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Scientist's Scientist

(See Cover)

One day last fortnight, at Chicago's Rubinkam Airport, a rugged old man with a brick-red face and steel-grey hair stood gazing at the sky. From a plane high overhead a dot detached itself; the dot unfolded like a white flower, drifted earthward. As the parachutist landed, the red-faced old man was waiting for him, to read the recordings of his breathing and heartbeat. The old man was Physiologist Anton Julius Carlson of the University of Chicago, the most colorful figure among U. S. scientists. Generations of students have called him "Ajax."

At Chicago's airport Ajax Carlson was trying to figure out a way for parachute jumpers to fall feet downward, without dangerous tumbling and swirling. It was a characteristic Carlson experiment. Old Ajax has never concerned himself with morgueanatic affairs: he is interested only in the human body alive and kicking. That consuming interest in vitality has carried him on a lifelong voyage of discovery—through the heart, stomach, alimentary tract, liver, ductless glands, lymphatic and nervous systems.

Last week Dr. Carlson, himself still very much alive and kicking, celebrated his 66th birthday. As professor emeritus of Chicago's physiology department (he retired last year), he received congratulations from all over the world. He also went to Kansas City, where the U. S. Food and Drug Administration, for whom he has done work in poisonous fruit sprays, gave him a party. And he announced that this week he is returning to the University to teach physiology to freshmen.

Rams to Crabs. Anton Julius Carlson was born in 1875 on a farm in Sweden, not far from Göteborg. At seven he was hired out as a shepherd boy to a neighboring farmer. In stony glacial pastures, he learned his first lessons in biology and showed his characteristic temper. Little Anton bossed his sheep like a top sergeant. He would jump between battling rams and beat them over the head even though they trampled on his toes till the blood ran. Today Ajax remembers his harsh beginnings with pride, scoffs at pampered youngsters who have no "granite" in their bread.

When he was 16, he followed his brother Gust to the U. S., settled in Chicago as a carpenter. By 1892 he had saved enough to go to Augustana College, Rock Island, Ill., bent on becoming a Lutheran minister. But there were things about religion that brought out his skepticism.

Steering his religious impulses into science, he began a lifelong worship of cold hard facts. He graduated from Augustana, took a Ph.D. in biology at Stanford University in California, finally won a Carnegie fellowship. In 1904 he went East, to the biologists' heaven—the marine laboratories at Woods Hole, Mass. In those days scientists were arguing furiously over the origin of the heartbeat; some claimed it started in the heart muscles, others in the nerves. Through his researches on the horseshoe crab, *Limulus*, young Anton Carlson proved that, at least in *Limulus*, the heartbeat originates in the nerves.

The discovery made his reputation among biologists. Within a year he got a teaching job at the University of Chicago.

Wanted: A Stomach. More than 100 years ago, on Mackinac Island in Lake Huron, a doctor named William Beaumont tried in vain to close the wound of a Canadian trapper who had accidentally been shot in the stomach. The edges of the hole healed, and Alexis St. Martin, the trapper, was not uncomfortable; if he plugged the wound, he could eat. The failure of Dr. Beaumont to heal that wound made him one of the great figures in medical history. For, by putting a tube in the wound, he observed the movements of St. Martin's gut, discovered the digestive juices and hydrochloric acid.

Anton Carlson envied Dr. Beaumont. For there were a number of vital questions

Myron H. Davis

AJAX AND STUDENTS
Sometimes he has himself wheeled in on an operating table.

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that plagued him, and which he had insufficient evidence to answer: What is hunger? What is appetite? Does hunger originate in the brain or the stomach?

His own stomach tantalized him. He could feel it writhing, could hear it rumble, could even measure its contractions (by swallowing a balloon, inflating it, and hitching the tube that protruded from his mouth to a delicate recording machine). But he could not see into it. He longed for a second Alexis St. Martin.

One day a Bohemian doctor brought one of his countrymen to Dr. Carlson's laboratory. Fred Vlcek, now known to medical school freshmen as "Mr. V.," was a barber who as a child had accidentally swallowed strong caustic soda solution. The soda burned his esophagus, and the scar tissue which formed there permanently closed it, so that no food could pass to his stomach. Surgeons had made a neat little hole in his stomach wall, inserted a rubber tube. Mr. V.'s method of eating was necessarily messy: he would first chew his food to enjoy the flavor, then spit it into a syringe, insert the syringe into his tube, and thus fill his stomach. Through the tube Dr. Carlson could observe, to his heart's content, Mr. V.'s sometimes quiescent, often restless stomach. For 13 years Mr. V. was employed in the laboratory, until he finally died of cancer of the esophagus.

After "feeding" Mr. V. everything from brandy to paraffin, and observing what happened to his internal workings, Dr. Carlson came to the following conclusions:

▶ When the stomach is empty, it begins to contract periodically. These hunger contractions are not started by sight, smell or taste of food, nor by schedules. In short, the stomach is an independent organ, uncontrolled by the brain or central nervous system.

▶ A person may or may not be aware of strong hunger contractions in his stomach. But appetite, which is stimulation of nerve endings in the mouth, is a conditioned response, with no relation to true hunger.

These observations, with many others, appeared in Dr. Carlson's classic book, *The Control of Hunger in Health and Disease* (1916). On his theories other scientists worked out diets for infant feeding, gastric ulcers, etc.

Once Dr. Carlson starved himself for five days, another time for ten. He was weak at the end of the fast, but as soon as he took food again his weakness and mental depression disappeared. By the second day Dr. Carlson felt as though he had enjoyed "a month's vacation in the mountains." His mind was "unusually clear," and he did more work without fatigue. "Occasional periods of starvation," he concluded, "say once or twice a year, in the case of healthy adult persons, may not only add to the joy of living, but also to the length of life."

In an age and a science notable for specialization, Dr. Carlson has been notable for versatility. He has dug into such diverse subjects as liver function, vitamin E, the relation between thyroid and ovaries, effect of protein digestion on the sex of

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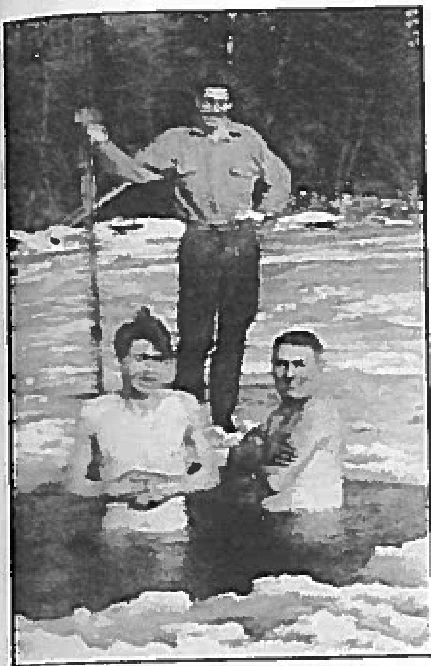

AJAX AND SON, BATHING
At bridge he is not so scientific.

rats, the bactericidal action of ozone.

But probably his most important contribution to biology has been as a strategist of biological campaigns. His caustic question: "Vot iss de effidence?" has launched a thousand experiments. Many of his pupils and onetime pupils have notable discoveries to their credit. Northwestern University's top-flight Physiologist Andrew Conway Ivy, a pupil of Dr. Carlson's, who is working on gastric ulcers, frequently consults Dr. Carlson when he has a new lead. Dr. Ivy is also in charge of the parachute experiments sponsored by Northwestern. Sidney Smith,* one of Dr. Carlson's medical students, last year developed, under Dr. Carlson's guidance, a new technique for stitching together torn blood vessels (TIME, June 10).

Ajax, the Teacher. For years to come, the University of Chicago campus will echo with stories in Swedish dialect:

▶ Once when he saw a girl with an electric wire trying to stimulate a frog muscle that was sodden with salt solution, Ajax barked: "You might as vell try to stick your electrodes in the ocean and stimulate Ireland."

▶ Another time he had two beakers of liquid before him: one containing urine, the other, sugar solution. He stuck his finger in one of the containers, tasted it and said: "Ya, dot's sugar."

When lecturing, Ajax holds his hands behind his back, charges across the platform in bull-like rushes. Suddenly he may stop short, wave his arms, thrust out his jaw, fix a quivering freshman with his hard blue eyes. Frequently his lectures start as dramatically as a murder mystery. He has himself wheeled into class on an operating table, while white-coated assistants draw blood from his veins.

Since 1909, there are few national or international conventions of physiologists which Ajax has not attended. He boasts

* Not to be confused with Chicago's late comic-strip creator of the Gumps.

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that he has never fallen asleep at a scientific meeting—not because what he hears is always stimulating, but because he fears that his colleagues might put something over on the world if he nodded. He considers himself a watchdog of the sciences. At such meetings he is still the truculent, aggressive shepherd lad who kicked the rams around in a Swedish pasture. Whenever he thinks a theory has been presented without sufficient evidence, he leaps to his feet and pitches into the unlucky author without mercy. Most of his colleagues have a respect for him that verges on awe.

At the International Physiological Congress in Stockholm, some 15 years ago, Monkey-Gland Specialist Serge Voronoff presented a paper on rejuvenation. Ajax denounced him with prompt violence. "I know the case of a 'rejuvenated man' in the United States," he began, "who felt young until he receifed his physician's bill. Dot vas so high he suddenly felt old again." Voronoff stalked out in a dudgeon, swore he would never attend another meeting where Dr. Carlson was present. But Ajax got a burst of applause and an enthusiastic kiss from a bearded French scientist.

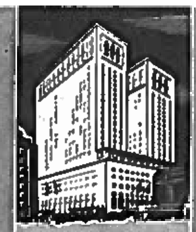
No Monk and No Monastery. Dr. Carlson's most distinguished opponent is Chicago's President Robert Maynard Hutchins, who tends to minimize the value of a scientific education. "Three hundred years ago," said Ajax recently, "Hutchins vould haf been a monk in a monastery. I don't belief in retreating from de vorld; I belief in staying in it and mastering it."

Once, at a meeting, a number of faculty members charged the University with not giving certain of its teachers secure tenure of their jobs. President Hutchins claimed that this practice kept them on their toes. "Vot you mean," Ajax burst out, "is dot it keeps dem on deir knees."

He lives with his wife, daughter of a Swedish immigrant family, and his doctor son Alvin Julius, in a narrow six-room house, cluttered with books and papers. From his house Dr. Carlson can see five grey squirrels who frisk in his back yard, and even that stimulates his scientific mind. Last spring in *Science* he noted that a pregnant squirrel dug up old bones, gnawed them constantly. He suggested that someone experiment with squirrels' craving for bones and their physical need for calcium and phosphorus during pregnancy.

Summer and winter, old Ajax takes a few days off to spend at his log cabin in the Michigan woods. There he goes fishing, makes hot cakes for his companions, in winter still occasionally chops a hole in the ice to take a dip.

Sometimes in the afternoon Dr. Carlson goes to the Quadrangle (faculty) Club on the campus to smoke his pipe and play bridge. He plays a most unscientific game, but usually has plenty to say to his partner after a losing hand. Often his colleagues could cheerfully strangle him, for he stifles all bridge table chat. If someone drops an irrelevant remark, he raises his head and barks an equivalent of his famous query: "Vot iss de effidence?"



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