



PROFESSOR ANDERSON'S

"Food Shot From Guns"

FREDERICK L. JOHNSON

A series of shotgun-like explosions echoing from the New York Botanical Garden laboratory of botanist Alexander P. Anderson brought concerned colleagues rushing to his research station. Anderson's mentor, former University of Minnesota professor Daniel T. MacDougal, arrived first. On the table in front of the scientists, standing out among the shards of exploded test tubes, was a "white-as-snow" stick of pure starch.¹

What his discovery on that day in December 1901 might portend for the future, Anderson could not know, but he immediately grasped its promise. When fully developed, the process produced "puffed" rice, wheat, and corn cereal, helping set the table for a revolutionized American breakfast and the nation's cold-cereal industry.

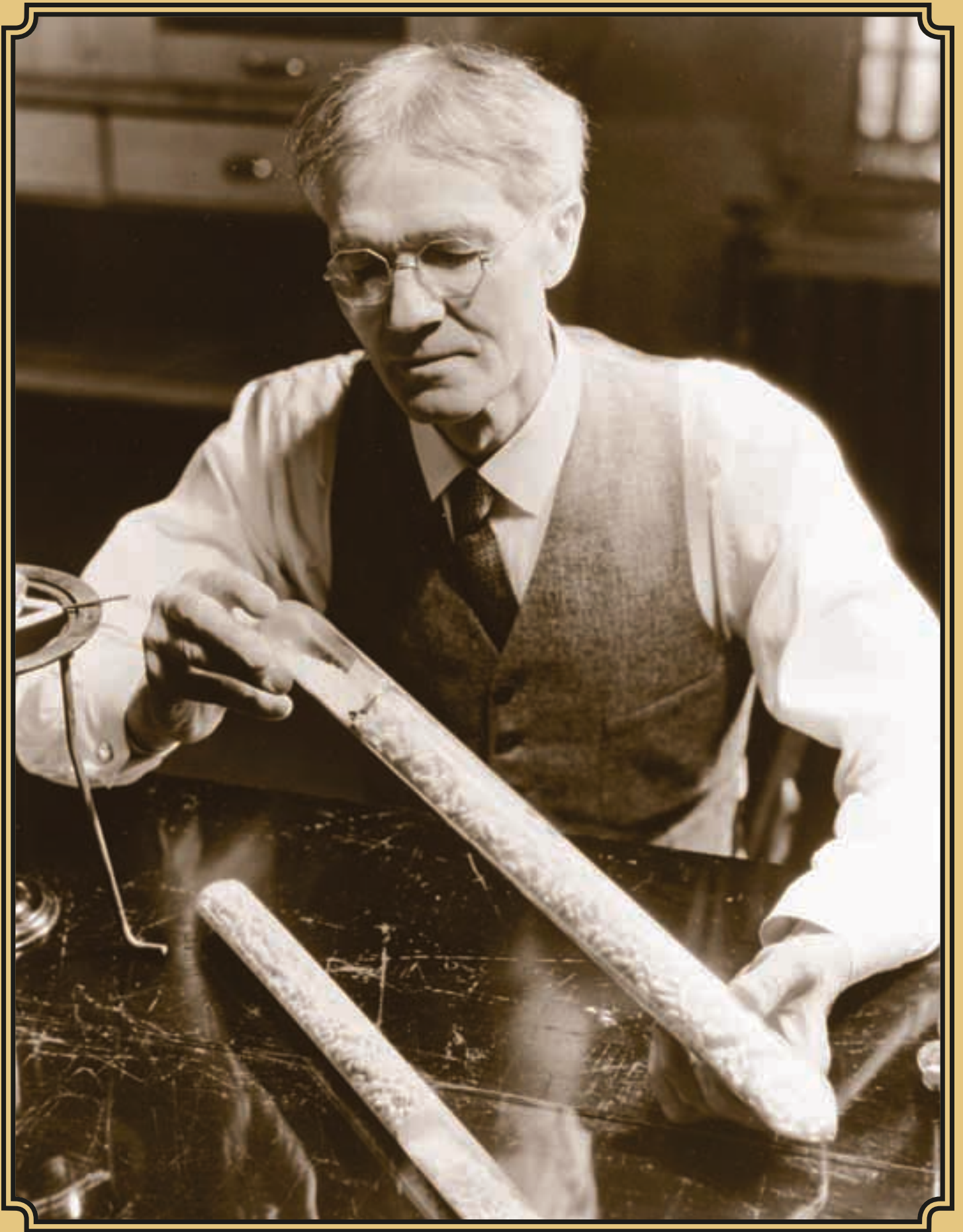
Puffed cereal also created an advertising icon for the Quaker Oats Company. This firm, to which the unassuming Swedish American inventor eventually

assigned his patented puffing process, capitalized on Anderson's image as a scholarly professor whose research produced a new and nutritious ready-to-eat cereal. For a time Quaker advertising campaigns would immodestly tout Anderson's cereal product as "The Eighth Wonder of the World." The explosions in Anderson's laboratory also fueled another advertising slogan known to this day. Anderson had invented "food shot from guns."

Alexander Pierce Anderson seemed born to the life of a Minnesota farmer. His parents, John and Britta Maria Anderson, left Sweden's Småland region in 1855 on an 11-week trip to what became Goodhue County, where they planned to settle and farm. The Andersons paid \$14 for 160 acres in Featherstone township's Spring Creek valley, ten miles from Red Wing, and that first winter lived in a dugout on the valley's south side. Alex, born November 23, 1862,

RIGHT: *Prof. Alexander P. Anderson with tubes of "puffed" grain, Tower View laboratory, 1933*

ABOVE: *Early Quaker Puffed Rice advertising postcard*



started plowing at age seven with a team of horses he could harness himself. He fished, trapped, and hunted and also attended classes at Common School District #18. His main ambition, according to his notes for an autobiography, was to be able “to do a man’s work in the field” by the time he reached age 12.²

Young Alex loved the natural beauty of the valley and enjoyed studying it. At 13 he used profits from the sale of 100 muskrat skins to buy his first book, *Manual of Zoology*. His love of learning led the teenager to study taxidermy and local fossils, contribute puzzles and enigmas to the *St. Paul Pioneer Press*, and investigate the popular theory of phrenology.³

Circumstances seemed to conspire to keep Anderson from reaching an important goal—a university education. His four brothers and only sister left home to pursue careers, education, and marriage, while Alex remained on the farm. After completing common school, he passed a licensing exam and taught in one-room country schools for eight years. Eager for advanced schooling, he also managed to enroll in 1882 for a sub-freshman term at the University of Minnesota, where he spent the fall semester in 1884. Yet five years later he was still primarily managing the family farm.⁴

Anderson saw his farm workload increasing and, with it, his responsibilities. “Aims and plans as to how I



Teacher Anderson at school in Goodhue County, 1889, and in a Red Wing studio portrait before leaving to attend the university

could help my parents and relieve them from anxieties about debts and what their own children would do weighed upon my mind,” he later wrote. At age 22 he built a small house for his parents, himself, and his brother Arthur and assumed control of 120 acres of the family’s original farm. He made plans to finish university when the mortgage was paid off.⁵

Life changed dramatically during a four-month period of family adversities beginning with the death of his mother in October 1889. The following month the new farmhouse burned to the ground; then, in January, his father died. Alex was 27 and, in his own words, “now alone in the world.” He was also released from any obligation to continue living on the farm.⁶

Anderson later reflected that he regretted the belated start to what would become his life’s work. In *The Seventh Reader*, his largely autobiographical 1941 book about farming

on the Minnesota frontier, he wrote, “We blame circumstances for certain failures, delays, time lost, years lost; for example, by having to stay out of school.” In another note about that difficult time he recalled: “My little poem of sorrow—I had lost 7 years. I was 7 years older than the rest of my class. In 1894, in 1895, in 1896, in 1897.”⁷

In September 1890 Anderson began his freshman year at the University of Minnesota, and by the spring of his second year he informed his brother Arthur, “I am now registered as an agr. [agriculture] student.” He faced a rigorous schedule of physics, chemistry, botany, and zoology and was completing his study of German, the language he used for graduate study. Anderson delivered newspapers to help support himself, explaining that one could make \$100 during the nine-month school year.⁸

As a senior, Anderson displayed both talent and interest in research

Frederick Johnson is a retired St. Paul teacher and an adjunct faculty member at Hamline University in St. Paul. His three books, contributions to periodicals, and published school curriculum focus on the history of Minnesota.

and mechanical engineering when he invented a self-registering balance that measured water vapor given off by green plants. He then used his invention, which instrument makers Bausch & Lomb Optical Company manufactured as the “Anderson Registering Balance,” to conduct a detailed study of the growth of pumpkins, an investigation he began by planting seeds on the south side of the university’s Pillsbury Hall in the spring of 1894.⁹

The next fall, a faculty committee awarded Anderson the Howard Fellowship, which helped fund his study toward a master’s degree in plant physiology. He had become a stand-out in botany under the tutelage of two exceptional professors—Conway MacMillan, the astute and talented department head, and Daniel MacDougal, plant physiologist, prolific researcher, and, later, personal friend. MacDougal once insisted, “You must make up your mind never to give up original work under any circumstances.”¹⁰

Anderson next decided to pursue a doctoral degree at a world-renowned university in Munich. In June 1895 the self-described “meek and mild” botanist, now 32, combined his own savings with an \$850 loan from his cousin, John Lind, the former three-term congressman and future Minnesota governor, and traveled to Munich. Lind’s 17 year-old-son Norman, who also planned to study abroad, joined Anderson for the trip.¹¹

Arriving in Munich, Anderson immediately visited the home of Freiherr von Tubeuf with a letter of introduction from MacMillan. The next day he met Tubeuf and Robert Hartig, Tubeuf’s father-in-law, both Ph.Ds in botanical science. Anderson attended lectures and worked in

Tubeuf’s laboratory. He also made research excursions and traveled extensively by train, lake steamer, and, very often, on foot in southern Germany and Switzerland. Along the way he met with prominent botanists from universities and botanical gardens. Minnesota’s MacDougal briefly visited and traveled with Anderson and Lind.¹²

Anderson focused on the theories of German plant physiologist Heinrich Mayr regarding the internal structure of the starch granule. Professor Frei van Goebel’s detailed lectures on starch structure also made a lasting impression on the visiting Minnesotan. A year later, Anderson submitted his dissertation, written in German, on abnormalities found in the resin canals of diseased pine trees. He received his doctorate and returned to the United States.¹³

Schooling completed, Anderson began his career with a three-month

research term at Shaw Botanical Gardens in St. Louis. In December he moved to South Carolina as a botanist and bacteriologist at the new Clemson Agricultural College and its agricultural experiment station. Anderson, who earned \$1,200 per year, started designing an ambitious research plan for his department.¹⁴

A touch of gold fever and doubts about the security of his position at the four-year-old college led him in August 1897 to ask John Lind’s advice about joining the rush to the Klondike gold fields. Lind did not “have the fever at all,” for he advised Anderson against going unless he could join “a Gov’t. expedition which would assure you of *pay* and *grub* with the chance to do some gold hunting.” Lind continued, “I think your future lies in devoting all your ability and energy to the work you have chosen. Sooner or later it will bring its reward.”¹⁵

Anderson (wearing vest) joined a university zoological survey party in 1893 (photographed at Long Lake on the Gull Lake Expedition) that included Conway MacMillan (seated, center) and Josephine Tilden, later famous for her studies of algae.



A glance out his boardinghouse window later that fall changed Anderson's life forever. Lydia McDougall Johnson, an attractive, 21-year-old Scottish nanny for a U.S. naval officer's family, walked past, and the botany professor was smitten. They courted and married on August 11, 1898, at Highlands, North Carolina, a Blue Ridge mountain village 50 miles distant. Alex adored Lydia, his "sweetheart of the valley," and later wrote, "Her beauty to me was angelic, although beauty must come from the soul and heart and not facial form. . . . Hers was a combination of heart, soul and all." Alex, now 35, considered himself fortunate that Lydia would consent to marry a "plodder in the field of science with a low salary (and) an inferiority complex."¹⁶

Alex and Lydia enjoyed the people and climate of South Carolina while he continued researching at Clemson and publishing about plant diseases. It was surprising, then, that they returned to the University of Minnesota in 1899 when Alex received a teaching position. They stayed just one year before returning to Clemson, however. He noted that his Minnesota colleagues thought the move was "crazy." Many at Clemson thought it "strange when we . . . moved to Mples [*sic*]. They thought it still stranger when we came back in a year."¹⁷

Alex seemed to be searching for something that he did not find when he returned to Clemson. MacDougal, now at the New York Botanical Garden, informed Anderson of a job opening as herbarium curator at Columbia University that promised time for independent research. Alex and Lydia discussed the possible move to New York, a decision complicated by the recent birth of their



Lydia Anderson, photo taken in Scotland in 1898, the year of her marriage

son, Leonard. Lydia asked Alex what he would do if he were alone. Anderson later wrote, "I said, I would go. She said, then we go." He resigned from Clemson on September 1, 1901, leaving a "good position & good pay" for one with a "big title" and less pay.¹⁸

Three months later Alex found himself working in the laboratories of the New York garden, testing the starch-crystal theories of Heinrich Mayr and the ideas of other German botanists with whom he had studied. Was Mayr correct in believing that the starch granule was actually a sphere-like crystal with an infinitesimally small speck of free water in its central nucleus?¹⁹

Late one evening, while sitting in their second-floor New York duplex, Anderson thought of a way to test Mayr's theory. He would hermetically seal a teaspoonful of starch granules inside a glass tube and heat it to a high temperature in a baking oven. Great pressure would form inside the tube and inside each granule. When the starch began to show signs of turning brown, he would remove the

tube from the oven and crack it open with a hammer. The pressure would be reduced to zero in an instant, while the water inside the starch granule, which had expanded into steam, would cool to the temperature of the room. "Theoretically," he wrote, "the starch grains should explode on account of the enclosed steam they contain which suddenly is set free." The next morning, December 12, 1901, Alex grabbed a package of corn starch and some wheat flour from his pantry and hurried to his lab in the Bronx. He performed the experiment as planned, using six test tubes—three each two-thirds full with corn starch and wheat flour.²⁰

One after the other, Anderson cracked open the sealed test tubes, getting a "shot-gun-like explosion" from all three cornstarch tubes but no change in the starch. The fourth explosion produced a substance that he believed was "wheat flour that swelled up into a white, porous mass." Upon microscopic examination, Anderson could find no single starch granule that "had not been ruptured, exploded, or torn into particles far smaller than any starch granule that was enclosed in the tube." The explosions brought MacDougal to the laboratory, soon followed by Botanical Garden director N. L. Britton, who seemed "sort of worried." They discussed Anderson's contention that the exploded material was pure starch.

Four days after these experiments, Anderson wrote to his brother Leonard about the discoveries and possible practical applications. Alex's first idea was to make bread by exploding wheat flour into molds. This would not require yeast, baking powder or soda, or even water. Bread made by Anderson's process would defy spoil-

age and be easily digestible since it would mostly dissolve in water. Alex told Leonard enthusiastically that he tested the concept in the laboratory and wanted to experiment on a larger scale, promising to send miniature samples of the “coming bread—the bread of the 20th century.” Finally, he cautioned Leonard to keep the process he had described a secret.²¹

Surmising that raw rice, with its high percentage of starch, might be exploded in a similar fashion, Anderson conducted an experiment three days later on long-grain Carolina rice. He heated the sealed test tubes containing the rice more slowly than he had in his first experiments, allowing the grain’s moisture to saturate the empty space of the tubes. Then he broke the test tubes inside a protective wire cage.²²

“The greatest surprise of my life happened,” the astounded Anderson reported. The rice kernels had enlarged to ten times their former size while retaining their original shape, causing this cream-colored rice to shower onto the floor. Anderson tasted the changed rice kernels and found them cooked, porous on the inside, and covered completely with a transparent sealed skin. He had expected the rice to be blasted to dust but observed that the exploded starch-granule particles instead “pasted themselves together into cell walls surrounding an empty cell interior.”

Anderson wrote his brother, “I just thought of trying rice at noon today.” He then enclosed what was formed from one spoonful of common rice—a puffed rice so digestible it could be given to a baby with impunity. In fact, Alex and Lydia gave their infant son Leonard a sample, and he

“would have eaten all we had.”²³

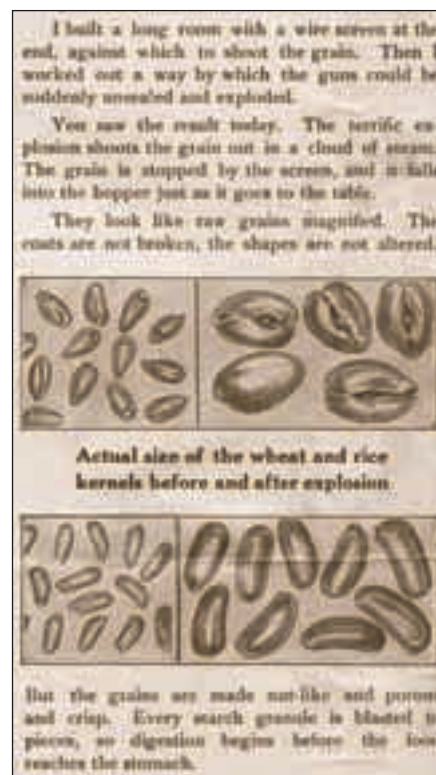
Alex explained to his brother the implications of the new discovery. When “worked out from our theoretical knowledge of starch, the idea can be patented, i.e. the *idea* of heating starch, flour containing starch, or the whole grain as wheat, corn, rice, etc. in a sealed receptacle, mould or oven.” He added that products from his invention “can of course also be prepared as a breakfast food, etc.,—and served with cream, sugar etc.” This concept would make Anderson and his ideas famous.

America’s ready-to-eat cereal industry was just about to muscle its way onto the nation’s breakfast tables in more than one way. While Anderson labored with puffed grains, John H. Kellogg, the noted health guru of Battle Creek, Michigan, and his brother perfected the cornflake, an evolution from a preceding leathery wheat concoction called Granose Flakes. Kellogg later proclaimed Granose “the first of the modern breakfast foods.” Charles W. Post, Kellogg’s former patient, would have challenged that claim. A gifted entrepreneur and tireless promoter, Post created Grape-Nuts in 1898 as a coffee substitute and companion product to his already successful Postum, a wheat berry, bran, and molasses drink. When Grape-Nuts did not sell well, Post later sweetened it and marketed it as a cold cereal.²⁴

The American breakfast certainly needed revision. From the nation’s formative years and well into the nineteenth century, Americans started their day with a “formidable exercise in gluttony”—an hour and a half of heavy eating. In New England, breakfast typically consisted of fish, beefsteak, sausages, boiled fowl, ham

and bacon, and corn bread and gravy, along with potatoes and vegetables. Fruit pie topped it off. The southern breakfast included much of the above as well as hominy grits, eggs, and hot breads saturated in butter or jelly. Meanwhile, the diet found on the American frontier, wrote one observer, featured “saleratus (baking soda) and grease, to which a little flour and pork are added.” Dyspepsia or indigestion, according to the 1830 edition of *Encyclopedia Americana*, was found in “all classes and ages.”²⁵

Growing numbers of European immigrants neither desired nor could afford these massive morning repasts. Some newcomers, particularly Scottish and Irish, knew that oatmeal, typically sold in the U.S. as easily digestible pap for convalescents, had applications for breakfast. The first



Detail from “Prof. Anderson’s Story,” a 1910 advertisement in *Woman’s Home Companion*, showing wheat kernels and rice grains, raw and popped

recipe for a breakfast oatmeal appeared in a cookbook in 1874, and by the century's turn, it was the best-selling cereal in the land. But oatmeal had its detractors. Dr. Kellogg later claimed that one of his reasons for inventing the cornflake was "to

displace the half-cooked, pasty, dyspepsia-producing breakfast mush." Samuel Johnson much earlier asserted that the English gave oats to horses, but in Scotland the grain "supports the people."²⁶

In the 1880s Kellogg developed

an inexpensive breakfast food patterned after Granula, a rock-hard, baked and crumbled whole-wheat-flour creation of James C. Jackson. After a copyright infringement battle, Kellogg reformulated his blend as "Granola." In 1895 Henry D. Perky, a



Anderson's notebooks list products he enthusiastically tested for "puffing" qualities in 1902, including tapioca, coffee, arrowroot, and macaroni.

heretofore failed promoter and dyspeptic, stumbled upon the process for creating “shredded” wheat, cooked wheat run through a shredder and baked. He marketed his immediately popular food by highlighting its versatility. Shredded wheat complemented food items ranging from chocolate jelly to creamed oysters, with a recipe book full of ideas in between. It would take a while for shredded wheat to become exclusively a breakfast cereal.²⁷

But Alexander Anderson was coming from an entirely different direction to the revolution in ready-to-eat cereal. While more than 100 copycat cornflake companies began a struggle for ascendancy in Battle Creek during the century’s first decade, Anderson worked to perfect and help to market his puffed cereal concept. To do so, however, he needed serious financial backers.²⁸

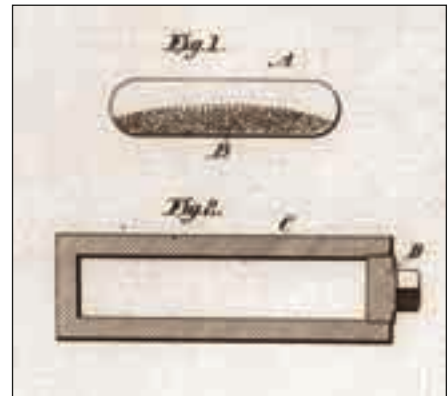
Six weeks after his discovery in New York, Anderson was in Minneapolis at the invitation of John Lind and W. C. Edgar, prominent and influential editor of *Northwestern Miller* magazine, discussing the commercial possibilities of Anderson’s process. Four days later Edgar, Lind, and a consortium of 18 other leading Minneapolis businessmen, including Lewis S. Gillette, John F. Calhoun, Clive T. Jaffray, and Alfred F. Pillsbury, signed a contract with Anderson to form a corporation that would develop commercial applications for his process. Anderson owned one-third and the 20 investors two-thirds. As part of the agreement, Anderson granted his partners “exclusive right and license” to use his invention, in the belief that they would start producing puffed-grain cereal.²⁹

Edgar then nearly compromised Anderson’s still-secret process. The

Minneapolis Tribune printed a story and an editorial on March 25, 1902, reporting on a discovery by “Prof. Andrews” that “may lead to the launching of a new breakfast food in Minneapolis.” In this same story, the *Tribune’s* Washington D. C. correspondent disclosed that “Mr. Edgar’s mission in the East is not entirely confined to the London Dock bill,” noting the editor’s interest in a new breakfast food “said to be one of the most perfect foods of its kind ever produced.” Ten days later Edgar, in a *Tribune* interview, “disclaimed all connection with the project.” The contract to “form a corporation” signed two months earlier was evidence to the contrary.³⁰

Alex next traveled to Washington to secure a patent for his process and returned to New York to continue experiments. In August he was back in Minneapolis to begin exploring methods of mass-producing puffed-grain products in a laboratory set up by investor Gillette at the Minneapolis Steel and Machinery Company. After a series of unsuccessful trials, Anderson built a working model. He constructed a cylindrical device from a 4-by-36-inch gas pipe made airtight when sealed by pipe heads, one removable, at each end. Rice was sealed inside, and the cylinder was rotated while being heated. When a gauge indicated that the proper pressure had been reached, Anderson knocked the removable head off the device with a sledgehammer and a shower of puffed rice burst from the opened “barrel.”³¹

Among those watching the explosively successful demonstration were Henry P. Crowell and Robert Stuart, president and secretary-treasurer of Quaker Oats Company. Crowell and Stuart liked what they saw and



Detail from Anderson’s 1904 Cereal Product patent #766,212, showing the glass cylinder and pressure tube used in the puffing process

moved to acquire the invention. They offered the Minneapolis investors \$50,000 cash or \$2,500 each for their rights to Anderson’s process. None had as yet paid more than \$100 of their original commitment, and they decided to take the quick profit. Anderson got nothing beyond the \$166.66 monthly salary he had drawn for a half-year.³²

Anderson moved his family to Chicago in December 1902 where he continued his research, now working for American Cereal Co., a Quaker subsidiary. The company set up his lab at the old Imperial Mill site at Sixteenth and Dearborn, where he worked to improve his puffing equipment and tested his process on pearled hominy and barley, Carolina rice, Japanese rice, roasting coffee, oat groats, unhulled (paddy) rice, and macaroni. In July 1903 he discovered that puffed rice could be sugared in the same cylinder in which it was made. He also learned how to crisp puffed rice, attempted to create a cereal coffee from puffed barley and green coffee, developed a treatment of rice for “confectionery purposes,” and ob-

tained three more U.S. patents for cereal, adhesive paste, and stationery adhesive. His notebooks show a pattern of almost continuous work, although he had yet to profit from his efforts since American Cereal had not marketed any product originating from his research.³³

The company's reluctance to move forward frustrated Anderson, who wrote to his attorney and cousin John Lind in Minneapolis. American's management team was "not giving me any encouragement as to the rice in any way, and this has been their method ever since I came here," he complained. Anderson reported American's idea that his rice could "be put on the market as a confection . . .

like a 'Cracker Jack' but they do not think that they would care to handle it." He worried that the sluggish officials might give up his ideas entirely or, worse yet, hold them in limbo for another year.³⁴

Alex confided to Lind that he had been working on a new food starch for use in "confectionery, ice creams, infant foods, baking powders, fancy baking products, pastry, jellies, etc." that could be produced for "3 to 5 dollars per ton." It had already been examined by Corn Products Company's chief chemist who labeled it as "valuable." Anderson was thinking of jumping the American Cereal ship by buying his way out, since company officials said to him that they "would

be willing to part with the whole thing—rice, starch, and all their interest in the process, for what it has cost them."

Nevertheless, Anderson had not totally given up on American Cereal. In his letter to Lind, he described his plans to make a small-scale demonstration of the puffing process before the crowds attending the 1904 St. Louis World's Fair. Alex predicted, "Worked the right way there—say discharging one of the small drums every 10 minutes would be as good a draw card as anything at the fair outside of the Wild West Show. I dare say that I could sell more of the rice put up as a 'cracker jack,' buttered & salted, than I could make." He hoped

American Cereal's popular confection booth at the St. Louis World's Fair, 1904 (Anderson stands at far right)



his company would back this promotion. But if they would not act, he would get things moving himself.

On August 27 curious onlookers in the fair's Agricultural Building watched as Anderson heated in an oven a group of eight bronze, 20-inch-long cylinders looking very much like small cannons. When the rotating cylinders, each containing six pounds of raw rice, reached 300° centigrade, the "artillery" was run out of the oven on tracks. Alex then unsealed the capped muzzles of his "cannons" and, to the amazement of the onlookers, a volley of puffed rice showered into a two-story-high, 40-foot-wide cage. It was the first public demonstration of "food shot from guns," and the crowds loved it. Before the end of the fair on December 1, Anderson and his assistants puffed more than 20,000 pounds of rice (six pounds of rice made about 25 quarts) and sold more than a quarter-million packages at a nickel each. Anderson himself operated the cannons most of the time, and American Cereal provided financial support.³⁵

The popularity of puffed rice at the fair convinced an eastern confectioner to contract with American Cereal for the entire output of Anderson's remarkable cannons, and more than 30,000 barrels of puffed rice were sold to candy manufacturers. The miniature bronze cylinders soon evolved, in the words of a Quaker company historian, into a "muzzle-loading cannon of murderous caliber that would have been in place on a colonial frigate."³⁶

Quaker-owned American Cereal now began moving more quickly on Anderson's ideas. It started promoting puffed rice as a breakfast food and in May 1905 contracted with him to form Anderson Puffed Rice Co. The con-



In the morning porridge with sugar and cream or mixed with any fruit. *For breakfast or supper, serve like crackers, floating in bowls of milk.*

Prof. Anderson's Gift

To Food Science is Our Gift to You Today

Ten Dishes Free This Week

We Pay the 15 Cents

This is to offer you—entirely free—a package of Puffed Rice. One of the two great foods which Prof. Anderson contributed to our tables.

Not a sample package, but a full-size package—a regular 15-cent package. Take this coupon to your grocer. He will give you the package, and we will pay him the 15 cents.

You are asked to pay nothing at all.

A Surprise Package

If you never have tasted Puffed Rice or Puffed Wheat, this package will be a surprise. You will see crisp, toasted grains there, puffed to eight times normal size.

You will see grains that float like balloons. Any morsel with this, leaves walls surrounding a myriad cells.

But when you taste them comes the main surprise, for the taste is like toasted nuts. And the grains fairly melt in the mouth.

Then you will know what millions know—that these are the two most enticing foods ever made from grain.

When that was done the guns were shot. The steam exploded and every food granule was literally inflated to pieces. Inside of each grain there occur in this process a hundred million explosions.

The result is easy and complete digestion. These grains are cooked as cereals never were cooked before. All the elements, for the first time, are made available as food.

Good for 15 Cents

This coupon will buy you—at your store—a package of Puffed Rice. Get it and let your folks enjoy it as our treat.

Serve some with cream and sugar. Mix some with fruit. Serve some in bowls of milk. Use some like nut meats in home-candy making or as garnish for ice cream.

For these are both foods and confections.

Let us buy enough for ten meals. You will buy a thousand when you find these Puffed Grains out.

Cut out this coupon. Lay it aside. Present it when you go to the store. It will not appear again.

| | |
|---|-----------------------------|
| Puffed Wheat, 10c Puffed Rice, 15c | Sample Full-size Best |
|---|-----------------------------|

Done for a Serious Purpose

But this College Professor had another purpose in making Puffed Wheat and Puffed Rice. He found that whole grains, by no cooking process, were great made wholly digestible.

So he soaked up the grains in gum, and applied terrific heat. Thus he turned to steam the molten inside of each food granule.

The Quaker Oats Company
Sole Makers

SIGN AND PRESENT TO YOUR GROCER

(Good in United States or Canada Only)

This coupon, when you present this coupon to your grocer, will entitle you to a 15-cent package of Puffed Rice.

To the Grocer

Name _____

Address _____

City _____ State _____

Date _____ 1914

This coupon will good if presented after June 25, 1914. Grocers must send all returned coupons to us by July 31.

Quaker Oats widely advertised Puffed Wheat and Puffed Rice as a breakthrough in culinary science (Ladies' Home Journal, May 1914)

tract to license, manufacture, and sell puffed rice called for a quarterly payment ranging from 3¢ per pound for the first 2.25 million pounds sold to 1½¢ per pound if sales exceeded nine

million pounds. Alex finally made a profit from his patented ideas.³⁷

In 1907 Quaker Oats, which had taken over American Cereal's assets the year before, introduced Ander-

son's puffed wheat under the name Wheat Berries. The new product was slow to catch on until the company changed its name to Puffed Wheat. Quaker now marketed puffed wheat and rice products together in the nation's groceries as ready-to-eat cereals. The company then launched a new advertising campaign. It focused the ads on Anderson's prestige as a college professor who produced a scientific and nutritious food, the "Eighth Wonder of the World." The cereals proved a "nationwide sensation," boosting Quaker's 1909 profits by nearly a half-million dollars.³⁸

Alex's name and image appeared in magazine ad copy under such headlines as "Prof. Anderson's Story," "Prof. Anderson's Invention," "All Because Prof. Anderson Thought of Exploding Grain," "What Prof. Anderson Did for Your Doctor," and "He Invented Food Shot from Guns." Profits soared for Quaker and its Anderson Cereal subsidiary as Americans devoured puffed rice and wheat.³⁹

Anderson continued to pursue experiments in his Chicago labo-

ratory, developing new products including puffed corn. With his improved finances, he began fulfilling a personal dream. He started buying land in Minnesota and by 1911 owned 320 acres in Spring Creek valley and had repurchased and rebuilt the family farm. He then bought more land in Goodhue County, including 115 acres at the intersection of Highways 61 and 19, where in 1915 he began constructing Tower View Farm, a new family home and research facility.⁴⁰

Lydia, Alex's closest companion, skillfully handled her husband's many career moves, reducing the strain on him and their children. One of their heaviest blows came in 1904 when their son, Leonard, died of spinal meningitis at age four. Nine weeks later Alex wrote to John Lind, "It seems impossible to believe and even yet we can hardly realize that he has gone from us after all our care and hopes." Lydia and Alex raised four other children, Louise, John, Lydia Elizabeth, and Jean, born be-



ABOVE: *Tower View, the Anderson family retreat and research facility that included a greenhouse, water tower, and two laboratory buildings connected by tunnels*
LEFT: *The Andersons at Tower View Farm, 1917. The children, from left, are Louise (Sargent), John, baby Jean (Chesley), and Lydia Elizabeth (Hedin).*

tween 1904 and 1916. When work separated Alex and Lydia—she and the children summered at a home in Highlands, North Carolina, while he stayed in Chicago—they wrote to each other twice a day.⁴¹

Alex's health had been worn down by his demanding work. Tubercular for many years, he had developed severe ulcers during the pressure-filled early days with Quaker. Yet Anderson continued his research regimen for Quaker in the two laboratory buildings at Tower View and in 1922 was engineering the machinery for the "continuous puffing process" of cereal production. It took nearly 10 years to refine this technique, which led to the development of another new cereal, Quaker Crackles. Meanwhile, full-scale farming operations flourished at Tower View and two other farms Anderson ran, including the "Upper Farm" where his parents had settled in 1855.⁴²

While his experiments for Quaker continued until 1941, when Anderson

Puffed Rice Company was liquidated, he also conducted major research on the suitability of plantago psyllium seed as a commercially viable crop in Minnesota. Alex also explored his early interest in aerodynamics. Beginning in 1899 he made notes about the use of wind power for a device that would be self-rising and lifting. In 1925 he began experiments to replicate a tornado's whirling vortex. During his 35-year research career, Anderson filled 40 volumes with 12,000 handwritten pages detailing his cereal experiments. Another 20 notebooks dealt with aerodynamics research.⁴³

Remembering the institutions that gave him his educational start, Alex and Lydia endowed fellowships in the biological sciences at the University of Minnesota, Clemson College, and New York Botanical Garden. They also donated 400 acres of farmland for a new Vasa Orphans Home, later the Vasa Lutheran Home for Children, to replace the Swedish

orphanage originally built in 1865 a few miles from the family farm.⁴⁴

Alex's roots in Goodhue County led him to bring family members not originally buried there to the Anderson plot at the township cemetery. Lydia joined them in September 1934 when cancer took her life at age 58. Alex would live nine more busy years, still researching, writing, and taking pleasure in seeing his children marry and begin successful lives.

Alex died on May 7, 1943, at age 80. Starting out in the farm fields of Goodhue County, he had completed a journey that carried him far beyond the Minnesota horizon. Using his ability, determination, and capacity for hard work, his scientific research helped create America's cold cereal industry and, in the process, made him widely familiar as the trusted "Professor Anderson." □

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Notes

1. Anderson autobiography, "Food Shot From Guns," 2–4, prepared for Quaker Oats Co., in "Testimony of Dr. Alexander P. Anderson in *Jersey Cereal Co. v. Quaker Oats Co.*," Oct. 30, 1937; George I. Haight to Alexander P. Anderson, Oct. 30, 1937—both in Alexander P. Anderson Papers, Minnesota Historical Society (MHS), St. Paul.

2. Lydia E. Hedin, Jean M. Chesley, John P. Anderson, and Louise A. Sargent, *Alexander P. Anderson* (Red Wing: privately published, 1997), 1–2; Alexander P. Anderson (hereinafter APA), notes for autobiography, "Itinerary," 1, transcription by daughter Lydia E. Hedin, Anderson papers. Anderson wrote on almost any scrap of loose paper available, not always dating his work and often connecting two or three words into one; Hedin painstakingly organized the papers and transcribed some works.

3. APA, "Itinerary," 1–3. Anderson's interest in fossils led him as a 13-year-old to take a 17-mile stagecoach trip to Cannon Falls to visit with Wilbur H. Scofield, drug-

store owner and geologist, who coauthored with Newton H. Winchell et al., *The Geology of Minnesota*, vol. III. See also, APA, *The Seventh Reader: Short Stories with Some Verse* (Caldwell, ID: Caxton Printers, 1941), 85–89.

4. APA, "Itinerary," 2–3; Hedin et al., *Alexander P. Anderson*, 54–56.

5. APA, *Seventh Reader*, 328, quote from "The Strange Story of Joe Allan," in which Anderson revisits his own youth.

6. APA, "Itinerary," 2–3. Anderson wondered if the fire was caused by his chemistry set in the attic.

7. APA, *Seventh Reader*, 294–95; APA, notes for "Itinerary," 4n7, 12, in family possession.

8. APA to Arthur E. Anderson, Mar. 6, 1892, Anderson papers.

9. APA, "On a New Registering Balance," *Minnesota Botanical Studies*, Sept. 1894, p. 177–80; APA, "The Grand Period of Growth in a New Fruit of Cucurbita Pepo Determined by Weight," *Minnesota Botani-*

cal Studies, Mar. 1895, p. 238–79. Bausch and Lomb advertised his balance along with two other "physiological apparatus" developed at the University of Minnesota; see advertisement in envelope titled "The Howard Fellowship of \$160," Anderson papers.

10. *Minneapolis Times*, Sept. 27, 1894, p. 4; *Minneapolis Tribune*, Sept. 27, 1894, p. 5; Daniel MacDougal to APA, Mar. 3, 1896, Letters, Anderson papers. MacMillan headed the department from 1891 to 1906. MacDougal left Minnesota in 1899 to become assistant director at the New York Botanical Garden. A MacMillan student later claimed that Anderson did not properly credit MacMillan for the idea of expanding starch molecules; the author's research with the MacMillan family disproves this claim.

11. *Gopher* yearbook, 1894, p. 38. John Lind, who was among Anderson's first teachers, would become his future supporter and business associate. Lind's family had stayed with the Andersons in 1868 following their emigration from Sweden

before building their own log home in the Spring Creek valley. Lind, eight years Alex's senior, enjoyed trout fishing with his cousin and later recalled "when they used to divide bait"; APA to George M. Stephenson, undated letter, John and Norman Lind Papers, MHS; John Lind to Aleck [Anderson], Oct. 7, 1890, Anderson papers.

12. APA, "Tramps Abroad and From Home, June 19, 1895, to Aug. 17, 1896," journal, 37-47, Anderson papers.

13. APA, "Food Shot From Guns," 2-4.

14. William Trelease to APA, Sept. 10, 1896, Anderson papers.

15. John Lind to APA, Aug. 14, 1897, Anderson papers.

16. APA, "Itinerary," notes in family possession; Hedin et al., *Alexander P. Anderson*, 13-14. Anderson enjoyed writing short stories and poetry, and many poems about his love for Lydia appear in *Seventh Reader*.

17. Interview with Anderson's daughters Elizabeth Hedin and Jean Chesley, July 21, 2001, notes in author's possession; Hedin et al., *Alexander P. Anderson*, 12-14.

18. APA, "Itinerary," notes in family possession.

19. APA, "Food Shot From Guns," 2-6.

20. Here and below, APA, Notebook I, Alexander P. Anderson Notebooks, microfilm M314, roll 1, p. 13-24, MHS; APA, "Food Shot From Guns," 6-8.

21. APA to Leonard Anderson, Dec. 16, 1901, Anderson papers. Understanding the implications of his invention, Alex wrote, "I never was as enthusiastic about anything in all my life."

22. Here and below, APA, "Food Shot From Guns," 9-10.

23. Here and below, APA to Leonard Anderson, Dec. 19, 1901, Anderson papers.

24. William Gould, *Business Portraits: Kellogg's* (Lincolnwood, IL: VGM Career Horizons, 1997), 11-12; Scott Bruce and Bill Crawford, *Cerealizing America: The Unsweetened Story of American Breakfast Cereal* (Boston: Faber and Faber, 1995), 21-30. An ailing Post had visited Kellogg's Medical and Surgical Sanitarium for a chronic stomach ailment and later opened his competing La Vita Inn in Battle Creek; see Postum Cereal Co., *A Trip Through Postumville* (Battle Creek, MI: 1920), n. p.

25. Harrison J. Thornton, *The History of the Quaker Oats Company* (Chicago: University of Chicago Press, 1933), 84-85; Arthur F. Marquette, *Brands, Trademarks and Goodwill: The Story of the Quaker Oats Company* (New York: McGraw-Hill, 1967), 13-14; Bruce and Crawford, *Cerealizing America*, 4.

26. Johnson quote in Bruce and Crawford, *Cerealizing America*, 68-69.

27. Marquette, *Brands*, 16-18. In 1893 Tom Amidon, a Grand Forks miller, produced a breakfast porridge, later named Cream of Wheat, that became so popular



Puffed cereals based on Anderson's processes remained a staple in the Quaker Oats products line (St. Paul Sunday Pioneer Press, Sept. 28, 1941)

that the firm moved to a larger production facility in Minneapolis; see *Adding Warmth to Mornings for 100 Years, 1893-1993*, advertising pamphlet, Oct. 7, 1993, MHS. By 1902, 1.5 million copies of Perky's recipe book for shredded wheat, *The Vital Question Cookbook*, had been distributed; Bruce and Crawford, *Cerealizing America*, 45.

28. Bruce and Crawford, *Cerealizing America*, 52.

29. Contract between Anderson and Minneapolis investors, Feb. 3, 1902, Anderson papers.

30. *Minneapolis Tribune*, Mar. 25, 1902, p. 6, Apr. 3, 1902, p. 7.

31. APA, Notebook I, Microfilm 314, roll 1, p. 1-24, MHS. Anderson received Patent No. 707,892, "The Art of Treating Starch Material," on Aug. 26, 1902; copy in "25 U. S. A. Patents, 1901-1936 to Alexander P. Anderson," Anderson papers.

32. APA to John E. Calhoun, June 29, 1933, Anderson papers.

33. APA to H. P. Crowell, Nov. 18, 1902, and "25 U. S. A. Patents, 1901-1936," #766,212, 769,289, and 769,290, Anderson papers. American Cereal, an 1891 consolidation of six Midwest oatmeal companies, was soon held by Quaker Oats Co., founded in 1901. Anderson signed some contracts with American Cereal, but Quaker controlled American at that time. See Thornton, *Quaker Oats Company*, 57-70.

34. Here and two paragraphs below, APA to John Lind, May 9, 1904, Lind papers.

35. APA, Notebook IV, Microfilm 314, roll 2, p. 1-8, MHS; Thornton, *Quaker Oats*, 246-48.

36. Thornton, *Quaker Oats*, 247-48.

37. Contract between Anderson Cereal Co. and American Cereal (Quaker subsidiary), May 1905, Anderson papers.

38. Marquette, *Brands*, 109-112.

39. See Anderson Puffed Rice Co. Annual Reports, Director's Meetings, etc., 1905-1941 file, and magazine and newspaper advertisement notebooks, Anderson papers.

40. Hedin et al., *Alexander P. Anderson*, 14-15, 24.

41. Hedin et al., *Alexander P. Anderson*, 14-15 and family genealogy.

42. Interview with Hedin and Chesley, July 21, 2001, notes in author's possession; Hedin et al., *Alexander P. Anderson*, 31.

43. Anderson's psyllium notebooks and papers are in the University of Minnesota's agronomy and plant pathology department's records. Other notebooks are in the possession of the Anderson family.

44. Carol H. Woodward, "Creator of Puffed Cereals and Benefactor of Science," *Journal of the New York Botanical Garden* 44 (Aug. 1943): 173-80; APA, "Vasa Orphans Home," Anderson papers.

The images on p. 4, 6, 7, 8, 9, 12, 13, 14, and 16 are from the Anderson Family collection. Images on p. 10, from roll 1 of the Anderson Notebooks (M314), on p. 11, from the Anderson Papers, and p. 5 are all from the MHS collections.



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