking in 1952. During that year, about 96,000 research engineers and scientists labored over test tubes, slide rules, blueprints and calculations to produce the gizmos, machines and instruments that help make this country what it is.

These figures and findings, the latest available, have been compiled by the U. S. Department of Labor in a 106-page report, "Scientific Research and Development in American Industry." The figures come from questionnaires returned by 2,000 companies. They represent an estimated 85% of America's full research potential.

Turnover in the research ranks became a matter of "grave concern" as the Korean War created a different kind of military conflict: a need for young men in the armed services and, at the same time, a need for more researchers to carry out defense developments.

Yet in spite of the Korean War, the military services took only three men out of each 100 research workers employed, on the average. About 13 others per 100 researchers either quit, retired, were laid off, were fired or died.

However, at the beginning of 1952, the number of young men in industrial research who were subject to military duty jumped to an average of 25 out of each 100 researchers. About 19 of these men were members of the reserves or National Guard. The other six were classified 1A or 2A.

Industry has considered getting the utmost from its research workers by supplying them with a staff of technicians to twirl knobs, take hourly readings and run series of long, routine tests.

About 143,000 supporting workers were helping the 96,000 research scientists and engineers. This averages about 1.5 technicians to each scientist. Some companies gave each of their research scientists a staff of nine technicians.

The size of the supporting staff "has become a matter of great interest and importance in research management," the report states. This sort of organization helped America over an industrial hump during World War II when skilled men were at a premium.

A crew of non-skilled labor, for instance, went down the airplane assembly line and "set up" for a welder. Another crew cleaned up behind him. Thus the welder's specialized skill was used to its fullest extent. The welder did not have to waste his valuable time attending to details that are not essential to his job.

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