

HEART TISSUE BEATS LONG AFTER DEATH

Dr. Carrel Announces Startling
Results of His Experiments
with Cultures.

"PERMANENT LIFE" POSSIBLE

Fragments of a Chick's Heart Pul-
sated Rhythmically Two Months
After Removal.

Dr. Alexis Carrel of the Rockefeller Institute for Medical Research, whose surgical discoveries and innovations in operative procedure have amazed the scientific world at frequent intervals in the last few years, now announces that he has been able to keep pieces of the heart tissue pulsating rhythmically outside the organism from which they were taken for two months. The fragments were preserved in glass jars, in suitable media. He found also that a fragment of tissue preserved in the same manner retained its normal function for a long time.

These experiments, which are described in the current issue of *The Journal of Experimental Medicine*, are part of a series to determine whether or not the life of tissue can be prolonged indefinitely outside of the body. In this connection, Dr. Carrel expressed this opinion:

"It is even conceivable that the length of the life of a tissue outside of the organism could exceed greatly its normal duration in the body, because elemental death might be postponed indefinitely by a proper artificial nutrition."

He further states, after outlining the method of cultivating the tissues, that "these results showed that the early death of tissues cultivated in vitro was preventable, and, therefore, that their permanent life was not impossible."

Dr. Carrel's most astonishing statement follows this announcement.

"Subsequently," he says, "I developed other techniques by which it might be possible to obtain permanent life of tissues."

Here is Dr. Carrel's account of some of the experiments and his conclusions:

"Cultivation of the heart. (Experiment 720-1).—On Jan. 17, 1912, a small fragment of the heart of an eighteen-day-old chick was cultivated in hypotonic plasma. The fragment pulsated regularly for a few days and grew extensively, but there were no rhythmical contractions.

Still Pulsated After Two Months.

"On Jan. 29 and Feb. 1, 3, 6, 9, 12, 15, 17, 20, 24, and 28 the culture underwent eleven washings and passages. It became surrounded by fusiform cells and many dead cells. There were no pulsations. After the twelfth passage the culture did not grow at all. Then the tissue was dissected and the old plasma was completely extirpated. A small central fragment was removed, washed, and put in a new medium. On March 1 it was pulsating at a rate that varied between 60 and 84 a minute. On March 2 the pulsations were 104 at 41 degrees C., and on March 3, 80 at 40 degrees C., but on March 4 the pulsations were very weak and stopped altogether at 2 P. M.

"On March 5 the culture underwent its fourteenth passage, and the pulsations reappeared immediately. They became weak again on March 6. On March 8 the fifteenth passage was made. On March 9 the pulsations were again 80 to 82 a minute at 40 degrees C., and on March 12 they were 60 a minute. They then became slower and weaker. After the sixteenth passage on March 12 the pulsations were irregular, and the fragment beat for a series of 3 to 4 pulsations, and then stopped for about 20 seconds. After the seventeenth passage on March 16 regular pulsations at 52 beats a minute reappeared, and the tissue grew abundantly. After the eighteenth passage on March 19 the pulsations were irregular.

"It was thus demonstrated that a fragment of chicken heart could still pulsate rhythmically at the beginning of the third month of its life outside of the organism. It showed, consequently, that a fragment of tissue living in vitro could retain its normal function for a long time.

"The maximum age that tissues living in vitro can reach is still undetermined. Many cultures have died after less than two months, but a few were very active at the beginning of the third month of their life outside the organism. Generally, the tissues seemed, after a time, to adapt themselves to their new condition, and after the fourteenth or fifteenth passage very few cultures died spontaneously. In the handling and changes required by the passages, the cultures were exposed to many accidents, chiefly to microbial infections.

"In case of a local infection the part of the culture that was not yet infected was resected with a cataract knife and placed in a new medium. Often the culture recovered and produced several generations of cells that were free from microbial infection. But when infection was generalized, the tissues always died rapidly. Many cultures died of sepsis.

Large Growth of Fixed Cells.

"Of sixteen cultures of heart and blood-vessels made on Jan. 17, 1912, five were still very active in March, 1912, and of the five active ones, two heart cultures previously described grew slowly, but pulsated, and another heart culture, which pulsated from time to time, produced a large growth of ameboid and fixed cells which covered an extensive area of the medium. In this instance, after having been motionless for two months, the central part of the culture manifested strong rhythmical contractions on the sixty-fifth day of its life in vitro. Moreover, two cultures of connective tissue made on Jan. 17 were growing actively at the beginning of April. The rate of growth and the increase in their volume became very much greater as they grew older.

"In two series of experiments made at the end of 1911 and at the beginning of 1912, new techniques were developed with the view of investigating the problem of prolonging indefinitely the life of tissues isolated from the organism. These techniques are far from perfect and will doubtless be modified in the future. But

they have already permitted the establishment of new facts.

"Fragments of connective tissue have been kept in vitro in a condition of active life for more than two months. As a few cultures are now eighty-five days old and are growing very actively, it is probable that, if no accident occurs, the life of these cultures will continue for a long time.

"In some cases the rate of growth of the tissues increased in direct ratio to the age of the culture.

"Fragments of heart pulsated rhythmically at the beginning of the third month of their life in vitro.

"These facts show that experiments made with these or with more perfect techniques and followed over long periods of time may lead to the solution of the problem of permanent life of tissues in vitro, and give important information on the characters acquired by tissues liberated from the control of the organism from which they were derived."

GETS FIRST POLICE PASSPORT

Mechanic's Honest Kit-Bag Too Sus-
picious Looking for Safety.

Ralph Fisher, a mechanic who lives at 552 West Fifty-fourth Street, became the possessor yesterday of the first and only passport ever given out by the Police Department of this city. Commissioner Waldo handed the passport to Fisher and told him then that he hoped it would prevent his arrest in the future.

For Fisher has been arrested sixteen times in the last few weeks and can scarcely go out at night without being taken in charge by a watchful policeman or detective. He has a job with a firm in the St. James Building, which undertakes to care for the kitchen utensils and other things in the culinary departments of the big hotels and restaurants. He is handy with repairs and so has been assigned to work from midnight until the closing of the various hotels and restaurants. He is subject to a hurry call at any hour after midnight.

He carries a big bag of tools with him, and this bag has never failed to excite the suspicion of any policeman or detective who has seen it. Time and again Fisher has explained what his job is and who he is, only to be taken to the station house until now almost every desk lieutenant throughout the hotel district knows him.

Commissioner Waldo's passport tells who Fisher is, what his job is, and why he is entitled to carry what might be mistaken for a kit of burglar's tools. Both the Commissioner and Mr. Fisher hope that the passport will save him from frequent arrest in the future.

NORRIE'S ESTATE \$842,117.

Stocks and Bonds Mostly, and \$4,000
Worth of Wines.

Ambrose Lanfear Norrie, who died at his home at 15 East Eighty-fourth Street on Dec. 22, 1910, left an estate valued at \$842,117.63, according to the appraisal filed yesterday in the Transfer Tax Office by Deputy State Controller Wallace S. Fraser. He was a member of the Metropolitan and many other clubs, and well known in Wall Street. His realty is valued at \$70,000, and all the rest is in personalty consisting of various stocks and bonds.

These include 1,000 shares of the Capitol Traction Company, worth \$128,625; bonds of the Ohio Mining and Manufacturing Company, of which he was a Director, worth \$20,000; 190 shares New York Trust Company, worth \$116,850; 155 shares of the American Tobacco Company, worth \$64,170, and 400 shares of the Consolidated Gas Company, worth \$53,500. He owned at the time of his death about \$4,000 worth of wines and liquors. These included 109 dozen bottles of Chateaux Margaux and 120 dozen bottles of Monton Rothschild of 1906, worth \$2,288; four cases Pommery Vin Nature of 1900, worth \$184, and 120 dozen bottles of Chateau Yquem Sauterne of 1906, worth \$1,528.56.

According to the terms of the will the beneficiaries and the values of the legacies are as follows: Ethel Barbey Norrie, his wife, \$589,034; Lanfear Barbey Norrie, son, remainder after wife's death; Adam and Van Horne Norrie, brothers, \$4,500 each.

OFFICE-BOYLAWYERREBUKED

Judge McAvoy Refuses to Let Him
Answer Calendar Call.

Justices of both the Supreme and City Courts have recently indulged in much grumbling and frowning because of the legal habit in this city of sending stenographers or office boys to court to answer calendar calls and to submit briefs. But it remained for Judge McAvoy of the City Court, to administer yesterday a definite rebuke.

The Judge was sitting in Special Term calling the motion calendar. When one of the titles was called, an office boy in knickerbockers stepped forward and answered: "We are ready, Your Honor."

The Judge surveyed the lad calmly.

"Are you the attorney in this action?" he asked grimly.

"No, sir," stammered the boy, not sure that he had understood aright.

"Well," replied the Judge, "you may take back those papers to the lawyer who sent you and tell him that he must answer my call on them himself. In the meantime, the case is adjourned."