

GENETICS

Genetic Clue to Diseases

Human defects such as Mongoloid idiocy, genetic intersexes and, possibly, leukemia may be caused by abnormalities in the number of chromosomes an individual has.

► **CHROMOSOMES**, the microscopic threads that carry the genes of heredity, may be the cause of serious human ills.

A team of British researchers reports in the British medical journal, *The Lancet*, that irregularities in the number of chromosomes an individual has may lead to Mongoloid idiocy, abnormalities of the sex organs and, possibly, leukemia.

In a complex process involving making cell cultures from human marrow, treating the cells to make them expand and then staining the chromosomes inside the cells at a critical stage in chromosome duplication, the scientists were able to "map" the chromosomes. They found derangements in the sex chromosomes and, they believe, in the number of body chromosomes.

In two genetic intersexes, or humans with sex abnormalities, the researchers found some sex chromosomes were definitely deformed or missing.

An extra chromosome, believed to be nonsexual, was found in the six Mongoloids studied. Instead of the normal number of 46 chromosomes, these individuals had 47. However, the researchers report, it was so small that the Mongoloids could live although with impaired faculties.

The problems faced by cell researchers, or cytologists, in studying and mapping chro-

mosomes are very complex. It is still not known how much variation there can be in a "normal" individual. However, on the basis of studies made so far at the University of Colorado Medical Center, Denver, by Drs. T. T. Puck, Arthur Robinson and J. H. Tjio, there appears to be an exceedingly high degree of uniformity in the chromosome make-up of normal individuals. The researchers are currently working on the relationship between chromosomal abnormalities and genetic disease.

As yet no one has been able to determine the location of genes responsible for human genetic diseases except for some that are sex-linked, such as color-blindness.

The chromosome mapping reported by the British research team, headed by Dr. Charles E. Ford, British Medical Research Council at Harwell, and Prof. L. S. Penrose, University College, London, may be an extremely important step in this direction.

The technique they used, based largely on the work of such researchers as Prof. T. C. Hsu of the M. D. Anderson Hospital, Houston, Texas, and Dr. Tjio of the Colorado Medical Center, may provide important clues to the causes of many serious diseases and defects.

Science News Letter, April 18, 1959

easier-to-care-for garments has encouraged the search for chemical compounds which can be made into inexpensive disposable items, Dr. Shailer said.

Cleaning cloths, tissues, towels and napkins have already found widespread acceptance, and the favorable heat, sound, and mechanical properties of the nonwovens promise use in the automotive industry as padding in car doors.

The textile industry is not alone in the nonwoven field. The chemical industry is expanding production of nonwoven fibers, and the paper industry may soon be entering the field, Drs. Willard Carlson and Kenneth Arnold reported for St. Regis Paper Co.

The development of plastics has allowed paper makers to use fibers not derived from wood, and these synthetic fibers can be modified to produce fibers from a paper-making machine which are suitable for garments.

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SURGERY

Heart Massage Technique Is Available to All GP's

► **THE TECHNIQUE** of heart massage is being taught in community centers to doctors who did not learn the method in medical school.

Heart massage now saves many cardiac arrest victims, Dr. William H. Snyder of Los Angeles pointed out to colleagues attending the 11th annual scientific assembly in San Francisco of the American Academy of General Practice. In fact, the technique is now taught to all medical students.

With the aid of a series of diagrams, Dr. Snyder showed doctors the life-saving incision and surgical separation of the ribs that enable the doctor to grasp the heart gently and massage it to simulate normal pumping action.

Serious brain damage can occur if heart massage is not started promptly, he added.

Dr. Snyder urged that all doctors learn the heart massage technique and be prepared to act quickly when a sudden and unanticipated emergency arises.

Since the earliest days of surgery, doctors have struggled to prevent sudden, unanticipated deaths in the operating rooms and emergency wards. Sometimes, for no apparent reason, the patient's heart simply stops. The surgeon must be ready to cope with these cases of "cardiac arrest," he said.

Surgery in the heart is now considered to be an everyday procedure in most medical centers, Dr. Norman E. Shumway of Stanford University School of Medicine added.

Within 20 years of the dawn of clinical heart surgery, direct vision or open-heart operations have become a reality. Much of this progress has been made possible by artificial heart-lung machines and clinical techniques that reduce body temperature during surgery.

The first "blue-baby" operation was performed in the early 1940's. This operation diverts part of the system's blood flow into an infant's lungs and has saved thousands of infants.

Science News Letter, April 18, 1959

CHEMISTRY

New Chemical Products

► **FOAM PLASTIC** smoke may soon be used for tracing rockets and satellites.

This prediction was made by the inventor, Miss Betty Lou Raskin, Johns Hopkins University, Baltimore, Md., at the American Chemical Society meeting in Boston, Mass.

The smoke is composed of minute foam particles, which could be metallized. This reflecting material could then follow a rocket or satellite and make possible greater echoing for radar tracking of these targets.

"Since it is believed that these particles will not simply float in space, but, because of their electrical charges, will be in some kind of orbit, smoke distortion patterns produced by rockets and satellites might also be found to have scientific value," she said.

The strategic placing of metallized particles above the ionosphere, the layer of the upper atmosphere that reflects radio waves, might improve radio communication. As cloud-seeding agents, the foamed smokes have several advantages over the commonly used silver iodide crystals. They also might prove valuable as a shield to protect ground personnel from thermal radiation emanating from experimental nuclear blasts, Miss Raskin said, adding:

"Since urethane foams have good thermal insulating properties, and since the resulting smokes have unusually slow settling rates, another application could be to protect crops against low temperatures in a manner similar to that for which carbon smoke from smudge pots is now used. They also should make efficient carriers for relatively large quantities of insecticides."

The toxicity of these smokes has not yet been thoroughly investigated, but the particle size suggests they would be filtered out by the human nose, and once the particles are well-dispersed in the air, their chances of causing physiological damage is minimized.

Throw-Away Bathing Suit

► **THE CHEMICAL** industry may soon be making bathing suits to throw away after a single use, scientists were told today at the Chemical Society meeting.

Dr. L. Shailer Jr. of B. F. Goodrich Chemical Company introduced a symposium on nonwoven fabrics by discussing the many engineering possibilities of man-made fibers. The growing desire for lighter weight,