Iowa People and Events . . .

Iowa Space Package

The present generation has seen the opening of a new era in the history of mankind—the Age of Space. Significant developments in the exploration of space since 1957 and the notable contributions of Iowa Scientists are now graphically illustrated in the State Historical Building.

An exhibit completed on the third anniversary of America's second successful earth satellite features the spare payload of Explorer III, a scale model of the Jupiter-C rocket, pictures, and explanatory charts. The display was made possible through the cooperation of the State University of Iowa and Professor James Van Allen who has received international recognition for his work in this country's space program. He and his associates have also helped to establish a collection of historical papers and original records on space exploration in the manuscript division of the Iowa State Department of History and Archives.

The fourth stage Explorer III, carrying an exact duplicate the "Iowa Package" shown in the display, was launched into orbit March 26, 1958. Instruments designed at the State University of Iowa reported during the following month what is regarded as one of the greatest scientific discoveries in modern times. Explorer III instruments proved that the mysterious behavior of Explorer I between February 1 and March 15 had not been due to faulty performance, and confirmed the existence of a previously unknown zone of intensely radioactive particles starting about 500 miles out from the surface of the earth. Dr. Van Allen informed a joint meeting of the American Physics Society and National Academy of Sciences of this "unexpectedly intense radiation" on May 1, 1958.

A later American space probe, equipped with Iowa-designed detectors, Pioneer III, rocketed some 70,000 miles into space to return information to show the zone of radiation divided into two distinct belts. Their peak intensities were found at 2,000 and 10,000 miles out, with the outer belt extending to

some 15,000 miles, the farther boundary varying after periodic solar eruptions of charged particles.

This new geophysical phenomenon was soon called the Van Allen zone, and later the Van Allen belts, the name being accepted by scientists throughout most of the world. Thus, the 47-year-old native of Mt. Pleasant, Iowa has been honored in having his name given to the largest volume of matter and energy ever named for a mortal earth man. The vast area occupied by these teeming particles, exceeding the volume of the earth at least one hundredfold, constitutes a peculiar hazard to space travel and may well hold the answers to many sun-earth relationships.

The satellite which discovered the Van Allen belts had practically the same shape, weight and dimensions of Explorer I: an 80-inch long cylinder six inches in diameter weighing 31 pounds with 18½ pounds devoted to instruments. Its signals were heard regularly through May 10, and intermittently until June 18, 1958. Explorer III re-entered the atmosphere June 28, 1958 after 93 days in orbit, and was destroyed by the intense heat of friction.

It carried the first tape recorder into space, a tiny magnetic memory (eight ounces in weight and 2¼ inches in diameter) developed by George Ludwig, a graduate student from Tiffin working under the supervision of Dr. Van Allen and now an engineer with the National Aeronautics and Space Administration in Washington, D.C. The recorder stored up data during an entire orbit of the earth, 116 minutes, then released the information within a six-second period when the satellite was over a command-receiving station in the United States or South America. A ratchet system drove the tape forward .005 of an inch in recording each second of the satellite's path aroun dthe earth. The tape wound a return spring as it advanced and erased itself instaneously after each playback.

Explorer III was the 80th vehicle to carry Iowa Scientific equipment into the upper atmosphere and outer space during the International Geophysical Year (July 1, 1957 through December 31, 1958). They included balloons, "rockoons" in the Arctic and Antarctic, research rockets at Hudson Bay, and the first American earth satellite, Explorer I. The Van Allen

group later prepared made-in-Iowa instruments for Explorer IV and designed others for space probes, Pioneer II, III, and IV. Their experiments continued in 1958 and 1959 with Iowans contributing to the success of Pioneer IV, the first American vehicle to escape earth's gravity and become a satellite of the sun, and also Explorer VII, launched October 13, 1959 and still reporting after 17 months in space. At least three 1961 space probes and satellites are expected soon to carry more made-in-Iowa instrument payloads into space.

Horseless Carriage Made in Des Moines

Newspaper accounts indicate one of the first automobiles was made and successfully operated in Des Moines about 1890. A triumphal drive down Walnut Street is described as the sensation of the day. The two men who designed and built it were Dr. Lew Arntz, a watch repairman and expert mechanic, and William Morrison, a penniless but able chemist recently arrived from Coventry in England. They had worked together for some time before Morrison conceived the idea of constructing a "horseless carriage," Dr. Arntz agreeing to finance the purchase of the necessary materials and make many of the parts.

The machine that finally emerged from their shop across from the police station resembled an ordinary surrey with three seats carrying nine passengers. The most difficult problem encountered proved to be the perfection of storage batteries to power the conveyance. With twenty-four batteries, twelve on each side, it looked like a light, neat spring wagon or drag, and attracted much attention everywhere it went. Arntz and Morrison raced their curiosity against a streetcar in 1891, and the next year took several newspapermen on a twenty-mile ride through Des Moines to demonstrate the practicability of their horseless carriage. It is reported to have beat the streetcar back to the waiting room from 29th and Cottage Grove by six minutes, and at the end of the trip it was not the least bit heated and the batteries were still supplying a strong current.

The two Iowans took their invention to the World's Columbian Exposition in Chicago in 1893 to gain their greatest

moment of glory. People fought to get a seat for a free ride every afternoon, sometimes patiently waiting five or six hours. President Cleveland and all the foreign ambassadors inspected and rode in the machine. A small three-wheeled French electric runabout was shortly withdrawn from the fair leaving the Iowa-built automobile the only vehicle of its kind at the exposition, its owners and builders receiving a gold medal. The car was later sold to a Chicago banker, and subsequent generations have all but forgotten that one of the earliest horseless carriages first appeared on the streets of Des Moines seventy years ago.

The Writing Machine

Queen Anne of England granted a patent on a "writing machine" as early as 1714. However, few persons possessed the cultural distinction of being able to read or write in the eighteenth century and its use was principally restricted to the recording of public documents. Practical development of the typewriter came later in America were popular education and the growth of commerce and industry produced a need for speedily transcribing letters, professional and business records.

William Burt received the first patent on a writing machine in the United States in July of 1829, but his "typographer" proved impractical and never got into production. A machine patented by Charles Thurber in 1843 first employed the roller-platen used today, though it too was never manufactured. The first successful typewriter was invented in 1866 by Christopher Lathan Sholes, a Milwaukee editor and printer. Samuel W. Soulé and Carlos Glidden helped him build several prototypes, altering and improving them until finally after seven years they had developed a satisfactory working model.

A number of technical problems had to be solved before Sholes' typewriter could be manufactured. He and James Desmore, an oilman who financed much of his work, sought the assistance of E. Remington & Sons, a firm that had turned to making sewing machines and agricultural implements after the Civil War. Philo Remington, son of the founder of the company, put a group of experienced mechanics to work on

Sholes' machine. The most troublesome part was the keyboard. They finally discarded alphabetical arrangement of the letters and rearranged them according to convenience, a decision which has remained unchanged in the further development and production of modern typewriters. Remington & Sons manufactured the first commercial typewriter in September, 1873. An electric machine appeared in 1925 with a satisfactory all-purpose model becoming available in 1949.

Battle of Black River Bridge

Some months before he passed away in 1899, Samuel Merrill vividly recalled the tragic opening of the Battle of Black River Bridge eleven miles from Vicksburg on May 17, 1863 in an unpublished letter to his sister. Severely wounded that day he later served as governor of Iowa from 1868 to 1872, and was a prominent figure in state affairs before removing to California in 1886 where he passed the remainder of his years. E. D. Merrill of Washington, D.C., has kindly forwarded a photostatic copy from which the following is extracted:

Los Angeles, Calif, May 30, '99

My dear Sister:

. . . We had been on the battle line for two long months, Millikens Bend, Youngs Point, Port Gibson, Jackson, Champion Hills, Black River Bridge and Vicksburg . . .

At Black River Bridge, I was in command a part of the time of a Brigade consisting of the 21st, 22d & 23d Iowa and 99th Illinois, and 2d Iowa Battery. Col. Kinsman of the 23d Iowa, and myself were ordered to prepare to charge the "Rebel Works." They consisted of water in front of earth works and trees cut down and the limbs cut pointed, requiring slow work to separate the pointed limbs, wade the creek and mount the earth works. Colonel Kinsman, myself, my adjutant Howard and Sergeant Moore, the latter a Methodist Clergyman, were consulting as to the plans of the charge, Colonel Kinsman to the right and my Regiment to the left. Before we four separated, Sergeant Moore gently struck up the tune of Old Hundred, "Be Thou O God Exalted High" and all of us, quartett, joined, my Adjutant Howard, a broad chested young man with a grand old bass, all singing tenderly. It was one of the most impressive and solemn scenes of my life time, but sadder things were to follow. Before I gave the order to charge the works, Sergeant Moore was shot in the neck and lay dead. In ten minutes our commands were struggling for the capture of the Works. In less than an hour Col. Kinsman, Adjutant Howard and myself lay near each other under the care of the surgeons. Both Col. Kinsman and Adjutant Howard died before morning . . . It is like yesterday to me . . .