

MEDICINE

Predisposition to Cancer

Hormone production of mother's glands during pregnancy may cause tendency to certain types of cancer, research with tadpoles shows.

► A PREDISPOSITION to some kinds of cancers may be caused by the kind of hormone production of the mother's glands during pregnancy.

Evidence for this comes from research by Dr. Emil Witschi of the State University of Iowa. Dr. Witschi's findings were announced by the American Cancer Society, which supports his research, as follows:

When pregnant animals are given the female hormone estrogen, their offspring may develop drastically altered hormone production patterns.

Most of Dr. Witschi's basic research was done on tadpoles. He finds that similar hormonal responses exist in salamanders, birds and marsupials (opossum), while the reactions in frog larvae are closer to those of mammals.

This research, designed to trace the evolutionary genesis of sex, may explain the "adrenogenital syndrome" of humans—the virilism of young males and females. In this condition the adrenal glands become enlarged and produce prodigious amounts of male hormone.

Young women, so affected, grow beards, develop deep voices and muscular figures, lack breast development and have prominent male-like secondary sex organ structures. Boys barely out of infancy have the voices and sex development of men.

Scientists elsewhere have found that this condition can be controlled satisfactorily with small daily doses of the adrenocortical hormone, cortisone. This puts the adrenals at rest and stops the excessive production of adrenal male hormone, unless this is due to an adrenal tumor.

Dr. Witschi's findings indicate that this congenital condition may be caused by the mother's profuse secretion of estrogen during pregnancy.

When the Iowa zoologist injected male tadpoles with moderate doses of estrogen, the males were feminized. Apparently the drug impaired the development of the male hormone-producing (interstitial) cells of the testes.

High dosages of estrogen, on the other hand, masculinized female tadpoles. It made the male hormone-producing (interstitial) cells of the ovaries develop to massive proportions and repressed the female hormone-producing (follicular) cells.

The effect of the dosage was so drastic that the sex of the animals was reversed in opposite directions—genetic males became females in low, and females became males in high concentrations. At the high dose,

the adrenal glands enlarged tenfold by weight, and showed signs of hyperactivity.

The Iowa scientist found that the effects on the adrenal were mediated by the pituitary, a tiny gland at the base of the brain which controls hormone output by the adrenal, sex and other glands. On the other hand, the sex glands are also directly affected by the estrogen. When he removed the tadpoles' pituitaries, neither low, moderate nor high estrogen doses had any effect on the animals' adrenal development, but sex reversal occurred as in unoperated larvae.

The embryonic tissue which is affected by treating the frog larvae with estrogen is the undifferentiated mesonephric blastema. Normally it develops into such organs as sex glands, adrenals, and urinary tubules. Under the influence of hormones the relative proportions of these differentiations are changed. It has been shown at the State University of Iowa and by other scientists that cancers of all these organs are affected or even caused by hormone stimulation.

Dr. Witschi has reported that human tumors of all these organs, in the light of his

experiments, may arise from abnormal prenatal hormonal stimulation. The hormones may be produced by the mother's ovaries or adrenals or by the placenta which protects and nourishes the fetus.

The results of these experiments indicate that predisposition to certain cancers may be congenital—that is, it may be brought about by environmental conditions in the womb—but not hereditary. In this event, genes may be involved only insofar as they affect the maternal hormone production.

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GENERAL SCIENCE

Byrd Plans Another Trip To Antarctic

► REAR ADMIRAL Richard E. Byrd, U.S.N. Ret., plans another trip to the South Pole region "if world conditions permit."

Meanwhile he will be busy supervising studies on the nutritional value of high protein bread. These will be in Germany and India, in remote U. S. Weather Bureau stations, at military installations at isolated posts and on ships long at sea. The studies will be made with fresh frozen bread which has already been shipped to Germany and soon will be en route to India.

The studies will be made for the frozen products division of Arnold Bakers, Inc., Port Chester, N. Y., which has just been set up with Admiral Byrd in charge as vice president.

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A "GARDEN OF EDEN"—Few white men have ever seen this spot, Canaima Falls in the heart of the Venezuela jungle. To the right is a "pink sand" beach, just three hours from Caracas by air. Landings are made in park-like stretches, free of trees, surrounding the area.